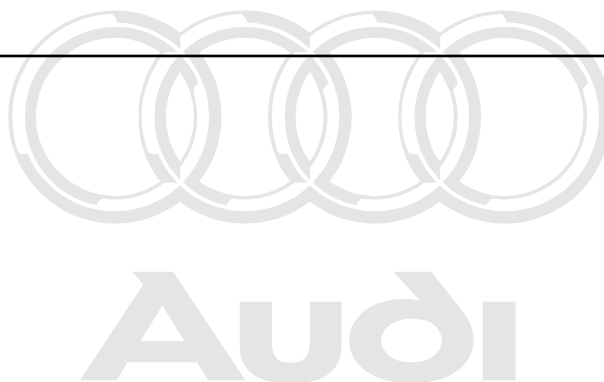




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## Workshop Manual Audi A1 2011 ➤

### Heating, air conditioning

Edition 06.2016

## 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

(ARL004619; Edition 06.2016)

⇒ [“1.1 Type plates”, page 1](#)

⇒ [“1.2 Notes on odours in vehicles without air conditioner”, page 3](#)

⇒ [“1.3 Notes on odours in vehicles with air conditioner”, page 3](#)

⇒ [“1.4 Seat heating”, page 5](#)

⇒ [“1.5 Heated rear window”, page 5](#)

⇒ [“1.6 Supplementary heater”, page 5](#)

⇒ [“1.7 Operating unit”, page 6](#)

⇒ [“1.8 Notes on control motors”, page 9](#)

#### 1.1 Type plates

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

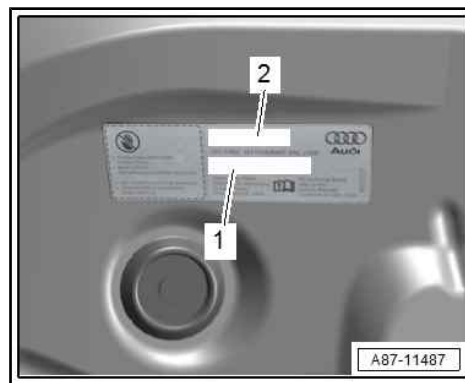


#### Note

- ◆ *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 49, ⇒ 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.*

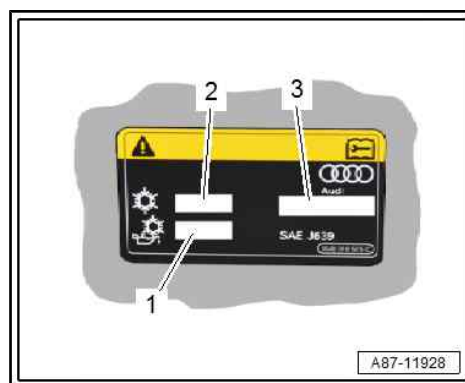
## Version "1"

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



## 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 51](#)).
- 2 - Refrigerant designation, e.g. R134a or R1234yf (depending on production date and version). Depending on the type plate version and vehicle production period, the GWP (global warming potential) value may be included for the refrigerant used ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems ("Refrigerant R134a", "Environmental aspects for refrigerant R134a"), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical and physical principles .
- 3 - Refrigerant capacity



## Note

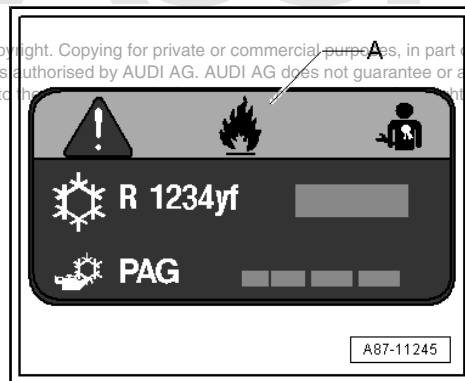
- ◆ For refrigerant R134a and refrigerant oil capacities, as well as approved refrigerant oils, refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils .
- ◆ For refrigerant R1234yf and refrigerant oil capacities as well as approved refrigerant oils, refer to ⇒ ["4 Technical data", page 49](#) , and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .

## Version "3"



## Note

Explanation of information on label -A- ⇒ [page 2](#) .



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## 1.2 Notes on odours in vehicles without air conditioner

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

| Type of odour                          | Possible cause and remedy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Smell of burnt oil                     | <ul style="list-style-type: none"> <li>◆ Usually originates in engine compartment due to leak(s) in engine or gearbox.</li> <li>– Eliminate leak(s) in engine or gearbox.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Sulphurous smell of exhaust gas        | <ul style="list-style-type: none"> <li>◆ Leak(s) in exhaust system</li> <li>◆ Exhaust gas entering passenger compartment (e.g. when reversing through a cloud of exhaust fumes)</li> <li>– Eliminate leak(s) in exhaust system.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Fishy smell of coolant                 | <ul style="list-style-type: none"> <li>◆ Leak(s) in engine cooling system or heat exchanger for heater</li> <li>– If fishy odour occurs in both fresh air and air recirculation mode, check heat exchanger for leaks.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Scorched clutch smell                  | <ul style="list-style-type: none"> <li>◆ Clutch linings worn or clutch operated incorrectly</li> <li>– Check clutch.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Other odours                           | <ul style="list-style-type: none"> <li>◆ Floor mats, retrofitted protective seat covers etc.</li> <li>– Check and renew or clean floor mats or protective covers.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Mouldy smell from front end of vehicle | <ul style="list-style-type: none"> <li>◆ Water can enter fresh air intake via drip rail if plenum chamber cover is damaged or not installed properly.</li> <li>– Check fresh air intake of heater unit ⇒ <a href="#">page 232</a>.</li> <li>◆ Deposits (leaves, pine needles etc) may have accumulated in plenum chamber.</li> <li>– Check plenum chamber for deposits ⇒ <a href="#">page 233</a>.</li> <li>◆ Water may not be able to drain out of plenum chamber.</li> <li>– Check water drains ⇒ <a href="#">page 233</a>.</li> </ul>                                                                                                                                                                                                                                                                                                                         |
| Odour from heater                      | <ul style="list-style-type: none"> <li>◆ Odours originating in the heater are usually perceptible in both fresh air mode and air recirculation mode. If an odour problem occurs only in fresh air mode or only in air recirculation mode, the heater is usually not the cause of the problem.</li> <li>◆ If a heat exchanger is leaking, the odour of the escaping coolant will be perceptible in both fresh air and air recirculation mode. However, the odour may be less noticeable in the "cold" setting of the heater control unit - J65- than in heating mode. Reason: Not all the air flows through the heat exchanger constantly; however, there is a constant flow of coolant through the heat exchanger.</li> <li>◆ Old or severely contaminated dust and pollen filter</li> <li>– Check dust and pollen filter ⇒ <a href="#">page 204</a>.</li> </ul> |

## 1.3 Notes on odours in vehicles with air conditioner

Odours coming from the air conditioner can have various causes. Not all of these odours originate in the evaporator of the air conditioning unit and can therefore be eliminated by cleaning the evaporator.

| Type of odour      | Possible cause and remedy                                                                                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Smell of burnt oil | <ul style="list-style-type: none"> <li>◆ Usually originates in engine compartment due to leak(s) in engine or gearbox.</li> <li>– Eliminate leak(s) in engine or gearbox.</li> </ul> |

| Type of odour                          | Possible cause and remedy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sulphurous smell of exhaust gas        | <ul style="list-style-type: none"> <li>◆ Leak(s) in exhaust system</li> <li>◆ Exhaust gas entering passenger compartment (e.g. when reversing through a cloud of exhaust fumes)</li> <li>– Eliminate leak(s) in exhaust system.</li> </ul>                                                                                                                                                                                                                                                                                                          |
| Fishy smell of coolant                 | <ul style="list-style-type: none"> <li>◆ Leak(s) in engine cooling system or air conditioner heat exchanger</li> <li>– If fishy odour occurs in both fresh air and air recirculation mode, check air conditioner heat exchanger for leaks.</li> </ul>                                                                                                                                                                                                                                                                                               |
| Scorched clutch smell                  | <ul style="list-style-type: none"> <li>◆ Clutch linings worn or clutch operated incorrectly</li> <li>– Check clutch.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Other odours                           | <ul style="list-style-type: none"> <li>◆ Floor mats, retrofitted protective seat covers etc.</li> <li>– Check and renew or clean floor mats or protective covers.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                        |
| Mouldy smell from front end of vehicle | <ul style="list-style-type: none"> <li>◆ Water can enter fresh air intake via drip rail if plenum chamber cover is damaged or not installed properly.</li> <li>– Check fresh air intake of air conditioning unit ⇒ <a href="#">page 232</a></li> <li>◆ Deposits (leaves, pine needles etc) may have accumulated in plenum chamber.</li> <li>– Check plenum chamber for deposits ⇒ <a href="#">page 233</a> .</li> <li>◆ Water may not be able to drain out of plenum chamber.</li> <li>– Check water drains ⇒ <a href="#">page 233</a> .</li> </ul> |
| Odour from air conditioning unit       | <ul style="list-style-type: none"> <li>◆ Too much water condensation in air conditioning unit</li> <li>– Check condensation drain ⇒ <a href="#">page 215</a> .</li> <li>◆ Old or severely contaminated dust and pollen filter</li> <li>– Check dust and pollen filter ⇒ <a href="#">page 204</a> .</li> <li>◆ Deposits on evaporator fins</li> <li>– Clean evaporator ⇒ <a href="#">page 189</a> .</li> </ul>                                                                                                                                       |



## 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 the 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            |

## 1.4 Seat heating

There is no option for the activation of the heated seats in -J65- , -J301- and -J255- . 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

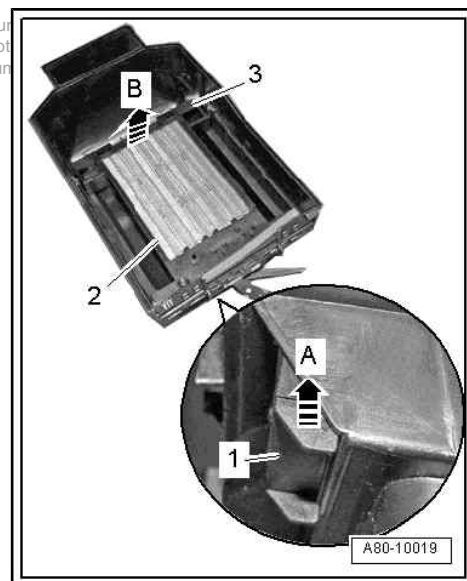
## 1.5 Heated rear window

There is no option for the activation of the heated rear window - Z1- in -J65- , -J301- and -J255- .

Checking activation signal from heated rear window ⇒ Vehicle diagnostic tester, "Guided Fault Finding" function for onboard supply control unit - J519-

## 1.6 Supplementary heater

- ◆ An electric supplementary heater is currently available for all vehicles with a TDI engine.
- ◆ A supplementary heater is currently only available for certain vehicles with a petrol engine (gradual introduction from model year 2012 onwards, depending on engine and country version).
- ◆ On vehicles with TDI engine, the electric supplementary heater ( auxiliary air heater element - Z35- ) is activated via the engine control unit. On vehicles with petrol engine, the activation procedure depends on the engine and the production date. The control units exchange the relevant information via the data bus ⇒ Vehicle diagnostic tester, "Guided Fault Finding" function and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ◆ The auxiliary air heater element - Z35- -item 2- is installed in the bottom section of the air duct housing -1- for heater ⇒ [page 199](#) .
- ◆ Checking operation and resistance value of auxiliary air heater element -Z35- ⇒ Vehicle diagnostic tester ("Guided Fault Finding")



## 1.7 Operating unit

⇒ [“1.7.1 General notes on operating unit \( air conditioning system control unit J301 \) - manually controlled air conditioner”, page 6](#)

⇒ [“1.7.2 General notes on operating unit \( Climatronic control unit J255 \) - automatically controlled air conditioner”, page 7](#)

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

- ◆ There is no option for the activation of the heated rear window - Z1- and the seat heating in -J301-. Checking heated rear window ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic tester, “Guided Fault Finding” function for onboard supply control unit - J519- ; checking seat heating ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ◆ 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- (TDI engine and certain petrol engines from model year 2012 onwards - gradual introduction), a signal is transmitted to the engine control unit via the data bus when **heat is selected as the temperature setting**.  
⇒ [“5.5 Checking auxiliary air heater element Z35”, page 196](#).  
On -J301-, there already is an output for activating -Z35- (via engine control unit) on all versions from the start of production onwards (different on heater control unit - J65- ⇒ [“5.5 Checking auxiliary air heater element Z35”, page 196](#) ).
- ◆ 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 air conditioning system control unit - J301- , no humidity sender - G355- is installed. The permissible stop time is calculated using characteristic curves which are influenced by the measured outside temperature, the function “air recirculation mode” and the status of the windscreen wipers. In order for the -J301- to allow the stop function, the time calculated must be greater than approx. 20 seconds. To prevent the front and door windows from misting up, the stop time may be reduced at low outside temperatures when the air recirculation mode is active or if it is raining. If the time calculated for the stop function is less than approx. 20 seconds, this will be prevented.
- ◆ On vehicles with 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 ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

- ◆ The text on the button for switching the air conditioner on and off varies on the air conditioning system control unit - J301- . On components with part number "8X0 820 045" (installed on vehicles with type codes "8XA" and "8X1" in vehicle identification number), the button reads AC. On components with part number "8XA 820 045" (installed on vehicles with type codes "8XF" and "8XK" in vehicle identification number), the button reads A/C. It is important to observe the correct version and assignment ⇒ Electronic parts catalogue .
- ◆ 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.

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

- ◆ There is no option for the activation of the heated rear window - Z1- and the seat heating in -J255- . Checking heated rear window ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic tester, "Guided Fault Finding" function for onboard supply control unit - J519- ; checking seat heating ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ◆ On vehicles with auxiliary air heater element - Z35- (TDI engine and certain petrol engines from model year 2012 onwards - gradual introduction), a signal is transmitted to the engine control unit via the data bus when "heat" is selected as the temperature setting  
⇒ ["5.5 Checking auxiliary air heater element Z35 ", page 196](#) .
- ◆ From model year 2012 onwards, -Z35- is also installed on vehicles with certain petrol engines (gradual introduction). The correct version of the operating unit ( Climatronic control unit - J255- , part number 8X0 820 043 from index "B" onwards) and the correct version of the engine control unit must be installed so that the operating unit -J255- and the corresponding engine control unit can activate -Z35- ⇒ Vehicle diagnostic tester and ⇒ Electronic parts catalogue .
- ◆ 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 ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ◆ Air conditioner operating units ( Climatronic control unit - J255- ) can currently be exchanged in the familiar manner (component protection not active) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ 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.
- ◆ 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 the 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 ⇒ Vehicle diagnostic tester, "Guided Fault Finding".
- ◆ On vehicles with an operating unit ( Climatronic control unit - J255- ) a humidity sender - G355- for the air conditioner control function is fitted in the interior mirror ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system . The measured values of - G355- are evaluated directly by -J255- (part number up to index "B") on vehicles up to model year 2011. From model year 2012 onwards, the measured value are evaluated by the on-board supply control unit - J519- and transmitted to -J255- (part number from index "C" onwards) via the data bus. Therefore make sure that the correct version is installed and that these components are correctly assigned ⇒ Vehicle diagnostic tester and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ◆ On vehicles with air conditioning system control unit - J301- , no humidity sender - G355- is installed. The permissible stop time is calculated using characteristic curves which are influenced by the measured outside temperature, the function "air recirculation mode" and the status of the windscreen wipers. In order for the -J301- to allow the stop function, the time calculated must be greater than approx. 20 seconds. To prevent the front and door windows from misting up, the stop time may be reduced at low outside temperatures when the air recirculation mode is active or if it is raining. If the time calculated for the stop function is less than approx. 20 seconds, this will be prevented.
- ◆ The text on the button for switching the air conditioner on and off on the operating unit ( Climatronic control unit - J255- ) varies. Up to part number 8X0 820 043 with index "B", the button's text reads  and from index "C" onwards it reads  ⇒ Electronic parts catalogue .
- ◆ There are different versions of the operating unit ( Climatronic control unit - J255- ) with different part numbers. Components with part number "8X0 820 043" are installed e.g. in vehicles with type codes "8XA" and "8X1" in the vehicle identification number. Components with part number "8XA 820 043" are installed e.g. in vehicles with type codes "8XF" and "8XK" in the vehicle identification number. It is important to observe the correct version and assignment ⇒ Electronic parts catalogue .

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

- Check coding.
- Perform basic setting.
- Check adaption if applicable.

- Interrogate event memory and delete any entries displayed.

## 1.8 Notes on control motors

⇒ [“1.8.1 Notes on control motors”, page 9](#)

⇒ [“1.8.2 Preparing adapter cable for activation of control motors”, page 10](#)

### 1.8.1 Notes on control motors



#### Caution

*Heater and air conditioner malfunctions can occur.*

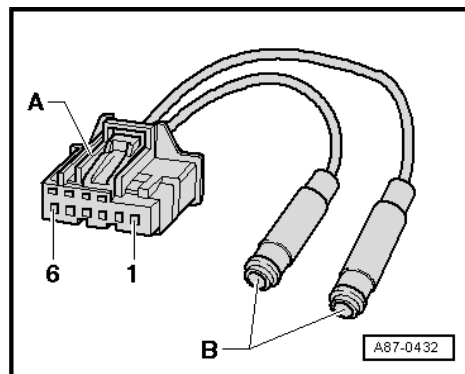
- ◆ *The heater/air conditioner will not function properly if control motors and/or the corresponding connectors are interchanged.*
- ◆ *The connectors of the control motors are identical. If these are connected incorrectly, the corresponding flaps can no longer be properly matched and/or activated.*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

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

## 1.8.2 Preparing adapter cable for activation of control motors

### Procedure

- Connect one wire each (with a cross section of 0.25 mm<sup>2</sup>) 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-.



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## 2 Safety precautions

⇒ [“2.1 Safety precautions when handling refrigerants”, page 11](#)

⇒ [“2.2 Safety precautions when working on vehicles with start/stop system”, page 13](#)

⇒ [“2.3 Safety precautions when using testers and measuring instruments during a road test”, page 13](#)

⇒ [“2.4 Safety precautions when working on the cooling system”, page 14](#)

### 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 49](#).*

#### 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

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

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).**

## 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 your eyes do not hurt.**
- ◆ **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.**



#### WARNING

*Danger from escaping pressurised refrigerant.*

*Danger of frostbite on skin and other parts of the body.*

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

## 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).*

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## 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 ⇒ Engine, mechanics; 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.*



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## 3 Repair instructions

- ⇒ [“3.1 Rules for cleanliness”, page 15](#)
- ⇒ [“3.2 General notes”, page 15](#)
- ⇒ [“3.3 General repair instructions”, page 16](#)
- ⇒ [“3.4 Contact corrosion”, page 17](#)
- ⇒ [“3.5 Routing and attaching pipes and wiring”, page 17](#)
- ⇒ [“3.6 Installing radiators and condensers”, page 17](#)
- ⇒ [“3.7 Checking heating output”, page 18](#)
- ⇒ [“3.8 Checking cooling output”, page 29](#)
- ⇒ [“3.9 Discharging refrigerant circuit”, page 45](#)
- ⇒ [“3.10 Working on refrigerant circuit”, page 46](#)
- ⇒ [“3.11 Paint repairs on vehicles with air conditioning system”, page 46](#)
- ⇒ [“3.12 Refrigerant circuit seals”, page 46](#)
- ⇒ [“3.13 Notes on dust and pollen filter”, page 47](#)

### 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 information on air conditioning systems , and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Repair instructions; Refrigerant and refrigerant oil .

### 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 11](#) ).
- ◆ 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.

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#### Note

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

If it is necessary for certain repair measures of the heater and air conditioner to discharge and open the air conditioner refrigerant circuit, the steps involved are described in the corresponding work procedure. Specific tools are required for discharging the refrigerant circuit; such work may only be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (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 information 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. Use of other parts, in part or in whole, is not recommended. Audi AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.
- ◆ 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.

## 3.7 Checking heating output

⇒ ["3.7.1 Notes on checking heating output and tools required", page 18](#)

⇒ ["3.7.2 Checking heating output - vehicles without air conditioner", page 19](#)

⇒ ["3.7.3 Checking heating output - vehicles with manually controlled air conditioner", page 23](#) .

⇒ ["3.7.4 Checking heating output - vehicles with automatically controlled air conditioner", page 25](#) .

⇒ ["5.5 Checking auxiliary air heater element Z35 ", page 196](#)

### 3.7.1 Notes on checking heating output and tools required



#### Note

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

#### Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester
- ◆ Commercially available thermometer (for measuring temperature; if applicable use thermometer with 2 probes for simultaneous measurement of temperature e.g. on right and left)
- 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 ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .

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## Note

- ◆ *On vehicles without an air conditioner, but with a start/stop system, the stop function may be disabled depending on the setting on the operating unit ( heater control unit - J65- ), e.g. in heating mode. The engine is started as soon as there is a request for heating.*
- ◆ *On vehicles with a manually controlled air conditioner and a start/stop system, the stop function may be disabled depending on the setting on the operating unit ( air conditioning system control unit - J301- ), e.g. in heating mode. The engine is started as soon as there is a request for heating. In cooling mode, there are no limitations for the stop function via the air conditioning system control unit - J301-.*
- ◆ *On vehicles with an automatically controlled air conditioner and a start/stop system, the stop function is disabled depending on the setting on the operating unit ( Climatronic control unit - J255- ). For example, the stop function is not possible, or the stop function is interrupted and the engine is switched on as soon as the "defrost" mode is selected. This also applies if the difference between the set specified temperature and the measured actual temperature exceeds a certain value in heating and cooling mode ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ◆ Depending on the engine version, the coolant circuit may be fitted with an electric coolant pump (designation: continued coolant circulation pump - V51- or auxiliary pump for heating - V488- ) 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, for example, -V51- / -V488- may be activated in "stop mode" (engine stopped) to maintain the flow of coolant through the heat exchanger.
- ◆ Depending on the engine version, a coolant shut-off valve - N82- may be installed in the coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations. -N82- is activated by the engine control unit - J623- if e.g. no heating output is being requested by -J65- / -J301- / -J255- and the engine is still cold ⇒ Vehicle diagnostic tester, "Guided Fault Finding" function (for engine control unit). No heated coolant can flow through the heat exchanger when -N82- is activated.

## 3.7.2 Checking heating output - vehicles without air conditioner

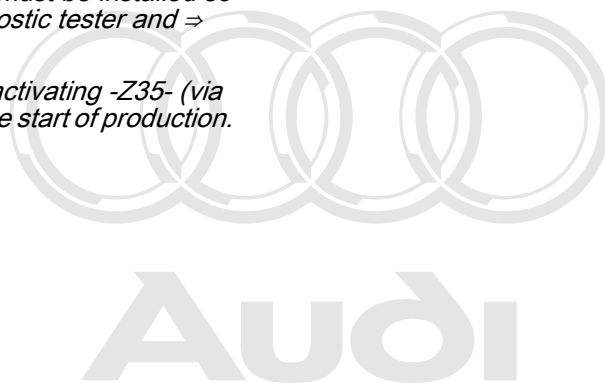
### Test requirements

- Coolant circuit bled as specified ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
- All air ducts, covers and seals OK and properly installed.
- Air flow in dust and pollen filter not impaired by dirt; checking ⇒ ["5.10 Removing and installing dust and pollen filter", page 204](#) .
- Air intake of heater (in fresh air and air recirculation mode) not impeded by dirt or retrofitted components.
- Engine warm: coolant temperature above 80 °C.

- Flexible shaft and operating lever of temperature flap OK and fitted correctly.
- Engine thermostat OK ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant .
- Foam seal at heat exchanger OK ⇒ [page 61](#) .
- On vehicles with auxiliary air heater element - Z35- , operation of supplementary heater and activation by heater control unit - J65- OK ⇒ [page 196](#) ; checking operation ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode for auxiliary air heater for engine.
- Activation of engine control unit by heater control unit - J65- OK; checking operation ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode for engine.
- On vehicles with auxiliary air heater element - Z35- , activation of -Z35- by -J255- (via engine control unit) OK; checking operation ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode for engine control unit.

**Note**

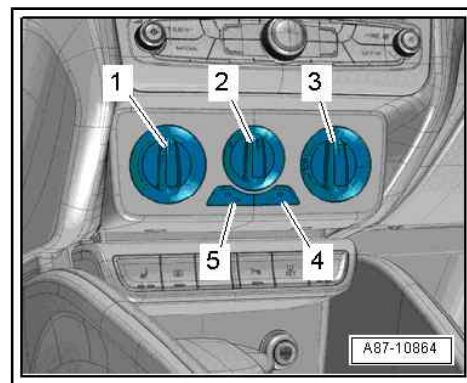
- ◆ *From model year 2012 onwards, -Z35- is also installed on vehicles with certain petrol engines (gradual introduction). The correct version of the engine control unit must be installed so that it can activate -Z35- ⇒ Vehicle diagnostic tester and ⇒ Electronic parts catalogue .*
- ◆ *On -J65- , there already is an output for activating -Z35- (via engine control unit) on all versions from the start of production.*



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## Checking

- Close bonnet, doors, windows and sunroof.
- Open all dash panel vents.
- Measure ambient temperature (temperature in workshop).
- Start the engine and make the following settings on the operating unit ( heater control unit - J65- ):
  - Set rotary temperature control -1- to “cold” stop.
  - Set rotary control -3- for air distribution to “Dash panel vents”.
  - Set rotary control -2- for fresh air blower to speed “4”.
  - Measure temperature of air emerging from dash panel vents (left and right) using a thermometer.



### Note

- ◆ *The heater operates in fresh air mode; the indicator lamp in the "Air recirculation" button -5- is not on.*
- ◆ *The fresh air blower runs at maximum speed.*

### Specifications:

- The temperature of the air emerging from the dash panel vents (left and right) should not be more than 15° C higher than the ambient temperature (measured earlier).
- The difference in the temperature of the air emerging from the left and right dash panel vents should be less than 8 °C.
- Set highest possible temperature (rotary temperature control to “warm” stop).
- Measure temperature of air emerging from dash panel vents (left and right) using a thermometer.

### Specifications:

- The temperature of the air emerging from the dash panel vents (left and right) should increase to a value above 45 °C (at an engine temperature of approx. 90 °C).
- The difference in the temperature of the air emerging from the left and right dash panel vents should be less than 8 °C.



### Note

*At ambient temperatures below 10°C, the temperature of the air emerging from the dash panel vents (left and right) will not always be higher than 45 °C if the setting "maximum fresh air blower speed, engine idling" is selected. The engine speed must therefore be increased to 1500 rpm when performing this test at low ambient temperatures.*

- 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:

- Within 5 minutes, the temperature should drop to a value that is max. 15° C higher than the ambient temperature (measured earlier).

If results do not match specifications:

If the air emerging from the vents is too warm in the "cold" setting, check the following:

- Check flexible temperature adjustment shaft and activation of temperature flaps ⇒ [page 219](#) .
- Check operation of temperature flaps in air distribution housing  
⇒ ["5.9 Removing and installing air distribution housing", page 203](#) .
- Check plenum chamber cover and seal between engine compartment and plenum chamber.

If the air emerging from the vents is too cold in the "warm" setting, check the following:

- Coolant circuit properly bled ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
- Connections between heat exchanger and coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .
- Flexible temperature adjustment shaft and activation of temperature flap (flap must reach both end stops) ⇒ [page 219](#) .
- Foam seal at heat exchanger ⇒ [page 210](#) .
- Check thermostat (engine coolant may not become properly warm if thermostat is defective) ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Checking thermostat .
- Check operation of temperature flaps in air distribution housing  
⇒ ["5.9 Removing and installing air distribution housing", page 203](#) .
- On vehicles with an electric coolant pump which assists the engine coolant pump, check the activation and operation of this pump and make sure it is incorporated correctly into the coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly .



#### Note

*An electric pump which assists the engine coolant pump is installed e.g. on vehicles with a 3-cylinder TDI engine. There are different designations for this coolant pump ( continued coolant circulation pump - V51- / auxiliary pump for heating - V488- ), depending on the engine version ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant .*

If no fault is found:

- Increase engine speed to approx. 1500 rpm and check temperature again.

If heating output is OK now:

- Check thermostat (engine coolant may not become properly warm if thermostat is defective) ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Checking thermostat .
- Check coolant pump ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant pump .

### 3.7.3 Checking heating output - vehicles with manually controlled air conditioner

#### Test requirements

- Coolant circuit bled as specified ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
- All air ducts, covers and seals OK and properly installed.
- If fitted: Operation of electric coolant pump ( continued coolant circulation pump - V51- or auxiliary pump for heating - V488- ) and coolant shut-off valve -N82- OK.
- Air flow in dust and pollen filter not impaired by dirt; checking ⇒ ["5.10 Removing and installing dust and pollen filter", page 204](#) .
- Vehicle not exposed to sunlight.
- Engine warm: coolant temperature above 80 °C.
- Event memory of operating unit ( air conditioning system control unit - J301- ) interrogated and erased, basic setting performed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- On vehicles with auxiliary air heater element - Z35- , activation of -Z35- by -J301- (via engine control unit) OK; checking ⇒ [page 196](#) and ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode for engine control unit.



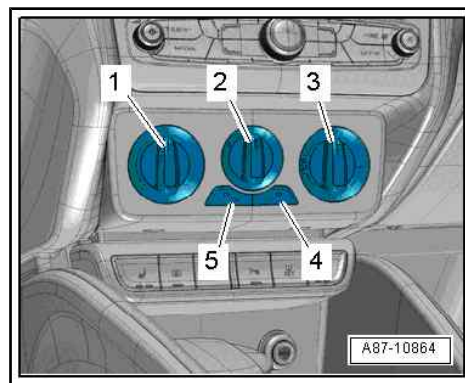
#### Note

*From model year 2012 onwards, -Z35- is also installed on vehicles with certain petrol engines (gradual introduction). The correct version of the engine control unit must be installed so that it can activate -Z35- ⇒ Vehicle diagnostic tester and ⇒ Electronic parts catalogue .*

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## 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 -4-on).
- With the engine running, operate the air conditioner for several minutes at maximum cooling output.
- Set rotary control -3- for air distribution to “Dash panel vents”.
- Set rotary control -2- for fresh air blower to speed “4”.
- Use a thermometer to measure temperature of air emerging from dash panel vents (left and right).
- Compare measured values to measured value displayed (for evaporator output temperature sender - G263- ). 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 highest possible temperature (rotary temperature control to “warm” stop).
- Measure temperature of air emerging from dash panel vents (left and right) using a thermometer.

## Specifications:

- Temperature increases to above 45 °C (with engine temperature of approx. 90 °C), difference between left and right side less than 8 °C.



## Note

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*At ambient temperatures below 10 °C, the temperature of the air emerging from the dash panel vents (left and right) will not always be higher than 45 °C if the setting “maximum fresh air blower speed, engine idling” is selected. The engine speed must therefore be increased to 1500 rpm when performing this test at low ambient temperatures.*

- 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).

If results do not match specifications:

If the air emerging from the vents is too warm in the “cold” setting, check the following:

- Air conditioner cooling output ⇒ [page 29](#) .

If the air emerging from the vents is too cold in the "warm" setting, check the following:

- Coolant circuit properly bled ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
- Connections between heat exchanger and coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .
- Flexible temperature adjustment shaft and activation of temperature flap (flap must reach both end stops) ⇒ [page 219](#) .
- Foam seal at heat exchanger ⇒ [page 210](#) .
- Operation of temperature flaps in air distribution housing ⇒ ["5.9 Removing and installing air distribution housing", page 203](#)
- Check thermostat (engine coolant may not become properly warm if thermostat is defective) ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant .
- Check operation of temperature flaps in air distribution housing ⇒ ["5.9 Removing and installing air distribution housing", page 203](#) .
- On vehicles with an electric coolant pump which assists the engine coolant pump, check the activation and operation of this pump and make sure it is incorporated correctly into the coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly .



#### Note

*An electric pump which assists the engine coolant pump is installed e.g. on vehicles with a 3-cylinder TDI engine. There are different designations for this coolant pump ( continued coolant circulation pump - V51- / auxiliary pump for heating - V488- ), depending on the engine version ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant .*

If no fault is found:

- Increase engine speed to approx. 1500 rpm and check temperature again.

If heating output is OK now:

- Check thermostat (engine coolant may not become properly warm if thermostat is defective) ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Checking thermostat .
- Check coolant pump ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant pump .

### 3.7.4 Checking heating output - vehicles with automatically controlled air conditioner

#### Test requirements

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

- Air flow in dust and pollen filter not impaired by dirt; checking  
⇒ ["5.10 Removing and installing dust and pollen filter"](#),  
[page 204](#) .
- If fitted: Operation of electric coolant pump ( continued coolant  
circulation pump - V51- or auxiliary pump for heating - V488- )  
and coolant shut-off valve -N82- OK.
- Vehicle not exposed to sunlight.
- Engine warm: coolant temperature above 80 °C.
- Event memory of operating unit ( Climatronic control unit -  
J255- ) interrogated and erased, basic setting performed ⇒ Ve-  
hicle diagnostic tester ("Guided Fault Finding").
- Encoding and adaption of operating unit ( Climatronic control  
unit - J255- ) checked ⇒ Vehicle diagnostic tester ("Guided  
Fault Finding").
- On vehicles with auxiliary air heater element - Z35- , activation  
of -Z35- by -J255- (via engine control unit) OK; checking  
⇒ [page 196](#) and ⇒ Vehicle diagnostic tester in "Guided Fault  
Finding" mode for engine control unit.

**Note**

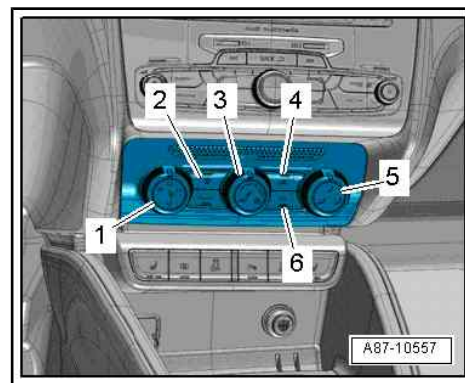
*From model year 2012 onwards, -Z35- is also installed on vehicles with certain petrol engines (gradual introduction). The correct version of the operating unit ( Climatronic control unit - J255- , part number 8X0 820 043 from index "B" onwards) and the correct version of the engine control unit must be installed so that the operating unit -J255- and the corresponding engine control unit can activate -Z35- ⇒ Vehicle diagnostic tester and ⇒ Electronic parts catalogue .*



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## Checking

- Close doors, bonnet, windows, sunroof and rear lid.
- Open all dash panel vents.
- Start the engine and make the following settings on the operating unit:
  - Set rotary temperature control -1- to “LO” stop.
  - Air conditioner compressor on (lamp in **AC** or **A/C** button -6-on).
- With the engine running, operate the air conditioner for several minutes at maximum cooling output.
- Read out measured values for centre vent temperature sender - G191- and footwell vent temperature sender - G192- → Vehicle diagnostic tester, “Guided Fault Finding”.
- Compare measured values on display.



## Specifications:

- Temperature max. 12 °C (depending on ambient temperature), difference between measured values less than 3 °C.
- Set air distribution to dash panel and footwell vents.



## Note

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

- Set highest possible temperature (rotary temperature control to “Hi”).
- Read out measured values for centre vent temperature sender - G191- and footwell vent temperature sender - G192- .

## Specifications:

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 In the display zone with the measured value for -G191- / -G192- the temperature increases to a value above 45 °C (at an engine temperature of approx. 90 °C).



## Note

*At ambient temperatures below 10 °C, the temperature of the air emerging from the dash panel vents (left and right) will not always be higher than 45 °C if the setting “maximum fresh air blower speed, engine idling” is selected. The engine speed must therefore be increased to 1500 rpm when performing this test at low ambient temperatures.*

- Set lowest possible temperature (rotary temperature control to “LO”).
- Read out measured values for -G191- / -G192- .

## Specifications:

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

If results do not match specifications:

If the air emerging from the vents is too warm in the “cold” setting, check the following:

- Air conditioner cooling output ⇒ [page 29](#) .

If the air emerging from the vents is too cold in the "warm" setting, check the following:

- Coolant circuit properly bled ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
- Connections between heat exchanger and coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .
- Activation and operation of temperature flap control motor - V68- ⇒ Vehicle diagnostic tester, "Guided Fault Finding".
- Foam seal at heat exchanger for heater of air conditioning unit ⇒ [page 210](#)
- Operation of temperature flaps in air distribution housing ⇒ ["5.9 Removing and installing air distribution housing", page 203](#)
- Check thermostat (engine coolant may not become properly warm if thermostat is defective) ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Checking thermostat .
- On vehicles with an electric coolant pump which assists the engine coolant pump, check the activation and operation of this pump and make sure it is incorporated correctly into the coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly .



#### Note

*An electric pump which assists the engine coolant pump is installed e.g. on vehicles with a 3-cylinder TDI engine. There are different designations for this coolant pump (continued coolant circulation pump - V51- / auxiliary pump for heating - V488- ), depending on the engine version ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant .*

If no fault is found:

- Increase engine speed to approx. 1500 rpm and check temperature again.

If heating output is OK now:

- Check thermostat (engine coolant may not become properly warm if thermostat is defective) ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Checking thermostat .
- Check coolant pump ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant pump .
- If fitted: Check operation of continued coolant circulation pump - V51- ( auxiliary pump for heating - V488- ) and coolant shut-off valve - N82- ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

## 3.8 Checking cooling output

⇒ [“3.8.1 Notes on checking cooling output and tools required”, page 29](#)

⇒ [“3.8.2 Requirements for checking cooling output of air conditioner”, page 29](#)

⇒ [“3.8.3 Checking cooling output - vehicles with manually controlled air conditioner”, page 32](#)

⇒ [“3.8.4 Checking cooling output - vehicles with automatically controlled air conditioner”, page 37](#)

⇒ [“3.8.5 Fault Finding if results do not match specifications”, page 42](#)

⇒ [“3.8.6 Fault Finding if temperature increases downstream of evaporator”, page 43](#)

⇒ [“3.8.7 Fault Finding if ice forms at evaporator”, page 43](#)

### 3.8.1 Notes on checking cooling output and tools required

#### 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 a start/stop system and an automatically controlled air conditioner, the stop function is disabled depending on the setting on the air conditioning system control unit - J301-. In heating mode for example, the stop function is not possible or the stop function is interrupted and the engine is started as soon as a request for heating is detected. In cooling mode, there are no limitations for the stop function via the air conditioning system control unit - J301-. For checking, select “Read measured values” in “Guided Fault Finding” mode for air conditioner ⇒ Vehicle diagnostic tester.*
- ◆ *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. For checking, select “Read measured values” in “Guided Fault Finding” mode for air conditioner ⇒ Vehicle diagnostic tester.*

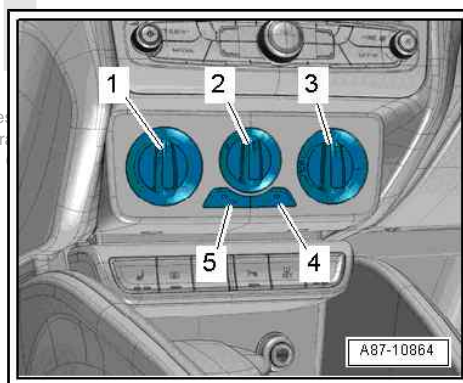
### 3.8.2 Requirements for checking cooling output of air conditioner

- 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.
- All air ducts, covers and seals OK and properly installed.

- Air flow in dust and pollen filter not impaired by dirt; checking  
⇒ ["5.10 Removing and installing dust and pollen filter", page 204](#).
- Air intake of air conditioning unit (in fresh air and air recirculation mode) not impeded by dirt or retrofitted components.
- Vehicle not exposed to sunlight.
- Engine warm: coolant temperature above 80 °C.
- Event memory of operating unit ( air conditioning system control unit - J301- / Climatronic control unit - J255- ) interrogated and erased, basic setting performed and coding checked for - J301- / -J255- ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- Adaption of -J301- / -J255- checked ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- All dash panel vents open.
- Air outlet from rear footwell vents (beneath front seats) not obstructed by floor mats or other objects; check.
- Bonnet closed.
- Engine running.

#### Vehicles with manually controlled air conditioner:

- Make the following settings on the operating unit ( air conditioning system control unit - J301- ):
- Set rotary temperature control -1- to "cold" stop.
- Air conditioner compressor on (lamp in **AC** or **A/C** button -4- on).
- Air recirculation mode on (lamp in "Air recirculation" button -5- on).
- Set rotary control -3- for air distribution to "Dash panel vents".
- Set rotary control -2- for fresh air blower to speed "4".



