

Workshop Manual

Audi Q3 2012 ➤
Audi Q3 China 2013 ➤

Heating, air conditioning

Edition 06.2016



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List of Workshop Manual Repair Groups

Repair Group

00 - Technical data

80 - Heating

87 - Air conditioning system



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

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00 – Technical data

1 General notes

(ARL004625; Edition 06.2016)

⇒ [“1.1 Type plates”, page 1](#)

⇒ [“1.2 Notes on odours in vehicles with air conditioner”, page 3](#)

⇒ [“1.3 Seat heating”, page 5](#)

⇒ [“1.4 Heated rear window”, page 9](#)

⇒ [“1.5 Radiator fan”, page 12](#)

⇒ [“1.6 Ambient temperature indicator G106”, page 13](#)

⇒ [“1.7 Checking pressure signal from high-pressure sender G65”, page 13](#)

1.1 Type plates

The type plate indicating the type of refrigerant and the refrigerant capacity is located on the lock carrier cover.

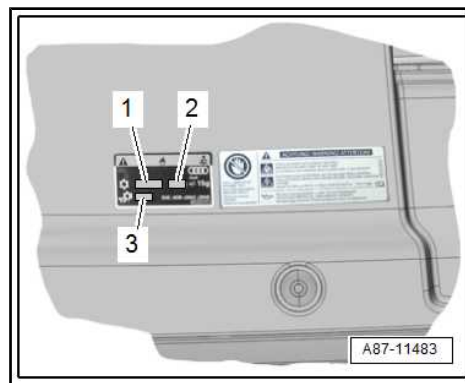


Note

- ◆ *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 conditioner with refrigerant R1234yf - General notes; 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 ⇒ “4 Technical data”, page 60, ⇒ 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.*

Version "1"

- 1 - 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 notes on air conditioning systems ("Refrigerant R134a", "Environmental aspects for refrigerant R134a"), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical and physical principles .
- 2 - Refrigerant capacity
- 3 - Refrigerant oil designation, in this case PAG oil (for further information, refer to
⇒ ["4.2 Approved refrigerant oils and refrigerant oil capacities", page 62](#)).



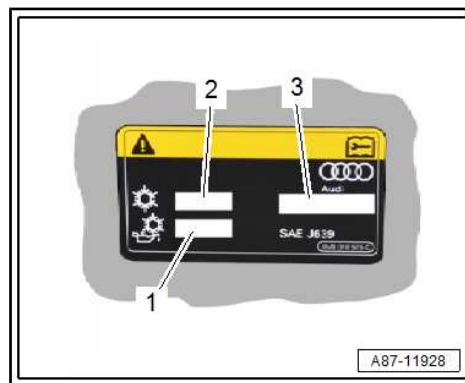
Note

- ◆ 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
⇒ ["4 Technical data", page 60](#) , and ⇒ *Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data* .

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Version "2"

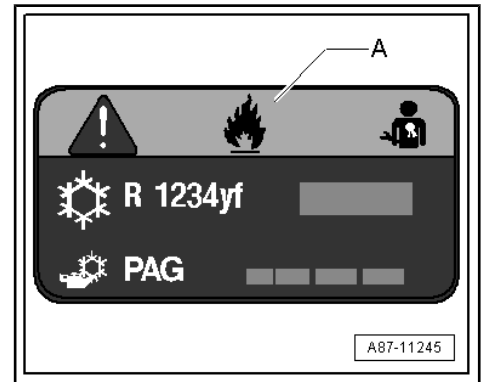
- 1 - Refrigerant oil designation, in this case PAG oil (for further information, refer to
⇒ ["4.2 Approved refrigerant oils and refrigerant oil capacities", page 62](#)).
- 2 - Refrigerant designation, e.g. R134a or R1234yf (depending on production date and version). Depending on the type plate version 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 notes on air conditioning systems ("Refrigerant R134a", "Environmental aspects for refrigerant R134a"), 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* .
- ◆ Capacities for refrigerant R1234yf, refrigerant oil and approved refrigerant oils ⇒ ["4 Technical data", page 60](#) and
⇒ ["4.1.2 Capacities for refrigerant R1234yf", page 61](#) .

Version "3"



1.2 Notes on odours in vehicles with air conditioner

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



Note

On the Audi Q3, an evaporator is also installed in the heater, but has no function. If odours occur in the evaporator installed in the heater, clean the heater (evaporator) using the same procedure as for the air conditioning unit in vehicles with air conditioner.

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 cover is damaged or not installed properly. – Check fresh air intake of air conditioning unit ⇒ page 246 ◆ Deposits (leaves, pine needles etc) may have accumulated in plenum chamber. – Check plenum chamber for deposits ⇒ page 246 . ◆ Water may not be able to drain out of plenum chamber. – Check water drains ⇒ page 246 .

Type of odour	Possible cause and remedy
Odour from air conditioning unit	◆ Too much water condensation in air conditioning unit – Check condensation drain ➔ page 227 . ◆ Old or severely contaminated dust and pollen filter – Check dust and pollen filter ➔ page 215 . ◆ Deposits on evaporator fins – Clean evaporator ➔ page 195 .



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" sub-menu. 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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1.3 Seat heating

⇒ "1.3.1 Vehicles with manually controlled air conditioner (heater without air conditioner)", page 5

⇒ "1.3.2 Vehicles with automatically controlled air conditioner", page 6

1.3.1 Vehicles with manually controlled air conditioner (heater without air conditioner)

Components involved in activation of seat heating

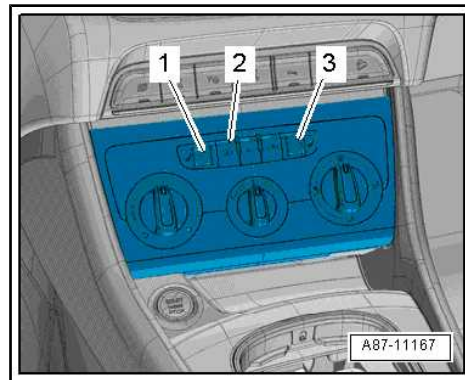
The operating unit (air conditioning system control unit - J301- / heater control unit - J65-) does not activate the seat heating directly. Depending on the setting of the heated driver seat regulator - E94- and heated front passenger seat regulator - E95- , - J301- (-J65-) uses voltage signals to transmit the request for activation of the seat heating to the heated front seats control unit - J774- . -J774- then activates the seat heating ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.



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Procedure

- The seat heating setting is selected using the knurled wheels -1, 3- on the operating unit (air conditioning system control unit - J301- / heater control unit - J65-).
- ◆ On vehicles with a start/stop system, the seat heating might be deactivated (by the onboard supply control unit - J519-) 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 (-J301- / -J65-). The seat heating is switched on again after the engine is restarted via the start function ⇒ Vehicle diagnostic tester ("Guided Fault Finding" function for onboard supply control unit - J519-).
- ◆ Depending on the vehicle, the selected setting for the seat heating may be reduced automatically by -J774- by one stage after a certain period of time (e.g. 10 minutes) has elapsed ⇒ Owner's Manual .



Note

- ◆ *The seat heating setting is selected on -J301- (-J65-) via -E94- and -E95-. This setting is transmitted to the heated front seats control unit - J774-. The specified temperatures for the different seat heating settings are stored in -J774-. Depending on the version of -J774-, the specified seat heating temperature may therefore differ although the setting is the same on the operating unit (-J301- / -J65-) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
 - ◆ *No diagnosis is provided for activation of the seat heating in -J301- (-J65-) and -J774- .*
 - ◆ *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 not stored as faults in -J301- (-J65-) or -J774- .*
 - ◆ *For example, however, if the voltage measured at terminal "30" of the onboard supply control unit - J519- falls below a value stored in -J519- , the seat heating output is reduced or deactivated completely to relieve the load on the alternator - C- ⇒ Vehicle diagnostic tester in the "Guided Fault Finding" function of -J519- .*
- Checking operation of seat heating and servicing ⇒ General body repairs, interior; Rep. gr. 74 ; Covers and padding on front seats; Overview - seat heating element and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

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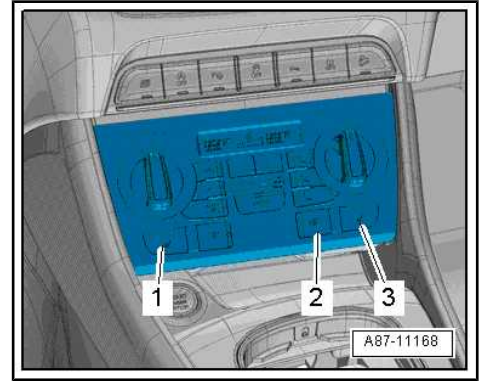
1.3.2 Vehicles with automatically controlled air conditioner

Components involved in activation of seat heating

The operating unit (Climatronic control unit - J255-) activates the seat heating directly ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Procedure

- The seat heating setting is selected using buttons -1, 3- on the operating unit (Climatronic control unit - J255-).
- The function indicator lamps in the buttons light when seat heating is switched on ⇒ Owner's Manual .
- ◆ On vehicles with a start/stop system, the seat heating might be deactivated 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 (Climatronic control unit - J255-). The seat heating is switched on again after the engine has been re-started via the start function ⇒ Vehicle diagnostic tester ("Guided Fault Finding")
- ◆ The heating setting for the driver's seat can be stored in -J255- for a specific key. The settings selected before switching off the ignition are then used the next time the vehicle is driven ⇒ Owner's Manual .
- ◆ On vehicles with no seat occupied sensor for the front passenger seat and the rear seats, the seat heating is currently not deactivated automatically by -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 .
- ◆ Depending on the vehicle, -J255- may reduce the selected setting for the seat heating automatically by one stage after a certain period of time (e.g. 10 minutes) has elapsed ⇒ Owner's Manual .



**Note**

- ◆ *The seat heating setting is selected on -J255-. The specified temperatures for the different seat heating settings are stored in -J255-. Depending on the version of -J255-, 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.*
- ◆ *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 (Climatronic control unit - 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").*
- ◆ *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 the Climatronic control unit - J255- (depending on the vehicle equipment and the version of the vehicle). 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 operating unit (Climatronic control unit - 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-).*
- ◆ *The procedure for checking the activation of the seat heating is described in ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ◆ *If, for example, the voltage measured at terminal "30" of the onboard supply control unit - J519- falls below a value stored in -J519-, the seat heating output is reduced or deactivated completely to relieve the load on the alternator - C- ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ◆ *The "Read measured values" function of the Guided Fault Finding routine for the operating unit (Climatronic control unit - 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 ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*

1.4 Heated rear window

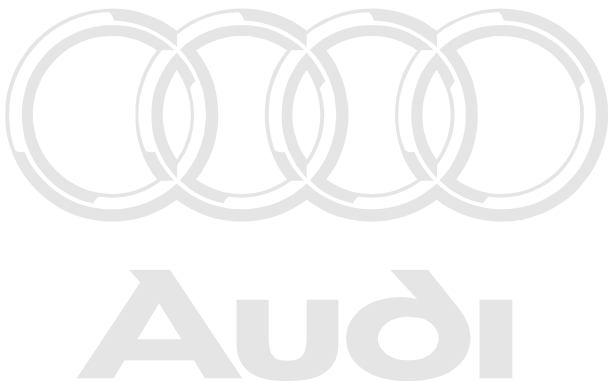
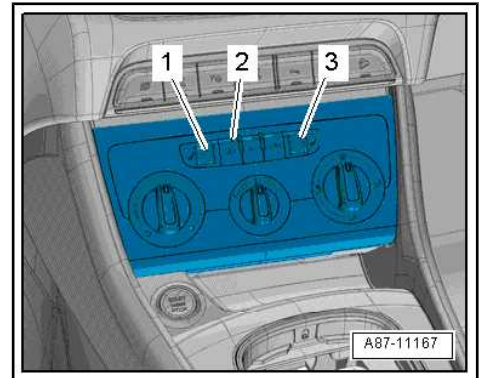
⇒ “1.4.1 Checking heated rear window Z1 , vehicles with manually controlled air conditioner (heater without air conditioner)”, page 9

⇒ “1.4.2 Checking heated rear window Z1 , vehicles with automatically controlled air conditioner”, page 11

1.4.1 Checking heated rear window - Z1- , vehicles with manually controlled air conditioner (heater without air conditioner)

Procedure

The heated rear window is switched on via button -2- on the operating unit (air conditioning system control unit - J301- / heater control unit - J65-).



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**Note**

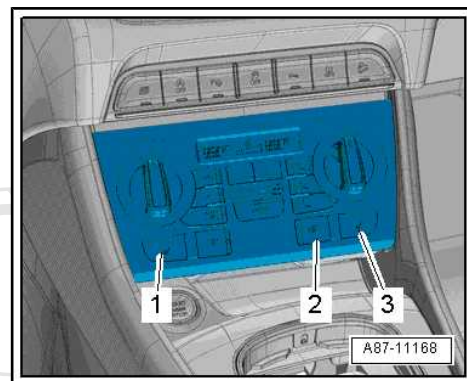
- ◆ *When button -2- is pressed with the ignition switched on, the onboard supply control unit - J519- is activated by the operating unit (air conditioning system control unit - J301- / heater control unit - J65-) via the data bus. As soon as -J519- switches the rear window heating on (only with engine 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 and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- ◆ *If the voltage measured at -J519- at terminal "30" drops below a value stored in -J519- or the operating unit (-J301- / -J65-), the rear window heating is deactivated completely (or the power is reduced). The load on the alternator - C- is then reduced ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ◆ *-Z1- is only activated by -J519- when the engine is running. When the engine is stopped, there is no activation and no feedback from -J519- ; the LED in button -2- does not light up or goes out again shortly after it is pressed ⇒ Owner's Manual and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- ◆ *If -Z1- has to be shut off due to undervoltage, the indicator lamp in button -2- for rear window heating in the operating unit -J301- (-J65-) stays on. However, should the shut-off last longer, -J519- switches off the indicator lamp.*
- ◆ *The "Read measured values" function of the Guided Fault Finding routine for the operating unit -J301- (-J65-) 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").*
- ◆ *The procedure for checking the actuation of the rear window heating is described in ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ◆ *-Z1- is switched off automatically by -J519- at ambient temperatures above 0 °C after the operating time stored in -J519- (approx. 10 minutes).*
- ◆ *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 (approx. 10 minutes) stored in -J519- .*
- ◆ *On vehicles with a start/stop system, the rear window heating might be deactivated 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 after the engine has been re-started via the start function ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*

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1.4.2 Checking heated rear window - Z1- , vehicles with automatically controlled air conditioner

Procedure

The heated rear window is switched on via button -2- on the operating unit (Climatronic control unit - J255-).



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**Note**

- ◆ *When button -2- is pressed with the ignition switched on, the onboard supply control unit - J519- is activated by the operating unit (Climatronic control unit - J255-) via the data bus. As soon as -J519- switches the rear window heating on (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 button -2- again and switching off the ignition ⇒ Owner's Manual and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- ◆ *Situations preventing the rear window heating from being switched on (short circuit in connection to rear window, open circuit in power supply to operating unit (Climatronic control unit - J255-) or to onboard supply control unit - J519-) are stored as faults in the corresponding control unit ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ◆ *If the voltage measured at the onboard supply control unit - J519- at terminal "30" drops below a value stored in the -J519-, the rear window heating is deactivated completely (or the power is reduced). The load on the alternator - C- is then reduced ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ◆ *The rear window heating is only actuated by the -J519- when the engine is running. With the engine stopped, there is no feedback from the -J519- and the LED in button -2- of -J255- goes out again shortly after the button is pressed.*
- ◆ *If the activation of -Z1- has to be shut off due to undervoltage, the indicator lamp in the button for rear window heating in -J255- stays on. However, if deactivation lasts longer than approx. 150 seconds -J255- switches off the indicator lamp.*
- ◆ *The "Read measured values" function of the Guided Fault Finding routine for the operating unit (Climatronic control unit - J255-) indicates that the rear window heating is switched on or why there is no actuation although there is a corresponding request ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ◆ *The procedure for checking the actuation of the rear window heating is described in ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ◆ *-Z1- is switched off automatically by -J519- at ambient temperatures above 0 °C after the operating time stored in -J519- (approx. 10 minutes).*
- ◆ *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 (approx. 10 minutes) stored in -J519- .*
- ◆ *On vehicles with a start/stop system, the rear window heating might be deactivated 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 after the engine has been re-started via the start function ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*

1.5 Radiator fan

- ◆ Different versions ⇒ Electronic parts catalogue
- ◆ The request for activation in air conditioning mode (to cool the condenser) is transmitted by the operating unit (Climatronic control unit - J255- or air conditioning system control unit - J301-) to the engine control unit via the data bus. The engine

control unit then activates the fan(s) (-V7- and -V177-) directly or via the radiator fan control unit - J293- ⇒ Rep. gr. 19 ; Radiator/radiator fans; Removing and installing radiator and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

- ◆ To check activation of the radiator fans by -J255-, refer to ⇒ Vehicle diagnostic tester ("Guided Fault Finding")
- ◆ The corresponding engine control unit switches -V7- and -V177- (either directly or via the radiator fan control unit - J293-) to the desired output (depending on engine type) ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

1.6 Ambient temperature indicator - G106-

- ◆ Part of control unit in dash panel insert - J285- ⇒ Electrical system; Rep. gr. 90 ; Dash panel insert; Exploded view - dash panel insert
- ◆ If an incorrect temperature is displayed, check the measured value of the ambient temperature sensor - G17- ⇒ Vehicle diagnostic tester ("Guided Fault Finding", air conditioner, instrument cluster "Read measured values").



Note

An incorrect measured value for ambient temperature sensor - G17- may lead to problems with air conditioner control. If the ambient temperature is too low, the operating unit (Climatronic control unit - J255- or air conditioning system control unit - J301-) does not activate the air conditioner compressor ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

1.7 Checking pressure signal from high-pressure sender - G65-



Note

- ◆ *The cooling output cannot be checked when the high-pressure sender - G65- is removed; the operating unit (Climatronic control unit - J255- / air conditioning system control unit - J301-) does not switch on the air conditioner compressor. "Read measured values" ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*

- ◆ *After the air conditioner compressor is switched off, it might take a relatively long period on this vehicle before the pressure in the high-pressure side drops (the expansion valve is cold and the pressure in the low-pressure side increases rapidly after the compressor is switched off, the expansion valve is closed and the refrigerant can flow to the low-pressure side only slowly).*

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Test sequence

- Unplug electrical connector -A-.

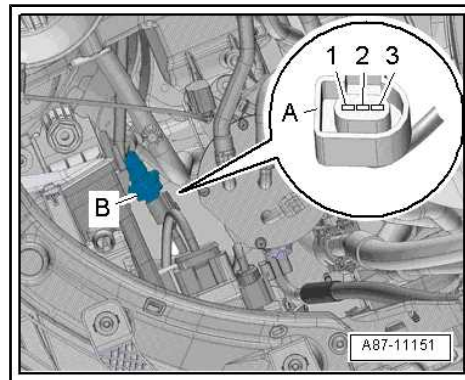
Assignment of 3-pin connector at high-pressure sender - G65-

- 1 - Earth
- 2 - Signal output - square-wave signal to air conditioner operating unit (Climatronic control unit - J255- / air conditioning system control unit - J301-)
- 3 - Terminal "75" (positive)



Note

- ◆ *The air conditioner compressor is not switched on if the connector is unplugged.*
- ◆ *The high-pressure sender - G65- -item B- is an electronic control unit which generates a square-wave signal with a ratio which varies with the pressure in the refrigerant circuit.*



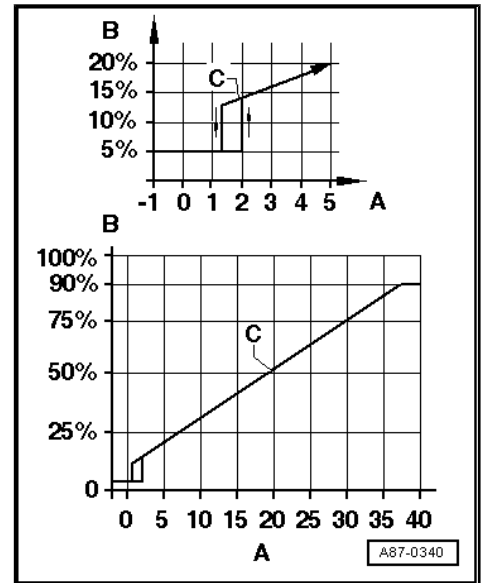
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Pressure signal from high-pressure sender - G65-

A - Pressure on high-pressure side of refrigerant circuit in bar (absolute pressure)

B - Duty cycle of square-wave signal

C - Characteristic curve for duty cycle of square-wave signal



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**Note**

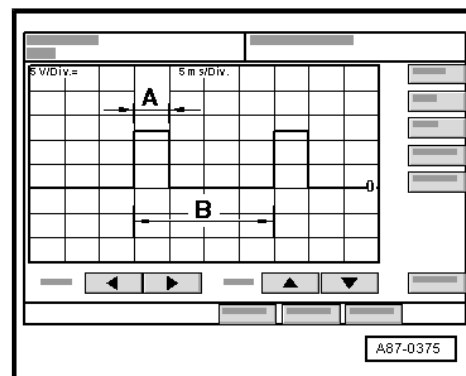
- ◆ *As soon as there is no air conditioner compressor shut-off criterion, the operating unit (Climatronic control unit - J255- / air conditioning system control unit - J301-) switches on the air conditioner compressor (by activating the air conditioner compressor regulating valve - N280-) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ◆ *If no other shut-off criterion is active, the air conditioner operating unit switches on the air conditioner compressor if the duty cycle is above approx. 12 % (corresponding to approx. 1.2 bar absolute) and below approx. 78 % (corresponding to approx. 3.2 bar absolute).*
- ◆ *If the duty cycle is above 12 % (equivalent to approx. 1.2 bar absolute pressure) and below 78 % (equivalent to approx. 3.2 bar absolute pressure).*
- ◆ *If the duty cycle is below 12 % or over 78 %, the air conditioner compressor is not switched on (-N280- is not activated).*
- ◆ *The duty cycle and the pressure calculated by the operating unit (-J255- / -J301-) are displayed as a measured value ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ◆ *On the absolute pressure scale, 0 bar corresponds to an absolute vacuum. Normal ambient pressure thus corresponds to an absolute pressure of roughly 1 bar. On the scales of most pressure gauges, 0 bar corresponds to an absolute pressure of 1 bar (can be seen from "-1" mark below "0").*
- ◆ *Depending on the pressure calculated in the refrigerant circuit with the air conditioner compressor activated, the operating unit (-J255- / -J301-) transmits a request for increased speed of the radiator fan -V7- via the data bus to the engine control unit, which activates -V7- directly or via the radiator fan control unit - J293- (depending on the version, at a certain pressure in the refrigerant circuit or as soon as the compressor is switched on regardless of the pressure). The request determined by the operating unit (-J255- / -J301-) is displayed as a measured value ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ◆ *Currently, the request for activation of the radiator fan -V7- is only transmitted on the data bus system by the air conditioner operating unit (-J255- / -J301-) above a specific pressure in the refrigerant circuit. If the pressure in the refrigerant circuit is above approx. 9 bar (6 bar if the pressure was previously above 9 bar) and below approx. 20 bar, between 30 and 100% is requested depending on the pressure.*
- ◆ *If the pressure in the refrigerant circuit is less than approx. 9 bar (6 bar if the pressure was previously more than 9 bar), activation of the radiator fan -V7- is currently not requested by the air conditioner operating unit (-J255- / -J301-).*
- ◆ *If the pressure in the refrigerant circuit is more than approx. 20 bar, 100% activation of the radiator fan -V7- is currently requested by the air conditioner operating unit (-J255- / -J301-); however, the actual activation may be less than 100% depending on the version of the engine control unit/radiator fan control unit - J293-.*

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- ◆ The signal generated by the high-pressure sender - G65- is also used for engine control. The operating unit (-J255- / -J301-) transmits the information via the data bus system to the engine control unit (the torque required for driving the air conditioner compressor depends on the pressure in the refrigerant circuit). Depending on the version of the engine control unit, the signal is displayed as a duty cycle under "Read measured values" (for the respective engine control unit installed) ⇒ Vehicle diagnostic tester.

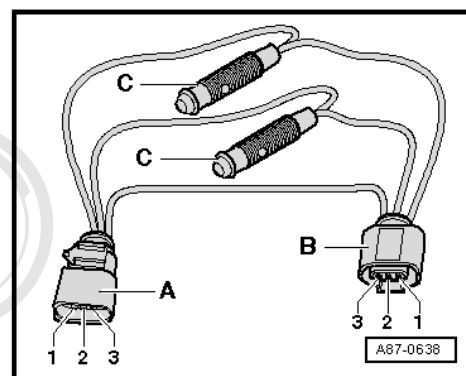
This pattern will appear on the screen of an oscilloscope (e.g. vehicle diagnostic tester) if the following conditions are met:

- Ignition on (positive at contact "3" and earth at contact "1" of high-pressure sender - G65-)
- Oscilloscope setting: 5 V/div. = (5 V DC per unit), 5 ms/div. (5 milliseconds per unit)
- Test lead (signal wire) connected to contact "2" at high-pressure sender - G65-
- Test lead (screen) connected to contact "1" (earth at high-pressure sender - G65-)



Note

- ◆ The illustration shows the signal transmitted at a pressure of approx. 7 bar in the refrigerant circuit, corresponding to a duty cycle of approx. 25 % (occurs when air conditioner compressor is not running, ambient temperature is 30 °C and refrigerant circuit is charged).
- ◆ Pulse width -A- depends on the pressure in the refrigerant circuit (area -A- becomes broader as the pressure increases).
- ◆ The signal distance -B- is always 20 milliseconds (corresponding to a frequency of 50 Hertz).
- ◆ The duty cycle is derived from the ratio of pulse width -A- to signal distance -B-.
- ◆ For this test you can use e.g. test leads from the auxiliary measuring set - V.A.G 1594C- or an improvised adapter lead. For this, use one connector -A- and -B- each (with part number 1J0 973 703 and 1J0 973 803 and the corresponding plug contacts ⇒ Electronic parts catalogue), two commercially available sockets for banana plugs -C- and three wires with a cross section of 0.5 mm² for example.



2 Safety precautions

⇒ [“2.1 Safety precautions when handling refrigerants”, page 18](#)

⇒ [“2.2 Safety precautions when working on vehicles with start/stop system”, page 20](#)

⇒ [“2.3 Safety precautions when using testers and measuring instruments during a road test”, page 20](#)

⇒ [“2.4 Safety precautions when working on the cooling system”, page 21](#)

2.1 Safety precautions when handling refrigerants

The components and piping system of the air conditioner are filled with the following refrigerant:



Note

For vehicles manufactured up to week 22/2016, the air conditioning system is charged with refrigerant R134a. For vehicles manufactured from week 22/2016 onwards, the air conditioning system is charged with refrigerant R134a or R1234yf, depending on the version ⇒ [“1.1 Type plates”, page 1](#) , and ⇒ [“4 Technical data”, page 60](#) .

Refrigerant R134a

1.1.1 2-tetrafluoroethane ($\text{CF}_3\text{-CH}_2\text{F}$ or $\text{CH}_2\text{F-CF}_3$)

This refrigerant is currently known in Germany by the trade names R134a, H-FKW 134a, SUVA 134a and KLEA 134a (other trade names may be used in other countries).

Refrigerant R1234yf

2,3,3,3-tetrafluoropropene ($\text{C}_3\text{H}_2\text{F}_4$ or $\text{CF}_3\text{CF}=\text{CH}_2$)

This refrigerant is currently known in Germany by the trade names R1234yf, HFO 1234yf, Opteon 1234yf etc. (other trade names may be used in other countries).



WARNING

Refrigerant R1234yf is a gas which is flammable in a particular concentration in the air (flammability limits of 6.2% and 12.3% by volume of air).

- ◆ **Static electricity, sparks from tools (e.g. against a hard surface), hot surfaces and open flame can cause the mixture of refrigerant R1234yf and air to ignite.**
- ◆ **Risk of explosion if refrigerant gas mixes with air in the vicinity of an ignition source.**
- ◆ **Keep ignition sources of any kind away from pressurised containers and equipment associated with refrigerant R1234yf.**
- ◆ **Ensure good ventilation when handling refrigerant and working on the refrigerant circuit (exchange of air at least once per hour in workshops and 3 times per hour in low-level areas (e.g. inspection pits)).**

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Both types of refrigerant

In Germany, observe the following safety measures for this refrigerant (additional regulations may apply in other countries).



Caution

Refrigerant is a potential health hazard!

- ◆ **Before performing repair work on an open refrigerant circuit, discharge 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 .**
- ◆ **Always perform work on the refrigerant circuit in well ventilated areas. Make sure that there are no inspection pits, open shafts or cellar entrances within a radius of 5 metres.**



WARNING

Danger of asphyxiation, frostbite and poisoning from escaping refrigerant.

- ◆ **Switch on the exhaust gas extraction system.**
- ◆ **Escaping refrigerant is colourless, odourless and heavier than air (it displaces oxygen). Should refrigerant gas escape, this can result in an imperceptible danger of asphyxiation in poorly ventilated areas and inspection pits.**

Risk of dry coughing and nausea caused by toxic chemical decomposition products of refrigerant gas.

- ◆ **Smoking, welding, soldering and brazing are not permitted in areas exposed to refrigerant. The high temperature of a naked flame or hot objects causes decomposition of refrigerant gas. The resultant decomposition products are toxic.**

Risk of eye injuries!

- ◆ **Keep an eye-bath to hand.**
- ◆ **Should liquid refrigerant come into contact with your eyes, rinse them thoroughly with water for about 15 minutes.**
- ◆ **Then apply eye drops and consult a doctor immediately, even if you do not experience any pain in the eyes.**
- ◆ **Always inform the doctor of the type of refrigerant involved.**

Intensive exposure to refrigerant would cause frostbite on unprotected parts of the body. All contact with liquid refrigerant or refrigerant vapours should be avoided.

- ◆ **Wear rubber gloves to protect your hands.**
- ◆ **Wear safety goggles to protect your eyes.**
- ◆ **Should liquid refrigerant come into contact with other parts of the body, rinse these thoroughly with cold water for about 15 minutes.**

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**WARNING**

Danger from escaping pressurised refrigerant.

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.*

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

**WARNING**

Injury risk due to automatic engine start (vehicles with start/stop system).

- ◆ *On vehicles with an activated start/stop system (indicated by a message in the instrument cluster display), the engine may start automatically on demand.*
- ◆ *Therefore, please make sure that the start/stop system is deactivated when performing repair work on the vehicle (switch off the ignition, and switch it on again if required).*

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

If using testers and measuring instruments during a road test, please note the following:

**WARNING**

Accidents can be caused if the driver is distracted by test equipment, or if test equipment is not properly secured.

Injuries can also be caused if the passenger airbag is triggered in a collision.

- *The use of test equipment while driving causes distraction.*
- *There is an increased risk of injury if test equipment is not secured.*
- ◆ *Testers and measuring instruments should always be secured on the rear seat with a strap and should be operated by a second person sitting in the rear.*

2.4 Safety precautions when working on the cooling system

Note the following when working on the cooling system:



WARNING

Danger of scalding from hot steam or hot coolant.

- ◆ *The cooling system is pressurised. When the engine is warm, the coolant temperature may be above 90 °C.*
- ◆ *Release pressure and wait for temperature to drop before starting work on the cooling system → Engine, mechanics; Rep. gr. 00; Safety precautions; Safety precautions when working on the cooling system .*
- ◆ *Release pressure in the coolant circuit by opening the cap on the coolant expansion tank → Rep. gr. 19; Cooling system/coolant; Draining and filling cooling system .*



Caution

Risk of overheating if cap is not fitted properly.

- ◆ *You must feel and hear cap engage when closing it.*

3 Repair instructions

- ⇒ [“3.1 Rules for cleanliness”, page 22](#)
- ⇒ [“3.2 General notes”, page 22](#)
- ⇒ [“3.3 General repair instructions”, page 23](#)
- ⇒ [“3.4 Contact corrosion”, page 24](#)
- ⇒ [“3.5 Routing and attaching pipes and wiring”, page 24](#)
- ⇒ [“3.6 Installing radiators and condensers”, page 24](#)
- ⇒ [“3.7 Checking heating output”, page 25](#)
- ⇒ [“3.8 Checking cooling output”, page 34](#)
- ⇒ [“3.9 Discharging refrigerant circuit”, page 49](#)
- ⇒ [“3.10 Working on refrigerant circuit”, page 50](#)
- ⇒ [“3.11 Notes on general repairs”, page 51](#)
- ⇒ [“3.12 Paint repairs on vehicles with air conditioning system”, page 53](#)
- ⇒ [“3.13 Refrigerant circuit seals”, page 53](#)
- ⇒ [“3.14 Notes on control motors”, page 54](#)
- ⇒ [“3.15 Notes on dust and pollen filter”, page 59](#)

3.1 Rules for cleanliness

Even slight soiling can lead to malfunctions. 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 parts that have been removed on a clean surface and cover them over (do not use fluffy 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 connectors against dirt and moisture and always make sure they are dry before plugging them in again.

3.2 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 1](#) .
- ◆ 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 notes on air conditioning systems , and ⇒ Air conditioner with refrigerant R1234yf - General notes, Rep. gr. 00 .
Repair instructions; Refrigerant and refrigerant oil

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3.3 General repair instructions



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:

- ◆ If this is required by the safety precautions (⇒ [page 18](#)).
- ◆ 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

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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 (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), and ⇒ Air conditioner with refrigerant R1234yf - General notes; 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 notes on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations .

3.4 Contact corrosion

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

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

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

If you are not sure whether parts are suitable, always use new parts ⇒ Electronic parts catalogue .

Please note:

- ◆ We recommend the use of genuine replacement parts only, as these have been tested and are compatible with aluminium.
- ◆ We recommend using Audi accessories.
- ◆ Damage caused by contact corrosion is not covered by warranty.

3.5 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.

3.6 Installing radiators and condensers

- ◆ Even if fitted correctly, there may be slight pressure marks on the radiator and condenser fins. This, however, does not mean that the radiators and condensers are damaged; they do not need to be renewed if such minor marks are noticed.
- ◆ 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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3.7 Checking heating output

⇒ [“3.7.1 Checking heating output”, page 25](#)

⇒ [“3.7.2 Checking heating output - heating without air conditioner”, page 26](#)

⇒ [“3.7.3 Checking heating output - manually controlled air conditioner”, page 29](#)

⇒ [“3.7.4 Checking heating output - automatically controlled air conditioner”, page 30](#)

3.7.1 Checking heating output



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)
- 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

- 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 ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .

**Note**

- ◆ *On vehicles with start/stop function and a manually controlled air conditioner (with heater and without air conditioner), the stop function may be disabled depending on the setting on the operating unit (air conditioning system control unit - J301- / heater control unit - J65-), 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 -J301- (-J65-).*
- ◆ *On vehicles with a start/stop system and an automatically controlled air conditioner, 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.*
- ◆ *On vehicles with start/stop system, no additional coolant pump is currently installed for the start/stop function. However, depending on the vehicle's engine, an electric coolant pump (activated by the engine control unit) may be installed ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - electric coolant pump and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- ◆ *Depending on the engine version, a continued coolant circulation pump - V51- / auxiliary pump for heating - V488- (different designations depending on engine version) may be fitted to assist the engine coolant pump ⇒ 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.*

3.7.2 Checking heating output - heating without air conditioner

Test requirements

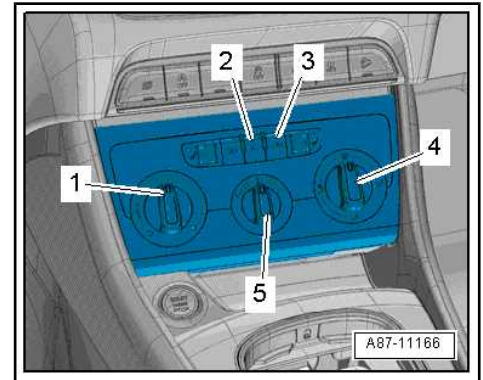
- Coolant circuit bled as specified ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and adding coolant .
- All air ducts, covers and seals OK and properly installed.
- Air flow in dust and pollen filter not impaired by dirt; checking ⇒ ["5.11 Removing and installing dust and pollen filter", page 215](#) .
- Temperature flap control motor - V68- and corresponding flaps reach their end position; checking ⇒ Vehicle diagnostic tester ("Guided Fault Finding")
- Vehicle not exposed to sunlight.
- Engine warm
- Event memory of operating unit (heater control unit - J65-) interrogated and erased, basic setting performed in ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

Checking

Note

*This illustration shows an operating unit from the manually controlled air conditioner (air conditioning system control unit - J301-). The **A/C** button -2- is not installed on the heater control unit - J65- (on vehicles without air conditioner).*

- Close bonnet, doors, windows and sunroof.
- Open all dash panel vents.
- Start the engine and make the following settings on the operating unit:
- Set rotary temperature control -1- to “cold” stop.
- Operate heater (with engine running) at the “cold” setting for several minutes.
- Measure the ambient temperature in the windscreen area.
- Set rotary control -4- for air distribution to “Dash panel vents”.
- Set rotary control -5- for fresh air blower to speed “4”.
- Measure temperature of air emerging from dash panel vents (left and right) using a thermometer.



Specifications:

- If measured value of evaporator output temperature sender - G263- is being evaluated ⇒ Vehicle diagnostic tester (“Guided Fault Finding”), compare your measured values with the one displayed (from -G263-). The measured values must not be lower and after 5 minutes must be max. 5 °C higher than value of -G263- .
- If measured value of evaporator output temperature sender - G263- is not being evaluated ⇒ Vehicle diagnostic tester (“Guided Fault Finding”), the temperature of the air emerging from the dash panel vents (left and right) must have increased by a maximum of 15 °C compared with the previously measured ambient temperature after 5 minutes.

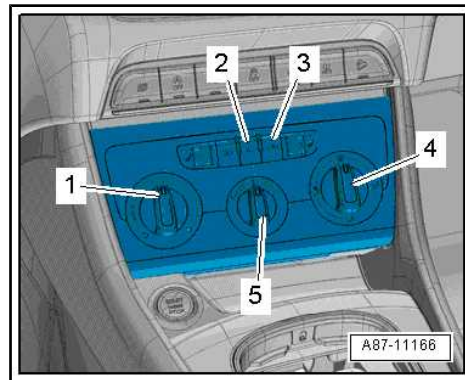
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- Set the highest possible temperature.
- Set rotary temperature control -1- to “warm” stop.
- Measure temperature of air emerging from dash panel vents (left and right) using a thermometer.

Specifications:

- Temperature increases to above 55 °C (with engine temperature of approx. 90 °C), difference between left and right side less than 8 °C.
- Set lowest possible temperature (rotary temperature control to “cold” stop).
- Measure temperature of air emerging from dash panel vents (left and right) using a thermometer.



Specifications:

- If measured value of evaporator output temperature sender - G263- is being evaluated ⇒ Vehicle diagnostic tester (“Guided Fault Finding”), compare your measured values with the one displayed (from -G263-). The measured values must not be lower and after 5 minutes must be max. 5 °C higher than value of -G263- .
- If measured value of evaporator output temperature sender - G263- is not being evaluated ⇒ Vehicle diagnostic tester (“Guided Fault Finding”), the temperature of the air emerging from the dash panel vents (left and right) must have increased by a maximum of 15 °C compared with the previously measured ambient temperature after 5 minutes.

Check the following if results do not match specifications:

- Bleeding of coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and adding coolant .
- Incorporation of heating system heat exchanger into coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram for coolant hoses .
- Foam seal at heat exchanger for heater ⇒ [page 219](#)
- Activation and operation of temperature flap control motor - V68- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- Operation of temperature flap in air distribution housing ⇒ [page 192](#) .
- Thermostat (engine coolant may not become properly warm if thermostat is defective) ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly .
- If fitted, operation of continued coolant circulation pump - V51- / auxiliary pump for heating - V488- (different designations depending on engine version) ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant .



Note

Depending on the engine version, a continued coolant circulation pump - V51- / auxiliary pump for heating - V488- (different designations depending on engine version) may be fitted to assist the engine coolant pump ⇒ 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.

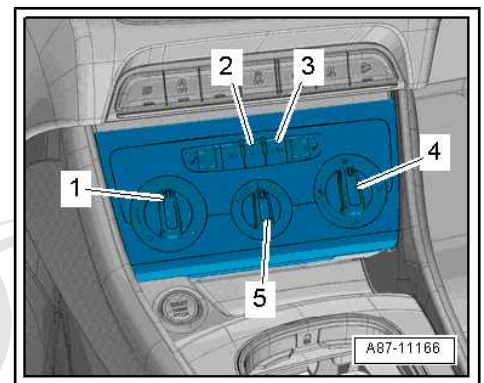
3.7.3 Checking heating output - manually controlled air conditioner

Test requirements

- Coolant circuit bled as specified ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and adding coolant .
- All air ducts, covers and seals OK and properly installed.
- Air flow in dust and pollen filter not impaired by dirt; checking ⇒ ["5.11 Removing and installing dust and pollen filter", page 215](#) .
-
- Cooling output of air conditioner checked and OK ⇒ [page 34](#)
- Vehicle not exposed to sunlight.
- Engine warm
- Event memory of operating unit (air conditioning system control unit - J301-) interrogated and erased, basic setting performed in "Guided Fault Finding" mode ⇒ Vehicle diagnostic tester.

Checking

- Close bonnet, doors, windows and sunroof.
- Open all dash panel vents.
- Start the engine and make the following settings on the operating unit:
 - Set rotary temperature control -1- to "cold" stop.
 - Air conditioner compressor on (lamp in **AC** or **A/C** button -2- on).
- With the engine running, operate the air conditioner for several minutes at maximum cooling output.
- Set rotary control -4- for air distribution to "Dash panel vents".
- Set rotary control -5- for fresh air blower to speed "4".
- Measure temperature of air emerging from dash panel vents (left and right) using a thermometer.
- Compare measured values to measured value displayed (for evaporator output temperature sender - G263-). The measured values must not be lower and after 5 minutes must be max. 3 °C higher than value of -G263-.



Specifications:

- Temperature max. 12 °C (depending on ambient temperature), difference between measured values less than 3 °C.

- Set the highest possible temperature.
- Set rotary temperature control -1- to “warm” stop.
- Measure temperature of air emerging from dash panel vents (left and right) using a thermometer.

Specifications:

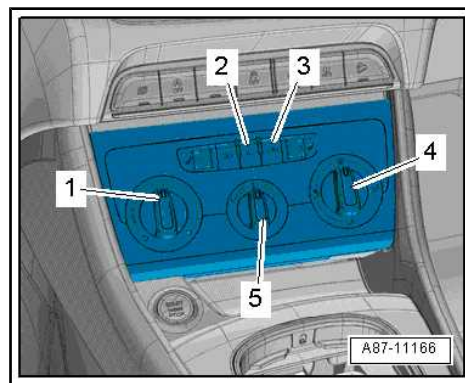
- Temperature increases to above 55 °C (with engine temperature of approx. 90 °C), difference between left and right side less than 8 °C.
- Set lowest possible temperature (rotary temperature control to “cold” stop).
- Measure temperature of air emerging from dash panel vents (left and right) using a thermometer.

Specifications:

- Temperature drops to less than 12 °C within 5 minutes (depending on ambient temperature).

Check the following if results do not match specifications:

- Bleeding of coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and adding coolant .
- Incorporation of heat exchanger for heater (in air conditioning unit) into coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .
- Foam seal at heat exchanger for heater of air conditioning unit ⇒ [page 219](#)
- Activation and operation of temperature flap control motor - V68- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- Operation of temperature flap in air distribution housing ⇒ [page 192](#) .
- Thermostat (engine coolant may not become properly warm if thermostat is defective) ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly .
- If fitted, operation of continued coolant circulation pump - V51- / auxiliary pump for heating - V488- (different designations depending on engine version) ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant .



Note

Depending on the engine version, a continued coolant circulation pump - V51- / auxiliary pump for heating - V488- (different designations depending on engine version) may be fitted to assist the engine coolant pump ⇒ 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.

3.7.4 Checking heating output - automatically controlled air conditioner

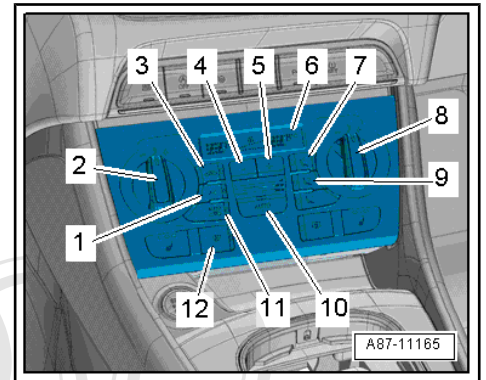
Test requirements

- Coolant circuit bled as specified ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and adding coolant .
- All air ducts, covers and seals OK and properly installed.

- Air flow through dust and pollen filter not impeded by dirt
⇒ [“5.11 Removing and installing dust and pollen filter”](#),
[page 215](#) .
- Cooling output of air conditioner checked and OK
⇒ [page 34](#) .
- Vehicle not exposed to sunlight.
- Engine warm
- Event memory of operating unit (Climatronic control unit - J255-) interrogated and erased, basic setting performed in “Guided Fault Finding” mode ⇒ Vehicle diagnostic tester.
- Encoding and adaption of operating unit (Climatronic control unit - J255-) in “Guided Fault Finding” mode ⇒ Vehicle diagnostic tester.

Checking

- Close bonnet, doors, windows and sunroof.
- Open all dash panel vents.
- Start the engine and make the following settings on the operating unit:
- Set temperature to “cold” using temperature selection switches -2, 8- – “LO” display for driver and front passenger side in display -6- of -J255- .
- Air conditioner compressor on (lamp in  or  button -1- on).
- Set air distribution to dash panel vents -9-.
- With the engine running, operate the air conditioner for several minutes at maximum cooling output.
- Read out measured values of vent temperature sender - G150- / -G151- in “Guided Fault Finding” mode ⇒ Vehicle diagnostic tester.
- Compare measured values on display.



Specifications:

- Temperature max. 12 °C (depending on ambient temperature), difference between measured values less than 3 °C.



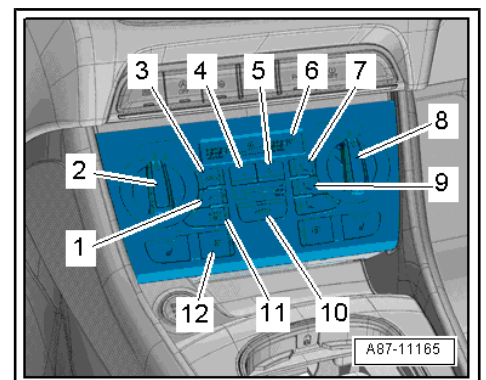
Note

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

- Set the highest possible temperature for the driver side.
- Set temperature to “warm” using switch -2-: “HI” display for driver side in display -6- of -J255- .
- Read measured values for vent temperature senders -G150- / -G151- .

Specifications:

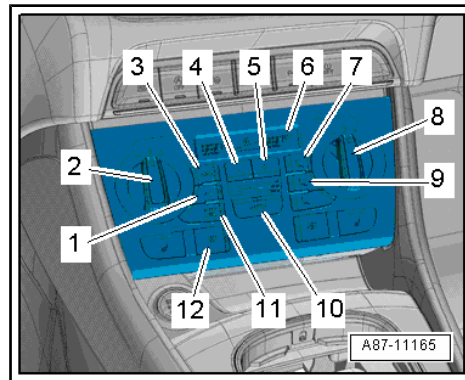
- In the display zone with the measured value for -G150- the temperature increases to a value above 55 °C (at an engine temperature of approx. 90 °C).
- In the display zone with the measured value for -G151- the temperature increases by less than 10 °C (at an engine temperature of approx. 90 °C).



- Set the highest possible temperature for the front passenger side.
- Set temperature to “warm” using switch -8-: “HI” display for front passenger side in display -6- of -J255- .
- Read measured values for vent temperature senders -G150- / -G151- .

Specifications:

- In the display zone with the measured value for -G151- the temperature increases to a value above 55 °C (at an engine temperature of approx. 90 °C).
- The difference between the display zones for the measured values for -G150- / -G151- should be less than 8 °C.



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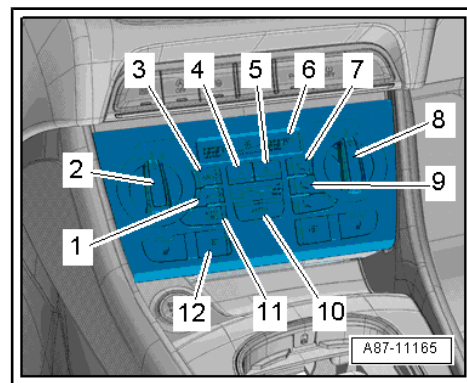
- Set the lowest possible temperature for the driver and front passenger side.
- Set temperature to “cold” using switches -2, 8- – “LO” display for driver and front passenger side in display -6- of -J255- .
- Read out measured values for -G150- / -G151- .

Specifications:

- The temperature drops within 5 minutes to less than 12 °C on the driver and front passenger side, depending on ambient temperature.

Check the following if results do not match specifications:

- Bleeding of coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and adding coolant .
- Incorporation of heat exchanger for heater (in air conditioning unit) into coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .
- Activation and operation of temperature flap control motor - V158- / -V159- , ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- Foam seal at heat exchanger for heater of air conditioning unit ⇒ [page 219](#)
- Operation of temperature flap in air distribution housing ⇒ [“6.2.2 Air intake and air outlet openings, heater and air conditioning unit”, page 234](#) .
- Thermostat (engine coolant may not become properly warm if thermostat is defective) ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly .
- If fitted, operation of continued coolant circulation pump - V51- / auxiliary pump for heating - V488- (different designations depending on engine version) ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant .



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Depending on the engine version, a continued coolant circulation pump - V51- / auxiliary pump for heating - V488- (different designations depending on engine version) may be fitted to assist the engine coolant pump ⇒ 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.

3.8 Checking cooling output

⇒ [“3.8.1 Checking cooling output”, page 34](#)

⇒ [“3.8.2 Requirements for checking cooling output of air conditioner”, page 34](#)

⇒ [“3.8.3 Checking cooling output - manually controlled air conditioner”, page 37](#) .

⇒ [“3.8.4 Checking cooling output - automatically controlled air conditioner”, page 42](#) .

⇒ [“3.8.5 Fault Finding if readout does not match specification”, page 46](#) .

⇒ [“3.8.6 Fault Finding if temperature increases downstream of evaporator”, page 47](#) .

⇒ [“3.8.7 Fault Finding if ice forms at evaporator”, page 48](#) .

3.8.1 Checking cooling output

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

- ♦ *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 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”).*

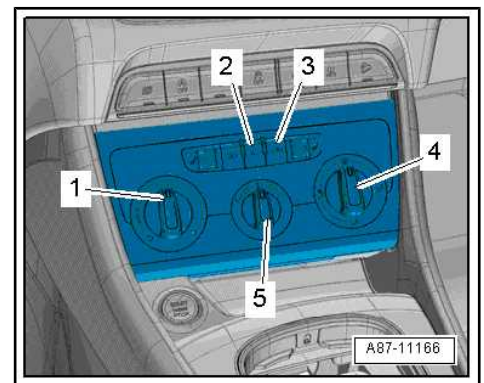
3.8.2 Requirements for checking cooling output of air conditioner

- 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
⇒ [page 133](#) .
- All air ducts, covers and seals OK and properly installed.
- Air flow through dust and pollen filter not impeded by dirt
⇒ [page 215](#) .
- Air intake of air conditioning unit (in fresh air and air recirculation mode) not impeded by dirt or retrofitted components.

- With glove box cooling, air duct for glove box cooling fitted as specified ⇒ [page 239](#) (if glove box cooling is not installed, connection for glove box cooling is closed off).
- Vehicle not exposed to direct sunlight
- Engine warm (coolant temperature above 80 °C).
- Event memory of operating unit (Climatronic control unit - J255- / air conditioning system control unit - J301-) interrogated and erased, basic setting performed and coding of -J255- checked ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- Adaption of -J255- checked ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- All dash panel vents and any vents in rear centre console open.
- With glove box cooling, vent for glove box cooling (in glove box) closed.
- Air outlet from rear footwell vents (beneath front seats) not obstructed by floor mats or other objects (check).
- Bonnet closed.
- Engine running.

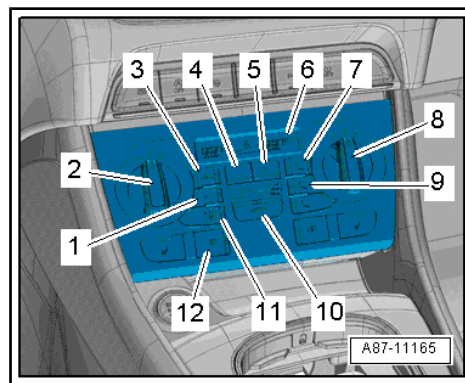
Make the following settings on the operating unit (air conditioning system control unit - J301-):

- Set rotary temperature control -1- to "cold" stop.
- Air conditioner compressor on (lamp in **AC** or **A/C** button -2- on).
- Air recirculation mode on (lamp in "Air recirculation" button -3- on).
- Set rotary control -5- for fresh air blower to speed "4".



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

- “Auto” mode - lamp in **AUTO** button -10- is on.
- Set temperature to “cold” using rotary controls -2, 8- – “LO” display for driver and front passenger side in display -6- of -J255- .
- Air conditioner compressor on (lamp in **AC** or **A/C** button -1- on).
- Setting for fresh air blower -5- “maximum speed” – on display of -J255- .



Note

- ◆ *Manual alteration of the fresh air blower speed causes the lamps in the **AUTO** buttons to go out.*
- ◆ *The maximum possible fresh air blower speed depends on several factors (electrical system voltage etc.).*

Functions with engine running:

- Radiator fan(s) (radiator fan - V7- and radiator fan 2 - V177-) running (activation and speed are governed by pressure in refrigerant circuit and engine temperature).



Note

- ◆ *Depending on the version of the operating unit (Climatronic control unit - J255-), the radiator fan(s) (radiator fan - V7- and radiator fan 2 - V177-) is/are only switched in when a certain pressure is exceeded in the refrigerant circuit (currently a pressure of approx. 9 bar upwards). 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.).

- Air conditioner switches to air recirculation mode (approx. 1 minute after engine is started, air flow / fresh air flap is closed and air recirculation flap is opened; air is drawn in from passenger compartment by fresh air blower underneath dash panel / behind glove box).

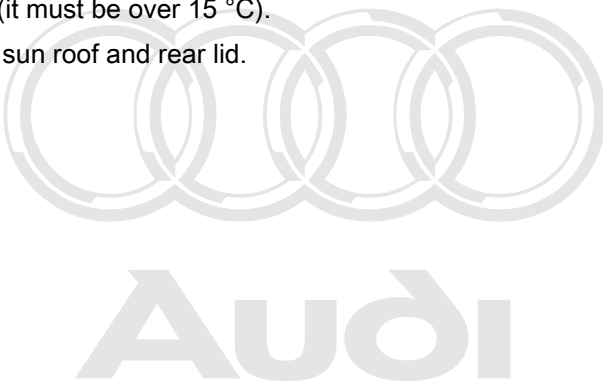
If one of these requirements is not met:

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

3.8.3 Checking cooling output - manually controlled air conditioner

Procedure

- ◆ Requirements for checking cooling output met ⇒ [page 34](#)
- Measure ambient temperature (it must be over 15 °C).
- Close doors, bonnet, windows, sun roof and rear lid.
- Open all dash panel vents.
- Start engine.

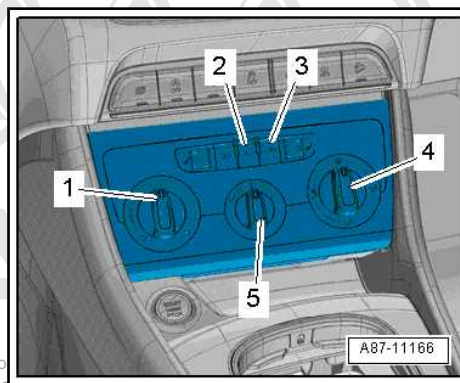


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- Switch air conditioner compressor off (lamp in **AC** or **A/C** button -2- does not light up).
- “Read measured values” in “Guided Fault Finding” mode for air conditioner ➔ Vehicle diagnostic tester.

Checking

- Read out activation of air conditioner compressor regulating valve - N280- .
- Activation of air conditioner compressor is switched off, display shows 0%.
- Read out measured value for high-pressure sender - G65-
- 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	4.0
20	5.0
25	6.0
30	7.0
35	8.0



Note

- ◆ *On the absolute pressure scale, 0 bar corresponds to an absolute vacuum. Normal ambient pressure thus corresponds to roughly 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 -J301-, 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 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.*

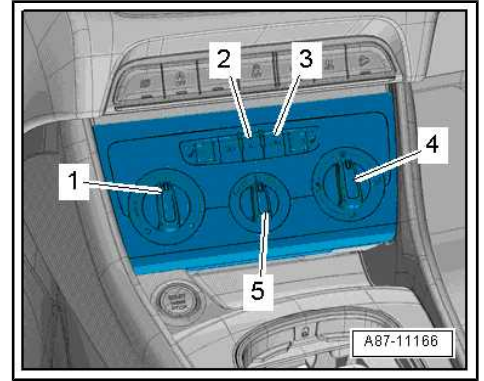
If the pressure displayed is lower than that given in the table:

- Check signal from high-pressure sender - G65- ➔ Vehicle diagnostic tester (“Guided Fault Finding”) and ➔ **“1.7 Checking pressure signal from high-pressure sender G65”, page 13** .
- If no fault is found at the high-pressure sender - G65- , there is not enough refrigerant in the circuit. 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 notes on air conditioning systems , or ➔ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations .

If pressure in refrigerant circuit is OK:

Make the following settings on the operating unit (air conditioning system control 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 -2- on).
- ◆ Air recirculation mode on (lamp in "Air recirculation" button -3- on).
- ◆ Set rotary control -5- for fresh air blower to speed “4”.
- “Read measured values” in “Guided Fault Finding” mode for air conditioner ⇒ Vehicle diagnostic tester.
- 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 with air conditioner compressor switched on.
 - Pressure indicated rises above value with air conditioner compressor switched off.



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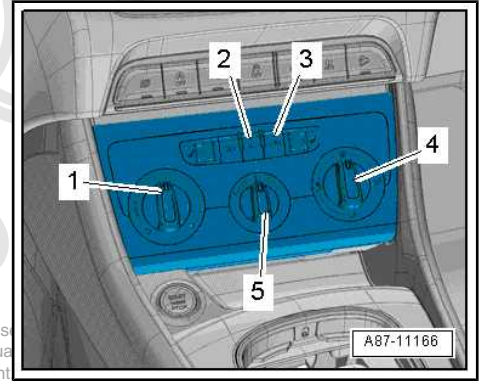
**Note**

- ◆ *If the pressure indicated does not change and 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 whether 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. 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 notes on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations . There may be problems with the control of the air conditioner compressor. Inform the workshop of the problem detected.*
- ◆ *-N280- is activated by -J301- so that the temperature of the air downstream of the evaporator reaches the specified value (approx. 2 to 5 °C).*
- ◆ *After starting the vehicle, a value above 0.55 A 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 48](#) .*
- ◆ *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").*
- ◆ *Certain malfunctions of -N280- (e.g. sticking valve or open circuit in coil) can lead to problems with the air conditioner compressor (no cooling output from air conditioner, evaporator icing up etc.). If -N280- (and not the air conditioner compressor itself) is the cause of the problem, the air conditioner compressor can be serviced by 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 .*
- ◆ *-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 .*



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- Press "Air recirculation" button -3- on operating unit (air conditioning system control unit - J301-).
- "Air recirculation" lamp in button is on.
- Set engine speed to 2000 rpm (start of time measurement).
- "Read measured values" in "Guided Fault Finding" mode for air conditioner ⇒ Vehicle diagnostic tester.



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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-

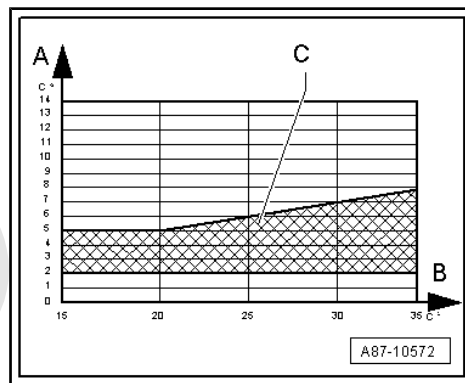
B - Ambient temperature

C - Permissible tolerance range

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

If the specified values are not attained:

- Measure temperature of air emerging from dash panel vents using a thermometer.
- Compare measured value to measured value displayed for evaporator output temperature sender - G263- .



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- ♦ *If the measured values only differ slightly, perform the measures to be taken if the readout does not match the specification ⇒ [page 46](#) . If the measured value for the evaporator output temperature sender - G263- is higher than your measured value, check that -G263- is correctly installed and perform the electrical checks for this sender ⇒ Vehicle diagnostic tester.*
- ♦ *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.*

If the measured value for the evaporator output temperature sender - G263- (and thus the system cooling output) is OK:

- Measure temperature of air emerging from dash panel vents (left and right) using a thermometer.
- Compare measured values of thermometer and evaporator output temperature sender - G263- .
- Measured values may not be lower nor (after 5 minutes) more than 3° C higher than value for evaporator output temperature sender - G263- .



Note

- ♦ *If the measured values obtained are lower, check that evaporator output temperature sender - G263- is installed correctly and check electrical wiring for contact resistance; renew sender if defective.*
- ♦ *If the specified values are not attained, check activation and operation of temperature flap. To do so, perform the measures to be taken in the event of a temperature increase downstream of the evaporator ⇒ [page 47](#) and ⇒ Vehicle diagnostic tester.*

3.8.4 Checking cooling output - automatically controlled air conditioner

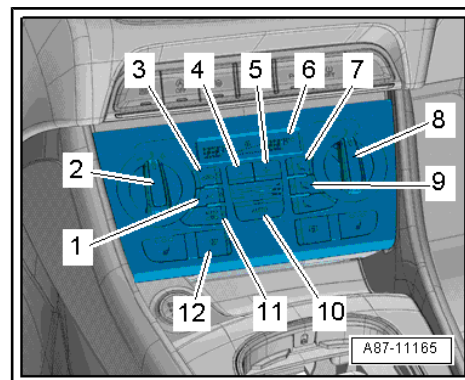
Procedure

- ♦ Requirements for checking cooling output met ⇒ [page 34](#)
- Measure ambient temperature (it must be over 15 °C).

- Close doors, bonnet, windows, sun roof and rear lid.
- Open all dash panel vents and any vents in rear centre console.
- Start engine.
- Switch air conditioner compressor off (lamp in **AC** or **A/C** button -1- does not light up).
- “Read measured values” in “Guided Fault Finding” mode for air conditioner ⇒ Vehicle diagnostic tester.

Checking

- Read out activation of air conditioner compressor regulating valve - N280- .
- Activation of air conditioner compressor is switched off, display shows 0 A (amps).
- 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	4.7
20	5.6
25	6.6
30	7.6
35	8.8



Note

- ◆ *On the absolute pressure scale, 0 bar corresponds to an absolute vacuum. Normal ambient pressure thus corresponds to roughly 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 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 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 pressure displayed is lower than that given in the table:

- Check signal from high-pressure sender - G65- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ [“1.7 Checking pressure signal from high-pressure sender G65”, page 13](#) .
- If no fault is found at the high-pressure sender - G65- , there is not enough refrigerant in the circuit. 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 notes on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations .

If pressure in refrigerant circuit is OK:

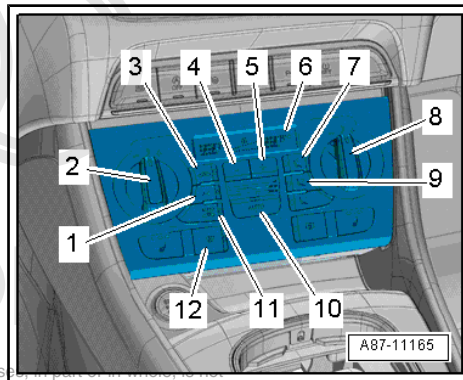
Make the following settings on the operating unit (Climatronic control unit - J255-):

- “Auto” mode - lamp in **AUTO** button -10- is on.
- Set temperature to “cold” using rotary controls -2, 8- – “LO” display for driver and front passenger side in display -6- of - J255- .
- Air conditioner compressor on (lamp in **AC** or **A/C** button -1- on).

– “Read measured values” in “Guided Fault Finding” mode for air conditioner ⇒ **Vehicle diagnostic tester**.

– Check display in display zones:

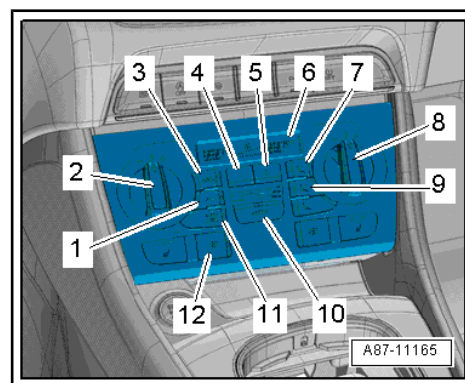
- Air conditioner compressor is switched on; current of greater than 0.3 A is displayed (current flows via air conditioner compressor regulating valve - N280-).
- Air conditioner compressor is switched on; duty cycle of greater than 30 % is displayed (air conditioner compressor regulating valve - N280- is activated).
- Pressure indicated rises above value with air conditioner compressor switched off.