### Vehicles with automatically controlled air conditioner:

- Make the following settings on the operating unit ( Climatronic control unit - J255- ):
  - “Auto” mode (lamp in **AUTO** button on).
  - Set rotary temperature control -1- to “cold” stop.
  - Set rotary control -5- for air distribution to “Dash panel vents”.
  - Air conditioner compressor on (lamp in **AC** or **A/C** button -6- on).

### All vehicles (continued):

Functions with engine running:

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



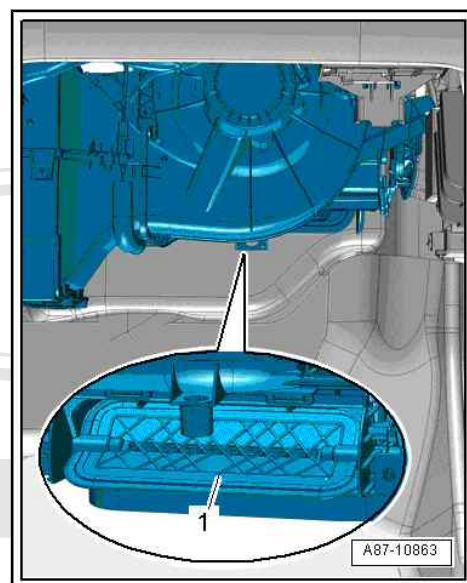
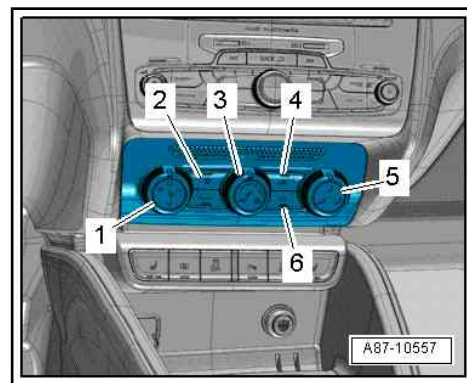
### Note

- ◆ Depending on the version of the operating unit -J301- / -J255-, the radiator fan(s) -V7- / -V177- is/are either switched on immediately or not switched on until a certain pressure is reached in the refrigerant circuit (currently 9 bar). Activation of the radiator fan(s) is displayed in the “Read measured values” function ⇒ Vehicle diagnostic tester, “Guided Fault Finding”.
- ◆ If one of these test requirements is not met, interrogate event memory, perform final control diagnosis and read out measured values of operating unit ( Climatronic control unit - J255- ) ⇒ Vehicle diagnostic tester, “Guided Fault Finding”.
- ◆ Depending on the vehicle version, radiator fan 2 - V177- may also be fitted ⇒ Engine, mechanics; Rep. gr. 19; Radiator/radiator fans; Exploded view - radiator/radiator fans .

- The fresh air blower runs at maximum speed.
- The air conditioner switches to air recirculation mode. Approx. 1 minute after starting the engine, the air flow/fresh air flap is closed and the air recirculation flap -1- is opened; air is drawn in by the fresh air blower from the passenger compartment beneath the dash panel/behind the glove box.

If one of these requirements is not met:

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



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### 3.8.3 Checking cooling output - vehicles with manually controlled air conditioner



#### Note

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

#### Procedure

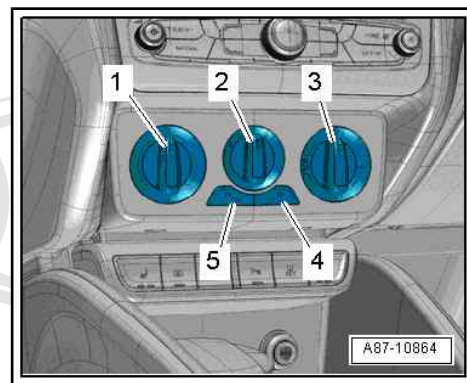
- Requirements for checking cooling output met ⇒ [page 29](#)
- Measure ambient temperature: It must be over 15 °C.
- Close doors, bonnet, windows, sunroof and rear lid.
- Open all dash panel vents.
- Start engine.

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- Press the **[AC]** (or **[A/C]**) button -4- to switch off the air conditioner at the operating unit.
- Lamp in **[AC]** (or **[A/C]**) button is not lit.
- “Read measured values” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

### Checking

- Read out activation of air conditioner compressor regulating valve -N280- .
- Activation of air conditioner compressor is switched off, 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 display (in bar absolute) |
|---------------------------|------------------------------------|
| 15                        | 4.0                                |
| 20                        | 5.0                                |
| 25                        | 6.0                                |
| 30                        | 7.0                                |
| 35                        | 8.0                                |

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### Note

- ◆ *On the absolute pressure scale, 0 bar corresponds to an absolute vacuum. Normal ambient pressure thus corresponds to approx. 1 bar absolute and 0 bar gauge pressure. On the scales of most pressure gauges, 0 bar gauge pressure corresponds to an absolute pressure of 1 bar (can be seen from -1 mark below 0).*
- ◆ *Currently the measured values for this vehicle are only 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 displayed pressure in the refrigerant circuit is lower than that indicated in the table:

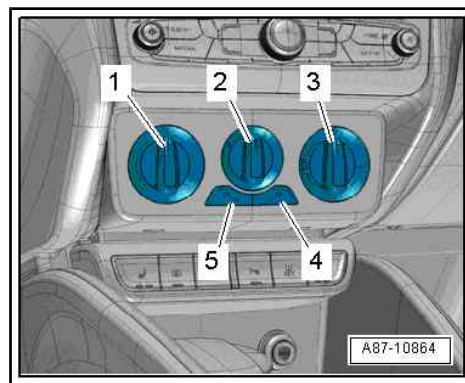
- Check signal of -G65- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

If no fault is found on -G65- , there is not enough refrigerant in the circuit.

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

If pressure displayed in refrigerant circuit is OK:

- Make the following settings on operating unit -J301- :
  - Set rotary temperature control -1- to “cold” stop.
  - Set rotary control -3- for air distribution to “Dash panel vents”.
  - Air conditioner compressor on (lamp in **AC** or **A/C** button -4-on).
  - Air recirculation mode on (lamp in "Air recirculation" button -5- on).
  - Set rotary control -2- for fresh air blower to speed “4”.
- “Read measured values” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- Check display in display zones:
  - Current calculated by air conditioning system control unit - J301- that flows via air conditioner compressor regulating valve - N280- is displayed as greater than 0.3 A (30 %) with air conditioner compressor switched on.
  - Pressure indicated rises above value with air conditioner compressor switched off.



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

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

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

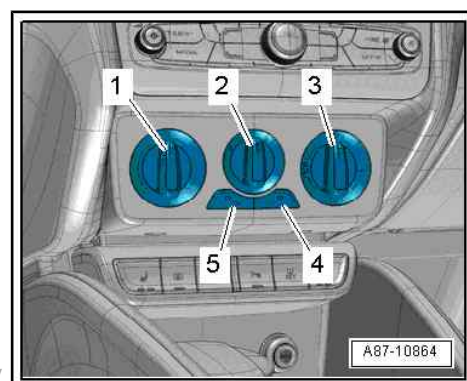
- The necessary work may only be performed by appropriately qualified personnel. If this is not possible on your premises, the vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant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



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# Note

- ◆ *-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 greater than 0.55 A is displayed for the activation of the air conditioner compressor regulating valve - N280- depending on the measured temperature, engine speed and voltage of 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 43](#) .*
  - ◆ *If no current is displayed in the measured values for the activation of the air conditioner compressor regulating valve - N280- or if the current is too low, check the activation of -N280- ⇒ Vehicle diagnostic tester, "Guided Fault Finding".*
- Press "Air recirculation" button -5- 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" ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



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

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

B - Ambient temperature

C - Permissible tolerance range

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

If specified values are not attained:

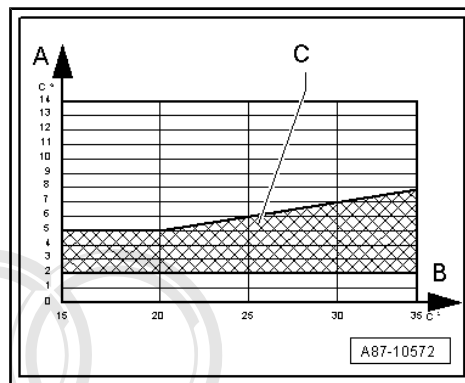
- Use a thermometer to measure temperature of air emerging from dash panel vents (left and right).
- Compare measured value to measured value displayed for evaporator output temperature sender - G263- .

If measured values only differ slightly:

- Perform Fault Finding measures to be taken if results do not match specification ⇒ [page 42](#) .

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

- Check that -G263- is correctly installed ⇒ [page 244](#) and perform electrical check for this sender ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



## Note

*The operation of the air conditioner can be detected e.g. from the fact that the refrigerant pipe on the low-pressure side (thick pipe from internal heat exchanger to air conditioner compressor) cools down ⇒ [page 89](#) .*

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

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

If measured values determined are lower:

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

If specified values are not attained:

- Check activation and operation of temperature flap. To do so, perform Fault Finding in the event of an increase in temperature downstream of the evaporator ⇒ [page 43](#) and ⇒ Vehicle diagnostic tester, "Guided Fault Finding".

### 3.8.4 Checking cooling output - vehicles with automatically controlled air conditioner



#### Note

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

#### Procedure

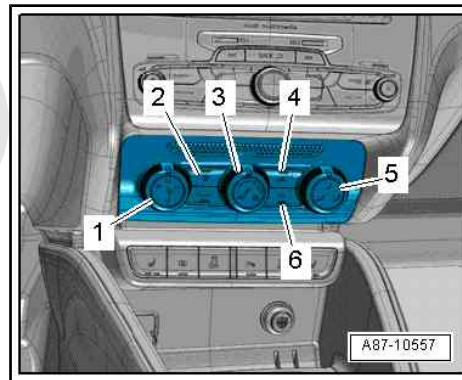
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- ◆ Requirements for checking cooling output met ⇒ [page 29](#)
- Measure ambient temperature: It must be over 15 °C.
- Close doors, bonnet, windows, sunroof and rear lid.
- Open all dash panel vents and any vents in rear centre console.
- Start engine.

- To switch off the air conditioner at the operating unit ( Climatronic control unit - J255- ), press the **[AC]** (or **[A/C]**) button -6-.
- Lamp in **[AC]** (or **[A/C]**) button is not lit.

### Checking

- Read out activation of air conditioner compressor regulating valve -N280- .
- The activation of air conditioner compressor is deactivated (via -N280- ): Display is 0 A (amps) or 0 %.
- Read measured value of pressure sender for refrigerant circuit -G65- .
- Pressure in refrigerant circuit is identical to or above value in table below (depending on ambient temperature).



| Ambient temperature in °C | Pressure display (in bar absolute) |
|---------------------------|------------------------------------|
| 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 approx. 1 bar absolute and 0 bar gauge pressure. On the scales of most pressure gauges, 0 bar gauge pressure corresponds to an absolute pressure of 1 bar (can be seen from -1 mark below 0).
- ◆ The pressure in the refrigerant circuit depends on the ambient temperature. Due to the radiation of heat by components (e.g. radiator), the pressure displayed when the engine is warm is slightly higher than that given for the corresponding ambient temperature.

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

- Check signal of -G65- ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

If no fault is found on -G65- , there is not enough refrigerant in the circuit.

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

If pressure displayed in refrigerant circuit is OK:

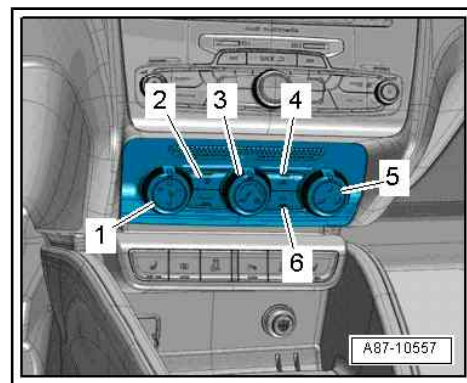
- Make the following settings on operating unit -J255- :
  - “Auto” mode (lamp in **AUTO** button on).
  - Set rotary temperature control -1- to “cold” stop.
  - Set rotary control -5- for air distribution to “Dash panel vents”.
  - Air conditioner compressor on (lamp in **AC** or **A/C** button -6-on).
- “Read measured values” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- Check display in display zones:
  - A current above 0.3 A (30%) is displayed (current flowing via air conditioner compressor regulating valve - N280- ): Air conditioner compressor is switched on.
  - 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.

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

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

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

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

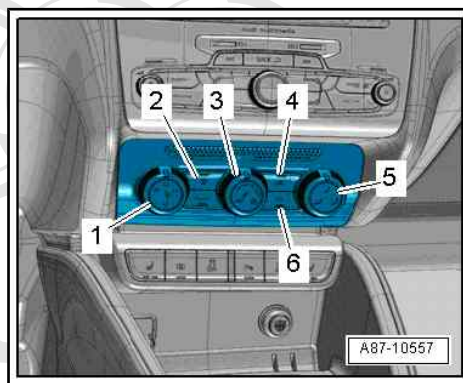




## Note

- ◆ *-N280- is activated by -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 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, 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 43](#) .*
- ◆ *If no current is displayed in the measured values for the activation of the air conditioner compressor regulating valve - N280- or if the current is too low, check the activation of -N280- ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*

- Press "Air recirculation" button -4- on 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" ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



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

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

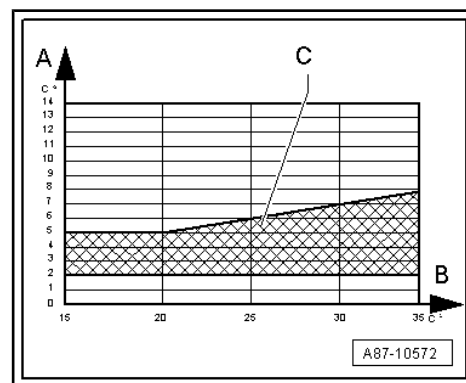
B - Ambient temperature

C - Permissible tolerance range

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

If specified values are not attained:

- Compare measured values for centre vent temperature sender - G191- with measured value displayed for evaporator output temperature sender - G263- ⇒ Vehicle diagnostic tester, "Guided Fault Finding".



#### Note

*The temperature of the air flowing out of the centre dash panel vents can also be measured e.g. using a commercially available thermometer.*

If measured values for -G263- and -G191- only differ slightly:

- Perform Fault Finding measures to be taken if results do not match specification ⇒ [page 42](#).

If measured value for evaporator output temperature sender - G263- is higher than measured value for -G191- :

- Check that -G263- is correctly installed ⇒ [page 244](#) and perform electrical check for this sender ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



#### Note

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

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

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

- Perform Fault Finding if results do not match specification (required cooling output is not attained) ⇒ [page 42](#).

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

- Check activation of temperature flaps in air conditioning unit ⇒ [page 18](#) and ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

**Note**

- ◆ Depending on the operating unit ( Climatronic control unit - J255- ), the temperature flap control motor - V68- on vehicles manufactured in 2010 may also be displayed as the left temperature flap control motor - V158- ⇒ Vehicle diagnostic tester, "Guided Fault Finding".
- ◆ If no fault can be determined for the centre vent temperature sender - G191- or the temperature flap control motor - V68- , perform the Fault Finding for cases in which there is a temperature increase downstream of the evaporator  
⇒ [page 43](#) .
- ◆ If there are differences in the temperature of the air flowing out of the vents in the same setting (in control mode), there are several possible causes: The temperature flaps in the air distribution housing do not close fully or do not reach their final position  
⇒ ["5.9 Removing and installing air distribution housing", page 203](#) and ⇒ Vehicle diagnostic tester, "Guided Fault Finding".  
There is air in the heat exchanger, causing uneven coolant flow and heat distribution in the heat exchanger; or the foam seal was loosened when the heat exchanger was installed, allowing air to flow past the heat exchanger.

### 3.8.5 Fault Finding if results do not match specifications

Required cooling output is not attained ⇒ [page 32](#) and  
⇒ [page 37](#) .

**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.



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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 information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations . Inform the workshop of the problem detected.

### 3.8.6 Fault Finding if temperature increases downstream of evaporator

The increase in temperature in the air conditioning unit is excessive ⇒ [page 32](#) and ⇒ [page 37](#) .



#### 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 -J301- / -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 above 0.55 A (75 %) may be displayed in the "Read measured values" function for the operating unit -J301- / -J255- for the activation of the air conditioner compressor regulating valve - N280- depending on the measured temperature, engine speed and voltage of vehicle electrical system ⇒ Vehicle diagnostic tester "Guided Fault Finding" function. As soon as the temperature measured by the evaporator output temperature sender - G263- approaches the specified value, the activation is reduced and the compressor output is decreased.

- ◆ Under extreme ambient conditions ice could form at the evaporator if certain settings are selected on the air conditioner, e.g. air outflow direction set to dash panel vents with these vents closed, maximum cooling output with minimum fresh air blower speed selected. When these settings are selected, air no longer flows through the evaporator, which means that the temperature measured by the evaporator output temperature sender - G263- is higher than the actual temperature at the evaporator. However, the air conditioner control uses the measured value of -G263- as the basis for the actual evaporator temperature and continues to activate -N280-, as a consequence, the evaporator cools down too much.
- ◆ Under certain operating conditions, residual moisture in the refrigerant circuit may lead to the formation of ice at the compressor regulating valve and expansion valve. Such ice formation impedes the control of the air conditioner compressor. The evaporator is cooled down too much and ices up. An iced-up evaporator may cause the following problems  
⇒ [page 44](#) .

Possible customer complaint:

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

Remedy:

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

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

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

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

- The necessary work may only be performed by appropriately qualified personnel. If this is not possible on your premises, the vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations . Inform the workshop of the problem detected.
- Check the refrigerant line between the internal heat exchanger (evaporator) and the air conditioner compressor (thick pipe, low-pressure side) with the engine running.

If this line is severely iced up when problem occurs (thin layer of ice is permissible), this also indicates that evaporator temperature is too low. There may be problems with the control of the air conditioner compressor.

- The necessary work may only be performed by appropriately qualified personnel. If this is not possible on your premises, the vehicle must be taken to a workshop equipped with the

necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations . Inform the workshop of the problem detected.

### 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 equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations .

#### Reason:

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



#### Note

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



#### WARNING

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

- ◆ *Exposure to heat generates considerable pressure in the air conditioning system, which could cause it to burst.*
- ◆ *Welding, brazing and soldering work must not be performed on components of air conditioning system when charged. This also applies to welding and soldering work on the vehicle if there is a danger of air conditioner components becoming hot.*
- ◆ *Renew damaged or leaking components of the air conditioner.*



#### Caution

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

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

### 3.11 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:

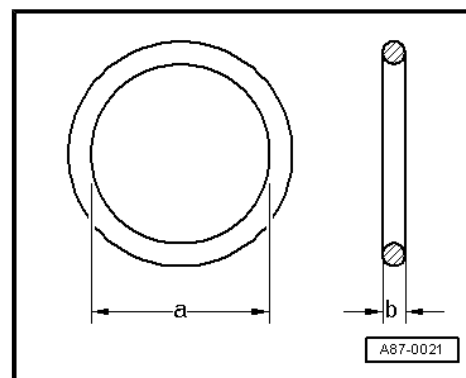
Exposure to heat generates considerable pressure in the system, which could cause it to burst.

### 3.12 Refrigerant circuit seals

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

### Note

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



## 3.13 Notes on dust and pollen filter

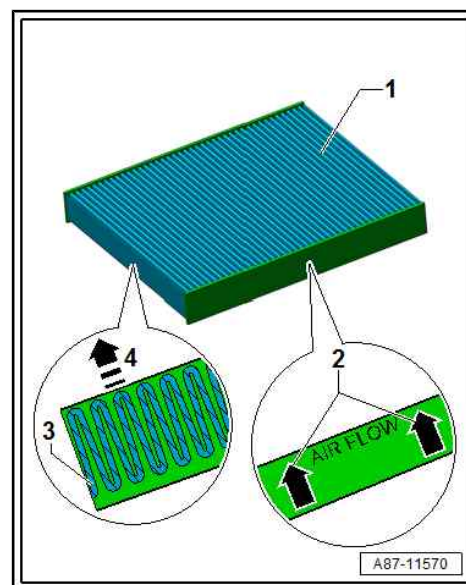
⇒ "3.13.1 Notes on dust and pollen filter", page 47

⇒ "3.13.2 Dust and pollen filter with activated charcoal filter insert", page 47

### 3.13.1 Notes on dust and pollen filter

### Note

- ◆ Different versions: Vehicles without an air conditioner or with a manually controlled air conditioner are currently fitted with a dust and pollen filter without activated charcoal filter insert, whereas vehicles with an automatically controlled air conditioner are equipped with a filter with an activated charcoal filter insert ⇒ *Electronic parts catalogue*.
- ◆ The dust and pollen filter -1- is available in different versions (installed in heater/air conditioning unit with or without filter frame). Pay attention to the correct version and assignment of the dust and pollen filter, the filter frame and the slot cover (slot cover with additional guide in version for dust and pollen filter without filter frame) ⇒ *Electronic parts catalogue*.
- ◆ The version of the dust and pollen filter -1- that is installed without a filter frame is slightly larger than the version installed with a filter frame (outer dimensions approx. 224 mm x 255 mm x 36 mm vs. 216 mm x 252 mm x 32 mm).
- ◆ Depending on the version and manufacturer of the dust and pollen filter -1-, the direction of air flow may be marked on the filter with arrows -2-. If you are using a dust and pollen filter without arrow marks -2-, pay attention to the direction of air flow; it varies depending on the filter version.
- ◆ On the filter version that is installed without the use of a filter frame the direction of air flow can be identified by the folds of the filter paper -3- and arrow -4-. On the filter version that is installed with a filter frame, the arrow -4- points towards the fresh air blower - V2- (direction opposite to air flow), and the first layer of the filter paper (may be slightly shorter than in illustration) is inserted in the filter frame mounting.



### 3.13.2 Dust and pollen filter with activated charcoal filter insert

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 pre-

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vent 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 “automatic air recirculation” function 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.*



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## 4 Technical data

⇒ [“4.1 Refrigerant capacities”, page 49](#)

⇒ [“4.2 Approved refrigerant oils and refrigerant oil capacities”, page 51](#)

⇒ [“4.3 Oil distribution”, page 55](#)

### 4.1 Refrigerant capacities

⇒ [“4.1.1 Capacities for refrigerant R134a”, page 49](#)

⇒ [“4.1.2 Capacities for refrigerant R1234yf”, page 50](#)

#### 4.1.1 Capacities for refrigerant R134a

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

- 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 123](#)



#### 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 notes refer to ⇒ [page 1](#) and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit .*



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## 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 54 , 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 123](#)

### Capacity for refrigerant R1234yf

| Vehicle model | Production period  | Capacity in grams       | Differing characteristics of this refrigerant circuit |
|---------------|--------------------|-------------------------|-------------------------------------------------------|
| Audi A1       | From 06.16 onwards | 450 <sup>+</sup> / - 15 | • None                                                |

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## 4.2 Approved refrigerant oils and refrigerant oil capacities

⇒ ["4.2.1 Approved refrigerant oils and refrigerant oil capacities for refrigerant R134a", page 51](#)

⇒ ["4.2.2 Approved refrigerant oils for refrigerant R1234yf", page 52](#)

⇒ ["4.2.3 Refrigerant oil capacities in refrigerant circuits for refrigerant R1234yf", page 54](#)

### 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 123](#) , and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (Air conditioner with refrigerant R134a, General information on air conditioning systems). Before using air conditioner after system has been re-charged.



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

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

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

- ◆ ***Too much refrigerant oil in the refrigerant circuit results in higher pressures and a reduction in the cooling output of the system.***
- ◆ ***Too little refrigerant oil in the refrigerant circuit may result in failure of the air conditioner compressor due to lubrication problems.***

***Risk of corrosion in refrigerant circuit.***

- ◆ ***Refrigerant oil absorbs moisture. Never use refrigerant oil from containers which have been open for a lengthy period ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems .***

#### Important information:

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

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**Important information:**

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

 **Note**

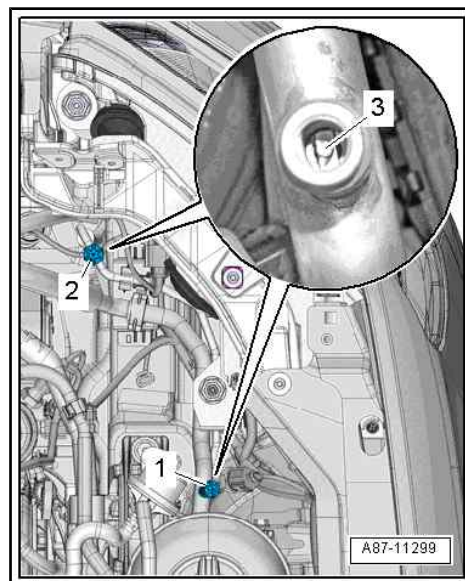
- ◆ *A use-by date for the refrigerant oil is stated on the bottle in which the refrigerant oil is supplied.*
- ◆ *This date is not relevant if the bottle is sealed air-tight.*
- ◆ *If the bottle is sealed air-tight, the refrigerant oil can also be used after the date stated on the bottle.*
- ◆ The refrigerant 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 89](#) .



⇒ ["4.2.3 Refrigerant oil capacities in refrigerant circuits for refrigerant R1234yf", page 54](#)

## 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", "Visteon" and "Sanden" air conditioner compressors ⇒ ["4.2.2 Approved refrigerant oils for refrigerant R1234yf", page 52](#) , 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 52](#)
- ◆ Layout and characteristics of refrigerant circuit ⇒ ["2.1 System overview - refrigerant circuit", page 89](#)

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| Vehicle model | Production period  | Total quantity of oil in refrigerant circuit in cm <sup>3</sup> | Quantity of refrigerant oil in replacement compressor in cm <sup>3</sup> | Differing characteristics of this refrigerant circuit |
|---------------|--------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------|
| Audi A1       | 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             |



#### 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 56](#)

⇒ [“1.2 Overview of fitting locations - components in passenger compartment \(front\)”, page 57](#)

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

##### 1 - Fresh air intake grille

- ☐ Removing and installing  
⇒ [page 232](#)

##### 2 - Water drain (right-side)

- ☐ Checking ⇒ [page 233](#)

##### 3 - Forced ventilation vent (left-side)

- ☐ Checking ⇒ [page 230](#)
- ☐ Removing and installing  
⇒ [page 231](#)

##### 4 - Forced ventilation vent (right-side)

- ☐ Checking ⇒ [page 230](#)
- ☐ Removing and installing  
⇒ [page 231](#)

##### 5 - Heated rear window - Z1-

- ☐ Not part of heater controls
- ☐ Checking activation  
⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode for on-board supply control unit - J519- and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

##### 6 - Water drain (left-side)

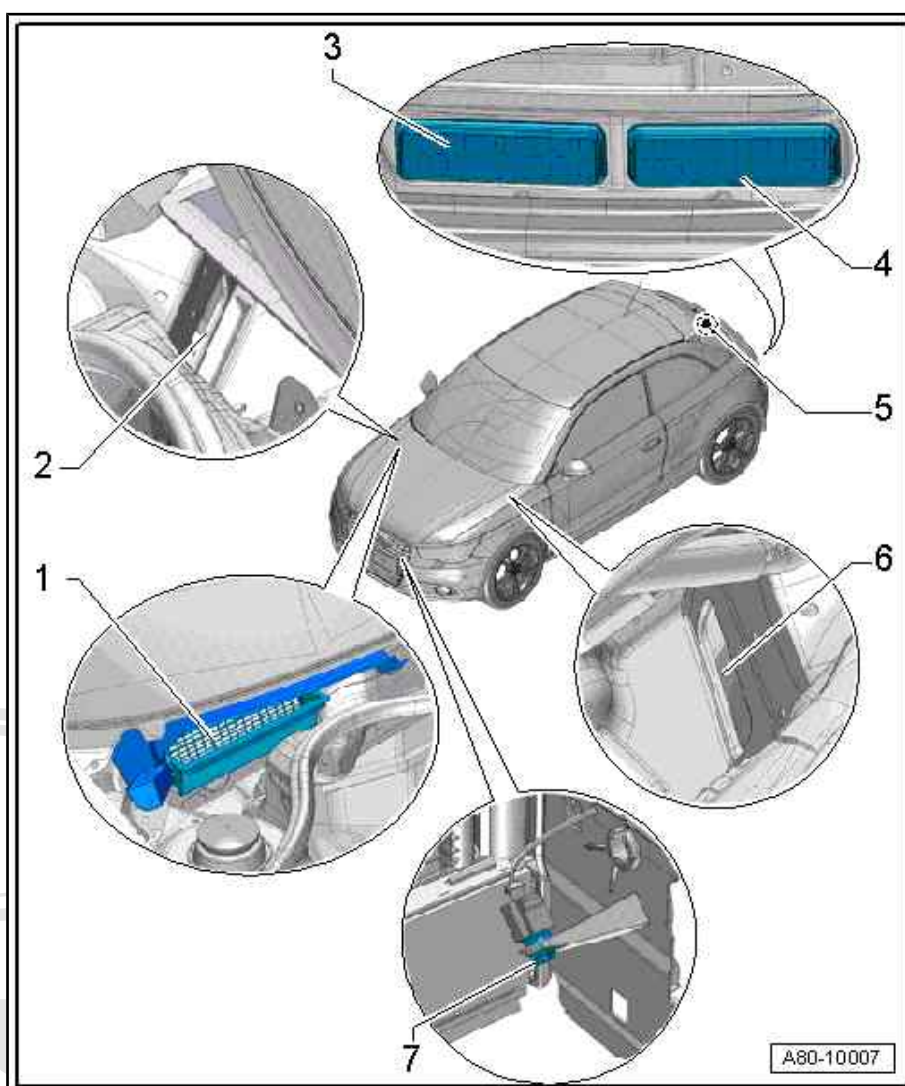
- ☐ Checking ⇒ [page 233](#)

##### 7 - Ambient temperature sensor - G17-

- ☐ Depending on equipment version

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

- ☐ Removing and installing ⇒ [page 242](#)



## 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 57](#)

⇒ ["1.2.2 Overview of fitting locations - components in passenger compartment \(front right\)", page 59](#)

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

#### 1 - 16-pin connector - T16-- diagnostic connection

- ☐ No self-diagnosis or "Guided Fault Finding" capability is provided for the heater control unit - J65- with part number "8X0 819 045" (installed in vehicles with type codes "8XA" and "8X1" in vehicle identification number ⇒ Electronic parts catalogue ).
- ☐ Self-diagnosis is available for the heater control unit - J65- with part number "8XA 819 045" (installed in vehicles with type codes "8XF" and "8XK" in vehicle identification number ⇒ Electronic parts catalogue ) ⇒ Vehicle diagnostic tester, "Guided Fault Finding" function.

#### 2 - Dash panel vent (left-side)

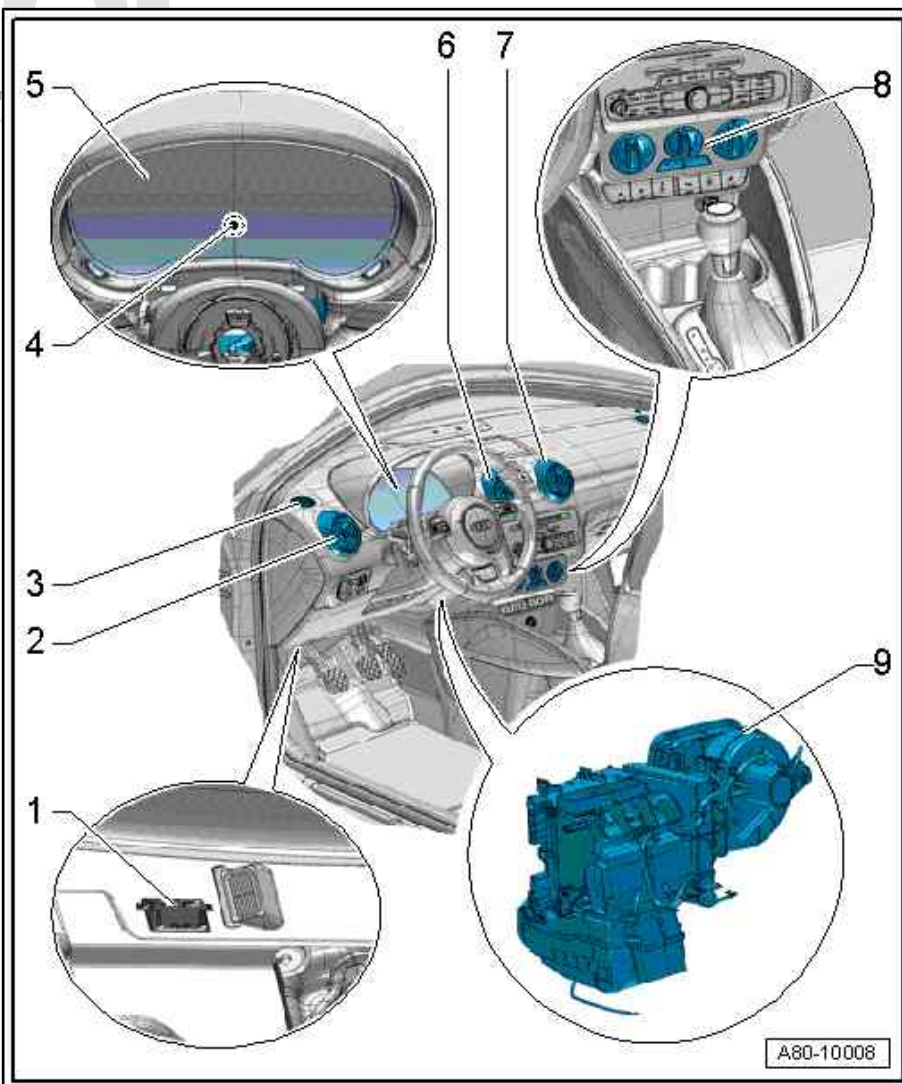
- ☐ Removing and installing  
⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel vents

#### 3 - 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)

#### 4 - Ambient temperature indicator - G106-

- ☐ Depending on equipment version
- ☐ Part of control unit in dash panel insert - J285-
- ☐ If temperature display is faulty, "Read measured values" for temperature sensor ⇒ Vehicle diagnostic tester, "Guided Fault Finding" function



**Note**

*The measured value of the ambient temperature sensor - G17- has no influence on the control of the heater and supplementary heater ⇒ Vehicle diagnostic tester, "Guided Fault Finding" mode for engine.*

**5 - Instrument cluster**

- ☐ With control unit in dash panel insert - J285- and ambient temperature indicator - G106-
- ☐ Control unit in dash panel insert - J285- evaluates measured value of ambient temperature sensor - G17- , and ambient temperature calculated is displayed by ambient temperature indicator - G106- .

**6 - Dash panel vent (centre left)**

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

**7 - Dash panel vent (centre right)**

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

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**8 - Heater controls**

- ☐ With heater control unit - J65-
- ☐ Removing and installing ⇒ [page 74](#)
- ☐ Function ⇒ [page 73](#)

**Note**

- ◆ *Seat heating is not activated via heater control unit - J65- , but rather via two separate buttons. Checking ⇒ General body repairs, interior; Rep. gr. 74 ; Covers and padding on front seats*
- ◆ *Different versions of heater controls, depending on production period and vehicle identification number (differences in pin assignment and functions of -J65- ) ⇒ [page 74](#) and ⇒ Electronic parts catalogue*
- ◆ *No self-diagnosis or "Guided Fault Finding" capability is provided for the heater control unit - J65- with part number "8X0 819 045" (installed in vehicles with type codes "8XA" and "8X1" in vehicle identification number ⇒ Electronic parts catalogue ).*
- ◆ *Self-diagnosis is available for the heater control unit - J65- with part number "8XA 819 045" (installed in vehicles with type codes "8XF" and "8XK" in vehicle identification number ⇒ Electronic parts catalogue ) ⇒ Vehicle diagnostic tester, "Guided Fault Finding" function.*

**9 - Heater unit (viewed from left)**

- ☐ Overview of air distribution system ⇒ [page 69](#)

- ❑ Removing and installing ⇒ [page 67](#)
- ❑ Exploded view ⇒ [page 61](#)



#### Note

*Different versions of heater unit, depending on production period and vehicle identification number (different heat exchanger, different attachments and seals etc.) ⇒ [page 61](#) and ⇒ Electronic parts catalogue*

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

### 1 - Windscreen defroster vent

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

### 2 - 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)

### 3 - Dash panel vent (right-side)

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

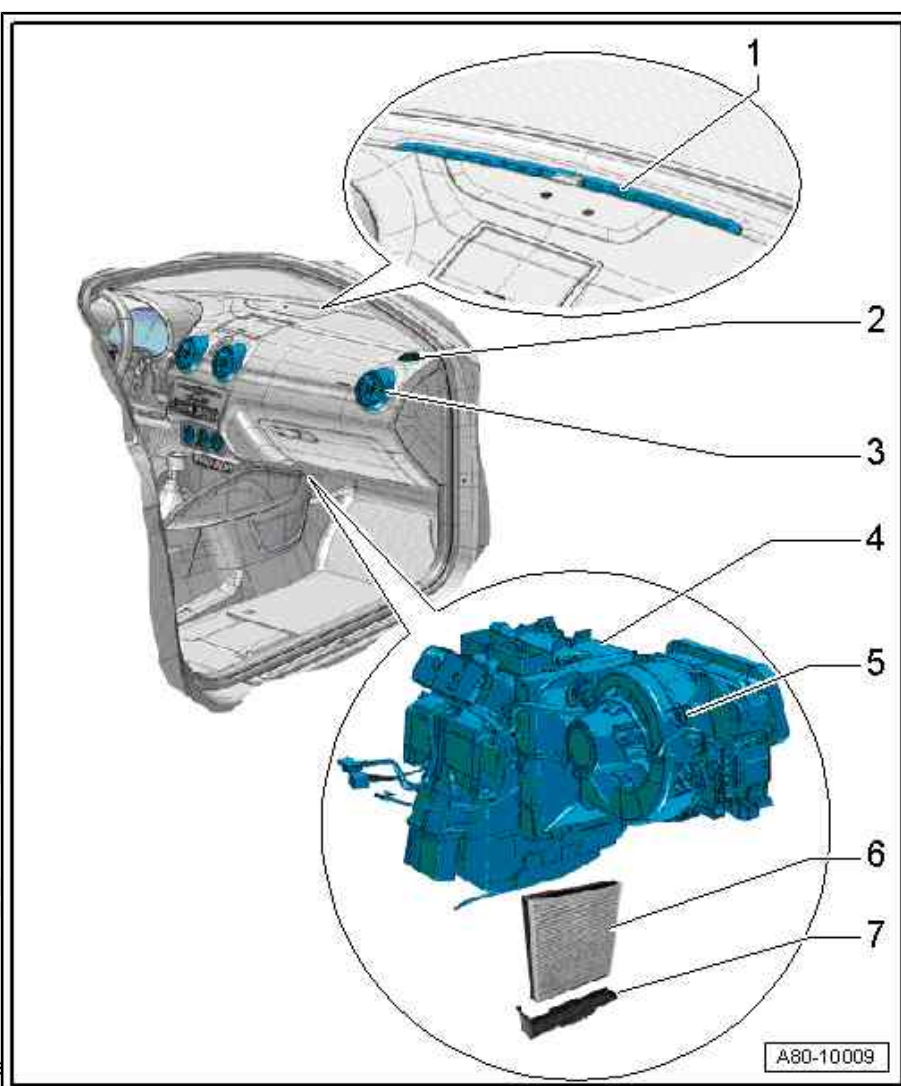
### 4 - Heater unit (viewed from right)

- ❑ Overview of air distribution system  
⇒ [page 69](#)
- ❑ Exploded view  
⇒ [page 61](#)
- ❑ Removing and installing  
⇒ [page 67](#)



#### Note

*Different versions of heater unit, depending on production period and vehicle identification number (different heat exchanger, different attachments and seals etc.) ⇒ [page 61](#) and ⇒ Electronic parts catalogue*



### 5 - Fresh air blower - V2-

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ [page 206](#)

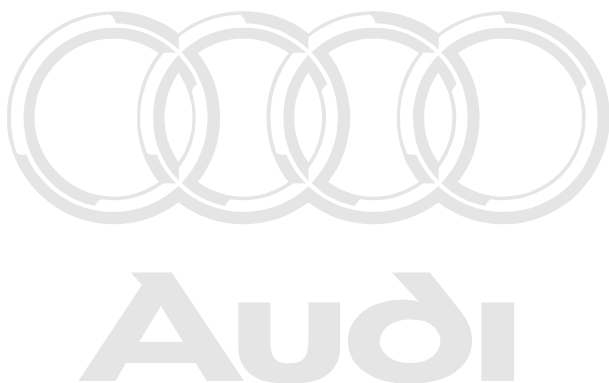


## 6 - Dust and pollen filter

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Notes on version with activated charcoal filter insert ⇒ [page 47](#)
- ☐ Observe replacement intervals ⇒ Maintenance tables
- ☐ Removing and installing ⇒ [page 204](#)

## 7 - Slot cover for dust and pollen filter

- ☐ Different versions (depending on version of dust and pollen filter) ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 204](#)



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## 2 Heater

⇒ [“2.1 Exploded view - heater unit”, page 61](#)

⇒ [“2.2 Exploded view - air intake box of heater unit”, page 65](#)

⇒ [“2.3 Removing and installing heater unit”, page 67](#)

### 2.1 Exploded view - heater unit

⇒ [“2.1.1 Notes on heater unit”, page 61](#)

⇒ [“2.1.2 Exploded view - heater unit, heat exchanger, flap control”, page 61](#)

#### 2.1.1 Notes on heater unit



##### Note

- ◆ *Different versions of heater unit (different heat exchanger, attachments, seals etc.) and of heater control unit - J65- (differences in pin assignment and functions of -J65- ) depending on production period and vehicle identification number ⇒ Electronic parts catalogue*
- ◆ *-J65- is available without a self-diagnosis option (part number “8X0 045 045”) for vehicles with type codes “8XA” and “8X1” in vehicle identification number.*
- ◆ *-J65- is available with a self-diagnosis option (part number “8XA 045 045”) for vehicles with type codes “8XF” and “8XK” in vehicle identification number.*

#### 2.1.2 Exploded view - heater unit, heat exchanger, flap control



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## 1 - Air distribution housing (bottom section)

- ❑ Removing and installing  
⇒ ["5.14 Removing and installing heat exchanger"](#), page 210



### Note

- ◆ Different versions depending on production period and vehicle identification number ⇒ *Electronic parts catalogue*
- ◆ On vehicles with the "8XF" and "8XK" in the identification number, the connecting flange on the heat exchanger is approx. 9 mm longer than on vehicles with the "8XA" and "8X1" in the identification number. The distribution housing and connecting seals are accordingly.

## 2 - Clip

- ❑ 6x

## 3 - Auxiliary air heater element - Z35-

- ❑ For vehicles with TDI engine and certain petrol engines from model year 2012 onwards (gradual introduction)
- ❑ Removing and installing  
⇒ [page 199](#)
- ❑ Checking function ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode for engine

## 4 - O-rings

- ❑ Renew

## 5 - Adapter for coolant hoses

- ❑ For heat exchanger
- ❑ Different versions ⇒ *Electronic parts catalogue*

## 6 - Bolt

- ❑ 8 Nm

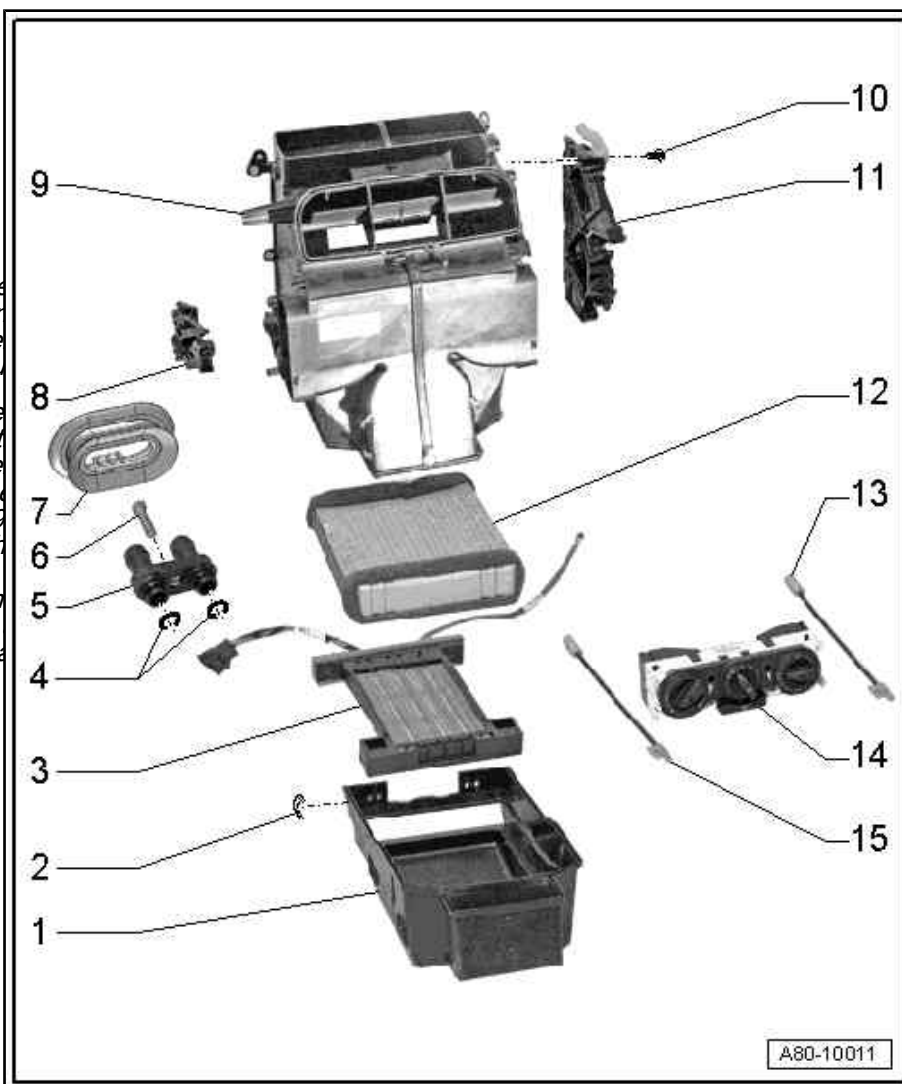
## 7 - Grommet

- ❑ Functions as seal



### Note

- ◆ Different versions depending on production period and vehicle identification number ⇒ *Electronic parts catalogue*



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- ◆ *On vehicles with the type codes "8XF" and "8XK" in the vehicle identification number, the connecting flange on the heat exchanger is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals are adapted accordingly.*

## 8 - Gear mechanism for temperature flap

- Removing and installing ⇒ [page 221](#)



### Note

- ◆ *Flexible shaft rotates twice if rotary heater control is turned once.*
- ◆ *Note installation position ⇒ [page 221](#).*

## 9 - Air distribution housing

- Removing and installing heater ⇒ [page 67](#)
- Exploded view ⇒ [page 185](#)



### Note

- ◆ *Different versions depending on production period and vehicle identification number ⇒ Electronic parts catalogue*
- ◆ *On vehicles with the type codes "8XF" and "8XK" in the vehicle identification number, the connecting flange on the heat exchanger is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals are adapted accordingly.*

## 10 - Bolt

- 1.5 Nm

## 11 - Gear mechanism for air distribution

- Removing and installing ⇒ [page 222](#)



### Note

- ◆ *Flexible shaft rotates twice if rotary heater control is turned once.*
- ◆ *Note installation position ⇒ [page 220](#).*

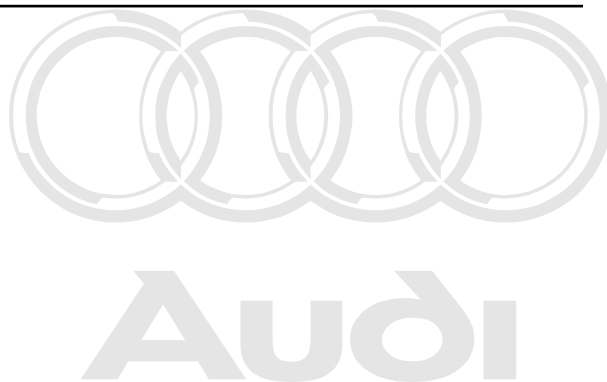
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## 12 - Heat exchanger for heater

- Removing and installing ⇒ [page 210](#)

**Note**

- ◆ *Different versions depending on production period and vehicle identification number ⇒ Electronic parts catalogue*
- ◆ *On vehicles with the type codes "8XF" and "8XK" in the vehicle identification number, the connecting flange on the heat exchanger is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals are adapted accordingly.*



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**13 - Flexible shaft**

- ☐ For gear mechanism for air distribution
- ☐ Removing and installing ⇒ [page 220](#)

**Note**

*Flexible shaft rotates twice if rotary heater control is turned once.*

**14 - Heater controls**

- ☐ With heater control unit - J65-
- ☐ Different versions ⇒ [page 74](#) and ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 74](#)

**Note**

- ◆ *Flexible shaft rotates twice if rotary heater control is turned once.*
- ◆ *From model year 2012 onwards, -Z35- is also installed on vehicles with certain petrol engines (gradual introduction). The correct version of the engine control unit must be installed so that it can activate -Z35- ⇒ Vehicle diagnostic tester and ⇒ Electronic parts catalogue .*
- ◆ *On -J65- , there already is an output for activating -Z35- (via engine control unit) on all versions from the start of production.*
- ◆ *Different versions depending on production period and vehicle identification number (differences in pin assignment and functions of -J65- ) ⇒ [page 74](#) and ⇒ Electronic parts catalogue*

**15 - Flexible shaft**

- ☐ For gear mechanism for temperature flap
- ☐ Removing and installing ⇒ [page 221](#)



## Note

Flexible shaft rotates twice if rotary heater control is turned once.

## 2.2 Exploded view - air intake box of heater unit

### 1 - Air distribution housing

- ☐ Removing and installing heater ⇒ [page 67](#)
- ☐ Exploded view ⇒ [page 185](#)



## Note

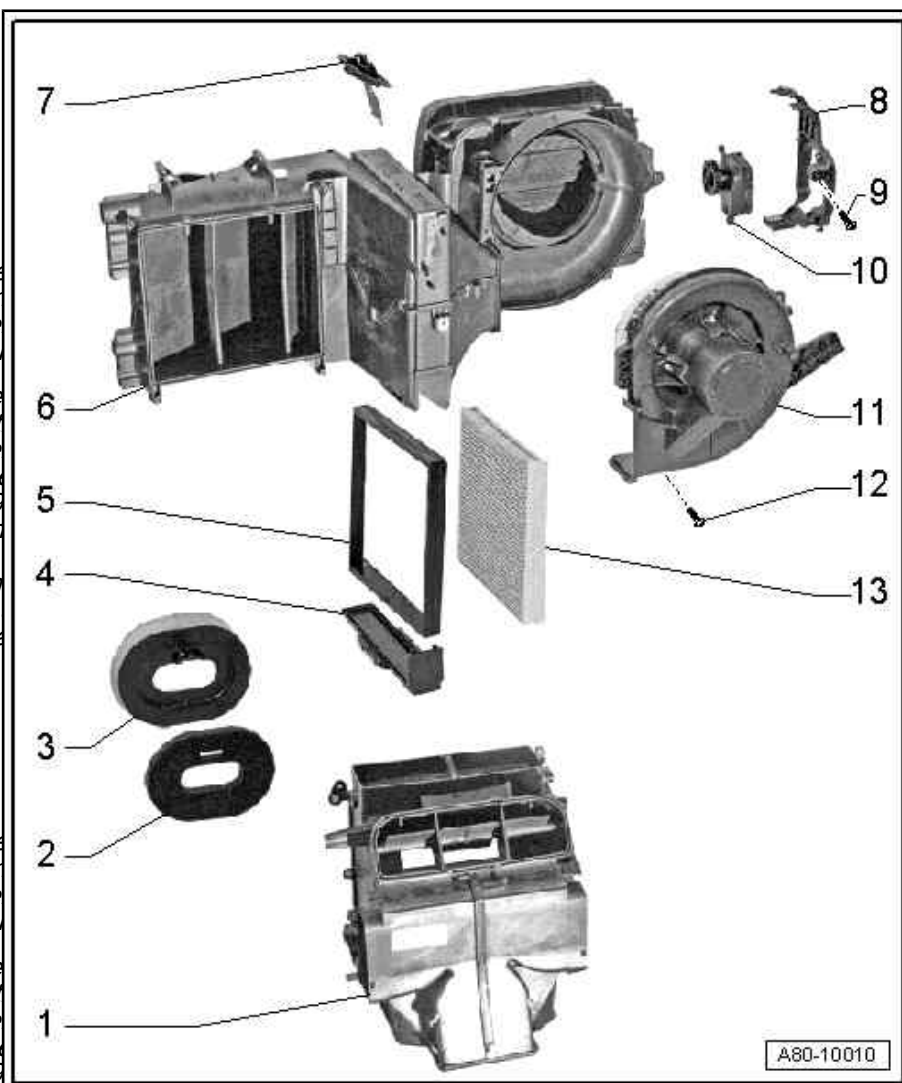
- ◆ Different versions depending on production period and vehicle identification number ⇒ Electronic parts catalogue
- ◆ On vehicles with the type codes "8XF" and "8XK" in the vehicle identification number, the connecting flange on the heater control actuator is approx. 9 mm. On vehicles with the type codes "8XA" and "8X1" in the vehicle identification number, the connecting flange on the heater control actuator is approx. 12 mm. The air distribution housing and corresponding seals are adapted accordingly.

### 2 - Foam spacer



## Note

- ◆ Different versions depending on production period and vehicle identification number ⇒ Electronic parts catalogue
- ◆ On vehicles with the type codes "8XF" and "8XK" in the vehicle identification number, the connecting flange on the heater control actuator is approx. 9 mm. On vehicles with the type codes "8XA" and "8X1" in the vehicle identification number, the connecting flange on the heater control actuator is approx. 12 mm. The air distribution housing and corresponding seals are adapted accordingly.



### 3 - Sealing element

- ☐ For sealing off heat exchanger from bulkhead
- ☐ Renew if foam seal is damaged



## Note

- ◆ Different versions depending on production period and vehicle identification number ⇒ Electronic parts catalogue

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- ◆ *On vehicles with the type codes "8XF" and "8XK" in the vehicle identification number, the connecting flange on the heat exchanger is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals are adapted accordingly.*

#### 4 - Slot cover for dust and pollen filter

- ☐ Different versions (depending on version of dust and pollen filter) ⇒ [page 204](#) and ⇒ Electronic parts catalogue

#### 5 - Filter frame

- ☐ For dust and pollen filter



#### Note

*Only necessary for certain version of dust and pollen filter, not always provided ⇒ [page 204](#)*

#### 6 - Air duct housing

- ☐ Exploded view ⇒ [page 185](#)

#### 7 - Fresh air blower series resistor with overheating fuse - N24

- ☐ Removing, installing and checking ⇒ [page 209](#)

#### 8 - Mounting

- ☐ For control motor

#### 9 - Bolt

- ☐ 2x
- ☐ 1.5 Nm

#### 10 - Fresh air and air recirculation flap control motor - V154-

- ☐ Removing and installing ⇒ [page 159](#)

#### 11 - Fresh air blower - V2-

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 206](#)

#### 12 - Bolt

- ☐ 4x
- ☐ 1.5 Nm

#### 13 - Dust and pollen filter

- ☐ Different versions ⇒ [page 204](#) and ⇒ Electronic parts catalogue
- ☐ Observe replacement intervals ⇒ Maintenance tables
- ☐ Removing and installing ⇒ [page 204](#)

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## 2.3 Removing and installing heater unit

### Removing

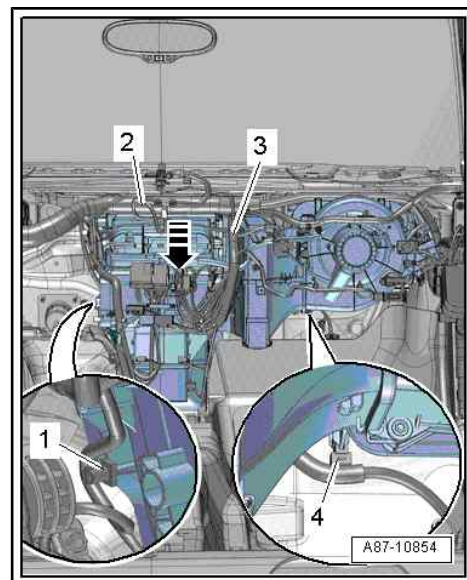
- Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
- Removing heat exchanger ⇒ [page 210](#)
- Remove central tube ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel .
- Unplug central connector on right side of fresh air blower.
- Disengage electrical wiring harness -2- at top of heater by sliding it towards rear out of guides -arrow-.
- Cut through cable ties -1 and 4- and move electrical wiring harness clear.



#### Caution

**Risk of irreparable damage to heater and fresh air blower.**

- ◆ **If the cable tie brackets are detached from the mounting pins on the heater or fresh air blower, the pins may break off.**
- ◆ **If the mounting pins are broken off, the heater or fresh air blower must be renewed.**



- Swivel heater -3- 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 at heater for damage prior to installation and renew damaged seals.**
- ◆ **Check that the sealing element at connections for coolant hoses is seated properly and check condition of corresponding seal.**
- ◆ **Make sure that the correct versions are installed and that the components are correctly assigned (e.g. seals, heat exchanger etc.)**
- ◆ **Different versions of heater unit (e.g. different heat exchanger and seals) and of heater control unit -J65- (e.g. differences in pin assignment and function of -J65- ) depending on production period and vehicle identification number ⇒ [page 61](#) , ⇒ [page 74](#) and ⇒ Electronic parts catalogue**
- Insert heater and engage central tube at mounting (left and right).
- Bolt heater to central tube.
- Install central tube ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel .
- Install heat exchanger ⇒ [page 210](#) .
- Check heater operation, and direction and distribution of air flow from defroster vent to windscreen.



- Check that direction of air flow corresponds with position of switch.
- Due to the gear mechanism at the heater and at the air distributor, one turn of the switch is equivalent to two turns of the flexible shaft.



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### 3 Air duct system

⇒ "3.1 Exploded view - routing of air flow and air distribution in passenger compartment", page 69

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

⇒ "3.1.1 Exploded view - routing of air flow and air distribution in passenger compartment, air intake and air outlet openings", page 69

⇒ "3.1.2 Exploded view - routing of air flow and air distribution in passenger compartment", page 70

##### 3.1.1 Exploded view - routing of air flow and air distribution in passenger compartment, air intake and air outlet openings



#### Note

*Different versions of heater unit (e.g. different heat exchanger and seals) and of heater control unit -J65- (e.g. differences in pin assignment and function of -J65- ) depending on production period and vehicle identification number*

⇒ "2.1.1 Notes on heater unit", page 61 ,

⇒ "4.2.2 Removing and installing heater controls with heater control unit J65 ", page 74 and ⇒ *Electronic parts catalogue*

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### 1 - Air inlet from plenum chamber

- ☐ Fresh air mode

### 2 - Air inlet from passenger compartment

- ☐ Air recirculation mode

### 3 - Heater

### 4 - To footwell vents (rear)

### 5 - To footwell vent (left-side)

### 6 - 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)

### 7 - To dash panel vents (centre)

### 8 - Auxiliary air heater element - Z35-

- ☐ For vehicles with TDI engine and certain petrol engines from model year 2012 onwards (gradual introduction)

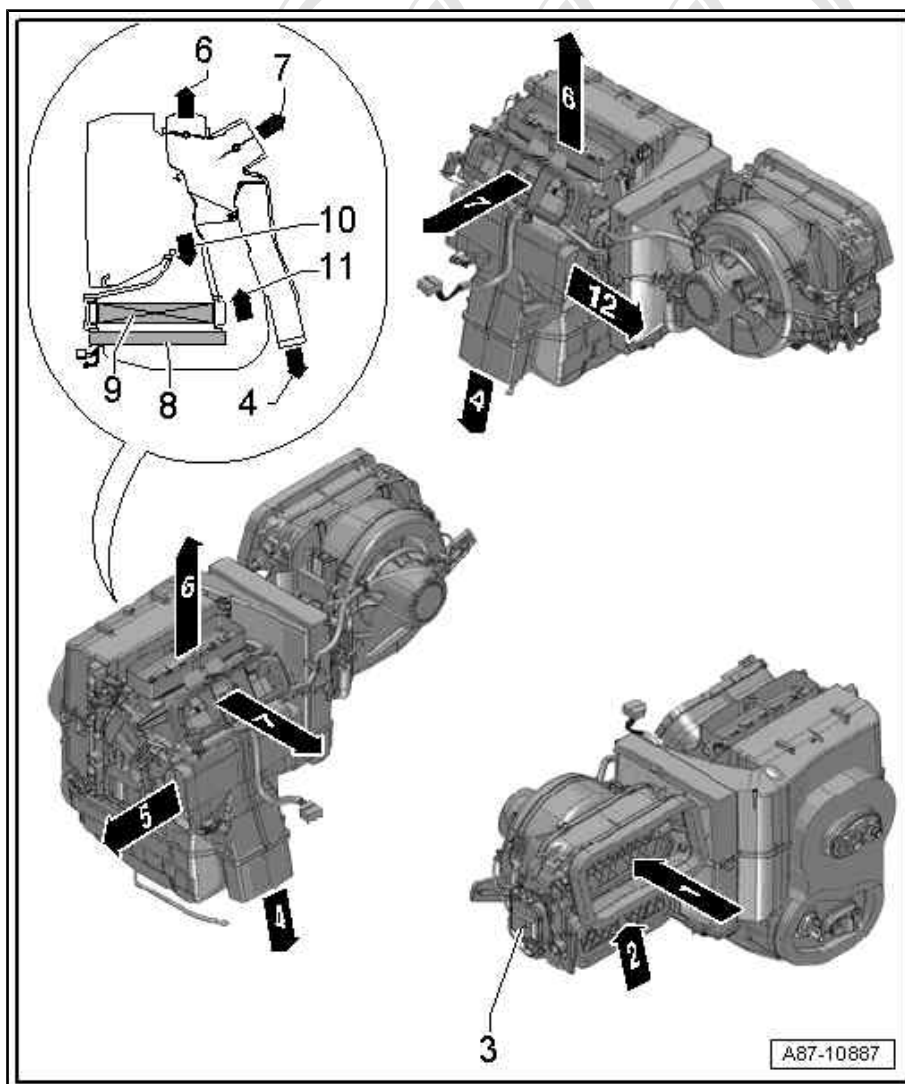
### 9 - Heat exchanger

### 10 - To heat exchanger

- ☐ Flows through heat exchanger and auxiliary air heater element - Z35- (if fitted)

### 11 - To vents

### 12 - To footwell vent (right-side)



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



### Note

Different versions of heater unit (e.g. different heat exchanger and seals) and of heater control unit -J65- (e.g. differences in pin assignment and function of -J65- ) depending on production period and vehicle identification number ⇒ [page 61](#) , ⇒ [page 74](#) and ⇒ [Electronic parts catalogue](#)

### 1 - Air duct

- ☐ For footwell vent (rear)
- ☐ Removing and installing ⇒ [page 229](#)

### 2 - Connecting collar

- ☐ To air duct for footwell vent (rear)

### 3 - Bolt

- ☐ 1.5 Nm

### 4 - Air duct for footwell vent (driver side)

- ☐ Removing and installing ⇒ [page 228](#)

### 5 - Heater

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- ☐ Removing and installing ⇒ [page 67](#)

### 6 - Air duct for defroster vent

- ☐ Air flow to windscreen will be uneven or insufficient if foam seal is squashed
- ☐ Removing and installing ⇒ [page 227](#)

### 7 - Air duct

- ☐ To defroster vents and dash panel 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

### 8 - Dash panel

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

### 9 - Bolt

- ☐ 1.5 Nm

### 10 - Air duct to footwell vent (passenger side)

- ☐ Removing and installing ⇒ [page 228](#)

### 11 - Air duct to centre dash panel vent

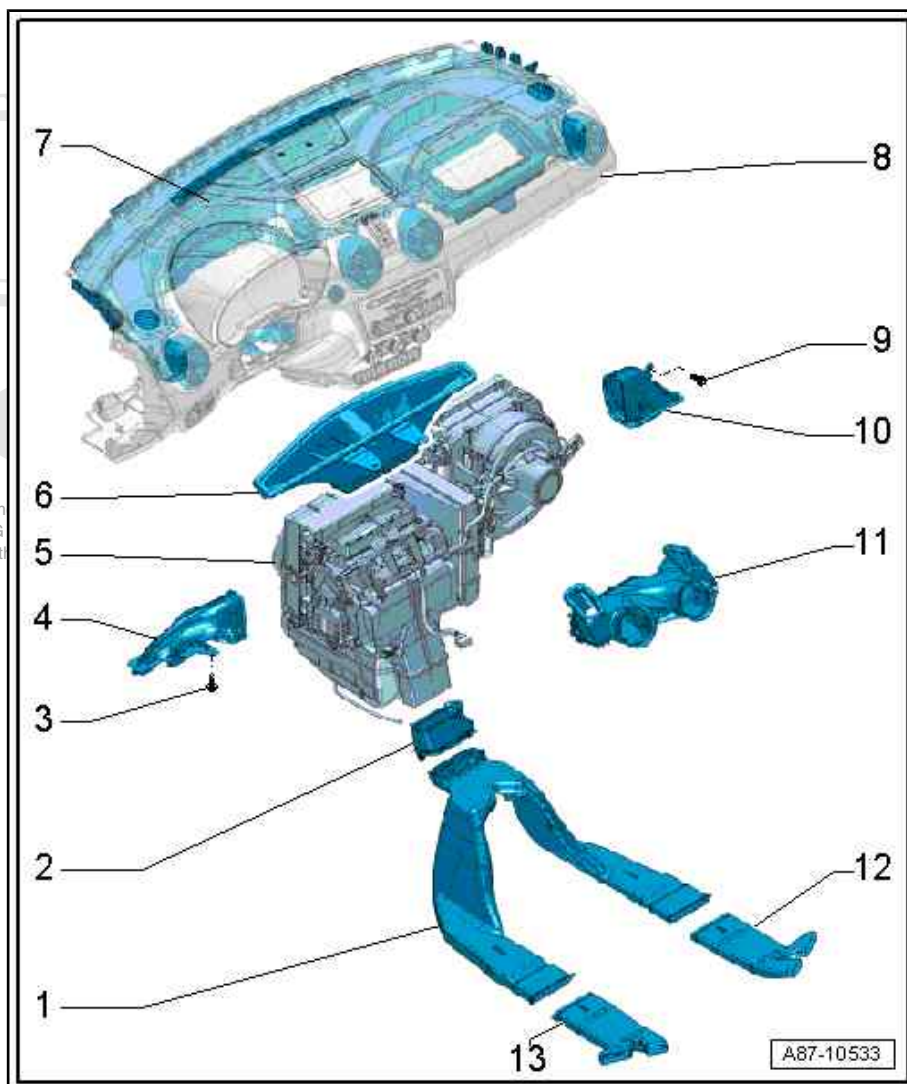
- ☐ Removing and installing ⇒ [page 227](#)

### 12 - Footwell vent (rear right)

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

### 13 - Footwell vent (rear left)

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



## 4 Operating and display unit

⇒ "4.1 Overview - operating and display unit", page 72

⇒ "4.2 Removing and installing operating and display unit", page 73

### 4.1 Overview - operating and display unit

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

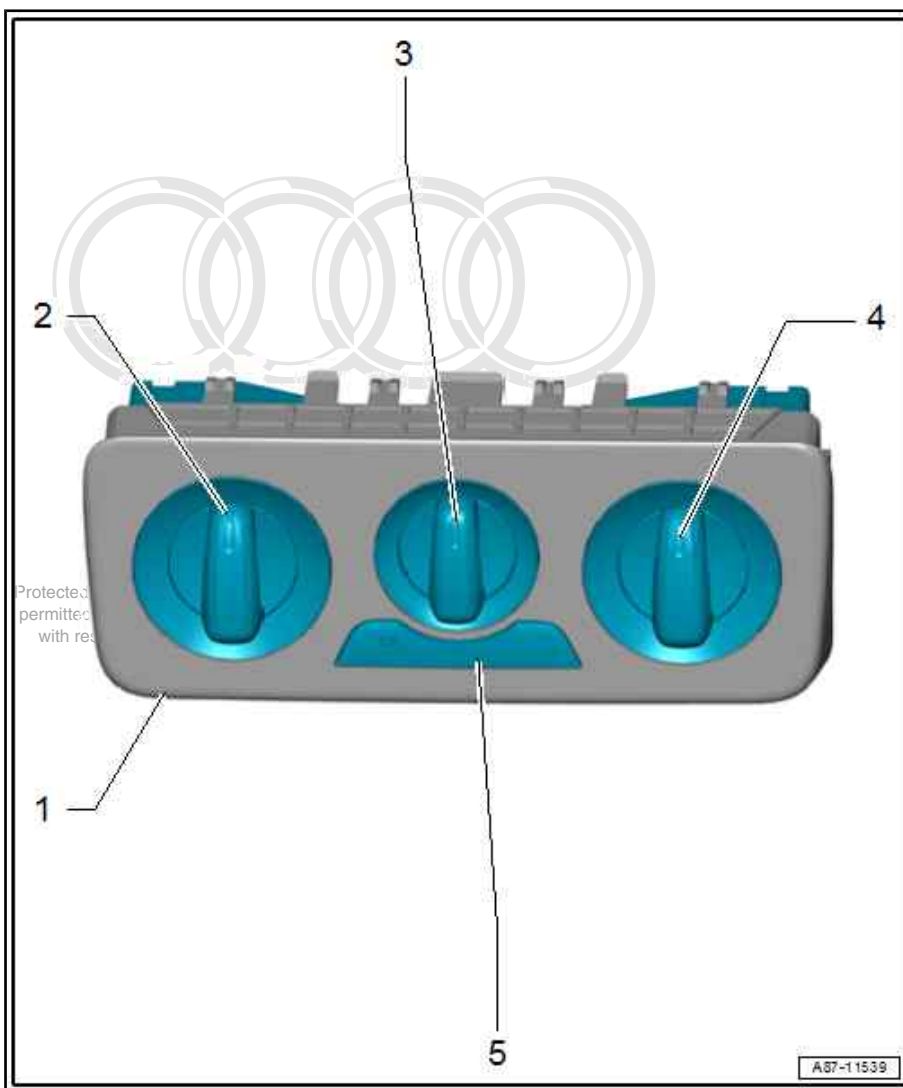
2 - Rotary temperature control

3 - Rotary control for fresh air blower - V2-

4 - Rotary control for setting air distribution

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)



## 4.2 Removing and installing operating and display unit

⇒ [“4.2.1 Checking functions of heater controls with heater control unit J65”, page 73](#)

⇒ [“4.2.2 Removing and installing heater controls with heater control unit J65”, page 74](#)

⇒ [“4.2.3 Removing and installing frame for heater controls”, page 76](#)

### 4.2.1 Checking functions of heater controls with heater control unit - J65-

#### General notes

- ◆ 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- (TDI engine and certain petrol engines from model year 2012 onwards - gradual introduction), a signal is transmitted to the engine control unit when “heat” is selected as the temperature setting ⇒ [“5.5 Checking auxiliary air heater element Z35”, page 196](#).
- ◆ The controls are fitted with a gear mechanism for actuating the flexible shaft for air distribution and temperature adjustment. Due to the gear mechanism at the heater and at the base plate of the heater controls, one turn of the switch is equivalent to two turns of the flexible shaft.
- ◆ The lamps for illuminating the buttons and rotary switches cannot be renewed separately. The entire heater control unit must always be renewed.
- ◆ The rotary control switches and buttons are illuminated via terminals “58s” and “58d”.
- ◆ The indicator lamp in the fresh air/air recirculation button -F- of the controls is supplied with voltage via terminal “58d”  
 ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ◆ Checking operation of air recirculation button and activation of fresh air and air recirculation flap control motor - V154-  
 ⇒ [page 161](#)
- ◆ On vehicles with auxiliary air heater element -Z35- with checking activation signal from engine control unit - Vehicle diagnostic tester in “Guided Fault Finding” mode for TDI engines and certain petrol engines from model year 2012 onwards (gradual introduction)
- ◆ The heater control unit - J65- has no influence on the start/stop function.
- ◆ Vehicles with a start/stop system are not fitted with an additional coolant pump for the start/stop function. However, depending on the engine, an electric coolant pump (activated by corresponding engine control unit) may be installed ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - electric coolant pump .
- ◆ Different versions of heater unit (e.g. different heat exchanger and seals) and of heater control unit -J65- (e.g. differences in pin assignment and function of -J65- ) depending on production period and vehicle identification number ⇒ [page 61](#) ,  
 ⇒ [page 74](#) and ⇒ Electronic parts catalogue

## 4.2.2 Removing and installing heater controls with heater control unit - J65-

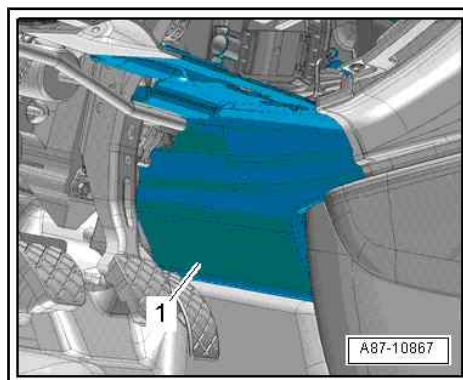


### Note

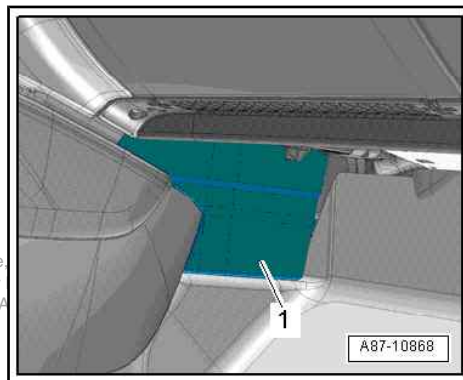
- ◆ Different versions depending on production period and vehicle identification number (differences in pin assignment and functions of -J65- ) ⇒ *Electronic parts catalogue*
- ◆ -J65- is available without a self-diagnosis option (part number "8X0 045 045") for vehicles with type codes "8XA" and "8X1" in the vehicle identification number. -J65- is available with a self-diagnosis option (part number "8XA 045 045") for vehicles with type codes "8XF" and "8XK" in the vehicle identification number ⇒ *Vehicle diagnostic tester*, ⇒ *Electronic parts catalogue* and ⇒ *Current flow diagrams, Electrical fault finding and Fitting locations*.

### 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) .
- If fitted, detach insulation -1-.

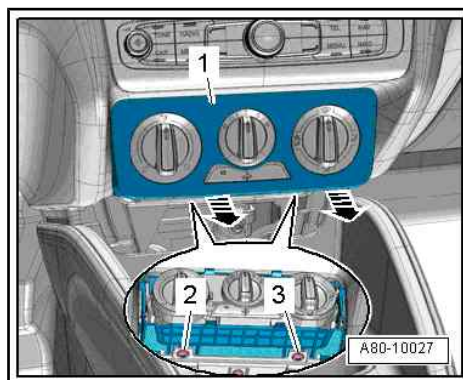


- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- If fitted, unfasten cover -1- from velcro strip.
- Remove mounting for switch unit (bottom) ⇒ Electrical system; Rep. gr. 96 ; Controls; Removing and installing switches in dash panel .

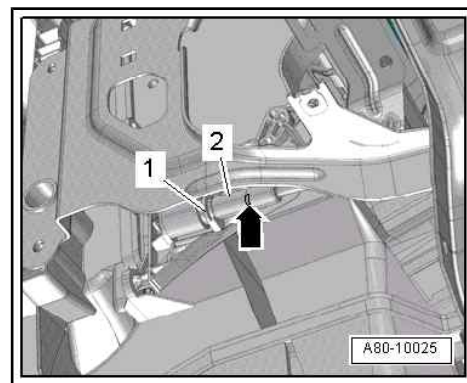


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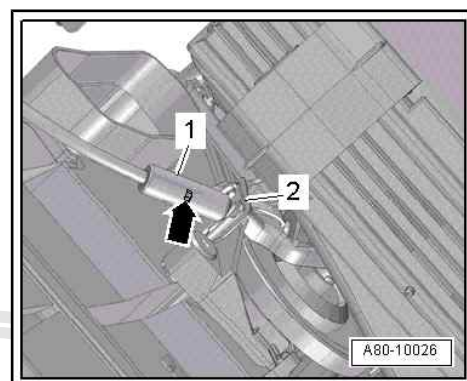
- Detach trim -1- for heater controls -arrows-.
- Remove bolts -2 and 3-.



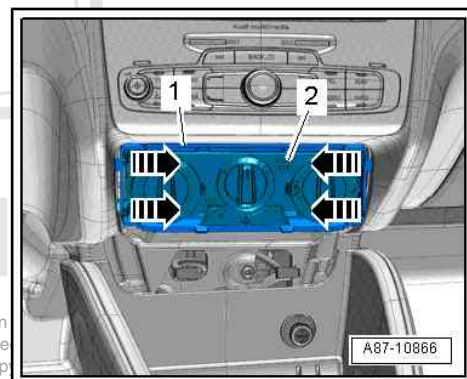
- Set rotary temperature control to “cold” stop.
- Press retaining tab -arrow- and detach flexible shaft -2- from gear mechanism for temperature flap -1-.



- Set rotary control for direction of air flow to “windscreen/foot-well” position.
- Press retaining tab -arrow- and detach flexible shaft -1- from gear mechanism for air distribution -2-.



- Carefully release fasteners -arrows- and pull heater controls -2- out of frame -1-.



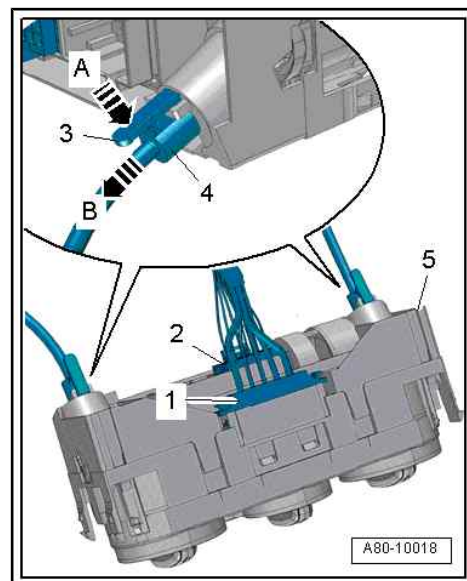
- Press retainer -3- -arrow A- and detach flexible shaft -4- from controls -5- -arrow B-.



#### Note

*Flexible shaft rotates twice if rotary heater control is turned once.*

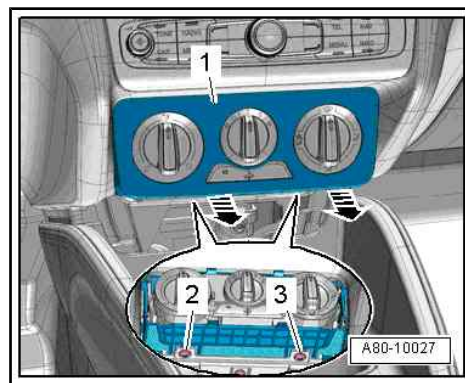
- Unplug electrical connectors -1, 2-.
- Detach heater controls.



## Installing

Install in reverse order of removal; note the following:

- For correct part number and assignment refer to ⇒ [page 74](#) and ⇒ Electronic parts catalogue .
- Tighten bolts -2 and 3- to 1.5 Nm.
- Install flexible shafts: temperature flap ⇒ [page 219](#) , air distribution ⇒ [page 220](#) .
- Check operation of temperature flap.
- The temperature flap must move audibly from one stop to the other.
- Rotary control must move from “cold” to “warm” position.
- If rotary control cannot be moved from “cold” to “warm” position, detach flexible shaft, turn rotary control and re-attach flexible shaft.
- Check operation of air distribution flaps.
- The air distribution flaps must be set to the same positions as the rotary control on heater/air conditioner.
- Check corresponding vents by hand.
- If flap positions do not correspond to rotary control for heater/air conditioner, detach flexible shaft, turn rotary control and re-attach flexible shaft.



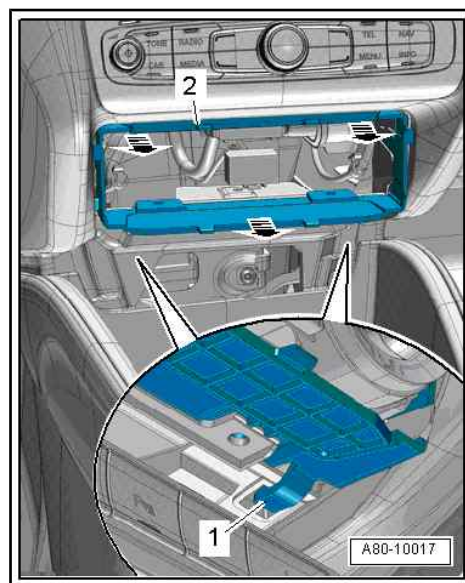
## 4.2.3 Removing and installing frame for heater controls

### Removing

- Remove heater controls ⇒ [page 74](#) .
- Release fasteners -1-.
- Detach frame -2- -arrows-.