Note

- ◆ *If the pressure displayed as the measured value does not change and activation of the air conditioner compressor is OK, check again whether the air conditioner compressor is actually being driven and whether the air conditioner compressor regulating valve - N280- is being activated. There is a fault in the refrigerant circuit if the air conditioner compressor is being driven and -N280- is being activated. 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 notes on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations . There may be problems with the control of the air conditioner compressor. Inform the workshop of the problem detected.*
 - ◆ *-N280- is activated by -J255- so that the temperature of the air downstream of the evaporator reaches the specified value (approx 2 to 5 °C).*
 - ◆ *After starting the vehicle, a value greater than 75 % (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 -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 48](#) .*
 - ◆ *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 the **Air recirculation** button -3- (or -12-, depending on the version) on the operating unit (Climatronic control unit - J255-).
 - “Air recirculation” lamp in button is on.
 - Set engine speed to 2000 rpm (start of time measurement).
 - “Read measured values” in “Guided Fault Finding” mode for air conditioner ⇒ Vehicle diagnostic tester.



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

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

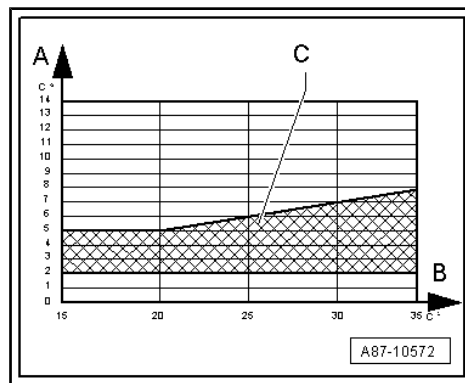
B - Ambient temperature

C - Permissible tolerance range

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

If the specified values are not attained:

- Compare the measured values of the left vent temperature sender - G150- and the right vent temperature sender - G151- with the measured value displayed for the evaporator output temperature sender - G263- .



Note

The temperature of the air emerging from the dash panel vents can also be measured with a thermometer.

- If the measured value for -G263- only differs slightly from the measured value for -G150- / -G151- , perform the measures to be taken if the readout does not match the specification ⇒ [page 46](#) .
- If the measured value for -G263- is greater than the measured value for -G150- and/or -G151- , check for proper installation of -G263- ⇒ [page 267](#) and perform the 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 the measured value of -G263- (and thus the cooling output of the air conditioner) is not OK, perform the measures to be taken if the readout does not match the specification (the required cooling output is not attained) ⇒ [page 46](#) .
- ◆ If the measured value of -G263- (and thus the cooling output of the air conditioner) is OK and there is a problem with excessively high or differing air conditioner outflow temperatures, check activation of the temperature flaps in the air conditioning unit ⇒ [page 25](#) and ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

3.8.5 Fault Finding if readout does not match specification

Required cooling output is not attained ⇒ [page 37](#) and ⇒ [page 42](#) .



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- .
- ◆ Requests transmitted by other control units to air conditioning system control unit - J301- / Climatronic control unit - J255- for deactivation of -N280- .
- ◆ Problem with operation of air conditioner compressor regulating valve -N280- .
- ◆ Faults in refrigerant circuit or air conditioner compressor.

If "Guided Fault Finding" reveals 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 notes 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.

3.8.6 Fault Finding if temperature increases downstream of evaporator

Required cooling output is not attained ⇒ [page 37](#) and [page 42](#) .



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 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.

3.8.7 Fault Finding if ice forms at evaporator

- ◆ The air conditioner compressor regulating valve - N280- is activated by the operating unit (Climatronic control unit - J255- / air conditioning system control unit - J301-) such that the temperature of the air downstream of the evaporator reaches the specified value (approx. 2 to 5 °C).
- ◆ After starting the vehicle, a value greater than 75 % (0.55 A) is displayed in the "Read measured values" function for the operating unit (-J255- / -J301-) for activation of the air conditioner compressor regulating valve - N280- depending on the measured temperature, the engine speed and the voltage of the vehicle electrical system ⇒ Vehicle diagnostic tester ("Guided Fault Finding"). 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 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:



Note

Under extreme ambient conditions ice could form at the evaporator if certain settings are selected on the air conditioner, for example 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 system assumes that the measured value of -G263- corresponds to the actual evaporator temperature and continues to activate -N280- , with the result that the evaporator cools down too much.

- The air conditioner fails repeatedly or sporadically (no cooling/heating output) after extended driving; after the vehicle has been stopped, 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 "de-frost" button e.g. on vehicles with an automatic air conditioner; after stopping the vehicle (or switching off the air condition)

and waiting a short while, the air conditioner functions properly again.

Remedy:

- Check measured value of evaporator output temperature sender - G263- in "Guided Fault Finding" mode ⇒ Vehicle diagnostic tester.
- If measured value for sender is too high under usage conditions described by customer (above e.g. 10 °C depending on ambient temperature, although air conditioner is functioning properly), check evaporator output temperature sender - G263- (incorrect measured value can cause evaporator to ice up).
- 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): 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 notes 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.
- Check refrigerant line from evaporator (from expansion valve) to air conditioner compressor (thick pipe, low-pressure side) with engine running. If this line is severely iced up when the problem occurs (thin layer of ice is permissible), this also indicates that evaporator temperature is too low. 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 notes on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Possible complaints . There may be problems with the control of the air conditioner compressor. Inform the workshop of the problem detected.

3.9 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. 87 ; Working with the air conditioner service station .

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 conditioner with refrigerant R1234yf - General notes; Rep. gr. 00; Laws and regulations.*

After discharging air conditioner, unplug electrical connector at air conditioner compressor regulating valve - N280- or high-pressure sender - G65- .

Reason:

The air conditioner compressor regulating valve - N280- is then no longer activated and the compressor runs at idle. The 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).

3.10 Working on refrigerant circuit



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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.*



Caution

- ◆ *After the air conditioner compressor is switched off, it might take a relatively long period on this vehicle before the pressure in the high-pressure side drops (the expansion valve is cold and the pressure in the low-pressure side increases rapidly after the compressor is switched off, the expansion valve is closed and the refrigerant can flow to the low-pressure side only slowly).*

3.11 Notes on general repairs

⇒ [“3.11.1 General notes on operating unit \(air conditioning system control unit J301 \) - manually controlled air conditioner”, page 51](#)

⇒ [“3.11.2 General notes on operating unit \(Climatronic control unit J255 \) - automatically controlled air conditioner”, page 52](#)

3.11.1 General notes on operating unit (air conditioning system control unit - J301-) - manually controlled air conditioner

- ◆ Air recirculation mode is not possible in the “defrost” (upwards) air distribution setting; if it is active, air recirculation mode is deactivated.
- ◆ On vehicles with auxiliary air heater element - Z35- (currently fitted on vehicles with TDI engine), a signal is transmitted via the data bus to the engine control unit in the “Heating” temperature setting
⇒ [“5.6 Checking auxiliary air heater element Z35 ”, page 204](#) .
- ◆ Air conditioner operation is not possible when the rotary fresh air blower switch is set to “0”.
- ◆ The “Guided Fault Finding” function only includes the functions “Read out event memory”, “Final control diagnosis” and “Read measured values” ⇒ Vehicle diagnostic tester.
- ◆ 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 start/stop system, no additional coolant pump is installed for the start/stop function. However, depending on the engine, an electric coolant pump (activated by corresponding engine control unit) may be installed ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ◆ The buttons and rotary controls are illuminated by LEDs which cannot be renewed separately.
- ◆ The function indicator lamps in the buttons and rotary controls and the rotary controls and buttons themselves cannot be renewed separately.
- ◆ Modified air conditioner operating units (on which the button has the lettering [\[A/C\]](#) instead of [\[AC\]](#), for example) will be introduced gradually in model year 2013. Observe correct assignment ⇒ Electronic parts catalogue .

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3.11.2 General notes on operating unit (Climatronic control unit - J255-) - automatically controlled air conditioner

- ◆ On vehicles with auxiliary air heater element - Z35- (currently fitted on vehicles with TDI engine), a signal is transmitted via the data bus to the engine control unit in the "Heating" temperature setting
⇒ ["5.6 Checking auxiliary air heater element Z35", page 204](#).
- ◆ 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").
- ◆ On vehicles with start/stop system, no additional coolant pump is installed for the start/stop function. However, depending on the engine, an electric coolant pump (activated by corresponding engine control unit) may be installed ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ◆ Currently air conditioner operating units (Climatronic control unit - J255-) can be exchanged in the familiar manner (component protection not active) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ The buttons are illuminated by LEDs which cannot be renewed separately.
- ◆ The function indicator lamps in the buttons cannot be renewed separately.
- ◆ If the measurements for the dash panel temperature sensor - G56- are incorrect, check the intake grille of the trim panel of the operating unit (Climatronic control unit - J255-) (must not be closed off) and check the operation of the temperature sensor blower - V42- ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ The functions selected are indicated by the illumination of the LEDs in the various buttons of the operating unit (Climatronic control unit - J255-).
- ◆ If a new operating unit (Climatronic control unit - J255-) has been installed and basic setting not performed, the control action of the operating unit (Climatronic control unit - J255-) is restricted; this is displayed as an entry in the event memory in "Guided Fault Finding" mode of ⇒ Vehicle diagnostic tester.
- ◆ Modified air conditioner operating units (on which the button has the lettering A/C instead of AC, for example) will be introduced gradually in model year 2013. Observe correct assignment ⇒ Electronic parts catalogue .
- ◆ Air conditioner operating units (Climatronic control unit - J255-) with part number from index "D" onwards have an OFF button. On these operating units -J255- , the functions of the air recirculation and automatic air recirculation buttons are combined in one button, and the button for activating and deactivating the air conditioner compressor has the lettering A/C instead of AC.
- ◆ For air conditioner operating units (Climatronic control unit - J255-) with part numbers from index "F" onwards, the lettering on the buttons and panel and their surface finish have

changed. Observe correct version and allocation ⇒ Electronic parts catalogue .

After renewing the operating unit (Climatronic control unit - J255-), always perform the following steps in "Guided Fault Finding" mode ⇒ Vehicle diagnostic tester.

- Check coding.
- Perform basic setting.
- Check adaption if applicable.
- Interrogate event memory and delete any entries displayed.

3.12 Paint 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.

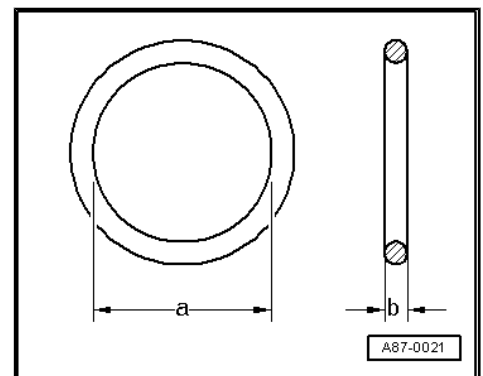
3.13 Refrigerant circuit seals

- ◆ 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.*



3.14 Notes on control motors

⇒ [“3.14.1 Notes on control motors”, page 54](#)

⇒ [“3.14.2 Inserting connecting element in shaft of control motor”, page 56](#)

⇒ [“3.14.3 Activating control motor with adapter cable”, page 58](#)

⇒ [“3.14.4 Preparing adapter cables for activation of control motors”, page 59](#)

3.14.1 Notes on control motors



Caution

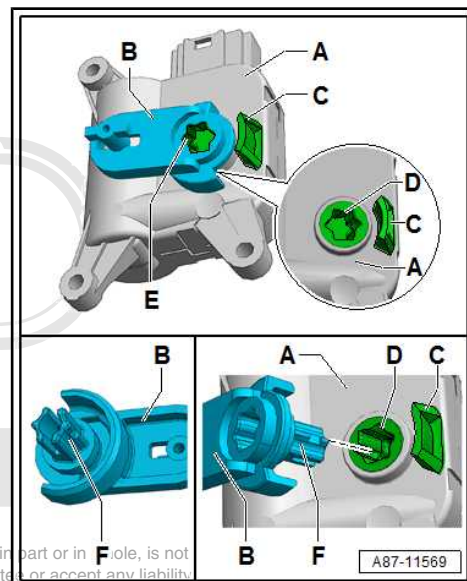
Air conditioner (heater) malfunctions can occur.

- ◆ *The air conditioner will not function properly if control motors and/or the corresponding connectors are interchanged.*
- ◆ *If a connecting element (lever, gear wheel) is interchanged or fitted incorrectly on a control motor, this will result in malfunctions of the air conditioner (heater).*
- ◆ *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.*



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- ◆ There are various identical connectors on the air conditioning unit (heater). To avoid the risk of interchanging them, mark the connectors before unplugging them.
- ◆ Different control motors are fitted on the air distribution unit and on the air intake unit of the air conditioner (heater). These control motors differ in their electrical values (due to their adjustment range, which is dependent on the various connecting elements), their connecting elements and their part numbers ⇒ Electronic parts catalogue . The control motors must therefore be marked before they are removed to avoid the risk of interchanging them.
- ◆ The control motors are being changed gradually from 10.2013 onwards. Up to that date, the connecting elements (levers, gear wheels etc.) fitted on the various control motors for the flaps in the air conditioning unit (heater) differed in colour. From 10.2013 onwards, control motors are being installed on which all the connecting elements to the various flaps of the air conditioning unit (heater) have the same colour (currently black). It is therefore no longer possible to identify them by colour. The illustration shows, for example, a temperature flap control motor - V68- -A- with the corresponding connecting element (lever) -B-.



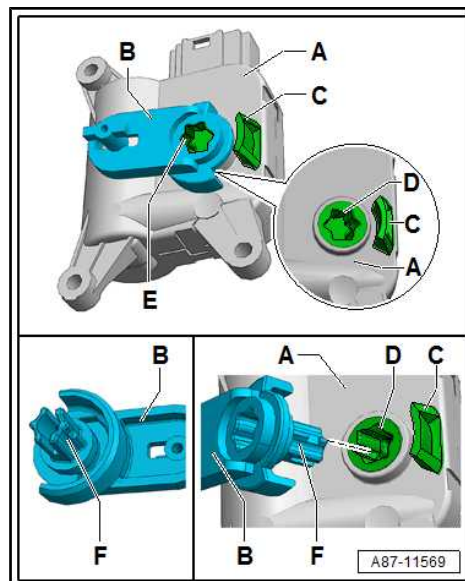
- ◆ Up to 10.2013, the various control motors were supplied as replacement parts with a pre-assembled, colour-coded connecting element (e.g. lever -B- on temperature flap control motor - V68- -A-) with different part numbers. From 10.2013 onwards, the replacement control motors will be supplied without a pre-assembled connecting element, but with a set of connecting elements (gradual introduction), e.g. lever -B- for temperature flap control motor - V68- -A- ⇒ Electronic parts catalogue . The required connecting element must be selected from this set (depending on the air conditioning unit/heater version and the fitting location of the control motor) and fitted in the shaft of the control motor ⇒ [page 56](#) .
- ◆ There are different versions of the control motors without fitted connecting elements -B- (installed/delivered as replacement parts from 10.2013 onwards). The version of the control motor installed as an air recirculation flap control motor - V113- on a heater or manually controlled air conditioner does not feature a potentiometer, for example (but does have a limit switch). For the control motors with potentiometer there are various adjustment ranges (maximum electrically evaluable adjustment range approx. 120° or 340°) ⇒ Electronic parts catalogue . Ensure the correct version and allocation. If a control motor with an incorrect adjustment range has been installed, this will lead to problems, e.g. during basic setting of the air conditioner and/or during operation of the air conditioner/heater ⇒ Vehicle diagnostic tester.
- ◆ After installing the control motor, perform basic setting of air conditioner ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ 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 interchange) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ After installing a new control motor, perform the basic setting and check the activation by the operating unit (Climatronic control unit - J255-) / the air conditioning system control unit - J301- (heater control unit - J65-) and the operation of the control motor ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

3.14.2 Inserting connecting element in shaft of control motor



Note

- ◆ Up to 10.2013, the various control motors were supplied as replacement parts with a pre-assembled, colour-coded connecting element (e.g. lever -B- on temperature flap control motor - V68- -A-) and with different part numbers. From 10.2013 onwards, the various replacement control motors will be supplied without a pre-assembled connecting element, but with a set of connecting elements (gradual introduction), e.g. lever -B- for temperature flap control motor - V68- -A- ➔ *Electronic parts catalogue*. The required connecting element must be selected from this set as required, allocated correctly and inserted in the new control motor.
- ◆ The connecting element (e.g. lever -B-) can only be inserted and engaged in shaft -D- of control motor -A- in one position.
- ◆ The connecting elements fitted in the control motors up to 10.2013 (e.g. lever -B-) are positively engaged in shaft -D- of the control motor. They can be prised out e.g. with two screwdrivers.
- ◆ The relevant connecting element -B- must be in the position shown in the illustration so that it can be inserted in shaft -D- of the control motor.



Inserting connecting element

- Remove connecting element from removed control motor (e.g. prise it out carefully using two screwdrivers) or select required connecting element from set of connecting elements ➔ *Electronic parts catalogue*.



Caution

If an incorrect connecting element has been selected or fitted, it may still be possible to install the control motor; however, there may be problems during the adaption of the newly installed control motor.

- ◆ The connecting elements are sometimes very similar, so it is important to make sure that the correct version is used.
- ◆ Only insert a connecting element which is exactly the same shape as the removed connecting element.

It is possible to install an incorrectly allocated control motor with the connecting element; however, there may be problems during the adaption of the newly installed control motor.

- ◆ The various control motors are identical in shape and can only be distinguished by their part numbers; therefore it is important that you take care to identify the correct version.
- ◆ Only install control motors which can be identified reliably.



Note

- ◆ *The connecting elements supplied in the set are not colour-coded ⇒ Electronic parts catalogue .*
- ◆ *The possible adjustment range of a control motor is determined by the shape of the connecting element -B- and the stop -C- on the control motor. The position of the control motor shaft -D- is determined by the corresponding control unit via an integrated potentiometer (or via a limit switch).*
- Check position of shaft -D- of control motor -A-; shaft -F- of the connecting element can only be inserted and engaged without applying force when shaft -D- is in the position shown.



Note

- ◆ *If shaft -D- of control motor -A- is not in the position shown (the connecting element can only be fitted in this position), activate the removed control motor until shaft -D- is brought to the illustrated position ⇒ [page 58](#) .*
- ◆ *Connecting element -B- may only be fitted in the position at which it can be inserted and engaged without exerting force. In order to make it easier to find the installation position, the contour -E- of the mounting for the control motor shaft -D- is stamped on various connecting elements. If the connecting element can only be inserted with force, check the control motor shaft -D- (it may be 180° out of position).*
- ◆ *Renew a connecting element if there are signs of wear; do NOT reuse it.*
- Insert connecting element -F- (either the one taken out of the shaft of the removed control motor, or the one selected from the set provided) into shaft of control motor -D- and engage it.
- Check that connecting element -B- is firmly seated in control motor -A-.
- Attach control motor to air conditioning unit (heater) at position provided.

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3.14.3 Activating control motor with adapter cable

Note

- ◆ *Shaft -D- must be in a specific position so that connecting element can be inserted in shaft -D- of control motor -A-. If shaft -D- is in a different position from the one shown in the illustration, it can be moved into the correct position by activating the control motor.*
- ◆ *The shaft -D- of the control motor has no stop. If the control motor has an integrated potentiometer, the shaft rotates constantly if voltage is applied to contacts 5 and 6 (at connector of control motor). Consequently, when the control motor is detached, voltage should only be applied if connecting element -B- is fitted or if shaft -D- must be moved to the correct position because the connecting element cannot be fitted.*
- ◆ *Shaft -D- may be incorrectly positioned if force is required to insert connecting element -B- in the control motor.*

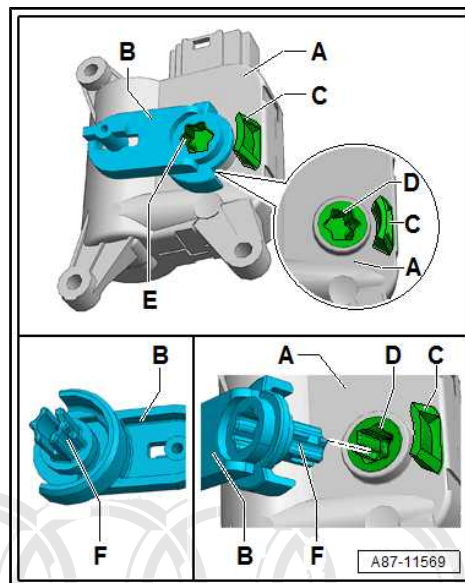
Moving shaft of control motor into correct position

- Connect adapter cable ➔ [page 59](#) to control motor -A-.

Note

Instead of using an adapter cable, contacts "5" and "6" (in connector of control motor -A-) can also be connected to a 12 V battery via a 5 A fuse using an auxiliary cable from auxiliary measuring set - V.A.G 1594/C- .

- Connect one of the two adapter cable wires to the **positive** terminal of e.g. a 12 V battery via a 5 A fuse.
- Connect the other of the two adapter cable wires to the **negative** terminal of the same 12 V battery only briefly (e.g. using an auxiliary cable from auxiliary measuring set - V.A.G 1594/C-).
- Activate the control motor so that the shaft -D- is moved to the position shown with the shortest possible adjustment travel.
- Watch the direction of rotation of the control motor shaft -D-; if the shaft turns in the wrong direction, switch the polarity of the wires.
- As soon as the shaft -D- of the control motor is in the correct position, stop activating the control motor.



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3.14.4 Preparing adapter cables for activation of control motors

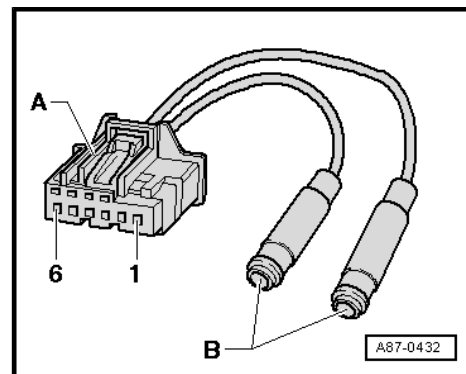
Procedure

- Connect one wire each (with a cross section of 0.25 mm²) 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 wire to a commercially available banana plug -B-.



Note

The wires can be connected to a 12 V source (e.g. a 12 V battery) via the banana plugs -B- (e.g. with auxiliary cables from auxiliary measuring set - V.A.G 1594/C-).



3.15 Notes on dust and pollen filter

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- .

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 prevent peak pollution levels from entering the passenger compartment.

Another purpose of the activated charcoal is to absorb the gaseous pollutants in the air flowing through. The activated charcoal layer in the dust and pollen filter has various effects on the different pollutants in the air:

- ◆ Certain pollutants are permanently absorbed by the activated charcoal layer.
- ◆ Others are converted into harmless compounds as in a catalytic converter.
- ◆ In all other cases, the activated charcoal acts like a condenser. As the impact level increases, pollutants are initially absorbed until a certain degree of saturation is attained. If the pollutant content decreases, the activated charcoal layer continuously emits the absorbed particles again.

As the activated charcoal layer permanently bonds some of the pollutant particles, it is advisable to renew the dust and pollen filter sooner than specified if the vehicle is used under the following conditions:

- ◆ Vehicle operation in areas with severe air pollution
- ◆ Vehicle operation with "air recirculation flap" deactivated



Note

- ◆ *The activated charcoal layer in the dust and pollen filter becomes saturated after a certain length of time.*
- ◆ *A saturated filter can no longer absorb pollutants and allows them to pass unhindered.*

4 Technical data

⇒ ["4.1 Refrigerant capacities", page 60](#)

⇒ ["4.2 Approved refrigerant oils and refrigerant oil capacities", page 62](#)

⇒ ["4.3 Oil distribution", page 66](#)

4.1 Refrigerant capacities

⇒ ["4.1.1 Capacities for refrigerant R134a", page 60](#)

⇒ ["4.1.2 Capacities for refrigerant R1234yf", page 61](#)

4.1.1 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).
- Starting up air conditioner after charging refrigerant circuit
⇒ [page 125](#)



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 1](#) 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).*

4.1.2 Capacities for refrigerant R1234yf



Note

- ◆ *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 repair manual for all models*
⇒ *"4.2.3 Refrigerant oil capacities in refrigerant circuits for refrigerant R1234yf", page 65* , and ⇒ *Air conditioner with refrigerant R1234yf - General notes; 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 conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
- Starting up air conditioner after charging refrigerant circuit
⇒ [page 125](#)

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Capacity for refrigerant R1234yf

Vehicle model	Production period	Capacity in grams	Differing characteristics of this refrigerant circuit
Audi Q3	From 06.16 onwards	530 ⁺ / - 15	• None

4.2 Approved refrigerant oils and refrigerant oil capacities

⇒ [“4.2.1 Approved refrigerant oils and refrigerant oil capacities for refrigerant R134a”, page 62](#)

⇒ [“4.2.2 Approved refrigerant oils for refrigerant R1234yf”, page 63](#)

⇒ [“4.2.3 Refrigerant oil capacities in refrigerant circuits for refrigerant R1234yf”, page 65](#)

4.2.1 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 .

- Discharging, evacuating and charging refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit
- Starting up air conditioner after charging refrigerant circuit ⇒ [page 125](#) , and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General notes on air conditioning systems (Air conditioner with refrigerant R134a, General notes on air conditioning systems). Before using air conditioner after system has been re-charged.



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 notes 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 the ingress of moisture.



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.*

4.2.2 Approved refrigerant oils for refrigerant R1234yf



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 conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Repair instructions; Refrigerant and refrigerant oil .***

Important information:

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

**Note**

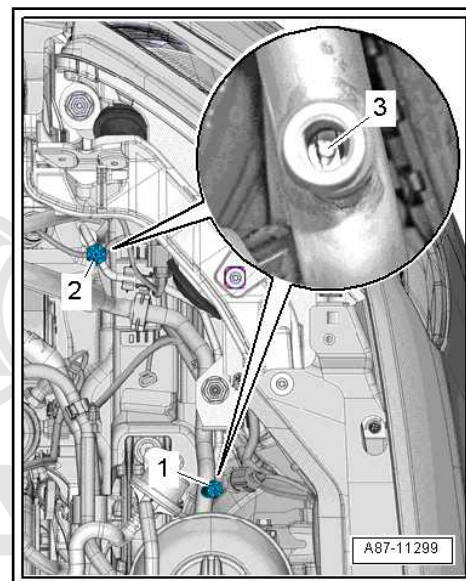
- ◆ *A use-by date for the refrigerant oil is stated on the bottle in which the refrigerant oil is supplied.*
- ◆ *This date is not relevant if the bottle is sealed air-tight.*
- ◆ *If the bottle is sealed air-tight, the refrigerant oil can also be used after the date stated on the bottle.*
- ◆ The refrigerant 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 conditioner with refrigerant R1234yf - General notes; 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 .

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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 conditioner with refrigerant R1234yf - General notes; 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 87](#) .



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4.2.3 Refrigerant oil capacities in refrigerant circuits for refrigerant R1234yf



Note

- ◆ 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", "Valeo", "Visteon" and "Sanden" air conditioner compressors ⇒ ["4.2.2 Approved refrigerant oils for refrigerant R1234yf", page 63](#) , 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 .
- ◆ ⇒ ["4.2.2 Approved refrigerant oils for refrigerant R1234yf", page 63](#)
- ◆ Layout and characteristics of refrigerant circuit ⇒ ["2.1 System overview - refrigerant circuit", page 87](#)

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 Q3	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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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 conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Renewing components .*
- ◆ *At the start of production, all vehicles are fitted with mechanically driven air conditioner compressors made by various manufacturers ⇒ 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.*

4.3 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 , 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 67](#)

⇒ [“1.2 Overview of fitting locations - components in passenger compartment \(front\)”, page 67](#)

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

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Note

- ◆ *At the start of production, the Audi Q3 was only available with an air conditioner.*
- ◆ *From model year 2014, a heater without an air conditioner will be available for certain vehicles (gradual introduction).*
- ◆ *The fresh air intake in the plenum chamber is the same as on vehicles with a manually controlled air conditioner*
⇒ [“1.1.2 Overview of fitting locations - components not located in passenger compartment \(front\), component group 2”, page 80](#).

All the information required for servicing the heater can be found in ⇒ [g r.87 “Air conditioning system”, page 77](#) . Note the following:

- ◆ The heater, the corresponding control motors and air ducts are the same as on vehicles with manually controlled air conditioner
⇒ [“1.1 Overview of fitting locations - components not located in passenger compartment”, page 77](#) ,
⇒ [“5.1.1 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 187](#) and ⇒ Electronic parts catalogue . However, the connections for the missing refrigerant lines at the expansion valves are sealed with a cap.

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



Note

- ◆ *At the start of production, the Audi Q3 was only available with an air conditioner.*
- ◆ *From model year 2014, a heater without an air conditioner will be available for certain vehicles (gradual introduction).*

All the information required for servicing the heater can be found in ⇒ [g r.87 “Air conditioning system”, page 77](#) . Note the following:

- ◆ The heater, the corresponding control motors and air ducts are the same as on vehicles with manually controlled air conditioner
⇒ [“5.1.1 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 187](#) and ⇒ Electronic

parts catalogue . However, the connections for the missing refrigerant lines at the expansion valves are sealed with a cap.

- ◆ The procedure for removing the heater is essentially the same as the procedure for removing the air conditioning unit on vehicles with manually controlled air conditioner; the only difference is that there are no refrigerant lines to the expansion valve
 - ⇒ [“5.8 Removing and installing heater and air conditioning unit”, page 208](#) ,
 - ⇒ [“1.2 Overview of fitting locations - components in passenger compartment \(front\)”, page 83](#) ,
 - ⇒ [“4.1 Exploded view - control motors \(front\)”, page 164](#) and
 - ⇒ Electronic parts catalogue .
- ◆ The heater control unit - J65- largely corresponds to the air conditioning control unit - J301- ; however, it does not have the [\[A/C\]](#) button or the functions necessary for activating the components of the air conditioner
 - ⇒ [“7.1.1 Overview - operating and display unit, manually controlled air conditioner \(heater without air conditioner\)”, page 248](#) , ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).



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2 Heater

⇒ [“2.1 Exploded view - heater unit”, page 69](#)

⇒ [“2.2 Removing and installing fresh air blower V2 ”, page 69](#)

⇒ [“2.3 Removing and installing fresh air blower series resistor with overheating fuse N24 ”, page 70](#)

⇒ [“2.4 Removing and installing auxiliary air heater element Z35 ”, page 70](#)

⇒ [“2.5 Removing and installing temperature flap control motor V68 with potentiometer G92 ”, page 70](#)

⇒ [“2.6 Removing and installing air recirculation flap control motor V113 ”, page 70](#)

⇒ [“2.7 Removing and installing centre flap control motor V70 ”, page 71](#)

⇒ [“2.8 Removing and installing dust and pollen filter”, page 71](#)

⇒ [“2.9 Removing and installing heat exchanger”, page 71](#)

⇒ [“2.10 Removing and installing heater unit”, page 71](#)

⇒ [“2.11 Dismantling and assembling heater unit”, page 72](#)

2.1 Exploded view - heater unit

The heater, the corresponding control motors and air ducts are the same as on vehicles with manually controlled air conditioner

⇒ [“5 Heater and air conditioning unit \(front\)”, page 187](#) ,

⇒ [“5.1.1 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 187](#) and ⇒ Electronic parts catalogue . However, the connections for the missing refrigerant lines at the expansion valves are sealed with a cap.

The procedure for removing the heater is essentially the same as the procedure for removing the air conditioning unit on vehicles with manually controlled air conditioner; the only difference is that there are no refrigerant lines to the expansion valve

⇒ [“5.8 Removing and installing heater and air conditioning unit”, page 208](#) .



Note

- ◆ *The condensation drain is redundant because an air conditioner is not installed. If the condensation drain is not installed correctly, moisture may enter the passenger compartment or noise may be generated by the heater during operation.*
- ◆ *Depending on the version of the vehicle, a condensation drain may not be installed; in such cases the openings on the vehicle underbody and the connection on the heater are sealed with sealing plugs ⇒ Electronic parts catalogue .*

2.2 Removing and installing fresh air blower - V2-

Removal and installation are the same as on vehicles with manually controlled air conditioner ⇒ [page 216](#) .

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**Note**

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

2.3 Removing and installing fresh air blower series resistor with overheating fuse - N24-

Removal and installation are the same as on vehicles with manually controlled air conditioner

⇒ ["5.13 Removing and installing fresh air blower series resistor with overheating fuse N24", page 217](#) .

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Checking operation ⇒ 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-

Removal and installation are the same as on vehicles with manually controlled air conditioner

⇒ ["5.7 Removing and installing auxiliary air heater element Z35", page 206](#) .

**Note**

Checking operation ⇒ 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-

Removal and installation are the same as on vehicles with manually controlled air conditioner

⇒ ["4.2 Removing and installing temperature flap control motor V68", page 168](#) .

**Note**

Checking operation ⇒ 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-

Removal and installation are the same as on vehicles with manually controlled air conditioner

⇒ ["4.5.1 Removing and installing air recirculation flap control motor V113 - manually controlled air conditioner \(or heater without air conditioner\)", page 176](#) .

 Note

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

2.7 Removing and installing centre flap control motor - V70-

Removal and installation are the same as on vehicles with manually controlled air conditioner

⇒ ["4.3 Removing and installing centre flap control motor V70"](#), page 171 .

 Note

Checking operation ⇒ 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

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Removal and installation are the same as on vehicles with manually controlled air conditioner

⇒ ["5.11 Removing and installing dust and pollen filter"](#), page 215 .

 Note

Different filters are available depending on equipment
⇒ ["5.11 Removing and installing dust and pollen filter"](#), page 215 and ⇒ *Electronic parts catalogue* .

2.9 Removing and installing heat exchanger

Removal and installation are the same as on vehicles with manually controlled air conditioner

⇒ ["5.15 Removing and installing heat exchanger"](#), page 219 .

2.10 Removing and installing heater unit

 Note

The layout of the heater unit is the same as the layout of the heater/air conditioning unit in vehicles with a manually controlled air conditioner. Not fitted: the refrigerant lines to the expansion valve.

The procedure for removing the heater is essentially the same as the procedure for removing the air conditioning unit on vehicles with manually controlled air conditioner; the only difference is that there are no refrigerant lines to the expansion valve

⇒ ["5.8 Removing and installing heater and air conditioning unit"](#), page 208 .



Note

- ◆ *The condensation drain is redundant because an air conditioner is not installed. If the condensation drain is not installed correctly, moisture may enter the passenger compartment or noise may be generated by the heater during operation.*
- ◆ *Depending on the version of the vehicle, a condensation drain may not be installed; in such cases the openings on the vehicle underbody and the connection on the heater are sealed with sealing plugs ⇒ Electronic parts catalogue .*

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

⇒ ["5 Heater and air conditioning unit \(front\)", page 187](#) .



Note

- ◆ *The layout of the heater unit is the same as the layout of the heater/air conditioning unit in vehicles with a manually controlled air conditioner*
⇒ ["5 Heater and air conditioning unit \(front\)", page 187](#) .
- ◆ *The condensation drain is redundant because an air conditioner is not installed. If the condensation drain is not installed correctly, moisture may enter the passenger compartment or noise may be generated by the heater during operation.*
- ◆ *Depending on the version of the vehicle, a condensation drain may not be installed; in such cases the openings on the vehicle underbody and the connection on the heater are sealed with sealing plugs ⇒ Electronic parts catalogue .*

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3 Air duct system

⇒ [“3.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 73](#)

⇒ [“3.2 Removing and installing vents \(front\)”, page 73](#)

⇒ [“3.3 Removing and installing fresh air intake”, page 73](#)

⇒ [“3.4 Checking forced ventilation vents in passenger compartment”, page 73](#)

⇒ [“3.5 Removing and installing forced ventilation vents in passenger compartment”, page 73](#)

⇒ [“3.6 Checking plenum chamber water drain”, page 74](#)

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

⇒ [“6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 230](#) .

⇒ [“6.2 Air intake and air outlet openings”, page 233](#)

⇒ [“6.3 Removing and installing footwell vent \(driver side\)”, page 236](#)

⇒ [“6.4 Removing and installing footwell vent \(front passenger side\)”, page 236](#)

⇒ [“6.5 Removing and installing rear footwell vent”, page 237](#)

⇒ [“6.6 Removing and installing air ducts”, page 238](#)

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 ⇒ 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

⇒ [“6.9 Removing and installing cover for fresh air intake”, page 245](#) and

⇒ [“6.10 Removing and installing fresh air intake”, page 246](#)

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3.4 Checking forced ventilation vents in passenger compartment

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

⇒ [“6.7 Checking forced ventilation vents in passenger compartment”, page 242](#) .

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

⇒ [“6.8 Removing and installing forced ventilation vents in passenger compartment”, page 244](#) .



3.6 Checking plenum chamber water drain

Checking is the same as for a vehicle with air conditioner

⇒ [“6.12 Cleaning plenum chamber water drain”, page 247](#) and

⇒ [“6.11 Checking plenum chamber water drain”, page 246](#) .



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4 Operating and display unit

⇒ [“4.1 Overview of fitting locations - operating and display unit J65”, page 75](#)

⇒ [“4.2 Removing and installing operating and display unit J65”, page 75](#)

4.1 Overview of fitting locations - operating and display unit J65

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The heater control unit - J65- largely corresponds to the air conditioning control unit - J301- ; however, it does not have the  button or the functions necessary for activating the components of the air conditioner

⇒ [“7.1.1 Overview - operating and display unit, manually controlled air conditioner \(heater without air conditioner\)”, page 248](#) and
⇒ Electronic parts catalogue .

4.2 Removing and installing operating and display unit -J65-

The removal and installation procedures are the same as for the air conditioning control unit - J301- in vehicles with manually controlled air conditioner

⇒ [“7.2.1 Removing and installing operating and display unit \(air conditioning system control unit J301 / heater control unit J65 \)”, page 253](#) .



Note

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

5 Further control components

⇒ ["5.1 Removing and installing ambient temperature sensor G17", page 76](#)

⇒ ["5.2 Removing and installing evaporator output temperature sender G263", page 76](#)

5.1 Removing and installing ambient temperature sensor - G17-

The removal and installation procedures are the same as for vehicles with air conditioner ⇒ [page 264](#) .



Note

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

5.2 Removing and installing evaporator output temperature sender - G263-

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

⇒ ["8.9 Removing and installing evaporator output temperature sender G263", page 267](#) .



Note

- ◆ *The evaporator output temperature sender - G263- is not active on vehicles without air conditioner (the evaporator is installed but is not active). Depending on the version of the heater control unit - J65- , the measured value from the sender can be evaluated by the control unit.*
- ◆ *Checking operation ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

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87 – Air conditioning system

1 Overview of fitting locations - air conditioner

⇒ [“1.1 Overview of fitting locations - components not located in passenger compartment”, page 77](#)

⇒ [“1.2 Overview of fitting locations - components in passenger compartment \(front\)”, page 83](#)

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

⇒ [“1.1.1 Overview of fitting locations - components not located in passenger compartment \(front\), component group 1”, page 77](#)

⇒ [“1.1.2 Overview of fitting locations - components not located in passenger compartment \(front\), component group 2”, page 80](#)

⇒ [“1.1.3 Overview of fitting locations - components not located in passenger compartment \(rear\)”, page 82](#)

1.1.1 Overview of fitting locations - components not located in passenger compartment (front), component group “1”



Note

Depending on the engine version, a continued coolant circulation pump - V51- / auxiliary pump for heating - V488- (different designations depending on engine version) may be fitted to assist the engine coolant pump (not shown in this illustration) ⇒ 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.

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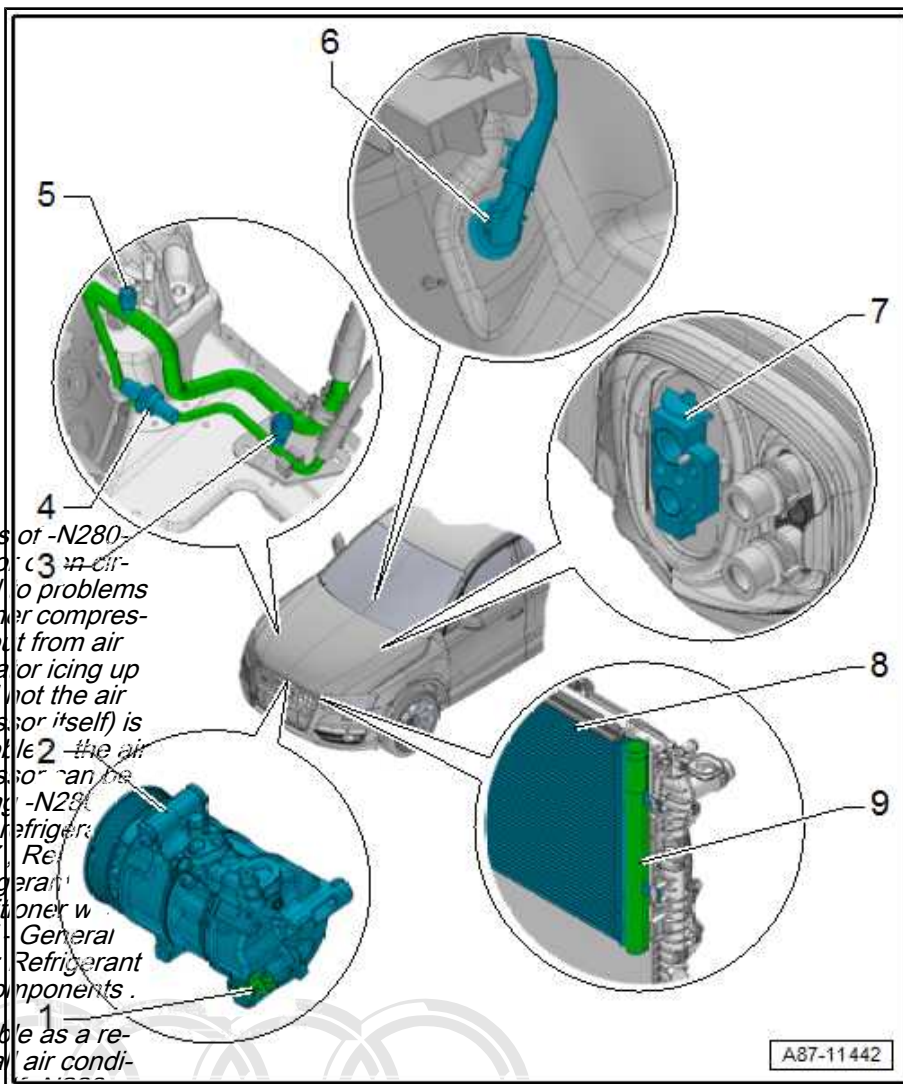
1 - Air conditioner compressor regulating valve - N280-

- ❑ Installed in air conditioner compressor
- ❑ Checking ⇒ Vehicle diagnostic tester ("Guided Fault Finding"), ⇒ ["2.4 Checking cut-in signal for air conditioner compressor regulating valve N280"](#), [page 97](#) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations



Note

- ◆ *Certain malfunctions of -N280- (e.g. sticking valve or circuit in coil) can lead to problems with the air conditioner compressor (no cooling output from air conditioner, evaporator icing up etc.). If -N280- (and not the air conditioner compressor itself) is the cause of the problem the air conditioner compressor can be serviced by 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.*
- ◆ *-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 ⇒ Electronic parts catalogue
- ❑ Exploded view ⇒ [page 128](#)
- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

3 - Service connection on high-pressure side

- ❑ For measuring, discharging and charging



Caution

Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.

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 notes 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 93](#)

☐ Different versions depending on refrigerant (R134a or R1234yf)
⇒ [“2.12 Differences in service connections depending on refrigerant \(R134a or R1234yf\)”](#), [page 120](#) and
⇒ Electronic parts catalogue

4 - High-pressure sender - G65-

☐ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”),
⇒ [“1.7 Checking pressure signal from high-pressure sender G65”](#), [page 13](#) and ⇒ Current flow diagrams,
Electrical fault finding and Fitting locations

☐ Exploded view ⇒ [page 93](#)

5 - Service connection on low-pressure side

☐ For measuring and discharging



Caution

Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.

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 notes 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 93](#)

☐ Different versions depending on refrigerant (R134a or R1234yf)
⇒ [“2.12 Differences in service connections depending on refrigerant \(R134a or R1234yf\)”](#), [page 120](#) and
⇒ Electronic parts catalogue

6 - Condensation drain

- ☐ Checking ⇒ [page 227](#)
- ☐ Removing and installing ⇒ [page 229](#)

7 - Expansion valve

- ☐ Exploded view ⇒ [page 93](#)
- ☐ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

8 - Condenser

- ☐ Exploded view ⇒ [page 91](#)

9 - Receiver

- ☐ Integrated into condenser
- ☐ Exploded view ⇒ [page 91](#)

1.1.2 Overview of fitting locations - components not located in passenger compartment (front), component group "2"



Note

Depending on the engine version, a continued coolant circulation pump - V51- / auxiliary pump for heating - V488- (different designations depending on engine version) may be fitted to assist the engine coolant pump (not shown in this illustration) ⇒ 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.

1 - Ambient temperature sensor - G17-

- ☐ The measured value is evaluated by the on-board supply control unit - J519- and transmitted to the operating unit (Climatronic control unit - J255- / air conditioning system control unit - J301- / heater control unit - J65-) via the data bus.
- ☐ Checking ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ☐ Removing and installing ⇒ [page 264](#)

2 - Water drain (right-side)

- ☐ Checking ⇒ [page 246](#)

3 - Fresh air intake

- ☐ Stops foreign matter (leaves etc) entering intake duct of air conditioning unit
- ☐ Make sure that component is seated correctly
- ☐ Removing and installing ⇒ [page 246](#)

4 - Nut

- ☐ 3 Nm

5 - Nut

- ☐ 3 Nm

6 - Bolt

- ☐ 3 Nm

7 - Cover for fresh air intake

- ☐ Removing and installing ⇒ [page 245](#)

8 - Air quality sensor - G238-

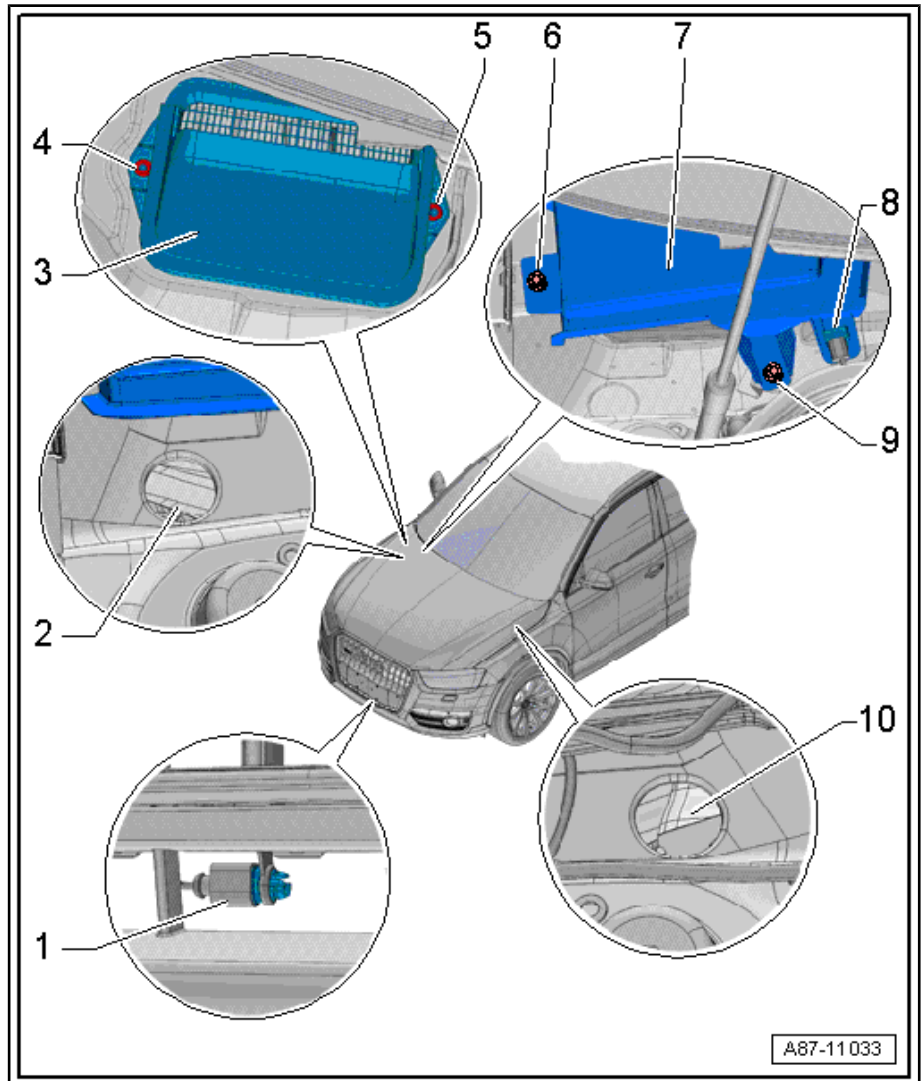
- ☐ With automatically controlled air conditioner only
- ☐ Operation ⇒ [page 259](#)
- ☐ Checking ⇒ [page 260](#)
- ☐ Removing and installing ⇒ [page 264](#)

9 - Bolt

- ☐ 3 Nm

10 - Water drain (left-side)

- ☐ Checking ⇒ [page 246](#)



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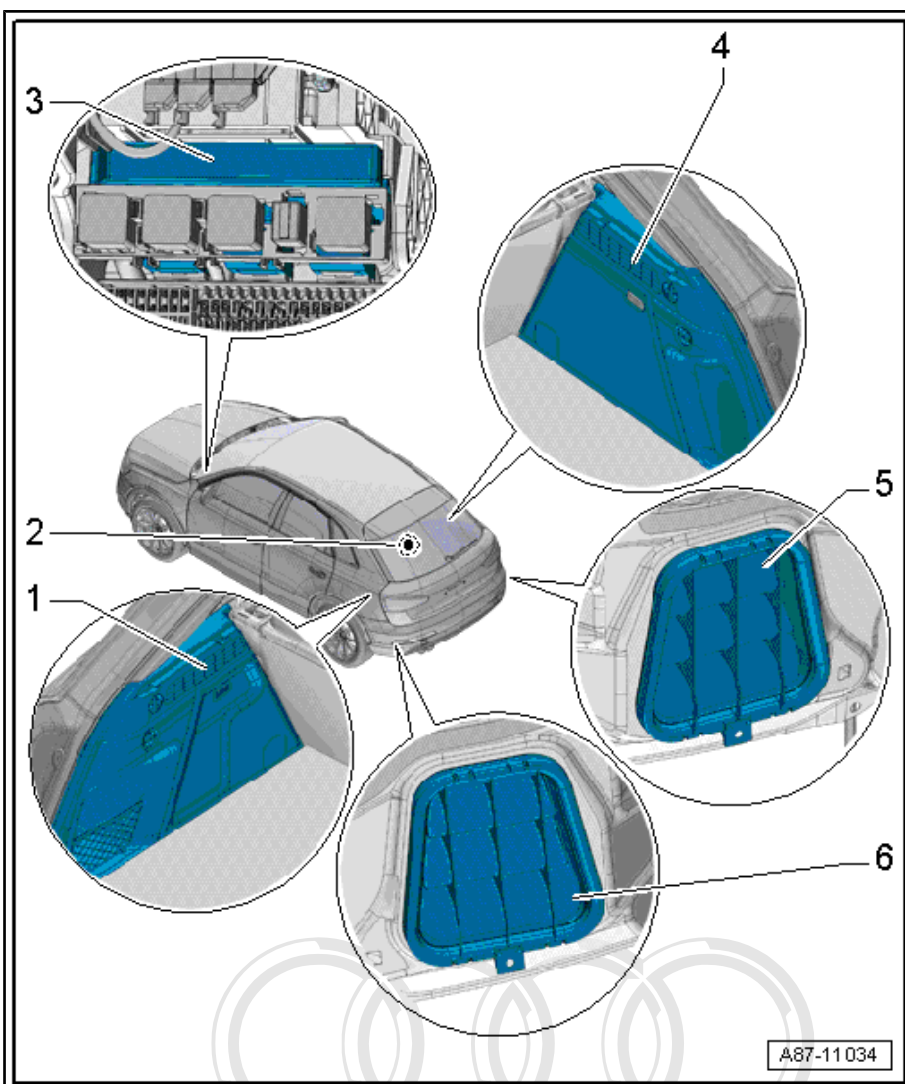
1.1.3 Overview of fitting locations - components not located in passenger compartment (rear)

1 - Ventilation slots in luggage compartment (left-side)

- ❑ Different versions ➔ Electronic parts catalogue
- ❑ Checking ➔ [page 242](#)

2 - Heated rear window - Z1-

- ❑ The request is transmitted by the operating unit (Climatronic control unit - J255- / air conditioning system control unit - J301- / heater control unit - J65-) via the data bus to the onboard supply control unit - J519- . Actuation is performed via -J519- ➔ Vehicle diagnostic tester ("Guided Fault Finding") and ➔ Current flow diagrams, Electrical fault finding and Fitting locations.
- ❑ Checking:
- ◆ Manually controlled air conditioner (heater without air conditioner) ➔ [page 9](#)
- ◆ Automatically controlled air conditioner ➔ [page 11](#)
- ❑ Removing and installing rear window ➔ General body repairs, exterior; Rep. gr. 64 ; Rear window; Removing and installing rear window



3 - Onboard supply control unit - J519-

- ❑ Various vehicle systems (e.g. heated rear window - Z1-) are activated and the signals of other components evaluated via -J519- ➔ Vehicle diagnostic tester ("Guided Fault Finding") and ➔ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ➔ Electrical system; Rep. gr. 97 ; Control units; Removing and installing onboard supply control unit - J519-

4 - Ventilation slots in luggage compartment (right-side)

- ❑ Different versions ➔ Electronic parts catalogue
- ❑ Checking ➔ [page 242](#)

5 - Forced ventilation vent (right-side)

- ❑ Different versions ➔ Electronic parts catalogue
- ❑ Checking ➔ [page 242](#)
- ❑ Removing and installing ➔ [page 244](#)

6 - Forced ventilation vent (left-side)

- ❑ Different versions ➔ Electronic parts catalogue
- ❑ Checking ➔ [page 242](#)
- ❑ Removing and installing ➔ [page 244](#)

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

⇒ [“1.2.1 Overview of fitting locations - components in passenger compartment \(front left\)”, page 83](#)

⇒ [“1.2.2 Overview of fitting locations - components in passenger compartment \(front right\)”, page 85](#)

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

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1 - Footwell vent (left-side)

- ☐ Exploded view
⇒ [page 230](#)

2 - Dash panel vent (left-side)

- ☐ Removing and installing
⇒ General body repairs, interior; Rep. gr. 70 ;
Dash panel; Removing and installing dash panel vents

3 - Left vent temperature sender - G150-

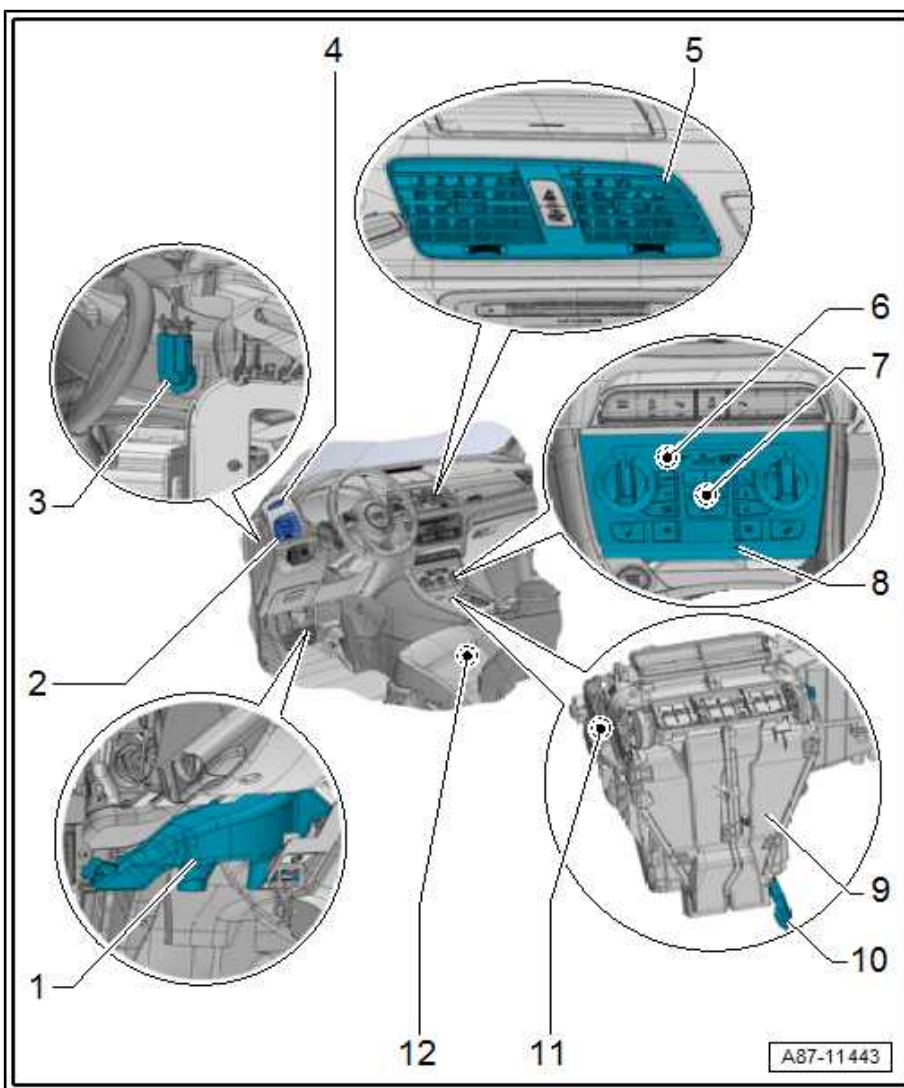
- ☐ With automatically controlled air conditioner only
- ☐ Checking, in “Guided Fault Finding” mode
⇒ Vehicle diagnostic tester
- ☐ Removing and installing
⇒ [page 265](#)

4 - Defroster vent for side window (left-side)

- ☐ Removing and installing
⇒ General body repairs, interior; Rep. gr. 70 ;
Dash panel; Removing and installing defroster vent (side)

5 - Centre dash panel vent

- ☐ Removing and installing
⇒ General body repairs, interior; Rep. gr. 70 ;
Dash panel; Removing and installing dash panel vents



6 - Dash panel temperature sensor - G56-

- ☐ With automatically controlled air conditioner only
- ☐ Integrated in Climatronic control unit - J255- , cannot be renewed separately

7 - Temperature sensor blower - V42-

- ☐ With automatically controlled air conditioner only
- ☐ Integrated in operating unit (Climatronic control unit - J255-)
- ☐ Removing and installing ⇒ [page 256](#)

8 - Air conditioner (heater) operating unit

- ☐ Different versions ⇒ Electronic parts catalogue

Manually controlled air conditioner (heater without air conditioner)

- ☐ General notes ⇒ [page 51](#)
- ☐ Removing and installing air conditioning system control unit - J301- (heater control unit - J65-)
⇒ [page 253](#)

Automatically controlled air conditioner

- ☐ General notes ⇒ [page 52](#)
- ☐ Removing and installing Climatronic control unit - J255- ⇒ [page 255](#)

9 - Air conditioning unit (viewed from left)

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Overview of air distribution system ⇒ [page 233](#)
- ☐ Exploded view ⇒ [page 187](#)
- ☐ Removing and installing ⇒ [page 208](#)

10 - Condensation drain

- ☐ Checking ⇒ [page 227](#)
- ☐ Removing and installing ⇒ [page 229](#)

11 - Left footwell vent temperature sender - G261-

- ☐ With automatically controlled air conditioner only
- ☐ Removing and installing ⇒ [page 266](#)

12 - Front seat (left-side)

- ☐ Equipment version with seat heating
- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ The seat heating setting is selected on the operating unit (Climatronic control unit - J255- / air conditioning system control unit - J301- / heater control unit - J65-).
- ☐ Checking activation and function ⇒ [page 5](#)
- ☐ Servicing seat heating ⇒ General body repairs, interior; Rep. gr. 74 ; Covers and padding on front seats; Overview - seat heating elements



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

1 - Slot cover for dust and pollen filter

2 - Dust and pollen filter

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Notes on version with activated charcoal filter insert ⇒ [page 59](#)
- ☐ Replacement intervals ⇒ Maintenance tables
- ☐ Removing and installing ⇒ [page 215](#)

3 - Evaporator output temperature sender - G263-

- ☐ Removing and installing ⇒ [page 267](#)

4 - Right footwell vent temperature sender - G262-

- ☐ With automatically controlled air conditioner only
- ☐ Removing and installing ⇒ [page 267](#)

5 - Air conditioning unit (viewed from right)

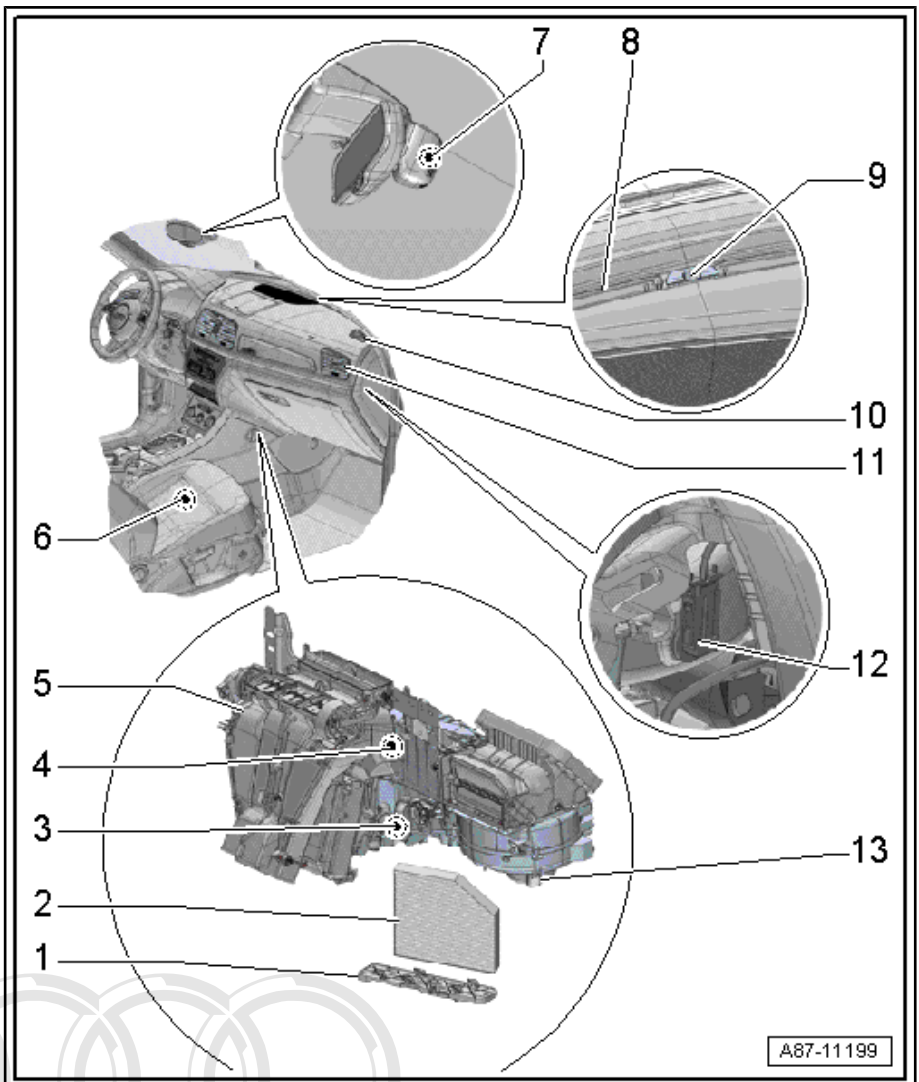
- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Overview of air distribution system ⇒ [page 233](#)
- ☐ Exploded view ⇒ [page 187](#)
- ☐ Removing and installing ⇒ [page 208](#)

6 - Front seat (right-side)

- ☐ Equipment version with seat heating
- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ The seat heating setting is selected on the operating unit (Climatronic control unit - J255- / air conditioning system control unit - J301- / heater control unit - J65-).
- ☐ Checking activation and function ⇒ [page 5](#)
- ☐ Servicing seat heating ⇒ General body repairs, interior: Rep. gr. 74 ; Covers and padding on front seats; Overview seat heating elements

7 - Humidity sender - G355-

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Fitted in mirror base
- ☐ Checking ⇒ Vehicle diagnostic tester ("Guided Fault Finding")
- ☐ Removing and installing ⇒ [page 268](#)



A87-11199



Note

-G355- is currently only evaluated by the operating unit (Climatronic control unit - J255-) on vehicles with an automatically controlled air conditioner.

8 - Windscreen defroster vent

- ☐ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel vents

9 - Sunlight penetration photosensor - G107-

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With automatically controlled air conditioner only
- ☐ For checking sunlight penetration measured by sunlight penetration photosensor - G107- and calculated by operating unit (Climatronic control unit - J255-) select "Read measured values" ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ☐ Removing and installing ⇒ [page 258](#)

10 - Defroster vent for side window (right-side)

- ☐ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing defroster vent (side)

11 - Dash panel vent (right-side)

- ☐ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel vents

12 - Right vent temperature sender - G151-

- ☐ With automatically controlled air conditioner only
- ☐ Checking ⇒ Vehicle diagnostic tester ("Guided Fault Finding")
- ☐ Removing and installing ⇒ [page 265](#)

13 - Fresh air blower - V2-

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Exploded view ⇒ [page 190](#)

2 Refrigerant circuit

⇒ [“2.1 System overview - refrigerant circuit”, page 87](#)

⇒ [“2.2 Exploded view - condenser”, page 91](#)

⇒ [“2.3 Removing and installing high-pressure sender G65”, page 96](#)

⇒ [“2.4 Checking cut-in signal for air conditioner compressor regulating valve N280”, page 97](#)

⇒ [“2.5 Detaching and attaching refrigerant lines at expansion valve”, page 101](#)

⇒ [“2.6 Removing and installing expansion valve”, page 103](#)

⇒ [“2.7 Detaching and attaching refrigerant lines at condenser”, page 105](#)

⇒ [“2.8 Removing and installing condenser”, page 107](#)

⇒ [“2.9 Removing and installing grommet for refrigerant lines”, page 109](#)

⇒ [“2.10 Removing and installing receiver”, page 110](#)

⇒ [“2.11 Removing and installing desiccant bag/desiccant cartridge”, page 112](#)

⇒ [“2.12 Differences in service connections depending on refrigerant \(R134a or R1234yf\)”, page 120](#)

⇒ [“2.13 Removing and installing service connections \(low and high-pressure sides\)”, page 123](#)

⇒ [“2.14 Starting up air conditioner after charging refrigerant circuit”, page 125](#)

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2.1 System overview - refrigerant circuit

HD = High-pressure side

ND = Low-pressure side

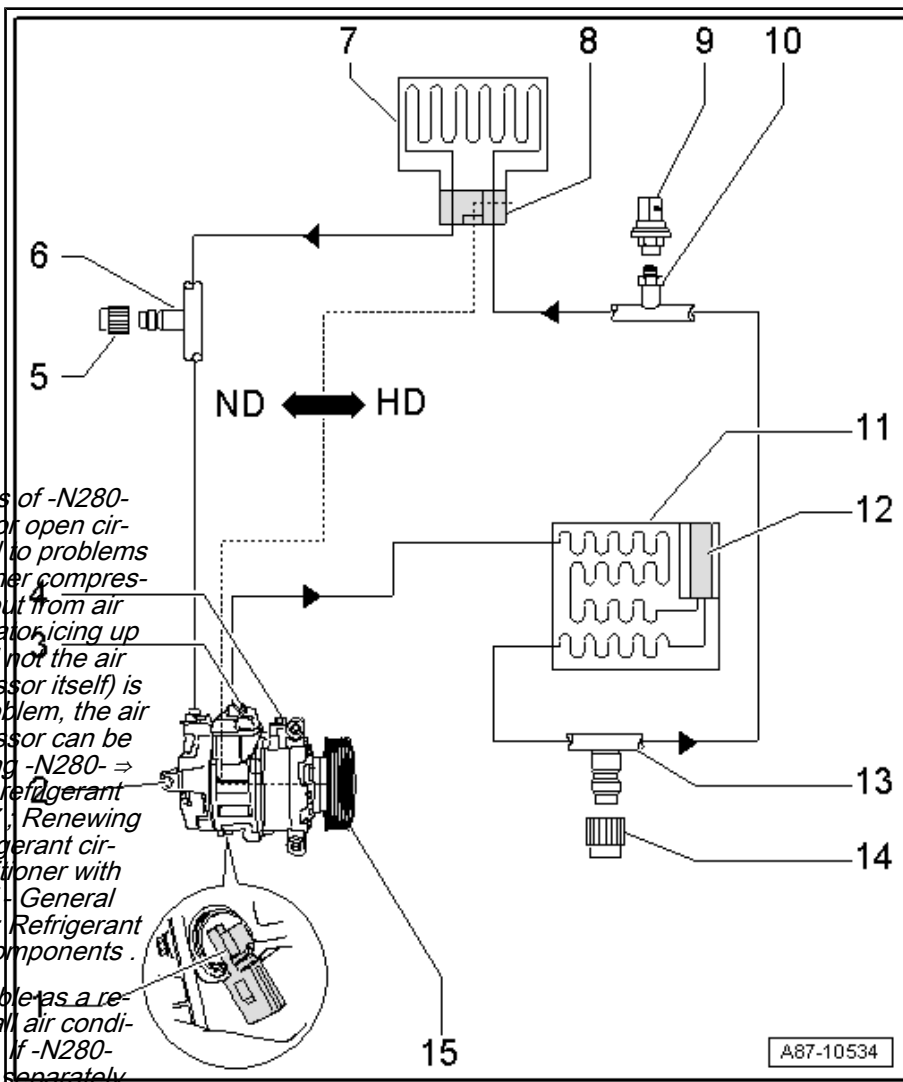
1 - Air conditioner compressor regulating valve - N280-

- ❑ Checking activation and function ⇒ Vehicle diagnostic tester ("Guided Fault Finding"), ⇒ ["2.4 Checking cut-in signal for air conditioner compressor regulating valve N280"](#), [page 97](#) 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 the air conditioner compressor (no cooling output from air conditioner, evaporator icing up etc.). If -N280- (and not the air conditioner compressor itself) is the cause of the problem, the air conditioner compressor can be serviced by 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.
- ◆ -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

- ❑ Exploded view ⇒ [page 128](#)
- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

3 - High-pressure safety valve



Caution

Danger from escaping pressurised refrigerant if valve is defective.
Frostbite on skin and other parts of the body.
Always discharge refrigerant circuit before removing component; connection has no valve.

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4 - Oil drain plug

5 - Cap

- ☐ With seal
- ☐ Always screw on
- ☐ Different versions depending on refrigerant (R134a or R1234yf)
⇒ [“2.12 Differences in service connections depending on refrigerant \(R134a or R1234yf\)”, page 120](#) and
⇒ Electronic parts catalogue

6 - Service connection on low-pressure side

- ☐ For measuring and discharging



Caution
*Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.
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 notes 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)
⇒ [“2.12 Differences in service connections depending on refrigerant \(R134a or R1234yf\)”, page 120](#) and
⇒ Electronic parts catalogue

7 - Evaporator

8 - Expansion valve

- ☐ Exploded view ⇒ [page 93](#)
- ☐ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

9 - High-pressure sender - G65-

- ☐ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”),
⇒ [“1.7 Checking pressure signal from high-pressure sender G65”, page 13](#) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ☐ Removing and installing ⇒ [page 96](#)

10 - Connection with valve

11 - Condenser

- ☐ Exploded view ⇒ [page 91](#)

12 - Receiver

- ☐ Receiver is integrated in condenser

13 - Service connection on high-pressure side

- ☐ For measuring, discharging and charging

**Caution**

Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.

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 notes 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)
➔ [“2.12 Differences in service connections depending on refrigerant \(R134a or R1234yf\)”, page 120](#) and
➔ Electronic parts catalogue

14 - Cap

- ☐ With seal
- ☐ Always screw on
- ☐ Different versions depending on refrigerant (R134a or R1234yf)
➔ [“2.12 Differences in service connections depending on refrigerant \(R134a or R1234yf\)”, page 120](#) and
➔ Electronic parts catalogue

15 - Pulley

- ☐ Renewing ➔ [page 133](#)
- ☐ Currently the pulley cannot be renewed separately on air conditioner compressors manufactured by “Delphi/Mahle”

**Note**

Vehicles with a 5-cylinder engine (Audi RS Q3) have 2 poly V-belts on the air conditioner compressor. The air conditioner compressor is therefore provided with a double-belt pulley.

2.2 Exploded view - condenser

⇒ ["2.2.1 Exploded view - condenser, desiccant cartridge", page 91](#)

⇒ ["2.2.2 Exploded view - condenser, air conditioner compressor, expansion valve, refrigerant line", page 93](#)

2.2.1 Exploded view - condenser, desiccant cartridge



Note

- ◆ There are different versions of the condenser, radiator and auxiliary radiator; pay attention to the correct assignment of these components ⇒ *Electronic parts catalogue*.
- ◆ Illustration shows "Modine" condenser.

1 - Condenser

- ☐ Different versions ⇒ *Electronic parts catalogue*
- ☐ Detaching and attaching refrigerant line
⇒ [page 105](#)
- ☐ Removing and installing
⇒ [page 107](#)

2 - Bolt

- ☐ 9 Nm

3 - Bolt

- ☐ 9 Nm

4 - O-ring

- ☐ Renew; for correct version refer to ⇒ *Electronic parts catalogue*
- ☐ Before installing, lubricate with refrigerant oil
⇒ [page 53](#)

5 - O-ring

- ☐ Renew; for correct version refer to ⇒ *Electronic parts catalogue*
- ☐ Before installing, lubricate with refrigerant oil
⇒ [page 53](#)

6 - Refrigerant line

- ☐ To air conditioner compressor

7 - Refrigerant line

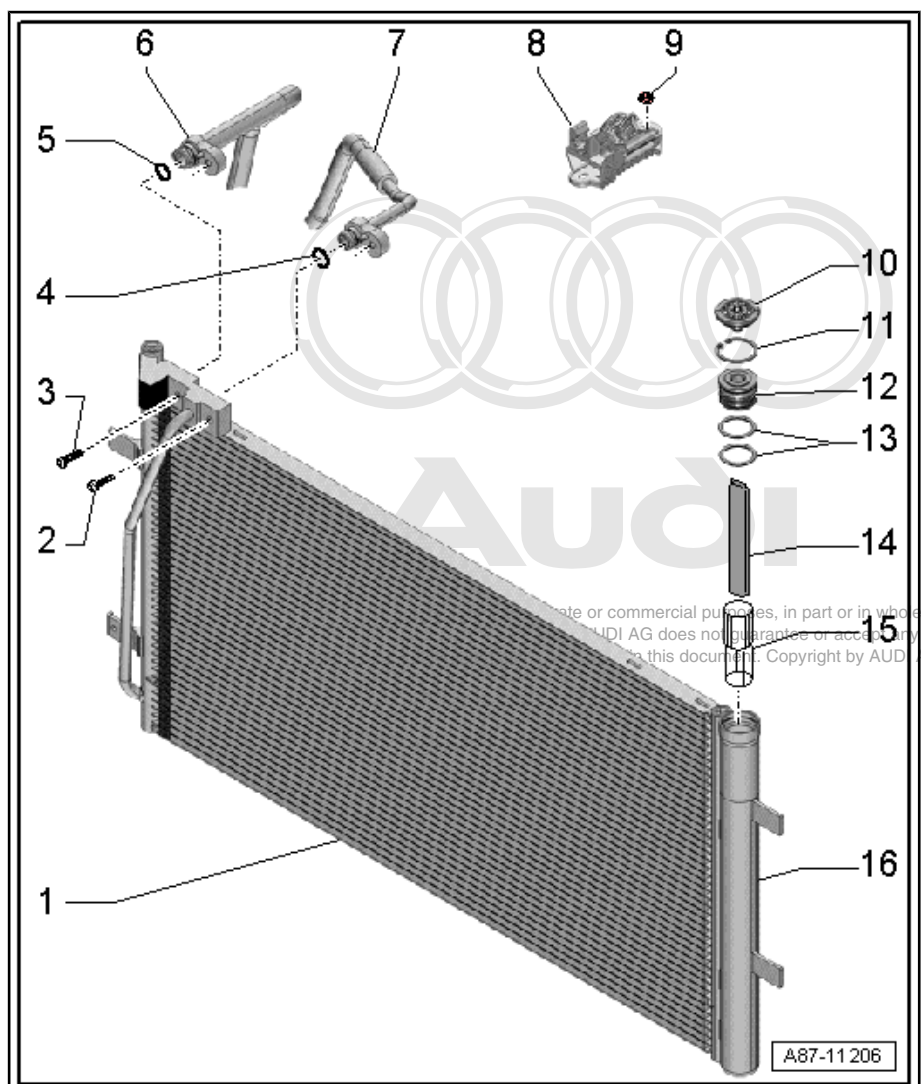
- ☐ To expansion valve
- ☐ With branch to service connection on high-pressure side
- ☐ Equipment version with connection point

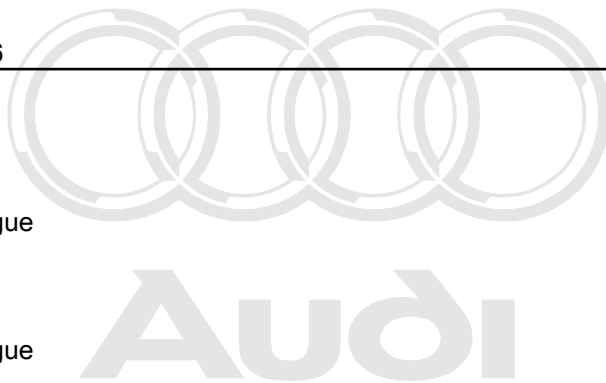
8 - Bracket

- ☐ For refrigerant lines

9 - Nut

- ☐ 2x





- ☐ 2.5 Nm

10 - Cap

- ☐ Different versions ⇒ Electronic parts catalogue

11 - Circlip

12 - Cap/plug

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ With O-rings
- ☐ Renew cap if damaged
- ☐ Lubricate O-ring with refrigerant oil before installing ⇒ [page 53](#)
- ☐ 2 Nm

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13 - O-rings

- ☐ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Before installing, lubricate with refrigerant oil ⇒ [page 53](#)

14 - Desiccant cartridge

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 112](#)

15 - Strainer

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 114](#)

16 - Receiver

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

- ◆ Showa/Keihin condenser ⇒ [page 110](#)



Note

Depending on the version, either the entire receiver or just the desiccant cartridge has to be renewed for the Showa/Keihin condenser.

2.2.2 Exploded view - condenser, air conditioner compressor, expansion valve, refrigerant line

1 - 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.

2 - Air conditioner compressor

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Detaching and attaching refrigerant line ⇒ [page 149](#)
- ☐ Removing and installing ⇒ [page 145](#)
- ☐ Removing and installing pulley, exploded view ⇒ [page 133](#)
- ☐ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

3 - O-ring

- ☐ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Before installing, lubricate with refrigerant oil ⇒ [page 53](#)

4 - Refrigerant line

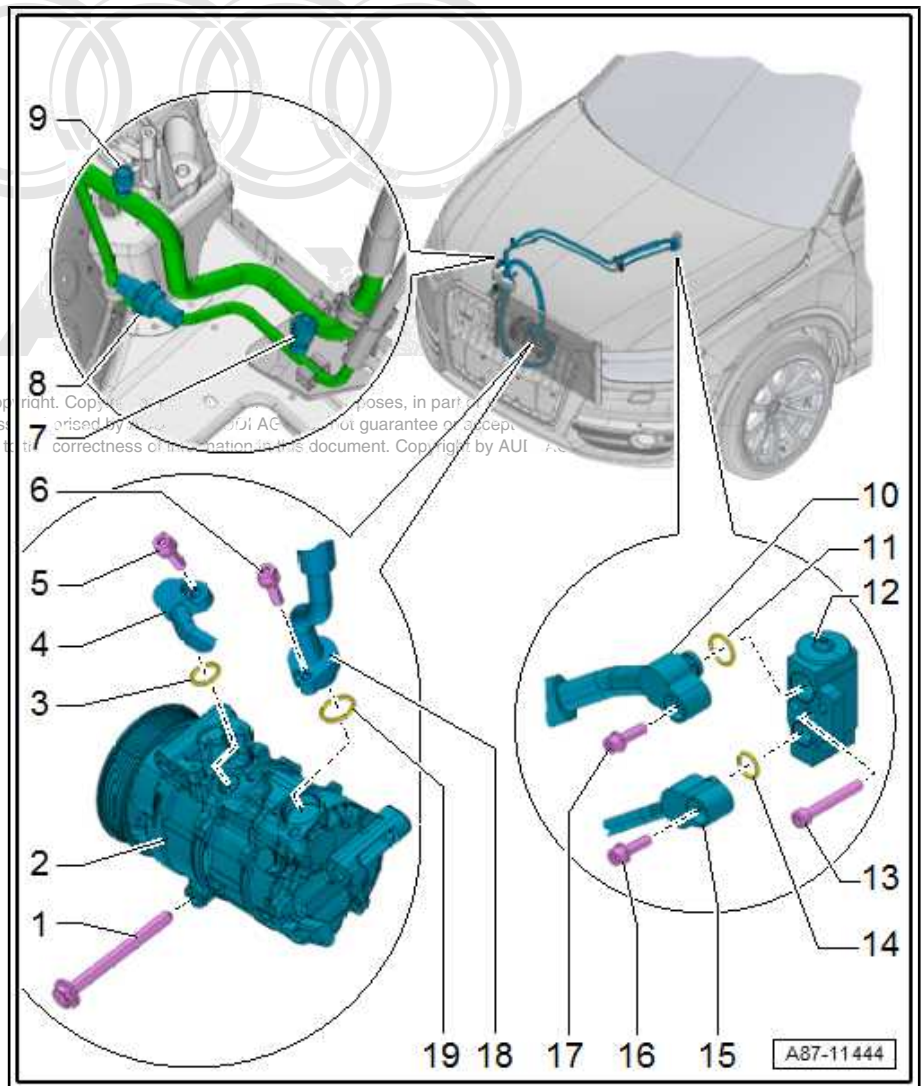
- ☐ To condenser
- ☐ Equipment version with connection point

5 - Bolt

- ☐ 22 Nm

6 - Bolt

- ☐ 22 Nm



7 - Service connection on high-pressure side



Caution

*Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.
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 notes 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)
⇒ ["2.12 Differences in service connections depending on refrigerant \(R134a or R1234yf\)", page 120](#) and
⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 123](#)

8 - High-pressure sender - G65-

- ☐ Checking ⇒ Vehicle diagnostic tester ("Guided Fault Finding"),
⇒ ["1.7 Checking pressure signal from high-pressure sender G65", page 13](#) and ⇒ Current flow diagrams,
Electrical fault finding and Fitting locations
- ☐ Removing and installing ⇒ [page 96](#)
- ☐ 8 Nm

9 - Service connection on low-pressure side



Caution

*Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.
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 notes 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)
⇒ ["2.12 Differences in service connections depending on refrigerant \(R134a or R1234yf\)", page 120](#) and
⇒ Electronic parts catalogue

- ☐ Removing and installing ⇒ [page 123](#)

10 - Refrigerant line

- ☐ To expansion valve
- ☐ Equipment version with connection point

11 - O-ring

- ☐ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Before installing, lubricate with refrigerant oil ⇒ [page 53](#)

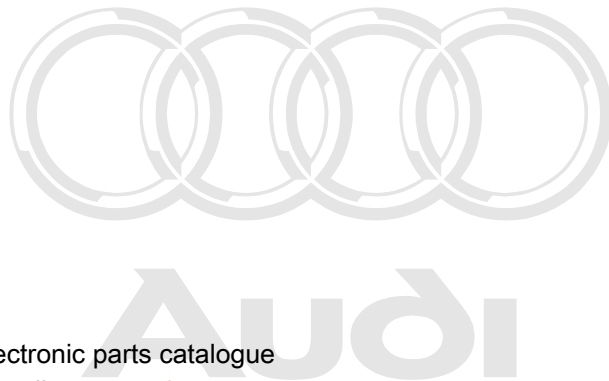
12 - Expansion valve

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Detaching and attaching refrigerant line ⇒ [page 101](#)
- ☐ Removing and installing ⇒ [page 103](#)



Note

*Different versions depending on refrigerant (R134a or R1234yf) ⇒
Electronic parts catalogue*



13 - Bolt

- ☐ 2x
- ☐ 10 Nm

14 - O-ring

- ☐ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Before installing, lubricate with refrigerant oil ⇒ [page 53](#)

15 - Refrigerant line

- ☐ From air conditioner compressor

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16 - Bolt

- ☐ 10 Nm

17 - Bolt

- ☐ 10 Nm

18 - Refrigerant line

- ☐ From condenser
- ☐ Equipment version with connection point

19 - O-ring

- ☐ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Before installing, lubricate with refrigerant oil ⇒ [page 53](#)

2.3 Removing and installing high-pressure sender - G65-



Note

- ◆ *The cooling output cannot be checked if the high-pressure sender - G65- has been removed; the operating and display unit (Climatronic control unit - J255- / air conditioning system control unit - J301-) does not switch on the air conditioner compressor ⇒ Vehicle diagnostic tester, "Guided Fault Finding" function for air conditioner ("Read measured values").*
- ◆ *The refrigerant circuit remains closed (connection with valve).*
- ◆ *Checking operation of high-pressure sender - G65- and signal output ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ "1.7 Checking pressure signal from high-pressure sender G65", page 13*
- ◆ *After the air conditioner compressor is switched off, it might take a relatively long period on this vehicle before the pressure in the high-pressure side drops (the expansion valve is cold and the pressure in the low-pressure side increases rapidly after the compressor is switched off, the expansion valve is closed and the refrigerant can flow to the low-pressure side only slowly).*



WARNING

Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.

Frostbite on skin and other parts of the body.

- ◆ ***If refrigerant emerges from refrigerant line for more than 1 second when -G805- is loosened, tighten -G805- again immediately.***
- ◆ ***If a valve is defective, extract refrigerant before removing and installing ⇒ 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 refrigerant line ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General notes on air conditioning systems (Air conditioner with refrigerant R134a; General notes on air conditioning systems), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .***

Removing

- Unplug electrical connector -2-.
- Remove high-pressure sender - G65- -item 1-.

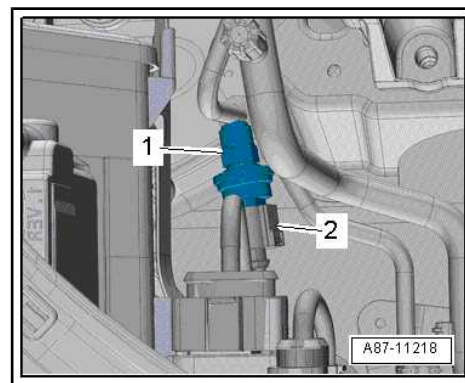
Installing

Install in reverse order of removal; note the following:

- Renew O-ring ⇒ [page 53](#) . For correct version refer to ⇒ Electronic parts catalogue .

Tightening torques

- ◆ ⇒ [“2.2.2 Exploded view - condenser, air conditioner compressor, expansion valve, refrigerant line”, page 93](#)



2.4 Checking cut-in signal for air conditioner compressor regulating valve - N280-



Note

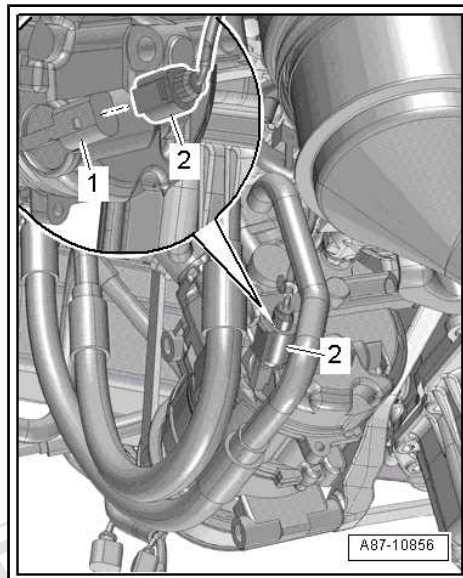
- ◆ *The following sequence describes the procedure for testing air conditioner compressors without air conditioning system magnetic clutch - N25- . Perform the check in the same manner on vehicles with a different type of compressor or a compressor from a different manufacturer.*
- ◆ *The difference 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 the air conditioner compressor (no cooling output from air conditioner, evaporator icing up etc.). If -N280- (and not the air conditioner compressor itself) is the cause of the problem, the air conditioner compressor can be serviced by 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 .*
- ◆ *-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 .*

Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester
- ◆ Test instrument adapter/DSO (3-pin) - VAS 5257- or auxiliary measuring set - V.A.G 1594C-
- ◆ Probe - VAS 5051/8-

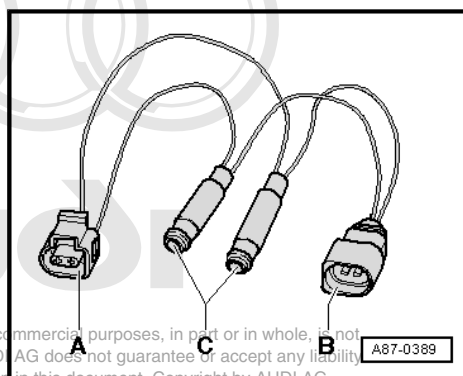
Test sequence

- 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- -item 1-.



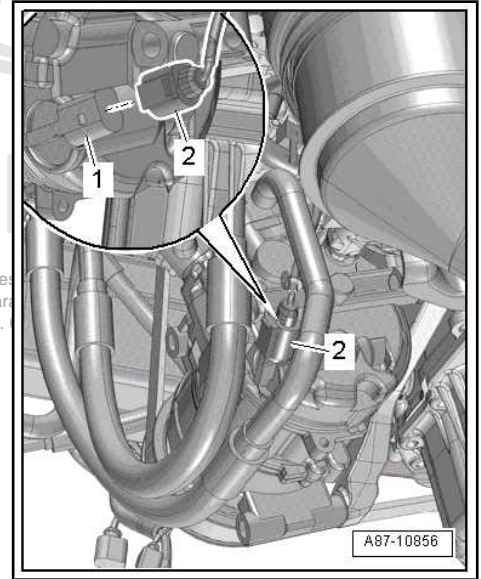
Note

- ◆ 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 (3-pin) - VAS 5257- must be used for an air conditioner compressor without -N25- , and test instrument adapter/DSO (2-pin) - VAS 5256- 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 mm²) 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- / 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.



- 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 the operating unit (Climatronic control unit - J255-). Use **Auto** and **AC** or **A/C** buttons to activate and deactivate air conditioner compressor regulating valve - N280- .
- Set rotary temperature control to coldest position on operating unit (air conditioning system control unit - J301-). Use **AC** or **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:

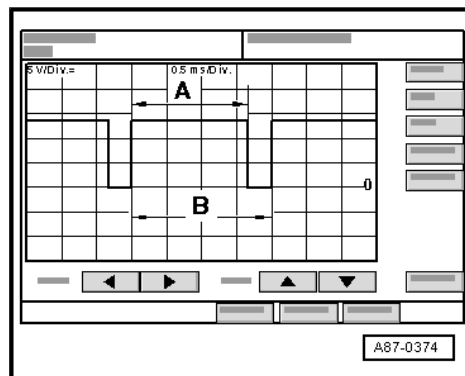


- In "OFF" mode (lamp in **AC** or **A/C** button not lit), no square-wave signal (air conditioner compressor regulating valve - N280- is not actuated).
- In "Auto" mode (automatically controlled air conditioner only) with **AC** (or **A/C**) button pressed (lamp in **AC** or **A/C** button lit), square-wave signal with a pulse width -A- between 75% and 100% (air conditioner compressor regulating valve - N280- is actuated).



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 (Climatronic control unit - J255- / air conditioning system control unit - J301-) 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

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- ◆ For example, in "Auto" mode (automatically controlled air conditioner) with "Lo" temperature setting and the **AC** button pressed (lamp in **AC** 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.

2.5 Detaching and attaching refrigerant lines at expansion valve



WARNING

Danger from escaping pressurised refrigerant.

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.*

Special tools and workshop equipment required

- ◆ Engine bung set - VAS 6122-

Removing

- Vehicles with TDI engine: Detach engine cover panel ⇒ Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- 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 .



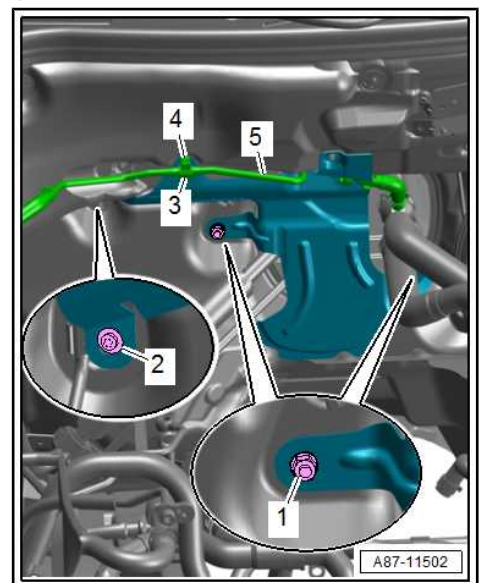
Note

Depending on the engine and vehicle version, it may be necessary to unfasten or remove the following components: Engine cover panel (top), compressed air pipe to throttle valve unit and intake manifold etc. ⇒ Engine; Rep. gr. 21 ; Charge air system; Exploded view - charge air system

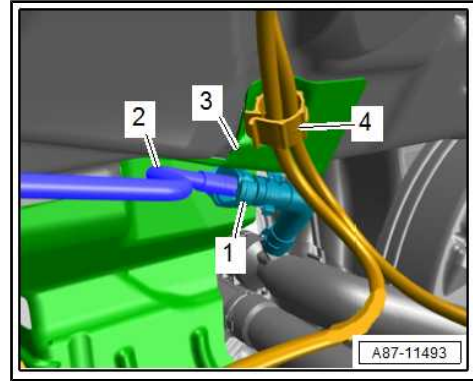
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Vehicles with 5-cylinder engine (Audi RS Q3):

- Remove air pipe (from air cleaner to turbocharger) ⇒ Engine; Rep. gr. 21 ; Charge air system; Exploded view - charge air system .
- Remove nuts -1- and bolt -2-.
- Open retainer -3- and move coolant line -5- clear.
- Detach retainer -4- from threaded pin.

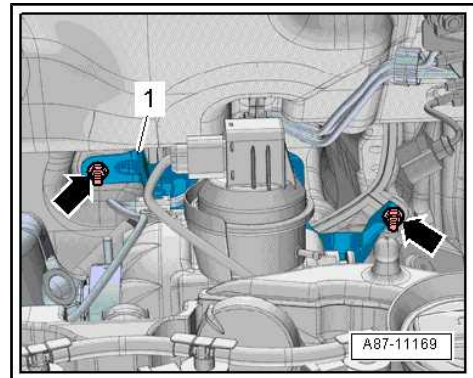


- Prise off wiring retainer -4-.
- Open retainer -1- and move coolant line -2- clear.
- Detach heat shield -3-.



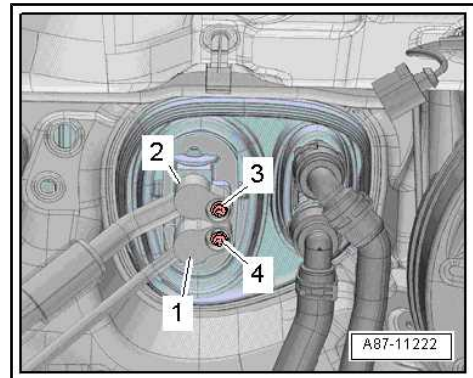
Vehicles with 4-cylinder engine:

- If fitted, unscrew nuts -arrows- and detach heat shield -1-.



All vehicles (continued):

- Remove bolts -3 and 4- and detach refrigerant lines -1 and 2-.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .

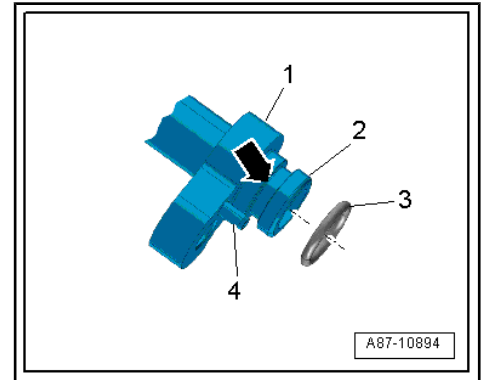


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Installing

Install in reverse order of removal; note the following:

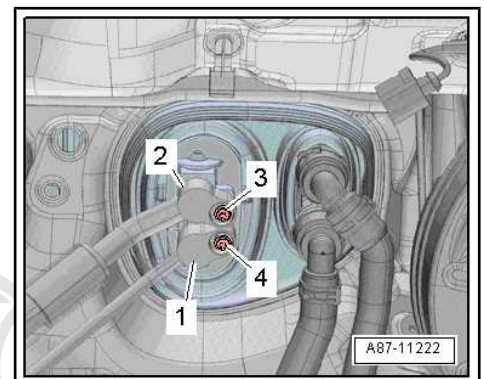
- Renew O-rings; for correct version, refer to ⇒ Electronic parts catalogue .
- If fitted, check that dowel pin -4- is not damaged and is seated correctly.
- Check guide ring -2- at refrigerant line connection for damage.
- Insert O-ring -3- in groove -arrow- in connection for refrigerant line -1-.



Note

- ◆ *Lubricate O-rings lightly with refrigerant oil before fitting ⇒ [page 53](#) .*
- ◆ *Check refrigerant pipes to evaporator for dirt and damage.*
- ◆ *Make sure O-rings are seated correctly in groove -arrow- of corresponding refrigerant line.*
- ◆ *After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.*

- Insert refrigerant lines -1, 2- in corresponding connections at expansion valve.
- Tighten bolts -3 and 4-.
- 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 125](#) .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



Tightening torques

- ◆ ⇒ ["2.2.2 Exploded view - condenser, air conditioner compressor, expansion valve, refrigerant line", page 93](#)

2.6 Removing and installing expansion valve

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Special tools and workshop equipment required

- ◆ Engine bung set - VAS 6122-



WARNING

Danger from escaping pressurised refrigerant.

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.***

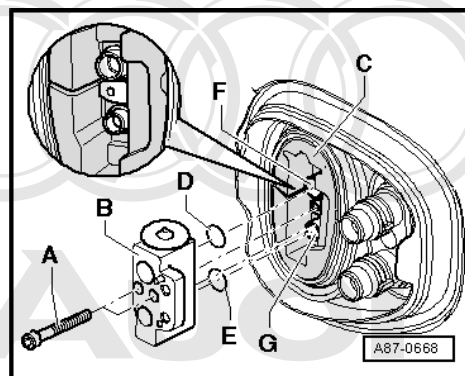


Note

- ◆ *After the air conditioner compressor is switched off, it might take a relatively long period on this vehicle before the pressure in the high-pressure side drops (the expansion valve is cold and the pressure in the low-pressure side increases rapidly after the compressor is switched off, the expansion valve is closed and the refrigerant can flow to the low-pressure side only slowly).*
- ◆ *Specific tools are required when discharging the refrigerant circuit, and this work may only be performed by 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 .*
- ◆ *Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue*
- ◆

Removing

- Detach refrigerant lines from expansion valve ⇒ [page 101](#) .
- Remove bolts -A-.
- Pull expansion valve -B- out of heat insulation -C-.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .



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Installing

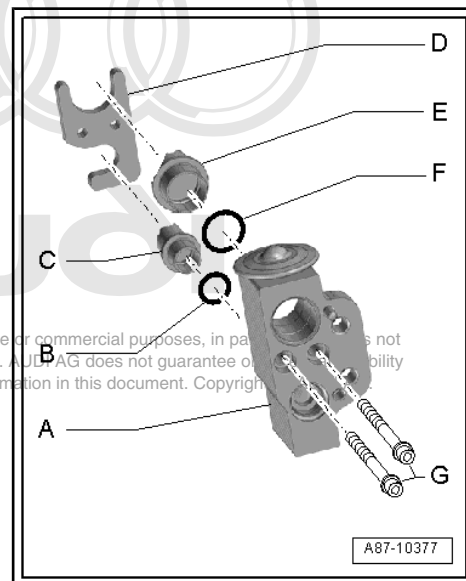
Install in reverse order of removal; note the following:

- Renew O-rings; for correct version, refer to ⇒ *Electronic parts catalogue* .
- Insert O-rings -B and F- at connecting pipes -C and E- to evaporator.



Note

- ◆ *Different versions depending on refrigerant (R134a or R1234yf) ⇒ *Electronic parts catalogue**
- ◆ *There are different versions of the expansion valve (identical housing but different characteristic control curve); therefore it is important to observe the correct assignment ⇒ *Electronic parts catalogue* .*
- ◆ *Lubricate O-rings lightly with refrigerant oil before fitting ⇒ [page 53](#) .*
- ◆ *Check refrigerant pipes to evaporator for dirt and damage.*
- ◆ *Make sure O-rings are seated correctly on connecting pipes of evaporator.*
- ◆ *If the heat insulation 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).*
- Insert expansion valve -A- at evaporator.
- Tighten bolts -G-.
- Attach refrigerant lines at expansion valve ⇒ [page 101](#) .
- 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 .



Tightening torques

- ◆ ⇒ [“2.2.2 Exploded view - condenser, air conditioner compressor, expansion valve, refrigerant line”, page 93](#)

2.7 Detaching and attaching refrigerant lines at condenser



WARNING

Danger from escaping pressurised refrigerant.

Frostbite on skin and other parts of the body.

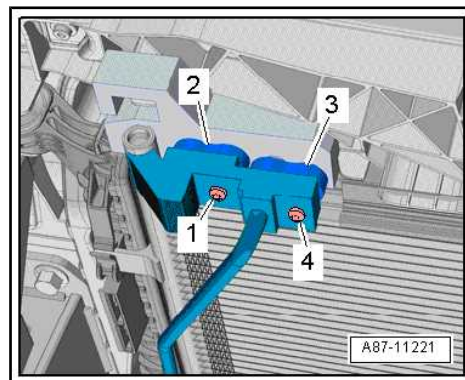
- *Extract the refrigerant and then immediately open up the refrigerant circuit.*
- *Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant circuit.*

Special tools and workshop equipment required

◆ Engine bung set - VAS 6122-

Removing

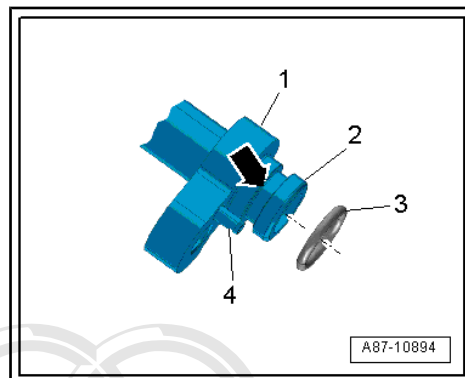
- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .
- Remove bolts -1 and 4- and detach refrigerant lines -2 and 3-.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .



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-.

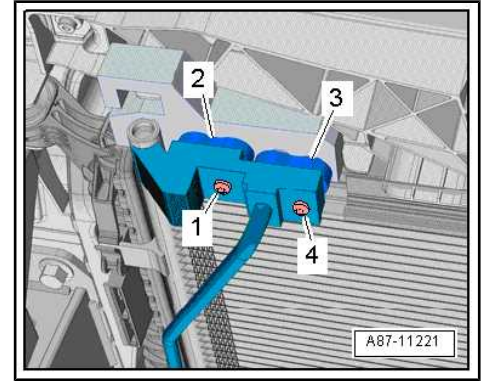


Note

- ◆ *Lubricate O-rings lightly with refrigerant oil before fitting ⇒ [page 53](#) .*
- ◆ *Make sure O-rings are seated correctly in groove -arrow- of corresponding refrigerant line.*
- ◆ *Routing and attaching refrigerant lines ⇒ [page 24](#)*

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- Insert refrigerant lines -2 and 3- in corresponding connections at condenser.
- Tighten bolts -1 and 4-.
- 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 125](#) .
- Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



Tightening torques

- ◆ ⇒ ["2.2.1 Exploded view - condenser, desiccant cartridge", page 91](#)

2.8 Removing and installing condenser



Note

- ◆ *Even if fitted correctly, there may be slight pressure marks on the radiator and condenser fins. This, however, does not mean that the radiators and condensers are damaged; they do not need to be renewed if such minor marks are noticed.*
- ◆ *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.*
- ◆ *There are different versions of the condenser, radiator and auxiliary radiator; pay attention to the correct assignment of these components ⇒ Electronic parts catalogue .*

Removing

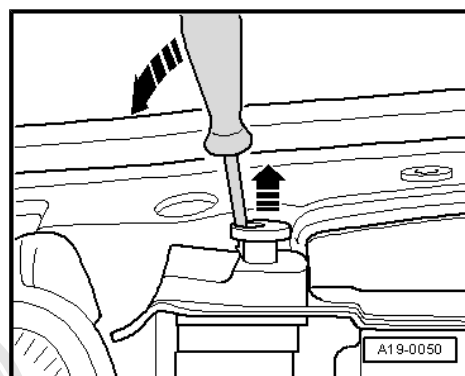
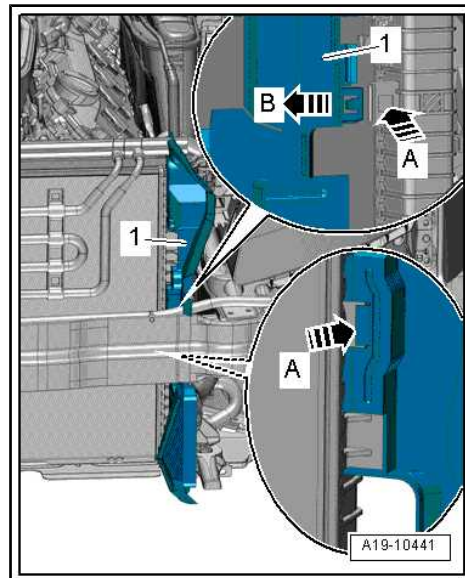
- Remove bumper cover (front) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .

On vehicles with auxiliary radiator (e.g. Audi RS Q3 with 5-cylinder engine)

- Remove impact bar ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing impact bar .
- Release auxiliary radiator and tilt it forwards ⇒ 5-cylinder direct injection engine (2.5 ltr. 4-valve TFSI); Rep. gr. 19 ; Radiators/radiator fans; Exploded view - radiators/radiator fans .

All vehicles

- Detach refrigerant lines from condenser ⇒ [page 105](#) .
- Release retaining tabs -arrows A- and detach air duct -1- (left and right) -arrow B-.
- Release retaining pins for radiator (both sides) and pull off upwards -arrows-.
- Swivel top edge of radiator slightly towards front.



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- Have a 2nd mechanic release retaining clips -2- in direction of -arrow A- and lift condenser -1- out of mountings on radiator -arrows B-.

Installing

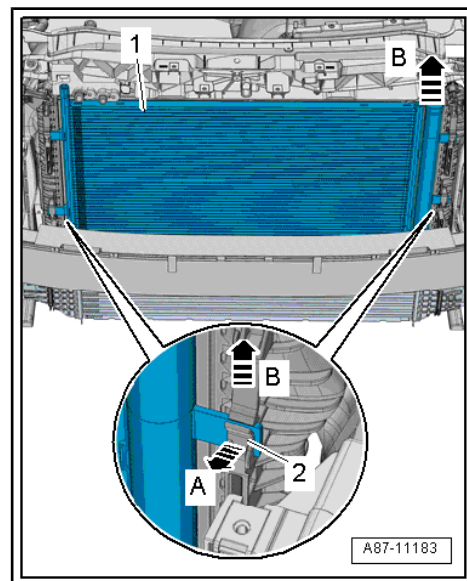
Install in reverse order of removal; note the following:



Note

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

- Install radiator ⇒ Rep. gr. 19 ; Radiators/radiator fans; Removing and installing radiator .
- Attach refrigerant lines to condenser ⇒ [page 105](#) .
- 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 125](#) .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



2.9 Removing and installing grommet for refrigerant lines

Removing

- Remove air conditioning unit (heater) ⇒ [page 208](#) .
- Coat support ring -C- with lubricant and prise out of mounting towards front.
- Unfasten grommet -A- from bulkhead mounting -B-.

Installing

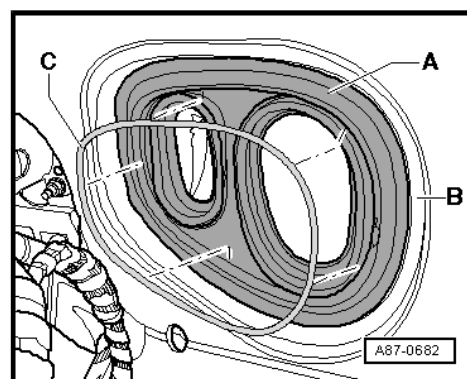
Install in reverse order of removal; note the following:



Note

Check all seals on air conditioning unit (heater) for damage prior to installation and renew damaged seals.

- Apply lubricant to grommet and install bulkhead.
- Insert support ring in grommet.
- Projection on support ring must face outwards.
- Install air conditioning unit (heater) ⇒ [page 208](#) .



2.10 Removing and installing receiver



WARNING

Danger from escaping pressurised refrigerant.

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

- ♦ *The receiver only has to be removed for the Showa/Keihin condenser.*
 - ♦ *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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Special tools and workshop equipment required

- ♦ Engine bung set - VAS 6122-

Removing

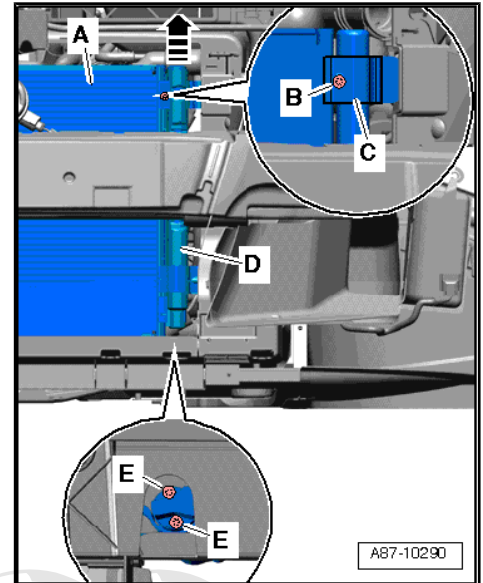
- Remove lock carrier cover ➤ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .
- Discharge refrigerant circuit ➤ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working 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); Removing and installing bumper cover .
- On vehicles with charge air cooler: Remove charge air cooler ➤ Rep. gr. 21 ; Charge air system; Removing and installing charge air cooler .

- Remove bolts -E-.
- Remove bolt -B- and detach bracket -C- downwards.
- Pull receiver -D- upwards out of condenser -A- -arrow-.
- Seal off open connections with clean plugs from engine bung set - VAS 6122- .

Installing

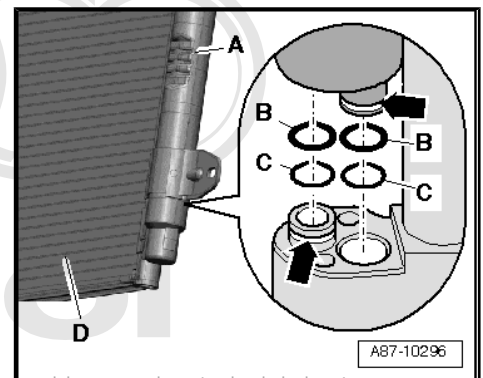
Install in reverse order of removal; note the following:

- Renew O-rings; for correct version, refer to ⇒ Electronic parts catalogue .



Note

- ◆ *Lubricate O-rings lightly with refrigerant oil before fitting ⇒ [page 53](#) .*
- ◆ *Make sure O-rings -B, C- are correctly seated in grooves -arrows- in corresponding mounting.*
- ◆ *Keep the receiver closed for as long as possible; only remove caps immediately before installation (the receiver contains a desiccant bag which quickly becomes saturated with moisture if the receiver is left open, rendering it unusable).*



- Clean contact surface of condenser -D-.
- Position receiver -A- on condenser and tighten bolts.
- On vehicles with charge air cooler: Install charge air cooler ⇒ Rep. gr. 21 ; Charge air system; Removing and installing charge air cooler .
- Install bumper cover (front) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .
- 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 125](#) .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

Tightening torques

- Receiver to condenser: 10 Nm

2.11 Removing and installing desiccant bag/ desiccant cartridge

⇒ [“2.11.1 Removing and installing desiccant cartridge - Denso condenser”, page 112](#)

⇒ [“2.11.2 Removing and installing desiccant cartridge - Modine condenser”, page 114](#)

⇒ [“2.11.3 Removing and installing desiccant cartridge - Showa/Keihin condenser”, page 118](#)

2.11.1 Removing and installing desiccant cartridge - Denso condenser



WARNING

Danger from escaping pressurised refrigerant.

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.***

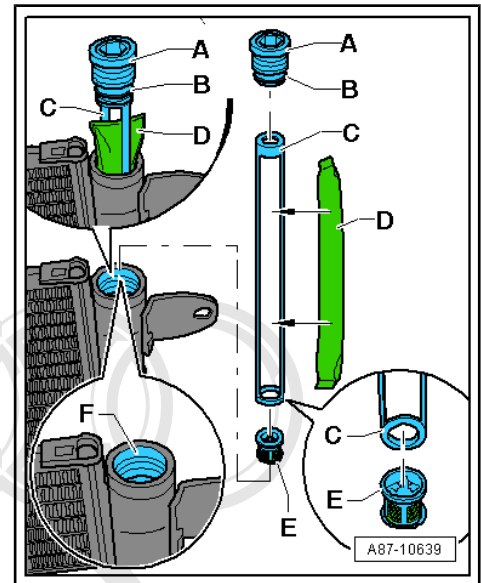
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Special tools and workshop equipment required

- ◆ Commercially available gripper tool

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 lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .
- 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.

Frostbite on skin and other parts of the body.

- ◆ ***Only remove the plug when the pressure in the refrigerant circuit is equal to or less than the atmospheric pressure.***

- Unscrew plug -A-.
- Lift dryer mount -C- with desiccant cartridge -D- out of condenser.
- Using e.g. a commercially available gripper tool, pull filter element -E- upwards out of condenser.
- Seal open receiver with plug -1- 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 .

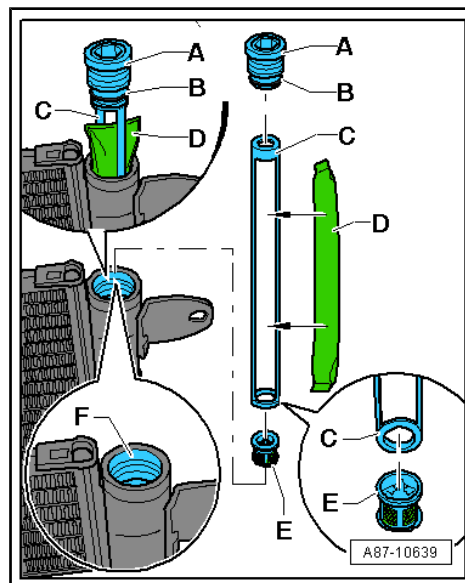
- Check threads and sealing surfaces of receiver at condenser for dirt or damage via opening.



Note

- ◆ *Keep bag with air-tight seal containing desiccant cartridge closed as long as possible. Only open bag immediately before inserting desiccant cartridge in 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 53](#) .*

- Insert filter element -E- in correct position in receiver of condenser.
- Take desiccant cartridge out of its bag and insert it in dryer mount.
- Insert dryer mount together with desiccant cartridge -D- in receiver of condenser.
- Fit and screw in plug -A-.
- Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .
- 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 125](#) .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



Tightening torques

- ♦ ⇒ ["2.2.1 Exploded view - condenser, desiccant cartridge", page 91](#)

2.11.2 Removing and installing desiccant cartridge - Modine condenser



WARNING

Danger from escaping pressurised refrigerant.

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.***

Special tools and workshop equipment required

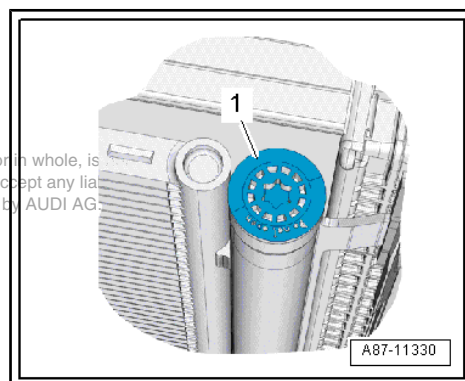
- ♦ Socket T70 - T10128- for version "2"

Removing

- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .
- 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 .

Version 1:

- Remove protective 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 .

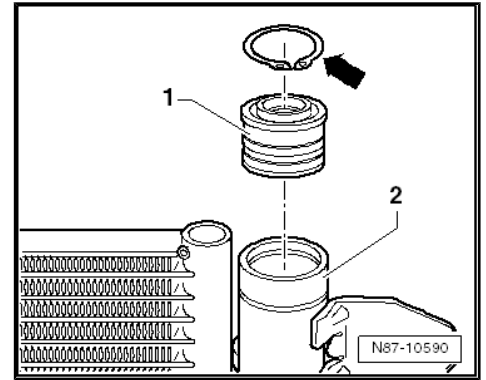


WARNING

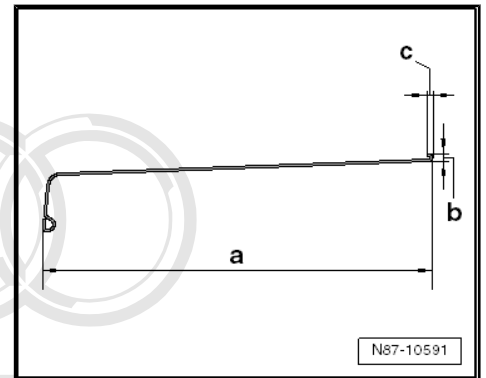
Danger from escaping pressurised refrigerant.

Frostbite on skin and other parts of the body.

- ◆ ***Only remove the circlip when the pressure in the refrigerant circuit is equal to or less than the atmospheric pressure.***

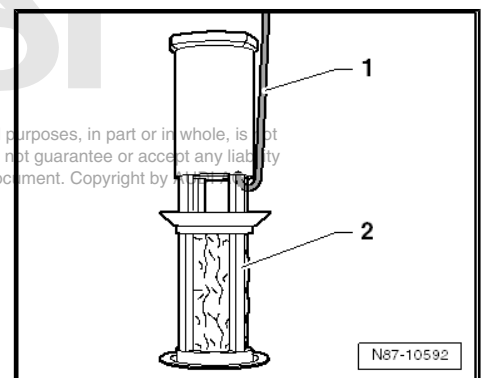


- Press cap -1- in slightly.
- Detach circlip -arrow- and pull cap out of condenser -2- using an M12 bolt.
- Prepare a length of welding wire ($\varnothing$ 2 mm) with the following dimensions:
 - Dimension -a- = 380 mm
 - Dimension -b- = max. 7 mm
 - Dimension -c- = max. 6 mm

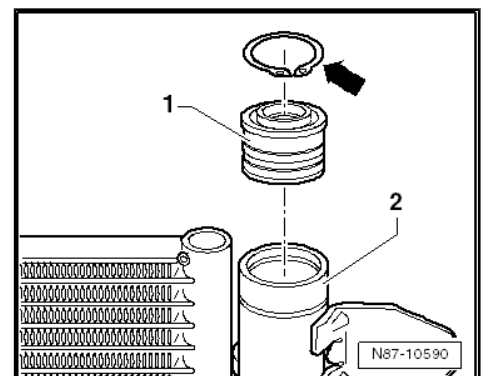


- To prevent damaging the condenser, it is important to hook the welding wire into the strainer as shown in the illustration.
- Using welding wire -1-, carefully pull filter element (strainer) -2- out of receiver.

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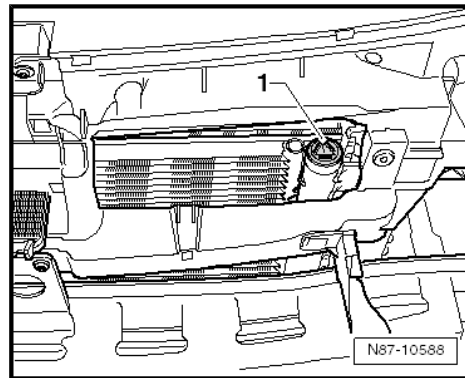


- Seal open receiver with cap -1- to prevent ingress of dirt and moisture.



Version 2:

- Remove protective cap -1- using socket T70 - T10128- .



- 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 .

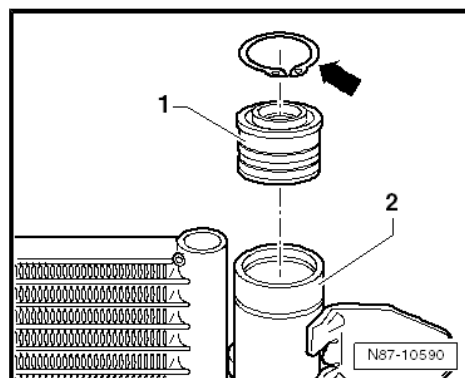


WARNING

Danger from escaping pressurised refrigerant.

Frostbite on skin and other parts of the body.

- ◆ ***Only remove the circlip when the pressure in the refrigerant circuit is equal to or less than the atmospheric pressure.***



- 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

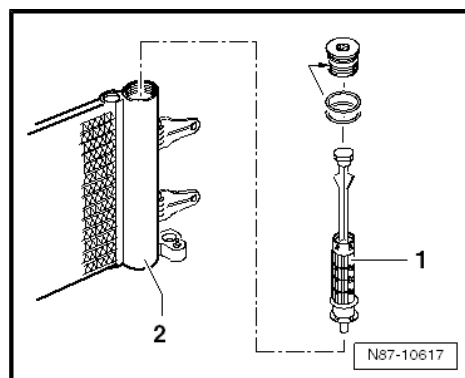
Install in reverse order of removal; note the following:



Note

The cap, O-rings, desiccant cartridge and filter element (strainer) must always be renewed after the receiver has been opened ⇒ Electronic parts catalogue .

- Check sealing surfaces of receiver at condenser for dirt or damage via opening.



Version 1:

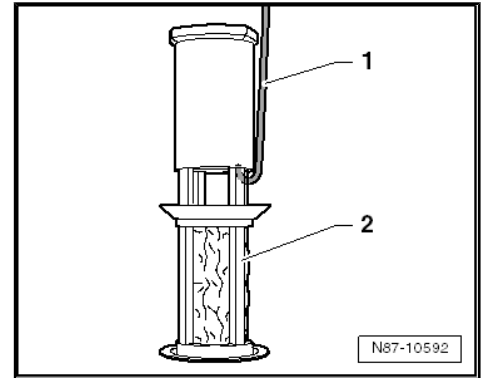
- Insert filter element (with strainer) -2- in correct position in receiver of condenser.
- Make sure filter element is pressed in as far as possible.



Note

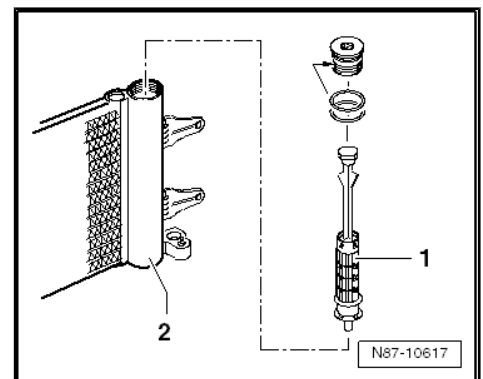
Keep bag with air-tight seal containing desiccant cartridge closed as long as possible. Only open bag immediately before inserting desiccant cartridge in condenser. After opening bag, desiccant cartridge soon becomes saturated with moisture from ambient air and becomes unusable.

- 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-.



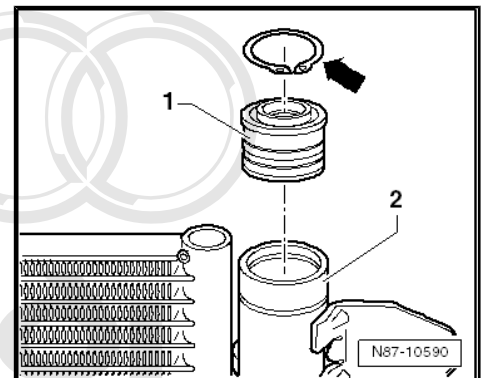
All versions (continued):

- Insert cap -1- and press it downwards until circlip -arrow- can engage in the groove.

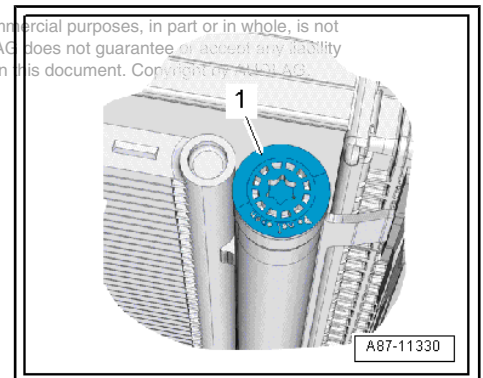


Note

*Coat O-rings of cap lightly with refrigerant oil before fitting
⇒ [page 53](#).*



- Version 1: Press on protective cap.
- Version 2: Screw in protective cap using socket T70 T10128-.
- 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 125](#) .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



2.11.3 Removing and installing desiccant cartridge - Showa/Keihin condenser



Note

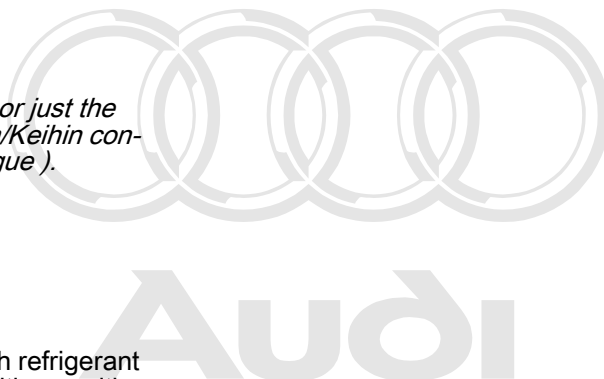
Depending on the version, either the entire receiver or just the desiccant cartridge has to be renewed for the Showa/Keihin condenser (different versions ⇒ Electronic parts catalogue).

Special tools and workshop equipment required

- ◆ Commercially available gripper tool

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 lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .



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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 .

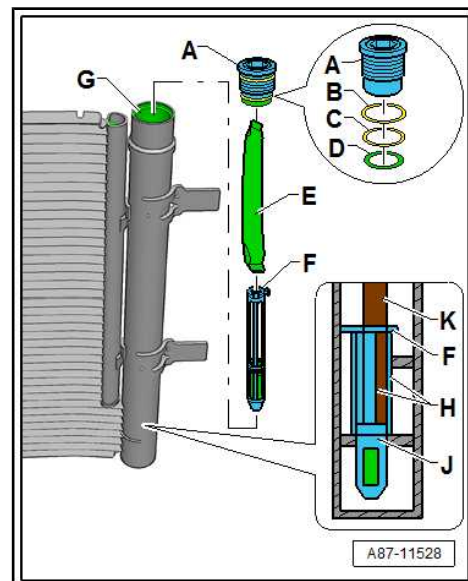


WARNING

Danger from escaping pressurised refrigerant.

Frostbite on skin and other parts of the body.

- ◆ ***Only remove the circlip when the pressure in the refrigerant circuit is equal to or less than the atmospheric pressure.***



- 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:

Tightening torque ⇒ [page 91](#)



Note

The plug, O-ring and desiccant cartridge must always be renewed after the receiver has been opened ⇒ Electronic parts catalogue .

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- 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 53](#) .***

- Lubricate filter element -F- in area of sealing surface -J- lightly with refrigerant oil before fitting ⇒ [page 53](#) .
- 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-.

- Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .
- 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 125](#) .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

2.12 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 77](#) and ⇒ ["2.1 System overview - refrigerant circuit", page 87](#)*
- ◆ *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 (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 .*
- ◆ *Removing and installing valve from service connection (low and high-pressure sides) ⇒ [page 123](#) .*
- ◆ *Always screw on sealing caps with seal.*

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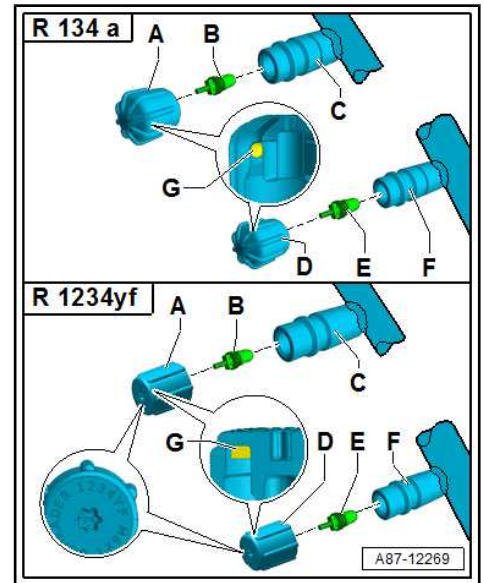
Service connections (refrigerant R134a and R1234yf)



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 (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 .