### Installing

Install in reverse order.



## 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 79](#)

⇒ [“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”



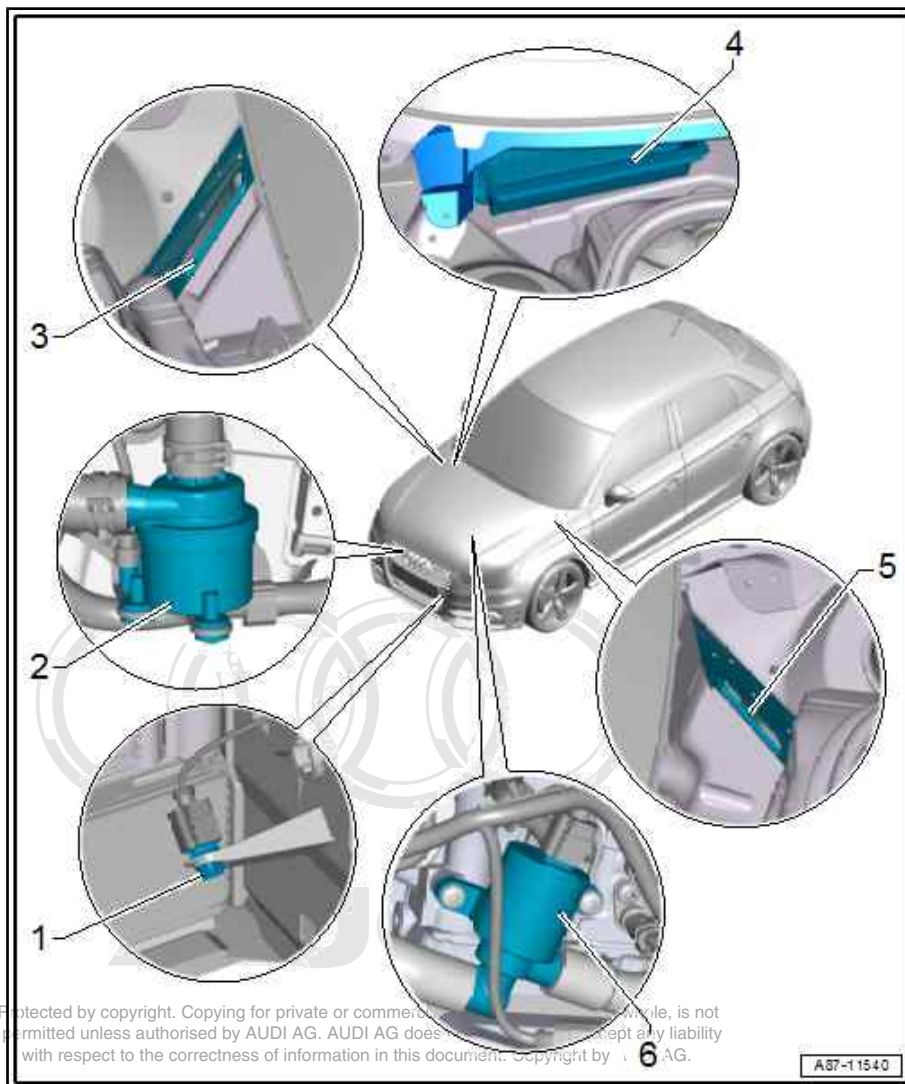
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### 1 - Ambient temperature sensor - G17-

- ❑ The measured value of the ambient temperature sensor -G17- is evaluated by the control unit in dash panel insert - J285- and transmitted via the data bus to the operating unit ( Climatronic control unit - J255- / air conditioning system control unit - J301- ).
- ❑ Checking ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ [page 242](#)

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

- ❑ Equipment-specific version
- ❑ May be installed in coolant circuit (depending on engine version) ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations



- ❑ Activated by engine control unit when requested by operating unit ( air conditioning system control unit - J301- / Climatronic control unit - J255- )
- ❑ Also supports engine coolant pump to improve flow of coolant through heat exchanger at certain engine speeds to enhance heating output
- ❑ Removing and installing ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - electric coolant pump



#### Note

*An electric pump which assists the engine coolant pump is installed e.g. on vehicles with a 3-cylinder TDI engine. There are different designations for this coolant pump (continued coolant circulation pump - V51- / auxiliary pump for heating - V488- ), depending on the engine version ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant .*

### 3 - Water drain (right-side)

- ❑ Checking ⇒ [page 233](#)

### 4 - Fresh air intake grille

- ❑ Stops foreign matter (leaves etc) entering intake duct of air conditioning unit

- ☐ Make sure that component is seated correctly
- ☐ Removing and installing ⇒ [page 232](#)

## 5 - Water drain (left-side)

- ☐ Checking ⇒ [page 233](#)

## 6 - Coolant shut-off valve - N82-

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

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

### 1 - Receiver

- ☐ Integrated into condenser
- ☐ Exploded view ⇒ [page 93](#)

### 2 - Condenser

- ☐ Exploded view ⇒ [page 93](#)

### 3 - Air conditioner compressor regulating valve - N280-

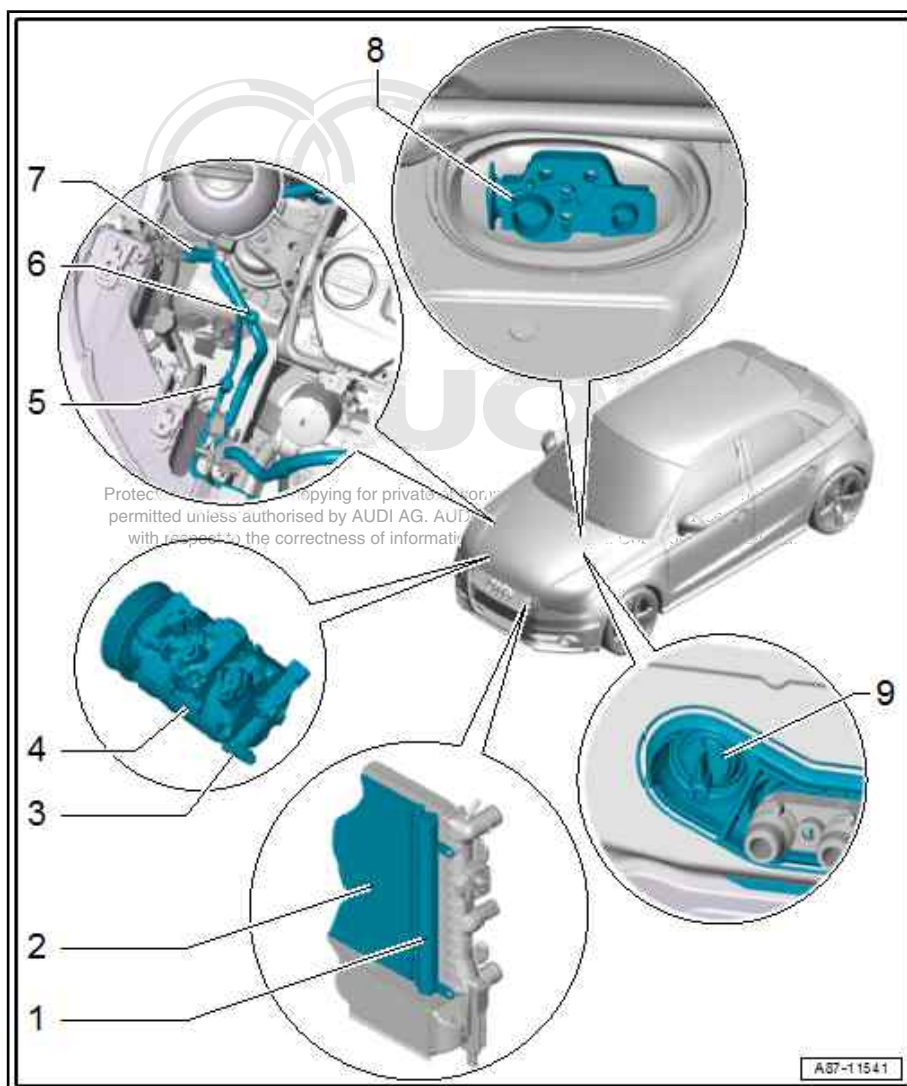
- ☐ Installed in air conditioner compressor
- ☐ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

### 4 - Air conditioner compressor

- ☐ For correct version refer to ⇒ Electronic parts catalogue
- ☐ Exploded view ⇒ [page 126](#)
- ☐ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

### 5 - Service connection on high-pressure side

- ☐ For measuring, discharging and charging





### Caution

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

*Danger of frostbite on skin and other parts of the body.*

*Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .*

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- ☐ Different versions depending on refrigerant (R134a or R1234yf)  
⇒ [“2.10 Differences in service connections depending on refrigerant \(R134a or R1234yf\)”, page 118](#) and  
⇒ Electronic parts catalogue
- ☐ Exploded view ⇒ [page 95](#)

## 6 - Service connection on low-pressure side

- ☐ For measuring and discharging



### Caution

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

*Danger of frostbite on skin and other parts of the body.*

*Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .*

- ☐ Different versions depending on refrigerant (R134a or R1234yf)  
⇒ [“2.10 Differences in service connections depending on refrigerant \(R134a or R1234yf\)”, page 118](#) and  
⇒ Electronic parts catalogue
- ☐ Exploded view ⇒ [page 95](#)

## 7 - High-pressure sender - G65-

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

- ☐ Exploded view ⇒ [page 95](#)

## 8 - Expansion valve

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

## 9 - Condensation drain

- ☐ Checking ⇒ [page 215](#)
- ☐ Removing and installing ⇒ [page 217](#)



### Note

- ◆ *Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue*
- ◆ *Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals are adapted accordingly.*



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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 230](#)

#### 2 - Heated rear window - Z1-

- ❑ Not controlled by air conditioning system
- ❑ Checking activation ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode for on-board supply control unit - J519- and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

#### 3 - Ventilation slots in luggage compartment (right-side)

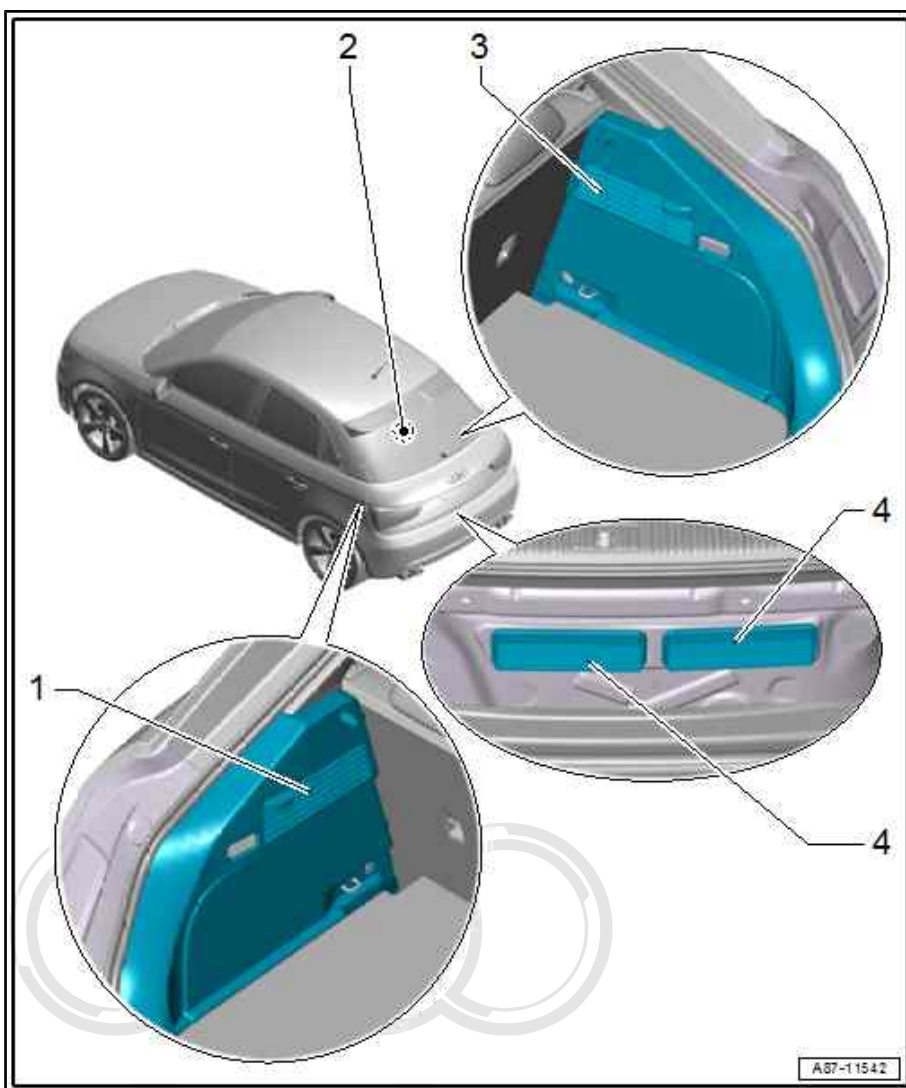
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Checking ⇒ [page 230](#)

#### 4 - Forced ventilation vent (right-side)

- ❑ Checking ⇒ [page 230](#)
- ❑ Removing and installing ⇒ [page 231](#)

#### 5 - Forced ventilation vent (left-side)

- ❑ Checking ⇒ [page 230](#)
- ❑ Removing and installing ⇒ [page 231](#)



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## 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 87

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

#### 1 - 16-pin connector - T16- - diagnostic connection

- ❑ Performing self-diagnosis of air conditioner  
⇒ Vehicle diagnostic tester, "Guided Fault Finding"

#### 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 - 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)

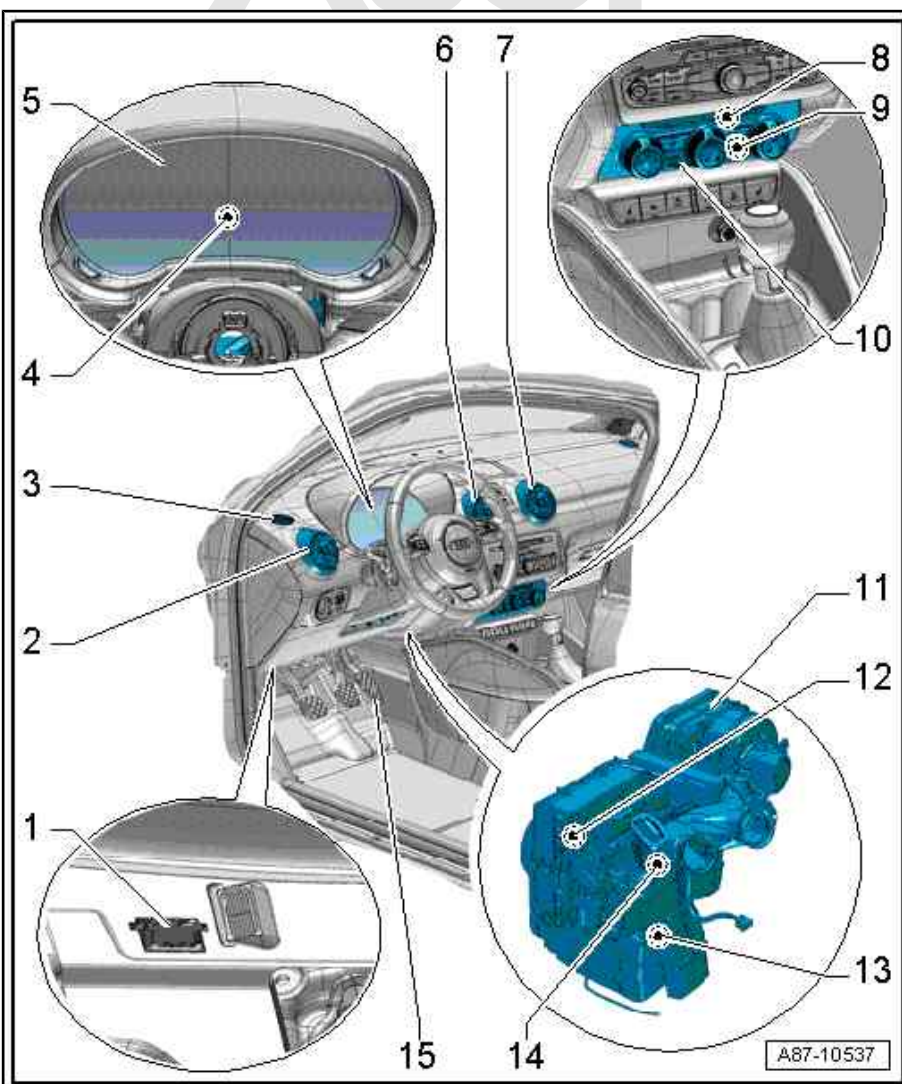
#### 4 - Ambient temperature indicator - G106-

- ❑ Part of control unit in dash panel insert - J285-
- ❑ If temperature display is faulty, "Read measured values" for temperature sensor ⇒ Vehicle diagnostic tester, "Guided Fault Finding" function



#### Note

*An incorrect measured value for ambient temperature sensor - G17- may lead to problems with air conditioner control ⇒ Vehicle diagnostic tester "Guided Fault Finding".*



#### 5 - Instrument cluster

- ❑ With control unit in dash panel insert - J285- and ambient temperature indicator - G106-
- ❑ Control unit in dash panel insert - J285- evaluates measured value of ambient temperature sensor - G17- and transmits this value via data bus to operating unit ( Climatronic control unit - J255- / air conditioning system control unit - J301- ). For checking, select "Read measured values" ⇒ Vehicle diagnostic tester, "Guided Fault Finding"

- ❑ If temperature display is faulty, "Read measured values" for temperature sensor ⇒ Vehicle diagnostic tester, "Guided Fault Finding" function

#### 6 - Dash panel vent (centre left)

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

#### 7 - Dash panel vent (centre right)

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

#### 8 - Temperature sensor blower - V42-

- ❑ With automatically controlled air conditioner only
- ❑ Integrated in operating unit (Climatronic control unit J255-)
- ❑ Removing and installing ⇒ [page 241](#)

#### 9 - Dash panel temperature sensor - G56-

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

#### 10 - Air conditioner operating unit

- ❑ Different versions ⇒ Vehicle diagnostic tester

#### Manually controlled air conditioner

- ❑ General notes ⇒ [page 6](#)
- ❑ Removing and installing air conditioning system control unit - J301- ⇒ [page 236](#)

#### Automatically controlled air conditioner

- ❑ General notes ⇒ [page 7](#)
- ❑ Removing and installing Climatronic control unit - J255- ⇒ [page 239](#)



#### Note

- ◆ *From model year 2012 onwards, -Z35- is also installed on vehicles with certain petrol engines (gradual introduction). The correct version of the operating unit (Climatronic control unit - J255- , part number 8X0 820 043 from index "B" onwards) and the correct version of the engine control unit must be installed so that the operating unit -J255- and the corresponding engine control unit can activate -Z35- ⇒ Vehicle diagnostic tester and ⇒ Electronic parts catalogue .*
- ◆ *On vehicles with an operating unit (Climatronic control unit - J255- ) a humidity sender - G355- for the air conditioner control function is fitted in the interior mirror ⇒ Electrical system; Rep. gr. 96 ; Further lights and controls in vehicle interior; Overview of fitting locations - further lights and controls in vehicle interior .*

- ◆ *The measured values of -G355- are evaluated directly by -J255- (part number up to index "B") on vehicles up to model year 2011. From model year 2012 onwards, the measured value are evaluated by the onboard supply control unit - J519- and transmitted to -J255- (part number from index "C" onwards) via the data bus. Therefore make sure that the correct version is installed and that these components are correctly assigned ⇒ Vehicle diagnostic tester and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- ◆ *On vehicles with air conditioning system control unit - J301- , no humidity sender - G355- is installed. The permissible stop time is calculated using characteristic curves which are influenced by the measured outside temperature, the function "air recirculation mode" and the status of the windscreen wipers. In order for the -J301- to allow the stop function, the time calculated must be greater than approx. 20 seconds. To prevent the front and door windows from misting up, the stop time may be reduced at low outside temperatures when the air recirculation mode is active or if it is raining. If the time calculated for the stop function is less than approx. 20 seconds, this will be prevented.*
- ◆ *On -J301- , there already is an output for activating -Z35- (via data bus and engine control unit) on all versions with part number "8X0 820 045" (and "8XA 820 045") from the start of production onwards ⇒ Vehicle diagnostic tester and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations (different on heater control unit - J65- ⇒ "5.5 Checking auxiliary air heater element Z35", page 196 ).*
- ◆ *The text on the button for switching the air conditioner on and off on the operating unit ( Climatronic control unit - J255- ) varies. Up to part number 8X0 820 043 with index "B", the button's text reads  and from index "C" onwards it reads  ⇒ Electronic parts catalogue .*



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- ◆ *The text on the button for switching the air conditioner on and off varies on the air conditioning system control unit - J301-. On components with part number "8X0 820 045" (installed on vehicles with type codes "8XA" and "8X1" in vehicle identification number), the button reads **AC**. On components with part number "8XA 820 045" (installed on vehicles with type codes "8XF" and "8XK" in vehicle identification number), the button reads **A/C**. It is important to observe the correct version and assignment ⇒ *Electronic parts catalogue*.*
- ◆ *Functions of operating units - J255- and -J301- vary depending on part number ("8X0 820 XXX" or "8XA 820 XXX") ⇒ *Vehicle diagnostic tester*. It is important to observe the correct version and assignment ⇒ *Electronic parts catalogue*.*

## 11 - Air conditioning unit (viewed from left)

- ☐ Overview of air distribution system ⇒ [page 69](#)

### Manually controlled air conditioner

- ☐ Exploded view ⇒ [page 173](#)
- ☐ Removing and installing ⇒ [page 200](#)

### Automatically controlled air conditioner

- ☐ Exploded view ⇒ [page 173](#)
- ☐ Removing and installing ⇒ [page 200](#)



#### Note

- ◆ *Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ *Electronic parts catalogue**
- ◆ *Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals are adapted accordingly.*



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## 12 - Evaporator output temperature sender - G263-

- ☐ Removing and installing ⇒ [page 244](#)

## 13 - Footwell vent temperature sender - G192-

- ☐ With automatically controlled air conditioner only
- ☐ Removing and installing ⇒ [page 243](#)

## 14 - Centre vent temperature sender - G191-

- ☐ With automatically controlled air conditioner only
- ☐ Removing and installing ⇒ [page 243](#)

## 15 - Accelerator mechanism

- ☐ Kick-down deactivation of air conditioner compressor by operating unit ( Climatronic control unit - J255- / air conditioning system control unit - J301- ) via air conditioner compressor regulating valve - N280- is implemented when requested by corresponding engine control unit (data exchange via data bus).
- ☐ To check current status, select "Read measured values" ⇒ Vehicle diagnostic tester, "Guided Fault Finding" function (for air conditioner and corresponding engine control unit)

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

### 1 - Sunlight penetration photo-sensor - G107-

- ☐ 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" function.
- ☐ Removing and installing ⇒ [page 242](#)

### 2 - Windscreen defroster vent

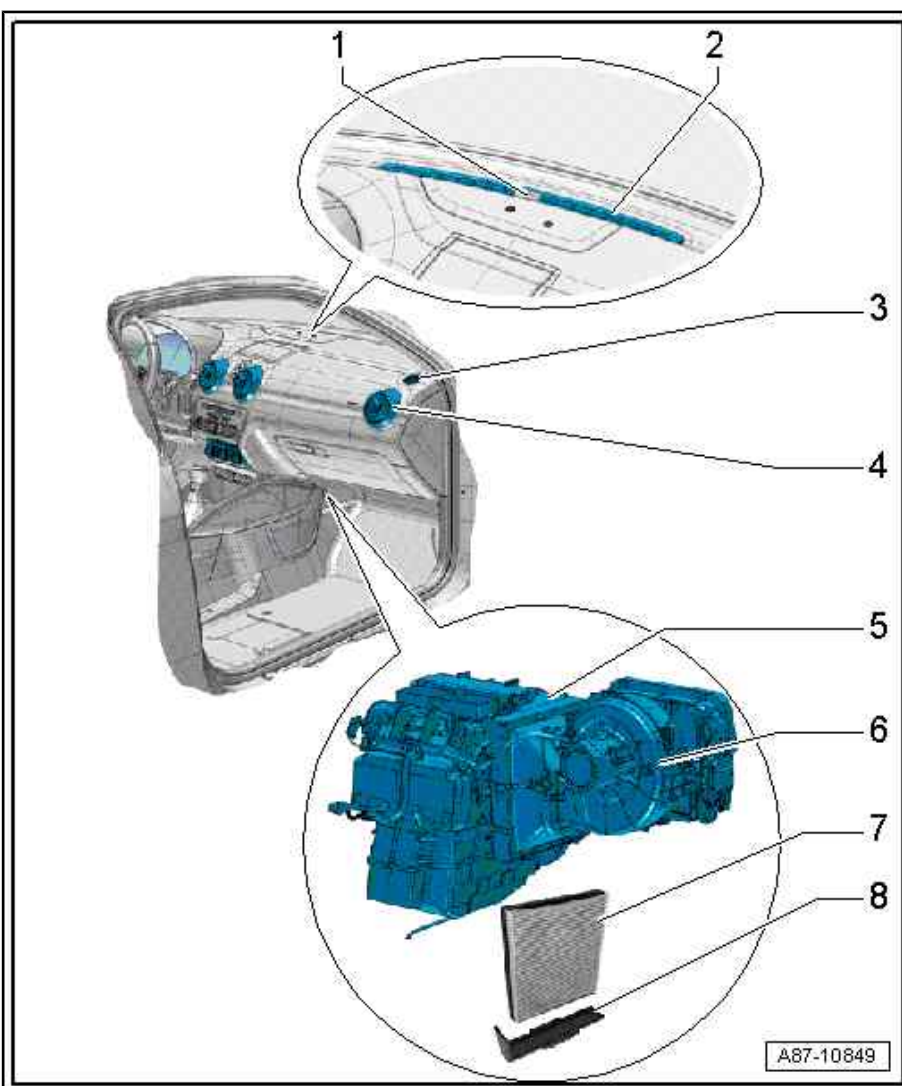
- ☐ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel vents

### 3 - 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)

### 4 - Dash panel vent (right-side)

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



## 5 - Air conditioning unit (viewed from right)

- ❑ Overview of air distribution system ⇒ [page 69](#)

### Manually controlled air conditioner

- ❑ Exploded view ⇒ [page 173](#)
- ❑ Removing and installing ⇒ [page 200](#)

### Automatically controlled air conditioner

- ❑ Exploded view ⇒ [page 173](#)
- ❑ Removing and installing ⇒ [page 200](#)



#### Note

- ◆ *Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue*
- ◆ *Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals are adapted accordingly.*



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## 6 - Fresh air blower - V2-

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ [page 207](#)

## 7 - Dust and pollen filter

- ❑ Different versions ⇒ [page 204](#) and ⇒ Electronic parts catalogue
- ❑ Notes on version with activated charcoal filter insert ⇒ [page 47](#)
- ❑ Observe replacement intervals ⇒ Maintenance tables
- ❑ Removing and installing ⇒ [page 204](#)

## 8 - Slot cover for dust and pollen filter

- ❑ Different versions (depending on version of dust and pollen filter) ⇒ [page 204](#) and ⇒ Electronic parts catalogue

## 2 Refrigerant circuit

- ⇒ [“2.1 System overview - refrigerant circuit”, page 89](#)
- ⇒ [“2.2 Exploded view - condenser”, page 93](#)
- ⇒ [“2.3 Removing and installing high-pressure sender G65”, page 99](#)
- ⇒ [“2.4 Checking cut-in signal for air conditioner compressor regulating valve N280”, page 100](#)
- ⇒ [“2.5 Detaching and attaching refrigerant lines at service connections”, page 104](#)
- ⇒ [“2.6 Removing and installing expansion valve”, page 106](#)
- ⇒ [“2.7 Detaching and attaching refrigerant lines at condenser”, page 108](#)
- ⇒ [“2.8 Removing and installing condenser”, page 110](#)
- ⇒ [“2.9 Removing and installing desiccant bag/desiccant cartridge”, page 113](#)
- ⇒ [“2.10 Differences in service connections depending on refrigerant \(R134a or R1234yf\)”, page 118](#)
- ⇒ [“2.11 Removing and installing evacuating and charging valve \(low-pressure and high-pressure sides\)”, page 121](#)
- ⇒ [“2.12 Starting up air conditioner after charging refrigerant circuit”, page 123](#)

### 2.1 System overview - refrigerant circuit

HD = High-pressure side

ND = Low-pressure side

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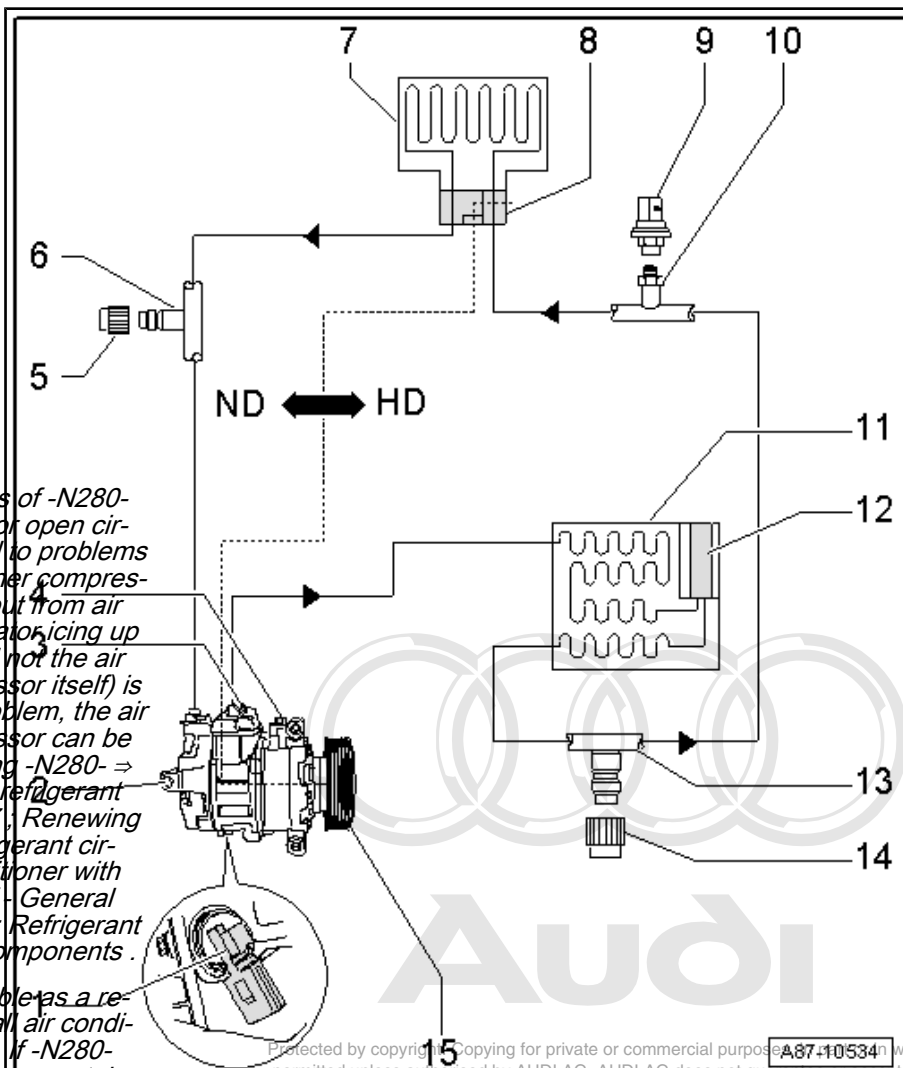
## 1 - Air conditioner compressor regulating valve - N280-

- ❑ Checking activation and function ⇒ Vehicle diagnostic tester ("Guided Fault Finding"), ⇒ ["2.4 Checking cut-in signal for air conditioner compressor regulating valve N280"](#), [page 100](#) 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.



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## 2 - Air conditioner compressor

- ❑ Exploded view ⇒ [page 126](#)
- ❑ 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.**  
**Danger of frostbite on skin and other parts of the body.**  
**Always discharge refrigerant circuit before removing component; connection has no valve.**

#### 4 - Oil drain plug

#### 5 - Cap

- ☐ With seal
- ☐ Always screw on
- ☐ Different versions depending on refrigerant (R134a or R1234yf)  
 ⇒ [“2.10 Differences in service connections depending on refrigerant \(R134a or R1234yf\)”, page 118](#) 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.*

*Danger of frostbite on skin and other parts of the body.*

*Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .*

- ☐ Different versions depending on refrigerant (R134a or R1234yf)  
 ⇒ [“2.10 Differences in service connections depending on refrigerant \(R134a or R1234yf\)”, page 118](#) and  
 ⇒ Electronic parts catalogue

#### 7 - Evaporator

#### 8 - Expansion valve

- ☐ Exploded view ⇒ [page 95](#)
- ☐ Different versions depending on refrigerant (R134a or R1234yf) ⇒ [Electronic parts catalogue](#)

#### 9 - High-pressure sender - G65

- ☐ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ☐ Removing and installing ⇒ [page 99](#)

#### 10 - Connection with valve

#### 11 - Condenser

- ☐ Exploded view ⇒ [page 93](#)

#### 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.*

*Danger of frostbite on skin and other parts of the body.*

*Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .*



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- ☐ Different versions depending on refrigerant (R134a or R1234yf)  
⇒ [“2.10 Differences in service connections depending on refrigerant \(R134a or R1234yf\)”, page 118](#) and  
⇒ Electronic parts catalogue

**14 - Cap**

- ☐ With seal
- ☐ Always screw on
- ☐ Different versions depending on refrigerant (R134a or R1234yf)  
⇒ [“2.10 Differences in service connections depending on refrigerant \(R134a or R1234yf\)”, page 118](#) and  
⇒ Electronic parts catalogue

**15 - Pulley**

- ☐ Renewing ⇒ [“3.2 Exploded view - pulley”, page 129](#)
- ☐ Currently the pulley cannot be renewed separately on air conditioner compressors manufactured by “Delphi/Mahle”

## 2.2 Exploded view - condenser

⇒ ["2.2.1 Exploded view - condenser, desiccant cartridge", page 93](#)

⇒ ["2.2.2 Exploded view - condenser, air conditioner compressor, expansion valve, refrigerant line", page 95](#)

### 2.2.1 Exploded view - condenser, desiccant cartridge

#### 1 - Condenser

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Detaching and attaching refrigerant line ⇒ [page 108](#)
- ☐ Removing and installing ⇒ [page 110](#)



#### Note

*Illustration shows "Modine" condenser.*

#### 2 - O-ring

- ☐ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Before installing, lubricate lightly with refrigerant oil ⇒ [page 46](#)

#### 3 - O-ring

- ☐ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Before installing, lubricate lightly with refrigerant oil ⇒ [page 46](#)

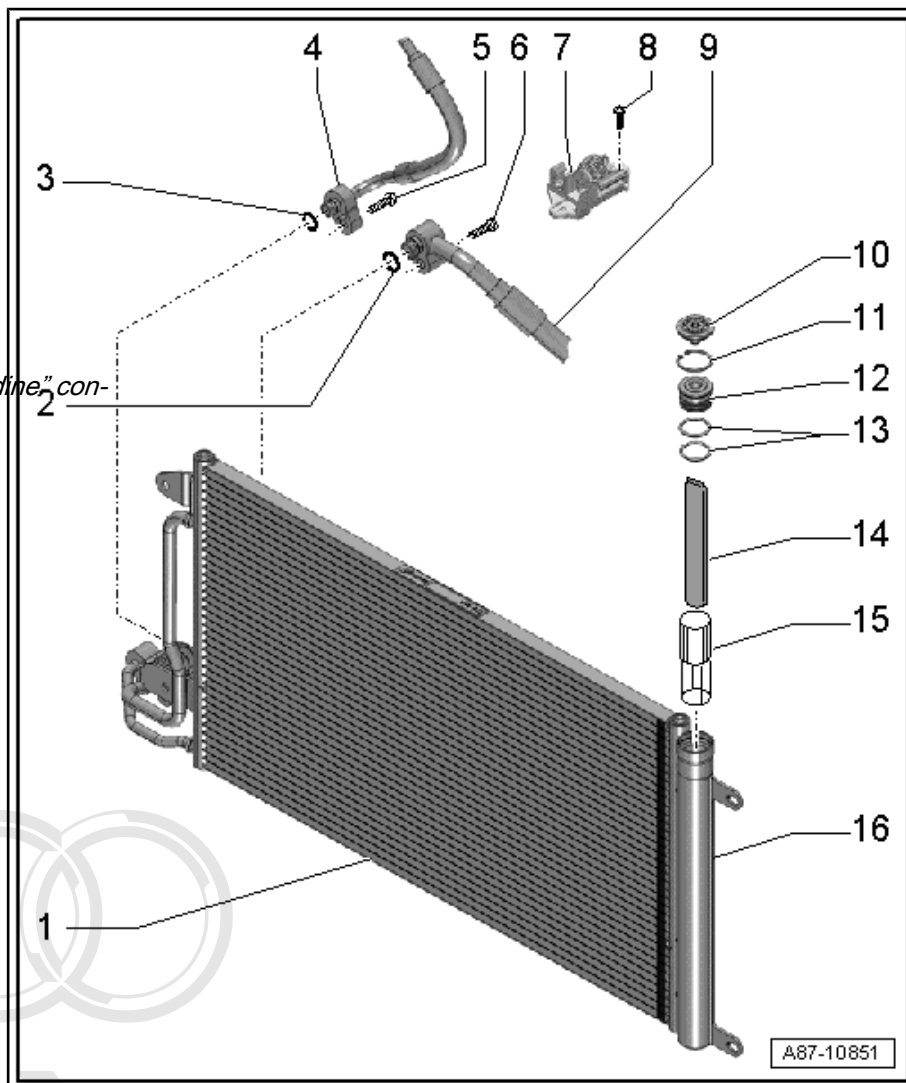
#### 4 - Refrigerant line

- ☐ To expansion valve
- ☐ With branch to service connection on high-pressure side
- ☐ With scuff guard



#### Note

◆ *Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue*



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- ◆ *Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.*



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**5 - Bolt - M6**

- ☐ 10 Nm

**6 - Bolt - M6**

- ☐ 10 Nm

**7 - Bracket**

- ☐ For refrigerant lines

**8 - Bolt**

- ☐ 2x
- ☐ 2 Nm

**9 - Refrigerant line**

- ☐ To air conditioner compressor

**10 - Cap**

- ☐ Different versions ⇒ Electronic parts catalogue

**11 - Circlip****12 - Cover**

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ With O-rings
- ☐ Renew cap if damaged
- ☐ Before installing, lubricate lightly with refrigerant oil ⇒ [page 46](#)

**13 - O-rings**

- ☐ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Before installing, lubricate lightly with refrigerant oil ⇒ [page 46](#)

**14 - Desiccant cartridge**

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 113](#)

**15 - Strainer**

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ ["2.9 Removing and installing desiccant bag/desiccant cartridge", page 113](#)

**16 - Receiver**

- ☐ Integrated into 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 138](#)
- ☐ Removing and installing ⇒ [page 139](#)
- ☐ Removing and installing pulley, exploded view ⇒ [page 129](#)
- ☐ 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 lightly with refrigerant oil ⇒ [page 46](#)

### 4 - O-ring

- ☐ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Before installing, lubricate lightly with refrigerant oil ⇒ [page 46](#)