- ◆ Cap for service connection on high-pressure side -A- with seal -G-
- ◆ Valve core on high-pressure side (version: Schrader valve or needle valve) -B-
- ◆ Service connection on high-pressure side -C-
- ◆ Cap for service connection on 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**

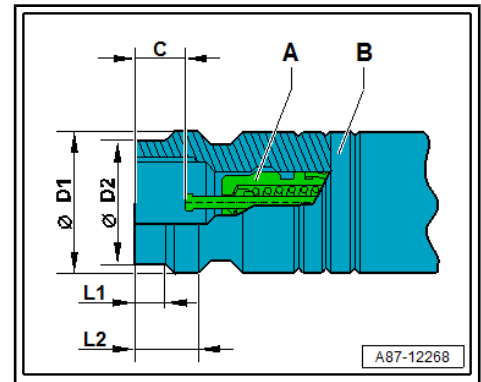
- ◆ *Service connections -C, F- for refrigerant R134a and R1234yf are available in different versions (depending on manufacturer), with different sealing caps -A, D- and valves -B, E-. Ensure correct assignment ⇒ [Electronic parts catalogue](#) .*
- ◆ *Sealing caps -A, D- for the service connections 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 122](#)).*
- ◆ *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 123](#) .*
- ◆ *Take care when tightening the valves -B, E- (low torque) ⇒ [page 123](#) .*
- ◆ *There are different versions of these valves; therefore tightening torques vary. For a valve core -C- with a VG5 thread (5.2 x 0.7 mm, tyre valve) the tightening torque is 0.4 Nm +/- 0.1 Nm; for a valve core with an M6 x 0.75 mm thread the tightening torque is 0.9 Nm +/- 0.1 Nm, and for a valve core with an M8 x 1.0 mm thread the tightening torque is 2.0 Nm +/- 0.2 Nm.*
- ◆ *There are different versions of valve caps -A, D-; therefore tightening torques vary. For a valve cap with an M8 x 1 mm or M10 x 1 mm thread the tightening torque is 0.4 Nm +/- 0.1 Nm.*

Dimensions of service connections

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- ◆ Valve core -A- (different versions) ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General notes on air conditioning systems , and ⇒ Air conditioner with refrigerant R1234yf - General notes; 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



2.13 Removing and installing service connections (low and high-pressure sides)



WARNING

Danger from escaping pressurised refrigerant.

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

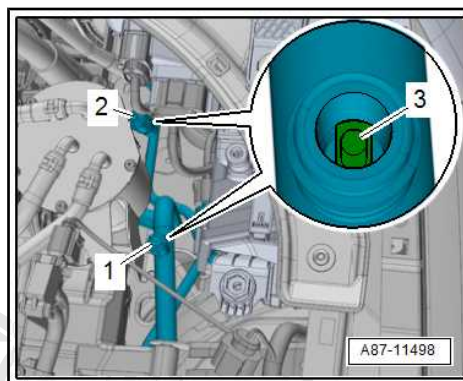
- ◆ *Specific tools are required for discharging the refrigerant circuit; such work may only be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General notes on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station*
- ◆ *Different versions depending on refrigerant (R134a or R1234yf)
⇒ "2.12 Differences in service connections depending on refrigerant (R134a or R1234yf)", page 120 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 (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 service connection -3- using socket - T10364- and a suitable adapter.



Note

For further information on the service connection, refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General notes 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 the reverse order; note the following:

- 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 125](#) .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

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2.14 Starting up air conditioner after charging refrigerant circuit

⇒ **"2.14.1 Procedure if it is unavoidable to start the engine with an empty refrigerant circuit", page 125**

⇒ **"2.14.2 Procedure when starting the engine for the first time after charging the refrigerant circuit", page 126**

2.14.1 Procedure if it is unavoidable to start the engine with an empty refrigerant circuit



Caution

Risk of damage to the air conditioner compressor if the engine is run with the refrigerant circuit empty ⇒ 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; Discharging refrigerant circuit .

- ◆ *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.

2.14.2 Procedure when starting the engine for the first time after charging the refrigerant circuit

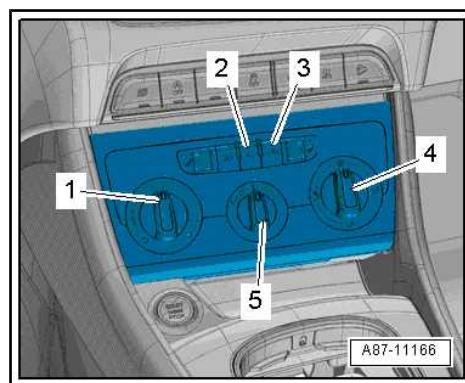
- All components removed have been re-installed.
- The refrigerant circuit is charged ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General notes on air conditioning systems (Air conditioner with refrigerant R134a; General notes on air conditioning systems), or ⇒ Air conditioner with refrigerant R1234yf; General notes; Rep. gr. 87; Working with the air conditioner service station; Starting up air conditioner after charging . Before using air conditioner after system has been re-charged.
- Open all dash panel vents and any vents in centre console.
- Switch on ignition.

Vehicles with manually controlled air conditioner:

- Lamp in **AC** or **A/C** button -2- is not lit.
- 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 on).

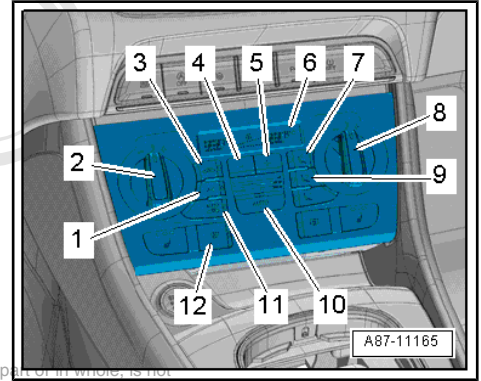


Vehicles with automatically controlled air conditioner:

- Lamp in **AC** or **A/C** button -1- is not lit.
- 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 -10- is on.
- Set temperature to “cold” using temperature selection switches -2, 8- – “LO” display for driver and front passenger side in display -6- of -J255-.
- Air conditioner compressor on (lamp in **AC** or **A/C** button -1- on).



All vehicles (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 notes on air conditioning systems (Air conditioner with refrigerant R134a; General notes 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 system has been re-charged.

3 Air conditioner compressor

⇒ "3.1 Exploded view - drive unit for air conditioner compressor", page 128

⇒ "3.2 Exploded view - pulley", page 133

⇒ "3.3 Detaching and attaching air conditioner compressor at bracket", page 145

⇒ "3.4 Detaching and attaching refrigerant lines at air conditioner compressor", page 149

⇒ "3.5 Removing and installing air conditioner compressor", page 151

⇒ "3.6 Preparations for renewing pulley", page 154

⇒ "3.7 Removing and installing pulley", page 154

3.1 Exploded view - drive unit for air conditioner compressor

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⇒ "3.1.1 Exploded view - drive unit for air conditioner compressor, vehicles with 4-cylinder engine", page 128

⇒ "3.1.2 Exploded view - drive unit for air conditioner compressor, 5-cylinder engine (Audi RS Q3)", page 131

3.1.1 Exploded view - drive unit for air conditioner compressor, vehicles with 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 - Dowel sleeve

- ☐ 2x

3 - Bracket for ancillaries

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing
⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing bracket for ancillaries

4 - O-ring

- ☐ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Before installing, lubricate with refrigerant oil
⇒ [page 53](#)

5 - Refrigerant line (high-pressure side)

6 - Bolt

- ☐ Tightening torque
⇒ [page 93](#)

7 - Bolt

- ☐ Tightening torque ⇒ [page 93](#)

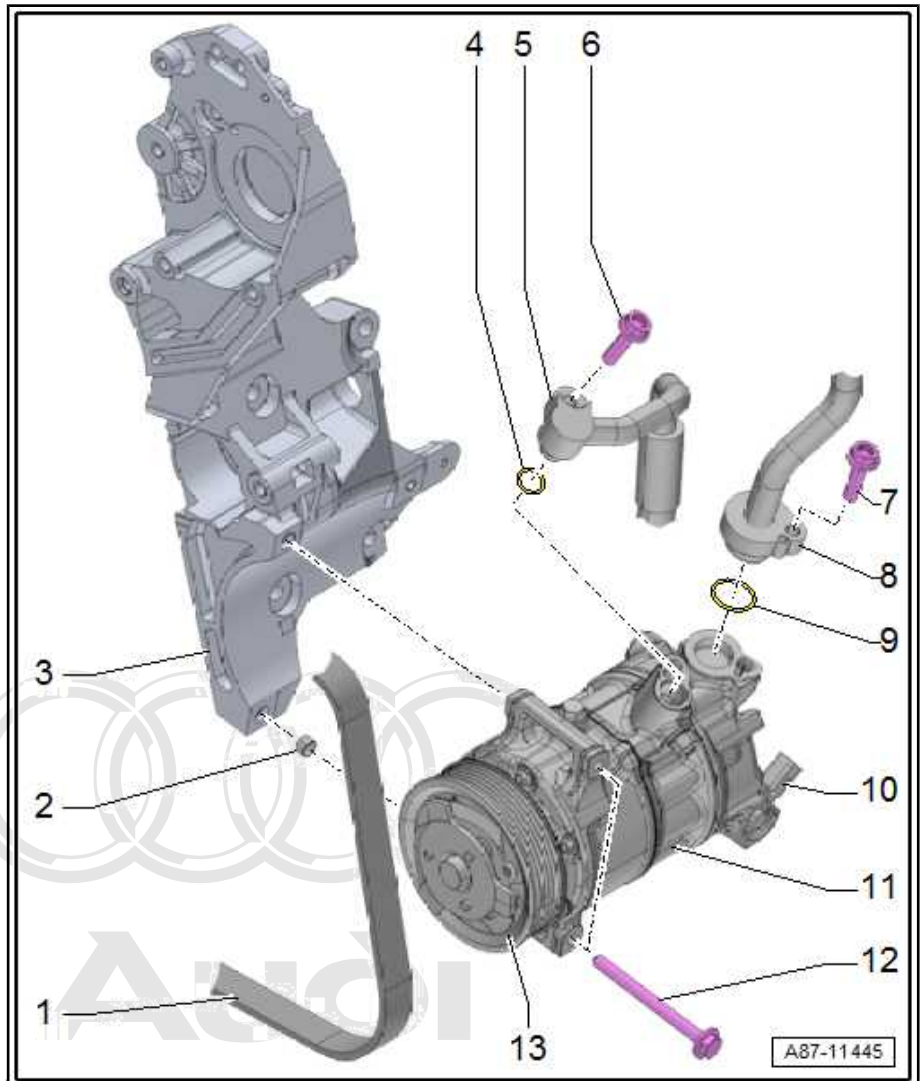
8 - Refrigerant line (low-pressure side)

9 - O-ring

- ☐ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Before installing, lubricate with refrigerant oil ⇒ [page 53](#)

10 - Air conditioner compressor regulating valve - N280-

- ☐ Checking ⇒ Vehicle diagnostic tester ("Guided Fault Finding"),
⇒ ["2.4 Checking cut-in signal for air conditioner compressor regulating valve N280"](#), [page 97](#) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations



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**Note**

- ◆ *Certain malfunctions of -N280- (e.g. sticking valve or open circuit in coil) can lead to problems with the air conditioner compressor (no cooling output from air conditioner, evaporator icing up etc.). If -N280- (and not the air conditioner compressor itself) is the cause of the problem, the air conditioner compressor can be serviced by 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.*
- ◆ *-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.*

11 - Air conditioner compressor

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Detaching and attaching refrigerant line ⇒ [page 149](#)
- ☐ Detaching and attaching at bracket ⇒ [page 145](#)
- ☐ Removing and installing ⇒ [page 151](#)

**Note**

Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

12 - Bolt

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- ☐ 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.

13 - Pulley with overload protection

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Exploded view ⇒ [page 133](#)

3.1.2 Exploded view - drive unit for air conditioner compressor, 5-cylinder engine (Audi RS Q3)

1 - Bracket for ancillaries

- ☐ Different versions ⇒
Electronic parts catalogue
- ☐ Removing and installing
⇒ Rep. gr. 13 ; Cylinder
block (pulley end); Re-
moving and installing
bracket for ancillaries

2 - Bolt

- ☐ Tightening torque ⇒
Rep. gr. 13 ; Cylinder
block (pulley end); Ex-
ploded view - cylinder
block (pulley end)

3 - Bolt

- ☐ Tightening torque ⇒
Rep. gr. 13 ; Cylinder
block (pulley end); Ex-
ploded view - cylinder
block (pulley end)

4 - Bolt

- ☐ Tightening torque ⇒
Rep. gr. 13 ; Cylinder
block (pulley end); Ex-
ploded view - cylinder
block (pulley end)

5 - Air conditioner compressor

- ☐ Different versions ⇒
Electronic parts cata-
logue
- ☐ Detaching and attach-
ing refrigerant line
⇒ [page 149](#)

☐ Detaching and attaching
at bracket ⇒ [page 145](#)

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- ☐ Removing and installing ⇒ [page 151](#)



Note

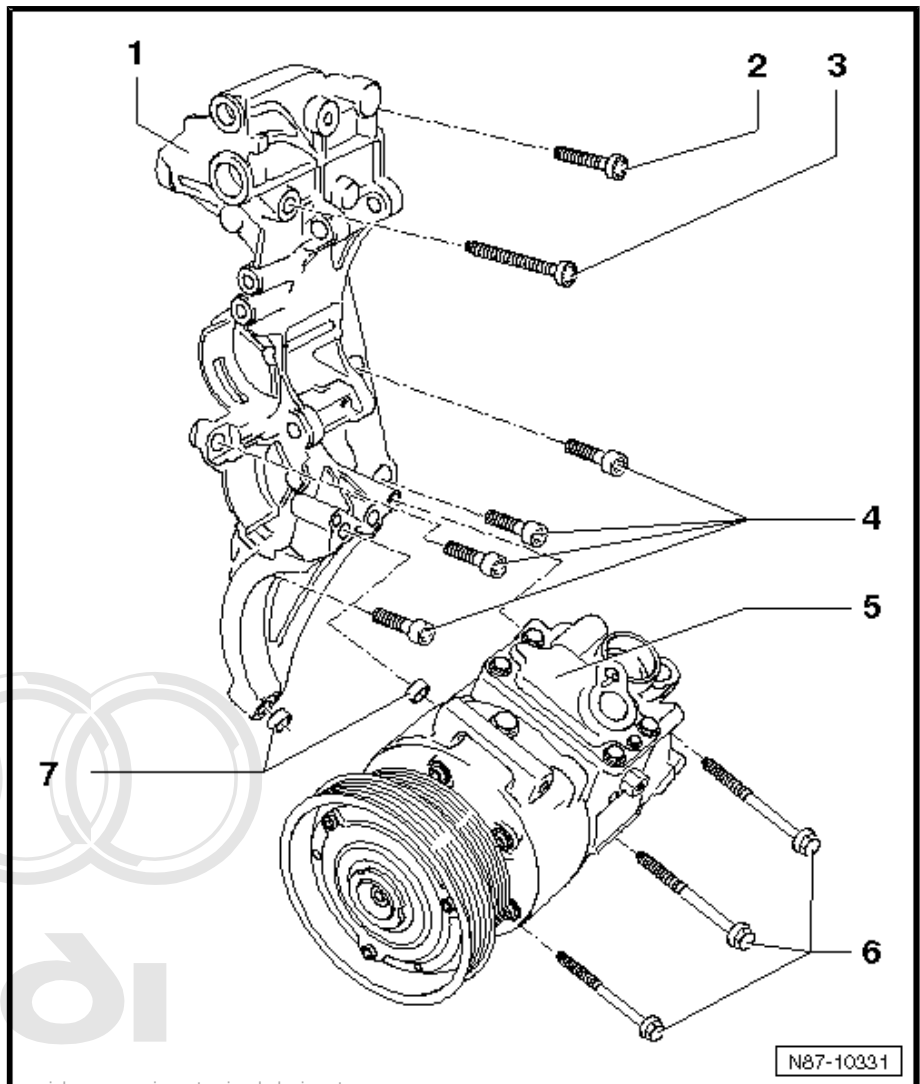
*Different versions depending on re-
frigerant (R134a or R1234yf) ⇒
Electronic parts catalogue*

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.

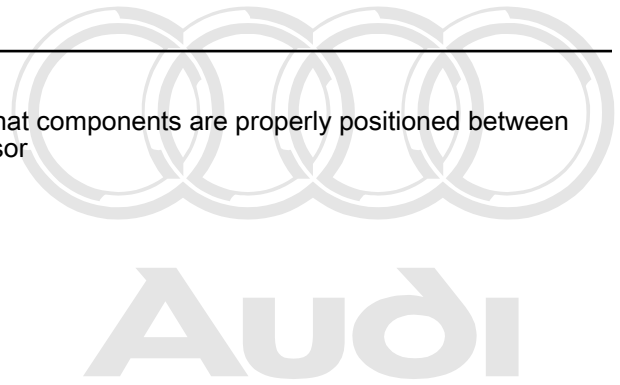
7 - Dowel sleeve

- ☐ 2x





- ☐ Make sure that correct version is being used and that components are properly positioned between bracket for ancillaries and air conditioner compressor



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3.2 Exploded view - pulley

⇒ [“3.2.1 Exploded view - Denso air conditioner compressor pulley, version 1”, page 133](#)

⇒ [“3.2.2 Exploded view - Denso air conditioner compressor pulley, version 2”, page 135](#)

⇒ [“3.2.3 Exploded view - Denso air conditioner compressor pulley, version 3”, page 136](#)

⇒ [“3.2.4 Exploded view - Valeo air conditioner compressor pulley”, page 137](#)

⇒ [“3.2.5 Exploded view - Sanden air conditioner compressor pulley, version 1”, page 138](#)

⇒ [“3.2.6 Exploded view - air conditioner compressor pulley, Sanden version 2 \(Delphi/Mahle version 1\)”, page 140](#)

⇒ [“3.2.7 Exploded view - Sanden air conditioner compressor pulley, version 3”, page 142](#)

3.2.1 Exploded view - Denso air conditioner compressor pulley, version 1



Note

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This type of pulley is installed e.g. on vehicles with air conditioner compressor version “7 SEU 16”.

1 - Bolt

- ☐ Renew
- ☐ 20 Nm

2 - Drive plate

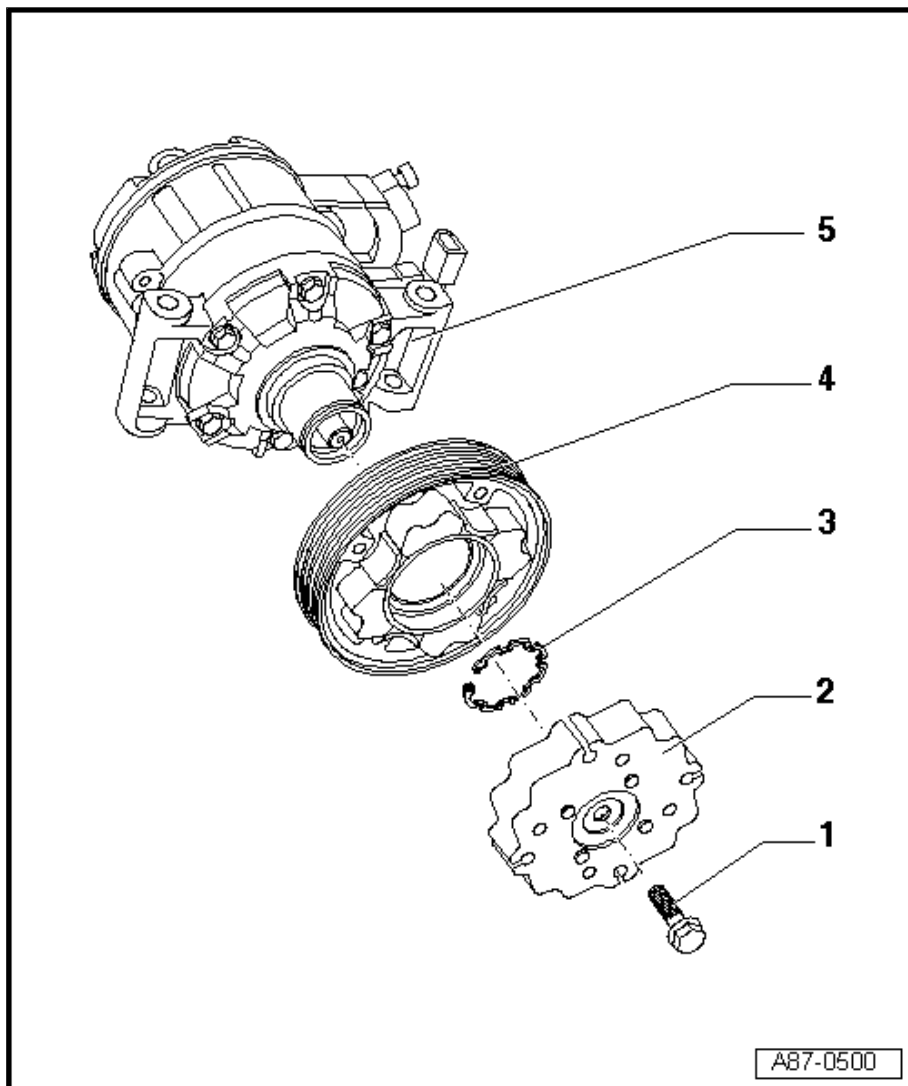
- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 154](#)
- ☐ With overload protection device; triggered if torque is too great (e.g. if air conditioner compressor cannot rotate freely) causing pulley to free-wheel without driving air conditioner compressor

3 - Circlip

- ☐ Renew
- ☐ Install correctly: flat side must face air conditioner compressor

4 - Pulley

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 154](#)
- ☐ Rubber element of pulley is 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.



Note

Under certain conditions (e.g. engine running roughly), rubber element of pulley may be triggered when there is no fault in the air conditioner compressor or refrigerant circuit.

5 - 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 - Denso air conditioner compressor pulley, version 2



This type of pulley is installed e.g. on vehicles with air conditioner compressor version "7 SEU 17".

1 - Circlip

- ☐ With vulcanised rubber disc
- ☐ Remove carefully using a small screwdriver or long-nose pliers (paying particular attention to pulley)
- ☐ Vulcanised rubber disc provides noise insulation when compressor output is low and engine is idling

2 - Drive plate

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 156](#)
- ☐ Screwed onto compressor shaft
- ☐ 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
- ☐ A plastic disc may have been bonded on, depending on production period ⇒ [page 156](#).
- ☐ 35 Nm

3 - Circlip

- ☐ Renew
- ☐ Install correctly: flat side must face air conditioner compressor

4 - Spacer

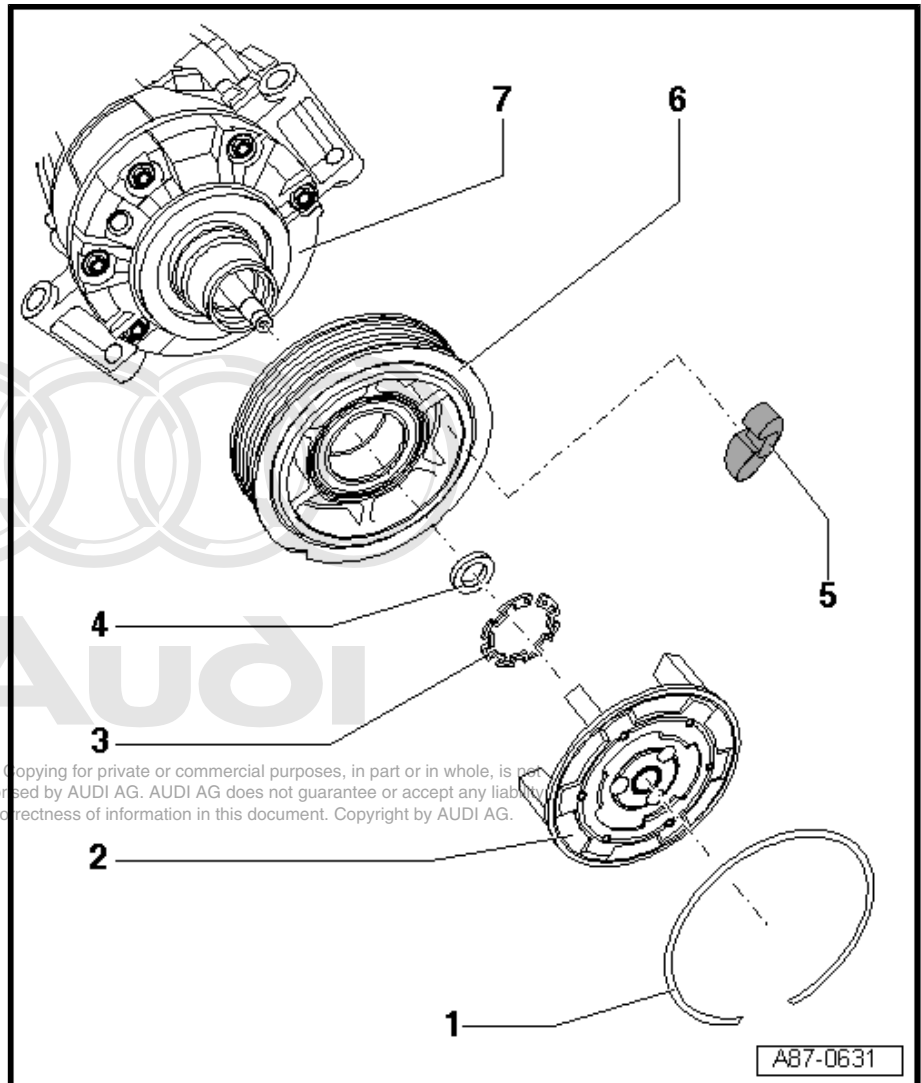
- ☐ Dimensions: 17.5 x 10 x 3 mm

5 - Rubber elements

- ☐ 6x
- ☐ Install in correct position ⇒ [page 156](#)
- ☐ Decouples pulley from air conditioner compressor drive shaft, damping vibration and noise

6 - Pulley

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Made of plastic, sensitive to impact
- ☐ Removing and installing ⇒ [page 156](#)



7 - Air conditioner compressor

- ☐ Clean air conditioner compressor drive shaft before fitting pulley



Note

*Different versions depending on re-
frigerant (R134a or R1234yf) →
Electronic parts catalogue*

3.2.3 Exploded view - Denso air conditioner compressor pulley, version 3



Note

This type of pulley is installed e.g. on vehicles with air conditioner compressor version "6 SEU 14".

1 - Cap

2 - Drive plate

- ☐ Renew
- ☐ Screwed onto compressor shaft



Note

*Thread of new drive plate has been
lubricated at factory with a pre-de-
termined amount of a specific
grease.*

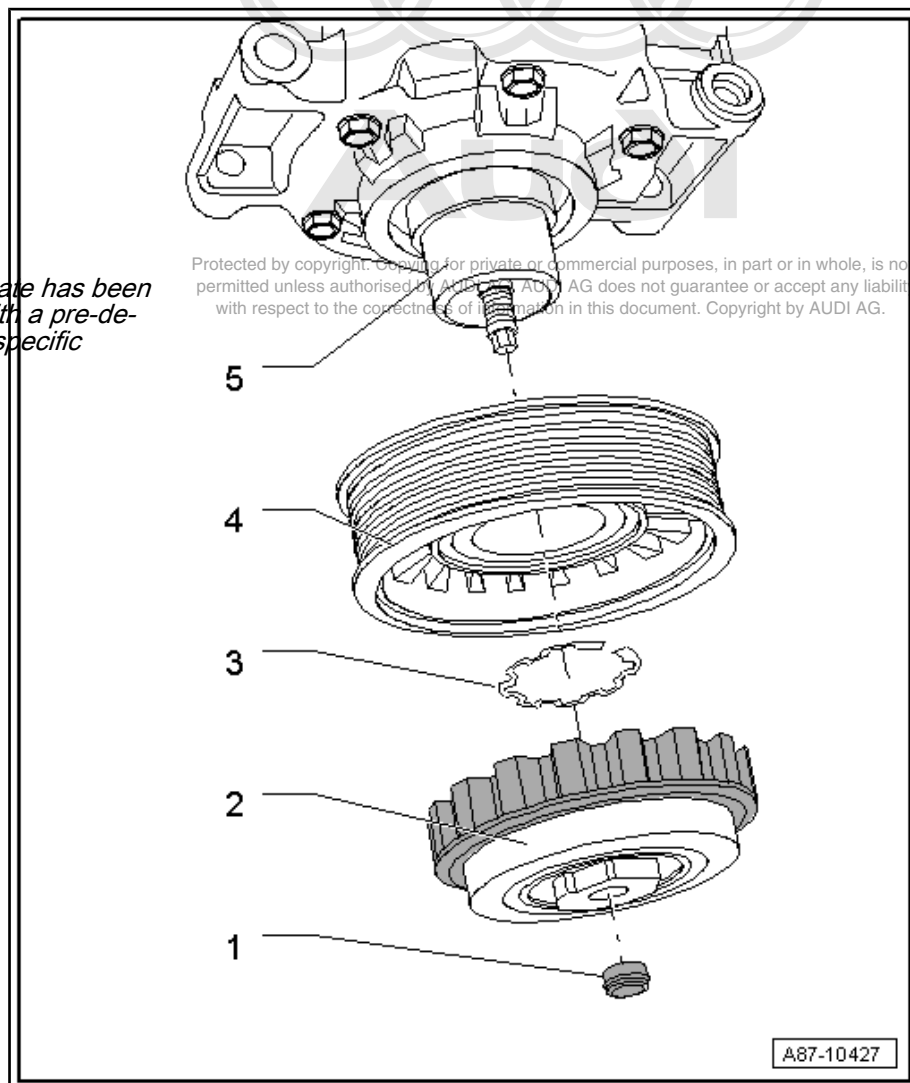
- ☐ Different versions →
Electronic parts cata-
logue
- ☐ With overload protec-
tion device; triggered if
torque is too great (e.g.
if air conditioner comp-
ressor cannot rotate
freely) causing pulley to
free-wheel without driv-
ing air conditioner com-
pressor
- ☐ With rubber elements
for decoupling the pulley
from the air conditioner
compressor drive shaft
and for damping vibra-
tion and noise
- ☐ Removing and installing
⇒ [page 158](#)
- ☐ 30 Nm

3 - Circlip

- ☐ Renew
- ☐ Install correctly: flat side must face air conditioner compressor

4 - Pulley

- ☐ Different versions → Electronic parts catalogue
- ☐ Made of plastic, sensitive to impact
- ☐ Removing and installing ⇒ [page 158](#)



5 - Air conditioner compressor

- ☐ Clean air conditioner compressor drive shaft before fitting pulley



Note

*Different versions depending on re-
frigerant (R134a or R1234yf) →
Electronic parts catalogue*

3.2.4 Exploded view - Valeo air conditioner compressor pulley

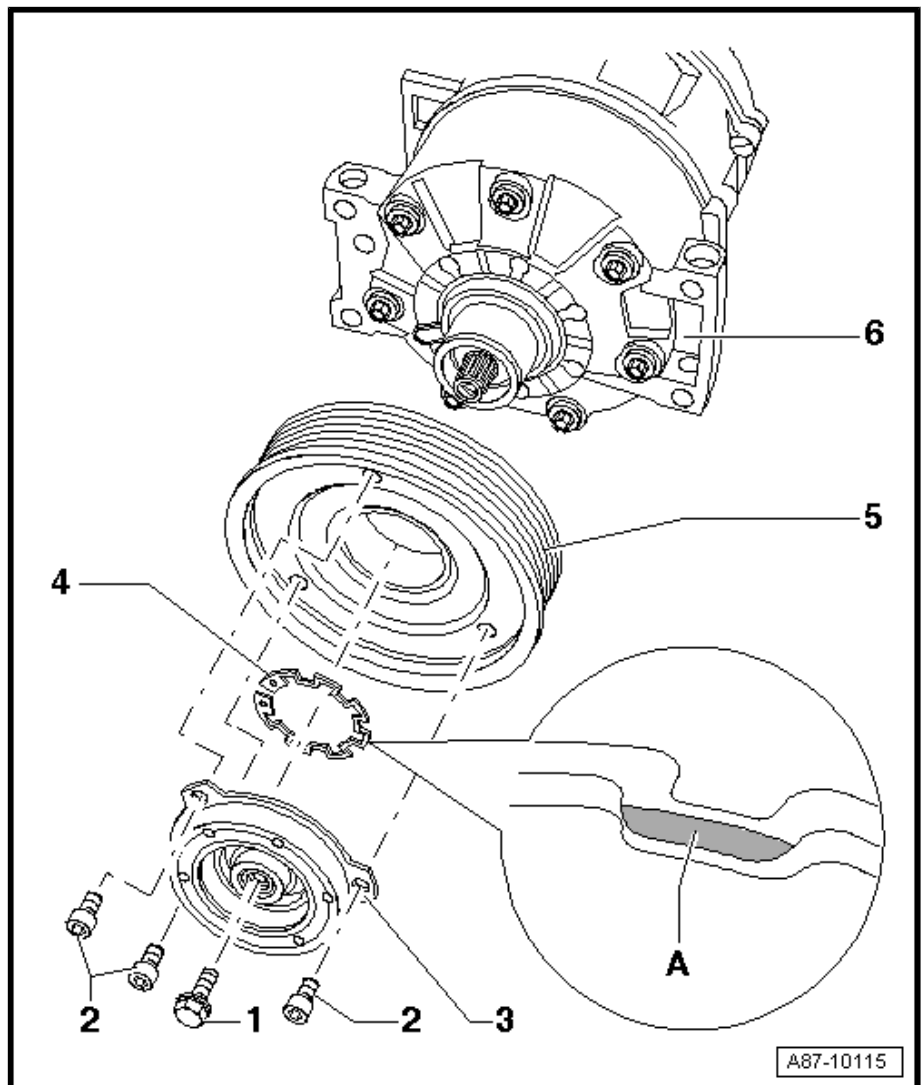
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1 - Bolt

- ☐ Renew
- ☐ 17 Nm
- Using e.g. a thread cutter, clean threaded holes into which self-locking bolts or bolts were screwed (screwed in with locking fluid). 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. For locking fluid, refer to ⇒ Electronic parts catalogue .

2 - Bolt

- ☐ 7 Nm
- Using e.g. a thread cutter, clean threaded holes into which self-locking bolts or bolts were screwed (screwed in with locking fluid). 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. For locking fluid, refer to ⇒ Electronic parts catalogue .



3 - Drive plate

- ☐ Removing and installing ⇒ [page 160](#)
- ☐ 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
- ☐ With rubber element for decoupling the pulley from the air conditioner compressor drive shaft, the rubber element damps vibration and noise

4 - Circlip

- ☐ Renew

- ☐ Install in correct position; insertion bevel -A- facing away from air conditioner compressor (flat side towards compressor)

5 - Pulley

- ☐ Removing and installing ⇒ [page 160](#)
- Using e.g. a thread cutter, clean threaded holes into which self-locking bolts or bolts were screwed (screwed in with locking fluid). Otherwise there is a danger of the bolts shearing off when removed again.

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*

3.2.5 Exploded view - Sanden air conditioner compressor pulley, version 1



Note

- ◆ *Installed on vehicles with 4-cylinder engine.*
- ◆ *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 pulley overload protection function is described e.g. in ⇒ Self-study programme No. 240 ; Audi A2 - Technology .*
- ◆ *The air conditioner compressor can be detached from the bracket on the engine and re-attached without opening up the refrigerant lines.*



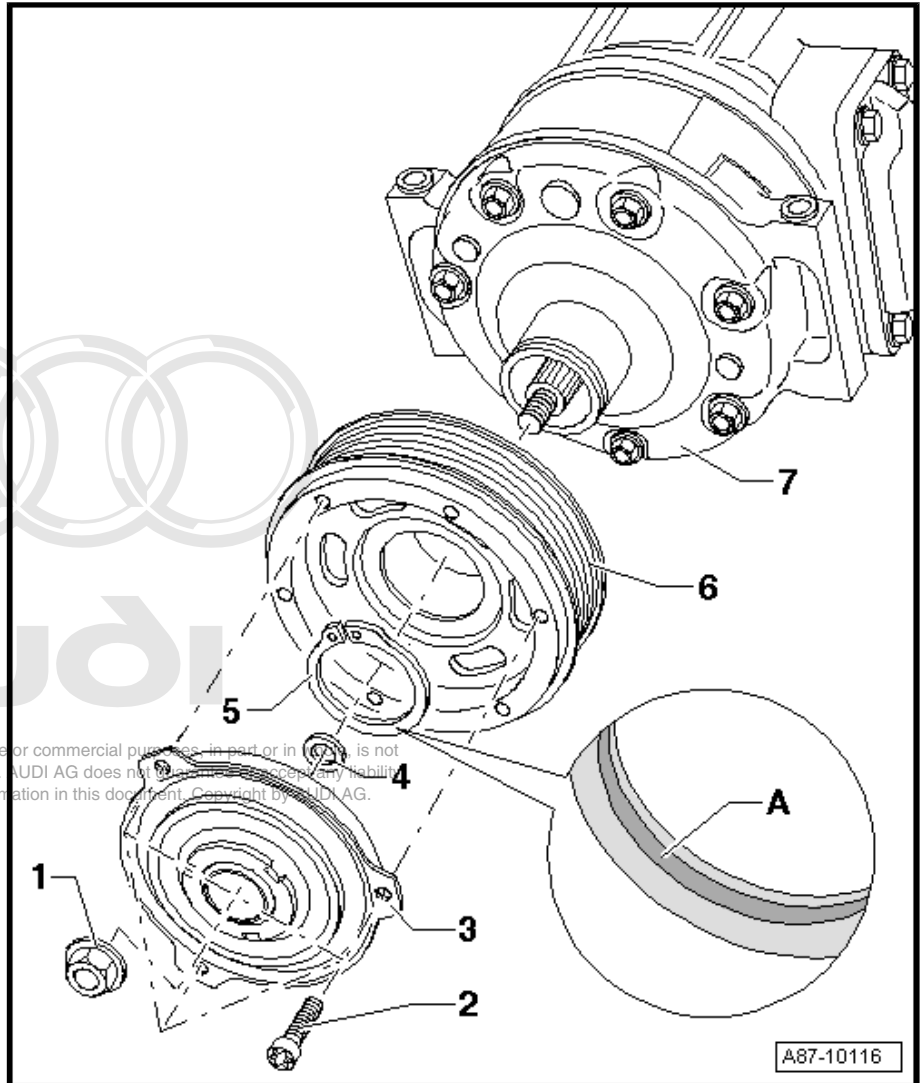
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1 - Hexagon nut

- ☐ 25 Nm
- Hold pulley in position using a commercially available strap wrench (with fabric strap) 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

- ☐ 4.5 Nm
- Hold pulley in position using a commercially available strap wrench (with fabric strap) when loosening or tightening bolts.
- Using e.g. a thread cutter, clean threaded holes into which self-locking bolts or bolts were screwed (screwed in with locking fluid). 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. For locking fluid, refer to ⇒ Electronic parts catalogue .

3 - 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
- ☐ With rubber element for decoupling the pulley from the air conditioner compressor drive shaft, the rubber element damps vibration and noise

4 - Washer

5 - Circlip

- ☐ Renew
- ☐ Install in correct position; insertion bevel -A- facing away from air conditioner compressor (flat side towards compressor)

6 - Pulley

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*

3.2.6 Exploded view - air conditioner compressor pulley, "Sanden" version 2 ("Delphi/Mahle" version 1)



Note

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- ◆ *Installed on vehicles with 4-cylinder engine.*
- ◆ *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.*
- ◆ *Currently, the pulley of the "Delphi/Mahle" air conditioner compressor (version "1") is identical to the pulley of the "Sanden" compressor (version "2"). The only difference is that the drive plate is attached to the air conditioner compressor shaft with a self-locking bolt.*
- ◆ *Detaching and attaching pulley ("Delphi/Mahle" air conditioner compressor, version "2")
⇒ "3.7.5 Removing and installing pulley - Delphi/Mahle air conditioner compressor", page 163.*
- ◆ *The pulley overload protection function is described e.g. in
⇒ Self-study programme No. 240 ; Audi A2 - Technology .*
- ◆ *The air conditioner compressor can be detached from the bracket on the engine and re-attached without opening up the refrigerant lines.*

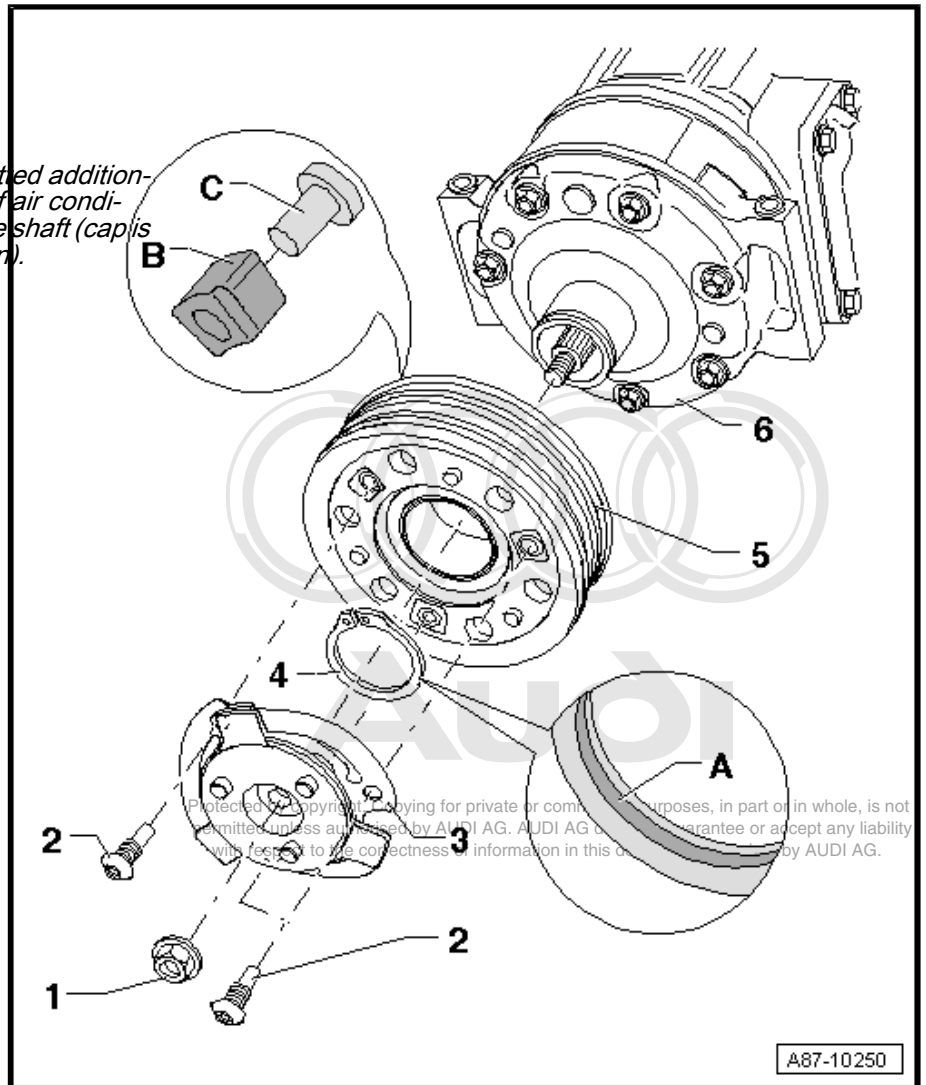
- 25 Nm



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 strap wrench (with fabric strap) 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 strap wrench (with fabric strap) when loosening or tightening bolts.
- Using e.g. a thread cutter, clean threaded holes into which self-locking bolts or bolts were screwed (screwed in with locking fluid). 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

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 air conditioner compressor drive shaft (rubber elements dampen vibrations and reduce noise)

**Note**

- ◆ Depending on version, threaded plates may also be linked via a ring.
- ◆ Air conditioner compressors with a smaller displacement are installed on vehicles for "cold countries" (e.g. in Central and Northern Europe); the pulley for these compressors differs slightly from the version in the illustration (for example, the rubber elements -B- are not installed as vibration dampers) ⇒ *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***

3.2.7 Exploded view - Sanden air conditioner compressor pulley, version 3**Note**

- ◆ *Installed on vehicles with 5-cylinder engine.*
- ◆ *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 pulley overload protection function is described e.g. in ⇒ Self-study programme No. 240 ; Audi A2 - Technology .*
- ◆ *The air conditioner compressor can be detached from the bracket on the engine and re-attached without opening up the refrigerant lines.*

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

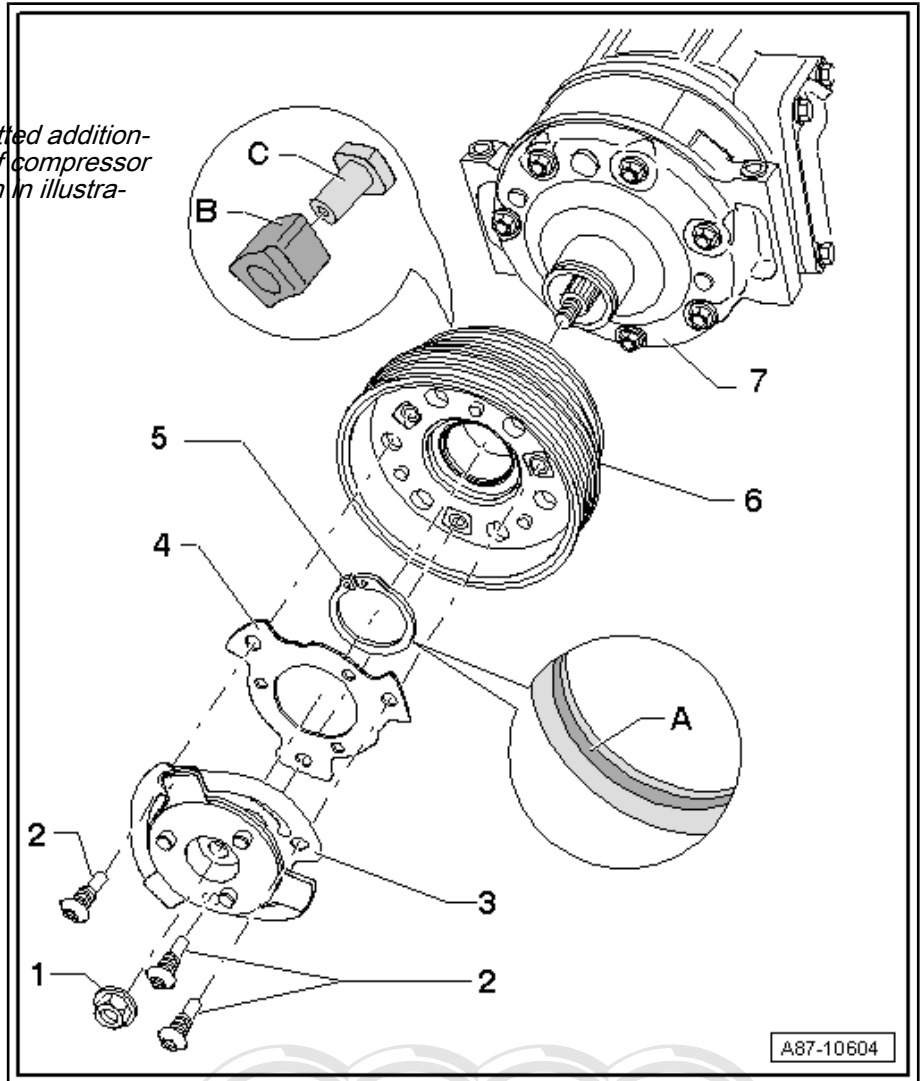
4 - Spacer

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 Q3).*

7 - Air conditioner compressor

- ☐ Different versions may be fitted, depending on type of engine 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*



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3.3 Detaching and attaching air conditioner compressor at bracket

⇒ [“3.3.1 Detaching and attaching air conditioner compressor at bracket - 4-cylinder engine”, page 145](#)

⇒ [“3.3.2 Detaching and attaching air conditioner compressor at bracket - 5-cylinder engine \(Audi RS Q3\)”, page 147](#)

3.3.1 Detaching and attaching air conditioner compressor at bracket - 4-cylinder engine

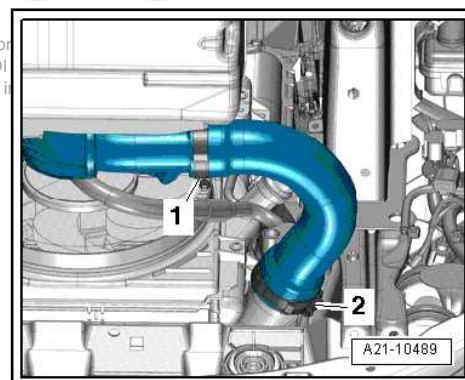


Note

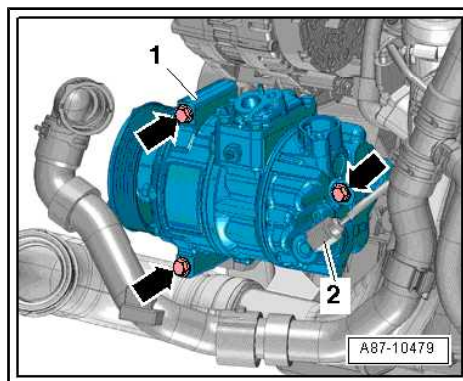
- ◆ *The air conditioner compressor can be detached from the bracket and re-attached without opening up the refrigerant lines.*
- ◆ *The procedures for detaching and attaching the air conditioner compressor are described in the following for vehicles with a 2.0 ltr. petrol engine and a “Denso” compressor (type “7 SEU 16”). There may be differences for vehicles with other engines or a different air conditioner compressor (depending on the engine, it may also be necessary to remove or unfasten certain ancillaries).*
- ◆ *Do not discharge the refrigerant circuit, and do not detach the refrigerant hoses and pipes at the air conditioner compressor.*
- ◆ *Do not unfasten the refrigerant lines and corresponding clamps.*
- ◆ *After detaching the air conditioner compressor, secure it to the longitudinal member, e.g. with a wire. Never leave it hanging from refrigerant lines.*
- ◆ *Before removal, mark direction of rotation of poly V-belt with chalk or felt-tipped pen. Running a used pulley in the opposite direction could damage it irreparably ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .*
- ◆ *Depending on the engine and the country-specific version, different air conditioner compressors may be installed ⇒ Electronic parts catalogue .*

Removing

- Vehicles with TDI engine: Unfasten hose clamps **1** and **2** and remove 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 .



- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Unplug electrical connector -2- at air conditioner compressor regulating valve - N280- .
- Unscrew bolts -arrows- and detach air conditioner compressor -1-.
- Suspend air conditioner compressor from lock carrier with a piece of wire.



Installing

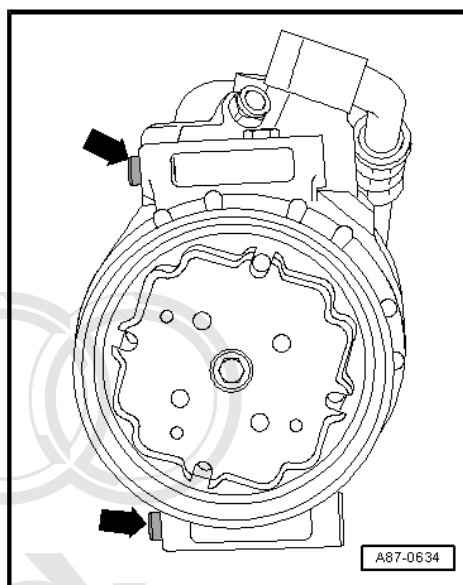
Install in reverse order of removal; note the following:

- 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 hose ⇒ Rep. gr. 21 ; Charge air system; Exploded view - charge air system .
- Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

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Tightening torques

- ♦ ⇒ [“3.1.1 Exploded view - drive unit for air conditioner compressor, vehicles with 4-cylinder engine”, page 128](#)

3.3.2 Detaching and attaching air conditioner compressor at bracket - 5-cylinder engine (Audi RS Q3)



Note

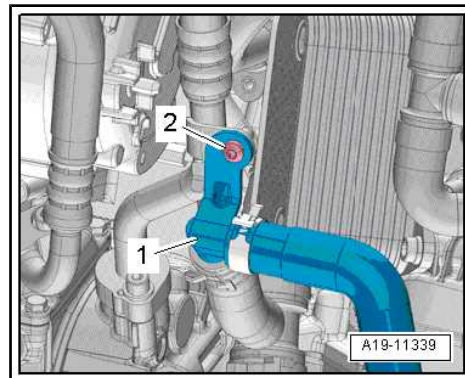
- ◆ *The air conditioner compressor can be detached from the bracket for ancillaries and re-attached without disconnecting refrigerant lines.*
- ◆ *The bracket for ancillaries (for air conditioner compressor and corresponding components) can be removed and installed without opening the refrigerant circuit.*
- ◆ *Vehicles with a 5-cylinder engine (Audi RS Q3) have 2 poly V-belts on the air conditioner compressor. The air conditioner compressor is therefore provided with a double-belt pulley. Removing poly V-belts ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .*
- ◆ *Routing the two poly V-belts ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .*
- ◆ *The procedure for detaching and attaching a "Sanden" air conditioner compressor is as follows:*
- ◆ *Do not discharge the refrigerant circuit, and do not detach the refrigerant hoses and pipes from the air conditioner compressor.*
- ◆ *Do not unfasten the refrigerant lines and corresponding clamps.*
- ◆ *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.*
- ◆ *Before removal, mark direction of rotation of poly V-belts with chalk or felt-tipped pen. Running a used pulley in the opposite direction could damage it irreparably.*
- ◆ *Depending on the engine and the country-specific version, different air conditioner compressors may be installed ⇒ Electronic parts catalogue .*

Removing

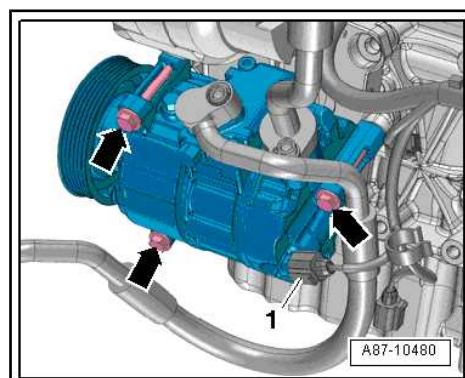
- Remove noise insulation (centre) and wheel housing liner (right-side) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
- Remove air pipe (right-side) ⇒ Rep. gr. 21 ; Charge air system; Exploded view - charge air system .

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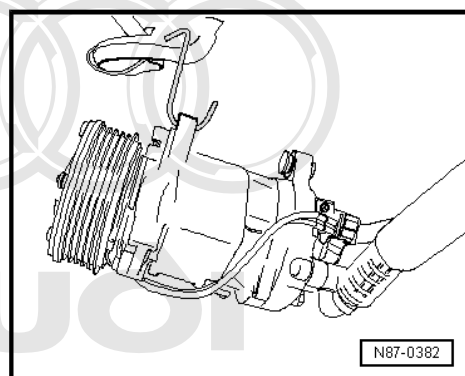
- Unscrew bolt -2- and move coolant line -1- clear.



- Unplug electrical connector -1- at air conditioner compressor regulating valve - N280- .
- Remove bolts -arrows-.



- Suspend air conditioner compressor from lock carrier with a piece of wire.



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Installing

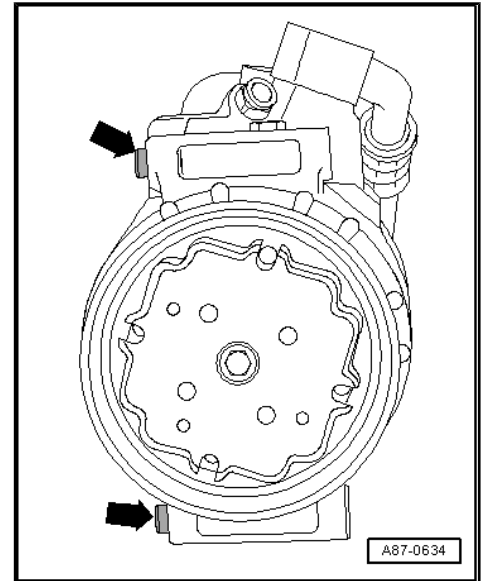
Install in reverse order of removal; note the following:

- 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, 5-cylinder engine \(Audi RS Q3\)”, page 131](#)

3.4 Detaching and attaching refrigerant lines at air conditioner compressor



WARNING

Danger from escaping pressurised refrigerant.

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.***

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 (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 noise insulation (if necessary; depends on engine version) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .



Caution

Risk of damage to refrigerant lines and hoses.

- ◆ **Do not stretch, kink or bend refrigerant lines and hoses.**



Note

Only remove the noise insulation if the refrigerant lines cannot be accessed from above.

Vehicles with 5-cylinder engine (Audi RS Q3)

- Detach air conditioner compressor from bracket
⇒ ["3.3.2 Detaching and attaching air conditioner compressor at bracket - 5-cylinder engine \(Audi RS Q3\)", page 147](#) .
- Swivel air conditioner compressor towards wheel housing (right-side).

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Note

The refrigerant lines are not accessible from above on vehicles with 5-cylinder engine (Audi RS Q3).

All vehicles

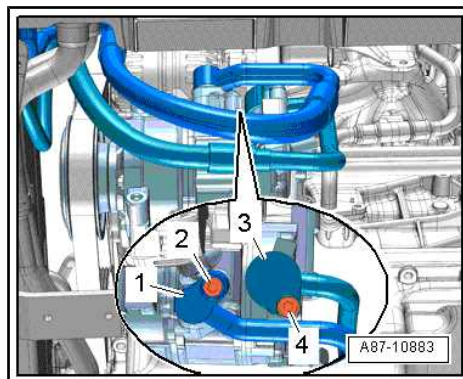
- Remove bolts -2 and 4- using socket - 3320/1- and detach refrigerant lines -1 and 3-.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .



Caution

Risk of irreparable damage to air conditioner compressor.

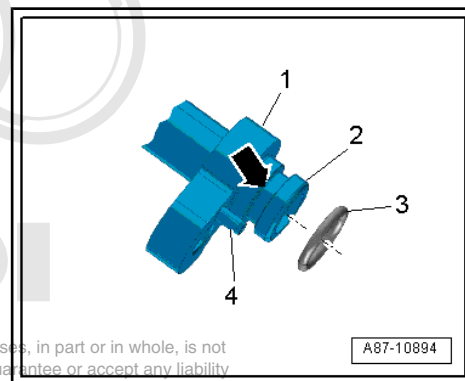
- ◆ **The air conditioner compressor is always driven when the engine is running (there is no magnetic clutch). Therefore do not start the engine unless the refrigerant circuit has been properly assembled.**
- ◆ **If, for example, the refrigerant lines are not connected to the air conditioner compressor 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

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-.

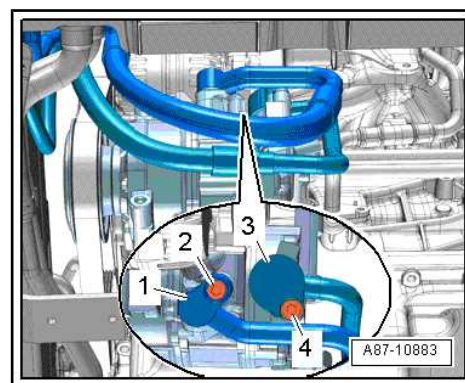


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Note

- ◆ *Do not use O-rings from caps of replacement compressor connections.*
- ◆ *Lubricate O-rings lightly with refrigerant oil before fitting ⇒ [page 53](#) .*
- ◆ *Make sure O-rings are seated correctly in groove -arrow- of corresponding refrigerant line.*
- ◆ *Routing and attaching refrigerant lines ⇒ [page 24](#)*
- 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 (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 125](#) .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



Tightening torques

- ⇒ ["2.2.2 Exploded view - condenser, air conditioner compressor, expansion valve, refrigerant line", page 93](#)

3.5 Removing and installing air conditioner compressor

Special tools and workshop equipment required

- ◆ Engine bung set - VAS 6122-



Note

- ◆ *The air conditioner compressor can also be detached from the bracket without opening the refrigerant circuit ⇒ [page 151](#) .*
- ◆ *Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue*

Removing

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Detach refrigerant lines from air conditioner compressor
⇒ [page 149](#) .

Vehicles with TDI engine:

- Unfasten hose clamps -1- and -2- and detach air hose (not necessary for all engine versions).



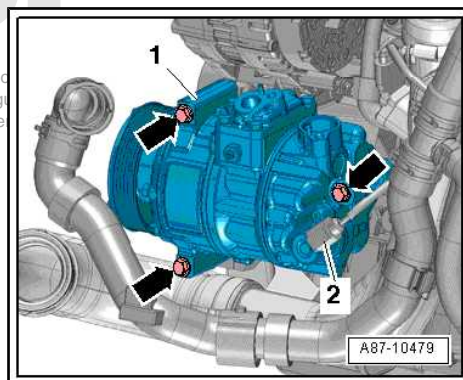
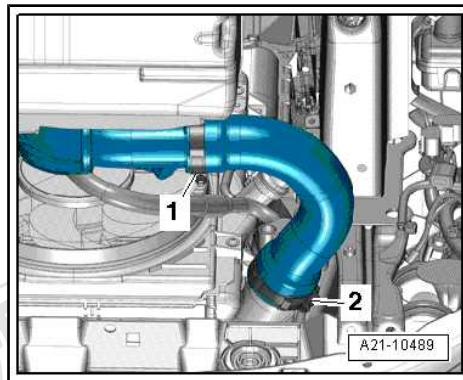
Note

Only remove the air hose if it is not possible to remove the air conditioner compressor with the air hose installed.

- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .

All vehicles (continued):

- 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-.



Installing

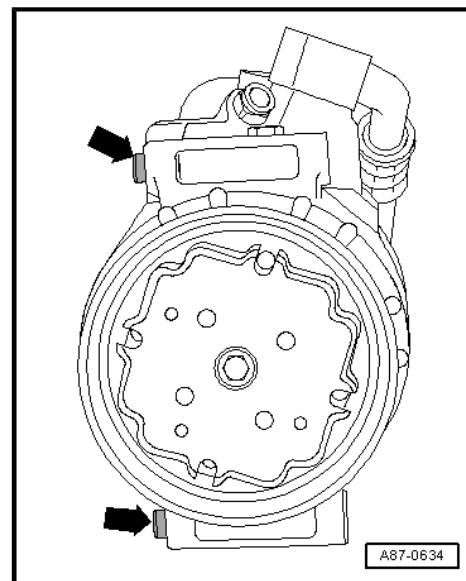
Install in reverse order of removal; note the following:

- Thoroughly clean contact surfaces on air conditioner compressor.
- Insert dowel sleeves -arrows- in air conditioner compressor.



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 ; Renewing components of refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Renewing components .*
- ◆ *When it is removed, the air conditioner compressor contains an indeterminate amount of refrigerant oil. For this reason it is important to observe the notes on renewing the compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air 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 125](#) .
- Observe notes on starting up air conditioner after installing air conditioner compressor (before using air conditioner after system has been re-charged) ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General notes on air conditioning systems (Air conditioner with refrigerant R134a; General notes 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 system has been re-charged.

Tightening torques

- ⇒ [“3.1 Exploded view - drive unit for air conditioner compressor”, page 128](#)

3.6 Preparations for renewing pulley

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- If fitted, remove frame for noise insulation (e.g. on Audi RS Q3 with 5-cylinder engine) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove wheel housing liner (right-side) (e.g. on Audi RS Q3 with 5-cylinder engine) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .
- Slacken off and detach poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
- Detach air conditioner compressor from engine if necessary
⇒ [page 145](#) .

3.7 Removing and installing pulley

⇒ [“3.7.1 Removing and installing pulley - Denso air conditioner compressor, version 1”, page 154](#)

⇒ [“3.7.2 Removing and installing pulley - Denso air conditioner compressor, version 2”, page 156](#)

⇒ [“3.7.3 Removing and installing pulley - Denso air conditioner compressor, version 3”, page 158](#)

⇒ [“3.7.4 Removing and installing pulley - Valeo air conditioner compressor”, page 160](#)

⇒ [“3.7.5 Removing and installing pulley - Delphi/Mahle air conditioner compressor”, page 163](#)

3.7.1 Removing and installing pulley - Denso air conditioner compressor, version 1



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.*

Removing

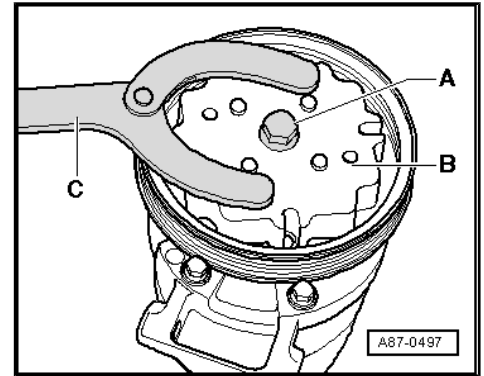
- Remove poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
- Counterhold with a commercially available two-hole pin wrench -C- (pin diameter 5.0 mm) at drive plate -B- and remove bolt -A-.



Note

If the pulley cannot be detached with the air conditioner compressor in position, detach the air conditioner compressor with the refrigerant lines connected

⇒ [“3.3 Detaching and attaching air conditioner compressor at bracket”, page 145](#) .

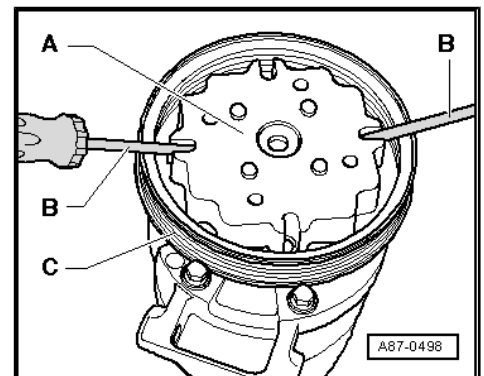


- Carefully and evenly prise off drive plate -A- using 2 screwdrivers -B-.



Note

- ◆ When prising off drive plate -A-, take care not to damage collar of pulley -C-.
- ◆ There are different versions of the pulley -C- and the drive plate -A-. For correct version refer to ⇒ [Electronic parts catalogue](#) .



- Remove circlip -A-.
- Detach pulley -B-.

Installing

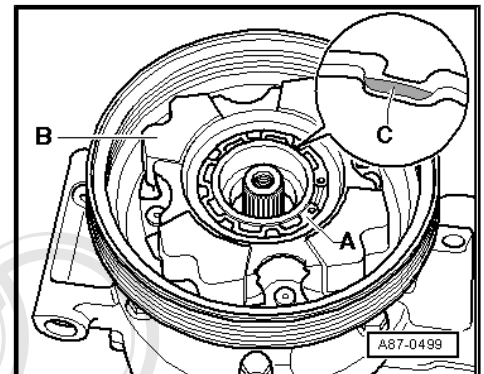
Install in reverse order of removal; note the following:



Note

Renew circlip.

- Clean air conditioner compressor flange before fitting pulley.
- Fit pulley on air conditioner compressor flange.
- It should be possible to attach the component without having to exert force.
- Insert circlip -A- in correct position.
- Fit with bevelled side -C- facing away from air conditioner compressor (flat side towards compressor).



- Install air conditioner compressor ⇒ [page 145](#)
- Install poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

Tightening torques

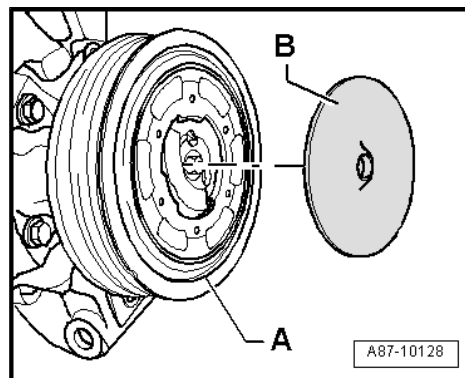
- ⇒ [“3.2.1 Exploded view - Denso air conditioner compressor pulley, version 1”, page 133](#)

3.7.2 Removing and installing pulley - Denso air conditioner compressor, version 2



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.*
- ◆ *For noise optimisation, a plastic disc -B- may have been bonded to the drive plate -A- of the pulley ⇒ Electronic parts catalogue .*
- ◆ *This plastic disc reduces the rattling (castanet-like) noise which can occur at the pulley, particularly on vehicles with TDI engine and the air conditioner switched off (activation of air conditioner compressor switched off); when the air conditioner is operating at full load the noise is barely audible.*



Removing

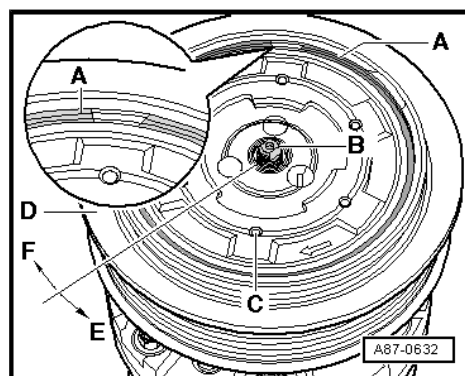
- Remove poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
- If fitted, detach plastic disc from pulley.
- Using a small screwdriver or long-nose pliers, carefully remove circlip -A- (with vulcanised rubber disc).



Caution

Risk of damage.

- ◆ *Take care not to damage the pulley when removing the circlip.*
- ◆ *The pulley must be renewed if it is damaged.*



- Counterhold air conditioner compressor drive shaft -B- using a commercially available Allen key.



Note

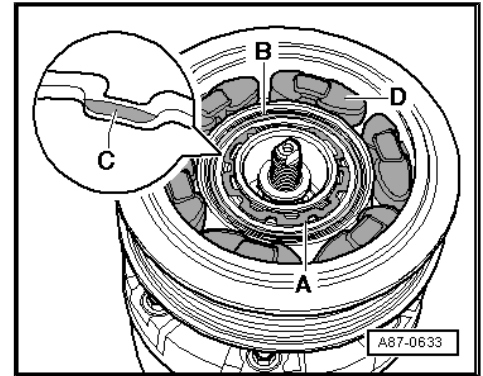
Depending on the version of the air conditioner compressor, a socket wrench from the shock absorber set - T10001- can be used to counterhold the drive shaft.

- Turn drive plate -C- with pulley -D- in direction of -arrow E-.
- Detach drive plate.

- Remove circlip -A-.
- Detach pulley -B-.

 Note

*If the pulley cannot be detached with the air conditioner compressor in position, detach the air conditioner compressor with the refrigerant lines connected
⇒ "3.3 Detaching and attaching air conditioner compressor at bracket", page 145 .*



Installing

Install in reverse order of removal; note the following:

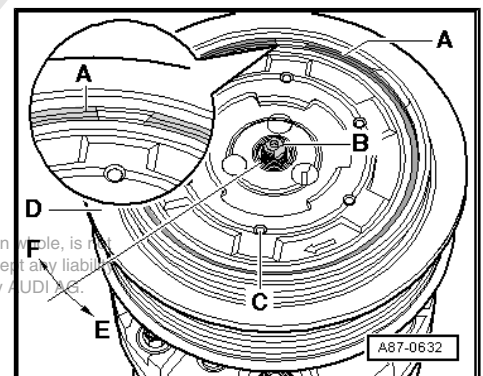
 Note

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 -A- in correct position.
- Fit with bevelled side -C- facing away from air conditioner compressor (flat side towards compressor).
- Insert rubber elements -D- in pulley -B-, as shown in illustration.
- Before fitting drive plate, coat rubber elements slightly with lubricant (e.g. tyre assembly paste or soap).
- Insert drive plate -C- in rubber elements until they make contact with air conditioner compressor drive shaft -B-.
- Position drive plate on air conditioner compressor flange and tighten in direction of -arrow F- using a commercially available strap wrench (with fabric strap); counterhold with an Allen key.

 Note

Depending on the version of the air conditioner compressor, a socket wrench from the shock absorber set - T10001- can be used to counterhold the drive shaft.



- Fit circlip -A- (with rubber disc).
- Install poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

Tightening torques

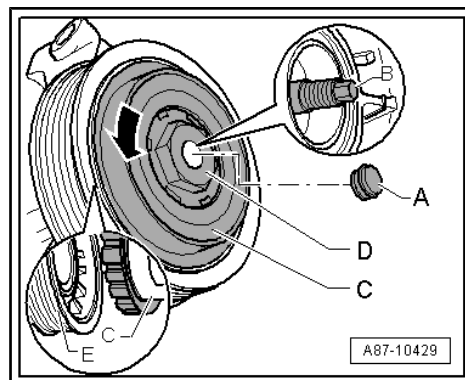
- ⇒ "3.2.2 Exploded view - Denso air conditioner compressor pulley, version 2", page 135

3.7.3 Removing and installing pulley - Denso air conditioner compressor, version 3



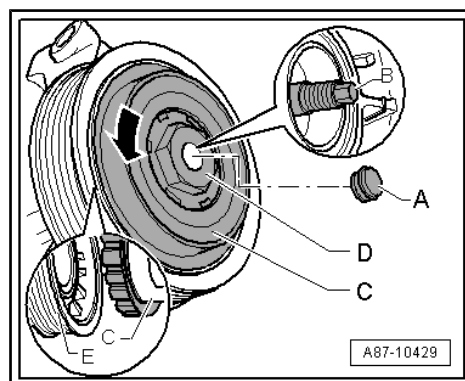
Note

- ◆ *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 overload protection of the drive plate -C- has been tripped, the pulley -E- can rotate with the outer section of the drive plate -C- without the air conditioner compressor shaft -B- and the hexagon -D- attached to the drive plate (inner section of drive plate -C-) also turning.*
- ◆ *The pulley is supplied as a replacement part together with the drive plate and cap, which are held together with a bolt. The bolt is not required and can be disposed of ⇒ Electronic parts catalogue .*
- ◆ *This bolt is used during manufacturing to insert a pre-determined amount of a specific grease into the thread of the drive plate (sufficient for fitting the drive plate onto the air conditioner compressor shaft once; do not re-use a drive plate that has been unscrewed).*



Removing

- Remove poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
- Remove cap -A-.
- Counterhold air conditioner compressor drive shaft -B- with a commercially available 7 mm Allen key.
- Turn drive plate -C- with pulley -E- in direction of -arrow-.
- Detach drive plate.



Note

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- ◆ *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.*

- Remove circlip -A-.
- Detach pulley -B-.

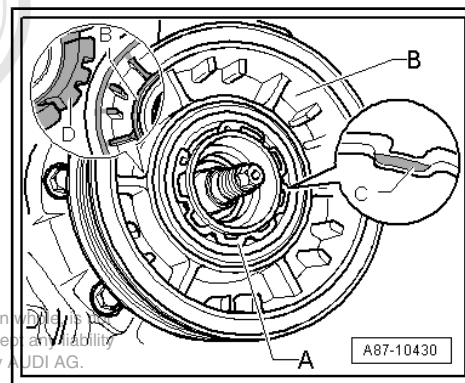


Note

If the pulley cannot be detached with the air conditioner compressor in position, detach the air conditioner compressor with the refrigerant lines connected

⇒ [“3.3 Detaching and attaching air conditioner compressor at bracket”, page 145](#)

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Installing

Install in reverse order of removal; note the following:



Note

Renew circlip.

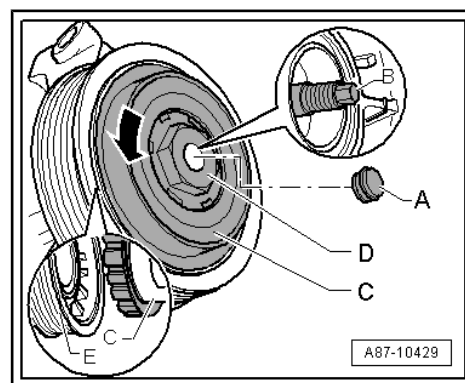
- Clean air conditioner compressor drive shaft before fitting pulley.
- Attach pulley to air conditioner compressor drive shaft.
- It should be possible to attach the component without having to exert force.
- Insert circlip -A- in correct position.
- Fit with bevelled side -C- facing away from air conditioner compressor (flat side towards 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.

- Insert rubber elements -D- in pulley -B- as shown and lubricate lightly with tyre assembly paste, soap solution or similar.
- Insert drive plate -C- in rubber elements until they make contact with air conditioner compressor drive shaft -B-.
- Press rubber element of drive plate into pulley -E- until drive plate makes contact with thread of air conditioner compressor drive shaft.
- Screw drive plate with pulley onto air conditioner compressor drive shaft by turning in opposite direction of -arrow-; counterhold with an Allen key.
- Install poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .



Tightening torques

- ⇒ [“3.2.3 Exploded view - Denso air conditioner compressor pulley, version 3”, page 136](#)

3.7.4 Removing and installing pulley - Valeo air conditioner compressor



Note

- ◆ On air conditioner compressors with part number 1K0 820 803 from index "N" onwards, the splines of the drive plate are bonded to the splines of the compressor shaft. For procedure for removing drive plate, refer to ➔ [page 160](#).
- ◆ On air conditioner compressors with part number 1K0 820 803 up to index "L", the splines of the drive plate are not bonded to the splines of the compressor shaft. With these air conditioner compressors, the splines of the drive plate may become worn and the compressor may no longer be driven ➔ [page 160](#). In this case, check that the air conditioner compressor can move freely, and if necessary renew the drive plate (use repair set 1K0 898 814) ➔ *Electronic parts catalogue*.
- ◆ If overload protection device of drive plate -D- has been triggered, pulley just free-wheels without driving air conditioner compressor.
- ◆ Check that air conditioner compressor can move freely by turning bolt -B-. If it is stiff, renew compressor with pulley.
- ◆ If air conditioner compressor moves freely, remove bolts -C- and detach drive plate. Then hold drive plate hub in position with pliers to loosen bolt -B-.

Removing

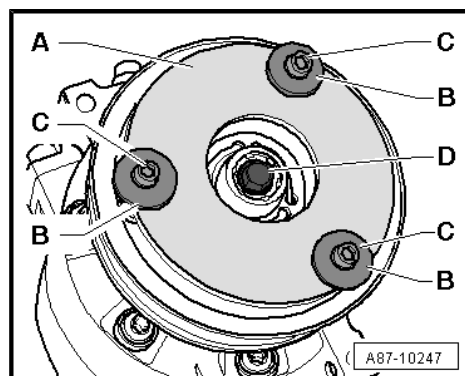
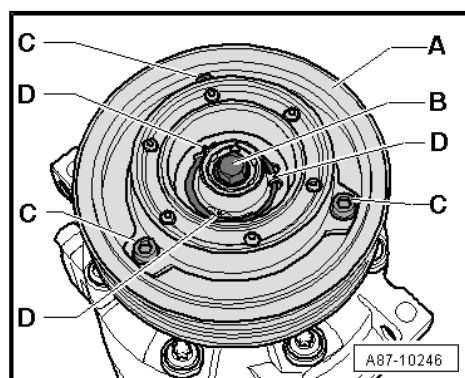
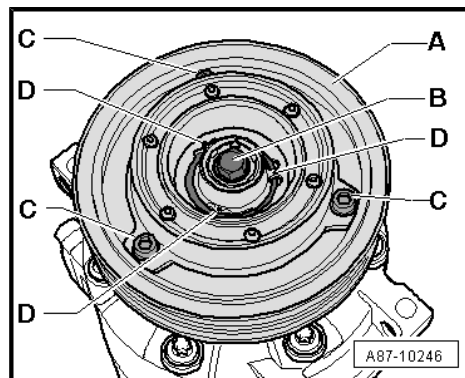
- Remove poly V-belt ➔ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt.
- To loosen bolt -B-, hold pulley -A- in position with a commercially available strap wrench (with fabric strap).



Note

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If the pulley splines have become worn, bolt -B- cannot be loosened (the air conditioner compressor shaft turns with the bolt).

- If pulley splines are worn, unscrew bolts -C-.
- Fit washer -A- with flat side facing outwards.
- Secure drive plate with washer -A- from repair set - 1K0 898 814- on air conditioner compressor shaft by fitting washers -B- and tightening bolts -C-.
- Remove bolt -D-.
- Detach washer and drive plate.

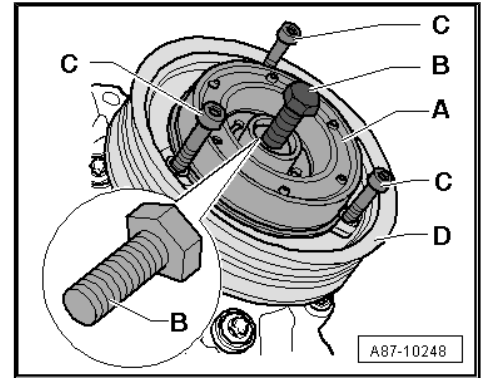




Note

If the drive plate is bonded to the air conditioner compressor shaft, press off the pulley.

- Screw long bolts -C- through holes in drive plate -A- into pulley -D-.
- Use a commercially available M8 bolt -B- (strength class min. 10.9) to press drive plate -A- off air conditioner compressor shaft; at the same time, counterhold pulley -D- with a commercially available strap wrench (with fabric strap).



Note

If the drive plate -A- has already been renewed at the workshop and the new drive plate was fixed in position on using sealant, it may be so firmly attached to the air conditioner compressor shaft that it can no longer be pressed off. In this case the air conditioner compressor must be renewed as a complete unit.

- Remove circlip ⇒ [Item 4 \(page 137\)](#) and detach pulley.



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Installing

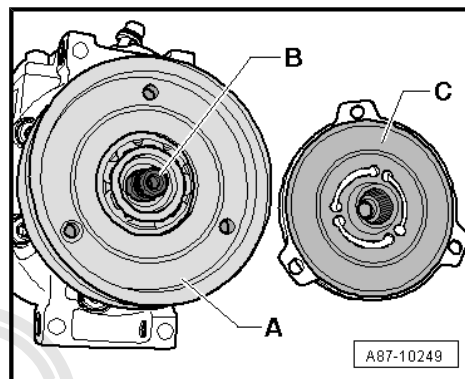
Install in reverse order of removal; note the following:

- Check splines of drive shaft -B- of air conditioner compressor and splines of drive plate -C- for wear and renew if necessary.



Caution

Do not use compressed air when cleaning; blowing out could cause dirt particles to settle on the seal of the air conditioner compressor shaft and damage it.



- Use a commercially available cleaning solution to remove rust, abrasion, old adhesive and other particles from splines of air conditioner compressor drive shaft -B-, pulley -A- and splines of drive plate -C-.
- Using e.g. a thread cutter, clean threaded holes into which self-locking bolts or bolts were screwed (screwed in with locking fluid). 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.
- Attach pulley to air conditioner compressor drive shaft and fit circlip.
- Apply thin coat of sealant to splines of air conditioner compressor drive shaft -B- and splines of drive plate -C-. For sealant, refer to ➔ Electronic parts catalogue .

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Note

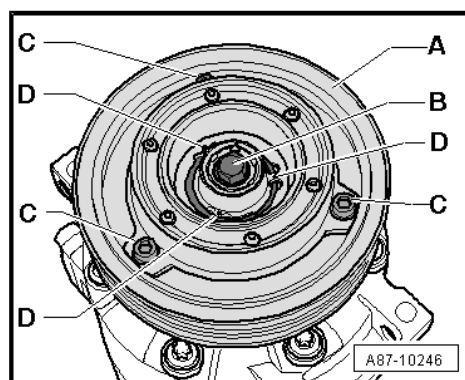
- ◆ *Make sure sealant does not come into contact with the seal for the air conditioner compressor drive shaft (in the air conditioner compressor).*
- ◆ *The sealant is also an adhesive. After it has dried, the drive plate can no longer be detached.*
- ◆ *After applying the sealant, the drive plate must be fitted within 5 minutes and the bolts tightened to the specified torque.*
- Slide drive plate onto air conditioner compressor drive shaft.
- Tighten bolts -B and C- to torque.



Caution

Risk of irreparable damage to air conditioner compressor.

- ◆ **After fitting the drive plate, wait 1 hour before starting the engine to ensure that the sealant has the necessary strength.**



- Install poly V-belt ➔ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

Tightening torques

- ➔ [“3.2.4 Exploded view - Valeo air conditioner compressor pulley”, page 137](#)

3.7.5 Removing and installing pulley - “Delphi/Mahle” air conditioner compressor

Note

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 ⇒ *Electronic parts catalogue and*
⇒ **“3.5 Removing and installing air conditioner compressor”, page 151** .

– Renew air conditioner compressor ⇒ **page 145** .

Pulley, version “1”

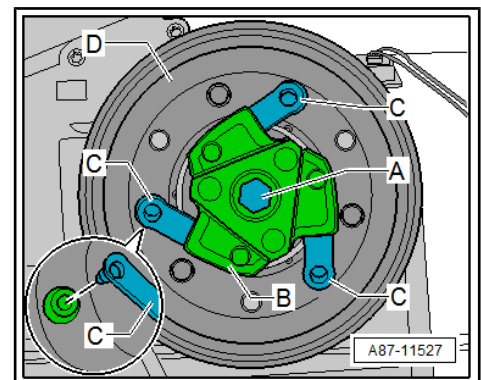
Note

Currently, the pulley of the “Delphi/Mahle” air conditioner compressor (version “1”) is identical to the pulley of the “Sanden” compressor (version “2”)
⇒ **“3.2.6 Exploded view - air conditioner compressor pulley, Sanden version 2 (Delphi/Mahle version 1)”, page 140** . The only difference is that the drive plate is attached to the air conditioner compressor shaft with a self-locking bolt ⇒ **Item 2 (page 141)** .

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.



4 Control motors

⇒ [“4.1 Exploded view - control motors \(front\)”, page 164](#)

⇒ [“4.2 Removing and installing temperature flap control motor V68 ”, page 168](#)

⇒ [“4.3 Removing and installing centre flap control motor V70 ”, page 171](#)

⇒ [“4.4 Removing and installing defroster flap control motor V107 ”, page 173](#)

⇒ [“4.5 Removing and installing air recirculation flap control motor V113 ”, page 176](#)

⇒ [“4.6 Removing and installing left temperature flap control motor V158 ”, page 181](#)

⇒ [“4.7 Removing and installing right temperature flap control motor V159 ”, page 184](#)

4.1 Exploded view - control motors (front)

⇒ [“4.1.1 Exploded view - control motors \(front\), air distribution housing, flap control \(left-side\)”, page 164](#)

⇒ [“4.1.2 Exploded view - control motors \(front\), air distribution housing, flap control \(right-side\)”, page 166](#)

⇒ [“4.1.3 Exploded view - control motors \(front\), intake duct, flap control”, page 167](#)

4.1.1 Exploded view - control motors (front), air distribution housing, flap control (left-side)

1 - Bolt

- ☐ 3x
- ☐ 1 Nm

2 - Centre flap control motor - V70-

- ☐ With potentiometer for centre flap control motor - G112-
- ☐ Removing and installing ⇒ [page 171](#)



Note

On vehicles with manually controlled air conditioner (with heater without air conditioner), the defroster is also activated by -V70- (via operating lever).

3 - Operating lever

- ☐ For activating warm air flap

4 - Bolt

- ☐ 2x
- ☐ 1 Nm

5 - Temperature flap control motor - V68- / left temperature flap control motor - V158-

Temperature flap control motor - V68- with manually controlled air conditioner (with heater without air conditioner)

- ☐ With potentiometer for temperature flap control motor - G92-
- ☐ The control motor activates both temperature flaps - the right and left temperature flaps are connected via the shaft
- ☐ Removing and installing ⇒ [page 168](#)

Left temperature flap control motor - V158- with automatically controlled air conditioner

- ☐ With potentiometer for left temperature flap control motor - G220-
- ☐ Removing and installing ⇒ [page 181](#)

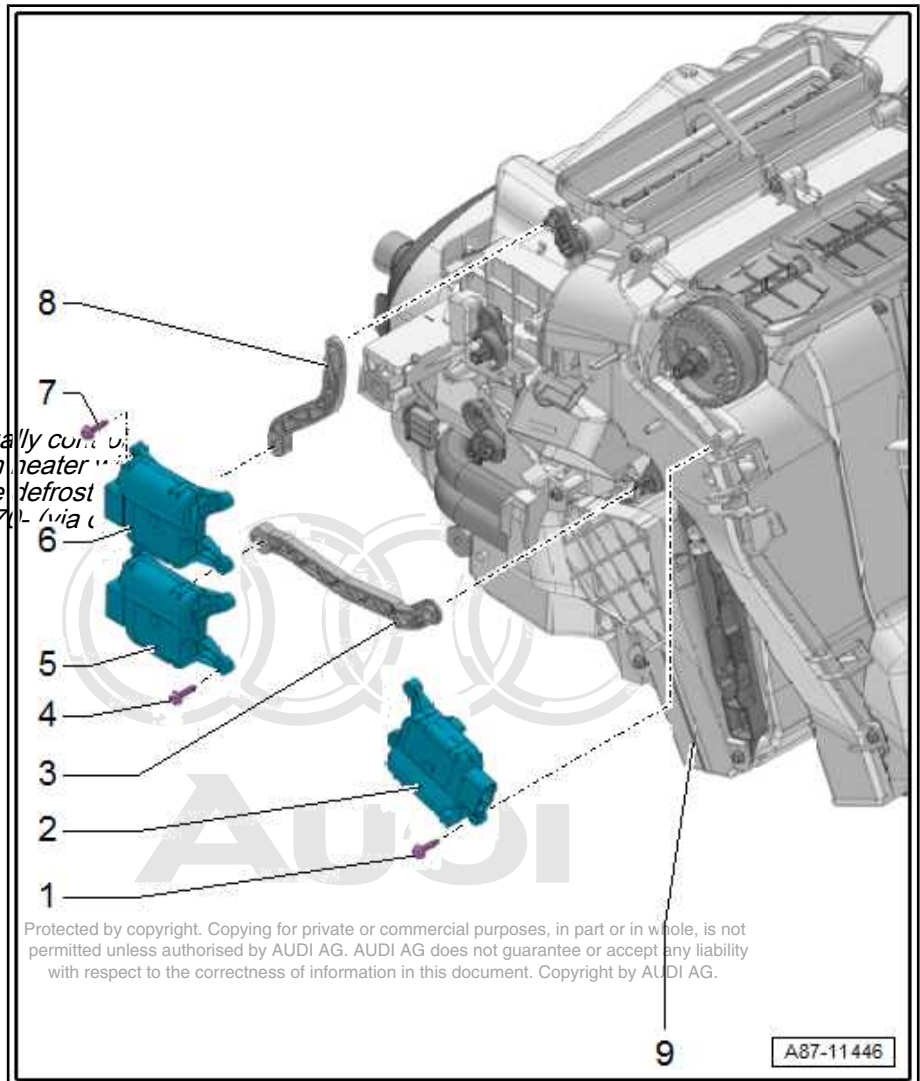
6 - Defroster flap control motor - V107-

- ☐ With potentiometer for defroster flap control motor - G135-
- ☐ With automatically controlled air conditioner only
- ☐ Removing and installing ⇒ [page 173](#)



Note

- ◆ *On right-hand drive vehicles, this control motor is attached to right side of air distribution housing*
- ◆ *On vehicles with manually controlled air conditioner (with heater without air conditioner), the defroster flap is activated by the centre flap control motor - V70- via the operating lever.*



7 - Bolt

- ☐ 2x
- ☐ 1 Nm

8 - Operating lever

- ☐ For activation of defroster flaps

9 - Air distribution housing

- ☐ Removing and installing air conditioning unit (heater) ⇒ [page 208](#)
- ☐ Exploded view ⇒ [page 187](#)
- ☐ Different versions for manually controlled air conditioner (with heating without air conditioner) and automatically controlled air conditioner ⇒ Electronic parts catalogue

4.1.2 Exploded view - control motors (front), air distribution housing, flap control (right-side)

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1 - Operating lever

- ☐ For right temperature flap control motor - V159-
- ☐ With automatically controlled air conditioner only

2 - Connecting element

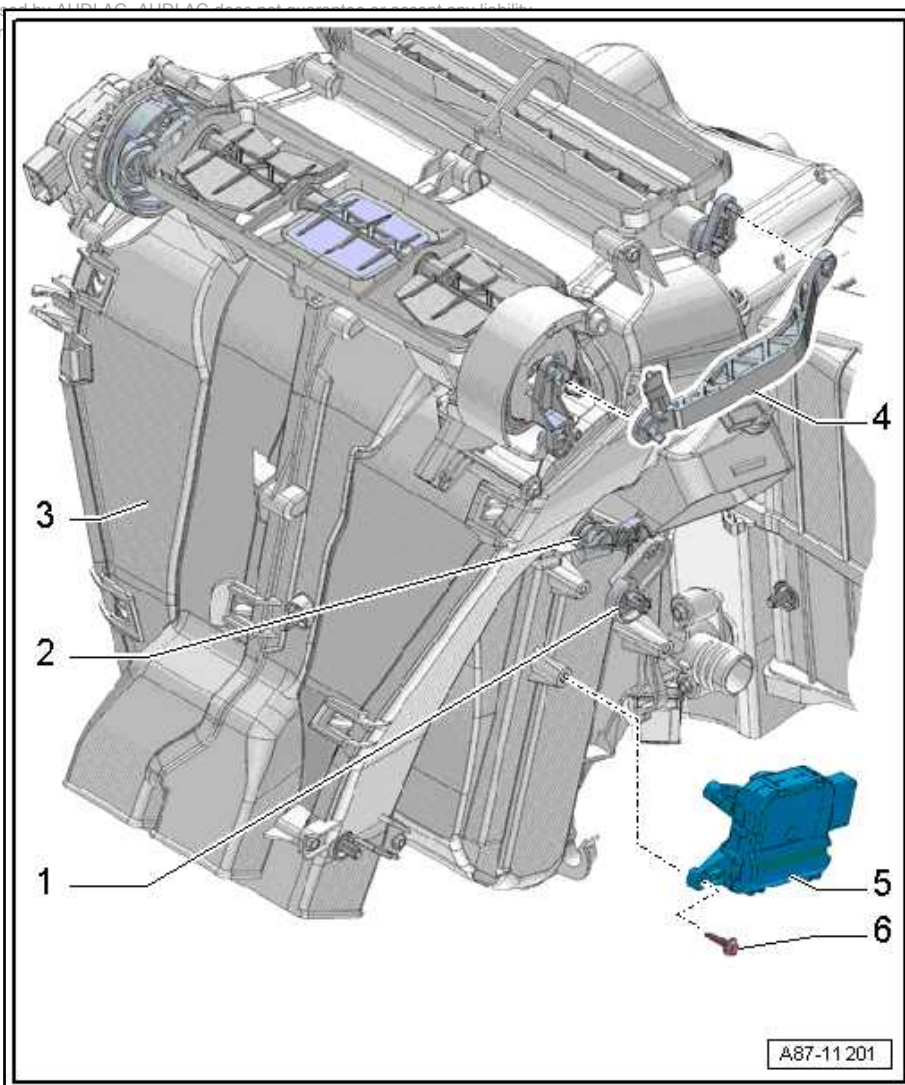
- ☐ For controlling flaps for front and rear footwell vents

3 - Air distribution housing

- ☐ Removing and installing air conditioning unit (heater) ⇒ [page 208](#)
- ☐ Exploded view ⇒ [page 187](#)
- ☐ Different versions for manually controlled air conditioner (with heating without air conditioner) and automatically controlled air conditioner ⇒ Electronic parts catalogue

4 - Connecting element

- ☐ For control of flaps for dash panel vent (centre) and dash panel vent (defroster)
- ☐ Only for manually controlled air conditioner (or with heater without air conditioner)





Note

On vehicles with manually controlled air conditioner (or with heater without air conditioner), the defroster flap is activated by the operating lever of the centre flap control motor - V70-.

5 - Right temperature flap control motor - V159-

- ☐ With potentiometer for right temperature flap control motor - G221-
- ☐ Removing and installing ⇒ [page 184](#)
- ☐ Only for automatically controlled air conditioner (heater without air conditioner)

6 - Bolt

- ☐ 2x
- ☐ 1 Nm

4.1.3 Exploded view - control motors (front), intake duct, flap control

1 - Evaporator housing

- ☐ Removing and installing
⇒ [page 214](#)

2 - Bolt

- ☐ 3x
- ☐ 1 Nm

3 - Air recirculation flap control motor - V113-

- ☐ For automatically controlled air conditioner
- ☐ Removing and installing
⇒ [page 178](#)

4 - Connecting element

- ☐ Between air recirculation flap control motor - V113- and air recirculation flap
- ☐ Automatically controlled air conditioner only
- ☐ Do not dismantle
- ☐ Coat mountings with small amount of grease
⇒ Electronic parts catalogue

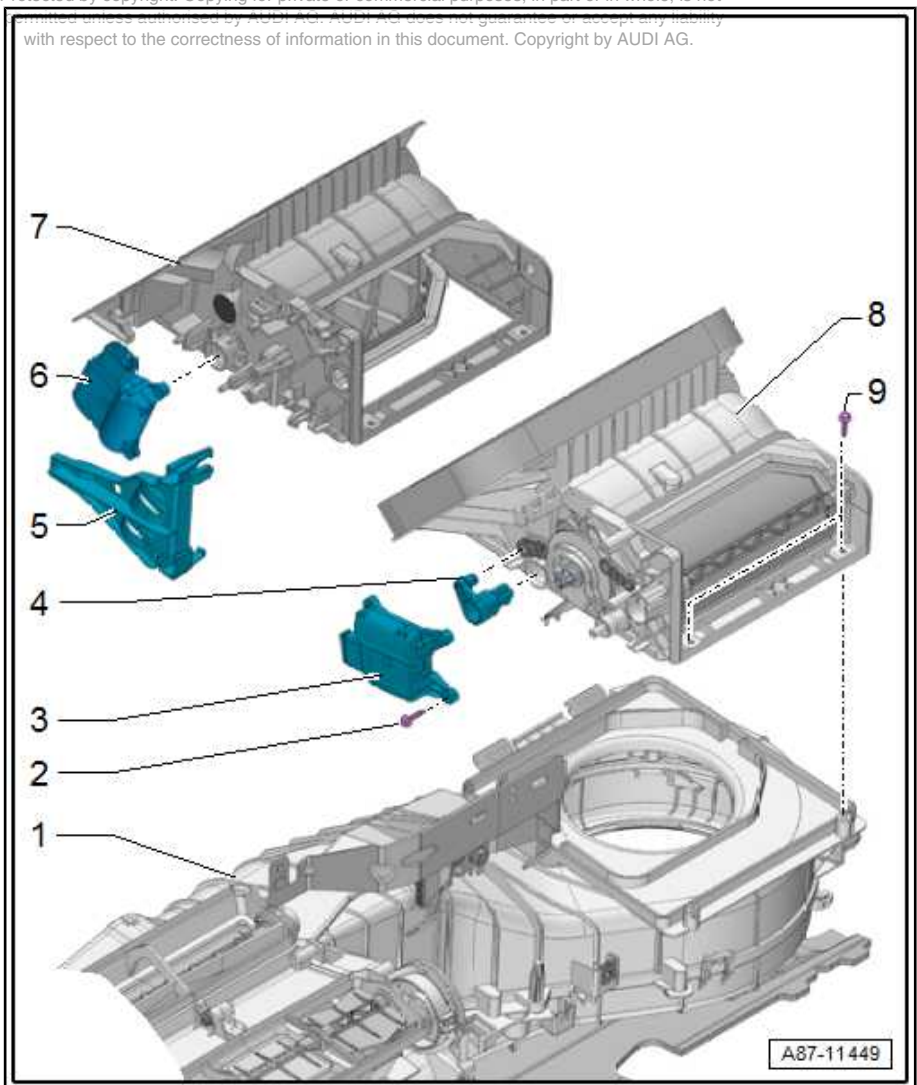
5 - Bracket

- ☐ Only manually controlled air conditioner (heater without air conditioner)

6 - Air recirculation flap control motor - V113-

- ☐ For manually controlled air conditioner (or heater without air conditioner)
- ☐ Removing and installing ⇒ [page 176](#)

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7 - Air intake duct

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Only manually controlled air conditioner (heater without air conditioner)
- ☐ With fresh air and air recirculation flap
- ☐ Do not dismantle
- ☐ Removing and installing ⇒ [page 214](#)

8 - Air intake duct

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Automatically controlled air conditioner only
- ☐ With fresh air and air recirculation flap and air flow flap
- ☐ Do not dismantle
- ☐ Removing and installing ⇒ [page 214](#)

9 - Bolt

- ☐ Tightening torque ⇒ [page 190](#)

4.2 Removing and installing temperature flap control motor - V68-



Note

- ◆ *Only for vehicles with manually controlled air conditioner (or with heater without air conditioner).*
- ◆ *The colour coding of the connecting element on the control motor is being gradually discontinued from 10.2013 onwards (for both the factory-fitted connecting elements and the replacement connecting elements). In addition, the replacement connecting elements for the control motors are no longer pre-assembled ⇒ [page 54](#) and ⇒ Electronic parts catalogue .*
- ◆ *The control motors and the corresponding connecting elements are different. However, in some cases the differences are so small that they cannot always be identified at first glance. If a version other than the intended control motor or connecting element is installed, this usually leads to problems which only show up during the subsequent basic setting ⇒ [page 54](#) and ⇒ Vehicle diagnostic tester (Guided Fault Finding).*

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Caution

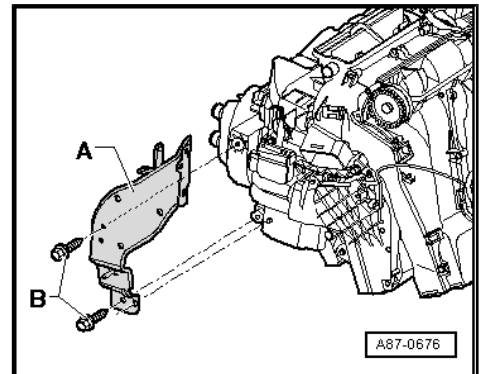
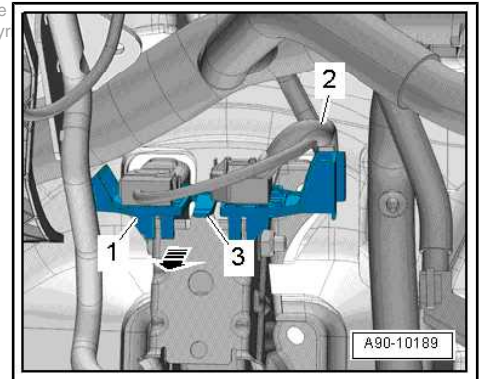
Problems occur with the operation of the air conditioner (heater) if incorrect component versions have been installed.

- ◆ **The different control motor versions can only be distinguished from the outside by their part numbers.**
- ◆ **The connecting elements are sometimes very similar and cannot be distinguished at first glance.**
- ◆ **Where possible, only remove a control motor once the new component and the corresponding connecting element are available for installation.**
- ◆ **Prior to installation, check carefully to ensure that the correct control motor and the correct connecting element allocated to it are being installed.**
- ◆ **If possible, only dispose of the removed components once you have checked that the newly installed components function correctly.**

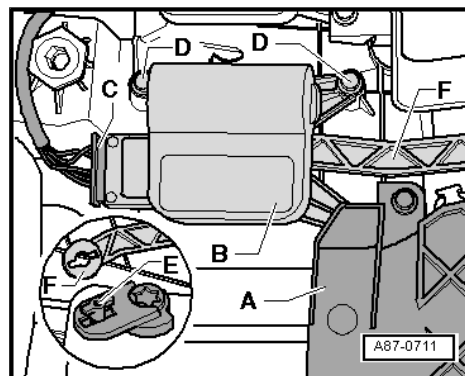
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Removing

- Observe general notes ➔ [page 54](#) .
- Remove dash panel ➔ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
- Remove data bus diagnostic interface ➔ Electrical system; Rep. gr. 97 ; Control units; Removing and installing data bus diagnostic interface - J533- .
- Move wiring harness -2- clear.
- Release retaining tab -3- and detach mounting -1- from pedal cluster -arrow-.
- Remove bolts -B-.
- Move clear electrical wiring harness at bracket -A-, disengage wiring duct and move to one side.



- Remove bolts -D-.
- Press cover -A- for heat exchanger slightly to one side at top and detach control motor -B- from temperature flap shaft.
- Mark electrical connector and control motor.
- Unplug electrical connector -C-.
- Detach connecting rod -F- from operating lever -E- for control motor.
- Turn control motor until opening of operating lever is opposite catch on operating lever.
- Detach control motor from operating lever.



Installing

Install in reverse order of removal; note the following:

- Prise connecting element (in this case: operating lever -E-) out of the control motor that is being renewed (or select connecting element from set of connecting elements) and install it in the new control motor that is being installed ⇒ [page 54](#) .
- Fit operating lever of control motor to connecting rod -F-.
- Mounting of connecting rod -F- can only be attached to operating lever -E- in one position.
- Mounting for connecting rod -F- must be opposite operating lever -E- as shown in illustration.



Note

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If mounting for connecting rod -F- and operating lever -E- are not opposite each other, mounting in control motor must be rotated.
Observe general notes ⇒ [page 54](#) .

- Plug in electrical connector.
- Position control motor on air distribution housing.
- There must be no play in the connection between the control motor, shaft and connecting rod -F-.
- Carefully tighten bolts (tightening torque: 1 Nm).
- Route electrical wiring harness so that it cannot come into contact with moving components (e.g. control motor lever).
- Install data bus diagnostic interface ⇒ Electrical system; Rep. gr. 97 ; Control units; Removing and installing data bus diagnostic interface - J533- .
- Install dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

After completing the repairs, perform the following work on the operating unit ⇒ Vehicle diagnostic tester ("Guided Fault Finding"):

- Read out event memory and delete any entries displayed.
- Perform basic setting.
- Perform final control diagnosis.

Tightening torques

- ◆ ⇒ ["4.1.1 Exploded view - control motors \(front\), air distribution housing, flap control \(left-side\)", page 164](#)

- ◆ ⇒ ["5.1.1 Exploded view - attachments for heater and air conditioning unit and air intake box", page 187](#)

4.3 Removing and installing centre flap control motor - V70-



Note

- ◆ *On vehicles with manually controlled air conditioner (or with heater without air conditioner), the defroster flap is also activated by the operating lever of the centre flap control motor - V70-.*
- ◆ *The colour coding of the connecting element on the control motor is being gradually discontinued from 10.2013 onwards (for both the factory-fitted connecting elements and the replacement connecting elements). In addition, the replacement connecting elements for the control motors are no longer pre-assembled ⇒ [page 54](#) and ⇒ *Electronic parts catalogue*.*
- ◆ *The control motors and the corresponding connecting elements are different. However, in some cases the differences are so small that they cannot always be identified at first glance. If a version other than the intended control motor or connecting element is installed, this usually leads to problems which only show up during the subsequent basic setting ⇒ [page 54](#) and ⇒ *Vehicle diagnostic tester (Guided Fault Finding)*.*



Caution

Problems occur with the operation of the air conditioner (heater) if incorrect component versions have been installed.

- ◆ *The different control motor versions can only be distinguished from the outside by their part numbers.*
- ◆ *The connecting elements are sometimes very similar and cannot be distinguished at first glance.*
- ◆ **Where possible, only remove a control motor once the new component and the corresponding connecting element are available for installation.**
- ◆ *Prior to installation, check carefully to ensure that the correct control motor and the correct connecting element allocated to it are being installed.*
- ◆ *If possible, only dispose of the removed components once you have checked that the newly installed components function correctly.*

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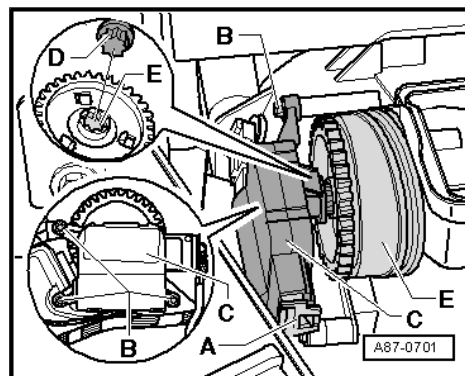
Removing

- Observe general notes ⇒ [page 54](#) .
- Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
- Mark electrical connector and control motor.
- Unplug electrical connector -A-.
- Remove bolts -B-.
- Detach control motor -C- from centre flap shaft.

Installing

Install in reverse order of removal; note the following:

- Prise connecting element (in this case: shaft -D-) out of the control motor that is being renewed (or select connecting element from set of connecting elements) and install it in the new control motor that is being installed ⇒ [page 54](#) .
- Control motor shaft -D- can only be attached to mounting -E- in one position at cam plate.
- The shaft in the control motor must be opposite the mounting as shown.



Note

If the actuator socket and shaft are not opposite one another, the socket in the control motor must be turned. Observe general notes ⇒ [page 54](#) .

- Plug in electrical connector.
- Position control motor on air distribution housing. The shaft must engage in the actuator socket.
- There must not be any play in the connection between the control motor and shaft.
- Carefully tighten bolts (tightening torque: 1 Nm).
- Route electrical wiring harness so that it cannot come into contact with moving components (e.g. control motor lever).
- Install dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

After completing the repairs, perform the following work on the operating unit ⇒ Vehicle diagnostic tester ("Guided Fault Finding"):

- Read out event memory and delete any entries displayed.
- Perform basic setting.
- Perform final control diagnosis.

Tightening torques

- ◆ ⇒ ["4.1.1 Exploded view - control motors \(front\), air distribution housing, flap control \(left-side\)", page 164](#)

4.4 Removing and installing defroster flap control motor - V107-



Note

- ◆ *Only installed on vehicles with automatically controlled air conditioner*
- ◆ *On vehicles with manually controlled air conditioner (or with heater without air conditioner), the defroster flap is activated by the operating lever of the centre flap control motor - V70-.*
- ◆ *The colour coding of the connecting element on the control motor is being gradually discontinued from 10.2013 onwards (for both the factory-fitted connecting elements and the replacement connecting elements). In addition, the replacement connecting elements for the control motors are no longer pre-assembled ➔ [page 54](#) and ➔ [Electronic parts catalogue](#)*
- ◆ *The control motors and the corresponding connecting elements are different. However, in some cases the differences are so small that they cannot always be identified at first glance. If a version other than the intended control motor or connecting element is installed, this usually leads to problems which only show up during the subsequent basic setting ➔ [page 54](#) and ➔ Vehicle diagnostic tester (Guided Fault Finding).*



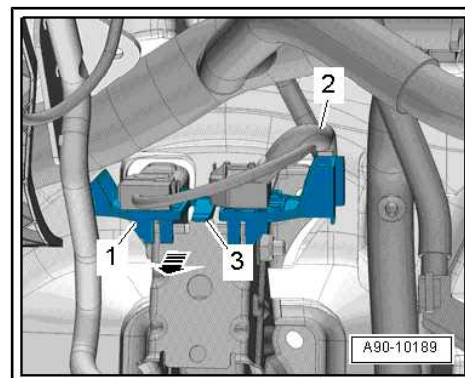
Caution

Problems occur with the operation of the air conditioner (heater) if incorrect component versions have been installed.

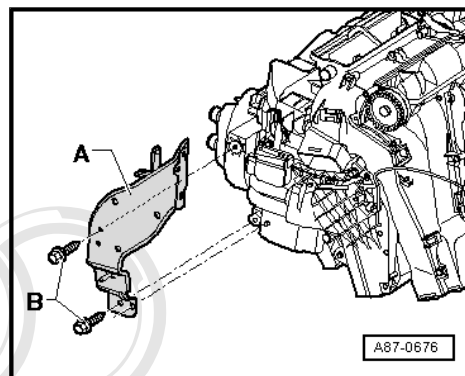
- ◆ *The different control motor versions can only be distinguished from the outside by their part numbers.*
- ◆ *The connecting elements are sometimes very similar and cannot be distinguished at first glance.*
- ◆ *Where possible, only remove a control motor once the new component and the corresponding connecting element are available for installation.*
- ◆ *Prior to installation, check carefully to ensure that the correct control motor and the correct connecting element allocated to it are being installed.*
- ◆ *If possible, only dispose of the removed components once you have checked that the newly installed components function correctly.*

Removing

- Observe general notes ➔ [page 54](#).
- Remove dash panel ➔ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel.
- Remove data bus diagnostic interface ➔ Electrical system; Rep. gr. 97 ; Control units; Removing and installing data bus diagnostic interface - J533-.
- Move wiring harness -2- clear.
- Release retaining tab -3- and detach mounting -1- from pedal cluster -arrow-.

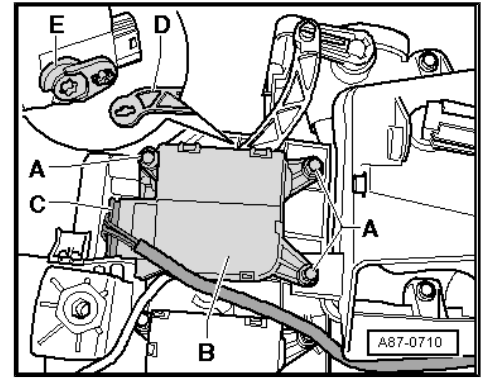


- Remove bolts -B-.
- Move clear electrical wiring harness at bracket -A-, disengage wiring duct and move to one side.



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- Remove bolts -A-.
- Detach control motor -B- from defroster flap shaft.
- Mark electrical connector and control motor.
- Unplug electrical connector -C-.
- Detach connecting rod -D- from operating lever -E- for control motor.
- Turn control motor until opening of operating lever is opposite catch on operating lever.
- Detach control motor from operating lever.



Installing

Install in reverse order of removal; note the following:

- Prise connecting element (in this case: operating lever -E-) out of the control motor that is being renewed (or select connecting element from set of connecting elements) and install it in the new control motor that is being installed ⇒ [page 54](#) .
- Fit operating lever of control motor to connecting rod -D-.
- Mounting of connecting rod -D- can only be attached to operating lever -E- in one position.
- Mounting for connecting rod -D- must be opposite operating lever -E- as shown in illustration.



Note

If mounting for connecting rod -D- and operating lever -E- are not opposite each other, mounting in control motor must be rotated. Observe general notes ⇒ [page 54](#) .

- Plug in electrical connector.
- Position control motor on air distribution housing.
- There must be no play in the connection between the control motor, shaft and connecting rod -D-.
- Carefully tighten bolts (tightening torque: 1 Nm).
- Route electrical wiring harness so that it cannot come into contact with moving components (e.g. control motor lever).
- Install data bus diagnostic interface ⇒ Electrical system; Rep. gr. 97 ; Control units; Removing and installing data bus diagnostic interface - J533- .
- Install dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

After completing the repairs, perform the following work on the operating unit ⇒ Vehicle diagnostic tester ("Guided Fault Finding"):

- Read out event memory and delete any entries displayed.
- Perform basic setting.
- Perform final control diagnosis.

Tightening torques

- ◆ ⇒ ["4.1.1 Exploded view - control motors \(front\), air distribution housing, flap control \(left-side\)", page 164](#)

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- ◆ ⇒ ["5.1.1 Exploded view - attachments for heater and air conditioning unit and air intake box", page 187](#)

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

⇒ ["4.5.1 Removing and installing air recirculation flap control motor V113 - manually controlled air conditioner \(or heater without air conditioner\)", page 176](#)

⇒ ["4.5.2 Removing and installing air recirculation flap control motor V113 - automatically controlled air conditioner", page 178](#)

4.5.1 Removing and installing air recirculation flap control motor - V113- - manually controlled air conditioner (or heater without air conditioner)



Note

- ◆ *The colour coding of the connecting element on the control motor is being gradually discontinued from 10.2013 onwards (for both the factory-fitted connecting elements and the replacement connecting elements). In addition, the replacement connecting elements for the control motors are no longer pre-assembled ⇒ [page 54](#) and ⇒ *Electronic parts catalogue*.*
- ◆ *The control motors and the corresponding connecting elements are different. However, in some cases the differences are so small that they cannot always be identified at first glance. If a version other than the intended control motor or connecting element is installed, this usually leads to problems which only show up during the subsequent basic setting ⇒ [page 54](#) and ⇒ *Vehicle diagnostic tester (Guided Fault Finding)*.*



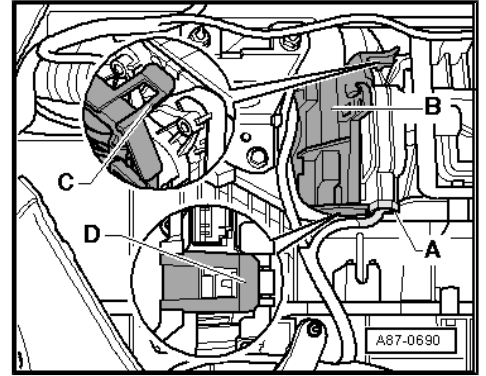
Caution

Problems occur with the operation of the air conditioner (heater) if incorrect component versions have been installed.

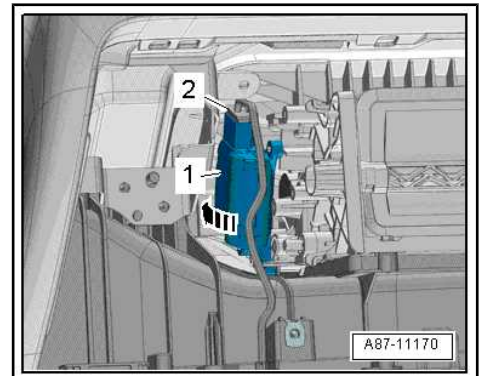
- ◆ *The different control motor versions can only be distinguished from the outside by their part numbers.*
- ◆ *The connecting elements are sometimes very similar and cannot be distinguished at first glance.*
- ◆ *Where possible, only remove a control motor once the new component and the corresponding connecting element are available for installation.*
- ◆ *Prior to installation, check carefully to ensure that the correct control motor and the correct connecting element allocated to it are being installed.*
- ◆ *If possible, only dispose of the removed components once you have checked that the newly installed components function correctly.*

Removing

- Observe general notes ➔ [page 54](#) .
- Remove glove box ➔ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- Move clear electrical wiring.
- Release tabs and detach bracket towards rear.



- Detach control motor -1- from air recirculation flap shaft -arrow-.
- Mark electrical connector and control motor.
- Unplug electrical connector -1-.

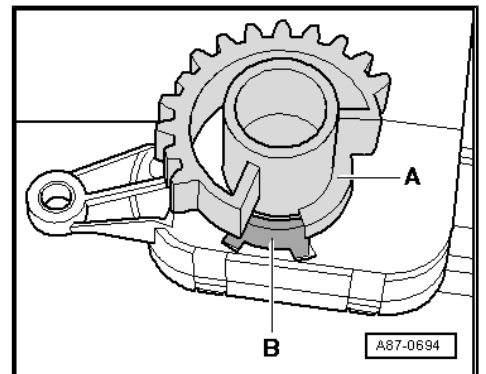


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Installing

Install in reverse order of removal; note the following:

- If there are problems due to moisture in the passenger compartment, also check the air recirculation flap (must close completely).
- The mounting for the control motor can only be attached to the shaft in the “air recirculation flap open” position.
- Prise connecting element (in this case: gear wheel -A-) out of the control motor that is being renewed (or select connecting element from set of connecting elements) and install it in the new control motor that is being installed ➔ [page 54](#) .
- The gear wheel -A- must make contact with the stop -B- as shown.

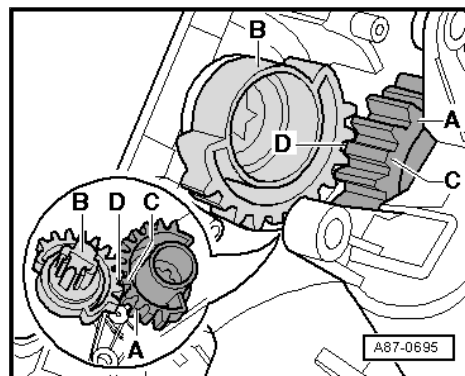


Note

If the gear wheel does not make contact with the stop, the mounting for the control motor must be turned. Observe general notes ➔ [page 54](#) .

- Plug in electrical connector -A-.

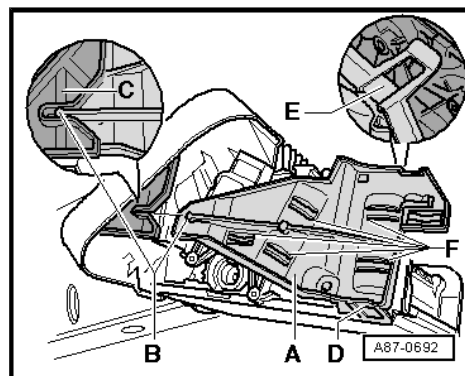
- Position control motor on air intake box with air recirculation flap open. The shaft of the air recirculation flap must engage in the mounting.
- To make it possible to slide gear wheel at control motor -A- onto gear wheel of air flow flap, short tooth -C- of gear wheel at control motor must be aligned with short tooth gap -D- of gear wheel at shaft of air flow flap -B-.
- There must not be any play in the connection between the control motor and shaft.



- Position bracket on air intake box; guide must engage in mounting.
- Tabs on bracket must engage audibly at air intake box.
- Route wiring harness -F- so that it cannot come into contact with moving components (e.g. control motor lever).
- Install glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .

After completing the repairs, perform the following work on the operating unit ⇒ Vehicle diagnostic tester ("Guided Fault Finding"):

- Read out event memory and delete any entries displayed.
- Perform basic setting.
- Perform final control diagnosis.



4.5.2 Removing and installing air recirculation flap control motor - V113- - automatically controlled air conditioner



Note

- ◆ *The colour coding of the connecting element on the control motor is being gradually discontinued from 10.2013 onwards (for both the factory-fitted connecting elements and the replacement connecting elements). In addition, the replacement connecting elements for the control motors are no longer pre-assembled ⇒ [page 54](#) and ⇒ *Electronic parts catalogue* .*
- ◆ *The control motors and the corresponding connecting elements are different. However, in some cases the differences are so small that they cannot always be identified at first glance. If a version other than the intended control motor or connecting element is installed, this usually leads to problems which only show up during the subsequent basic setting ⇒ [page 54](#) and ⇒ *Vehicle diagnostic tester (Guided Fault Finding)*.*

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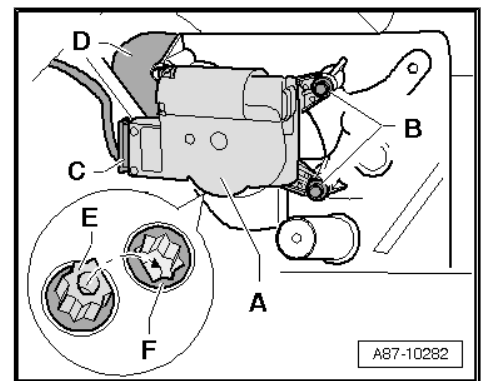
Caution

Problems occur with the operation of the air conditioner (heater) if incorrect component versions have been installed.

- ◆ **The different control motor versions can only be distinguished from the outside by their part numbers.**
- ◆ **If possible, only remove a control motor if the new component is available for installation.**
- ◆ **Before installing a control motor, check carefully to ensure that the correct version is being installed.**
- ◆ **If possible, only dispose of the removed components once you have checked that the newly installed components function correctly.**

Removing

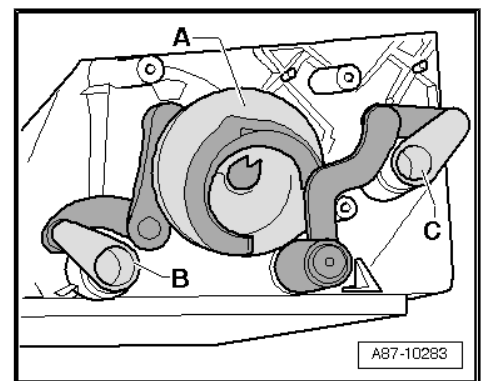
- Observe general notes ⇒ [page 54](#) .
- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- Remove bolts -B-.
- Detach control motor -A- from shaft -F- of cam plate for air recirculation flap.
- Mark electrical connector and control motor.
- Unplug electrical connector -C-.



Installing

Install in reverse order of removal; note the following:

- If there are problems due to moisture in the passenger compartment, also check the air recirculation flap (must close completely).
- Check actuation and operation of air recirculation flap -C- and fresh air flap -B- by turning cam plate -A-. When doing so, make sure lugs attached to levers are correctly seated in grooves of cam plate -A-.



- The mounting -F- for the control motor -A- can only be fitted onto the shaft -E- of the air recirculation flap in one position.
- The actuator socket in the control motor must be opposite the shaft as shown.



Note

If the actuator socket and shaft are not opposite one another, the socket in the control motor must be turned. Observe general notes ⇒ [page 54](#) .

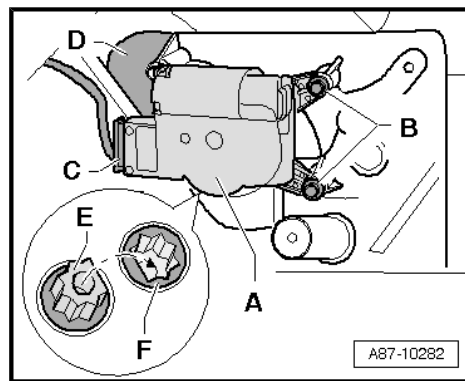
- Plug in electrical connector -A-.
- Position control motor on air distribution box. The shaft of the air flow flap must engage in the actuator socket.
- There must not be any play in the connection between the control motor and shaft.
- Tighten bolts -B- to specified torque (tightening torque: 1 Nm).
- Route wiring harness -G- so that it cannot come into contact with moving components (e.g. control motor lever).
- Install glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .

After completing the repairs, perform the following work on the operating unit ⇒ Vehicle diagnostic tester ("Guided Fault Finding"):

- Read out event memory and delete any entries displayed.
- Perform basic setting.
- Perform final control diagnosis.

Tightening torques

- ◆ ⇒ ["4.1.3 Exploded view - control motors \(front\), intake duct, flap control", page 167](#)



4.6 Removing and installing left temperature flap control motor - V158-



Note

- ◆ *Only installed on vehicles with automatically controlled air conditioner*
- ◆ *On vehicles with manually controlled air conditioner (or with heater and without air conditioner), the temperature flap control motor - V68- activates the temperature flaps. The right and left temperature flaps are linked by the shaft.*
- ◆ *The colour coding of the connecting element on the control motor is being gradually discontinued from 10.2013 onwards (for both the factory-fitted connecting elements and the replacement connecting elements). In addition, the replacement connecting elements for the control motors are no longer pre-assembled ⇒ [page 54](#) and ⇒ *Electronic parts catalogue*.*
- ◆ *The control motors and the corresponding connecting elements are different. However, in some cases the differences are so small that they cannot always be identified at first glance. If a version other than the intended control motor or connecting element is installed, this usually leads to problems which only show up during the subsequent basic setting ⇒ [page 54](#) and ⇒ *Vehicle diagnostic tester (Guided Fault Finding)*.*



Caution

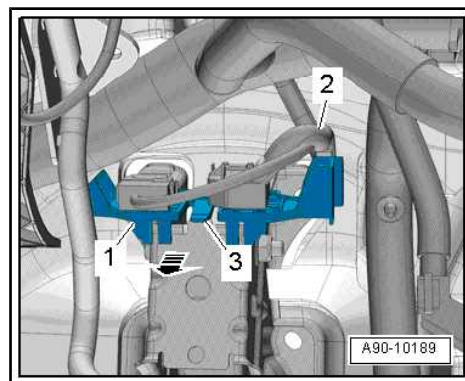
Problems occur with the operation of the air conditioner (heater) if incorrect component versions have been installed.

- ◆ *The different control motor versions can only be distinguished from the outside by their part numbers.*
- ◆ *The connecting elements are sometimes very similar and cannot be distinguished at first glance.*
- ◆ *Where possible, only remove a control motor once the new component and the corresponding connecting element are available for installation.*
- ◆ *Prior to installation, check carefully to ensure that the correct control motor and the correct connecting element allocated to it are being installed.*
- ◆ *If possible, only dispose of the removed components once you have checked that the newly installed components function correctly.*

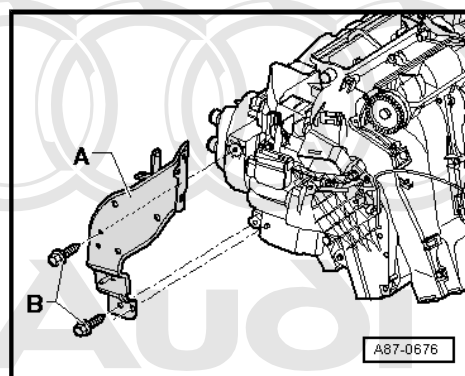
Removing

- Observe general notes ⇒ [page 54](#).
- Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel.
- Remove data bus diagnostic interface ⇒ Electrical system; Rep. gr. 97 ; Control units; Removing and installing data bus diagnostic interface - J533-.

- Move wiring harness -2- clear.
- Release retaining tab -3- and detach mounting -1- from pedal cluster -arrow-.

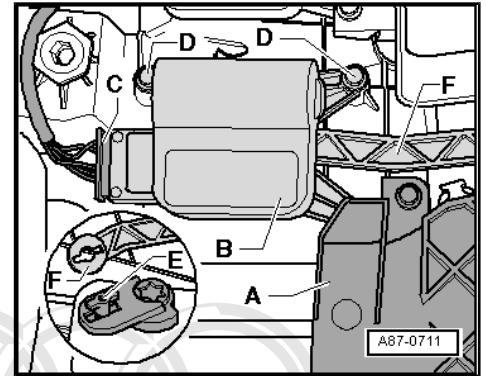


- Remove bolts -B-.
- Move clear electrical wiring harness at bracket -A-, disengage wiring duct and move to one side.



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- Remove bolts -D-.
- Press cover -A- for heat exchanger slightly to one side at top and detach control motor -B- from temperature flap shaft.
- Mark electrical connector and control motor.
- Unplug electrical connector -C-.
- Detach connecting rod -F- from operating lever -E- for control motor.
- Turn control motor until opening of operating lever is opposite catch on operating lever.
- Detach control motor from operating lever.



Installing

Install in reverse order of removal; note the following:

- Prise connecting element (in this case: operating lever -E-) out of the control motor that is being renewed (or select connecting element from set of connecting elements) and install it in the new control motor that is being installed [⇒ page 54](#).
- Fit operating lever of control motor to connecting rod -F-.
- Mounting of connecting rod -F- can only be attached to operating lever -E- in one position.
- Mounting for connecting rod -F- must be opposite operating lever -E- as shown in illustration.

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Note

If mounting for connecting rod -F- and operating lever -E- are not opposite each other, mounting in control motor must be rotated. Observe general notes [⇒ page 54](#).

- Plug in electrical connector.
- Position control motor on air distribution housing.
- There must be no play in the connection between the control motor, shaft and connecting rod -F-.
- Carefully tighten bolts (tightening torque: 1 Nm).
- Route electrical wiring harness so that it cannot come into contact with moving components (e.g. control motor lever).
- Install data bus diagnostic interface $\Rightarrow$ Electrical system; Rep. gr. 97 ; Control units; Removing and installing data bus diagnostic interface - J533- .
- Install dash panel $\Rightarrow$ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

After completing the repairs, perform the following work on the operating unit $\Rightarrow$ Vehicle diagnostic tester ("Guided Fault Finding"):

- Read out event memory and delete any entries displayed.
- Perform basic setting.
- Perform final control diagnosis.