### 5 - Refrigerant line

- ☐ To condenser

### 6 - Bolt

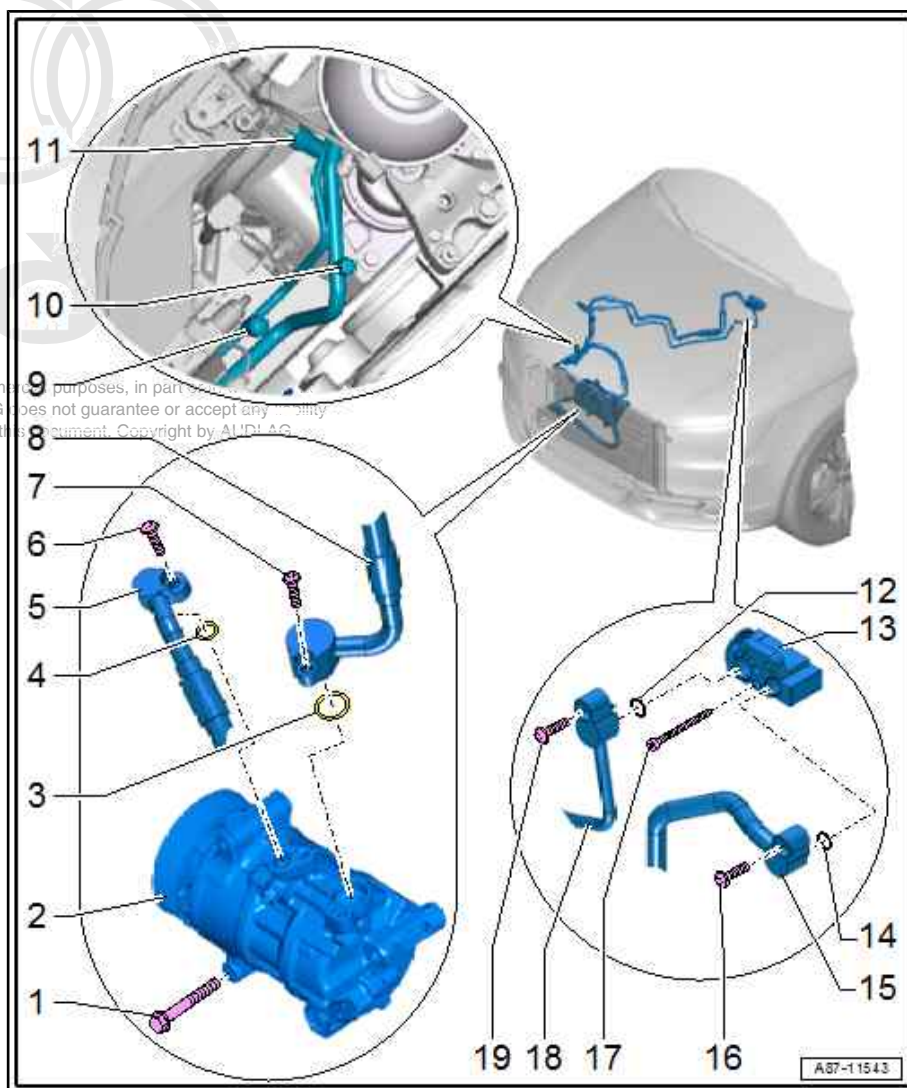
- ☐ M8 thread, 25 Nm
- ☐ M6 thread, 10 Nm

### 7 - Bolt

- ☐ M8 thread, 25 Nm
- ☐ M6 thread, 10 Nm

### 8 - Refrigerant line

- ☐ To expansion valve



## 9 - Service connection on high-pressure side



### Caution

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

*Danger of frostbite on skin and other parts of the body.*

*Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .*

- ☐ Different versions depending on refrigerant (R134a or R1234yf)  
⇒ ["2.10 Differences in service connections depending on refrigerant \(R134a or R1234yf\)", page 118](#) and  
⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 121](#)

## 10 - Service connection on low-pressure side



### Caution

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

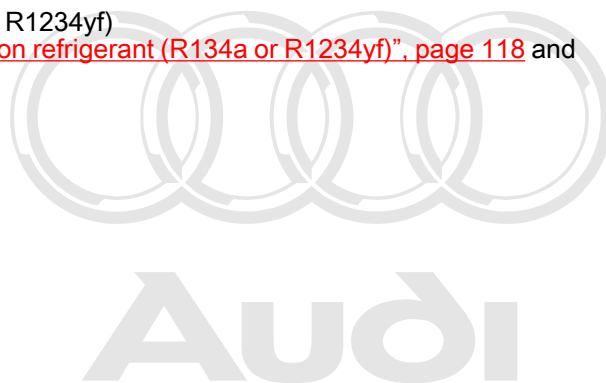
*Danger of frostbite on skin and other parts of the body.*

*Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .*

- ☐ Different versions depending on refrigerant (R134a or R1234yf)  
⇒ ["2.10 Differences in service connections depending on refrigerant \(R134a or R1234yf\)", page 118](#) and  
⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 121](#)

## 11 - High-pressure sender - G65-

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



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- ☐ Removing and installing ⇒ [page 99](#)
- ☐ 8 Nm

## 12 - O-ring

- ☐ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Before installing, lubricate lightly with refrigerant oil ⇒ [page 46](#)

## 13 - Expansion valve

- ☐ Different versions ⇒ [page 106](#) and ⇒ Electronic parts catalogue
- ☐ Detaching and attaching refrigerant line ⇒ [page 104](#)
- ☐ Removing and installing ⇒ [page 106](#)



### Note

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

- ◆ *Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue*

- ◆ *Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.*

## 14 - O-ring

- ☐ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Before installing, lubricate lightly with refrigerant oil ⇒ [page 46](#)

## 15 - Refrigerant line

- ☐ To air conditioner compressor
- ☐ Different versions ⇒ [page 104](#) and ⇒ Electronic parts catalogue



### Note

- ◆ *Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue*

- ◆ *Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.*

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#### 16 - Bolt - M6

- ☐ 10 Nm

#### 17 - Bolt

- ☐ 2x
- ☐ 10 Nm

#### 18 - Refrigerant line

- ☐ From condenser
- ☐ Different versions ⇒ [page 104](#) and ⇒ Electronic parts catalogue



#### Note

- ◆ *Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue*
- ◆ *Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.*

#### 19 - Bolt - M6

- ☐ 10 Nm

## 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 ⇒ Current flow diagrams, Electrical fault finding and Fitting locations*
- ◆ *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

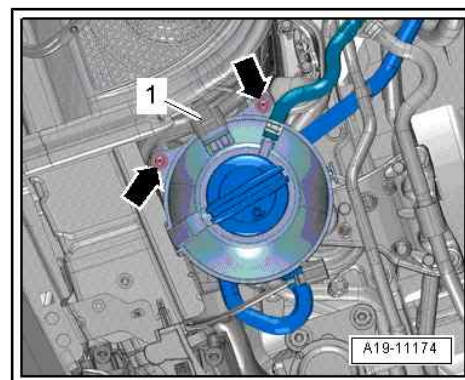
**Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.**

**Danger of frostbite on skin and other parts of the body.**

- ◆ **If refrigerant emerges from refrigerant line for more than 1 second when -G65- is loosened, tighten -G65- again immediately.**
- ◆ **Extract refrigerant before removing and installing ⇒ 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 .**
- ◆ **If defective, renew valve in refrigerant line ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .**

### Removing

- Remove bolts -arrows-.
- Unplug electrical connector -1-.
- Lift coolant expansion tank out of guide and place it to one side with coolant hoses connected.



- Unplug electrical connector -1-.
- Unscrew high-pressure sender - G65- -2-.

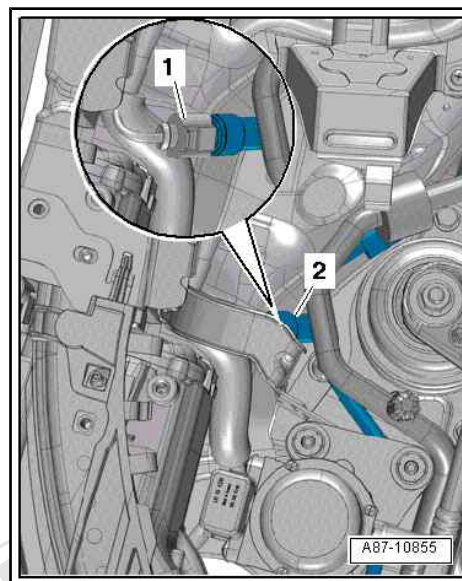
### Installing

Install in reverse order of removal; note the following:

- Renew O-ring ⇒ [page 46](#) . For correct version refer to ⇒ Electronic parts catalogue .

### Tightening torques

- ♦ ⇒ [“2.2.2 Exploded view - condenser, air conditioner compressor, expansion valve, refrigerant line”, page 95](#)



## 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 .*

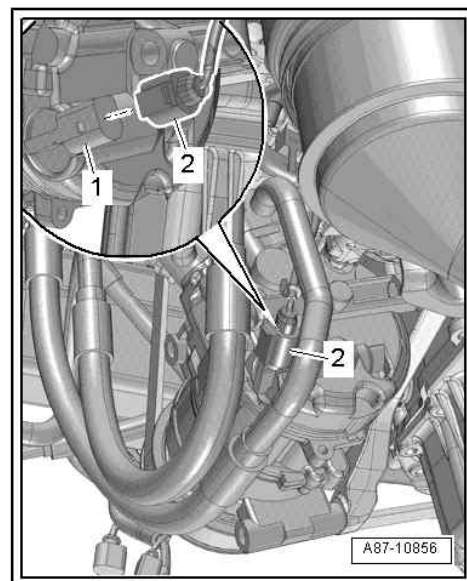
### Special tools and workshop equipment required

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

◆ Probe - VAS 5051/8-

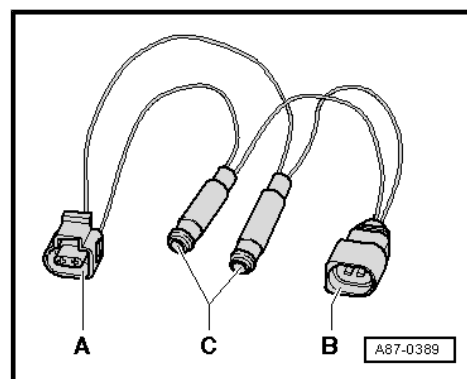
**Test sequence**

- 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-.



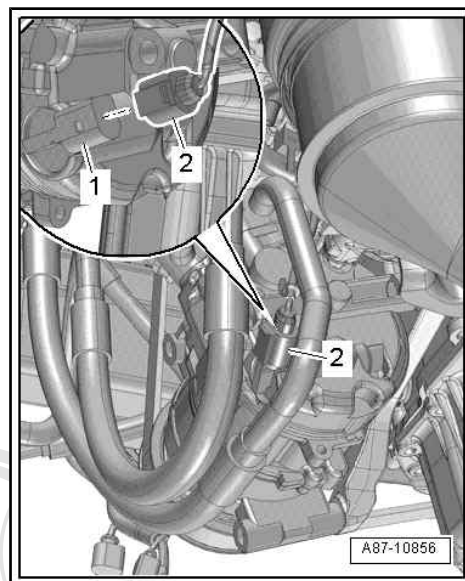
**Note**

- ◆ *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 mm<sup>2</sup>) 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:



# Audi

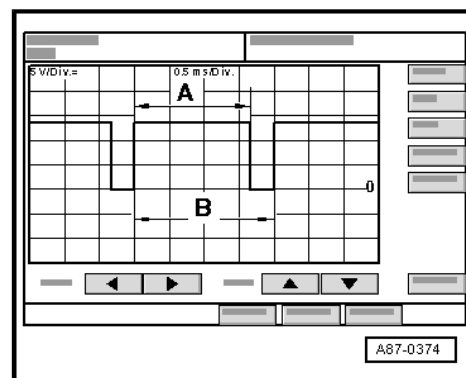
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- In "OFF" mode (lamp in **AC** or **A/C** button not lit), no square-wave signal (air conditioner compressor regulating valve - N280- is not actuated).
- In "AUTO" mode (automatic air conditioner only) with **AC** or **A/C** button pressed (lamp in **AC** or **A/C** button lit), square-wave signal with 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).



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#### Note

- ◆ 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 service connections

⇒ **"2.5.1 Detaching and attaching refrigerant lines at expansion valve", page 104**

### 2.5.1 Detaching and attaching refrigerant lines at expansion valve



#### WARNING

*Danger from escaping pressurised refrigerant.*

*Danger of frostbite on skin and other parts of the body.*

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

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#### Special tools and workshop equipment required

- ◆ Engine bung set - VAS 6122-

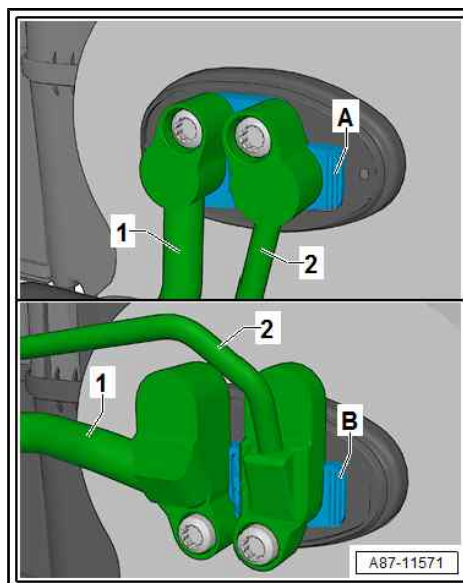


#### Note

- ◆ *Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue*
- ◆ *Vehicles with the type codes "8XA" and "8X1" in the vehicle identification number are fitted with an expansion valve -A- with two refrigerant lines -1 and 2- bolted on at the top. Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve -B- with two refrigerant lines -1 and 2- bolted on at the bottom. In addition, the connecting flange on the heat exchanger is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals are adapted accordingly.*

#### Removing

- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
- Depending on engine version, remove components impeding access to connections (e.g. on vehicles with 4-cylinder TDI engine: remove air cleaner housing and intake hose to turbo-charger ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .
- If fitted, remove heat insulation for expansion valve.

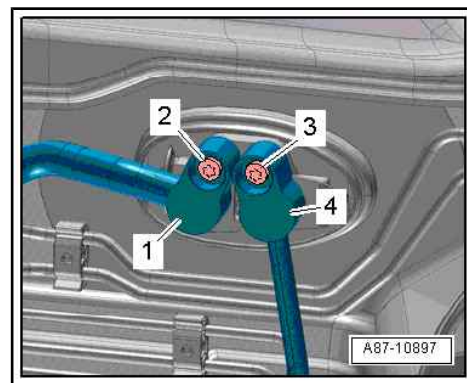


- Remove bolts -2 and 3- and detach refrigerant lines -1 and 4-.

**i Note**

*This illustration shows the refrigerant lines -1 and 4- on a vehicle with the type code "8X\_" in the vehicle identification number (routing to expansion valve). The bolts -2 and 3- are secured at the top at the expansion valve.*

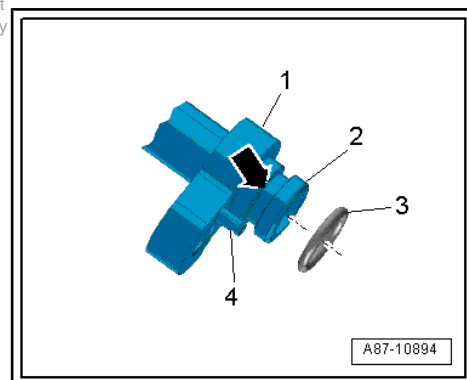
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .



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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-.



**i Note**

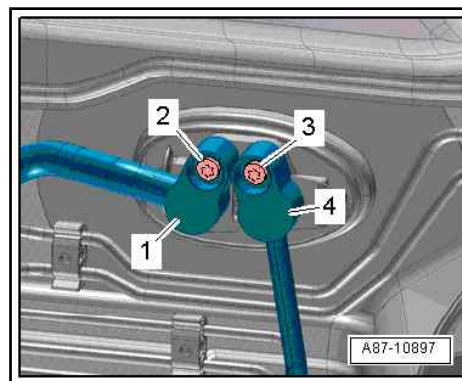
- ◆ Lubricate O-rings lightly with refrigerant oil before fitting ⇒ [page 46](#) .
- ◆ Check refrigerant pipes to evaporator for dirt and damage.
- ◆ Make sure O-rings are seated correctly in groove -arrow- of corresponding refrigerant line.
- ◆ After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.

- Insert refrigerant lines -1, 4- in corresponding connections at expansion valve.



### Note

*This illustration shows the refrigerant lines -1 and 4- on a vehicle with the type code "8X\_" in the vehicle identification number (routing to expansion valve). The bolts -2 and 3- are secured at the top at the expansion valve.*



- Tighten bolts -2 and 3-  
⇒ ["2.2.2 Exploded view - condenser, air conditioner compressor, expansion valve, refrigerant line", page 95](#) .
- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
- Start up air conditioner after charging refrigerant circuit  
⇒ [page 123](#) .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

## 2.6 Removing and installing expansion valve

### Special tools and workshop equipment required

- ♦ Engine bung set - VAS 6122-



### WARNING

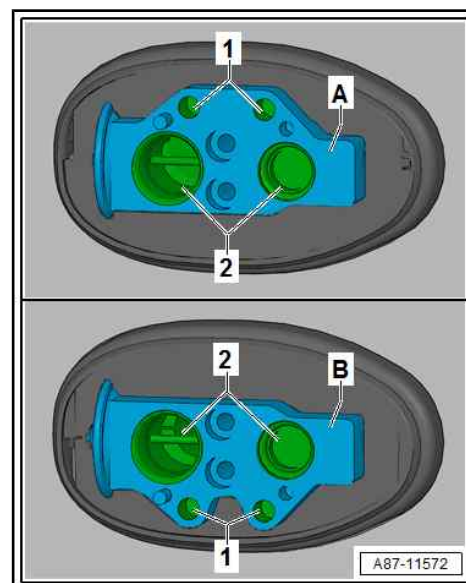
***Danger from escaping pressurised refrigerant.***

***Danger of frostbite on skin and other parts of the body.***

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

## 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
- ◆ Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue
- ◆ Vehicles with the type codes "8XA" and "8X1" in the vehicle identification number are fitted with an expansion valve -A- with the two refrigerant lines bolted on at the top. On vehicles with the type codes "8XF" and "8XK" in the vehicle identification number, the two refrigerant lines are bolted on at the bottom of the expansion valve -B-. In addition, the connecting flange on the heat exchanger is approx. 9 mm shorter than on vehicles with the type code "8X\_" in the vehicle identification number. The air distribution housing and corresponding seals are adapted accordingly.

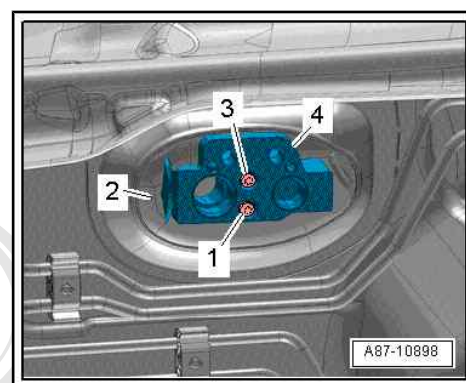


## Removing

### Note

This illustration shows an expansion valve -4- and a heat insulation -2- on a vehicle with type code "8XA" or "8X1" in the vehicle identification number.

- Detach refrigerant lines from expansion valve ⇒ [page 104](#).
- Remove bolts -1 and 3-.
- Pull expansion valve -4- out of heat insulation -2-.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122-.



## Installing

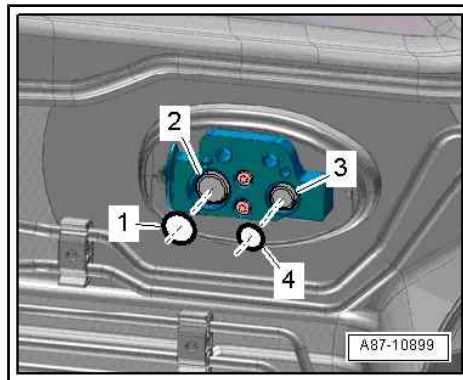


### Note

*This illustration shows an expansion valve (with heat insulation) on a vehicle with the type code "8X\_" in the vehicle identification number.*

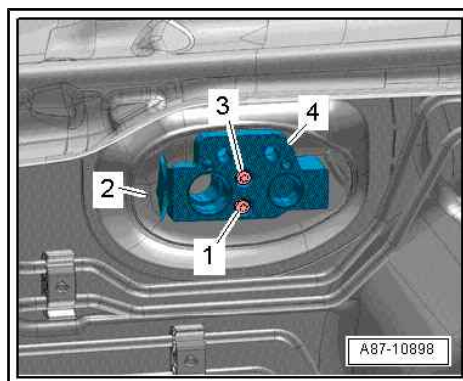
Install in reverse order of removal; note the following:

- Renew O-rings; for correct version, refer to ⇒ Electronic parts catalogue .
- Insert O-rings -1 and 4- at connecting pipes -2 and 3- to evaporator.



### 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 46](#) .*
- ◆ *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).*



- Insert expansion valve -4- at evaporator.
- Tighten bolts -1 and 3-  
⇒ ["2.2.2 Exploded view - condenser, air conditioner compressor, expansion valve, refrigerant line", page 95](#) .
- Attach refrigerant lines at expansion valve ⇒ [page 104](#) .
- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

## 2.7 Detaching and attaching refrigerant lines at condenser



### WARNING

***Danger from escaping pressurised refrigerant.***

***Danger of frostbite on skin and other parts of the body.***

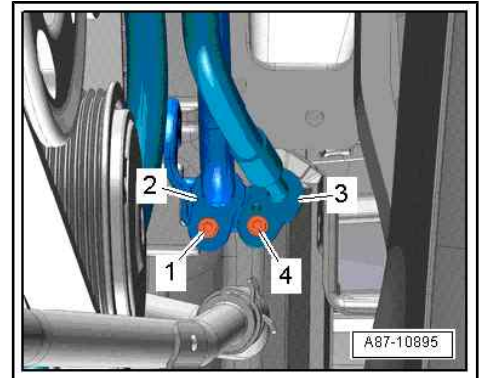
- ***Extract the refrigerant and then immediately open up the refrigerant circuit.***
- ***Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant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

## Special tools and workshop equipment required

- ◆ Engine bung set - VAS 6122-

### Removing

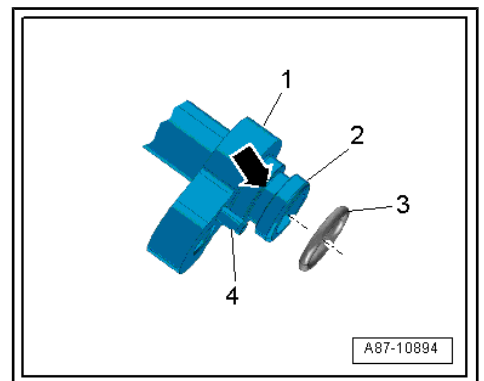
- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .
- 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

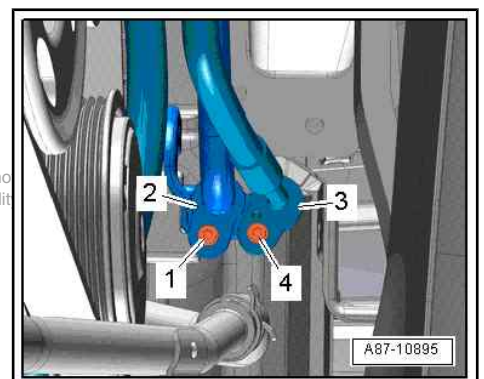
Install in reverse order of removal; note the following:

- 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

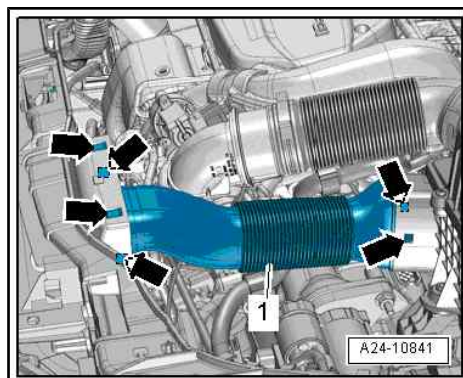
- ◆ *Lubricate O-rings lightly with refrigerant oil before fitting ⇒ [page 46](#) .*
- ◆ *Make sure O-rings are seated correctly in groove -arrow- of corresponding refrigerant line.*
- ◆ *After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.*
- Insert refrigerant lines -2 and 3- in corresponding connections at condenser.
- Tighten bolts -1 and 4-  
⇒ ["2.2.1 Exploded view - condenser, desiccant cartridge", page 93](#) .
- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
- Start up air conditioner after charging refrigerant circuit  
⇒ [page 123](#) .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



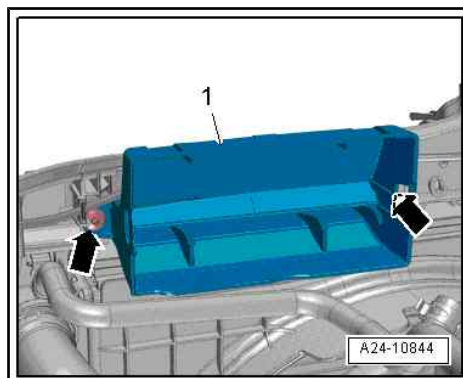
## 2.8 Removing and installing condenser

### Removing

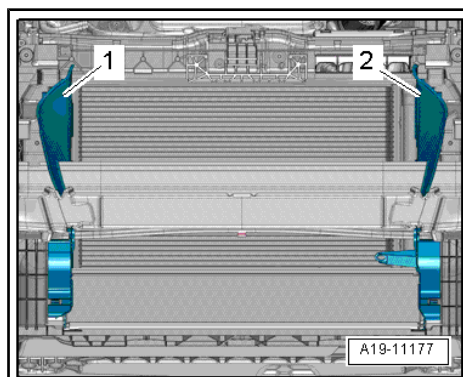
- Detach refrigerant lines from condenser ⇒ [page 108](#) .
- Remove radiator cowl ⇒ Engine, mechanics; Rep. gr. 19 ; Radiator/radiator fans; Removing and installing radiator cowl .
- Remove bumper cover (front) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .
- Release fasteners -arrows- and detach air duct -1-.



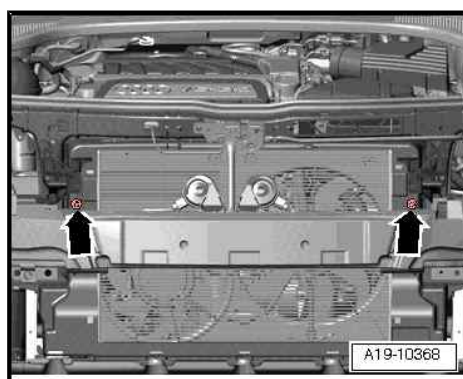
- Unscrew bolts -arrows- and detach air duct -1-.



- Release fasteners and detach air ducts -1 and 2-.

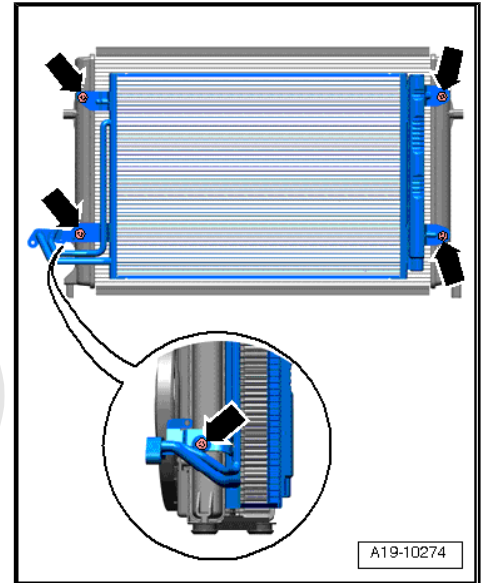


- Remove bolts -arrows-.
- Swivel top edge of radiator slightly to rear.
- Lift radiator, disengage it from lower mounting points and press to rear.



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- Remove bolts -arrows-.



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- Press radiator (top) -3- carefully towards rear.
- If necessary, unfasten refrigerant line on low-pressure side (from expansion valve to air conditioner compressor) and/or refrigerant lines on high-pressure side (from condenser to expansion valve and from air conditioner compressor to condenser) from brackets  
 ⇒ ["2.5.1 Detaching and attaching refrigerant lines at expansion valve", page 104](#) and  
 ⇒ ["3.4 Detaching and attaching refrigerant lines at air conditioner compressor", page 138](#) .

**If necessary, detach or remove the following components (depending on vehicle and engine version)**

Audi S1 and vehicles with 1.4 ltr. TFSI engine

Remove radiator ⇒ Engine, mechanics; Rep. gr. 19 ; Radiator/ radiator fan; Removing and installing radiator .

- Lift out condenser -2-.

Vehicles with a charge air cooler under radiator (e.g. vehicles with 1.6 ltr. TDI engine)

- **Detach or remove charge air cooler** – Engine, mechanics; Rep. gr. 21 ; Charge air system; Exploded view - charge air system .



#### Note

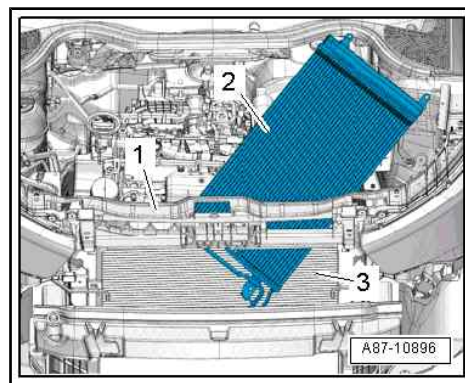
*If the charge air cooler has been removed, the condenser -2- can also be removed downwards (depending on vehicle).*

#### All versions



#### Note

- ◆ *Depending on its version, it may be necessary to remove the refrigerant line on the low-pressure side (from the expansion valve to the air conditioner compressor) in order to be able to press the radiator far enough to the rear.*
- ◆ *Depending on the version of the vehicle and engine, it may be necessary to unfasten e.g. the refrigerant line going from the condenser to the expansion valve from its mountings and brackets in order to be able to swivel the radiator slightly further to the rear so that the condenser can be removed.*
- Lift out condenser -2- between radiator and lock carrier -1-.



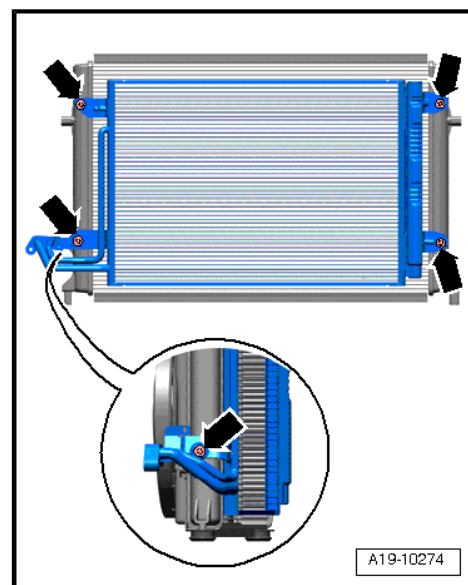
## Installing

Install in reverse order of removal; note the following:



### Note

- ◆ *Installing radiators and condensers* ⇒ [page 17](#)
- ◆ *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 .*
- Tighten bolts -arrows- to 6 Nm.
- Attach refrigerant lines to condenser ⇒ [page 108](#) .
- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



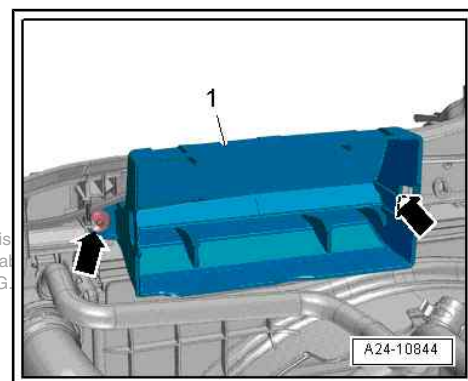
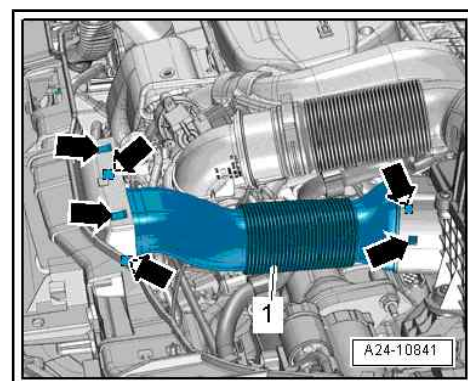
## 2.9 Removing and installing desiccant bag/ desiccant cartridge

### Special tools and workshop equipment required

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

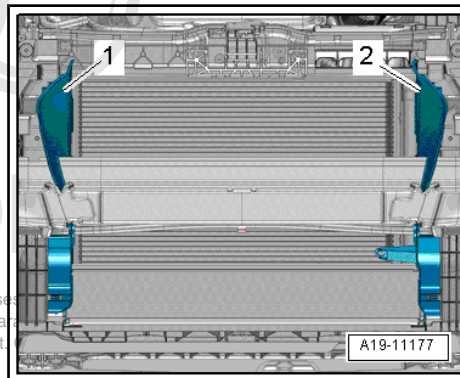
### Removing

- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
- Remove radiator cowl ⇒ Engine, mechanics; Rep. gr. 19 ; Radiator/radiator fans; Removing and installing radiator cowl .
- Remove bumper cover (front) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .
- Release fasteners -arrows- and detach air duct -1-.
- Unscrew bolts -arrows- and detach air duct -1-.



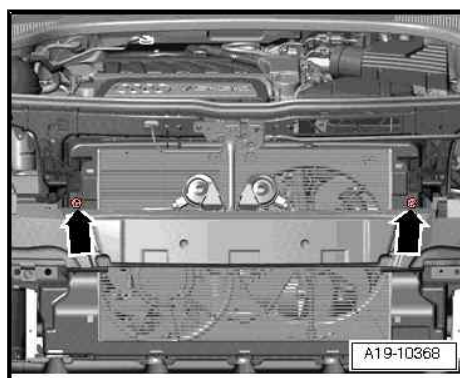
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- Release fasteners and detach air ducts -1 and 2-.

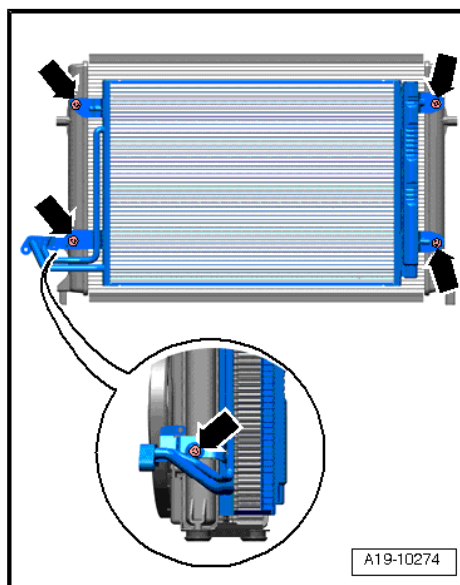


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- Remove bolts -arrows-.
- Swivel top edge of radiator slightly to rear.
- Lift radiator, disengage it from lower mounting points and press to rear.



- Remove bolts -arrows-.
- Press left side of condenser slightly towards front.



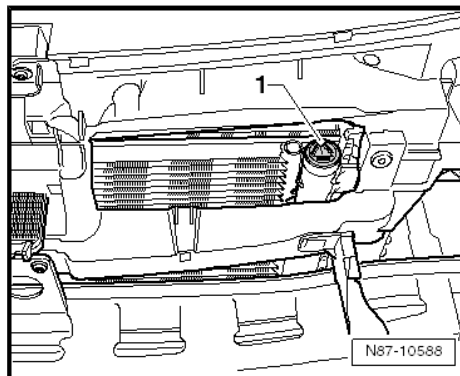
#### Version 1:

- Remove protective cap -1-.



#### WARNING

- ◆ *Before removing the cap -1-, the refrigerant must be extracted from the refrigerant circuit. Renewed evaporation may create pressure in the refrigerant circuit if the circlip -arrow- and the cap are not removed within 10 minutes. Extract refrigerant again.*



- Check pressure in refrigerant circuit via pressure gauge of air conditioner service station ⇒ 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 .



# **WARNING**

**Only remove the circlip -arrow- if 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.

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- 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

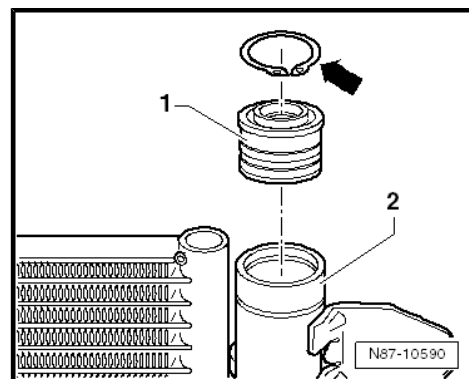
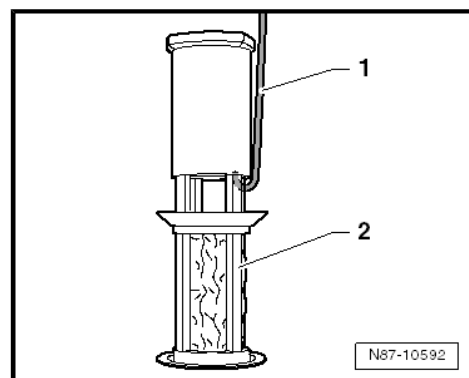
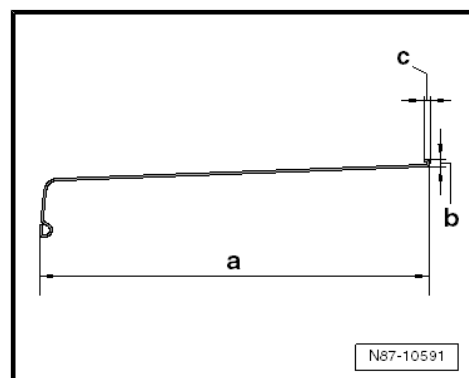
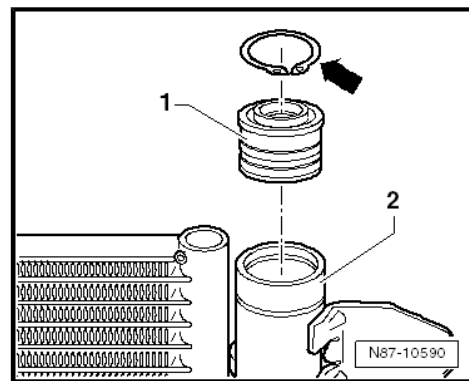
- To prevent damaging the condenser, it is important to hook the welding wire into the strainer as shown in the illustration.
- Using welding wire -1-, carefully pull filter element (strainer) -2- out of receiver.



# **Note**

*Depending on the lock carrier version, when removing the filter element (strainer) -2- it may be advisable to press the condenser carefully towards the rear at the top left rather than sliding it towards the front.*

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



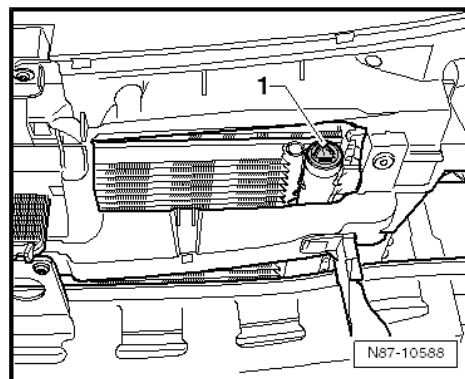
## Version 2:

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



### WARNING

- ◆ *Before removing the cap -1-, the refrigerant must be extracted from the refrigerant circuit. Renewed evaporation may create pressure in the refrigerant circuit if the circlip -arrow- and the cap are not removed within 10 minutes. Extract refrigerant again.*

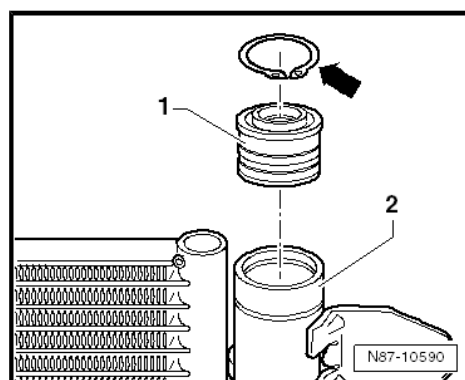


- Check pressure in refrigerant circuit via pressure gauge of air conditioner service station ⇒ Air conditioner with refrigerant R134a, Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .



### WARNING

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

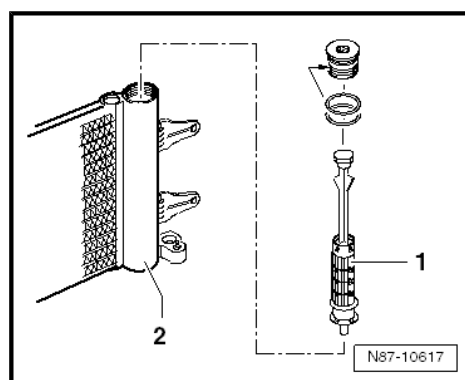


- Press cap -1- in slightly.
- Detach circlip -arrow- and pull cap out of condenser -2- using an M12 bolt.
- Using long-nose pliers, pull dryer unit -1- out of condenser -2-.