Tightening torques

- ♦ [⇒ "4.1.1 Exploded view - control motors \(front\), air distribution housing, flap control \(left-side\)", page 164](#)

- ◆ ⇒ ["5.1.1 Exploded view - attachments for heater and air conditioning unit and air intake box", page 187](#)

4.7 Removing and installing right temperature flap control motor - V159-



Note

- ◆ *Only installed on vehicles with automatically controlled air conditioner*
- ◆ *On vehicles with manually controlled air conditioner (or with heater and without air conditioner), the temperature flap control motor - V68- activates the temperature flaps. The right and left temperature flaps are linked by the shaft.*
- ◆ *The colour coding of the connecting element on the control motor is being gradually discontinued from 10.2013 onwards (for both the factory-fitted connecting elements and the replacement connecting elements). In addition, the replacement connecting elements for the control motors are no longer pre-assembled ⇒ [page 54](#) and ⇒ *Electronic parts catalogue* .*
- ◆ *The control motors and the corresponding connecting elements are different. However, in some cases the differences are so small that they cannot always be identified at first glance. If a version other than the intended control motor or connecting element is installed, this usually leads to problems which only show up during the subsequent basic setting ⇒ [page 54](#) and ⇒ *Vehicle diagnostic tester (Guided Fault Finding)*.*



Caution

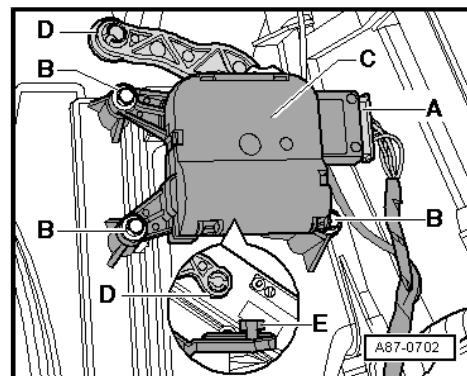
Problems occur with the operation of the air conditioner (heater) if incorrect component versions have been installed.

- ◆ *The different control motor versions can only be distinguished from the outside by their part numbers.*
- ◆ *The connecting elements are sometimes very similar and cannot be distinguished at first glance.*
- ◆ *Where possible, only remove a control motor once the new component and the corresponding connecting element are available for installation.*
- ◆ *Prior to installation, check carefully to ensure that the correct control motor and the correct connecting element allocated to it are being installed.*
- ◆ *If possible, only dispose of the removed components once you have checked that the newly installed components function correctly.*

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Removing

- Observe general notes ⇒ [page 54](#) .
- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- Remove footwell vent (front passenger side) ⇒ [page 236](#) .
- Mark electrical connector and control motor.
- Remove bolts -B-.
- Detach control motor -C- from temperature flap shaft.
- Unplug electrical connector -A-.
- Detach connecting rod -D- from operating lever -E- for control motor.
- Turn control motor until opening of operating lever is opposite catch on operating lever.
- Detach control motor from operating lever.



Installing

Install in reverse order of removal; note the following:

- Prise connecting element (in this case: operating lever -E-) out of the control motor that is being renewed (or select connecting element from set of connecting elements) and install it in the new control motor that is being installed ⇒ [page 54](#) .
- Fit operating lever of control motor to connecting rod -D-.
- Mounting of connecting rod -D- can only be attached to operating lever -E- in one position.
- Mounting for connecting rod -D- must be opposite operating lever -E- as shown in illustration.



Note

If mounting for connecting rod -D- and operating lever -E- are not opposite each other, mounting in control motor must be rotated. Observe general notes ⇒ [page 54](#) .

- Plug in electrical connector.
- Position control motor on air distribution housing.
- There must be no play in the connection between the control motor, shaft and connecting rod -D-.
- Carefully tighten bolts (tightening torque: 1 Nm).
- Route electrical wiring harness so that it cannot come into contact with moving components (e.g. control motor lever).
- Install footwell vent (front passenger side) ⇒ [page 236](#) .
- Install glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .

After completing the repairs, perform the following work on the operating unit ⇒ Vehicle diagnostic tester ("Guided Fault Finding"):

- Read out event memory and delete any entries displayed.
- Perform basic setting.
- Perform final control diagnosis.



Tightening torques

- ◆ ⇒ [“4.1.2 Exploded view - control motors \(front\), air distribution housing, flap control \(right-side\)”, page 166](#)



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5 Heater and air conditioning unit (front)

⇒ [“5.1 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 187](#)

⇒ [“5.2 Exploded view - flaps and partitions in air distribution housing”, page 192](#)

⇒ [“5.3 Exploded view - evaporator housing”, page 193](#)

⇒ [“5.4 Removing and installing evaporator”, page 194](#)

⇒ [“5.5 Cleaning evaporator”, page 195](#)

⇒ [“5.6 Checking auxiliary air heater element Z35 ”, page 204](#)

⇒ [“5.7 Removing and installing auxiliary air heater element Z35 ”, page 206](#)

⇒ [“5.8 Removing and installing heater and air conditioning unit”, page 208](#)

⇒ [“5.9 Removing and installing air intake box of heater and air conditioning unit”, page 214](#)

⇒ [“5.10 Removing and installing air distribution housing”, page 214](#)

⇒ [“5.11 Removing and installing dust and pollen filter”, page 215](#)

⇒ [“5.12 Removing and installing fresh air blower V2 ”, page 216](#)

⇒ [“5.13 Removing and installing fresh air blower series resistor with overheating fuse N24 ”, page 217](#)

⇒ [“5.14 Removing and installing fresh air blower control unit J126 ”, page 218](#)

⇒ [“5.15 Removing and installing heat exchanger”, page 219](#)

⇒ [“5.16 Checking condensation drain”, page 227](#)

⇒ [“5.17 Removing and installing condensation drain”, page 229](#)

5.1 Exploded view - attachments for heater and air conditioning unit and air intake box

⇒ [“5.1.1 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 187](#)

⇒ [“5.1.2 Exploded view - heater/air conditioning unit and air intake box attachments, heat exchanger, supplementary air heater element”, page 189](#)

⇒ [“5.1.3 Exploded view - heater/air conditioning unit and air intake box attachments, fresh air blower, cover”, page 190](#)

5.1.1 Exploded view - attachments for heater and air conditioning unit and air intake box

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1 - Sealing plug

- ☐ Equipment-specific version

2 - Bolt

- ☐ 1.5 Nm

3 - Bolt

- ☐ 1.5 Nm

4 - Air duct to footwell vent (left-side)

5 - Air distribution housing

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 214](#)

6 - Bolt

- ☐ 2x
- ☐ 6 Nm

7 - Bracket

- ☐ For air conditioning unit

8 - Foam spacer

- ☐ For refrigerant lines
- ☐ For seal/insulation

9 - Bolt

- ☐ 1.5 Nm

10 - Evaporator housing

- ☐ Removing and installing ⇒ ["5.10 Removing and installing air distribution housing", page 214](#)

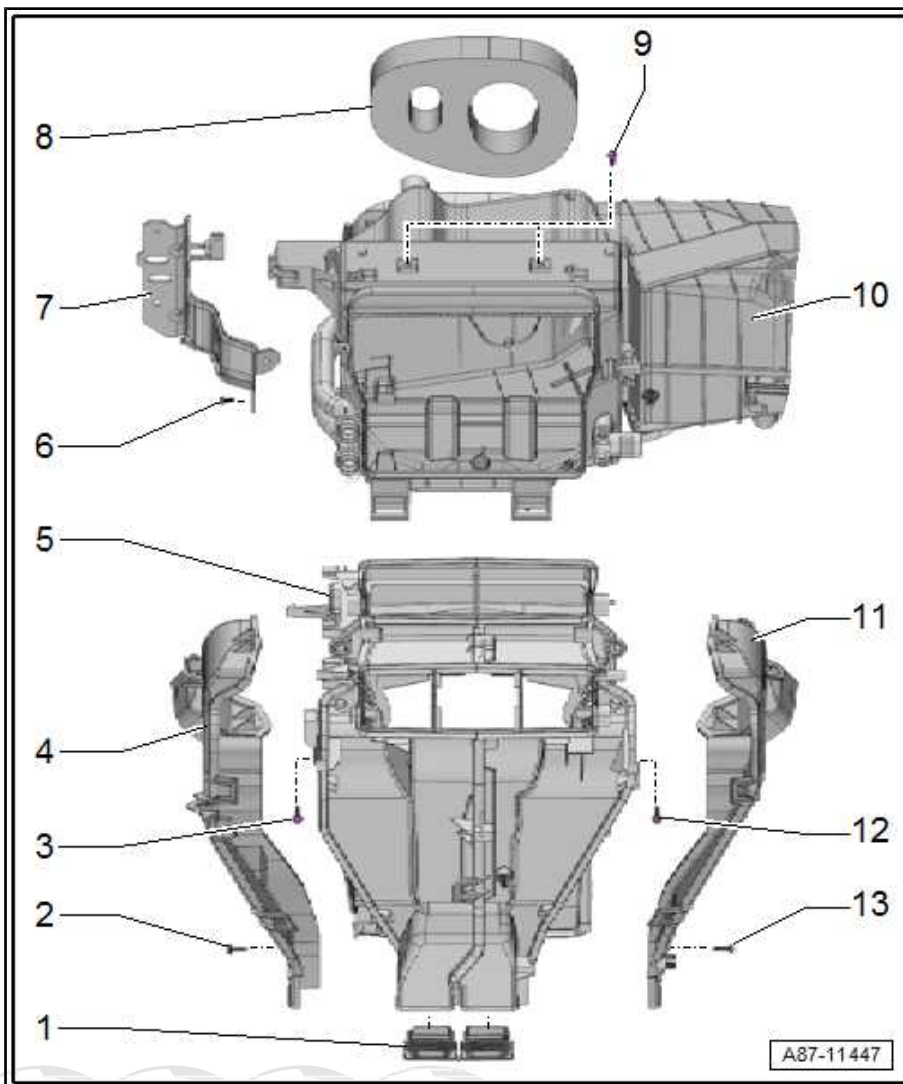
11 - Air duct to footwell vent (right-side)

12 - Bolt

- ☐ 1.5 Nm

13 - Bolt

- ☐ 1.5 Nm



5.1.2 Exploded view - heater/air conditioning unit and air intake box attachments, heat exchanger, supplementary air heater element

1 - Earth wire

- ☐ For supplementary heater
- ☐ Nut, 9 Nm

2 - Electrical wire

- ☐ For auxiliary air heater element - Z35-

3 - Bolt

- ☐ 3x
- ☐ 2 Nm

4 - Cover

- ☐ For heat exchanger

5 - Clamp

6 - Bolt

- ☐ 2 Nm

7 - O-ring

- ☐ Renew

8 - Coolant pipe for heat exchanger

- ☐ Coolant supply from engine

9 - Coolant pipe for heat exchanger

- ☐ Coolant return to engine

10 - Adapter for coolant hoses

- ☐ For heat exchanger
- ☐ Different versions ⇒ Electronic parts catalogue

11 - Bolt

- ☐ 8 Nm

12 - O-ring

- ☐ Renew

13 - Bolt

- ☐ 2 Nm

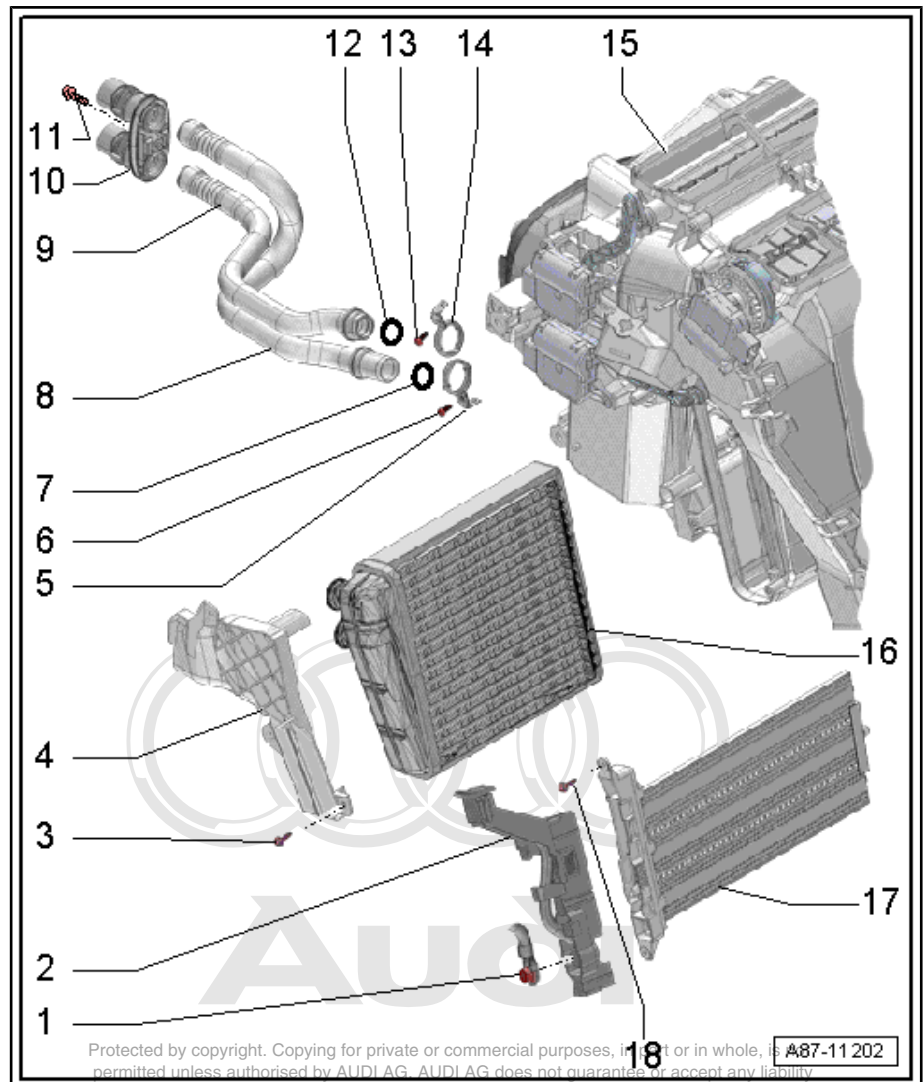
14 - Clamp

15 - Air distribution housing

- ☐ Opening for supplementary heater is sealed on vehicles with petrol engine and without auxiliary air heater element - Z35-
- ☐ Removing and installing air conditioning unit (heater) ⇒ [page 208](#)
- ☐ Exploded view ⇒ [page 187](#)
- ☐ Different versions for manually controlled air conditioner (with heating without air conditioner) and automatically controlled air conditioner ⇒ Electronic parts catalogue

16 - Heat exchanger

- ☐ Removing and installing ⇒ [page 219](#)



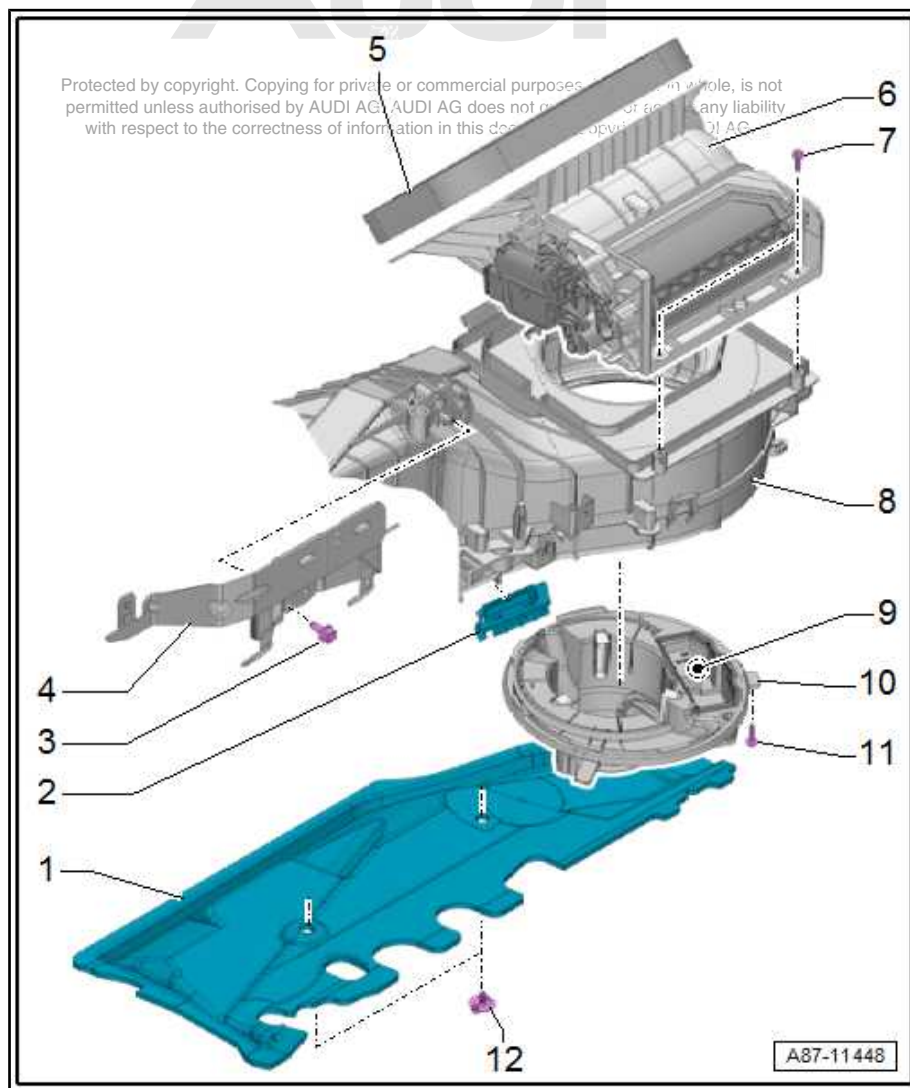
- ❑ Currently only fitted on vehicles with TDI engine
- ❑ Checking ⇒ [page 204](#)
- ❑ Removing and installing ⇒ [page 206](#)

2 Nm

206

2 - Fresh air blower series resistor with overheating fuse - N24-

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ With fresh air blower control unit - J126- for automatically controlled air conditioner
- ❑ Checking ⇒ Vehicle diagnostic tester ("Guided Fault Finding")
- ❑ Removing and installing ⇒ **page 216**





Note

For greater clarity, only the mounting for -V2- is shown here (-V2- is not shown).



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.

11 - Bolt

- ☐ 1 Nm

12 - Bolt

- ☐ 2x
- ☐ 0.5 Nm



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5.2 Exploded view - flaps and partitions in air distribution housing

1 - Air inlet from plenum chamber

- ☐ Fresh air mode

2 - Air inlet from passenger compartment

- ☐ Air recirculation mode

3 - To footwell vent (right-side)

4 - To dash panel vent (centre right)

5 - To dash panel vents (centre)

6 - To dash panel vent (centre left)

7 - To footwell vent (left-side)

8 - To dash panel air duct

- ☐ With air duct to wind-screen, side window defroster vents (left and right) and dash panel vents (left and right)

9 - To footwell vent (rear right)

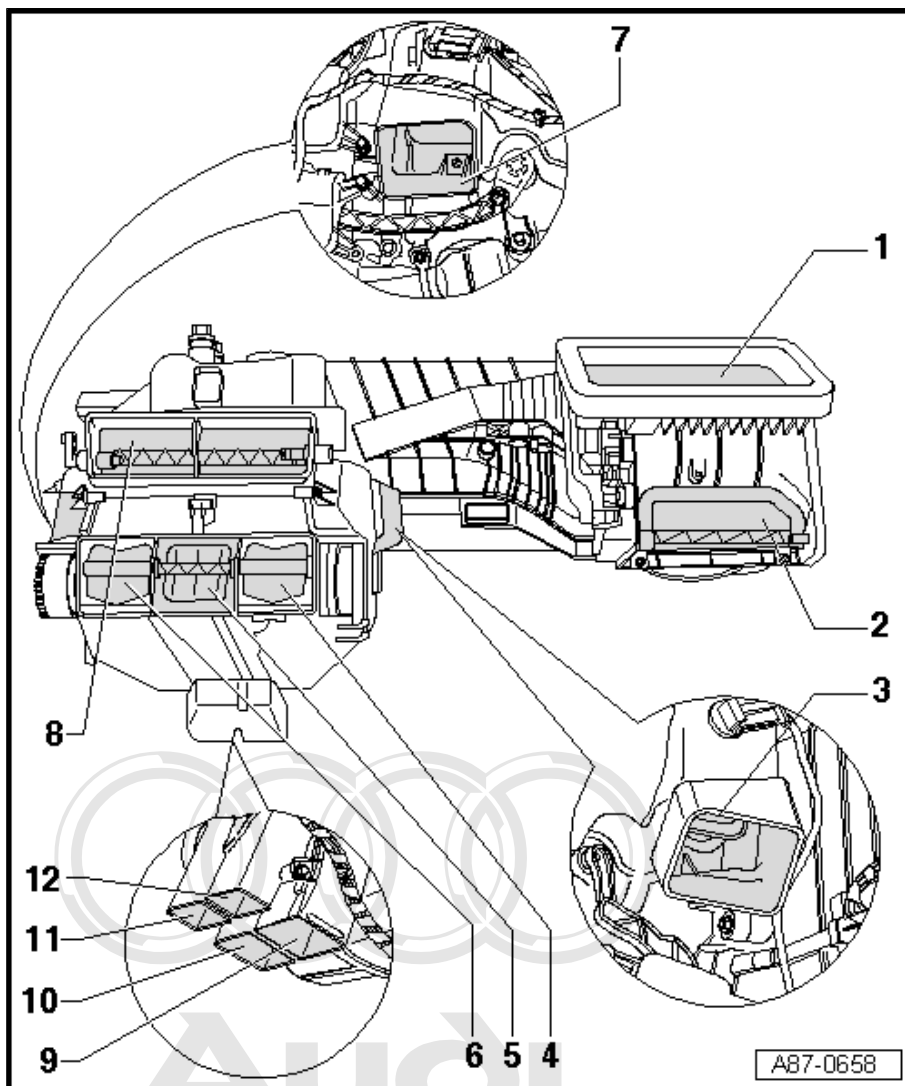
10 - To footwell vent (rear left)

11 - To vent in centre console (rear left)

- ☐ Depending on equipment, sealed off for vehicles with manually controlled air conditioner (or with heater without air conditioner)

12 - To vent in centre console (rear right)

- ☐ Depending on equipment, sealed off for vehicles with manually controlled air conditioner (or with heater without air conditioner)



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5.3 Exploded view - evaporator housing

1 - Evaporator housing (bottom section)

- ☐ Different versions ⇒
Electronic parts catalogue
- ☐ Removing and installing
⇒ ["5.4 Removing and installing evaporator"](#),
[page 194](#)

2 - Evaporator

- ☐ Removing and installing
⇒ [page 194](#)

3 - Clip

4 - Evaporator housing (top section)

- ☐ Different versions ⇒
Electronic parts catalogue
- ☐ Removing and installing
⇒ ["5.4 Removing and installing evaporator"](#),
[page 194](#)

5 - Bolt

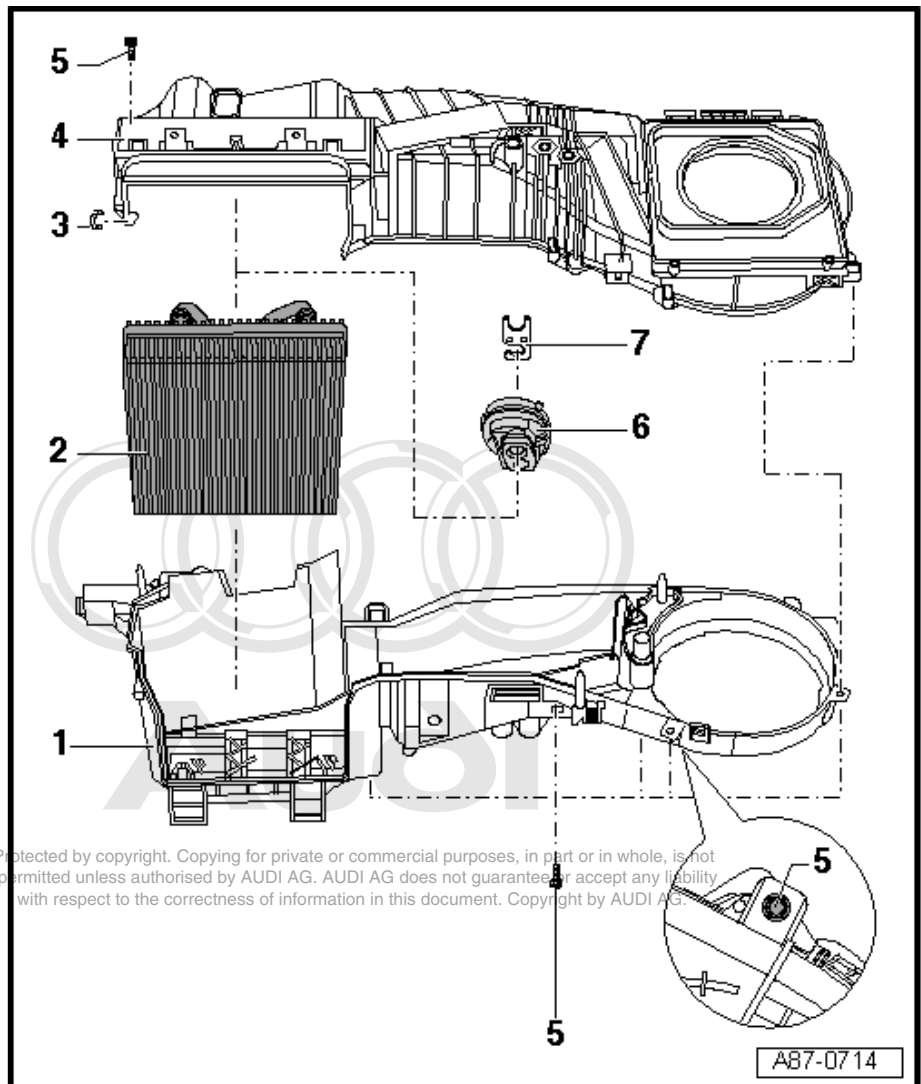
- ☐ 1.5 Nm

6 - Grommet

- ☐ With support ring; for
sealing opening for re-
frigerant lines through
bulkhead
- ☐ Removing and installing
⇒ [page 109](#)

7 - Retaining plate

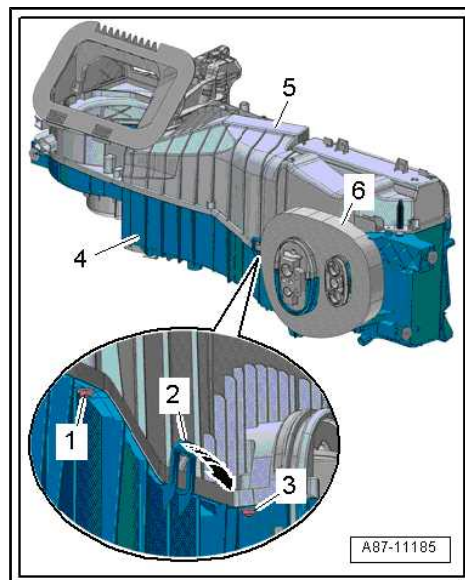
- ☐ For fixing refrigerant line
in position and securing
expansion valve



5.4 Removing and installing evaporator

Removing

- Remove air distribution housing ➔ [page 214](#) .
- Detach foam spacer -6-.
- Remove bolts -1 and 3-.
- Detach top section of air distribution housing -5- from bottom section -4- by releasing retaining clips -2- -arrow-.



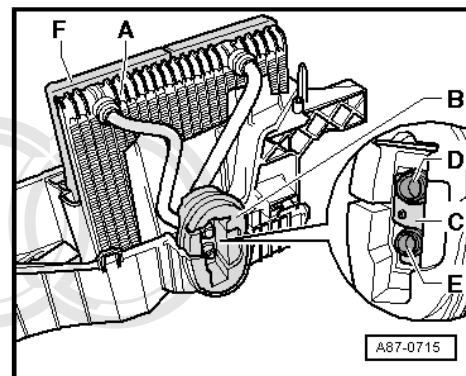
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- Take evaporator -A- out of evaporator housing (bottom section).
- Remove expansion valve ➔ [page 103](#) .
- Detach seal/insulation -B-; to do so, pull movable part to one side.
- Detach retaining plate -C- for refrigerant lines.

Installing

Install in reverse order of removal; note the following:

- Clean air duct housing (bottom section) and condensation drain before inserting evaporator.
- Seal -F- attached to evaporator must be bonded on all around; check for damage.
- Renew O-rings; for correct version, refer to ➔ Electronic parts catalogue .
- Insert O-rings at connecting pipes -D, E- to evaporator.



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Note

- ◆ *There are different versions of the expansion valve (identical housing but different characteristic control curve); therefore it is important to observe the correct assignment ➔ Electronic parts catalogue .*
- ◆ *Lubricate O-rings lightly with refrigerant oil before fitting ➔ [page 53](#) .*
- ◆ *Check refrigerant pipes to evaporator for dirt and damage.*
- ◆ *Make sure O-rings are seated correctly on connecting pipes of evaporator.*
- ◆ *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).*

Tightening torques

- ◆ ➔ ["5.3 Exploded view - evaporator housing", page 193](#) .

5.5 Cleaning evaporator

➔ ["5.5.1 Cleaning evaporator with an ultrasonic A/C cleaner", page 195](#)

➔ ["5.5.2 Cleaning evaporator using pressure-feed spray gun V.A.G 1538 and spray lance", page 198](#)

5.5.1 Cleaning evaporator with an ultrasonic A/C cleaner



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" (➔ ["1.2 Notes on odours in vehicles with air conditioner", page 3](#)).

Special tools and workshop equipment required

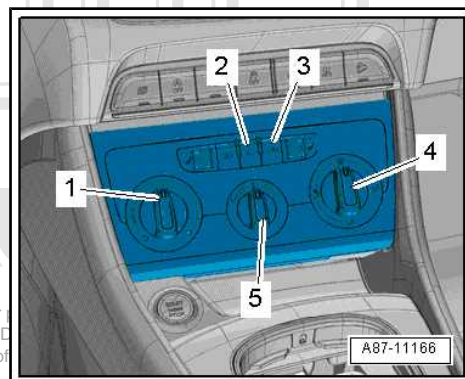
- ◆ Ultrasonic A/C cleaner - VAS 6189A- (for currently available ultrasonic A/C cleaners, refer to ➔ Electronic parts catalogue)
- ◆ Cleaning fluid - VAS 6189/1-
- ◆ Suction nozzle - VAS 6288-
- ◆ Commercially available vacuum cleaner

Procedure

- Check whether the air conditioning unit evaporator is really the source of the odour by switching from fresh air to air recirculation mode
➔ ["1.2 Notes on odours in vehicles with air conditioner", page 3](#) .
- Check and if necessary clean plenum chamber water drain
➔ [page 246](#) .
- Remove dust and pollen filter ➔ [page 215](#) .
- Clean installation slot for dust and pollen filter ➔ [page 216](#) .
- 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:

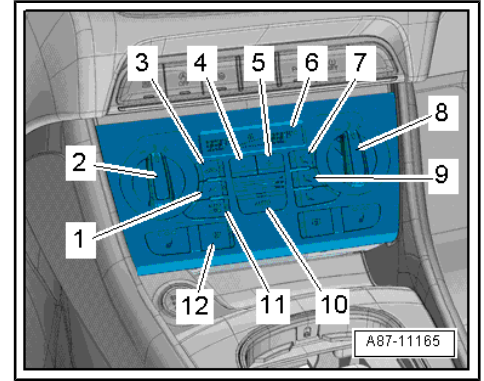
- Using rotary air distribution control -4-, set direction of air flow to "dash panel vents".
- Activate "air recirculation mode" on operating unit (air conditioning system control unit - J301-) and switch off air conditioner compressor.
 - Lamp in button -3- is on.
 - Lamp in button -2- is off.
- Set lowest possible temperature.
 - Rotary temperature control -1- on "cold" stop
- Set rotary fresh air blower control -5- to speed "1".



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Vehicles with automatically controlled air conditioner:

- Activate “air recirculation mode” on operating unit (Climatronic control unit - J255-) and switch off air conditioner compressor.
- Lamp in button -3- is on.
- Lamp in button -1- is off.
- Set lowest possible temperature.
- Set temperature using rotary controls -2, 8- – “LO” display for driver and front passenger side in display -6- of -J255- .
- Using air distribution button -9-, set direction of air flow to “dash panel vents”.
- Use fresh air blower button -4- to set lowest blower speed (- V2- running 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- .

- 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 process takes approx. 15 to 20 minutes and is completed when no further vapour emerges from the outlet hose of the ultrasound A/C cleaner - VAS 6189A- .

- Switch off ultrasound 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 215](#)

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5.5.2 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" (⇒ ["1.2 Notes on odours in vehicles with air conditioner", page 3](#)).

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, curved - V.A.G 1538/6- -A- (medium version: approx. 600 mm, curved or probe - VAS1538/7- as specified for this vehicle); for currently available probes, refer to ⇒ Electronic parts catalogue



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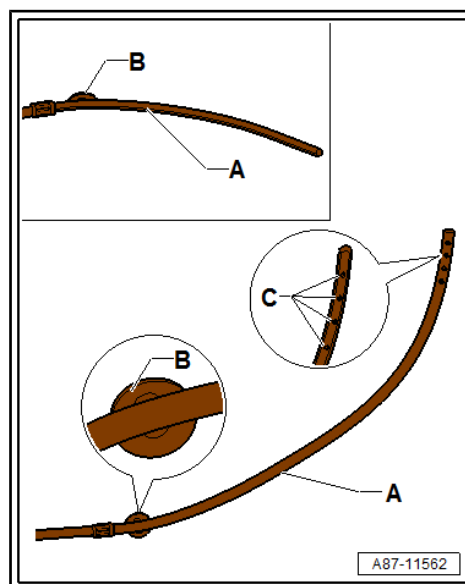
- ◆ Cleaning solution for evaporator in air conditioner "D 600 100 A2" (for currently available cleaning fluids, refer to ⇒ Electronic parts catalogue)
- ◆ Commercially available vacuum cleaner



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.*
- ◆ *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.*

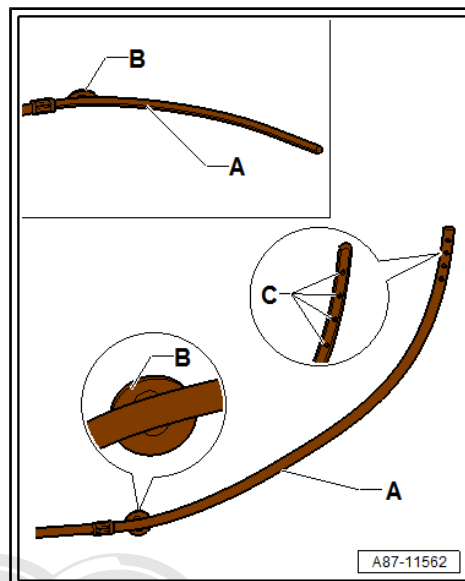
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Recommended bend radius of spray lance VAG 1538/6 (medium length) -A- for this vehicle



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.
- ◆ The spray lance -A- is curved in two dimensions for this vehicle (the tip with the holes -C- also curves towards the observer in the illustration).
- ◆ The spray lance V.A.G 1538/6 -A- with this bend radius is also suitable e.g. for the following vehicles: Audi A3 (2004 onwards), Audi TT (2007 onwards) and Audi Q3 (2013 onwards).



Preparation

- 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
⇒ [“1.2 Notes on odours in vehicles with air conditioner”, page 3](#).



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 cover beneath glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- Remove and check dust and pollen filter; renew if necessary after cleaning evaporator ⇒ [page 215](#) .



Note

We recommend renewing the used dust and pollen filter every time the evaporator is cleaned.

- Check the area between the mounting slot for dust and pollen filter and the fresh air blower - V2- in the evaporator housing for contamination and clean it if necessary ⇒ [page 215](#) .
- Check plenum chamber and water drain of plenum chamber and clean if necessary ⇒ [page 246](#) .



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 [⇒ "5.16 Checking condensation drain", page 227](#)).
- 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 200](#).
- 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.

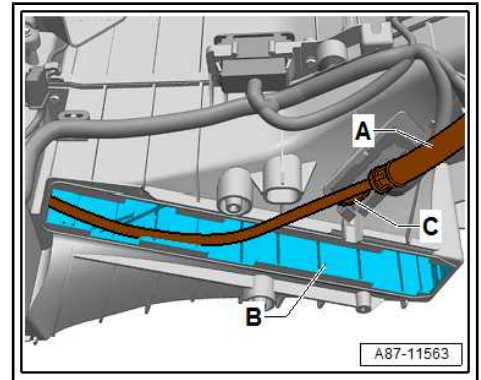


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- Insert spray lance -A- through opening for removed dust and pollen filter -B- and into evaporator housing with spray direction towards evaporator.

 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 drains 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**

→ "5.16 Checking condensation drain", page 227.

- 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 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.

5.6 Checking auxiliary air heater element - Z35-



Note

- ♦ *Vehicles with TDI engine are currently fitted with a supplementary heater. With this system, heat energy is supplied to the air after leaving the heat exchanger of the heater/air conditioning unit when there is a request from the operating unit (Climatronic control unit - J255- / -J301- / heater control unit - J65-). The electric supplementary air heater is activated by the engine control unit via the low heat output relay - J359- and the high heat output relay - J360- ⇒ Vehicle diagnostic tester ("Guided Fault Finding" for the corresponding engine control unit) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- ♦ *The electric supplementary heater is activated via the corresponding engine control unit. In the event of a request, the corresponding engine control unit activates the auxiliary air heater element - Z35- via the low heat output relay - J359- and the high heat output relay - J360- ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- ♦ *A start/stop system is offered for this vehicle. On vehicles with a start/stop system, the activation of the auxiliary air heater element -Z35- is switched off when the stop function is active (to protect the battery - A-). -Z35- is activated again after the engine has been re-started via the start function ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ♦ *Currently vehicles with petrol engine are not fitted with a supplementary heater.*

Cut-in criteria for activation of supplementary heater



Note

The cut-in criteria must be met in the operating unit (Climatronic control unit - J255- / air conditioning system control unit - J301- / heater control unit - J65-) and in the corresponding engine control unit.

Currently only fitted on vehicles with TDI engine

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

- ◆ Engine running for at least 8 seconds and engine speed above 500 rpm
- ◆ Engine temperature below 75 °C
- ◆ Calculated ambient temperature below 8 °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 faults stored in operating unit (-J255- / -J301- / -J65-).
- ◆ No faults stored in engine control unit and load of alternator - C- less than 30 ... 77 % (depending on engine speed; does not apply to activation of supplementary heater)
- ◆ Due to the setting and the measured temperatures, the operating unit (-J255- / -J301- / -J65-) 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 of the air conditioning unit 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 activated if, depending on the engine speed, the capacity utilisation of the alternator is below 30 ... 77 %) ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Shut-off criteria for activation of supplementary heater



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The activation is shut off as soon as one of the cut-in criteria is no longer met in the operating unit (-J255- / -J301-) or in the corresponding engine control unit, or if one of the shut-off criteria is detected.

- The operating unit (-J255- / -J301- / -J65-) deactivates the request for activation of the electric supplementary heater under the following conditions:
 - ◆ One of the cut-in criteria no longer met
 - ◆ Calculated ambient temperature above 11 °C
 - ◆ Load of alternator - C- above 95 %
 - ◆ Less than 60 % of the air is being routed through the heat exchanger of the air conditioning unit for the left and right side (position of temperature flaps).
 - ◆ Stop function of start/stop system active



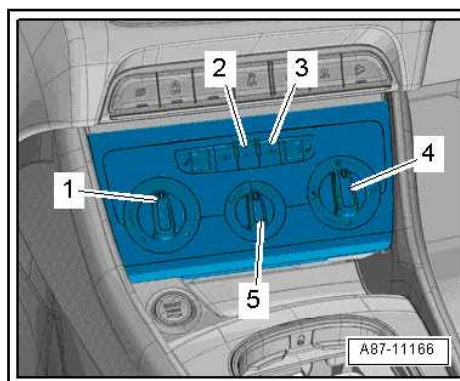
Note

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 output of the supplementary heater element is gradually reduced by approx. one third if the load of the alternator exceeds 95 %) ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

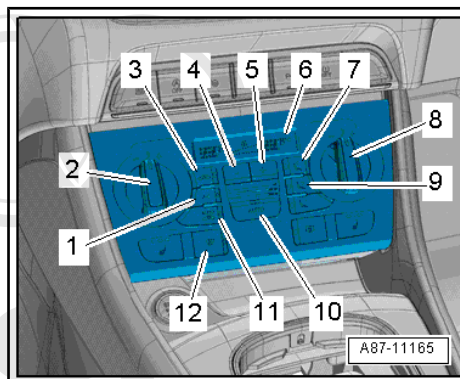
5.7 Removing and installing auxiliary air heater element - Z35-

Removing

- On vehicles with manually controlled air conditioner (or with heater without air conditioner), use rotary control -1- on operating unit (air conditioning system control unit - J301- / heater control unit - J65-) to set temperature to "warm".



- On vehicles with automatically controlled air conditioner, use rotary controls -2, 8- on operating unit (Climatronic control unit - J255-) to set temperature for driver and front passenger side to "warm".
- "HI" shown on display -6- of -J255- .



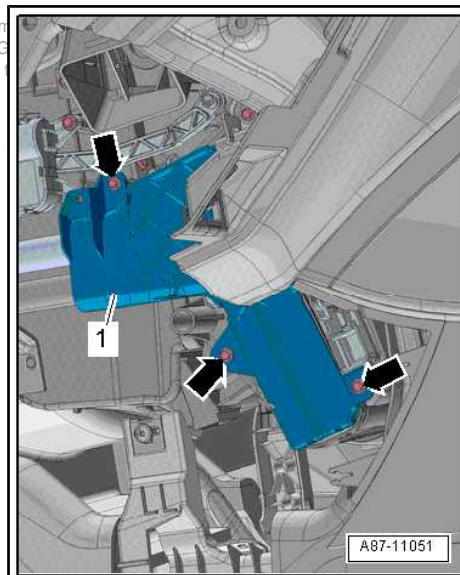
- Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel
- Unfasten central tube from vehicle and slide it slightly towards rear (or remove completely) ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Removing and installing central tube for dash panel .



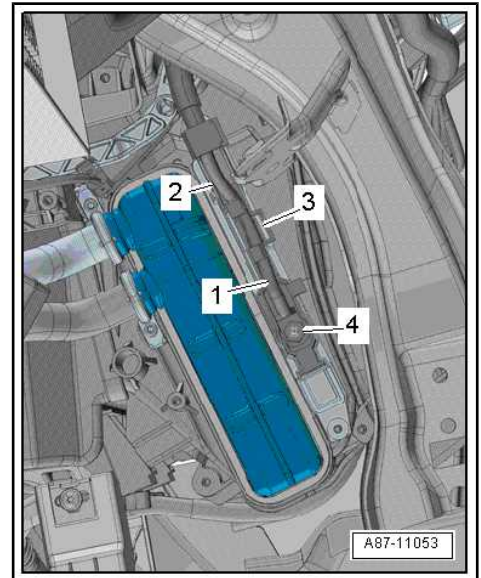
Note

On vehicles with right-hand drive, the central tube must always be removed ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Removing and installing central tube for dash panel .

- Remove footwell vent (driver side) ⇒ [page 236](#) .
- Remove bolts -arrows-.
- Detach cover -1- for heat exchanger.



- Unscrew nut -4- and detach earth wire -1-.
- Release retaining tab -3- and unplug electrical connector -2-.



- Remove bolt -arrow-.



WARNING

Risk of burns.

- ◆ *The auxiliary air heater element - Z35- may be hot if it was in operation prior to removal.*
- ◆ *Do not touch the hot cooling surface of the auxiliary air heater element -Z35- .*

- Pull heater element -1- out of air distribution housing -2-.

Installing

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Install in reverse order of removal; note the following:

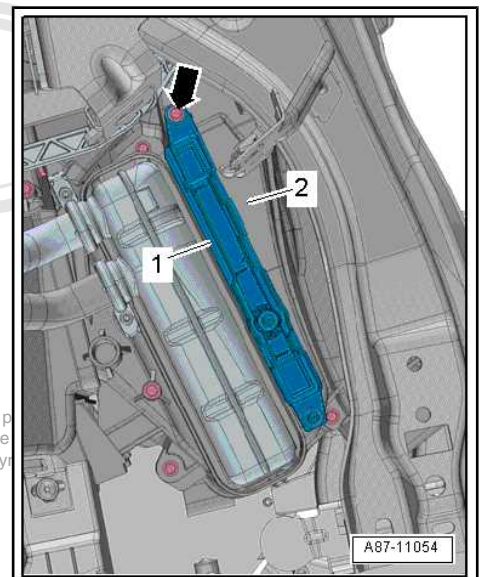
- Clean area around heater element in slot prior to installation.
- Secure/install central tube ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Removing and installing central tube for dash panel .
- Install dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
- Install footwell vent (driver side) ⇒ [page 236](#) .

After completing the repairs, perform the following work on the operating unit ⇒ Vehicle diagnostic tester ("Guided Fault Finding"):

- Read out event memory and delete any entries displayed.
- Check actuation and operation via engine control unit ⇒ Vehicle diagnostic tester ("Guided Fault Finding" for engine control unit).

Tightening torques

- ⇒ ["5.1.2 Exploded view - heater/air conditioning unit and air intake box attachments, heat exchanger, supplementary air heater element"](#), [page 189](#)



5.8 Removing and installing heater and air conditioning unit

Special tools and workshop equipment required

- ◆ Hose clamps up to 25 mm - 3094-
- ◆ Engine bung set - VAS 6122-
- ◆ Compressed-air gun, commercially available

Removing

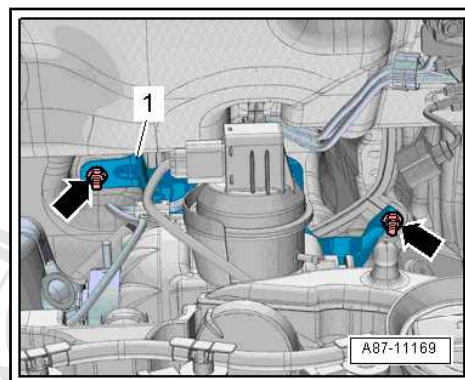
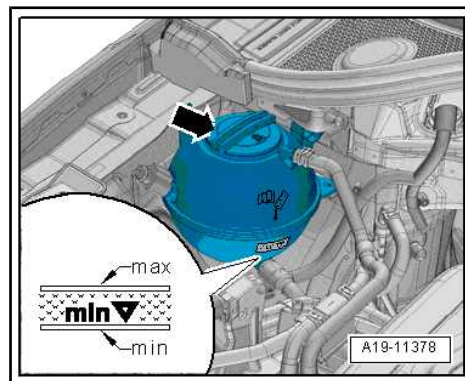


WARNING

Danger of scalding from hot steam or hot coolant.

- ◆ *The cooling system is pressurised when the engine is warm.*
- ◆ *To relieve pressure, cover coolant expansion tank cap with a cloth and open carefully.*

- Open cap -arrow- on coolant expansion tank.
- If fitted, unscrew nuts -arrows- and detach heat shield -1-.

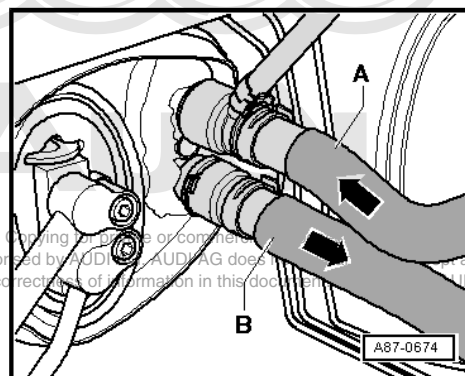


- Mark positions of coolant hoses -A, B-.



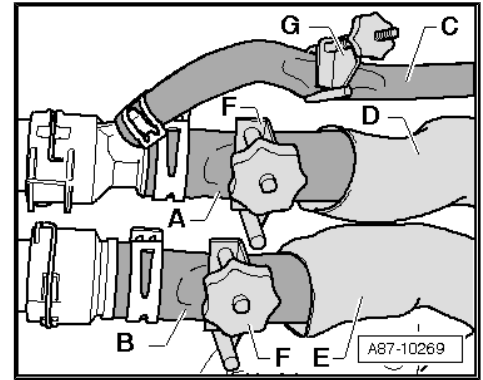
Note

The heat exchanger is designed for a certain coolant flow direction -arrows-. Therefore it is important to connect the coolant hoses correctly.

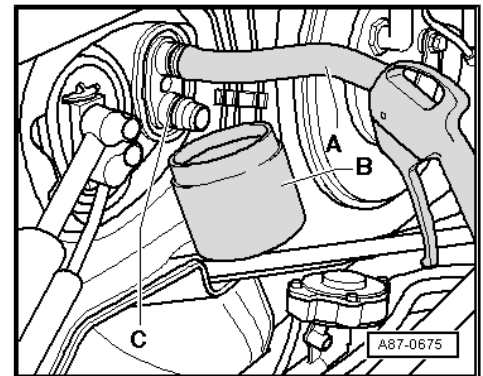


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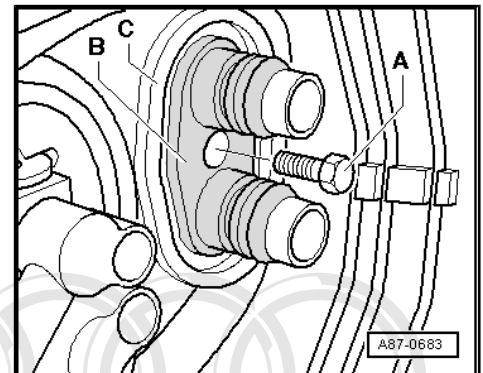
- Vehicles with petrol engine: Push back heat insulation -D, E- slightly and clamp off coolant hose -C- with hose clamp -3094- -G-.
- Clamp off coolant hoses -A, B- with hose clamps -3094- -F-, lift retaining clips and detach coolant hoses from heat exchanger.



- 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.

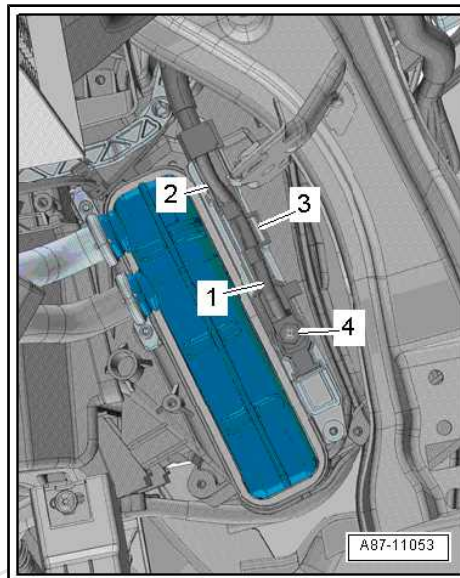


- Remove bolt -A-.
- Detach adapter -B- from connections of heat exchanger.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .
- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant 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 .
- Detach refrigerant lines from expansion valve ⇒ [page 101](#) .
- Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
- Remove air duct for windscreen defroster vent ⇒ [page 239](#) .
- Remove air duct for dash panel vent (centre) ⇒ [page 238](#) .

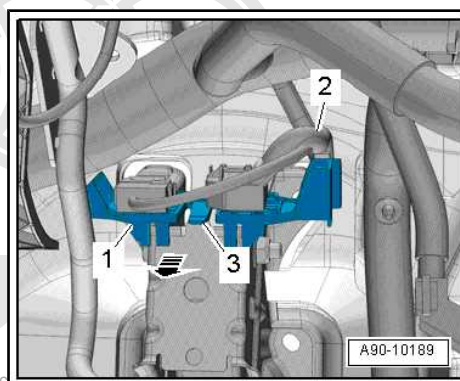


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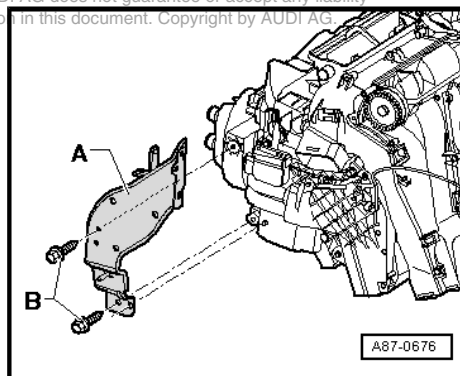
- Vehicles with auxiliary air heater element - Z35- : Unscrew nut -4- and detach earth wire -1-.
- Release retaining tab -3- and unplug electrical connector -2-.
- Remove central tube ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Removing and installing central tube for dash panel .



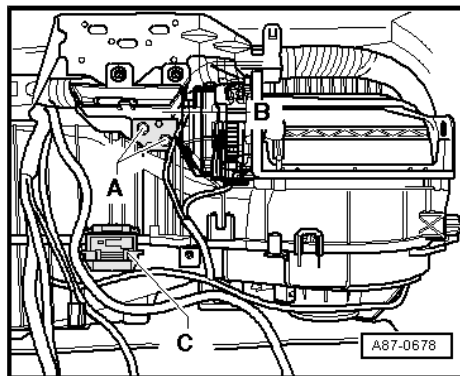
- Remove data bus diagnostic interface ⇒ Electrical system; Rep. gr. 97 ; Control units; Removing and installing data bus diagnostic interface - J533- .
- Move wiring harness -2- clear.
- Release retaining tab -3- and detach mounting -1- from pedal cluster -arrow-.



- Remove bolts -B-.
- Move bracket -A- with wiring duct clear to one side.



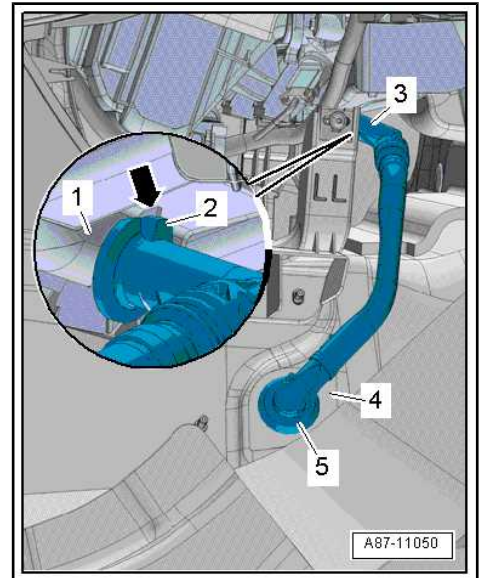
- If fitted, remove entry and start authorisation control unit - J518- ⇒ Electrical system; Rep. gr. 94 ; Entry and start authorisation; Removing and installing entry and and start authorisation control unit - J518- .
- Remove bolts -A-.
- Move bracket -B- with wiring duct clear to one side.
- Unplug electrical connector -C-.



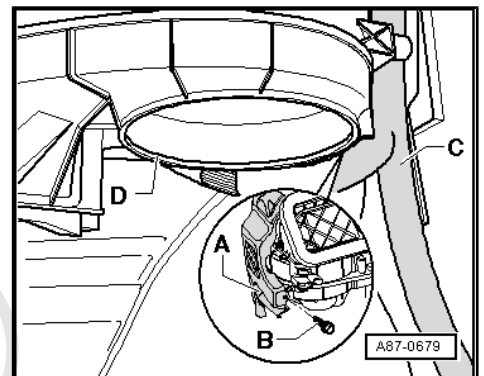
- Detach condensation drain hose -3- from connection of air conditioning unit -1-.

 Note

-Items 2, 4, 5, arrow- can be disregarded.



- Carefully pull right side of air conditioning unit (heater) -D- slightly towards rear.
- Remove bolt -B- and press bracket -A- with wiring harness -C- to one side.

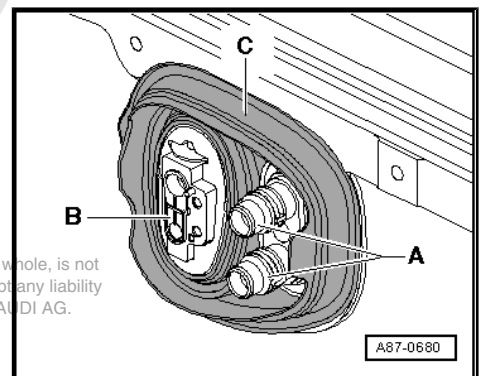


- Lift air conditioning unit (heater) slightly at rear and detach the two air ducts for rear vent and rear footwell vent.
- Pull air conditioning unit (heater) into passenger compartment; at the same time, guide coolant pipes -A- for heat exchanger and expansion valve -B- out of grommet -C-.

 Note

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Pay attention to the coolant pipes leading to the heat exchanger to ensure that they do not catch on the opening to the plenum chamber or on the noise insulation mat and become bent or damaged.



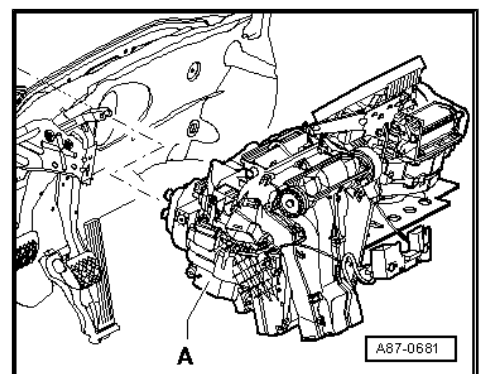
- Swivel air conditioning unit (heater) -A- into passenger compartment in area of fresh air blower and take it out towards right side.

Installing

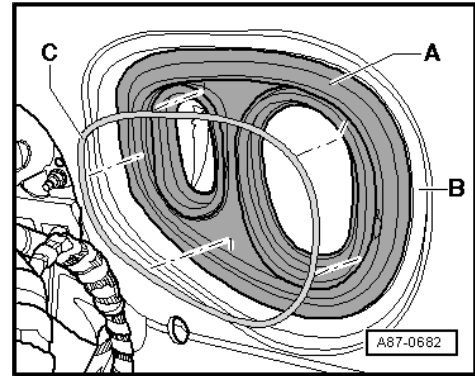
Install in reverse order of removal; note the following:

 Note

Check all seals on air conditioning unit (heater) for damage prior to installation and renew damaged seals.



- Make sure grommet -A- for leadthrough on bulkhead -B- is correctly seated.
- Insert support ring -C- in grommet.
- Projection on support ring must face outwards.

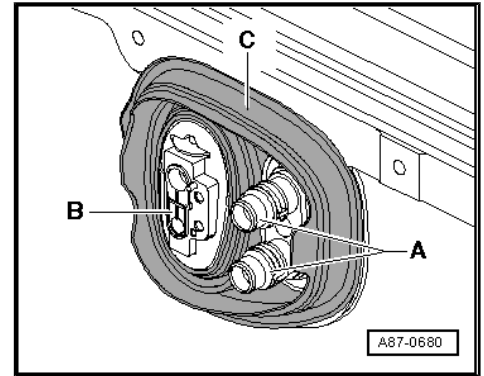


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- Coat grommet with lubricant.
- Insert air conditioning unit (heater), with a second mechanic guiding coolant pipes -A- for heat exchanger and expansion valve -B- through grommet -C-.

 Note

- ◆ *Make sure that the grommet is correctly seated on the bulk-head.*
- ◆ *Water will ingress into passenger compartment if grommet is damaged or not fitted correctly.*



- Install condensation drain hose ➔ [page 229](#) .
- Install central tube ➔ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Removing and installing central tube for dash panel .
- Vehicles with auxiliary air heater element - Z35- : Connect electrical wiring at -Z35- ➔ [page 206](#) .
- Install air duct for dash panel vent (centre) ➔ [page 238](#) .
- Install air duct for windscreen defroster vent ➔ [page 239](#) .
- Install dash panel ➔ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
- Attach refrigerant lines at expansion valve ➔ [page 101](#) .
- 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 .
- Top up coolant and bleed coolant circuit as specified ➔ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

After completing the repairs, perform the following work on the operating unit ➔ Vehicle diagnostic tester ("Guided Fault Finding"):

- Read out event memory and delete any entries displayed.
- Perform basic setting.
- Perform final control diagnosis.
- Start up air conditioner after charging refrigerant circuit ➔ [page 125](#) .
- Check air conditioner operation, and direction and distribution of air flow from defroster vent to windscreen.
- Check that direction of air flow corresponds with position of switch.

Tightening torques

- ◆ ➔ ["5.1.1 Exploded view - attachments for heater and air conditioning unit and air intake box", page 187](#)

5.9 Removing and installing air intake box of heater and air conditioning unit

Removing

- Remove air conditioning unit (heater) ⇒ [page 208](#) .
- Unplug electrical connector from control motor.
- Remove bolts -1 and 5-.
- Fold air intake duct -2- upwards -arrow- to disengage mountings -4- from guides -3- at evaporator housing (bottom section).
- Detach air intake duct.

Installing

Install in reverse order of removal; note the following:

- Insert air intake duct at guides. Guide must be completely within air duct housing.



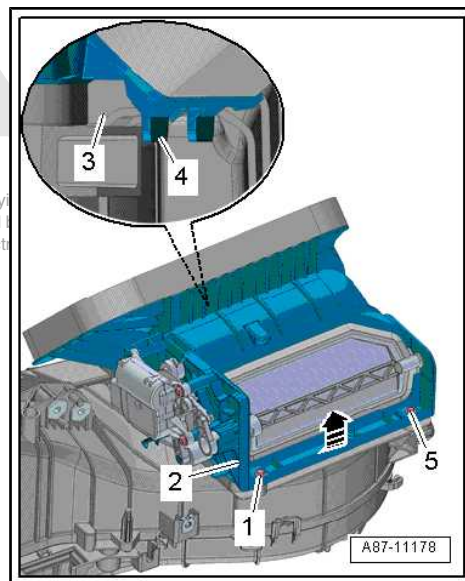
Note

Different versions for manually controlled air conditioner (with heating without air conditioner) and automatically controlled air conditioner ⇒ Electronic parts catalogue

- Install air conditioning unit (heater) ⇒ [page 208](#) .

Tightening torques

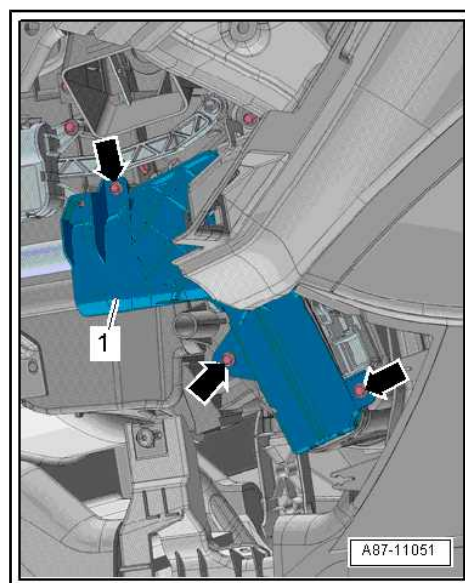
- ♦ ⇒ [“5.1.3 Exploded view - heater/air conditioning unit and air intake box attachments, fresh air blower, cover”, page 190](#)



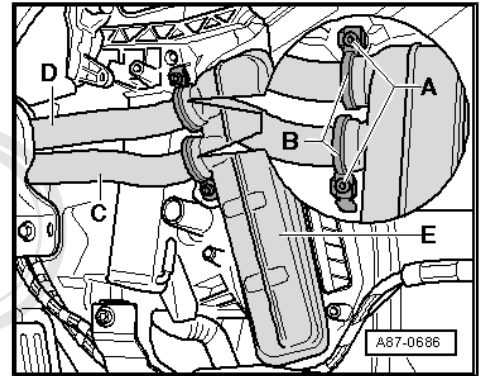
5.10 Removing and installing air distribution housing

Removing

- Remove air conditioning unit (heater) ⇒ [page 208](#) .
- Remove bolts -arrows-.
- Detach cover -1- for heat exchanger.



- Remove bolts -A-.
- Detach clamps -B-.
- Pull coolant pipes -C, D- out of heat exchanger -E- and move to one side.



- Remove bolts -1, 2 and 4-.
- Release retaining tabs -arrows- and swivel air distribution housing -3- towards rear. This disengages guides -5- at evaporator housing (bottom section) -6-.

Installing

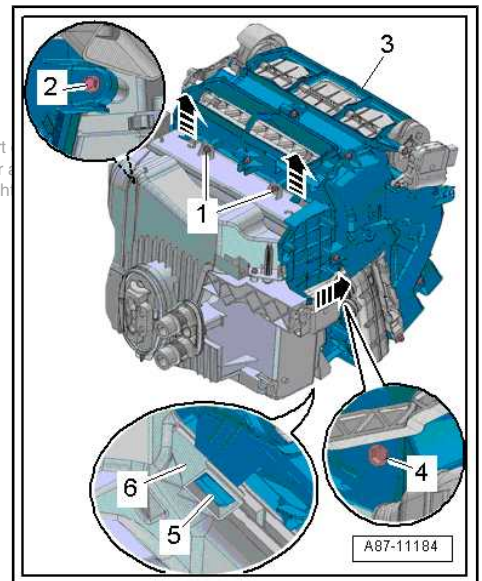
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Install in reverse order of removal; note the following:

- Install air conditioning unit (heater) ➔ [page 208](#) .