### Note

*Depending on the lock carrier version, when removing the dryer unit -1- it may be advisable to press the condenser -2- carefully towards the rear at the top left rather than sliding it towards the front.*



## 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.

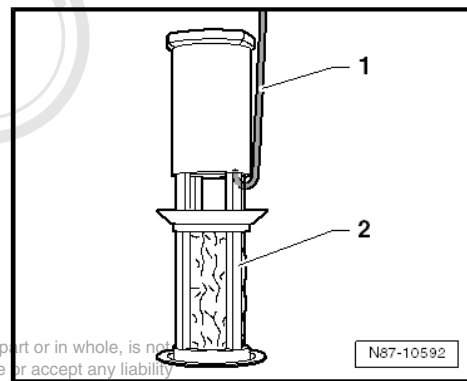
### Version 1:

- 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

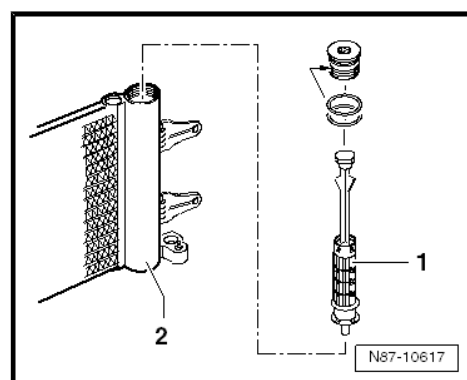
*Keep bag with air-tight seal containing desiccant cartridge closed as long as possible. Only open bag immediately before inserting desiccant cartridge in condenser. After opening bag, desiccant cartridge soon becomes saturated with moisture from ambient air and becomes unusable.*



- 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-.



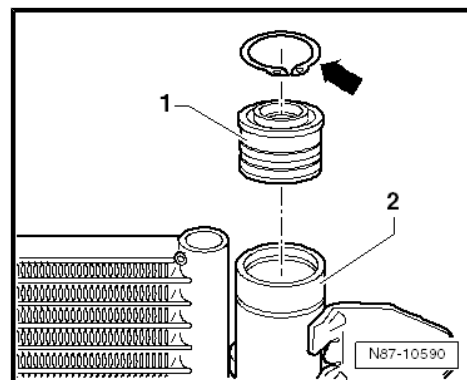
### All versions (continued):

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

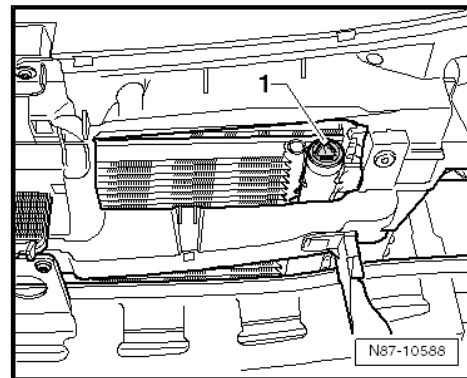


#### Note

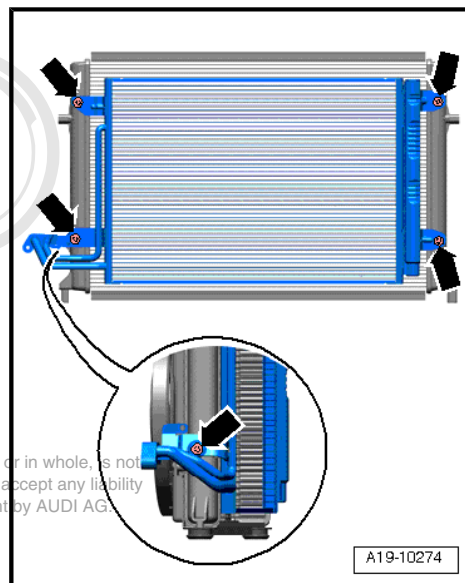
*Coat O-rings of cap lightly with refrigerant oil before fitting  
⇒ [page 46](#).*



- Version 1: Press on protective cap.
- Version 2: Screw in protective cap using socket T70 - T10128-.



- Tighten bolts -arrows- to 6 Nm.
- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
- Start up air conditioner after charging refrigerant circuit  
⇒ [page 123](#) .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



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## 2.10 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 89](#)
- ◆ 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 121](#) .
- ◆ Always screw on sealing caps with seal.

## Service connections (refrigerant R134a and R1234yf)

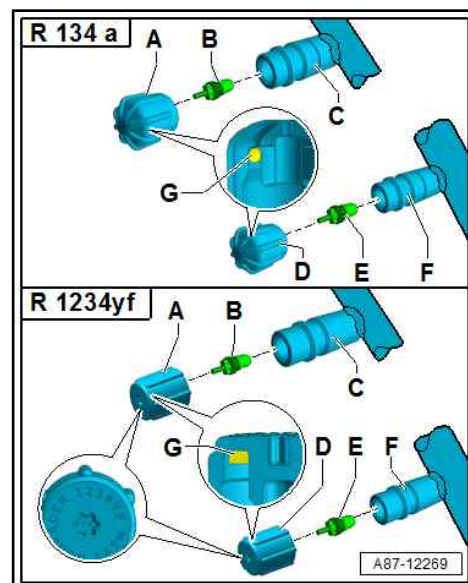


### WARNING

*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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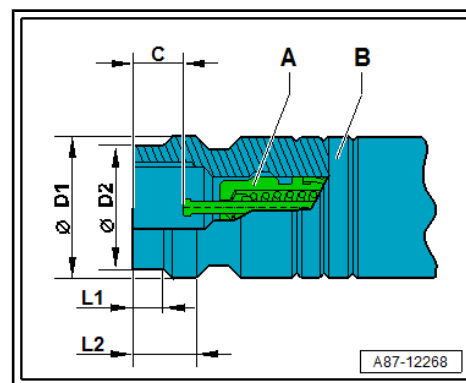
## Note

- ◆ *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 120](#) ).*
- ◆ *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 121](#) .*
- ◆ *Take care when tightening the valves -B, E- (low torque) ⇒ [page 121](#) .*
- ◆ *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

- ◆ Valve core -A- (different versions) ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information 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      |



## 2.11 Removing and installing evacuating and charging valve (low-pressure and high-pressure sides)



### WARNING

*Danger from escaping pressurised refrigerant.*

*Danger of frostbite on skin and other parts of the body.*

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



### Note

- ◆ *Specific tools are required 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)*  
⇒ *"2.10 Differences in service connections depending on refrigerant (R134a or R1234yf)", page 118 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 , 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.



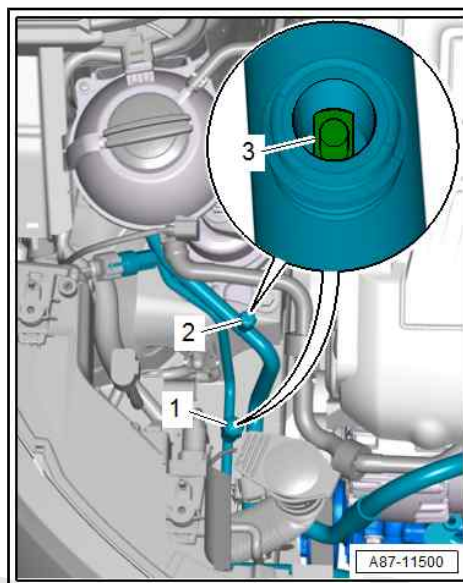
## Note

For further information on the service connection, refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

## Installing

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

- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
- Start up air conditioner after charging refrigerant circuit  
⇒ [page 123](#) .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



## 2.12 Starting up air conditioner after charging refrigerant circuit

⇒ **"2.12.1 Procedure if it is unavoidable to start the engine with an empty refrigerant circuit", page 123**

⇒ **"2.12.2 Procedure when starting the engine for the first time after charging the refrigerant circuit", page 124**

### 2.12.1 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 , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Evacuating refrigerant circuit .*
- ◆ *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.*

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

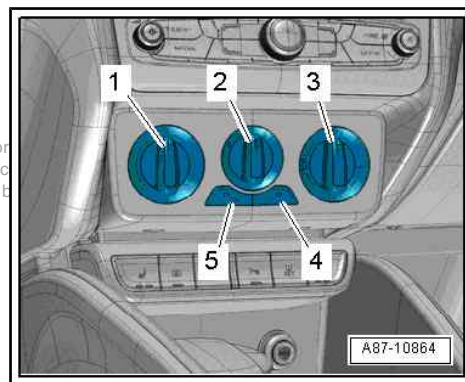
- All components removed have been re-installed.
- The refrigerant circuit is charged ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging .
- Open all dash panel vents.
- Switch on ignition.
- Start engine with air conditioner compressor switched off and wait for engine idling speed to stabilise.

### Vehicles with manually controlled air conditioner:

- Lamp in **AC** or **A/C** button -4- is not lit.

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).

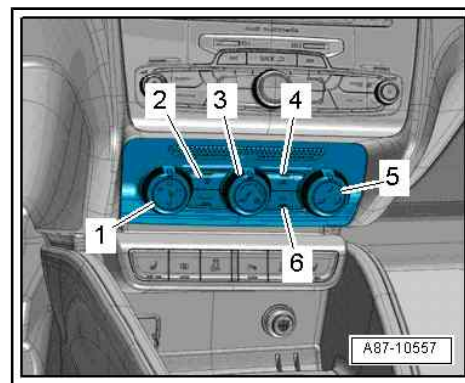


#### Vehicles with automatically controlled air conditioner:

- Lamp in **AC** or **A/C** button -6- 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 on).
- Set rotary temperature control -1- to “cold” stop.
- Air conditioner compressor on (lamp in **AC** or **A/C** button -6- on).



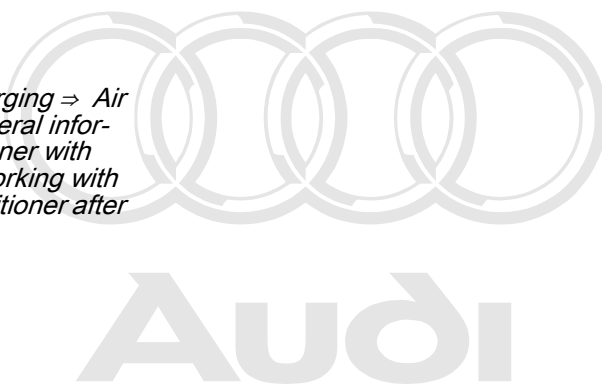
#### All vehicles (continued):

- 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 information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit .*



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### 3 Air conditioner compressor

⇒ ["3.1 Exploded view - drive unit for air conditioner compressor", page 126](#)

⇒ ["3.2 Exploded view - pulley", page 129](#)

⇒ ["3.3 Detaching and attaching air conditioner compressor at bracket", page 136](#)

⇒ ["3.4 Detaching and attaching refrigerant lines at air conditioner compressor", page 138](#)

⇒ ["3.5 Removing and installing air conditioner compressor", page 139](#)

⇒ ["3.6 Removing and installing pulley", page 143](#)

#### 3.1 Exploded view - drive unit for air conditioner compressor



##### Note

*Different versions; the illustration below shows the layout on a 4-cylinder 1.6 ltr. TDI engine ⇒ Engine, mechanics; Rep. gr. 13; Cylinder block (pulley end).*



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### 1 - Poly V-belt

- ☐ Check for wear
- ☐ Removing and installing  
⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt
- ☐ Mark direction; install in correct position ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt

### 2 - Bracket for ancillaries

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

### 3 - O-ring

- ☐ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Before installing, lubricate with refrigerant oil  
⇒ [page 46](#)

### 4 - Bolt

- ☐ Tightening torque  
⇒ [page 93](#)

### 5 - Refrigerant line (high-pressure side)

### 6 - Refrigerant line (low-pressure side)

### 7 - Bolt

- ☐ Tightening torque ⇒ [page 93](#)

### 8 - O-ring

- ☐ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ☐ Before installing, lubricate with refrigerant oil ⇒ [page 46](#)

### 9 - Air conditioner compressor regulating valve - N280-

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

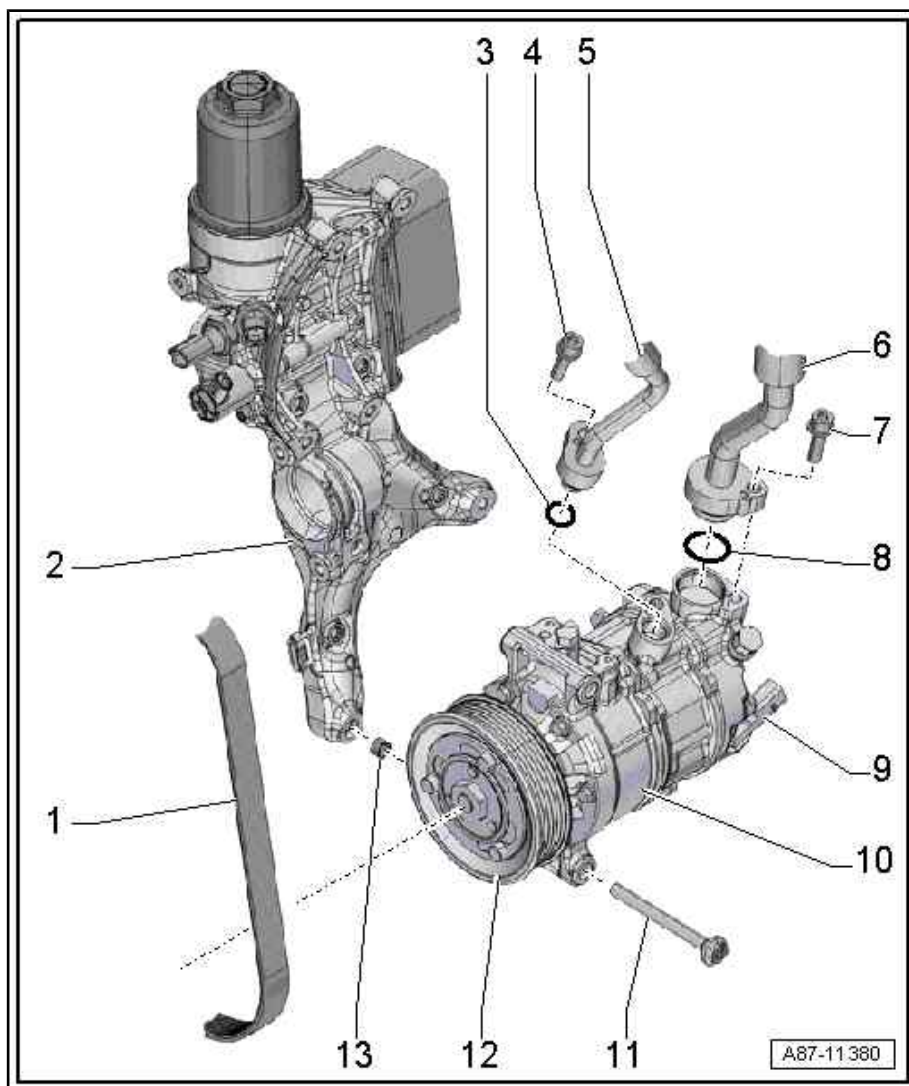
### 10 - Air conditioner compressor

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Detaching and attaching refrigerant line ⇒ [page 138](#)
- ☐ Detaching and attaching at bracket ⇒ [page 139](#)
- ☐ Removing and installing ⇒ [page 139](#)



#### Note

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





**11 - Bolt**

- ☐ 3x
- ☐ 25 Nm

**12 - Pulley with overload protection**

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Exploded view ⇒ [page 129](#)

**13 - Dowel sleeve**

- ☐ 2x



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## 3.2 Exploded view - pulley

⇒ [“3.2.1 Exploded view - Denso air conditioner compressor pulley, version 1”, page 129](#)

⇒ [“3.2.2 Exploded view - Denso air conditioner compressor pulley, version 2”, page 130](#)

⇒ [“3.2.3 Exploded view - Denso air conditioner compressor pulley, version 3”, page 131](#)

⇒ [“3.2.4 Exploded view - Denso air conditioner compressor pulley, version 4”, page 132](#)

⇒ [“3.2.5 Exploded view - Sanden air conditioner compressor pulley \(Delphi/Mahle version 1\)”, page 133](#)

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



#### Note

*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

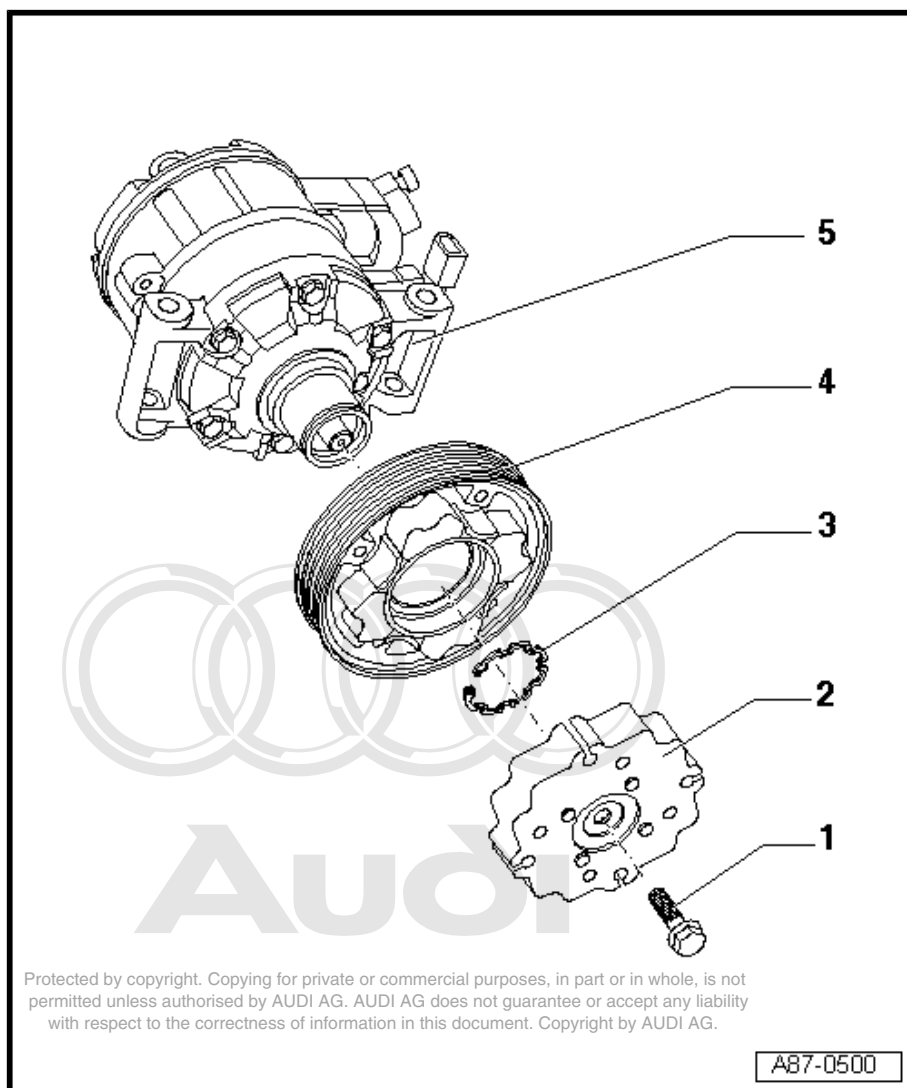
- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 143](#)
- ☐ With overload protection device; triggered if torque is too great (e.g. if air conditioner compressor cannot rotate freely) causing pulley to free-wheel without driving air conditioner compressor

#### 3 - Circlip

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

#### 4 - Pulley

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 143](#)
- ☐ 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

### 3.2.2 Exploded view - "Denso" air conditioner compressor pulley, version "2"



## Note

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

#### 1 - Circlip

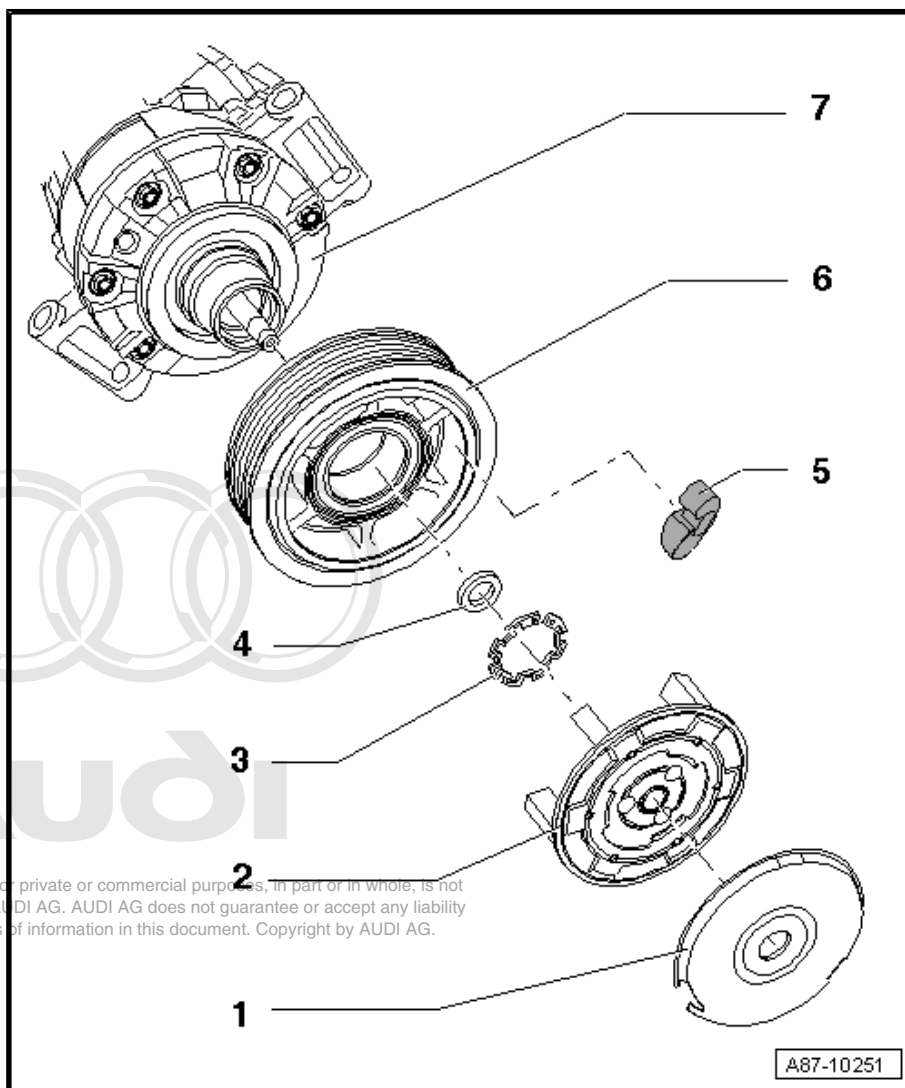
- ☐ With vulcanised rubber disc
- ☐ Remove carefully using a small screwdriver or long-nose pliers (paying particular attention to pulley)
- ☐ Vulcanised rubber disc provides noise insulation when compressor output is low and engine is idling

#### 2 - Drive plate

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 144](#)
- ☐ 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 144](#).
- ☐ 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 144](#)
- ☐ 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 144](#)

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#### 7 - Air conditioner compressor

- ☐ Clean air conditioner compressor drive shaft before fitting pulley

### 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

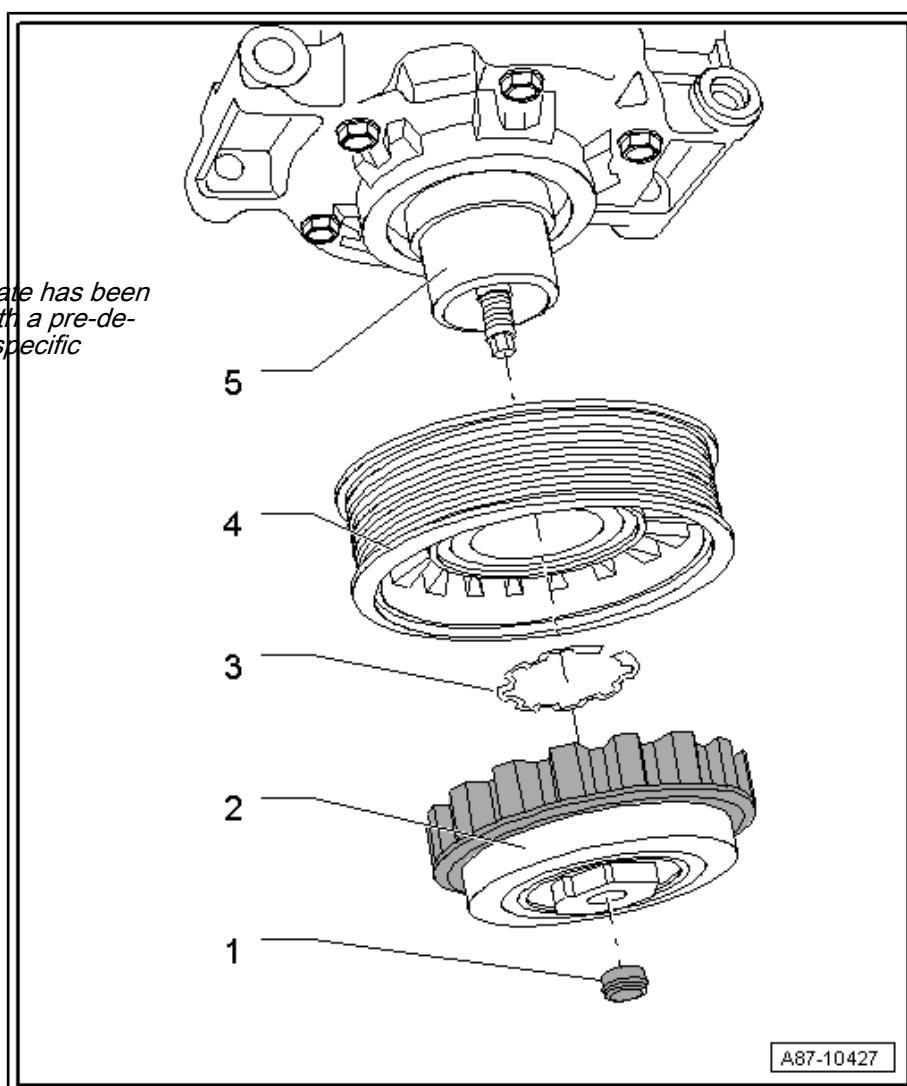
- ☐ Renew
- ☐ Screwed onto compressor shaft



#### Note

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

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ With overload protection device; triggered if torque is too great (e.g. if air conditioner compressor cannot rotate freely) causing pulley to free-wheel without driving air conditioner compressor
- ☐ With rubber elements for decoupling the pulley from the air conditioner compressor drive shaft and for damping vibration and noise
- ☐ Removing and installing ⇒ [page 146](#)
- ☐ 30 Nm



A87-10427

### 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 146](#)

### 5 - Air conditioner compressor

- ☐ Clean air conditioner compressor drive shaft before fitting pulley

## 3.2.4 Exploded view - "Denso" air conditioner compressor pulley, version "4"

### 1 - Bolt

- ☐ 3x
- ☐ 4.5 Nm

### 2 - Cap

### 3 - Nut

- ☐ 25 Nm

### 4 - Drive plate

- ☐ With overload protection device; triggered if torque is too great (e.g. if air conditioner compressor cannot rotate freely) causing pulley to free-wheel without driving air conditioner compressor

### 5 - Circlip

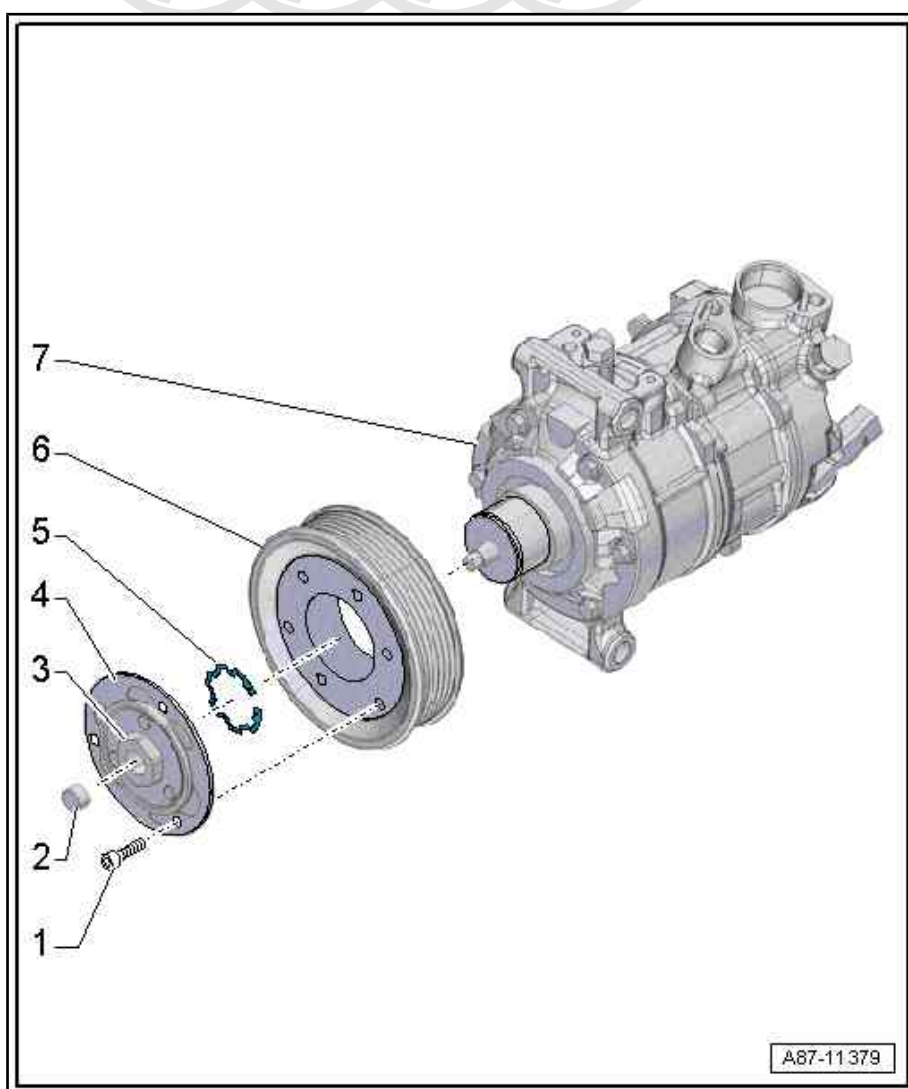
- ☐ Renew
- ☐ Install correctly: flat side must face air conditioner compressor

### 6 - Pulley

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Sensitive to impact, handle with care
- ☐ Removing and installing ⇒ [page 146](#)

### 7 - Air conditioner compressor

- ☐ Clean air conditioner compressor drive shaft before fitting pulley



### 3.2.5 Exploded view - "Sanden" air conditioner compressor pulley ("Delphi/Mahle" version "1")



#### Note

- ◆ *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.*
- ◆ *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 ⇒ [Item 2 \(page 135\)](#) .*
- ◆ *Detaching and attaching pulley ("Delphi/Mahle" air conditioner compressor, version "2")  
 ⇒ ["3.6.5 Removing and installing pulley - Delphi/Mahle air conditioner compressor", page 149](#) .*

#### Pulley, version "1"

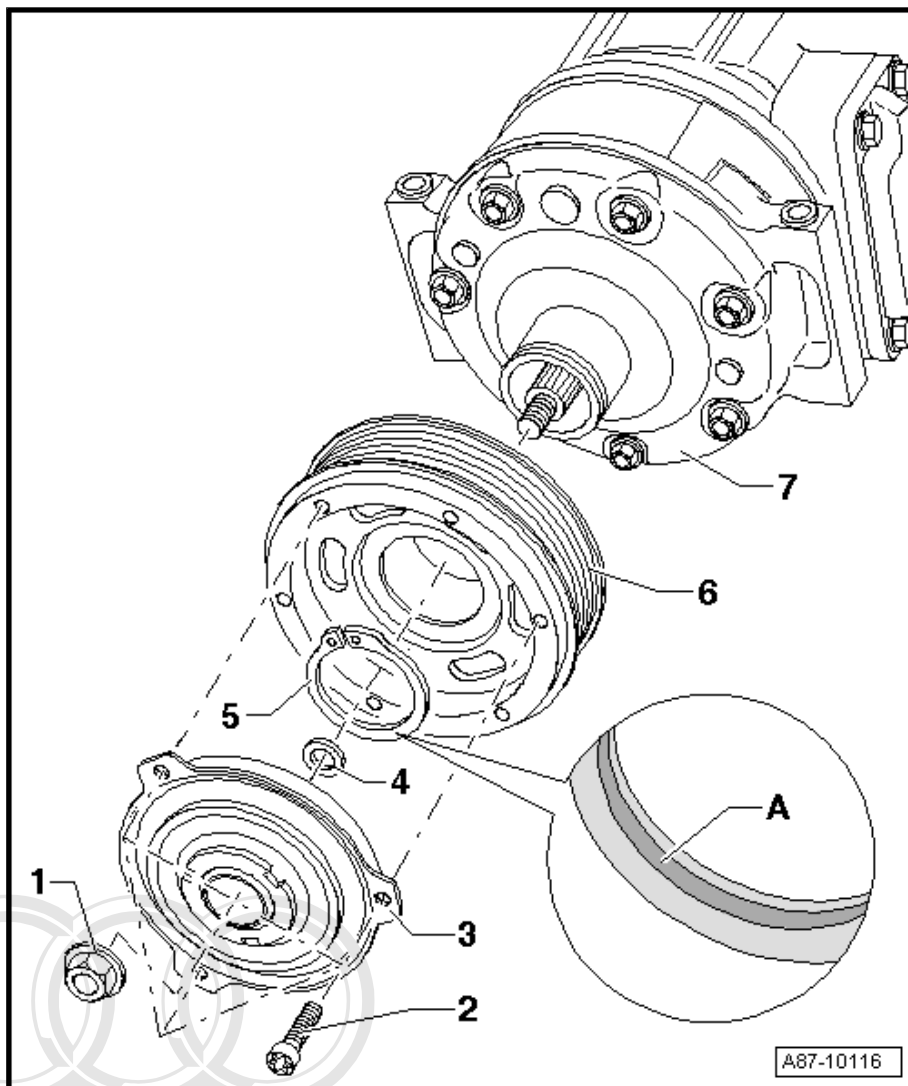
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### 1 - Hexagon nut

- ☐ 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

Pulley, version "2"

## 1 - Hexagon nut

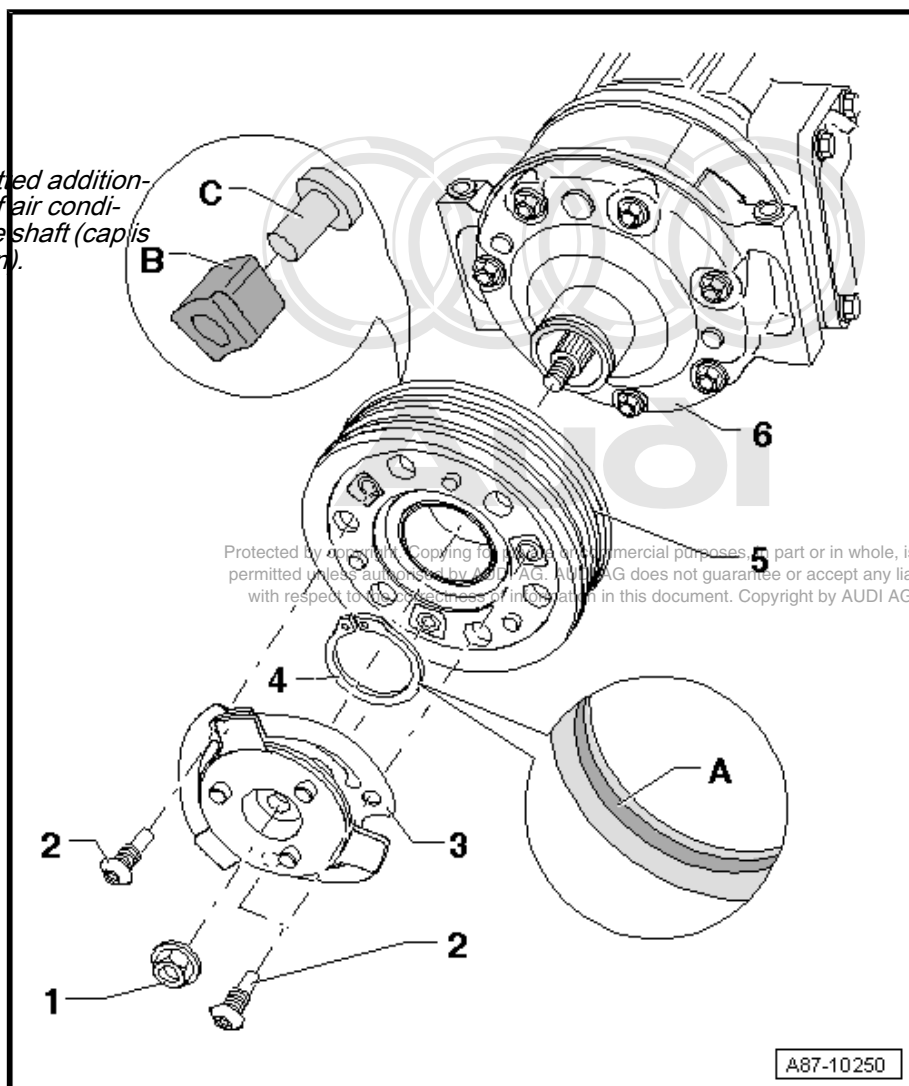
- ☐ 25 Nm



### Note

*A plastic cap may be fitted additionally to protect thread of air conditioner compressor drive shaft (cap is not shown in illustration).*

- Hold pulley in position using a commercially available 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.



## 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 isolating the pulley from the air conditioner compressor drive shaft, the 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

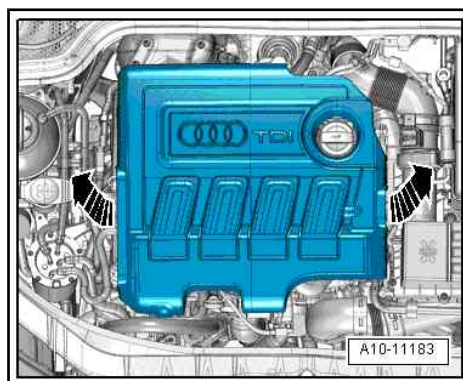
- Clean air conditioner compressor drive shaft before fitting pulley

## 3.3 Detaching and attaching air conditioner compressor at bracket

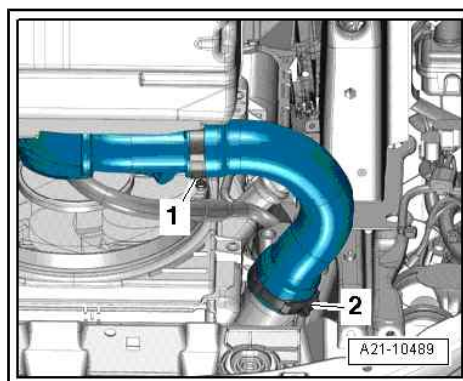
### Removing

Vehicles with 4-cyl. TDI engine:

- Detach engine cover panel -arrows-.

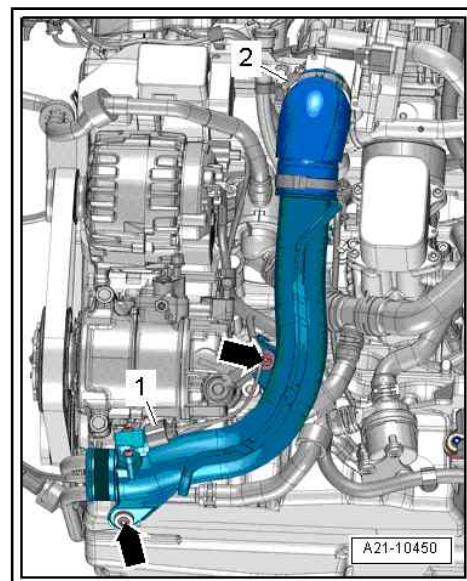


- Unfasten hose clamps -1- and -2- and detach air hose.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .



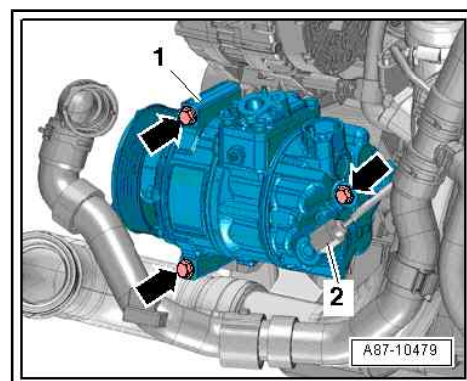
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- Loosen hose clip -2-.
- Remove bolts -arrows-.
- Unplug connector -1- at charge pressure sender - G31- / intake air temperature sender - G42- and detach air pipe (right-side).



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



## Installing

Install in reverse order of removal; note the following:

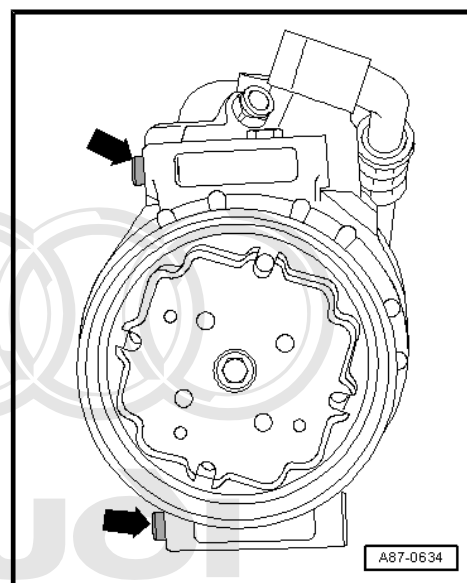
- Thoroughly clean contact surfaces on bracket and air conditioner compressor.
- Insert dowel sleeves -arrows- in air conditioner compressor.



### 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.*

- 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 .



## Tightening torques

- ◆ ⇒ [“3.1 Exploded view - drive unit for air conditioner compressor”, page 126](#) .

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### 3.4 Detaching and attaching refrigerant lines at air conditioner compressor



#### WARNING

*Danger from escaping pressurised refrigerant.*

*Danger of frostbite on skin and other parts of the body.*

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

#### 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 , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .

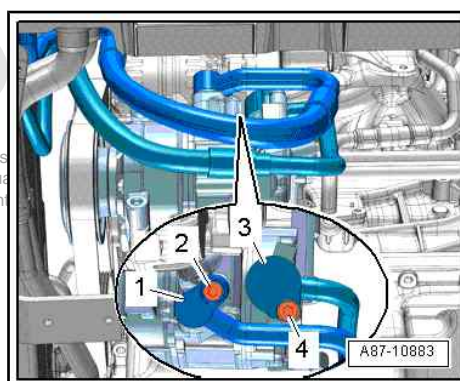


#### Caution

*Risk of damage to refrigerant lines and hoses.*

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

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



#### Caution

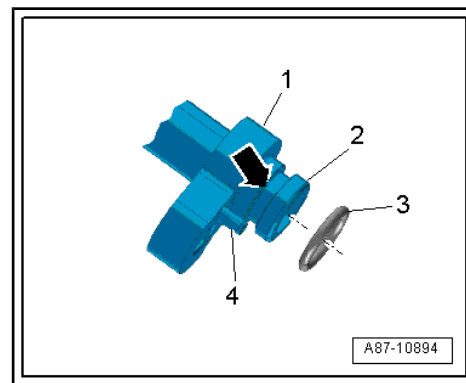
*Risk of irreparable damage to air conditioner compressor.*

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

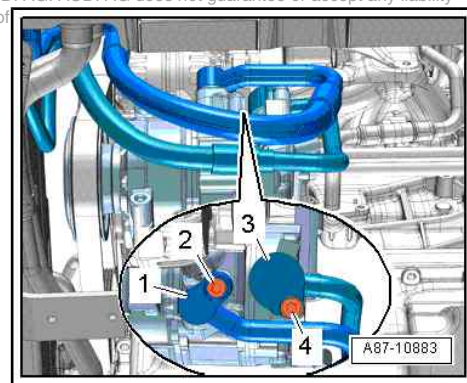


### Note

- ◆ Do not use O-rings from caps of replacement compressor connections.
- ◆ Lubricate O-rings lightly with refrigerant oil before fitting ⇒ [page 46](#) .
- ◆ Make sure O-rings are seated correctly in groove -arrow- of corresponding refrigerant line.
- ◆ After attaching the refrigerant lines to the air conditioner compressor (and after installing the air conditioner compressor) check the routing of the lines. They must be inserted in the brackets provided and must not make contact with other components.
- ◆ There are different versions of the refrigerant lines to the air conditioner compressor. Pay attention to correct assignment to model and to version of air conditioner compressor ⇒ [Electronic parts catalogue](#) .

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- Insert refrigerant lines -1 and 3- in corresponding connections on air conditioner compressor.
- Tighten bolts -2 and 4- ⇒ ["2.2 Exploded view - condenser", page 93](#) .
- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
- Start up air conditioner after charging refrigerant circuit ⇒ [page 123](#) .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



## 3.5 Removing and installing air conditioner compressor

### Special tools and workshop equipment required

- ◆ Engine bung set - VAS 6122-



## Note

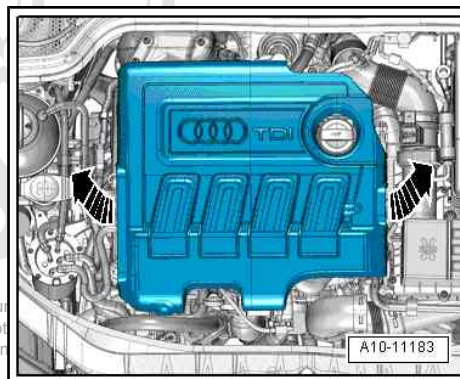
- ◆ The air conditioner compressor can also be detached from the bracket without opening the refrigerant circuit ⇒ [page 136](#).
- ◆ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

## Removing

- Detach refrigerant lines from air conditioner compressor ⇒ [page 138](#).

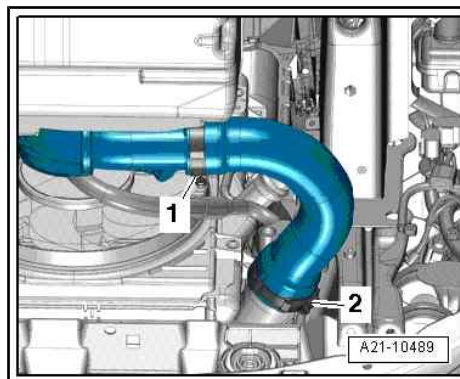
Vehicles with 4-cyl. TDI engine:

- Detach engine cover panel -arrows-.

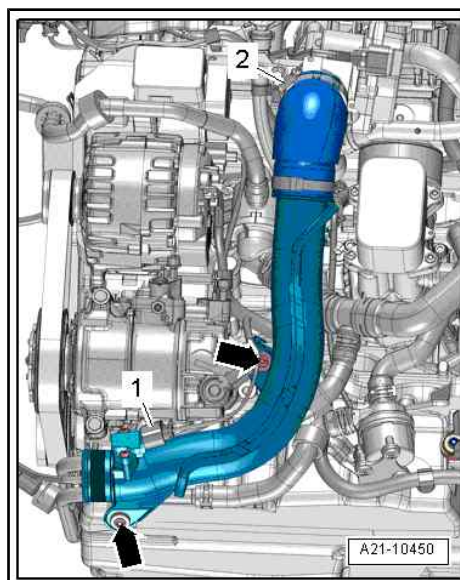


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- Unfasten hose clamps -1- and -2- and detach air hose.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122-.

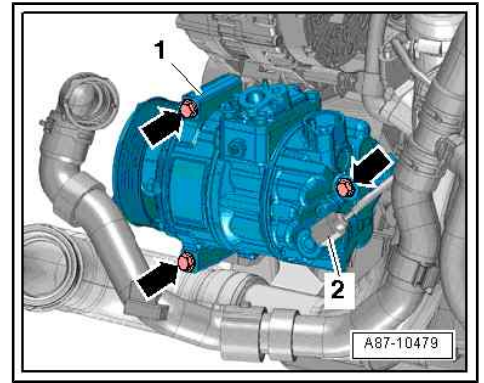


- Loosen hose clip -2-.
- Remove bolts -arrows-.
- Unplug connector -1- at charge pressure sender - G31- / intake air temperature sender - G42- and detach air pipe (right-side).



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-.



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## Installing

Install in reverse order of removal; note the following:

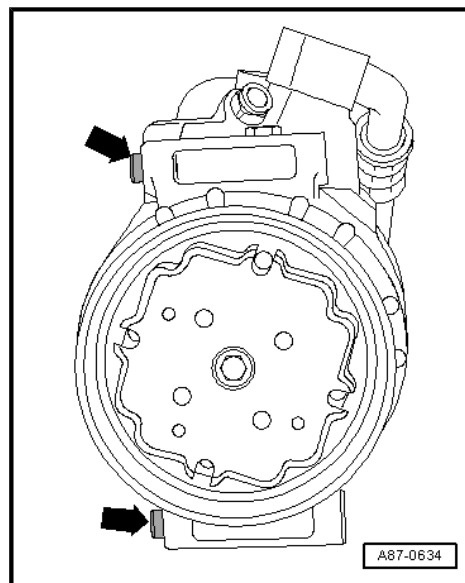
### Tightening torques

- ◆ ⇒ [“3.1 Exploded view - drive unit for air conditioner compressor”, page 126](#).
- Thoroughly clean contact surfaces on air conditioner compressor and bracket.
- Insert dowel sleeves -arrows- in air conditioner compressor.



### Note

- ◆ *Make sure that the dowel sleeves are positioned correctly and that the contact surfaces are clean. Incorrectly fitted dowel sleeves or dirty/damaged contact surfaces could lead to misalignment between the air conditioner compressor and the engine. After a period of operation, misalignment will cause damage to the air conditioner compressor.*
- ◆ *If the air conditioner compressor is renewed due to specific problems (e.g. internal damage), the refrigerant circuit must be cleaned ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87; Refrigerant circuit or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87; Working with the air conditioner service station; Cleaning refrigerant circuit.*
- ◆ *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.*
- ◆ *There are different versions of the refrigerant lines to the air conditioner compressor. Pay attention to correct assignment to model and to version of air conditioner compressor ⇒ Electronic parts catalogue.*
- After installing a new air conditioner compressor or pouring in fresh refrigerant oil and before fitting the poly V-belt (e.g. after cleaning the refrigerant circuit), crank the compressor 10 turns by hand before starting the engine for the first time to prevent damage to the compressor.
- Install poly V-belt ⇒ Rep. gr. 13; Cylinder block (pulley end); Removing and installing poly V-belt.
- Install air pipe with charge pressure sender G31 / intake air temperature sender G42 ⇒ Rep. gr. 21; Charge air system; Exploded view - charge air system.
- Attach refrigerant lines to air conditioner compressor ⇒ [page 138](#).
- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87; Refrigerant circuit, or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87; Working with the air conditioner service station.
- Observe notes on starting up air conditioner after installing air conditioner compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87; General information on air conditioning systems, 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.



## 3.6 Removing and installing pulley

⇒ ["3.6.1 Removing and installing pulley - Denso air conditioner compressor, version 1", page 143](#)

⇒ ["3.6.2 Removing and installing pulley - Denso air conditioner compressor, version 2", page 144](#)

⇒ ["3.6.3 Removing and installing pulley - Denso air conditioner compressor, version 3", page 146](#)

⇒ ["3.6.4 Removing and installing pulley - Denso air conditioner compressor, version 4", page 148](#)

⇒ ["3.6.5 Removing and installing pulley - Delphi/Mahle air conditioner compressor", page 149](#)

### 3.6.1 Removing and installing pulley - "Denso" air conditioner compressor, version "1"



#### Note

- ◆ 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.

#### 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

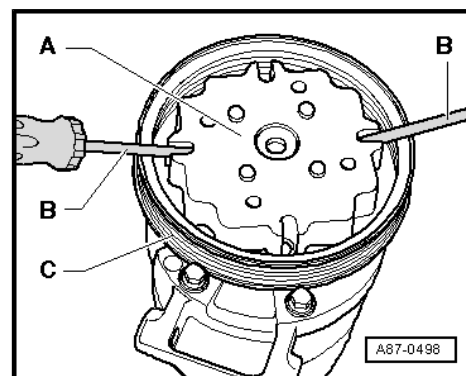
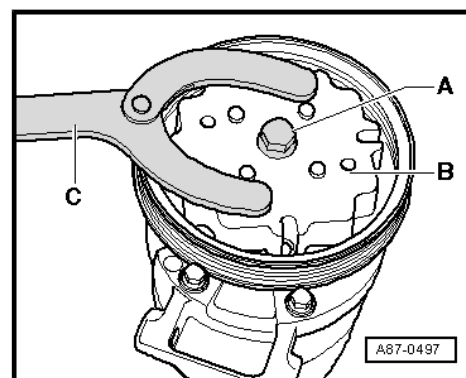
If the pulley cannot be detached with the air conditioner compressor in position, detach the air conditioner compressor with the refrigerant lines connected  
⇒ ["3.5 Removing and installing air conditioner compressor", page 139](#) .

- 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:

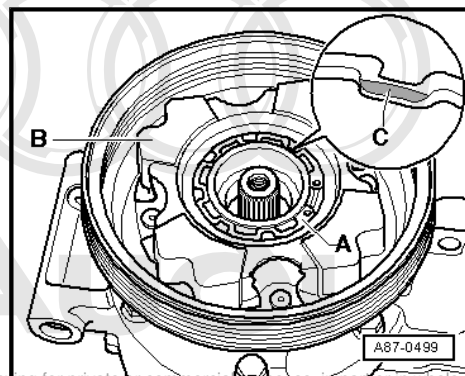
### Tightening torques

- ◆ ⇒ [“3.2.1 Exploded view - Denso air conditioner compressor pulley, version 1”](#), page 129 .



### Note

Renew circlip.



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- 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 139](#) .
- Install poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

## 3.6.2 Removing and installing pulley - “Denso” air conditioner compressor, version “2”



### Note

- ◆ *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 for ancillaries and re-attached without disconnecting refrigerant lines.*
- ◆ *Pulley is made of plastic, is sensitive to impact and should be treated with special care.*
- ◆ *For noise optimisation, a plastic disc may have been bonded to the drive plate of the pulley ⇒ Electronic parts catalogue .*
- ◆ *This plastic disc -B- 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

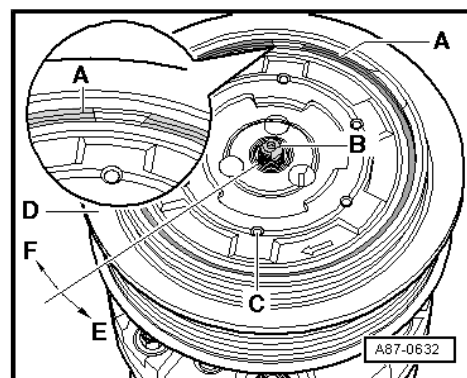
- Remove poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
- Using a small screwdriver or long-nose pliers, carefully remove circlip -A- (with vulcanised rubber disc).



### 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.*
- ◆ *Rotate pulley using e.g. a commercially available strap wrench (with fabric strap) when loosening or tightening hexagon nut.*

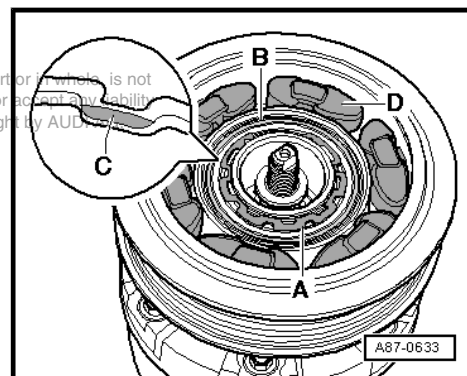
- Turn drive plate -C- with pulley -D- in direction of -arrow E-.
- Detach drive plate.
- Remove circlip -A-.
- Detach pulley -B-.

## Installing

Install in reverse order of removal; note the following:

### Tightening torques

- ◆ ⇒ ["3.2.2 Exploded view - Denso air conditioner compressor pulley, version 2", page 130](#) .
- 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).



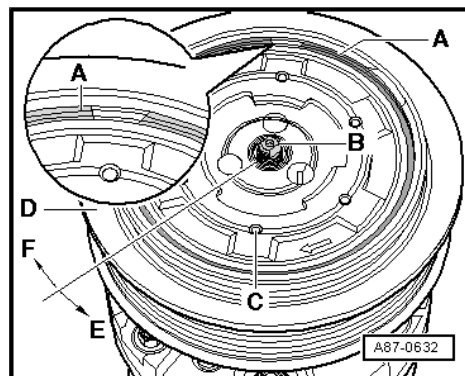
- Insert drive plate -C- in rubber elements until they make contact with air conditioner compressor drive shaft -B-.
- Position drive plate on air conditioner compressor flange and tighten in direction of -arrow F- using a commercially available strap wrench (with fabric strap); counterhold with an Allen 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 .

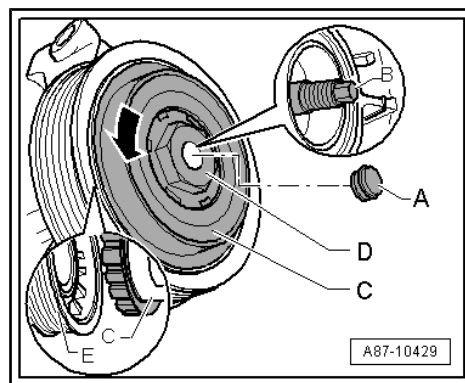


## 3.6.3 Removing and installing pulley - “Densso” air conditioner compressor, version “3”



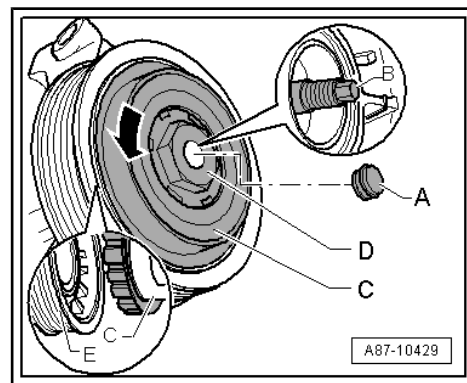
### Note

- ◆ If the pulley overload protection has been tripped, check the freedom of movement of the air conditioner compressor before renewing the pulley. If the air conditioner compressor does not rotate freely, renew the complete unit.
- ◆ The air conditioner compressor can be detached from the bracket for ancillaries and re-attached without disconnecting refrigerant lines.
- ◆ Pulley is made of plastic, is sensitive to impact and should be treated with special care.
- ◆ 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

- ◆ *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.*

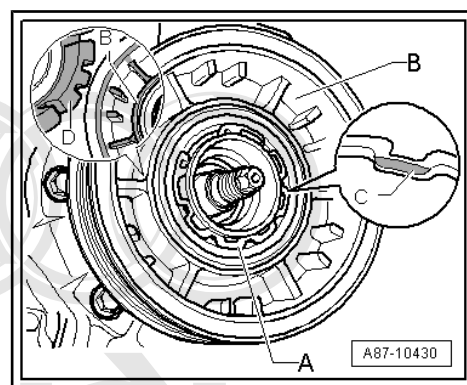
- Remove circlip -A-.
- Detach pulley -B-.

## Installing

Install in reverse order.

## Tightening torques

- ◆ ⇒ ["3.2.3 Exploded view - Denso air conditioner compressor pulley, version 3", page 131](#) .



### Note

*Renew circlip.*

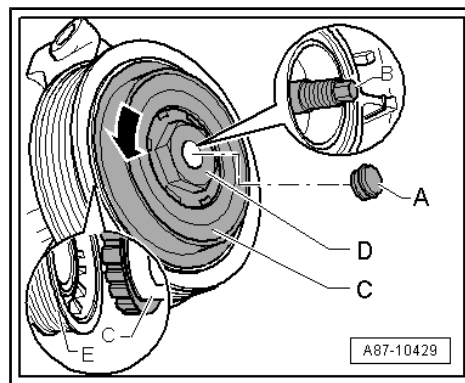
- Clean air conditioner compressor drive shaft before fitting pulley.
- Attach pulley to air conditioner compressor drive shaft.
  - It should be possible to attach the component without having to exert force.
- Insert circlip -A- in correct position.
  - Fit with bevelled side -C- facing away from air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



### 3.6.4 Removing and installing pulley - “Dens-o” air conditioner compressor, version “4”



#### Note

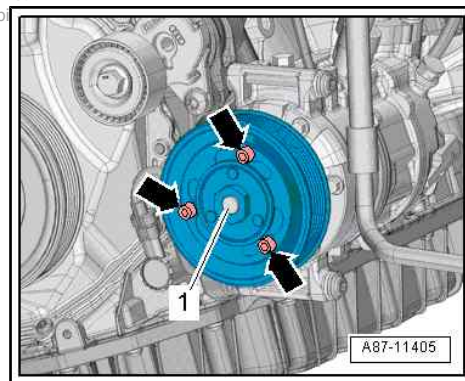
- ♦ *The pulley is sensitive to impact and should therefore be treated with extreme care.*
- ♦ *If pulley overload protection device has been triggered, check freedom of movement of air conditioner compressor before renewing pulley. If air conditioner compressor cannot rotate freely it must be renewed.*
- ♦ *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.*

#### Special tools and workshop equipment required

- ♦ Commercially available oil filter strap wrench

#### Removing

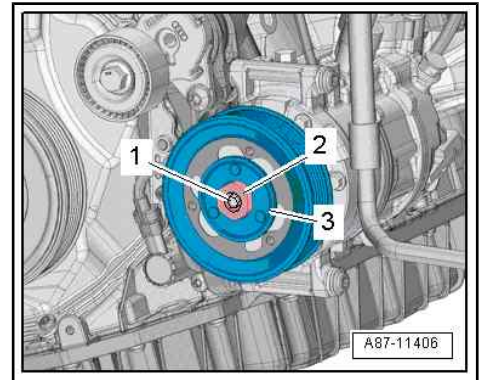
- Remove poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
- Detach cap -1-.
- Counterhold pulley with oil filter strap wrench and remove bolts -arrows-.



- Remove nut -2-; to do so counterhold drive shaft -1- for air conditioner compressor.
- Detach drive plate -3- with nut.

 **Note**

- ◆ *The torque for driving the air conditioner compressor is applied to the air conditioner compressor shaft via the thread securing the drive plate.*
- ◆ *If the drive plate has become so firmly attached to the air conditioner compressor shaft that it can no longer be released (the 7 mm hexagon flats can no longer transmit the necessary torque), the air conditioner compressor must be renewed.*



- Detach circlip -2-.
- Detach pulley -1-.

**Installing**

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

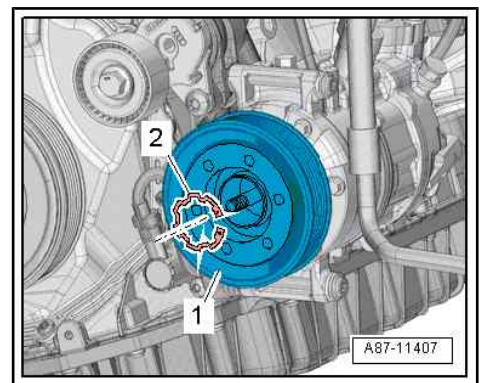
**Tightening torques**

- ◆ [⇒ "3.2.4 Exploded view - Denso air conditioner compressor pulley, version 4", page 132](#)

 **Note**

*Renew circlip.*

- Clean air conditioner compressor drive shaft before fitting pulley.
- Attach pulley to air conditioner compressor drive shaft.
  - It should be possible to attach the component without having to exert force.
- Insert circlip in correct position.
  - Flat side faces air conditioner compressor
- Clean thread of air conditioner compressor drive shaft before bolting on drive plate.



 **Note**

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

### 3.6.5 Removing and installing pulley - "Delphi/Mahle" air conditioner compressor

Currently the pulley cannot be renewed separately on air conditioner compressors manufactured by "Delphi/Mahle". If a customer reports a problem, the entire air conditioner compressor must be renewed.

- Renew air conditioner compressor [⇒ page 139](#).

## Pulley, version "1"



### Note

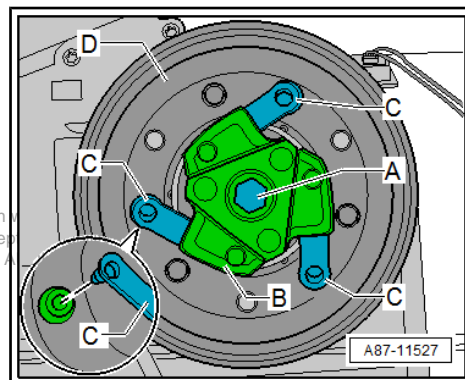
Currently, the pulley of the "Delphi/Mahle" air conditioner compressor (version "1") is identical to the pulley of the "Sanden" compressor (version "2")  
 ⇒ "3.2.5 Exploded view - Sanden air conditioner compressor pulley (Delphi/Mahle version 1)", page 133 . The only difference is that the drive plate is attached to the air conditioner compressor shaft with a self-locking bolt ⇒ Item 2 (page 135) .

## 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 Overview of fitting locations - control motors \(front\)”, page 151](#)

⇒ [“4.2 Removing and installing temperature flap control motor V68 and defroster flap control motor V107”, page 154](#)

⇒ [“4.3 Removing and installing centre flap control motor V70”, page 156](#)

⇒ [“4.4 Removing and installing air recirculation flap control motor V113”, page 157](#)

⇒ [“4.5 Removing and installing fresh air and air recirculation flap control motor V154”, page 159](#)

⇒ [“4.6 Checking operation of control motors”, page 161](#)

### 4.1 Overview of fitting locations - control motors (front)

⇒ [“4.1.1 Overview of fitting locations - control motors \(front\), manually controlled air conditioner”, page 151](#)

⇒ [“4.1.2 Overview of fitting locations - control motors \(front\), automatically controlled air conditioner”, page 153](#)

#### 4.1.1 Overview of fitting locations - control motors (front), manually controlled air conditioner



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# 1 - Air distribution housing (bottom section)

## 2 - Clip

☐ 6x

## 3 - Auxiliary air heater element - Z35-

## 4 - O-ring

☐ Renew

## 5 - Adapter for coolant hoses

## 6 - Bolt

## 7 - Grommet

☐ Functions as seal

## 8 - Gear mechanism for temperature flap

☐ Removing and installing  
⇒ [page 221](#)


### Note

◆ Flexible shaft rotates rotary air conditioner control once.

◆ Note installation position  
⇒ [page 221](#).

## 9 - Air distribution housing

☐ Removing and installing  
air conditioning unit  
⇒ [page 200](#)
☐ Exploded view  
⇒ [page 185](#)

## 10 - Bolt

☐ 1.5 Nm

## 11 - Gear mechanism for air distribution

☐ Removing and installing ⇒ [page 222](#)


### Note

◆ Flexible shaft rotates twice if rotary air conditioner control is turned once.

◆ Note installation position  
⇒ [page 220](#).

## 12 - Heat exchanger for heater

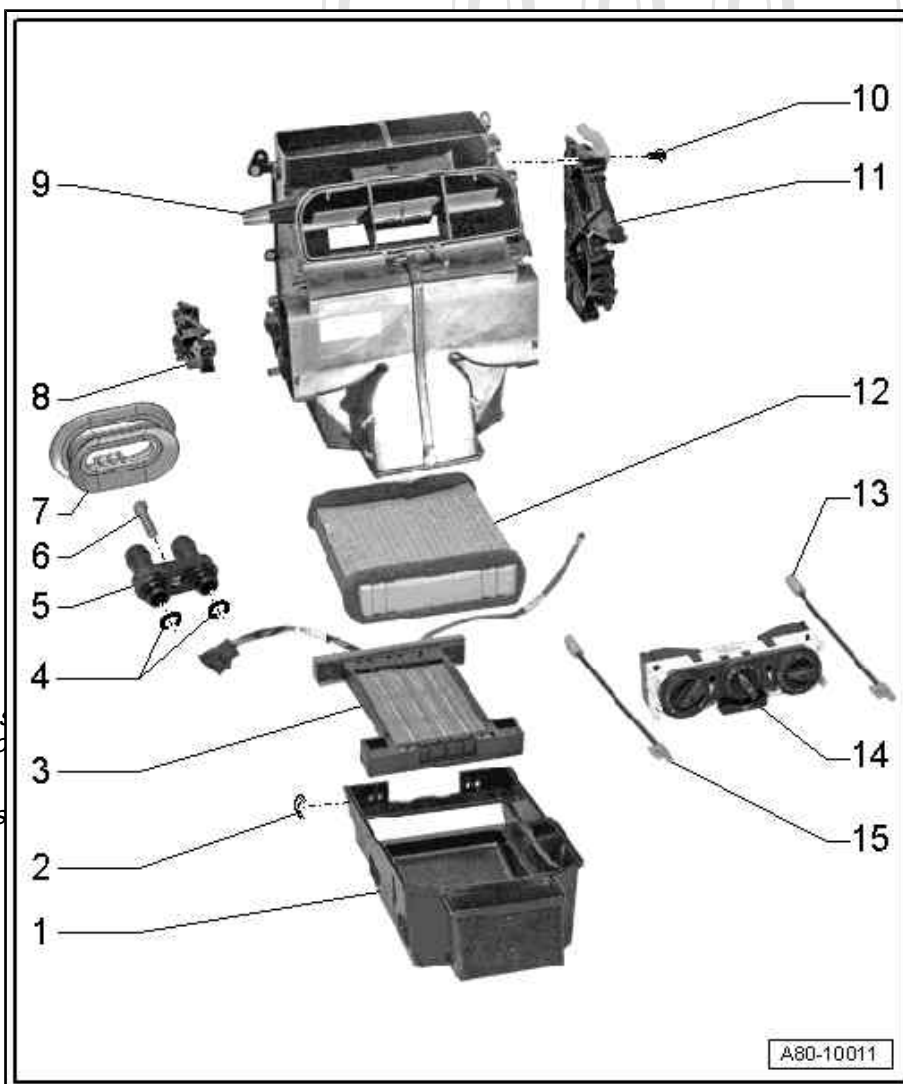
## 13 - Flexible shaft

☐ For gear mechanism for air distribution

☐ Removing and installing ⇒ [page 220](#)


### Note

Flexible shaft rotates twice if rotary air conditioner control is turned once.



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## 14 - Operating unit

- ☐ With air conditioning system control unit - J301- .



### Note

*Flexible shaft rotates twice if rotary air conditioner control is turned once.*

## 15 - Flexible shaft

- ☐ For gear mechanism for temperature flap
- ☐ Removing and installing ⇒ [page 221](#)



### Note

*Flexible shaft rotates twice if rotary air conditioner control is turned once.*

## 4.1.2 Overview of fitting locations - control motors (front), automatically controlled air conditioner

### 1 - Air distribution housing (bottom section)

### 2 - Clip

- ☐ 6x

### 3 - Auxiliary air heater element - Z35-

### 4 - O-ring

- ☐ Renew

### 5 - Adapter for coolant hoses

- ☐ For heat exchanger

### 6 - Bolt

### 7 - Grommet

- ☐ Functions as seal

### 8 - Temperature flap control motor - V68-

- ☐ With potentiometer for temperature flap control motor - G92-
- ☐ Removing and installing ⇒ [page 154](#)

### 9 - Mounting

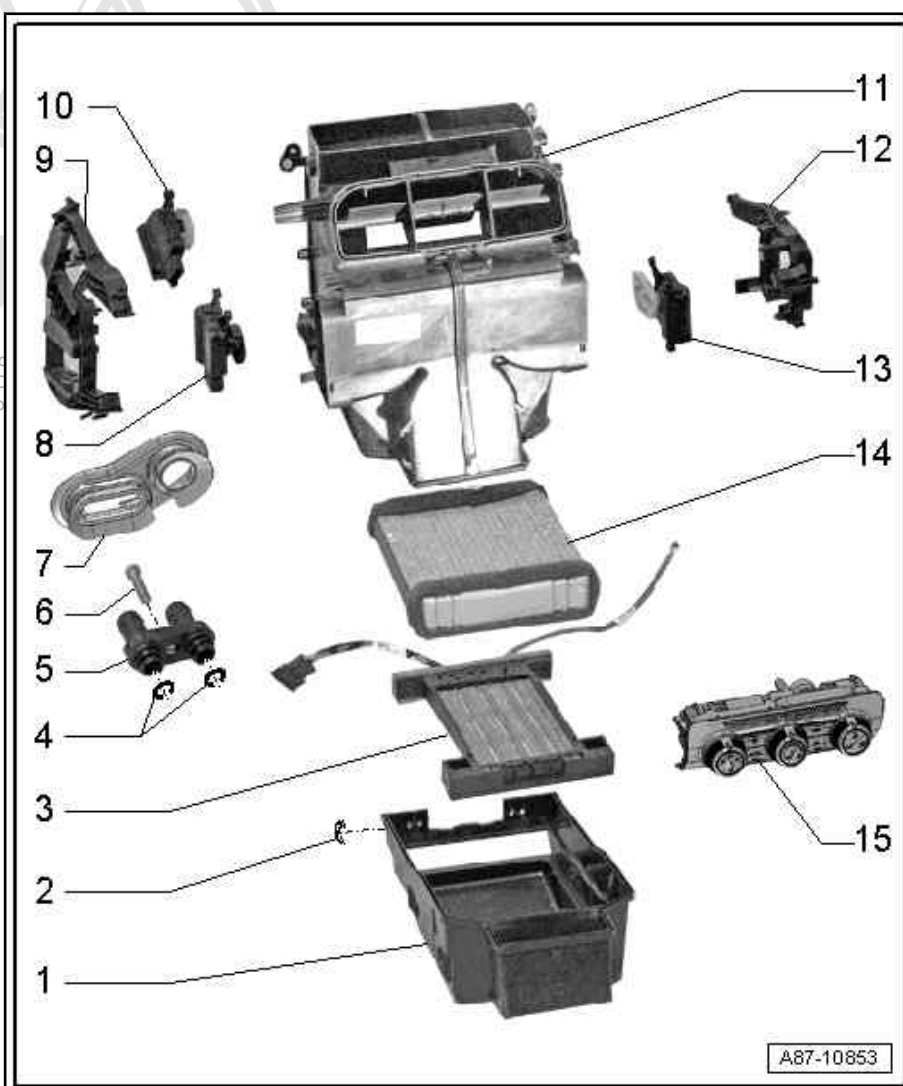
- ☐ For control motors

### 10 - Defroster flap control motor - V107-

- ☐ With potentiometer for defroster flap control motor - G135-
- ☐ Removing and installing ⇒ [page 154](#)

### 11 - Air distribution housing

- ☐ Exploded view ⇒ [page 185](#)



## 12 - Mounting

- ☐ For control motor

## 13 - Centre flap control motor - V70-

- ☐ With potentiometer for centre flap control motor - G112-
- ☐ Removing and installing ⇒ [page 156](#)

## 14 - Heat exchanger for heater

## 15 - Operating unit

## 4.2 Removing and installing temperature flap control motor - V68- and defroster flap control motor - V107-

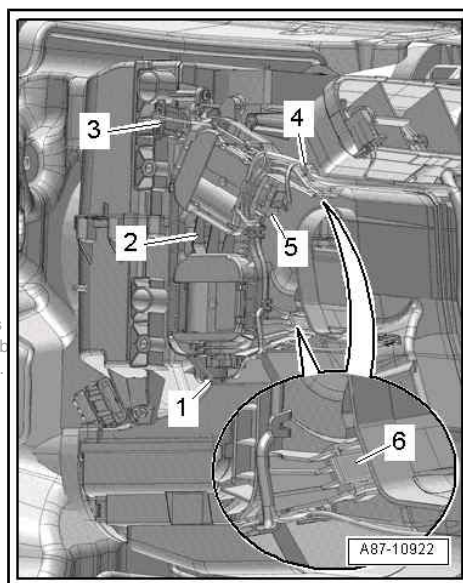


### Note

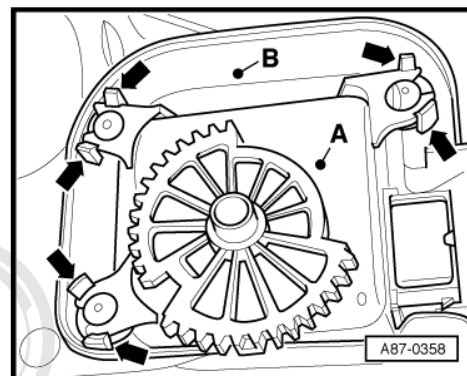
- ◆ *There are various identical connectors in the air intake unit. To avoid the risk of interchanging them, mark the connectors before unplugging them.*
- ◆ *Different control motors are fitted on the air conditioning unit and in the air intake unit; these motors have different electrical values and part number indices ⇒ *Electronic parts catalogue* . The control motors must be marked before they are removed to avoid the risk of interchanging them.*
- ◆ *Depending on the operating unit ( *Climatronic control unit - J255-* ), the temperature flap control motor - V68- on vehicles manufactured in 2010 may also be displayed as the left temperature flap control motor - V158- ⇒ *Vehicle diagnostic tester, "Guided Fault Finding"*.*

### Removing

- Observe general notes ⇒ [page 9](#) .
- Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
- Remove central tube ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel .
- Unplug electrical connectors -1, 3 and 5- and move wiring harness -4- clear.
- Release locking lugs -6- .
- Swivel out mounting -2- for control motors and disengage guide pin.



- Carefully press retaining tabs -arrows- outwards and take control motor -A- out of mounting -B-.



## Installing

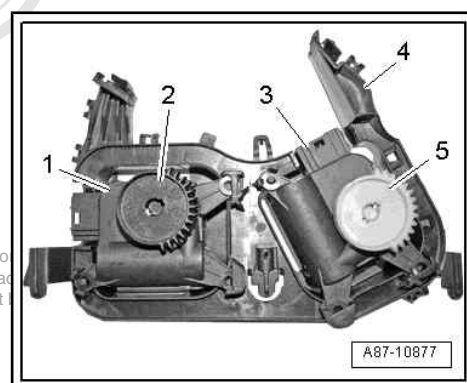
Install in reverse order of removal; note the following:



### Note

*The control motor mounting must be renewed if the retaining tabs in the mounting have broken off.*

- Insert new control motor in mounting -4-, paying attention to assignment.
  - Temperature flap control motor - V68- -item 1-, colour of gear wheel -2- = black
  - Defroster flap control motor - V107- -item 3-, colour of gear wheel -5- = white
- To check operation of control motor, connect an adapter cable ⇒ [page 10](#), or use a test lead from adapter set - V.A.G 1594C- to connect contacts "5" and "6" of control motor to a 12 V battery via a 5 A fuse.



### Note

- ◆ *Allow control motor to turn as far as stop. The direction of rotation can be reversed by interchanging positive and negative.*
- ◆ *If one of the control motors is not in the correct installation position with respect to its gear wheel, it must be rotated by applying 12 V to contacts "5" and "6".*

- Move lever for defroster flap -2- and for temperature flap -4- at air distribution housing of air conditioning unit to position shown.
- Insert mounting -1- at housing; gear wheel -3- on defroster flap control motor must engage in gear wheel -2- on defroster flap lever, as shown.



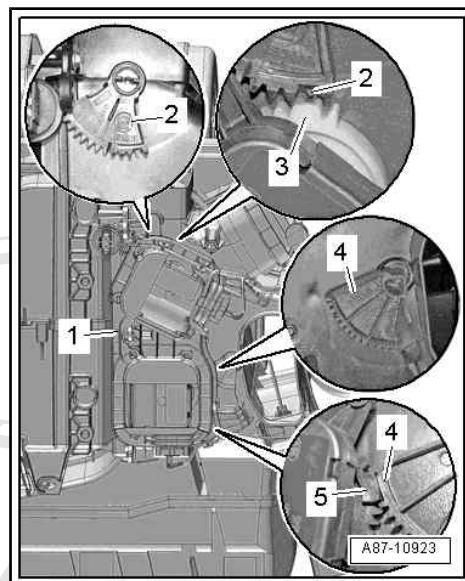
### Note

*When assembling the gear wheels, ensure that they are positioned correctly relative to each other (short tooth and short gap).*

- Gear wheel -5- at temperature flap control motor must engage in gear wheel -4- at temperature flap lever, as shown in illustration.
- Press mounting fully onto housing.
- Route electrical wiring harness so that it cannot come into contact with moving components (e.g. control motor lever).

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

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



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## 4.3 Removing and installing centre flap control motor - V70-

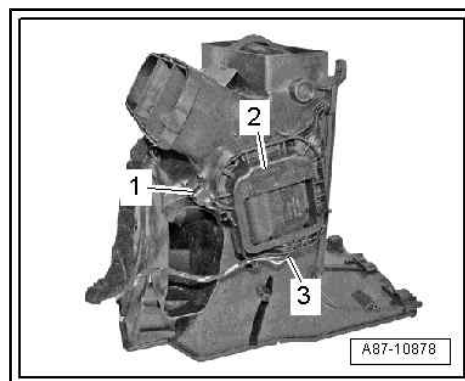


### Note

*Depending on the operating unit ( Climatronic control unit - J255- ), the centre flap control motor - V70- on vehicles manufactured in 2010 may also be displayed as e.g. the air distribution flap control motor - V428- ⇒ Vehicle diagnostic tester, "Guided Fault Finding".*

### Removing

- Observe general notes ⇒ [page 9](#) .
- Remove air conditioning unit ⇒ [page 200](#) .
- Remove air distribution housing ⇒ [page 203](#) .
- Unplug electrical connector -3-.
- Release locking lug -1-.
- Swivel out mounting -2- for control motor and disengage.