Tightening torques

- ◆ ➔ ["5.1.1 Exploded view - attachments for heater and air conditioning unit and air intake box", page 187](#)



5.11 Removing and installing dust and pollen filter

Special tools and workshop equipment required

- ◆ Commercially available vacuum cleaner

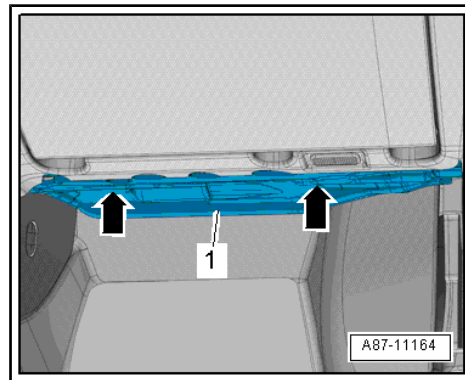


Note

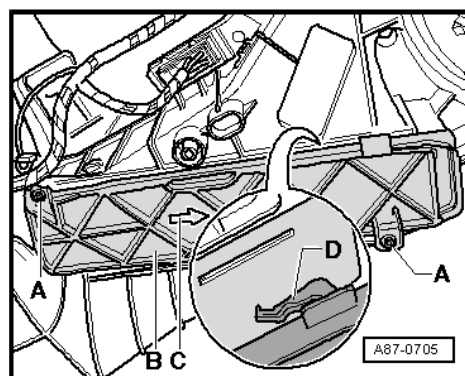
- ◆ *Observe replacement interval ➔ Maintenance tables .*
- ◆ *Different versions: Vehicles with the version with no air quality sensor - G238- are currently fitted with a dust and pollen filter without activated charcoal filter insert, whereas vehicles with an air quality sensor - G238- are equipped with a filter with an activated charcoal filter insert ➔ Electronic parts catalogue .*
- ◆ *It may be necessary to remove the driving instructor's pedals on driving school vehicles (depending on the version, the driving instructor's pedals may be provided with service disconnection points); refer to ➔ Fitting instructions for driving school equipment .*

Removing

- Use a screwdriver to unfasten quick-release fastener -arrows-.
- Detach cover -1-.
- Protect floor covering in front passenger's footwell beneath dust and pollen filter with paper (to catch any dirt).



- If fitted, remove bolts -A-.
- Slide slot cover -B- in direction of -arrow C- and detach downwards.

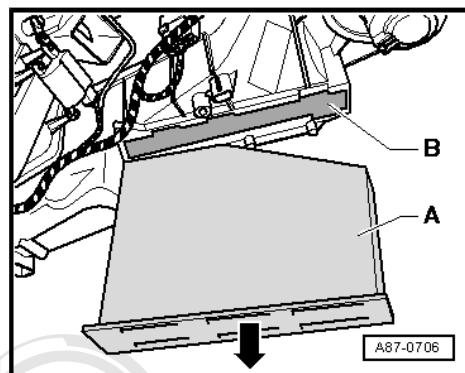


- Pull dust and pollen filter -A- out of housing -B-.

Installing

Install in reverse order of removal; note the following:

- Before installing a new filter, clean area around dust and pollen filter in slot in heater, e.g. with a vacuum cleaner.
- Insert dust and pollen filter with missing corner facing fresh air blower.
- Fit slot cover -1- and slide towards left as far as stop.



Note

If the fasteners for the slot cover are defective, bolts can be used to secure the slot cover.

5.12 Removing and installing fresh air blower - V2-

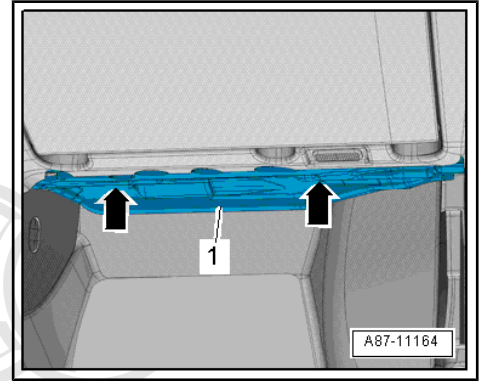


Note

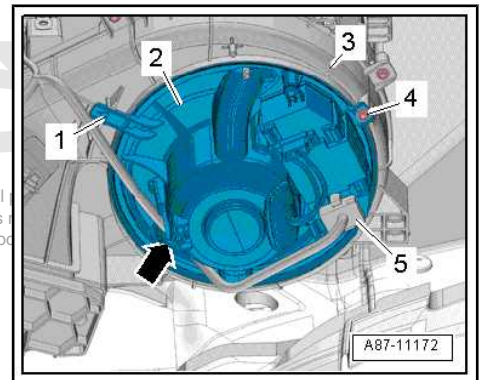
Different versions for manually controlled air conditioner (with heating without air conditioner) and automatically controlled air conditioner ⇒ Electronic parts catalogue

Removing

- Use a screwdriver to unfasten quick-release fastener -arrows-.
- Detach cover -1-.



- Unplug electrical connector -5-.
- Move clear wiring harness -arrow- on vehicles with automatically controlled air conditioner.
- If fitted, remove bolt -4-.
- Lift retaining tab -1- and turn fresh air blower -2- anti-clockwise.
- Pull fresh air blower out of evaporator housing (bottom section) -3-.



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.*

Installing

Install in reverse order.

Tightening torques

- ◆ ⇒ ["5.1.3 Exploded view - heater/air conditioning unit and air intake box attachments, fresh air blower, cover", page 190](#)

5.13 Removing and installing fresh air blower series resistor with overheating fuse - N24-



Note

Only for vehicles with manually controlled air conditioner (with heater without air conditioner).



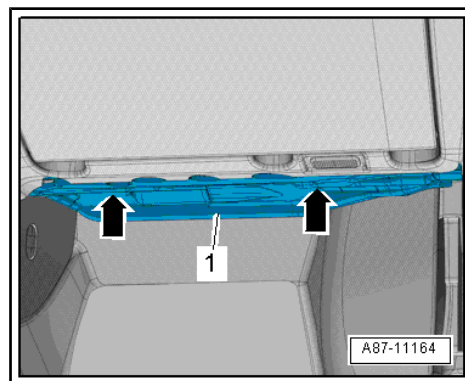
WARNING

Risk of burns.

- ◆ *The fresh air blower series resistor with overheating fuse - N24- might be hot.*
- ◆ *Before removing series resistor, let it cool down.*

Removing

- Use a screwdriver to unfasten quick-release fastener -arrows-.
- Detach cover -1-.

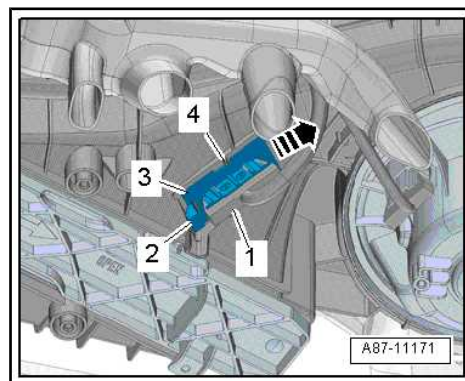


- Unplug electrical connector -1-.
- Release retaining tab -2- and slide series resistor -3- as far as stop -4- in direction of -arrow-.
- Remove series resistor downwards.

Installing

Install in reverse order of removal; note the following:

- Series resistor must be correctly positioned in mounting (retaining tab must engage audibly).



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

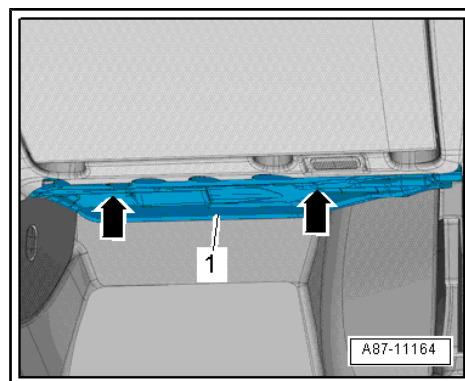


Note

Only installed on vehicles with automatically controlled air conditioner

Removing

- Use a screwdriver to unfasten quick-release fastener -arrows-.
- Detach cover -1-.



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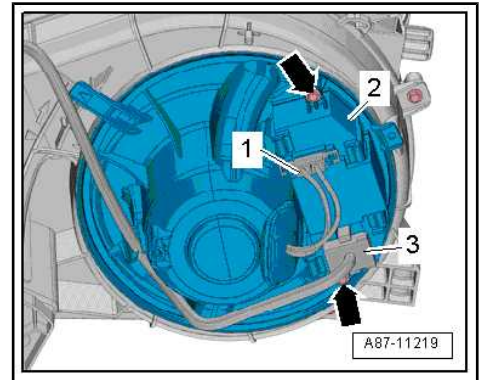
- Unplug electrical connectors -1, 3-.
- Remove bolts -arrows-.



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

Install in reverse order of removal; note the following:

- Tighten bolts to specified torque.

After completing the repairs, perform the following work on the operating unit → Vehicle diagnostic tester ("Guided Fault Finding"):

- Read out event memory and delete any entries displayed.
- Perform basic setting.
- Perform final control diagnosis.

Tightening torques

- ◆ ⇒ "5.1.3 Exploded view - heater/air conditioning unit and air intake box attachments, fresh air blower, cover", page 190

5.15 Removing and installing heat exchanger

Special tools and workshop equipment required

- ◆ Hose clamps up to 25 mm - 3094-
- ◆ Engine bung set - VAS 6122-
- ◆ Compressed-air gun, commercially available

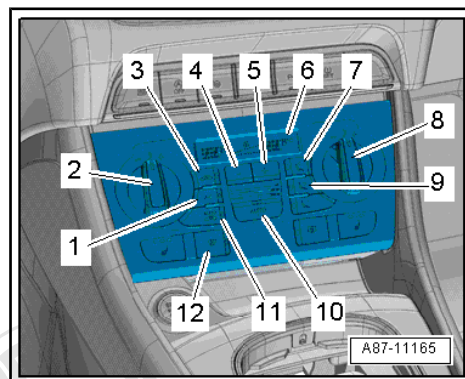
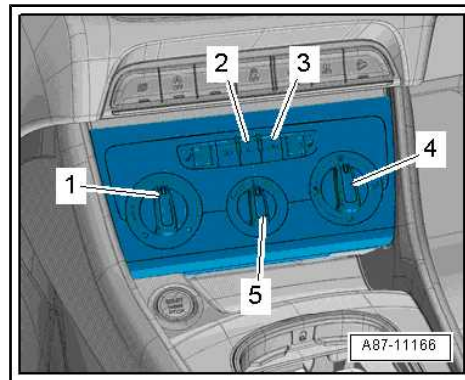


Note

Depending on the engine version, a continued coolant circulation pump - V51- / auxiliary pump for heating - V488- (different designations depending on engine version) may be fitted to assist the engine coolant pump ⇒ 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.

Removing

- On vehicles with manually controlled air conditioner (with heater without air conditioner), use rotary control -1- on operating unit (air conditioning system control unit - J301- / heater control unit - J65-) to set temperature to “warm”.
- On vehicles with automatically controlled air conditioner, use rotary controls -2, 8- on operating unit (Climatronic control unit - J255-) to set temperature for driver and front passenger side to “warm”.
- “HI” shown on display -6- of -J255- .



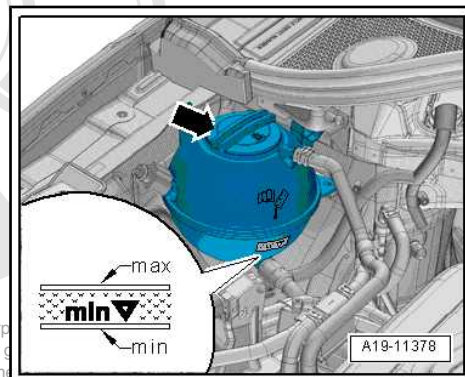
- Switch off ignition.



WARNING

Danger of scalding from hot steam or hot coolant.

- ◆ ***The cooling system is pressurised when the engine is warm.***
- ◆ ***To relieve pressure, cover coolant expansion tank cap with a cloth and open carefully.***



- Open cap -arrow- on coolant expansion tank.

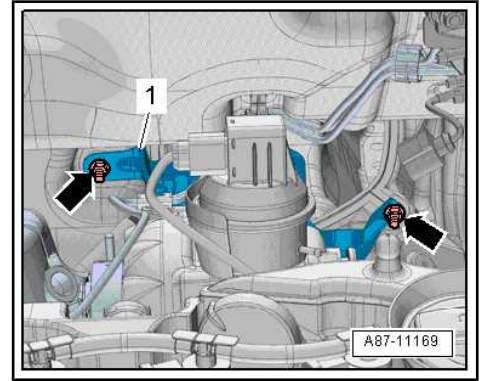


Note

Depending on the engine and vehicle version, it may be necessary to unfasten or remove the following components: Engine cover panel (top), compressed air pipe to throttle valve unit and intake manifold etc. ⇒ Engine; Rep. gr. 21 ; Charge air system; Exploded view - charge air system .

- On vehicles with 5-cylinder engine (Audi RS Q3), remove air pipe (from air cleaner to turbocharger) ⇒ Engine; Rep. gr. 21 ; Charge air system; Exploded view - charge air system .

- If fitted, unscrew nuts -arrows- and detach heat shield -1-.

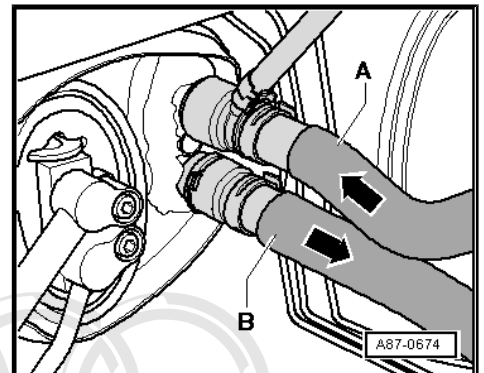


- Mark positions of coolant hoses -A, B-.

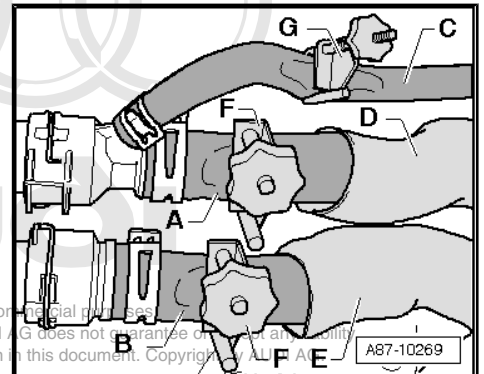


Note

The heat exchanger is designed for a certain coolant flow direction -arrows-. Therefore it is important to connect the coolant hoses correctly.

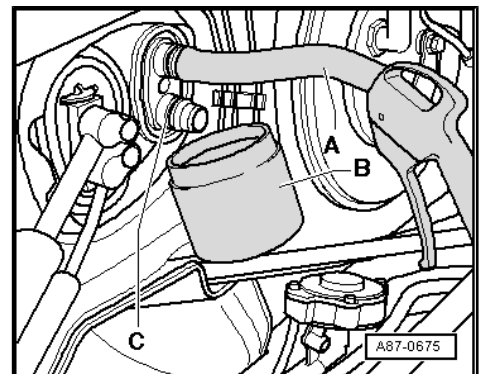


- Vehicles with petrol engine: Push back heat insulation -D, E- slightly and clamp off coolant hose -C- with hose clamp -3094- -G-.
- Clamp off coolant hoses -A, B- with hose clamps -3094- -F-, lift retaining clips and detach coolant hoses from heat exchanger.

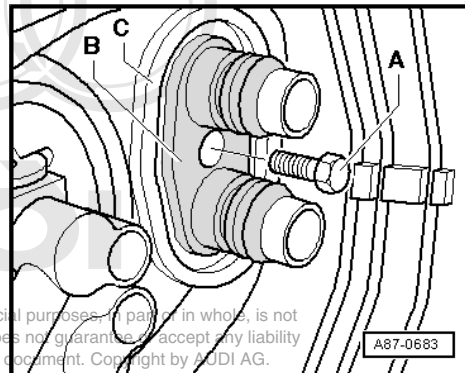


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- Fit a short hose -A- to upper connection.
- Insert compressed-air gun in end of hose.
- Hold container -B- under lower connection -C- and carefully blow coolant out of heat exchanger with compressed-air gun.



- Remove bolt -A-.
- Detach adapter -B- from connections of heat exchanger.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .



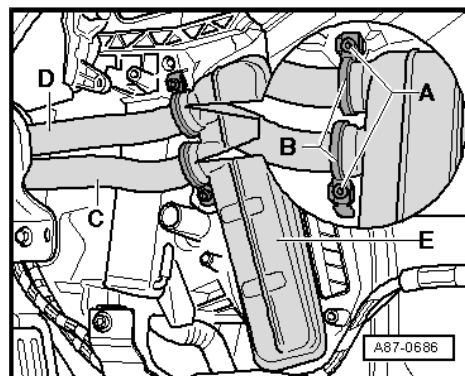
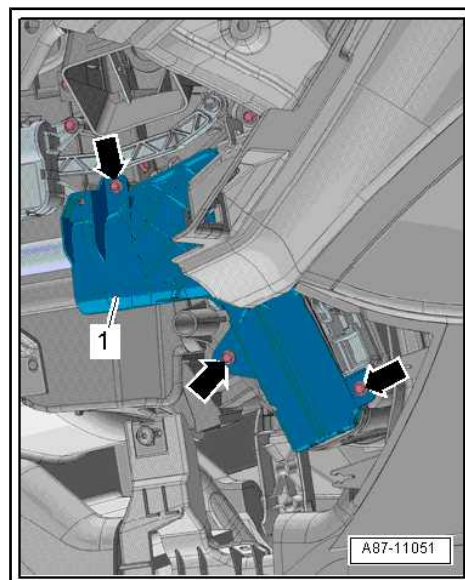
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Note

On vehicles with right-hand drive, the central tube must be removed instead of the storage compartment (driver side) ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Removing and installing central tube for dash panel .

- Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing dash panel cover (driver side) .
- Remove centre console footwell trim (front left) ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console footwell trim (front) .
- Remove footwell vent (driver side) ⇒ [page 236](#) .
- Remove bolts -arrows-.
- Detach cover -1- for heat exchanger.
- Protect floor covering in area beneath heat exchanger with waterproof sheeting and absorbent paper.
- Remove bolts -A-.
- Detach clamps -B-.
- Place a collector under coolant pipes -C, D-.
- Pull coolant pipes out of heat exchanger -E- and carefully swivel to one side.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .



- Remove bolt -5-.



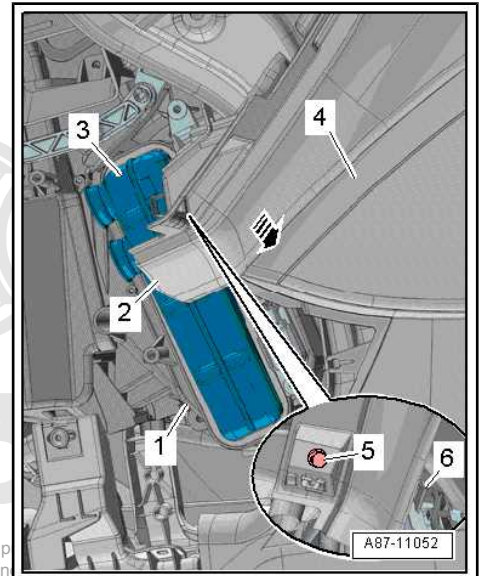
Caution

Risk of damage to dash panel

- ◆ *Proceed with care when detaching the dash panel from the mounting on the central tube.*
- ◆ *Dash panel must be renewed if it is damaged. Renew dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .*

- Disengage dash panel -2- from centre console -4-. To do so, raise dash panel until mountings -6- are exposed.
- Pull dash panel roughly 30 mm in direction of -arrow- as shown and at the same time pull heat exchanger -3- out of air distribution housing.

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Installing

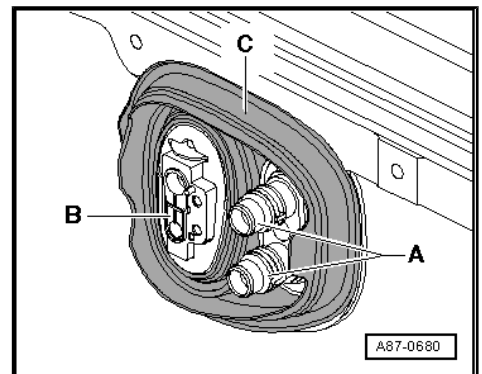
Install in reverse order of removal; note the following:



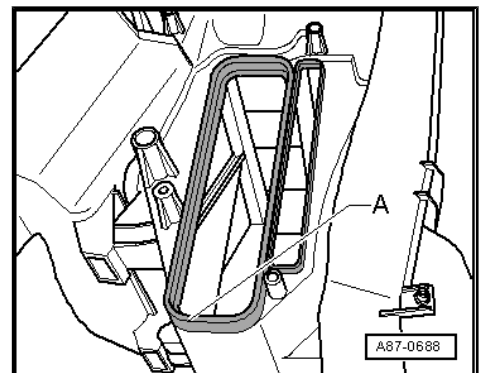
Note

Renew O-rings.

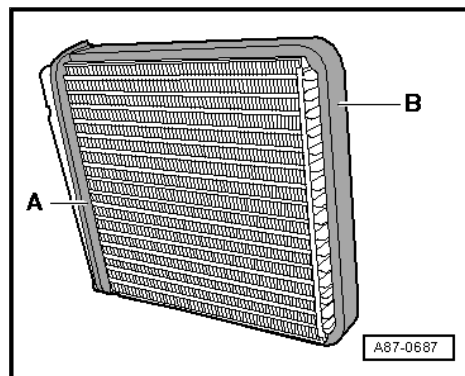
- Make sure that grommet -C- is correctly seated in bulkhead.



- Check heater slot -A- for dirt (heat exchanger removed).
- Remove any dirt or residual coolant.

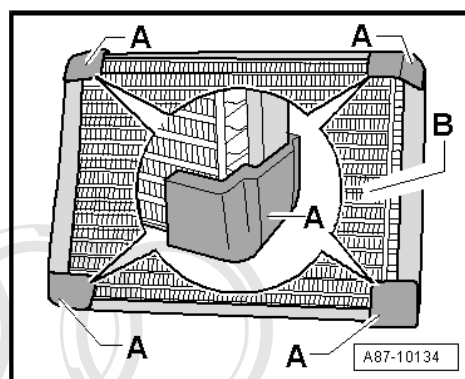


- Check foam seals -A and B- attached to heat exchanger for damage and renew if necessary.



Note

- ◆ *The 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.*
- ◆ *Additional foam strips -A- are bonded to the corners of the heat exchanger -B-. These foam strips -A- are designed to prevent rattling noises which may occur particularly on vehicles with TDI engine.*
- ◆ *Bond foam strips - 191 819 069- onto heat exchanger.*



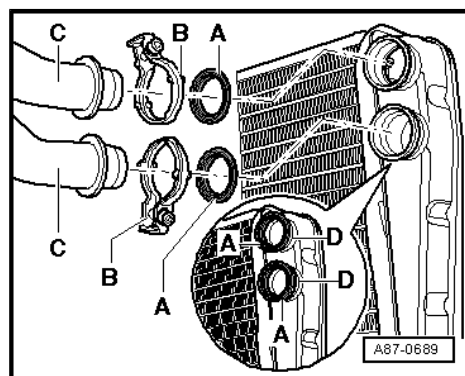
- Remove any dirt or remnants of escaped coolant from air conditioning unit (heater) e.g. after removing a leaking heat exchanger.
- Carefully slide heat exchanger into air conditioning unit (heater) as far as it will go.

Note

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When inserting the heat exchanger, take care not to damage the connections and coolant pipes.

- Check connections of heat exchanger and coolant pipes for damage or dirt.
- Clean and smooth sealing surface for O-ring.
- Coat new O-rings -A- lightly with coolant (or lubricate lightly with silicone grease) and insert in connections of heat exchanger -D-.
- Slide coolant pipes -C- into heat exchanger as far as stop.



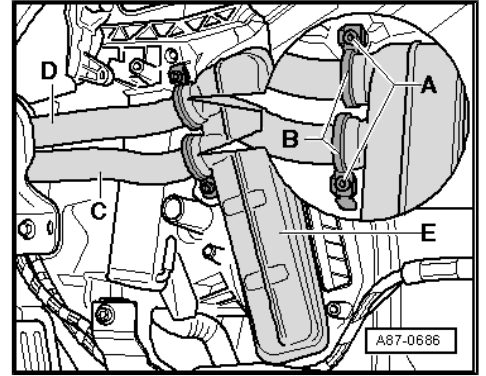
Caution

Risk of leaks at heat exchanger.

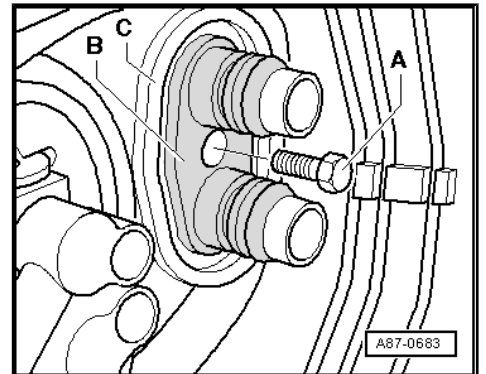
- ◆ *Crushed O-rings and coolant pipes that are not fitted straight or are not attached fully will lead to leaks.*

- Fit new screw-type clips -B- at connection between coolant pipe and heat exchanger.

- Tighten bolts -A-.

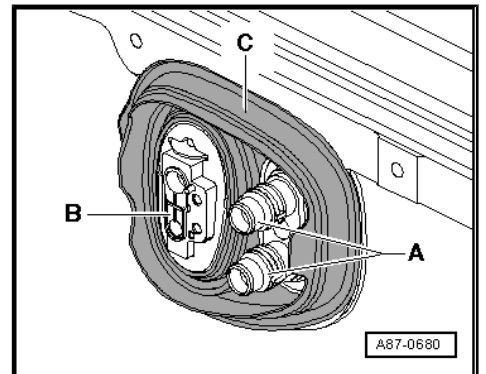


- Make sure that grommet -C- is seated in groove on adapter -B-.
- Slide grommet onto coolant pipes so it is free of tension.
- Tighten bolt -A-.



Note

- ◆ *Make sure that the grommet and coolant pipes -A- at the lead-through on the bulkhead are correctly seated.*
- ◆ *Water will ingress into passenger compartment if grommet is damaged or not fitted correctly.*
- Vehicles with right-hand drive: Install central tube and dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Removing and installing central tube for dash panel .
- Top up coolant and bleed coolant circuit as specified ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .



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Checking connections on heat exchanger for leaks:

- Use e.g. hand pump of cooling system tester - V.A.G 1274/- to carefully increase pressure in coolant circuit.
- Check coolant circuit for leaks, paying particular attention to connection between coolant pipes -C, D- and heat exchanger -E- ➔ Rep. gr. 19 ; Cooling system/coolant; Checking cooling system for leaks .



Note

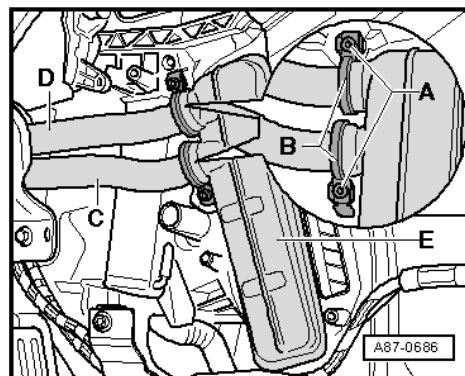
- ◆ *When bleeding the coolant circuit, take particular care to ensure that the heat exchanger is bled completely. If there are still air bubbles in the heat exchanger, there may be complaints about a lack of heating output in winter or about differences in the temperature of the air flowing out of the vents with the same setting in control mode. Checking heating output: manually controlled air conditioner (with heater without air conditioner) ➔ [page 29](#) , automatically controlled air conditioner ➔ [page 30](#) .*
- ◆ *Depending on the vehicle equipment and engine, there is heat insulation on the coolant hoses; the insulation must not be damaged and must be re-attached after installation.*
- Install footwell vent (driver side) ➔ [page 236](#) .
- Install centre console footwell trim (front left) ➔ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console footwell trim (front) .
- Install dash panel cover (driver side) ➔ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing dash panel cover (driver side) .

After completing the repairs, perform the following work on the operating unit ➔ Vehicle diagnostic tester ("Guided Fault Finding"):

- Read out event memory and delete any entries displayed.
- Perform basic setting.
- Perform final control diagnosis.
- Adjust different settings for air outflow direction to different vents on operating unit (Climatronic control unit - J255- / air conditioning system control unit - J301- / heater control unit - J65-) and check whether the volume of air blown out of the vents changes in accordance with the different settings.

Tightening torques

- ◆ ➔ ["5.1.2 Exploded view - heater/air conditioning unit and air intake box attachments, heat exchanger, supplementary air heater element"](#), [page 189](#)

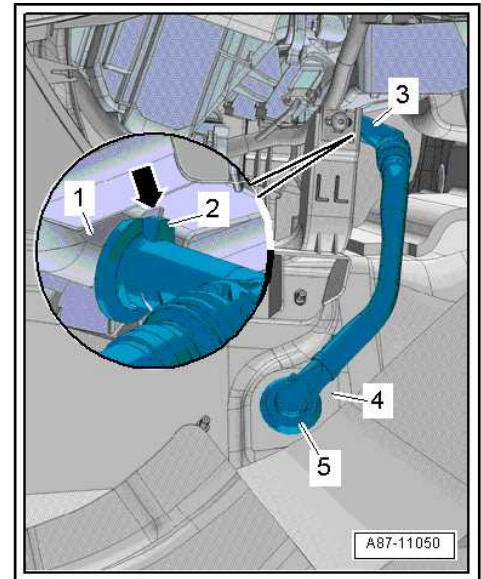


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5.16 Checking condensation drain

Procedure

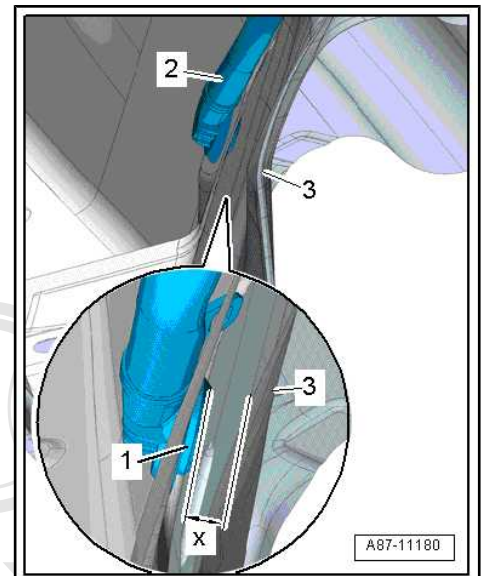
- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- Remove centre console footwell trim (front right) ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console footwell trim (front) .
- Carefully fold back floor covering in vicinity of condensation drain hose until hose is visible.
- Bracket -5- must be clipped into body opening -4- completely.
- If the bracket with the condensation drain hose is properly positioned in the body opening, the condensation drain hose must be checked for dirt.
- Remove condensation drain hose ⇒ [page 229](#) .



- 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 246](#) .
- Drip rail for damage and correct installation ⇒ [page 245](#) .
- Check that plenum chamber cover is installed correctly and not damaged ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Dust and pollen filter for dirt and correct installation ⇒ [page 215](#)
- Forced ventilation vents in luggage compartment ⇒ [page 242](#) .
- 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").

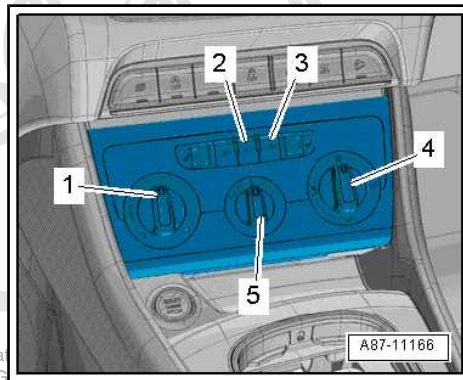
- Read out measured value for evaporator output temperature sender - G263- .

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- Check temperature of air flowing out of evaporator under usage conditions described by customer or with the following settings on operating unit:

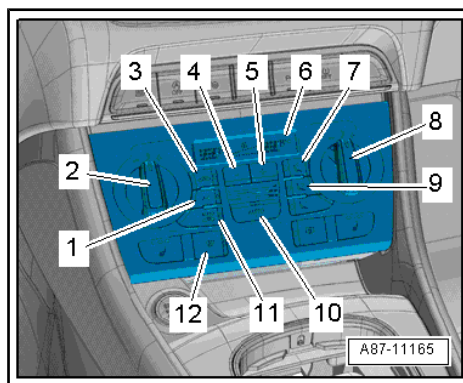
Vehicles with manually controlled air conditioner:

- Settings on operating unit (air conditioning system control unit - J301-):
- Air conditioner compressor switched on - lamp in **AC** or **A/C** button -2- lights up (not on heater without air conditioner).
- Rotary temperature control -1- set to “cold” stop.
- Lowest possible fresh air blower speed selected rotary control -5- for fresh air blower speed set to “1”.
- Fresh air mode - lamp in **Air recirculation** button -3- does not light up.



Vehicles with automatically controlled air conditioner:

- Settings on operating unit (Climatronic control unit - J255-):
- “Auto” mode, air conditioner compressor switched on - lamps in buttons -1, 10- light up.
- Set temperature using rotary controls -2, 8- – “LO” display for driver and front passenger side in display -6- of -J255- .
- Medium fresh air blower speed at a voltage of approx. 7 V at fresh air blower - V2- .
- Fresh air mode - lamp in **Air recirculation** button -3- does not light up.



All vehicles (continued):

- Dash panel vents open.
- 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 34](#) .
- Install centre console footwell trim (front right) ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console footwell trim (front) .
- Install glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .

5.17 Removing and installing condensation drain

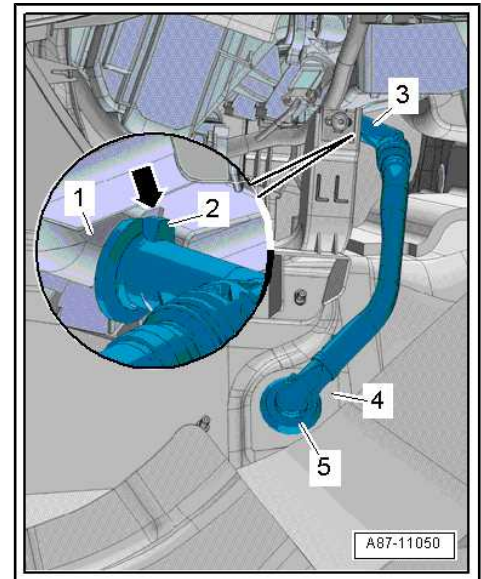
Removing

- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- Remove centre console footwell trim (front right) ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console footwell trim (front) .
- 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 air conditioning unit (heater) -1- and at body -4-.

Installing

Install in reverse order of removal; note the following:

- Condensation drain hose can only be pressed as far as stop onto air conditioning unit (heater) in one position.
- Lug -arrow- at connection must engage in guide -2-.
- Insert condensation drain hose in body opening -4- until it engages audibly.
- Condensation drain -5- must make proper contact with body.



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 a condensation drain hose is not fitted securely enough at the connection for the air conditioning unit, secure it with e.g. a hose clip to prevent it from slipping. Hose clip ⇒ Electronic parts catalogue .*
- Install centre console footwell trim (front right) ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console footwell trim (front) .
- Install glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .

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6 Air duct system

⇒ [“6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 230](#)

⇒ [“6.2 Air intake and air outlet openings”, page 233](#)

⇒ [“6.3 Removing and installing footwell vent \(driver side\)”, page 236](#)

⇒ [“6.4 Removing and installing footwell vent \(front passenger side\)”, page 236](#)

⇒ [“6.5 Removing and installing rear footwell vent”, page 237](#)

⇒ [“6.6 Removing and installing air ducts”, page 238](#)

⇒ [“6.7 Checking forced ventilation vents in passenger compartment”, page 242](#)

⇒ [“6.8 Removing and installing forced ventilation vents in passenger compartment”, page 244](#)

⇒ [“6.9 Removing and installing cover for fresh air intake”, page 245](#)

⇒ [“6.10 Removing and installing fresh air intake”, page 246](#)

⇒ [“6.11 Checking plenum chamber water drain”, page 246](#)

⇒ [“6.12 Cleaning plenum chamber water drain”, page 247](#)

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

⇒ [“6.1.1 Exploded view - routing of air flow and air distribution in passenger compartment, air ducts \(front\)”, page 230](#)

⇒ [“6.1.2 Exploded view - routing of air flow and air distribution in passenger compartment, air ducts \(rear\)”, page 232](#)

6.1.1 Exploded view - routing of air flow and air distribution in passenger compartment, 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 236](#)

3 - Air duct

- ☐ To defroster vents
- ☐ Air flow to windscreen and defroster vents will be uneven or insufficient if foam seal is squashed
- ☐ Removing and installing
⇒ [page 239](#)

4 - Bolt

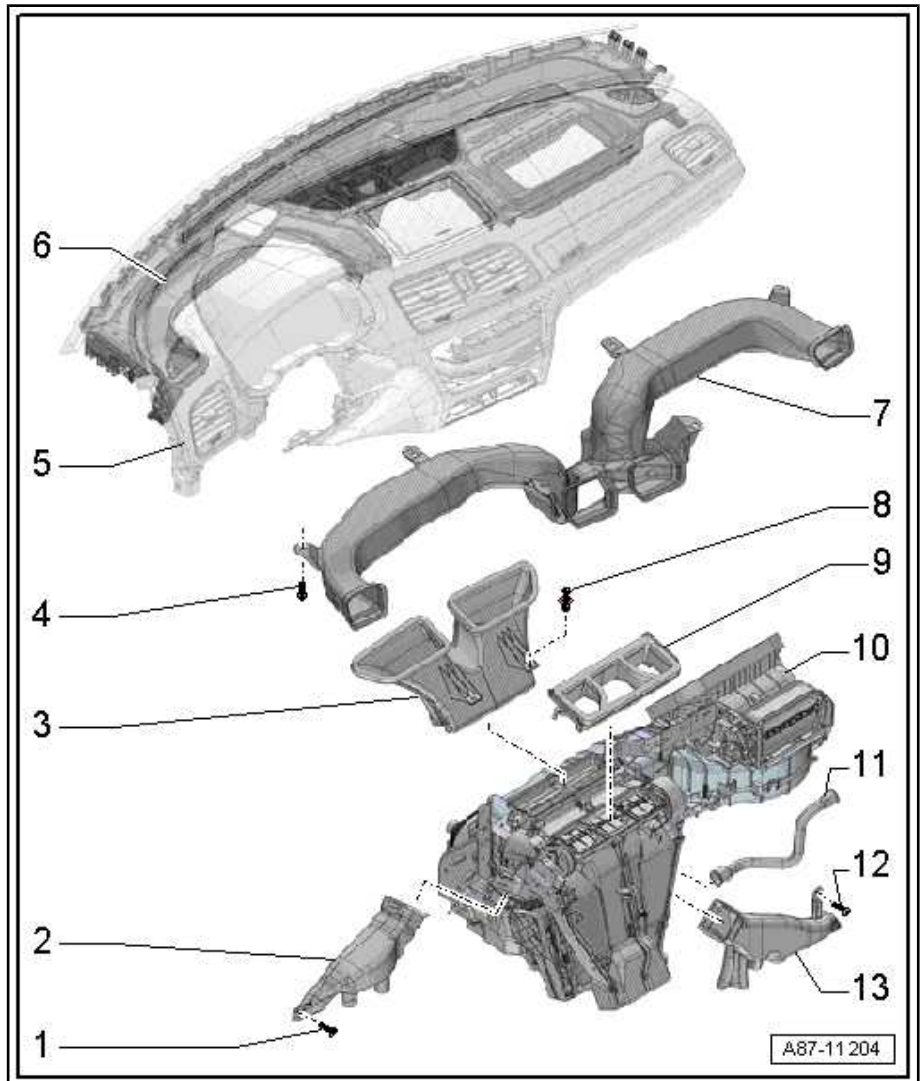
- ☐ 6x
- ☐ 1.5 Nm

5 - Dash panel

- ☐ With air duct to defroster vents and vent for "indirect ventilation"
- ☐ Removing and installing
⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel

6 - Air duct

- ☐ To defroster vents
- ☐ Forms part of dash panel and cannot be renewed separately
- ☐ Removing and installing dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel



7 - Air duct

- ☐ To dash panel vents
- ☐ Removing and installing ⇒ [page 239](#)

8 - Fastener

9 - Air duct to centre dash panel vent

- ☐ Removing and installing ⇒ [page 238](#)

10 - Air conditioner unit (heater)

- ☐ Air inlet and vents of air conditioning unit (heater) ⇒ [page 192](#)
- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ With or without auxiliary air heater element - Z35- , depending on equipment
- ☐ Removing and installing ⇒ [page 208](#)

11 - Air duct for glove box cooling

- ☐ With automatically controlled air conditioner only
- ☐ Removing and installing ⇒ [page 239](#)

12 - Bolt

- ☐ 1.5 Nm

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13 - Air duct to footwell vent (right-side) - front passenger side

- ☐ Removing and installing ⇒ [page 236](#)

6.1.2 Exploded view - routing of air flow and air distribution in passenger compartment, air ducts (rear)

1 - Air duct to footwell vent (rear left)

- ☐ Removing and installing ⇒ [page 237](#)

2 - Air duct (left-side)

- ☐ For footwell vent (rear)
- ☐ Removing and installing ⇒ [page 241](#)

3 - Sealing plug

- ☐ Depending on equipment version



Note

On vehicles with manually controlled air conditioner (or with heater without air conditioner), openings in air conditioning unit are either permanently sealed or sealed with plugs

4 - Air conditioner unit (heater)

- ☐ Air inlet and vents of air conditioning unit (heater) ⇒ [page 192](#)
- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ With or without auxiliary air heater element - Z35- , depending on equipment
- ☐ Removing and installing ⇒ [page 208](#)

5 - Air duct (right-side)

- ☐ For footwell vent (rear)
- ☐ Removing and installing ⇒ [page 241](#)

6 - Air duct to footwell vent (rear right)

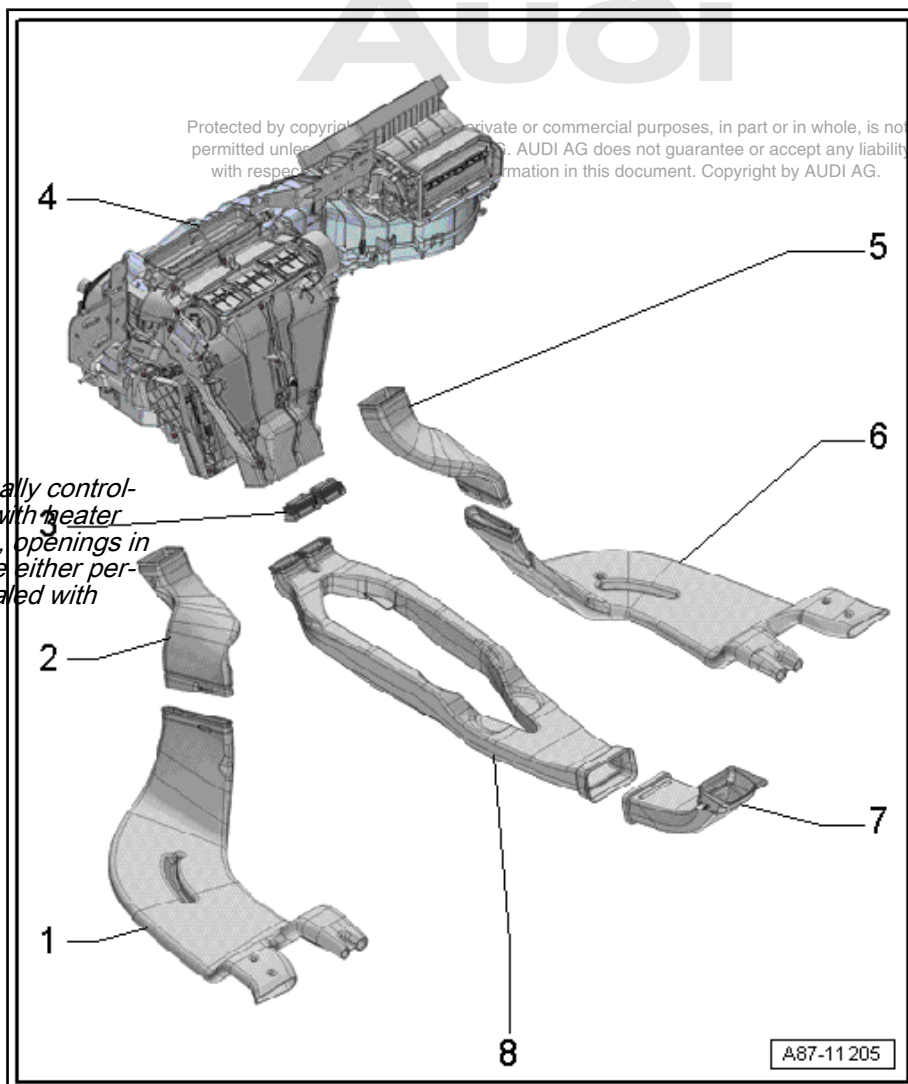
- ☐ Removing and installing ⇒ [page 237](#)

7 - Air duct to rear vent

- ☐ Depending on equipment version; currently only for vehicles with automatically controlled air conditioner
- ☐ Removing and installing ⇒ [page 242](#)

8 - Air duct (rear)

- ☐ Depending on equipment version; currently only for vehicles with automatically controlled air conditioner
- ☐ Removing and installing ⇒ [page 241](#)



6.2 Air intake and air outlet openings

⇒ [“6.2.1 Air intake and air outlet openings, air intake box”, page 233](#)

⇒ [“6.2.2 Air intake and air outlet openings, heater and air conditioning unit”, page 234](#)

6.2.1 Air intake and air outlet openings, air intake box

1 - Air duct housing

2 - Fresh air flap

- ☐ Different versions ⇒
Electronic parts catalogue
- ☐ Automatically controlled
air conditioner only

3 - Air recirculation flap / air recirculation/fresh air flap

- ☐ Different versions ⇒
Electronic parts catalogue

Manually controlled air conditioner (heater without air conditioner)

- ☐ Air recirculation flap/
fresh air flap

Automatically controlled air conditioner

- ☐ Air recirculation flap

4 - Fresh air blower - V2-

- ☐ Different versions ⇒
Electronic parts catalogue
- ☐ With fresh air blower
control unit - J126- for
automatically controlled
air conditioner

5 - Dust and pollen filter

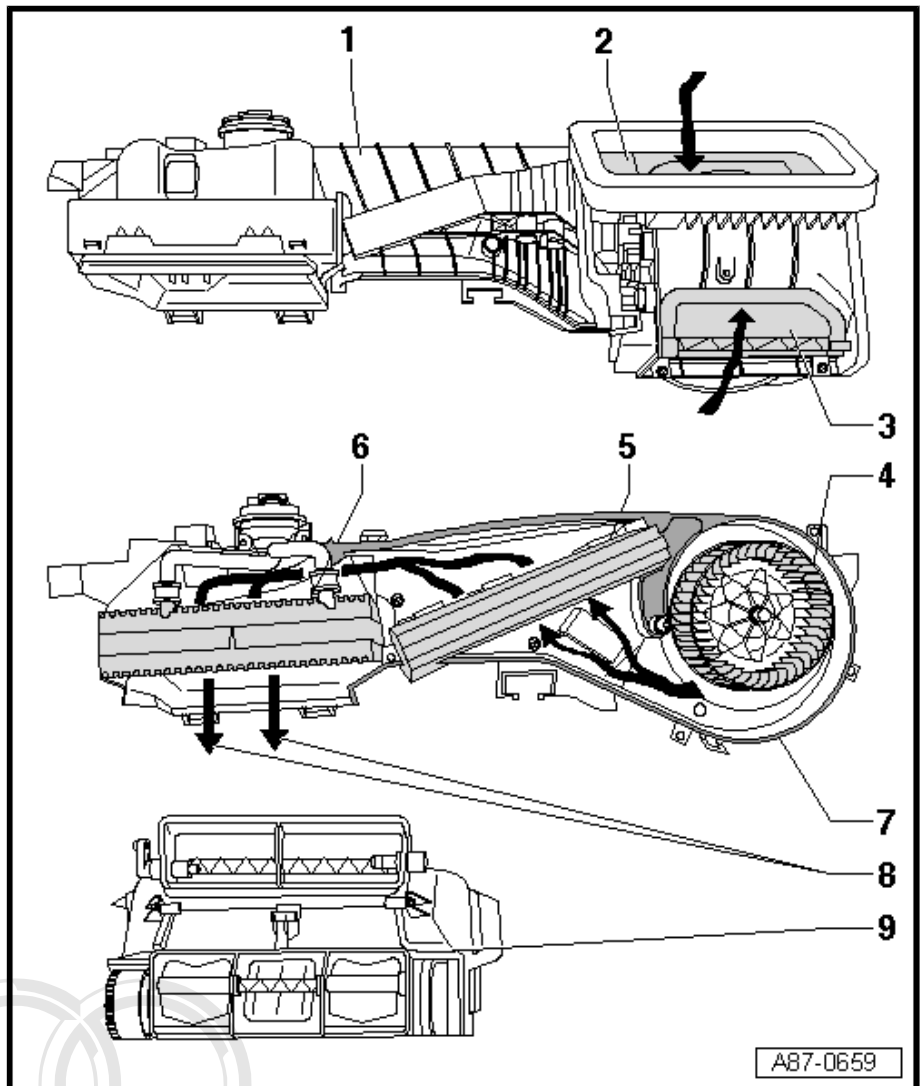
- ☐ Different versions ⇒
Electronic parts catalogue
- ☐ Removing and installing
⇒ [page 215](#)

6 - Evaporator

7 - Evaporator housing (bottom section)

8 - To air distribution housing

9 - Air distribution housing



6.2.2 Air intake and air outlet openings, heater and air conditioning unit



Note

To illustrate the routing of the air flow in the air distribution housing, it is shown in the form of sectional views "A" - "A" and "B" - "B".

1 - Air distribution housing

2 - Left temperature flap (driver side)

- ❑ On vehicles with manually controlled air conditioner (with heater without air conditioner), temperature flaps (left and right) are linked via shaft and moved jointly by temperature flap control motor - V68-
- ❑ On vehicles with automatically controlled air conditioner, temperature flap is moved by left temperature flap control motor - V158-

3 - Air duct

- ❑ To air duct, vent in rear centre console and centre dash panel vents

4 - Air duct

- ❑ To air duct, vent in rear centre console and centre dash panel vents

5 - Right temperature flap (front passenger side)

- ❑ On vehicles with manually controlled air conditioner (with heater without air conditioner), temperature flaps (left and right) are linked via shaft and moved jointly by temperature flap control motor - V68-
- ❑ On vehicles with automatically controlled air conditioner, temperature flap is moved by right temperature flap control motor - V159-

6 - Left footwell flap (driver side)

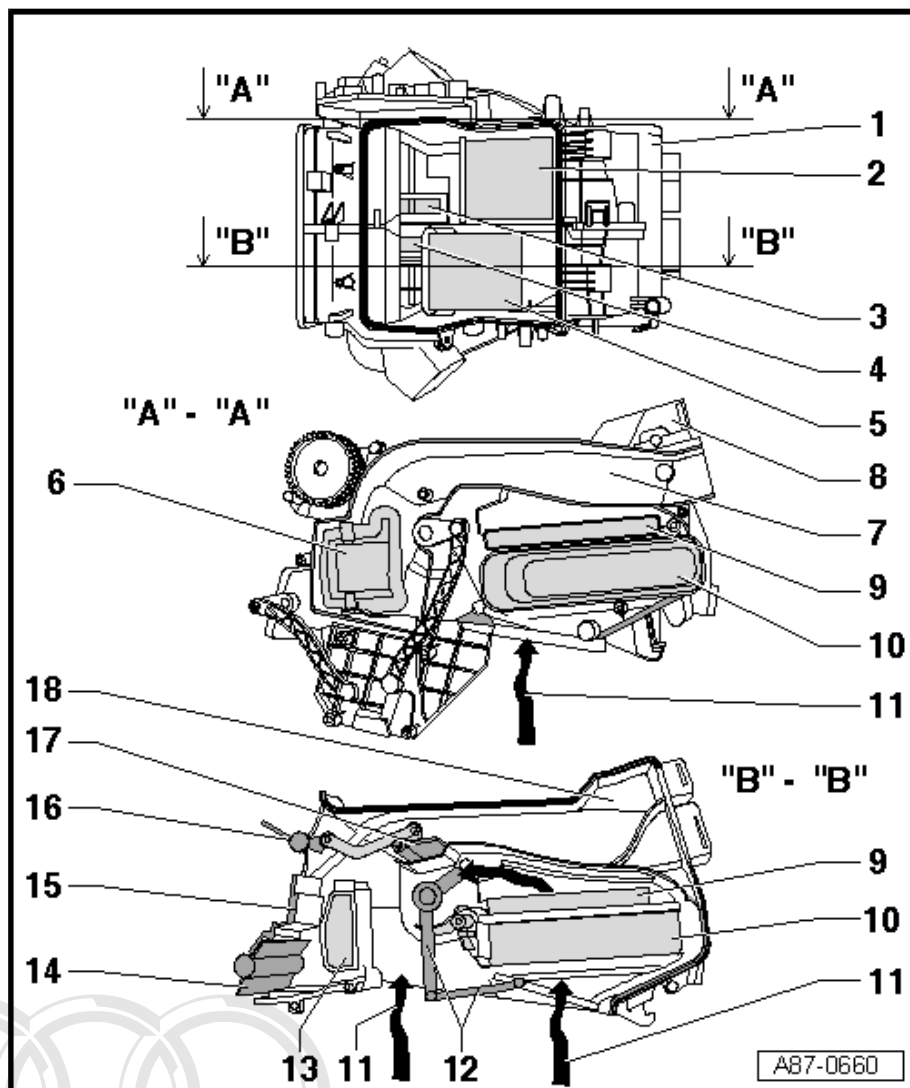
- ❑ On vehicles with manually controlled air conditioner (heater without air conditioner), footwell, defrost and centre flaps are linked by operating levers and moved by centre flap control motor - V70-
- ❑ On vehicles with automatically controlled air conditioner, footwell and centre flaps are linked by operating levers and moved by centre flap control motor - V70- . Defroster flap is moved by defroster flap control motor - V107-

7 - Air duct to left footwell (driver side)

8 - "A" - "A" sectional view of air distribution housing

9 - Auxiliary air heater element - Z35-

- ❑ Currently only fitted on vehicles with TDI engine



10 - Heat exchanger for heater

11 - Air inlet from evaporator housing

12 - Right temperature flap (front passenger side)

- ☐ On vehicles with manually controlled air conditioner (with heater without air conditioner), temperature flaps (left and right) are linked via shaft and moved jointly by temperature flap control motor - V68-
- ☐ On vehicles with automatically controlled air conditioner, temperature flap is moved by left temperature flap control motor - V158-

13 - Right footwell flap (front passenger side)

- ☐ On vehicles with manually controlled air conditioner (heater without air conditioner), footwell, defrost and centre flaps are linked by operating levers and moved by centre flap control motor - V70-
- ☐ On vehicles with automatically controlled air conditioner, footwell and centre flaps are linked by operating levers and moved by centre flap control motor - V70- . Defroster flap is moved by defroster flap control motor - V107-

14 - Defroster flap

- ☐ On vehicles with manually controlled air conditioner (heater without air conditioner), footwell, defrost and centre flaps are linked by operating levers and moved by centre flap control motor - V70-
- ☐ On vehicles with automatically controlled air conditioner, footwell and centre flaps are linked by operating levers and moved by centre flap control motor - V70- . Defroster flap is moved by defroster flap control motor - V107-

15 - "B"- "B" sectional view of air distribution housing

16 - Central flap "centre"

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- ☐ On vehicles with manually controlled air conditioner (heater without air conditioner), footwell, defrost and centre flaps are linked by operating levers and moved by centre flap control motor - V70-
- ☐ On vehicles with automatically controlled air conditioner, footwell and centre flaps are linked by operating levers and moved by centre flap control motor - V70- . Defroster flap is moved by defroster flap control motor - V107-

17 - Flap in air duct

- ☐ For air duct to vent in rear centre console
- ☐ This flap is actuated via an actuating arm attached to the centre flap in the middle
- ☐ Depending on equipment version; only for vehicles with automatically controlled air conditioner; not visible from outside

18 - Air duct

- ☐ For air duct to vent in rear centre console
- ☐ Depending on equipment version; sealed off on vehicles with manually controlled air conditioner (with heater without air conditioner)

6.3 Removing and installing footwell vent (driver side)

Removing

- Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing dash panel cover (driver side) .
- Remove bolt -1-.
- Detach footwell vent -2-.

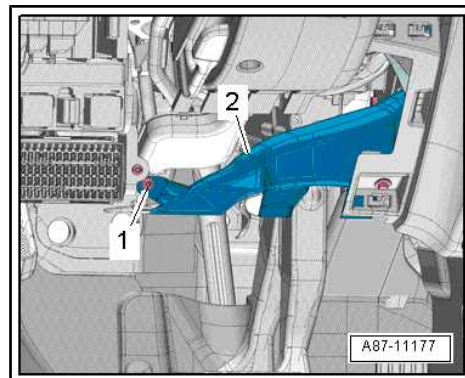
Installing

Install in reverse order of removal; note the following:

- Install dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing dash panel cover (driver side) .

Tightening torques

- ♦ ⇒ [“6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 230](#)



6.4 Removing and installing footwell vent (front passenger side)

Removing

- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- Remove bolt -2-.
- Detach footwell vent -1-.

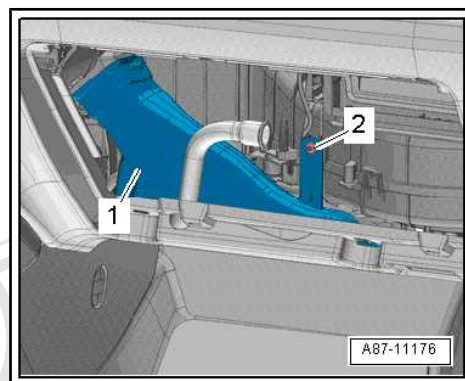
Installing

Install in reverse order of removal; note the following:

- Install glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .

Tightening torques

- ♦ ⇒ [“6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 230](#)



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6.5 Removing and installing rear footwell vent

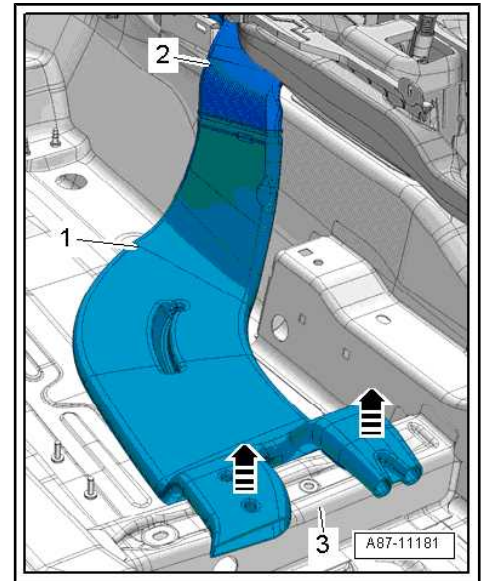
Removing

- Remove corresponding seat (driver or front passenger seat) ⇒ General body repairs, interior; Rep. gr. 72 ; Front seats; Removing and installing front seat .
- Lift floor covering until footwell vent can be removed ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .
- Release footwell vent (rear) -1- from the fasteners on body -3- -arrows-.
- Detach footwell vent (rear) from air duct -2- and remove.

Installing

Install in reverse order of removal; note the following:

- Install floor covering ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .
- Install the previously removed seat (driver or front passenger seat) ⇒ General body repairs, interior; Rep. gr. 72 ; Front seats; Removing and installing front seat .



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6.6 Removing and installing air ducts

⇒ [“6.6.1 Removing and installing air duct for dash panel vent \(centre\)”, page 238](#)

⇒ [“6.6.2 Removing and installing air duct for windscreen defroster vent”, page 239](#)

⇒ [“6.6.3 Removing and installing air duct for dash panel vent”, page 239](#)

⇒ [“6.6.4 Removing and installing air duct for glove box cooling”, page 239](#)

⇒ [“6.6.5 Removing and installing air duct \(rear\) - vehicles with automatically controlled air conditioner”, page 241](#)

⇒ [“6.6.6 Removing and installing air duct for footwell vent \(rear\)”, page 241](#)

⇒ [“6.6.7 Removing and installing air duct for rear vent - vehicles with automatically controlled air conditioner”, page 242](#)

6.6.1 Removing and installing air duct for dash panel vent (centre)

Removing

- Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
- Detach air duct for centre dash panel vent -1-.

Installing

Install in reverse order of removal; note the following:

- Renew damaged or defective foam seals -2-.



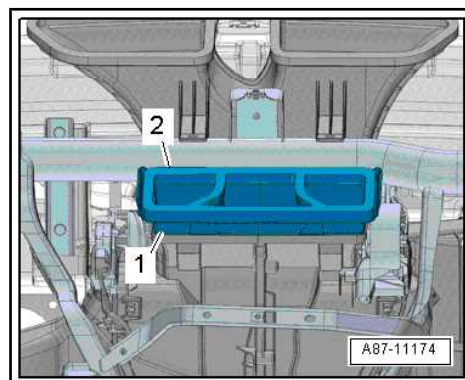
Note

- ♦ *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.

- Install dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

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6.6.2 Removing and installing air duct for windscreen defroster vent

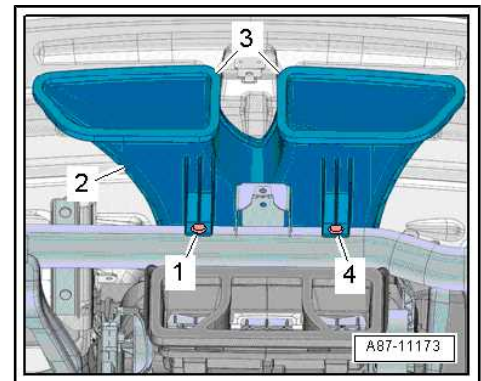
Removing

- Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
- Pull out spreader pins and remove fasteners -1, 4-.
- Lift off air duct -2-.

Installing

Install in reverse order of removal; note the following:

- Renew damaged or defective foam seals -3-.



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 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.*
- Install dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

6.6.3 Removing and installing air duct for dash panel vent

Removing

- Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
- Remove bolts -arrows-.
- Detach air duct -2- for dash panel vent from dash panel -1-.

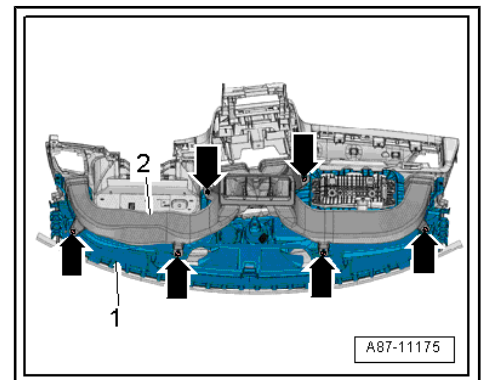
Installing

Install in reverse order of removal; note the following:

- Install dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

Tightening torques

- ◆ ⇒ [“6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 230](#)



6.6.4 Removing and installing air duct for glove box cooling

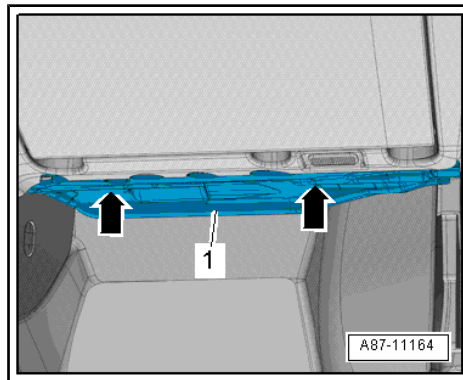


Note

Not fitted on all vehicles; depends on equipment version.

Removing

- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- Use a screwdriver to unfasten quick-release fastener -arrows-.
- Detach cover -1-.



- Detach air duct -1- at connection for air conditioning unit.

Installing

Install in reverse order of removal; note the following:

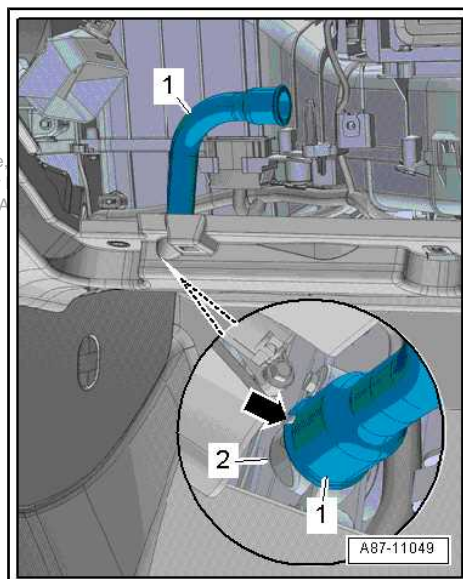


Note

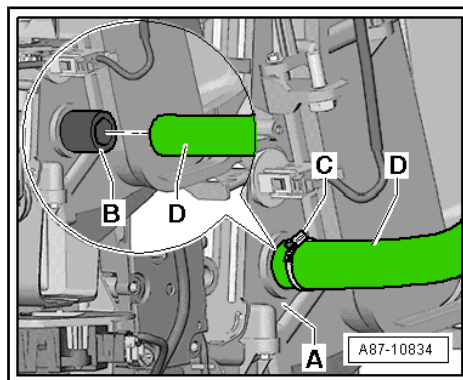
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If the air duct hose is not properly connected to the air conditioning unit or the glove box, this may result in noise at the connection.

- Air duct can only be pressed on as far as stop in one position on connection -2-.
- Lug -arrow- at connection must engage in guide.



- If air duct -D- is loose at connection -B-, it must be secured with a hose clip -C-. Hose clip ⇒ Electronic parts catalogue .
- Install footwell vent (front passenger side) ⇒ [page 236](#) .



6.6.5 Removing and installing air duct (rear) - vehicles with automatically controlled air conditioner

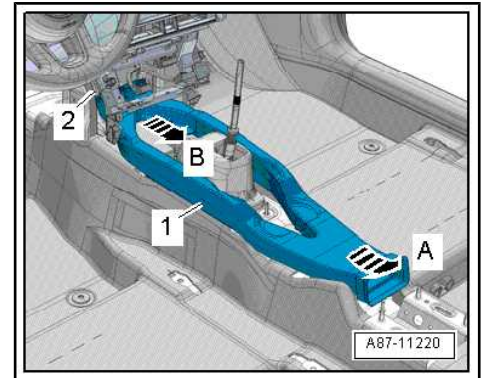
Removing

- Remove bracket (front) for centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing bracket for centre console .
- Swivel air duct -1- upwards at rear -arrow A- and release it from fastener at air distribution housing -2- -arrow B-.
- Detach air duct (rear).

Installing

Install in reverse order of removal; note the following:

- Install bracket (front) for centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing bracket for centre console .



6.6.6 Removing and installing air duct for footwell vent (rear)

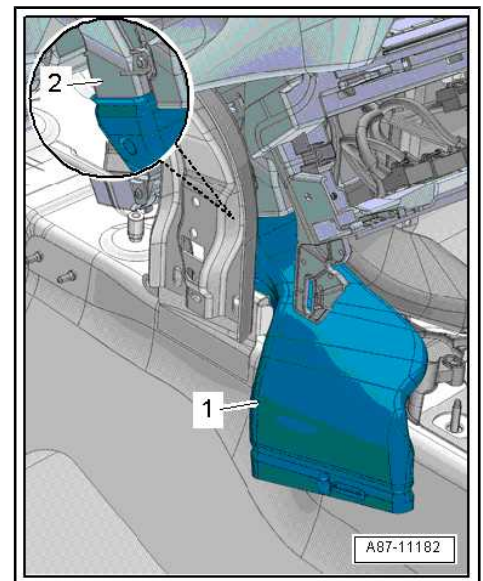
Removing

- Remove floor covering ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .
- Remove footwell vent (rear left and/or rear right)
 ⇒ [page 237](#) .
- Detach air duct -1- from air conditioning unit (from heater)
 -2- and remove.

Installing

Install in reverse order of removal; note the following:

- Install floor covering ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .



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6.6.7 Removing and installing air duct for rear vent - vehicles with automatically controlled air conditioner

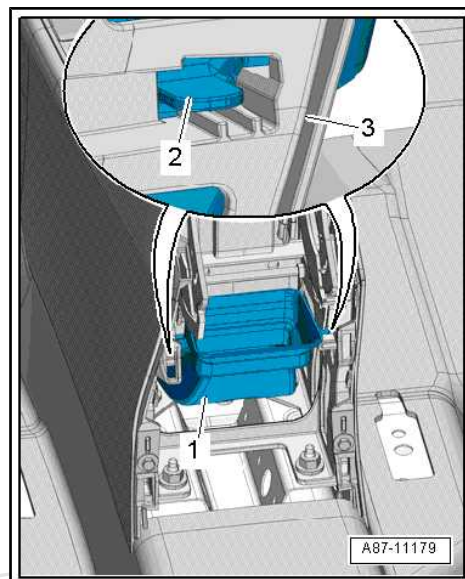
Removing

- Remove centre console trim (rear) ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console trim (rear) .
- Pull air duct -1- upwards until guides -2- are released from mountings -3-.
- Detach air duct towards rear.

Installing

Install in reverse order of removal; note the following:

- Renew damaged or defective foam seal at air duct.
- Install centre console trim (rear) ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console trim (rear) .



6.7 Checking forced ventilation vents in passenger compartment

⇒ [“6.7.1 Checking ventilation slots in luggage compartment”, page 242](#)

⇒ [“6.7.2 Checking forced ventilation frame from inside”, page 243](#)

6.7.1 Checking ventilation slots in luggage compartment

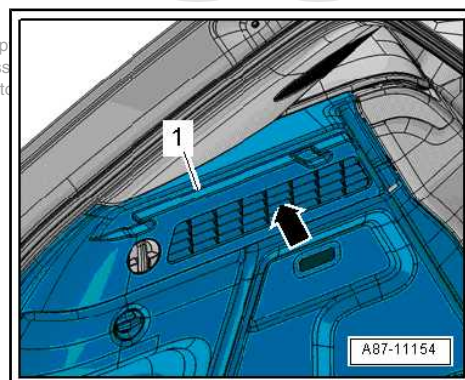
Test sequence

- 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.



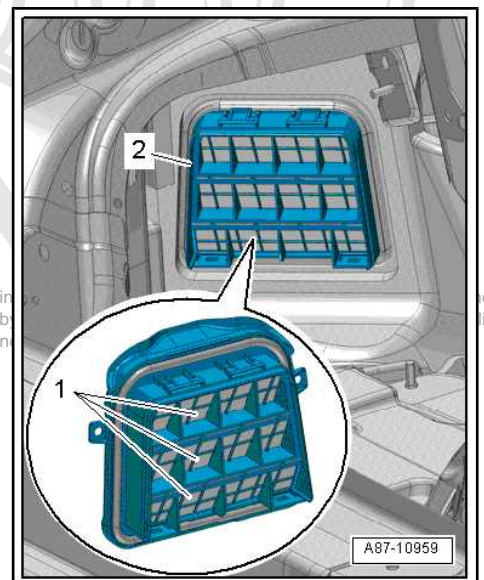
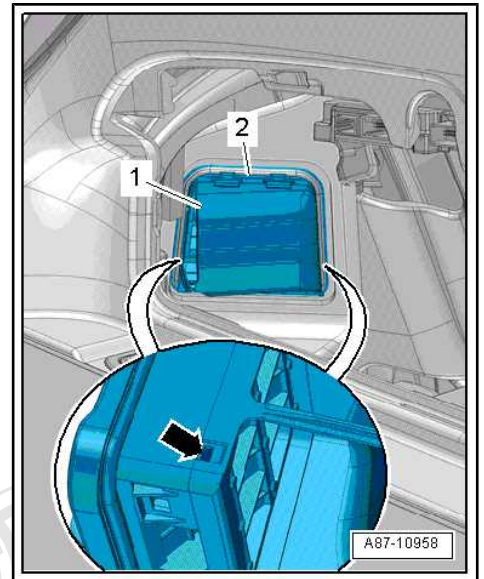
6.7.2 Checking forced ventilation frame from inside

Test sequence



Note

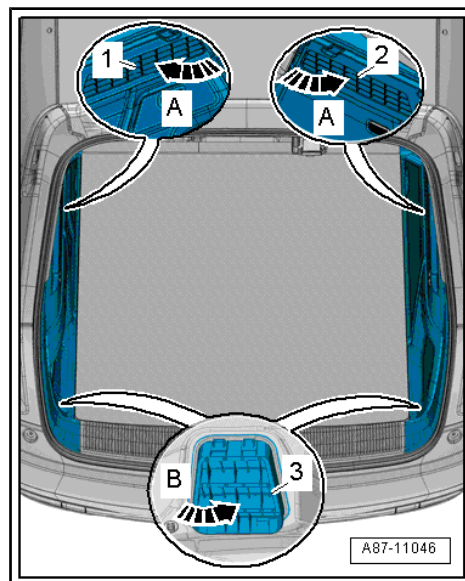
- ◆ *Gummed up sealing lips could cause the windows to mist up.*
- ◆ *The sealing lip in the ventilation frame must move freely and close automatically.*
- ◆ *If the air ducts to the ventilation frames are sealed off or blocked, the windows may mist up.*
- Open cover of luggage compartment side trim.
- If fitted, detach cover -1- at top of ventilation frame -2-.
- Release cover at side -arrow- and detach.
- Check that ventilation frame -2- is not blocked, and check that sealing lips -1- are functioning properly.



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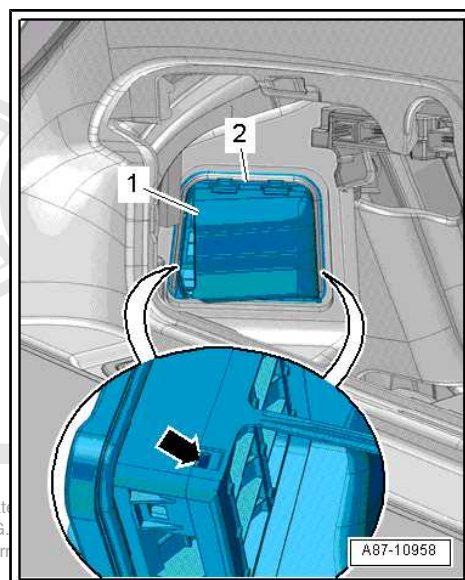
- To ensure proper ventilation of passenger compartment, ventilation openings in luggage compartment must not be blocked.
- It must be possible for the air -arrows A- to flow to the outside -arrow B- via ventilation openings -1 and 2- in the luggage compartment side trim to forced ventilation frames -3-.



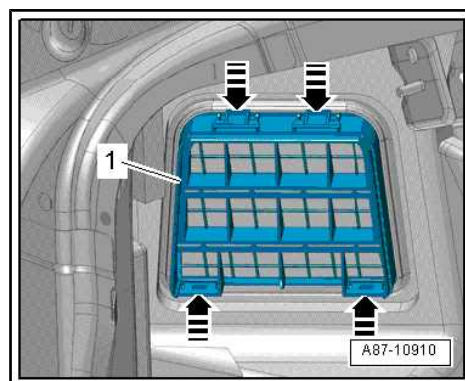
6.8 Removing and installing forced ventilation vents in passenger compartment

Removing

- Remove bumper cover (rear) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (rear); Removing and installing bumper cover .
- Open cover of luggage compartment side trim.
- If fitted, detach cover -1- at top of ventilation frame -2-.
- Release cover at side -arrow- and detach.



- Release retaining clips -arrows- and press forced ventilation frame -1- outwards.

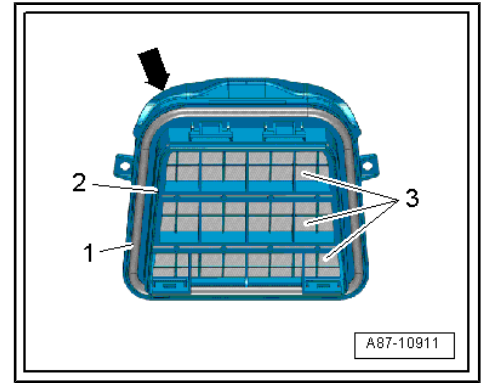


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Installing

Install in reverse order of removal; note the following:

- Check seal -1- for damage.
- The sealing lips -3- only close properly if the ventilation frame -2- has been installed in the correct position.
- The large radius -arrow- is at the top.
- When installing, press ventilation frame into opening at body until all the retaining tabs engage properly.
- Re-attach cover at ventilation frame.
- Install bumper cover (rear) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (rear); Removing and installing bumper cover .

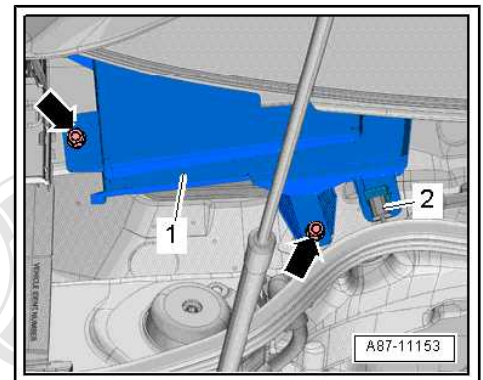


If bumper cover was removed, lane change assist control unit - J769- / -J770- must be re-calibrated ⇒ Electrical system; Rep. gr. 96 ; Lane change assist; Calibrating lane change assist .

6.9 Removing and installing cover for fresh air intake

Removing

- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- If fitted: Unplug electrical connector -2- from air quality sensor - G238- .
- Remove bolts -arrows-.
- Detach cover -1-.



Note

- ◆ *Water may flow into the fresh air intake duct if the cover is damaged or not fitted correctly. This may result in complaints about odour from the heater/air conditioner and/or moisture in the passenger compartment.*
- ◆ *Water may flow into the fresh air intake duct via the cover if the plenum chamber cover is damaged or not fitted correctly.*

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Installing

Install in reverse order of removal; note the following:

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

Tightening torques

- ◆ ⇒ "1.1.2 Overview of fitting locations - components not located in passenger compartment (front), component group 2", page 80

6.10 Removing and installing fresh air intake

Removing

- Remove cover for fresh air intake ➔ [page 245](#) .
- Remove nuts -arrows-.
- Take fresh air intake -1- out of plenum chamber.



Note

- ♦ *Water may flow into the fresh air intake duct if the fresh air intake grille is damaged or not fitted correctly. This may result in complaints about odour from the heater/air conditioner and/or moisture in the passenger compartment.*
- ♦ *Check seal attached to bottom of air intake grille for damage and renew if necessary.*

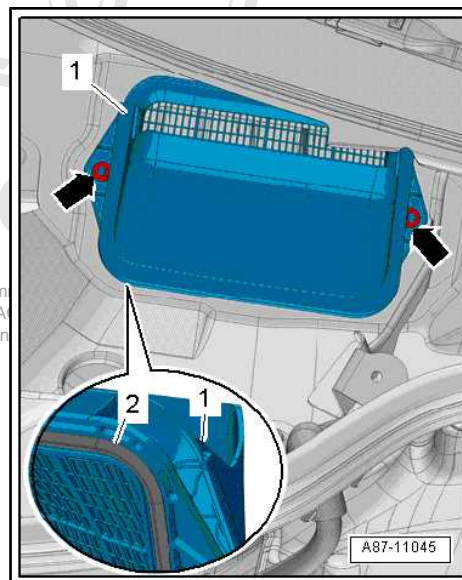
Installing

Install in reverse order of removal; note the following:

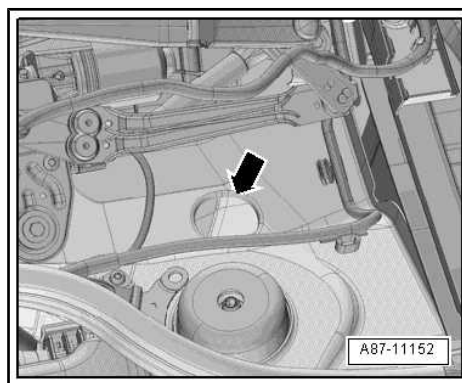
- Check bonded seal -2- between fresh air intake and body for damage.
- Install cover for fresh air intake ➔ [page 245](#) .

Tightening torques

- ♦ ➔ [“1.1.2 Overview of fitting locations - components not located in passenger compartment \(front\), component group 2”, page 80](#)

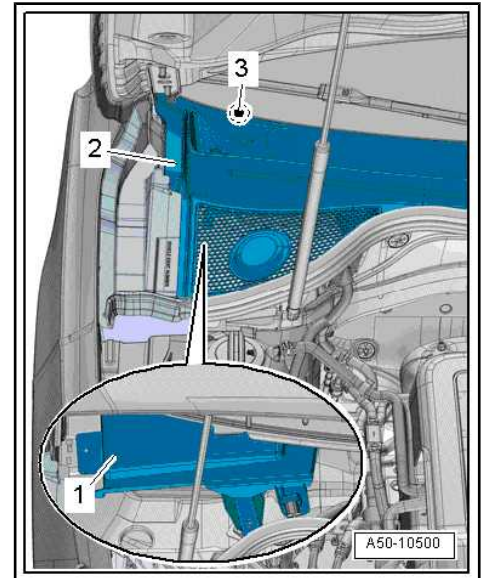


6.11 Checking plenum chamber water drain



 Note

- ◆ *Drainage of water out of the plenum chamber may be obstructed by deposits such as leaves and pine needles accumulating in the plenum chamber 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 air conditioning unit (the heater) via the intake duct 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 may flow into the fresh air intake duct via the drip rail -1- if the plenum chamber cover -2- is damaged or not fitted correctly. This may result in complaints about odour from the heater/air conditioner and/or moisture in the passenger compartment.*



6.12 Cleaning plenum chamber water drain

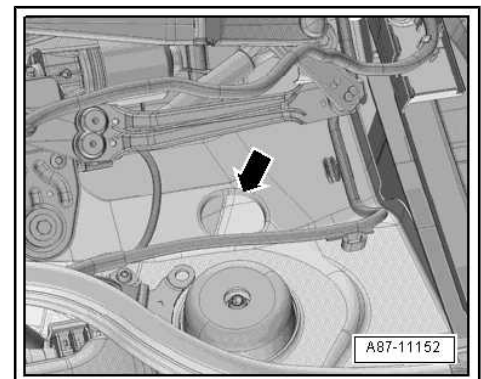
Procedure

- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Check for dirt in water drains -arrow-.

 Note

- ◆ *Use a commercially available illuminated endoscope or similar to check inaccessible water drains. A version with a flexible, waterproof swan neck is most practical.*
- ◆ *Use a commercially available flexible gripper tool or similar to loosen and remove coarse dirt when cleaning inaccessible water drains. Then rinse out the remaining dirt.*
- The water must be able to drain off.
- Clean water drains if obstructed with dirt.
- Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover

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7 Operating and display unit

⇒ [“7.1 Overview - operating and display unit”, page 248](#)

⇒ [“7.2 Removing and installing operating and display unit”, page 253](#)

⇒ [“7.3 Removing and installing temperature sensor blower”, page 256](#)

7.1 Overview - operating and display unit

⇒ [“7.1.1 Overview - operating and display unit, manually controlled air conditioner \(heater without air conditioner\)”, page 248](#)

⇒ [“7.1.2 Overview - operating and display unit \(Climatronic control unit J255 \), automatically controlled air conditioner”, page 250](#)

7.1.1 Overview - operating and display unit, manually controlled air conditioner (heater without air conditioner)

Air conditioning system control unit - J301- (heater control unit - J65-)



Note

- ◆ The following illustration shows an operating and display unit (air conditioning system control unit - J301-) of the type fitted up to model year 2013 (with **AC** button). Modified air conditioner operating units (on which the button has the lettering **A/C** instead of **AC**, for example) will be introduced gradually in model year 2013. Observe correct assignment ⇒ *Electronic parts catalogue* .
- ◆ For air conditioner operating units (Climatronic control unit - J301-) with part numbers from index “B” onwards, the button for switching activation of the air conditioner compressor on/off now has different lettering (**A/C** instead of **AC**).
- ◆ For heater operating units (heater control unit - J65-) installed on vehicles with heater without air conditioner, there is no **A/C** or **AC** button.

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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 rear window heating

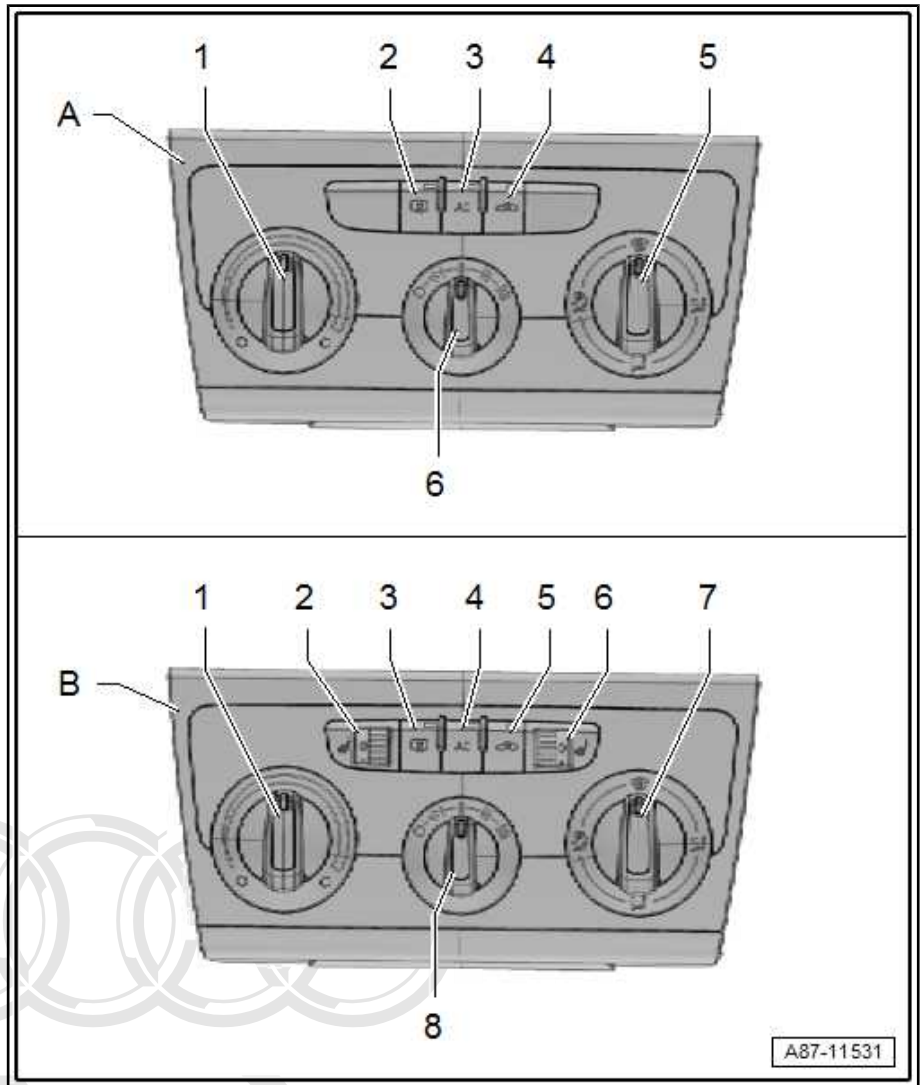
- ☐ If LED lights up, "Rear window heating on" is selected

3 - or button for air conditioner compressor

- ☐ If LED lights up, "air conditioner compressor on" is selected
- ☐ Lettering on button differs, depending on version of -J301-
- ☐ A trim cap is fitted instead of this button if a heater control unit - J65- is installed

4 - 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



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windscreen)

5 - Rotary control for setting air distribution

6 - Rotary control for fresh air blower - V2-

B - Operating unit (air conditioning system control unit - J301-) for vehicles with seat heating

1 - Rotary temperature control

2 - Regulator for heated driver seat

- ☐ The setting selected is indicated by the number on the knurled wheel

3 - Button for rear window heating

- ☐ If LED lights up, "Rear window heating on" is selected

4 - **AC** or **A/C** button for air conditioner compressor

- ☐ If LED lights up, "air conditioner compressor on" is selected
- ☐ Lettering on button differs, depending on version of -J301-
- ☐ A trim cap is fitted instead of this button if a heater control unit - J65- is installed

5 - 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)

6 - Regulator for heated front passenger seat

- ☐ The setting selected is indicated by the number on the knurled wheel

7 - Rotary control for setting air distribution

8 - Rotary control for fresh air blower - V2-

7.1.2 Overview - operating and display unit (Climatronic control unit - J255-), auto- matically controlled air conditioner



Note

- ◆ The following illustration shows an operating and display unit of the type fitted up to model year 2013 (with **AC** button). Modified air conditioner operating units (on which the button has the lettering **A/C** instead of **AC**, for example) will be introduced gradually in model year 2013. Observe correct assignment → Electronic parts catalogue .
- ◆ Air conditioner operating units (Climatronic control unit - J255-) with part number from index "D" onwards have an **OFF** button. On these operating units -J255- , the functions of the **air recirculation** and **automatic air recirculation** buttons are combined in one button, and the button for activating and deactivating the air conditioner compressor has the lettering **A/C** instead of **AC**.
- ◆ For air conditioner operating units (Climatronic control unit - J255-) with part numbers from index "F" onwards (gradual introduction in model year 2014), the buttons and panel now have different lettering and trim (e.g. the lettering on the button for defrost mode has been changed from **Front** to **MAX**). Ensure correct version and allocation → Electronic parts catalogue .

A - Operating unit (Climatronic control unit - J255-) for vehicles without seat heating

1 - or button for air conditioner compressor

- ☐ If LED lights up, "air conditioner compressor on" is selected
- ☐ Lettering on button differs, depending on version of -J255-

2 - Rotary temperature control (driver side)

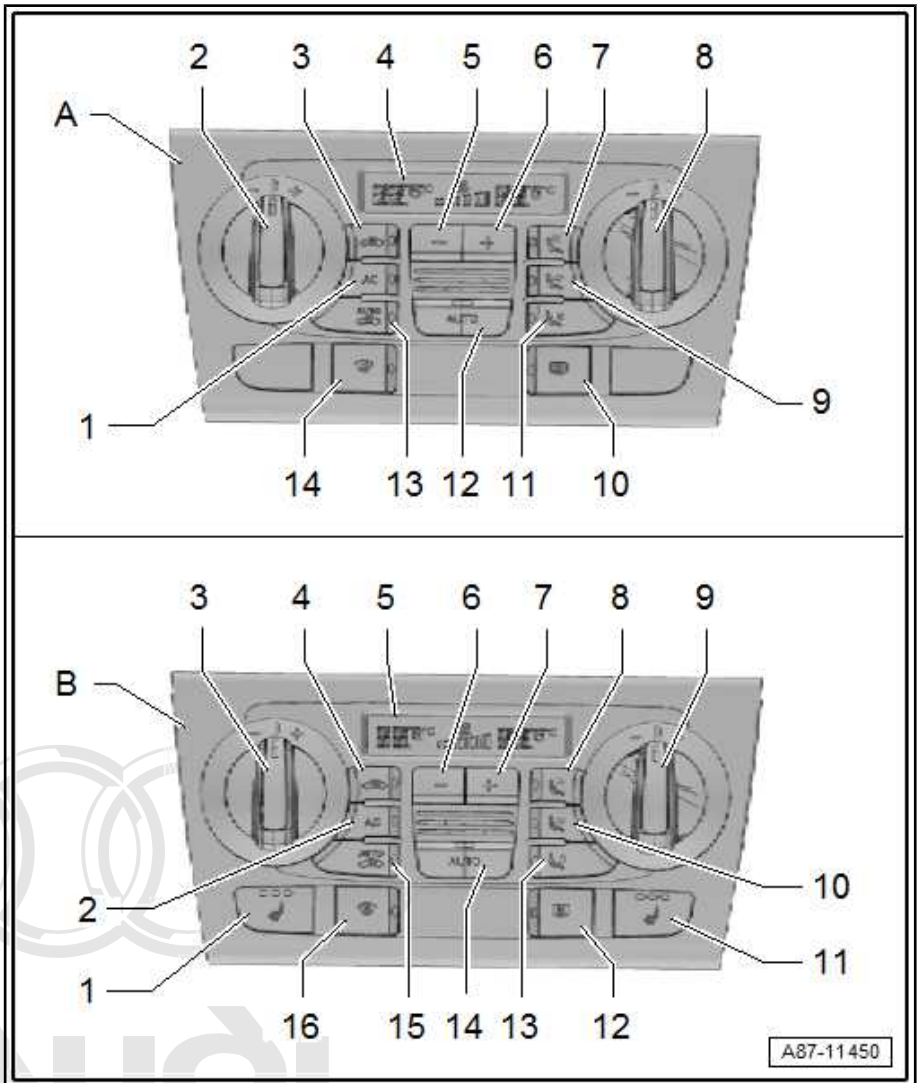
3 - Button for air recirculation mode / button

- ☐ If LEDs light up, "air recirculation mode" or "air conditioner off" is selected
- ☐ The "air recirculation mode" function is cancelled on pressing the button for defrost mode (air to windscreen)
- ☐ Different lettering and function, depending on version of -J255-

4 - Display

5 - button for fresh air blower - V2-

- ☐ For reducing blower speed
- ☐ Different lettering and symbols, depending on



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version of -J255-

6 - button for fresh air blower - V2-

- ☐ For increasing blower speed
- ☐ Different lettering and symbols, depending on version of -J255-

7 - Button for setting air distribution at top

- ☐ If LED lights up, "air distribution at top" is selected

8 - Rotary temperature control (front passenger side)

9 - Button for setting air distribution to centre

- ☐ If LED lights up, "air distribution to centre" is selected

10 - Button for rear window heating

- ☐ If LED lights up, "Rear window heating on" is selected

11 - Button for setting air distribution at bottom

- ☐ If LED lights up, "air distribution at bottom" is selected

12 - button for automatic air conditioner control

- ☐ If LED lights up, "automatic control" is selected

13 - Button for automatic control of air recirculation mode / button for automatic and manual air recirculation mode

- ☐ If LEDs light up, "automatic air recirculation mode" (or "manual air recirculation mode") function is selected
- ☐ Different lettering and function, depending on version of -J255- (on -J255- with  button, "manual air recirculation mode" function is also activated and deactivated via this button)
- ☐ The "manual air recirculation mode" function is cancelled on pressing the button for defrost mode (air to windscreen)

14 - Button for defrost mode

- ☐ If LED lights up, "defrost mode" is selected
- ☐ Different lettering and symbols, depending on version of -J255-

B - Operating unit (Climatronic control unit - J255-) for vehicles with seat heating

1 - Seat heating button (left-side)

- ☐ LEDs indicate selected setting
- ☐ Selected setting is reduced by one level after a pre-set time has elapsed ⇒ [page 7](#)

2 - or button for air conditioner compressor

- ☐ If LED lights up, "air conditioner compressor on" is selected
- ☐ Lettering on button differs, depending on version of -J255-

3 - Rotary temperature control (driver side)

4 - Button for air recirculation mode / button

- ☐ If LEDs light up, "air recirculation mode" or "air conditioner off" is selected
- ☐ The "air recirculation mode" function is cancelled on pressing the button for defrost mode (air to windscreen)
- ☐ Different lettering and function, depending on version of -J255-

5 - Display

6 - button for fresh air blower - V2-

- ☐ For reducing blower speed
- ☐ Different lettering and symbols, depending on version of -J255-

7 - button for fresh air blower - V2-

- ☐ For increasing blower speed
- ☐ Different lettering and symbols, depending on version of -J255-

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8 - Button for setting air distribution at top

- ☐ If LED lights up, "air distribution at top" is selected

9 - Rotary temperature control (front passenger side)

10 - Button for setting air distribution to centre

- ☐ If LED lights up, "air distribution to centre" is selected

11 - Seat heating button (right-side)

- ☐ LEDs indicate selected setting
- ☐ Selected setting is reduced by one level after a pre-set time has elapsed ⇒ [page 7](#)

12 - Button for rear window heating

- ☐ If LED lights up, "Rear window heating on" is selected

13 - Button for setting air distribution at bottom

- ☐ If LED lights up, "air distribution at bottom" is selected
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14 - **Auto** button for automatic air conditioner control

- ☐ If LED lights up, "automatic control" is selected

15 - Button for automatic control of air recirculation mode / button for automatic and manual air recirculation mode

- ☐ If LEDs light up, "automatic air recirculation mode" (or "manual air recirculation mode") function is selected
- ☐ Different lettering and function, depending on version of -J255- (on -J255- with **OFF** button, "manual air recirculation mode" function is also activated and deactivated via this button)
- ☐ The "manual air recirculation mode" function is cancelled on pressing the button for defrost mode (air to windscreen)

16 - Button for defrost mode

- ☐ If LED lights up, "defrost mode" is selected
- ☐ Different lettering and symbols, depending on version of -J255-

7.2 Removing and installing operating and display unit

⇒ ["7.2.1 Removing and installing operating and display unit \(air conditioning system control unit J301 / heater control unit J65 \)", page 253](#)

⇒ ["7.2.2 Removing and installing operating and display unit \(Climatronic control unit J255 \)", page 255](#)

7.2.1 Removing and installing operating and display unit (air conditioning system control unit - J301- / heater control unit - J65-)

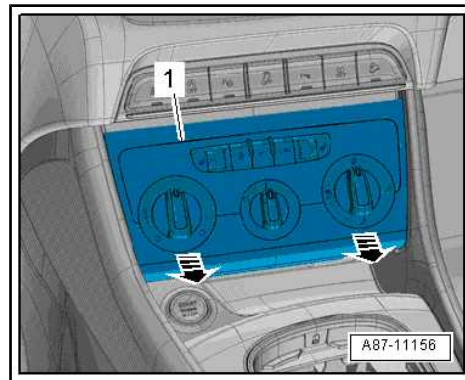


Note

- ◆ *Only for vehicles with manually controlled air conditioner (with heater without air conditioner).*
- ◆ *The heater control unit - J65- (for vehicles without air conditioner) has no **A/C** or **AC** button.*
- ◆ *Different versions (can be recognised e.g. by lettering **A/C** instead of **AC** on button); pay attention to correct assignment ⇒ Electronic parts catalogue .*

Removing

- Observe general notes ⇒ [page 51](#) .
- Detach trim -1- for operating unit (air conditioning system control unit - J301- / heater control unit - J65-) -arrows-.



- Remove bolts -arrows-.
- Unplug electrical connector -4-.
- Unplug electrical connectors -2, 6- by sliding locking elements -3, 5- upwards and pressing catch.
- Detach operating unit -1- (air conditioning system control unit - J301- / heater control unit - J65-).

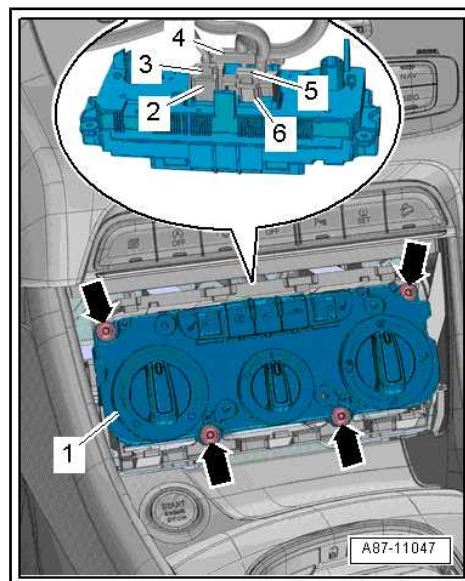
Installing

Install in reverse order of removal; note the following:

- Tighten bolts -arrows- to 1.5 Nm.
- When renewing an operating unit (air conditioning system control unit - J301- / heater control unit - J65-), take care to select the correct version ⇒ Electronic parts catalogue .

After renewing/installing the operating unit (air conditioning system control unit - J301- / heater control unit - J65-), always perform the following steps ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

- Perform/check coding.
- Perform basic setting.
- Read out event memory (and eliminate the cause of any entries displayed).
- Check adaption.
- Perform final control diagnosis if applicable.



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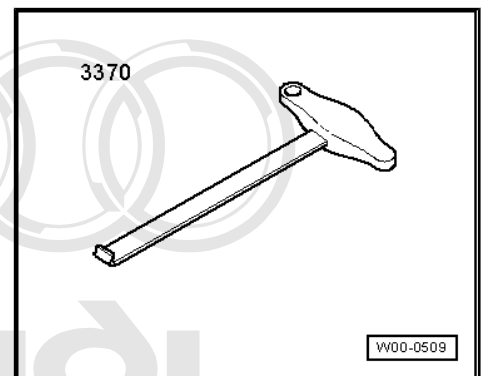
7.2.2 Removing and installing operating and display unit (Climatronic control unit - J255-)

Note

- ◆ Only installed on vehicles with automatically controlled air conditioner
 - ◆ Different versions (can be recognised e.g. by lettering A/C instead of AC on button); pay attention to correct assignment ⇒ Electronic parts catalogue .
 - ◆ Air conditioner operating units (Climatronic control unit - J255-) with part number from index "D" onwards have an OFF button. On these operating units -J255-, the functions of the air recirculation and automatic air recirculation buttons are combined in one button, and the button for activating and deactivating the air conditioner compressor has the lettering A/C instead of AC.
 - ◆ For air conditioner operating units (Climatronic control unit - J255-) with part numbers from index "F" onwards (gradual introduction in model year 2014), the buttons and panel now have different lettering and trim (e.g. the lettering on the button for defrost mode has been changed from Front to MAX). Ensure correct version and allocation ⇒ Electronic parts catalogue .
- If the operating unit (Climatronic control unit - J255-) is renewed, select "Replace control unit" ⇒ Vehicle diagnostic tester ("Guided Fault Finding" or "Guided Functions").

Special tools and workshop equipment required

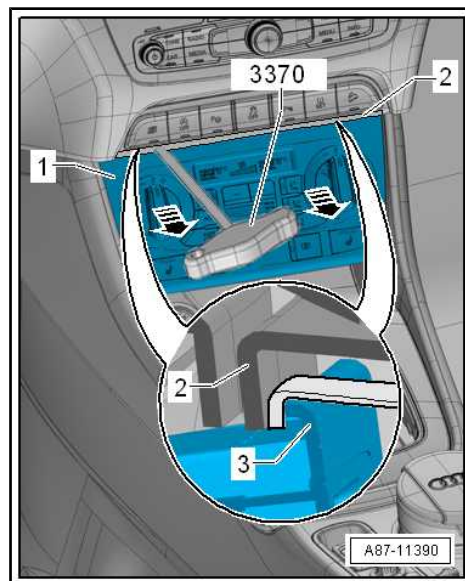
- ◆ Front-end hook - 3370-



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Removing

- Observe general notes ➔ [page 52](#) .
- Engage front-end hook - 3370- at operating unit -1- from top, as shown in illustration.
- When doing so, make sure that centre console -2- and top edge of operating unit -3- are not damaged.
- Carefully release operating unit from centre console -arrows-.
- Unplug electrical connectors.



Note

Should the operating unit -1- (-J255-) become tilted and stuck in the centre console mounting while you are trying to remove it -arrows B-, apply hook - T40207- from below at openings -arrows A-, as shown, and also pull at bottom carefully to release unit.

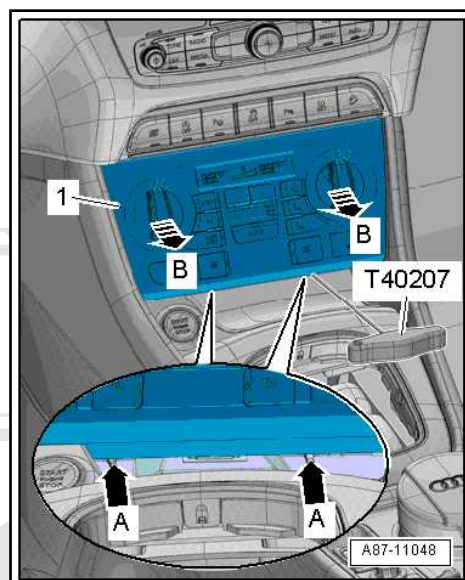
Installing

Install in reverse order of removal; note the following:

- When renewing the operating unit (Climatronic control unit - J255-), take care to select the correct version ➔ Electronic parts catalogue .

After renewing/installing the operating unit (Climatronic control unit - J255-), always perform the following steps ➔ Vehicle diagnostic tester (“Guided Fault Finding”).

- Perform/check coding.
- Perform basic setting.
- Read out event memory (and eliminate the cause of any entries displayed).
- Check adaption.
- Perform final control diagnosis if applicable.



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7.3 Removing and installing temperature sensor blower



Note

Only installed on vehicles with automatically controlled air conditioner

Removing

- Remove operating unit (Climatronic control unit - J255-)
⇒ [page 255](#) .
- Remove bolts -A-.
- Pull temperature sensor blower - V42- -item B- out of operating unit (Climatronic control unit - J255-).

Installing

Install in reverse order of removal; note the following:

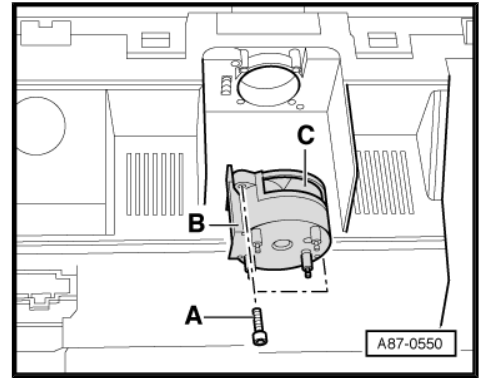


Note

When installing the temperature sensor blower -V42- , do not press down on the motor, but hold the blower at its housing.

Tightening torques

- ◆ Blower to operating unit: 0.8 Nm



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8 Further control components

⇒ ["8.1 Removing and installing sunlight penetration photosensor G107", page 258](#)

⇒ ["8.2 Operation of air quality sensor G238", page 259](#)

⇒ ["8.3 Removing and installing air quality sensor G238", page 264](#)

⇒ ["8.4 Removing and installing ambient temperature sensor G17", page 264](#)

⇒ ["8.5 Removing and installing left vent temperature sender G150", page 265](#)

⇒ ["8.6 Removing and installing right vent temperature sender G151", page 265](#)

⇒ ["8.7 Removing and installing left footwell vent temperature sender G261", page 266](#)

⇒ ["8.8 Removing and installing right footwell vent temperature sender G262", page 267](#)

⇒ ["8.9 Removing and installing evaporator output temperature sender G263", page 267](#)

⇒ ["8.10 Removing and installing humidity sender G355", page 268](#)

⇒ ["8.11 Removing and installing continued coolant circulation pump V51 / auxiliary pump for heating V488", page 270](#)

8.1 Removing and installing sunlight penetration photosensor - G107-



Note

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- ◆ *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

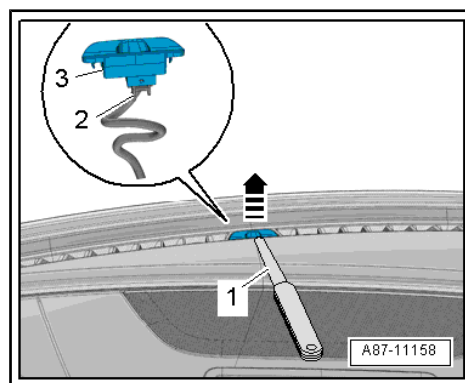
- Using a 0.4 mm feeler gauge -1-, carefully prise photosensor -3- out of defroster vent (top front) -arrow-.
- Unplug electrical connector -2-.

Installing

Install in reverse order of removal; note the following:

After completing the repairs, perform the following work on the operating unit ⇒ Vehicle diagnostic tester ("Guided Fault Finding"):

- Read out event memory and delete any entries displayed.



8.2 Operation of air quality sensor - G238-

⇒ ["8.2.1 Operation of air quality sensor G238 ", page 259](#)

⇒ ["8.2.2 Checking air quality sensor G238 ", page 260](#)

8.2.1 Operation of air quality sensor - G238-



Note

Only installed on vehicles with automatically controlled air conditioner

Operation

- ◆ After the ignition is switched on, it takes -G238- approx. 30 seconds 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- . -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 between approx. + 2 °C and approx. - 8 °C, the system only switches to air recirculation mode and at the same time activates the air conditioner compressor if there is a considerable increase in the pollutant concentration.
- At ambient temperatures below approx. -8 °C with the air conditioner compressor switched off, switch-over only occurs if there is a considerable increase in pollutant concentration and only for approx. 15 seconds.
- Lamp in  or  button is not lit.
- The maximum duration of "automatic air recirculation" is restricted to approx. 15 seconds by -J255- to prevent the windows from misting up on the inside.
- A decrease in concentration results in the air conditioner being switched back to fresh air mode.
- ◆ The "automatic air recirculation" function can be deactivated 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. - 8 °C, compressor operation is no longer possible.
- ◆ If the "automatic air recirculation" mode is set on the operating unit -J255- , the air conditioner compressor may be switched on down to temperatures of approx. - 8 °C even if air recirculation mode has been activated manually via the  button.
- ◆ 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 ingressing into the passenger compartment together with the fresh air drawn in before the fresh air flaps can close 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 fresh air/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 fresh air/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 again to such an extent that air recirculation mode would no longer be necessary.
- ◆ To clear misted windows as quickly as possible, the operating unit -J255- does not permit the air recirculation mode while the "defrost" mode is active.
- ◆ It takes approx. 30 seconds for the air quality sensor - G238- to warm up after the ignition is switched on. During this period, no requests are sent to the operating unit -J255- for "automatic air recirculation mode".
- ◆ The air quality sensor - G238- is a highly sensitive electronic component which could be damaged irreparably by direct exposure to solvents, fuels and certain chemical compounds. Sensors that have come into contact with such substances must not be installed in the vehicle.

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8.2.2 Checking air quality sensor - G238-



Note

Only installed on vehicles with automatically controlled air conditioner

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.

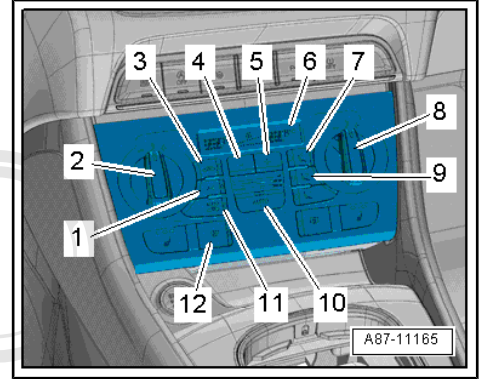
- Not contaminated with oil or fuel.
- The engine compartment and plenum chamber must not have been sprayed with solvent-based cleaning agents or anti-corrosion material.
- “Automatic air recirculation” must be switched on.

Checking operation

- Remove air quality sensor - G238- . Leave connector plugged in ⇒ [page 264](#) .

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

- “Auto” mode - lamp in **AUTO** button -10- is on.
- “Automatic air recirculation” mode - lamp in **air recirculation** button -11- is on.
- -G238- is ready for operation after a warm-up time of 30 seconds.
- Wait 30 seconds to allow air quality sensor - G238- to warm up.
- Read out event memory of operating unit (Climatronic control unit - J255-) and select “Read measured values” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- Read measured values for air quality sensor - G238-. The operating mode of the fresh air/air recirculation flap and the status of the signal from the air quality sensor - G238- are displayed.



Note

The value measured by -G238- is not displayed directly on all versions of the operating and display unit (Climatronic control unit - J255-). Some versions of -J255- may only display the measured value as a status indicating whether the heater and air conditioning unit is in fresh air mode or recirculated air mode ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051 .

- No request for “air recirculation mode”, air conditioner in fresh air mode.

Or

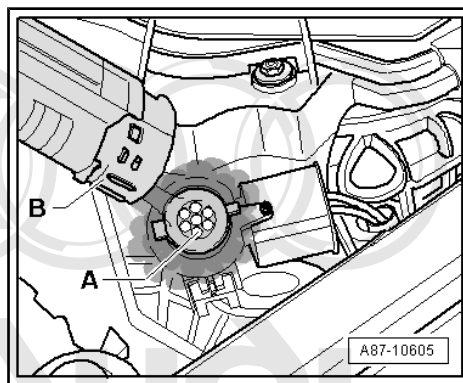
- No request for “air recirculation mode”, request for “partial air recirculation mode” (fresh air/air recirculation flap approx. in centre position).

- 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.



- Read measured values for air quality sensor - G238- .
- Specification: “Automatic air recirculation mode” requested, request met, air conditioner switches to air recirculation mode.
- Wait briefly (approx. 1 minute, depending on amount of gas applied to sensor).
- Read measured values for air quality sensor - G238- .
- Specification: no request for “air recirculation mode”, air conditioner in fresh air mode.

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Or

- Specification: no request for “automatic air recirculation mode”, request for partial air recirculation mode.



Note

To prevent the fresh air/air recirculation flap from being switched too frequently, a request from the air quality sensor - 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 again to such an extent that air recirculation mode would no longer be necessary.

- Operate windscreen wash/wipe switch until washer pump - V5- has conveyed fluid for approx. 2 seconds.
- Read measured values for air quality sensor - G238- .
- Specification: “air recirculation mode” requested due to windscreen washer system; air conditioner switches to air recirculation mode for approx. 10 seconds.
- Wait briefly.
- Read measured values for air quality sensor - G238- .
- Specification: no request for “air recirculation mode”, air conditioner in fresh air mode.

Or

- Specification: no request for “automatic air recirculation mode”, partial air recirculation mode activated.



Note

- ◆ *Depending on the composition of the windscreen washer fluid, the air quality sensor - G238- may detect air pollution and request "automatic air recirculation mode".*
- ◆ *If the air conditioner does not automatically switch to air recirculation mode when the windscreen wipe/wash switch is operated, check its operation (the information "windscreen wash" is transmitted to the steering column electronics control unit - J527- via the convenience data bus system) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- Install air quality sensor - G238- ⇒ [page 264](#) .

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 215](#) .
- 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 instructions ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

- Alternately read out displays in "Read measured values" function for measured values of 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- ⇒ [page 259](#) .

8.3 Removing and installing air quality sensor - G238-

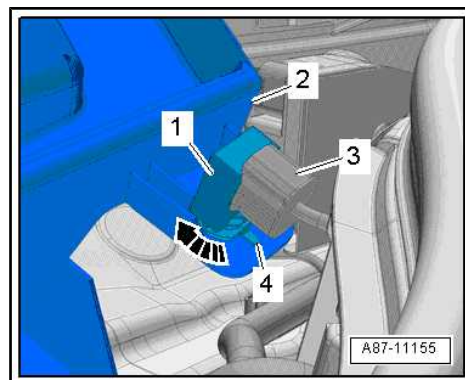
Removing

- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Release retaining tab -4- and turn housing -1- for -G238- anti-clockwise -arrow-.
- Take housing out of drip rail -2- for fresh air intake.
- Unplug electrical connector -3-.



Note

Following removal, do not set down air quality sensor - G238- in areas where it could come into contact with solvents, fuels or certain chemical compounds (liquids or vapours).



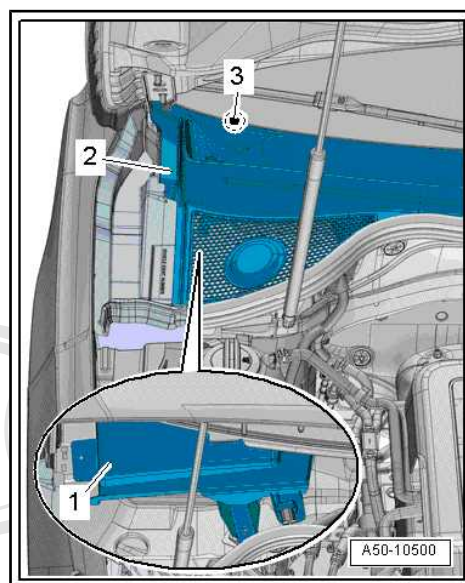
Installing

Install in reverse order of removal; note the following:



Note

- ♦ *The plenum chamber cover -2- must be undamaged in order to prevent water from running into the air conditioning unit (or the heater) via the drip rail -1- when the plenum chamber cover is fitted.*
- ♦ *Water may flow into the fresh air intake duct via the drip rail if the plenum chamber cover is damaged or not fitted correctly.*
- ♦ *The plenum chamber cover must be fully engaged in the windscreen frame -3- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .*
- Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .



8.4 Removing and installing ambient temperature sensor - G17-



Note

An incorrect measured value for ambient temperature sensor - G17- may lead to problems with the air conditioner control function ⇒ Vehicle diagnostic tester ("Guided Fault Finding" for dash panel insert).

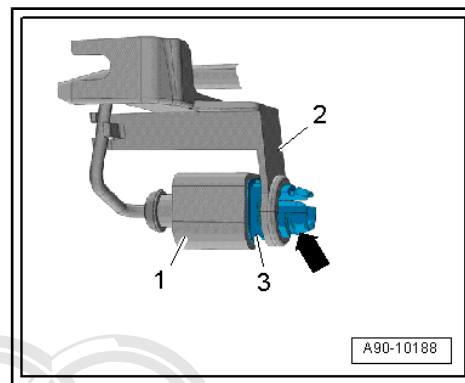
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Removing

- 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-.

Installing

Install in reverse order.



8.5 Removing and installing left vent temperature sender - G150-



Note

Only installed on vehicles with automatically controlled air conditioner

Removing

- Remove dash panel cover (driver side) ➔ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing dash panel cover (driver side) .
- Turn temperature sender -2- anti-clockwise and pull it out of the mounting.
- Unplug electrical connector -3-.

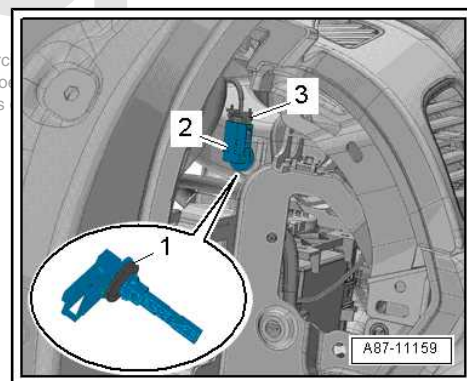
Installing

Install in reverse order of removal; note the following:

- Renew seal -1- if damaged or defective.
- Install dash panel cover (driver side) ➔ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing dash panel cover (driver side) .

After completing the repairs, perform the following work on the operating unit ➔ Vehicle diagnostic tester ("Guided Fault Finding"):

- Read out event memory and delete any entries displayed.



8.6 Removing and installing right vent temperature sender - G151-



Note

Only installed on vehicles with automatically controlled air conditioner

Removing

- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- Unplug electrical connector -1-.
- Turn temperature sender -2- anti-clockwise and pull it out of the mounting.

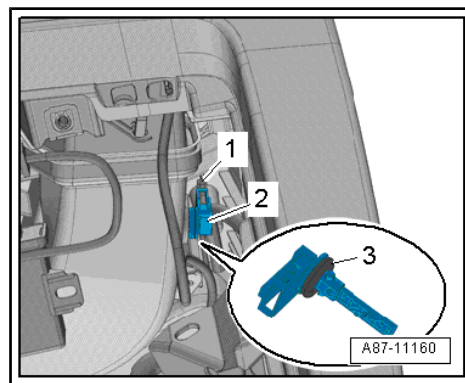
Installing

Install in reverse order of removal; note the following:

- Renew seal -3- if damaged or defective.
- Install glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .

After completing the repairs, perform the following work on the operating unit ⇒ Vehicle diagnostic tester ("Guided Fault Finding"):

- Read out event memory and delete any entries displayed.



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



Note

Only installed on vehicles with automatically controlled air conditioner

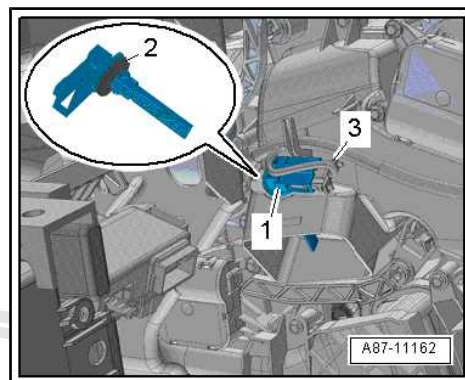
Removing

- Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing dash panel cover (driver side) .
- Remove footwell vent (driver side) ⇒ [page 236](#) .
- Turn temperature sender -1- anti-clockwise and pull it out of the mounting.
- Unplug electrical connector -3-.



Note

If the vent temperature sender cannot be turned or is not accessible due to other components, remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .



Installing

Install in reverse order of removal; note the following:

- Renew seal -2- if damaged or defective.
- Install footwell vent (driver side) ⇒ [page 236](#) .

After completing the repairs, perform the following work on the operating unit ⇒ Vehicle diagnostic tester ("Guided Fault Finding"):

- Read out event memory and delete any entries displayed.

8.8 Removing and installing right footwell vent temperature sender - G262-



Only installed on vehicles with automatically controlled air conditioner

Removing

- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- Unplug electrical connector -1-.
- Turn temperature sender -2- anti-clockwise and pull it out of the mounting.

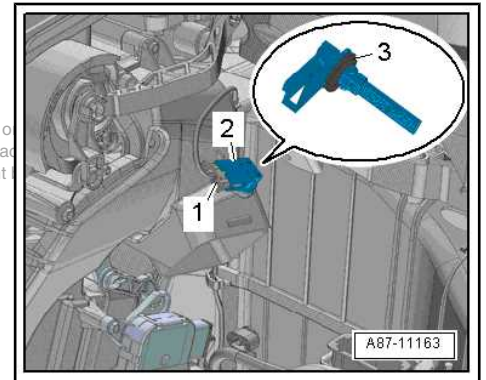
Installing

Install in reverse order of removal; note the following:

- Renew seal -3- if damaged or defective.
- Install glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .

After completing the repairs, perform the following work on the operating unit ⇒ Vehicle diagnostic tester ("Guided Fault Finding"):

- Read out event memory and delete any entries displayed.



8.9 Removing and installing evaporator output temperature sender - G263-

Removing

- Remove centre console footwell trim (front right) ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console footwell trim (front) .
- Unplug electrical connector -1-.
- Turn temperature sender -2- anti-clockwise and pull it out of the mounting.

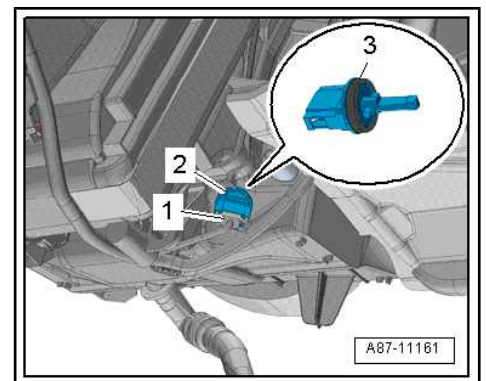
Installing

Install in reverse order of removal; note the following:

- Renew seal -3- if damaged or defective.
- Install centre console footwell trim (front) ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console footwell trim (front) .

After completing the repairs, perform the following work on the operating unit ⇒ Vehicle diagnostic tester ("Guided Fault Finding"):

- Read out event memory and delete any entries displayed.



8.10 Removing and installing humidity sender - G355-

⇒ "8.10.1 Removing and installing humidity sender G355 - vehicles without front camera for driver assist systems", page 268

⇒ "8.10.2 Removing and installing humidity sender G355 - vehicles with front camera for driver assist systems", page 269

8.10.1 Removing and installing humidity sender - G355- - vehicles without front camera for driver assist systems

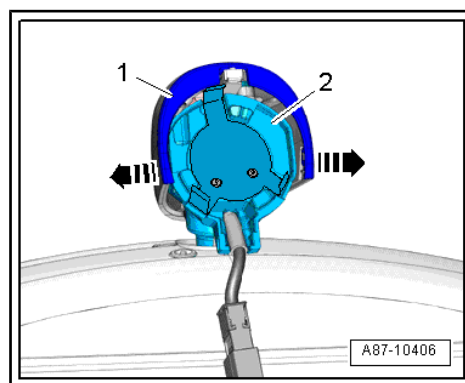


Note

- ◆ Only installed on vehicles with automatically controlled air conditioner
- ◆ Different versions ⇒ Electronic parts catalogue

Removing

- Remove interior mirror ⇒ General body repairs, interior; Rep. gr. 68 ; Interior mirror; Removing and installing interior mirror .
- Press apart cover -1- slightly on both sides -arrows- and detach cover from interior mirror base -2-.



- Unplug electrical connector -2-.
- Using a small screwdriver -3-, carefully press humidity sender - G355- item 4- off cover -1- -arrow- and at the same time pull it off upwards.

Installing

Install in reverse order of removal; note the following:

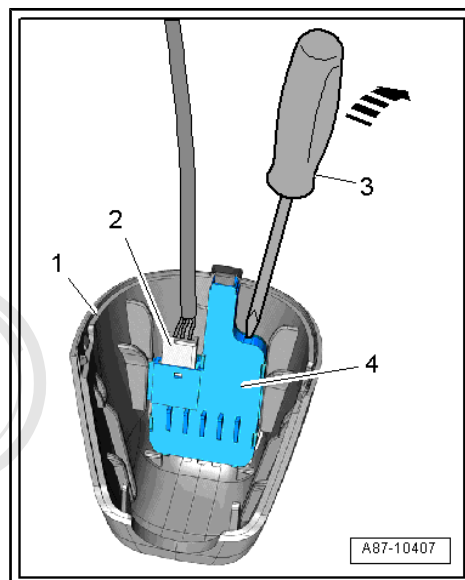
- Carefully insert humidity sender in guides at sides.



Note

The cover cannot be fitted if the humidity sender - G355- has not been inserted properly.

- Install interior mirror ⇒ General body repairs, interior; Rep. gr. 68 ; Interior mirror; Removing and installing interior mirror .



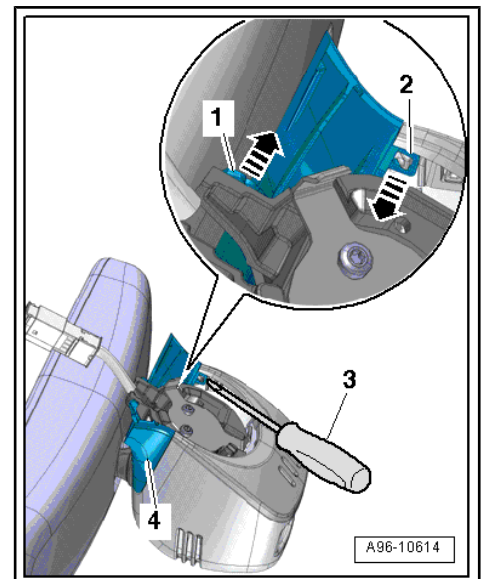
8.10.2 Removing and installing humidity sender - G355- - vehicles with front camera for driver assist systems

Note

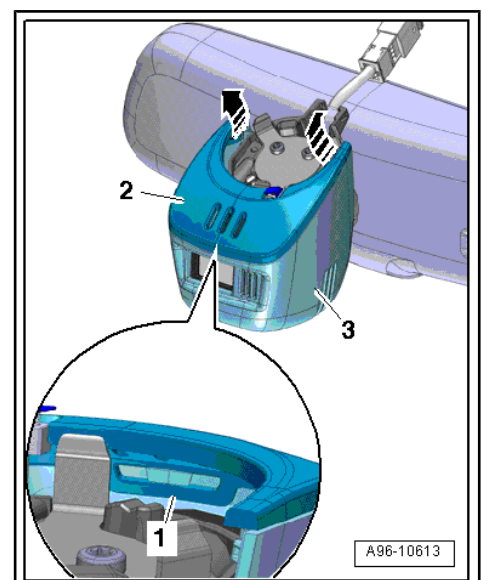
- ◆ *Only installed on vehicles with automatically controlled air conditioner*
- ◆ *Different versions ➔ Electronic parts catalogue*

Removing

- Remove interior mirror ➔ General body repairs, interior; Rep. gr. 68 ; Interior mirror; Removing and installing interior mirror .
- Release retaining tabs -1- and -2- with a screwdriver -3-.
- Disengage cover -4- at rear.

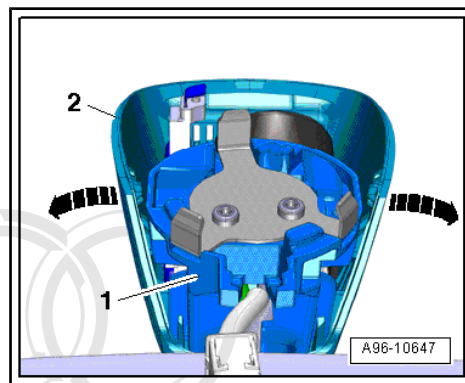


- Release retaining tabs -arrows- and carefully fold cover -2- upwards slightly at top.
- Disengage retaining tab -1- on cover -3- at front.
- Detach cover at top.



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- Disengage retaining hooks in direction of -arrows- and pull cover -2- downwards at front out of guide elements at interior mirror base -1-.

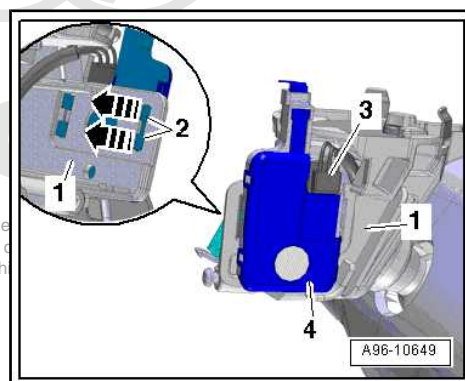


- Release retaining clips -2- -arrows- and detach humidity sender - G355- -item 4- from interior mirror base -1-.
- Unplug electrical connector -3-.

Installing

Install in reverse order of removal; note the following:

- Install interior mirror ⇒ General body repairs, interior; Rep. gr. 68 ; Interior mirror; Removing and installing interior mirror



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



Note

- ◆ Depending on the engine version, a continued coolant circulation pump - V51- / auxiliary pump for heating - V488- (different designations depending on engine version) may be fitted to assist the engine coolant pump ⇒ 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.
- ◆ 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