- Carefully press retaining tabs -arrows- outwards and take control motor -A- out of bracket -B-.

### Installing

Install in reverse order of removal; note the following:



#### Note

*The control motor mounting must be renewed if the retaining tabs in the mounting have broken off.*

- Insert new control motor -A- in mounting -B-.
- Position mounting -4- with control motor on housing.
  - Lever -1- must engage in upper guide of cam plate -2-.
  - Lever -3- must engage in lower guide of cam plate.
- Press mounting with control motor fully onto housing.
- Route electrical wiring harness so that it cannot come into contact with moving components (e.g. control motor lever).
- To check operation of control motor, connect an adapter cable ⇒ [page 10](#), or use a test lead from adapter set - V.A.G 1594C- to connect contacts "5" and "6" of control motor to a 12 V battery via a 5 A fuse.



#### Note

*Allow control motor to turn as far as stop. The direction of rotation can be reversed by interchanging positive and negative.*

- Install air distribution housing ⇒ [page 203](#).

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

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

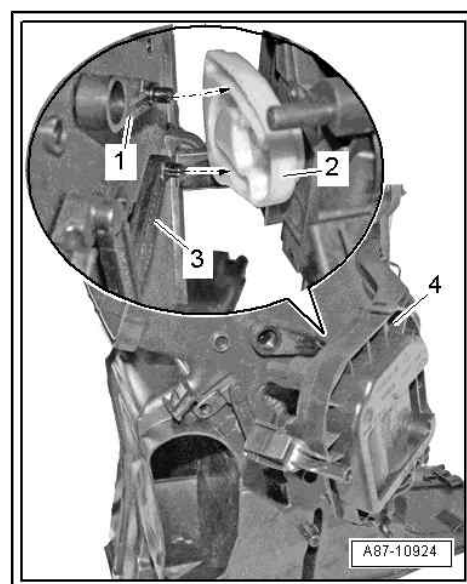
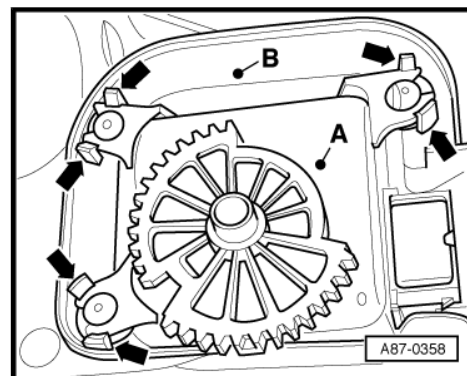
## 4.4 Removing and installing air recirculation flap control motor - V113-

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#### Note

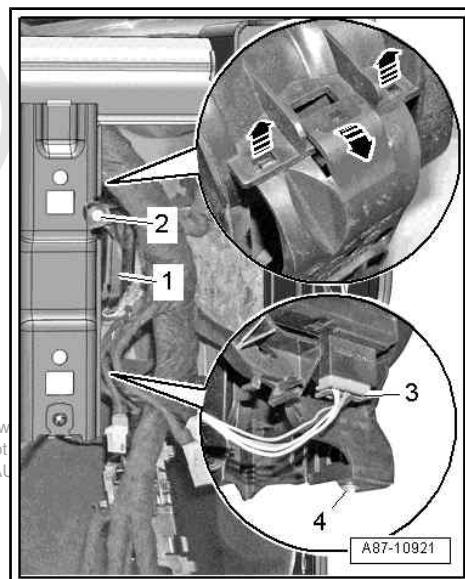
- ◆ *If necessary, the activation of electrical components of the air conditioner can be checked additionally via the "Guided Fault Finding" function, e.g. with the test for interchanged connections in the "Basic setting" ⇒ Vehicle diagnostic tester.*
- ◆ *Depending on the operating unit ( Climatronic control unit - J255- ), the air recirculation flap control motor - V113- on vehicles manufactured in 2010 may also be displayed as the fresh air/air recirculation, air flow flap control motor - V425- or fresh air and air recirculation flap control motor - V154- ⇒ Vehicle diagnostic tester, "Guided Fault Finding".*



## Removing

- Observe general notes ⇒ [page 9](#) .
- Remove fresh air blower ⇒ [page 206](#) .
- Remove bolts -2 and 4-.
- Release fasteners -arrows- and detach mounting with control motor -1-.
- Unplug electrical connector -3-.

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- Carefully press retaining tabs -arrows- outwards and take control motor -A- out of mounting -B-.

## Installing

Install in reverse order of removal; note the following:

### Tightening torques

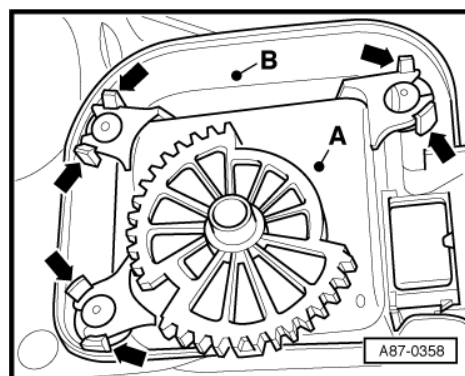
- ♦ ⇒ [“5.1 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 173](#) .



### Note

*The control motor mounting must be renewed if the retaining tabs in the mounting have broken off.*

- Insert new control motor -A- in mounting -B-.

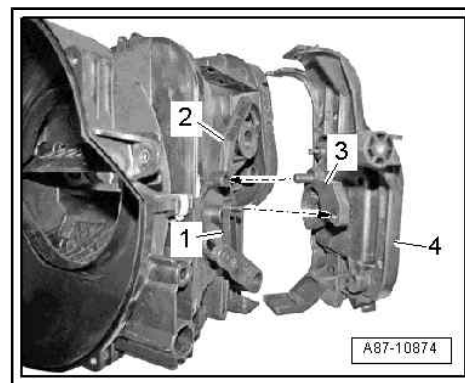


- Position mounting with control motor at top of housing.
- Lever -2- for fresh air flap must engage on pin on control motor -3-.
- Pin on air recirculation flap lever -1- must engage in hole in control motor.
- Press mounting -4- with control motor fully onto housing.



#### Note

*The mounting is not positioned correctly on the housing if the bolts cannot be fitted.*



- To check operation of control motor, connect an adapter cable ⇒ [page 10](#), or use a test lead from adapter set - V.A.G 1594C- to connect contacts "5" and "6" of control motor to a 12 V battery via a 5 A fuse.



#### Note

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*Allow control motor to turn as far as stop. The direction of rotation can be reversed by interchanging positive and negative.*

- Install fresh air blower ⇒ [page 206](#).

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

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

## 4.5 Removing and installing fresh air and air recirculation flap control motor - V154-

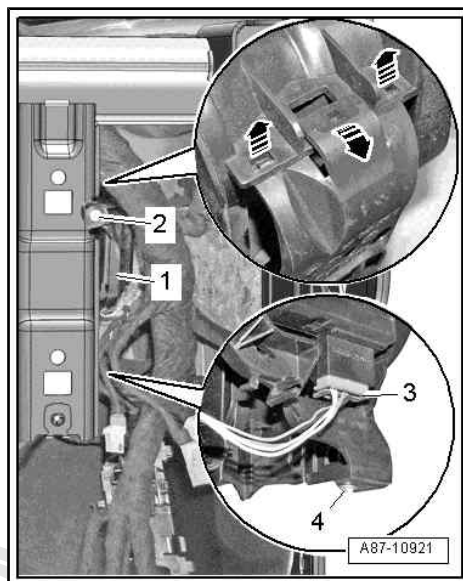


#### Note

- ◆ "Guided Fault Finding" is not possible on vehicles with a heater.
- ◆ On vehicles with a manually controlled air conditioner, the operation of the control motor can additionally be checked via the "Final control diagnosis" ⇒ Vehicle diagnostic tester, "Guided Fault Finding".

## Removing

- Observe general notes ⇒ [page 9](#) .
- Remove fresh air blower ⇒ [page 206](#) .
- Remove bolts -2 and 4-.
- Release fasteners -arrows- and detach mounting with control motor -1-.
- Unplug electrical connector -3-.



- Carefully press retaining tabs -arrows- outwards and take control motor -A- out of mounting -B-.

## Installing

Install in reverse order of removal; note the following:

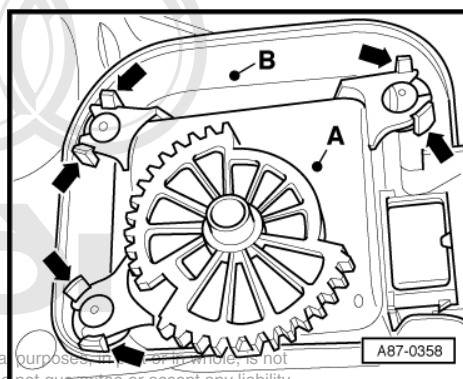
### Tightening torques

- ♦ ⇒ [“5.1 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 173](#) .



### Note

*The control motor mounting must be renewed if the retaining tabs in the mounting have broken off.*



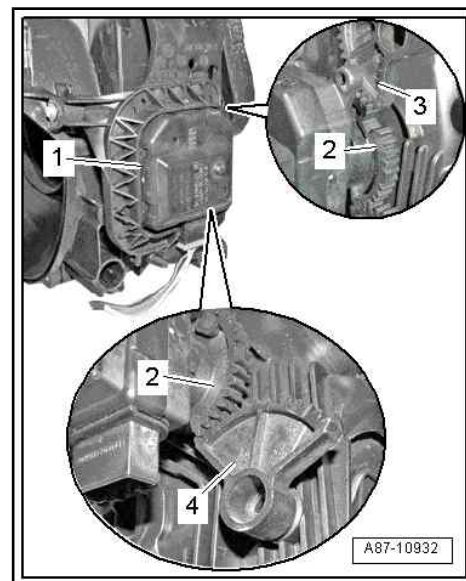
- Insert new control motor -A- in mounting -B-.

- Fresh air flap must be in "open" position.
- Air recirculation flap must be in "closed" position.
- Insert mounting -1- at housing; gear wheel -2- at control motor must engage in gear wheel -3- at fresh air flap lever, and gear wheel -4- must engage at air recirculation flap lever, as shown.
- Press mounting with control motor fully onto housing.



#### Note

- ◆ *The mounting is not positioned correctly on the housing if the bolts cannot be fitted.*
- ◆ *When assembling the gear wheels, ensure that they are positioned correctly relative to each other (large tooth and large gap).*
- Route electrical wiring harness so that it cannot come into contact with moving components (e.g. control motor lever).
- To check operation of control motor, connect an adapter cable ⇒ [page 10](#), or use a test lead from adapter set - V.A.G 1594C- to connect contacts "5" and "6" of control motor to a 12 V battery via a 5 A fuse.



#### Note

*Allow control motor to turn as far as stop. The direction of rotation can be reversed by interchanging positive and negative.*

- Install fresh air blower ⇒ [page 206](#).
- Vehicles with heater: Check operation of control motor ⇒ [page 163](#).
- Vehicles with manually controlled air conditioner: After completing the repairs, perform the following work on the operating unit ⇒ Vehicle diagnostic tester, "Guided Fault Finding" function: Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability for information in this document. Copyright by AUDI AG.
- Perform final control diagnosis.

## 4.6 Checking operation of control motors

⇒ ["4.6.1 Operation of fresh air and air recirculation flap control motor V154 and fresh air/air recirculation button - heater, manually controlled air conditioner", page 161](#)

⇒ ["4.6.2 Checking fresh air and air recirculation flap control motor V154 - heater, manually controlled air conditioner", page 163](#)

⇒ ["4.6.3 Checking control unit J65 / J301 and fresh air and air recirculation flap control motor V154", page 164](#)

⇒ ["4.6.4 Operation of air recirculation flap control motor V113 and fresh-air/air recirculation button - automatically controlled air conditioner", page 166](#)

⇒ ["4.6.5 Checking air recirculation flap control motor V113 - automatically controlled air conditioner", page 167](#)

⇒ ["4.6.6 Checking Climatronic control unit J255 and air recirculation flap control motor V113", page 169](#)

### 4.6.1 Operation of fresh air and air recirculation flap control motor - V154- and fresh

## air/air recirculation button - heater, manually controlled air conditioner

As no potentiometer is installed in the fresh air and air recirculation flap control motor - V154- , this control motor is only ever activated in one direction (fresh air or air recirculation mode). The direction of rotation of the control motor is reversed by interchanging positive and negative at the outputs of the heater control unit - J65- / air conditioning system control unit - J301- .

- The control unit detects that the control motor has reached its end position via the level of current flowing through it.

Self-diagnosis is not possible for heater control unit - J65- . Faults in the fresh air and air recirculation flap control motor - V154- are not detected.

As no potentiometer is installed in the fresh air and air recirculation flap control motor - V154- , a fault at the control motor or in its wiring is not always detected by the air conditioning system control unit - J301- .

The fresh air/air recirculation button is integrated into the heater control unit - J65- / air conditioning system control unit - J301- (air conditioner control).

The "air recirculation mode" function is cancelled automatically when the ignition is switched on again.

The windows may mist up in air recirculation mode.

- The humidity of the air in the passenger compartment increases and the windows mist up. With the air conditioner switched off (or on vehicles with heater only), the air is not dried by the cold evaporator of the air conditioner.



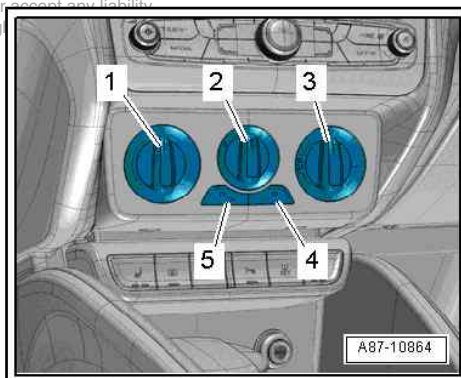
### Note

*On vehicles with a manually controlled air conditioner, the control motor -V154- can be activated via the "Final control diagnosis" ⇒ Vehicle diagnostic tester, "Guided Fault Finding".*

If the windows mist up after the ignition is switched on again, check the "fresh air/air recirculation mode" function.

To clear misted windows as quickly as possible, use the rotary control -3- for air distribution to set the air flow direction to "windscreen" (air recirculation mode is cancelled).

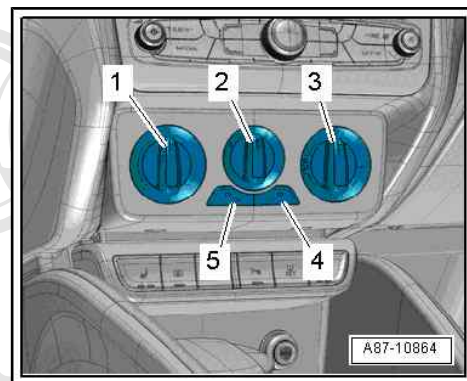
- The control unit switches automatically to fresh air mode after the rotary air distribution control has been moved to this position.
- Lamp in button -5- goes out.
- Check operation of fresh air/air recirculation button and activation of fresh air and air recirculation flap control motor - V154- ⇒ [page 163](#) .



## 4.6.2 Checking fresh air and air recirculation flap control motor - V154- - heater, manually controlled air conditioner

### Procedure

- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- Switch on ignition.
- Set rotary fresh air blower control -2- to speed "3".
- Set rotary control -3- for air distribution to "Dash panel vents".
- Fresh air/air recirculation button -5- not pressed.
- Fresh air mode - lamp in button is off.
- Air is drawn in from plenum chamber via fresh air intake.
- Press fresh air/air recirculation button.
- Air recirculation mode - lamp in button is on.
- Air is drawn in from area behind glove box (air recirculation mode).
- Set rotary control for air distribution to "Windscreen".
- Indicator lamp in fresh air/air recirculation button goes out; fresh air/air recirculation flap moves to "fresh air mode" position.



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### Note

*If operation is not OK, check electronics in heater control unit - J65- / air conditioning system control unit - J301- and activation of fresh air and air recirculation flap control motor -V154- ⇒ [page 164](#) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

If operation of fresh air/air recirculation flap is OK and windows mist up, check the following:

- Dust and pollen filter for contamination ⇒ [page 204](#)
- Forced ventilation vents for passenger compartment ⇒ [page 230](#)
- Ingress of water into passenger compartment ⇒ [page 233](#)
- Fresh-air intake from plenum chamber and plenum chamber water drain ⇒ [page 233](#)
- Seals between individual components of fresh air intake and vehicle for damage and leaks
- Activation of air conditioner compressor regulating valve - N280- and operation of air conditioner ⇒ "3.8 Checking cooling output", [page 29](#)



## Note

*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. Icing-up of the evaporator may be the cause of the windows misting up.*

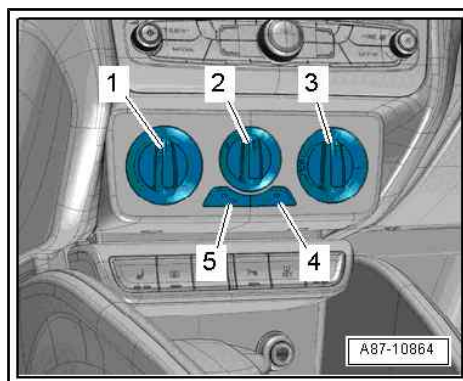
## 4.6.3 Checking control unit -J65- / -J301- and fresh air and air recirculation flap control motor - V154-

### Special tools and workshop equipment required

- ◆ Voltage tester - V.A.G 1527 B-
- ◆ Auxiliary measuring set - V.A.G 1594C-

### Procedure

- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- Switch on ignition.
- Set rotary control -3- for air distribution to "Dash panel vents".
- Fresh air/air recirculation button -5- not pressed.

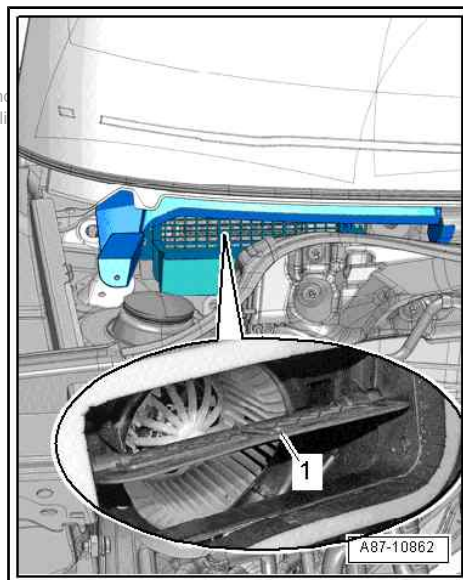


- Fresh air mode - lamp in button is off.
- Fresh air and air recirculation flap control motor - V154- set to "fresh air mode" - fresh air flap -1- in "open" position.
- Air recirculation flap closed.



## Note

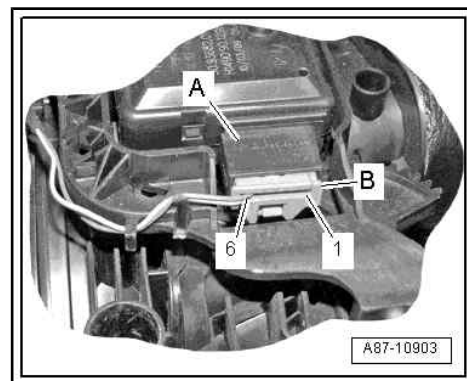
*This illustration shows the fresh air flap -1- with the plenum chamber cover removed.*



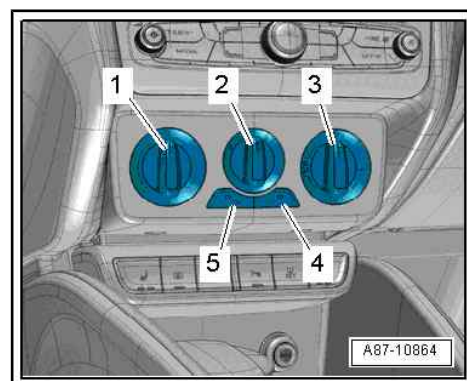
- Use voltage tester - V.A.G 1527 B- and test leads from auxiliary measuring set - V.A.G 1594C- at control motor -A- to connect contacts “5” and “6” at electrical connector -B-.

 **Note**

- ◆ Leave electrical connector plugged in.
- ◆ The control motor connections are interchanged on right-hand drive vehicles ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.



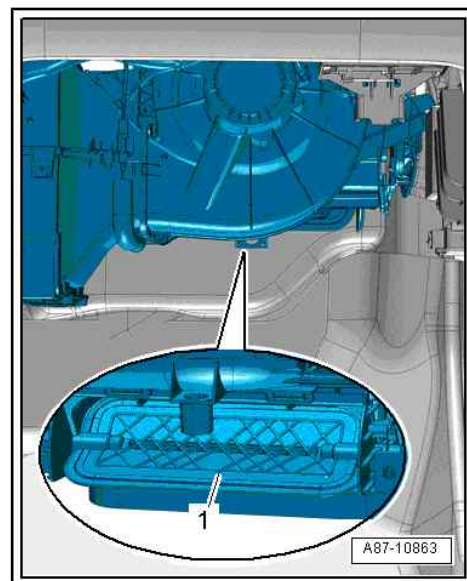
- Press fresh air/air recirculation button -5-.
- The lamp in the button lights up.
- “Earth” is briefly applied to contact “5” and “positive” is briefly applied to contact “6”.



- The fresh air and air recirculation flap control motor - V154- and therefore the air recirculation flap -1- move to the “air recirculation mode” position.
- The air recirculation mode opening is opened.

 **Note**

Positive is only applied for a certain time after the fresh-air/air recirculation button has been pressed. After this period, the control motor is then only activated with a specific duty cycle (lamp in voltage tester - V.A.G 1527B- only flashes briefly).

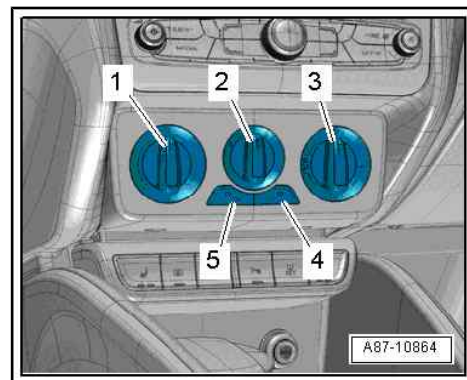


- Press fresh air/air recirculation button -5-.
- The lamp in the button goes out.

 **Note**

Pressing the fresh air/air recirculation button causes the control unit to alter the power supply to the control motor (positive and earth are interchanged).

- “Earth” is briefly applied to contact “6” and “positive” is briefly applied to contact “5”.



- The fresh air and air recirculation flap control motor - V154- and therefore the air recirculation flap -1- move to the “fresh air mode” position.
- The air recirculation mode opening is closed.



### Note

*The control motor connections are interchanged on right-hand drive vehicles ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

If this test does not reveal any problems with activation of fresh air and air recirculation flap control motor - V154- and flap does not move properly:

- Check freedom of movement of fresh air flap/air recirculation flap.
- Renew -V154- ⇒ [page 159](#) .

If activation and thus operation of fresh air and air recirculation flap control motor - V154- are not OK:

- Check wiring between -J65- / -J301- and -V154- for open circuit or short circuit ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Check power supply and earth connection to -J65- / -J301- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Renew control unit: -J65- ⇒ [page 74](#) , -J301- ⇒ [page 236](#) .

If operation of fresh air/air recirculation flap is OK and windows mist up, check the following:

- Dust and pollen filter for contamination ⇒ [page 204](#)
- Forced ventilation vents for passenger compartment ⇒ [page 230](#)
- Ingress of water into passenger compartment ⇒ [page 233](#)
- Fresh-air intake from plenum chamber and plenum chamber water drain ⇒ [page 233](#)
- Seals between individual components of fresh air intake and vehicle for damage and leaks
- Activation of air conditioner compressor regulating valve - N280- and operation of air conditioner ⇒ [“3.8 Checking cooling output”, page 29](#)

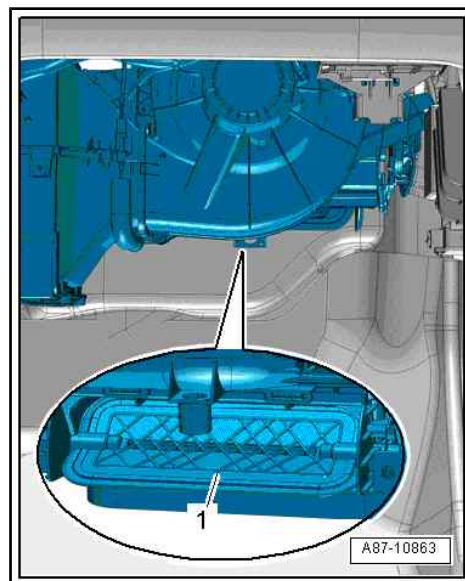
## 4.6.4 Operation of air recirculation flap control motor - V113- and fresh-air/air recirculation button - automatically controlled air conditioner



### Note

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*Depending on the operating unit ( Climatronic control unit - J255- ), the air recirculation flap control motor - V113- on vehicles manufactured in 2010 may also be displayed as the fresh air/air recirculation, air flow flap control motor - V425- or fresh air and air recirculation flap control motor - V154- ⇒ Vehicle diagnostic tester, “Guided Fault Finding”.*



On vehicles with an automatic air conditioner, the air recirculation flap control motor - V113- is activated e.g. via the "Basic setting" function. Via the potentiometer for air recirculation flap control motor - G143- (installed in this control motor on version for automatic air conditioner), the operation of the control motor is monitored by the operating and display unit ( Climatronic control unit - J255- ) ⇒ Vehicle diagnostic tester, "Guided Fault Finding".

The windows may mist up in air recirculation mode with the air conditioner switched off.

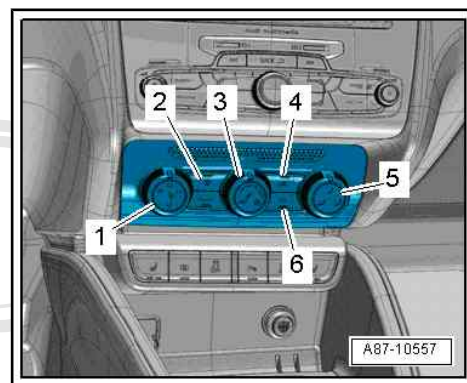
- The humidity of the air in the passenger compartment increases and the windows mist up. The air is not dried by the cold evaporator of the air conditioner.

The "air recirculation mode" function is currently cancelled automatically when the ignition is switched on again.

To clear misted windows as quickly as possible, air recirculation mode is not possible in "Defrost" mode (for air distribution to the "windscreen").

- The Climatronic control unit - J255- switches automatically to fresh air mode after the "Defrost" button is pressed.
- Lamp in button -2- is on.
- Lamp in button -4- goes out.

Checking operation of fresh air/air recirculation button and activation of air recirculation flap control motor -V113- ⇒ [page 167](#)



#### 4.6.5 Checking air recirculation flap control motor - V113- - automatically controlled air conditioner

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##### Note

*Depending on the operating unit ( Climatronic control unit - J255- ), the air recirculation flap control motor - V113- on vehicles manufactured in 2010 may also be displayed as the fresh air/air recirculation, air flow flap control motor - V425- or fresh air and air recirculation flap control motor - V154- ⇒ Vehicle diagnostic tester, "Guided Fault Finding".*

## Procedure

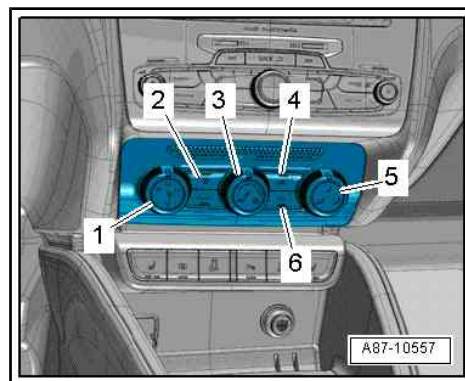
- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- Switch on ignition.



### Note

Operation of control motor is displayed in “Read measured values” function ⇒ Vehicle diagnostic tester, “Guided Fault Finding”.

- Set rotary fresh air blower control -3- to speed “3”.
- Set rotary control -5- for air distribution to “Dash panel vents”.
- Fresh air/air recirculation button -4- not pressed.
  - Fresh air mode - lamp in button is off.
  - Air is drawn in from plenum chamber via fresh air intake.
- Press fresh air/air recirculation button.
- Air recirculation mode - lamp in button is on.
- Air is drawn in from area behind glove box (air recirculation mode).
- Press “Defrost” button -2-.
- Lamp in button is on.
- Indicator lamp in fresh air/air recirculation button goes out; fresh air/air recirculation flap moves to “fresh air mode” position.



### Note

- ◆ If operation is not OK, check electronics in Climatronic control unit - J255- and activation of air recirculation flap control motor -V113- ⇒ Vehicle diagnostic tester, “Guided Fault Finding”.
- ◆ The “air recirculation mode” function is currently cancelled automatically when the ignition is switched on again.

If operation of fresh air/air recirculation flap is OK and windows mist up, check the following:

- Dust and pollen filter for contamination ⇒ [page 204](#)
- Forced ventilation vents for passenger compartment ⇒ [page 230](#)
- Ingress of water into passenger compartment ⇒ [page 233](#)
- Fresh-air intake from plenum chamber and plenum chamber water drain ⇒ [page 233](#)
- Seals between individual components of fresh air intake and vehicle for damage and leaks
- Activation of air conditioner compressor regulating valve - N280- and operation of air conditioner ⇒ [“3.8 Checking cooling output”, page 29](#)

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 **Note**

*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. Icing-up of the evaporator may be the cause of the windows misting up.*

#### 4.6.6 Checking Climatronic control unit - J255- and air recirculation flap control motor - V113-

 **Note**

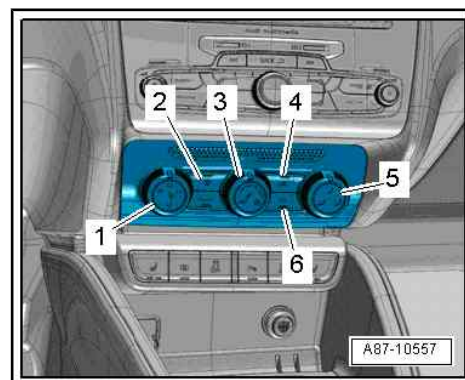
*Depending on the operating unit (Climatronic control unit - J255-), the air recirculation flap control motor - V113- on vehicles manufactured in 2010 may also be displayed as the fresh air/air recirculation, air flow flap control motor - V425- or fresh air and air recirculation flap control motor - V154- → Vehicle diagnostic tester, "Guided Fault Finding".*

#### Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester
- ◆ Voltage tester - V.A.G 1527 B-

#### Procedure

- Remove glove box → General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- Switch on ignition.
- Check operation of control motor via "Read measured values" function → Vehicle diagnostic tester, "Guided Fault Finding".
- Set rotary control -5- for air distribution to "Dash panel vents".
- Fresh air/air recirculation button -4- not pressed.

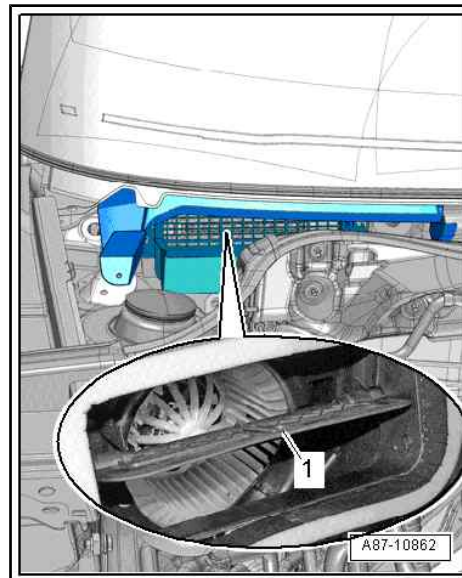


- Fresh air mode - lamp in button is off.
- Air recirculation flap control motor - V113- set to "fresh air mode" - fresh air flap -1- in "open" position.
- Air recirculation flap closed.



### Note

This illustration shows the fresh air flap -1- with the plenum chamber cover removed.

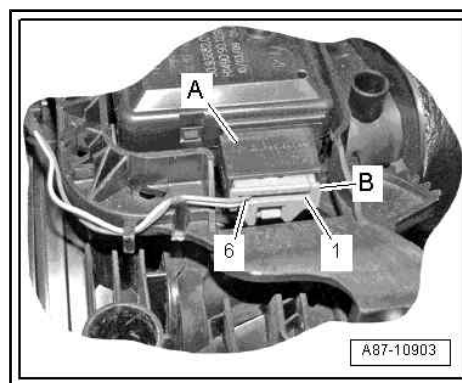


- Use voltage tester - V.A.G 1527 B- and test leads from auxiliary measuring set - V.A.G 1594C- at control motor -A- to connect contacts "5" and "6" at electrical connector -B-.

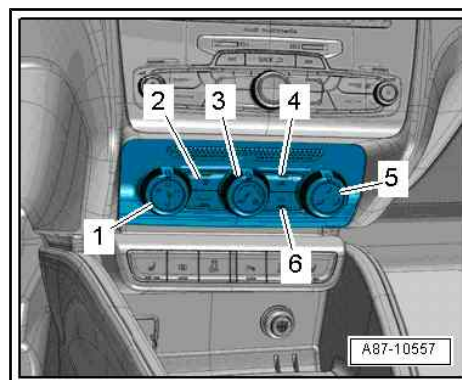


### Note

- ◆ Leave electrical connector plugged in.
- ◆ Operation of control motor is displayed in "Read measured values" function → Vehicle diagnostic tester, "Guided Fault Finding".
- ◆ This illustration shows the connector on a control motor for a manually controlled air conditioner; additional contacts are used in the connector on vehicles with an automatically controlled air conditioner → Current flow diagrams, Electrical fault finding and Fitting locations.
- ◆ The control motor connections are interchanged on right-hand drive vehicles → Current flow diagrams, Electrical fault finding and Fitting locations.



- Press fresh air/air recirculation button -4-.
- The lamp in the button lights up.
- "Earth" is briefly applied to contact "5" and "positive" is briefly applied to contact "6".

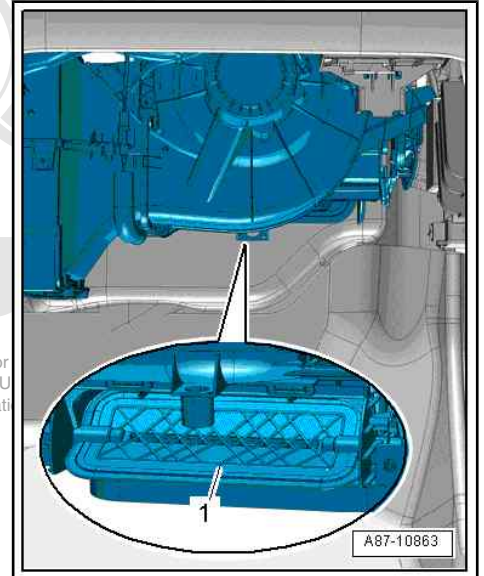


- The air recirculation flap control motor - V113- and therefore the air recirculation flap -1- move to the “air recirculation mode” position.
- The air recirculation mode opening is opened.

**i Note**

*Positive is only applied for a certain time after the fresh-air/air recirculation button has been pressed. After this period, the control motor is then only activated with a specific duty cycle (lamp in voltage tester - V.A.G 1527B- only flashes briefly).*

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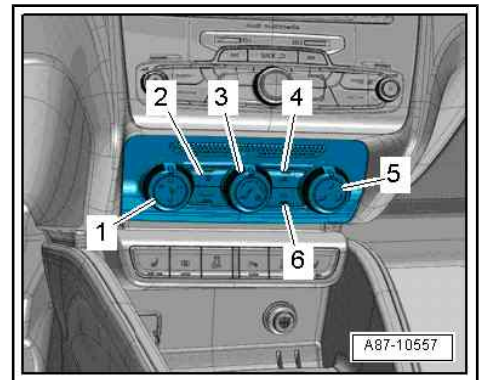


- Press fresh air/air recirculation button -4-.
- The lamp in the button goes out.

**i Note**

*Pressing the fresh air/air recirculation button causes the control unit to alter the power supply to the control motor (positive and earth are interchanged).*

- “Earth” is briefly applied to contact “6” and “positive” is briefly applied to contact “5”.



- The air recirculation flap control motor - V113- and therefore the air recirculation flap -1- move to the “fresh air mode” position.
- The air recirculation mode opening is closed.



### Note

*The control motor connections are interchanged on right-hand drive vehicles ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

If this test does not reveal any problems with activation of air recirculation flap control motor - V113- and flap does not move properly:

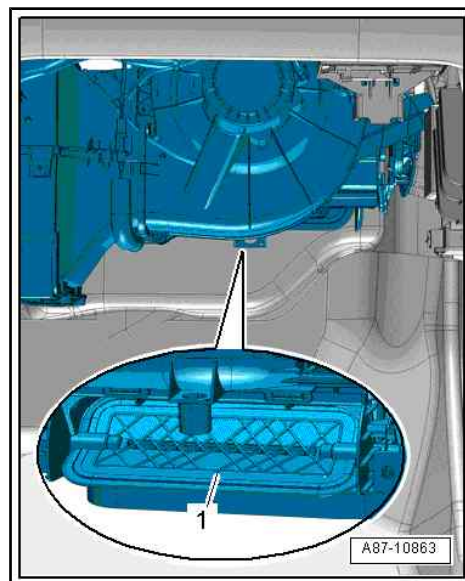
- Check freedom of movement of fresh air flap/air recirculation flap.
- Renew -V113- ⇒ [page 157](#) .

If activation and thus operation of air recirculation flap control motor - V113- are not OK:

- Check electronics in Climatronic control unit - J255- and activation of air recirculation flap control motor -V113- ⇒ Vehicle diagnostic tester, “Guided Fault Finding”.
- Check wiring between Climatronic control unit - J255- and - V113- for open circuit or short circuit ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Check power supply and earth connection to -J255- .
- Renew Climatronic control unit - J255- ⇒ [page 239](#) .

If operation of fresh air/air recirculation flap is OK and windows mist up, check the following:

- Dust and pollen filter for contamination ⇒ [page 204](#)
- Forced ventilation vents for passenger compartment ⇒ [page 230](#)
- Ingress of water into passenger compartment ⇒ [page 233](#)
- Fresh-air intake from plenum chamber and plenum chamber water drain ⇒ [page 233](#)
- Seals between individual components of fresh air intake and vehicle for damage and leaks
- Activation of air conditioner compressor regulating valve - N280- and operation of air conditioner ⇒ [“3.8 Checking cooling output”, page 29](#)



## 5 Heater and air conditioning unit (front)

⇒ [“5.1 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 173](#)

⇒ [“5.2 Exploded view - evaporator housing”, page 185](#)

⇒ [“5.3 Removing and installing evaporator”, page 188](#)

⇒ [“5.4 Cleaning evaporator”, page 189](#)

⇒ [“5.5 Checking auxiliary air heater element Z35”, page 196](#)

⇒ [“5.6 Removing and installing auxiliary air heater element Z35”, page 199](#)

⇒ [“5.7 Removing and installing heater and air conditioning unit”, page 200](#)

⇒ [“5.8 Dismantling and assembling heater and air conditioning unit”, page 201](#)

⇒ [“5.9 Removing and installing air distribution housing”, page 203](#)

⇒ [“5.10 Removing and installing dust and pollen filter”, page 204](#)

⇒ [“5.11 Removing and installing fresh air blower V2”, page 206](#)

⇒ [“5.12 Removing and installing fresh air blower series resistor with overheating fuse N24”, page 209](#)

⇒ [“5.13 Removing and installing fresh air blower control unit J126”, page 210](#)

⇒ [“5.14 Removing and installing heat exchanger”, page 210](#)

⇒ [“5.15 Checking condensation drain”, page 215](#)

⇒ [“5.16 Removing and installing condensation drain”, page 217](#)

⇒ [“5.17 Removing and installing flexible shafts”, page 219](#)

### 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, fresh air blower, dust and pollen filter - manually controlled air conditioner”, page 173](#)

⇒ [“5.1.2 Exploded view - attachments for heater and air conditioning unit and air intake box, fresh air blower, dust and pollen filter - automatically controlled air conditioner”, page 176](#)

⇒ [“5.1.3 Exploded view - attachments for heater and air conditioning unit and air intake box, heat exchanger, flap control - manually controlled air conditioner”, page 179](#)

⇒ [“5.1.4 Exploded view - attachments for heater and air conditioning unit and air intake box, heat exchanger, flap control - automatically controlled air conditioner”, page 182](#)

#### 5.1.1 Exploded view - attachments for heater and air conditioning unit and air intake box, fresh air blower, dust and pollen filter - manually controlled air conditioner

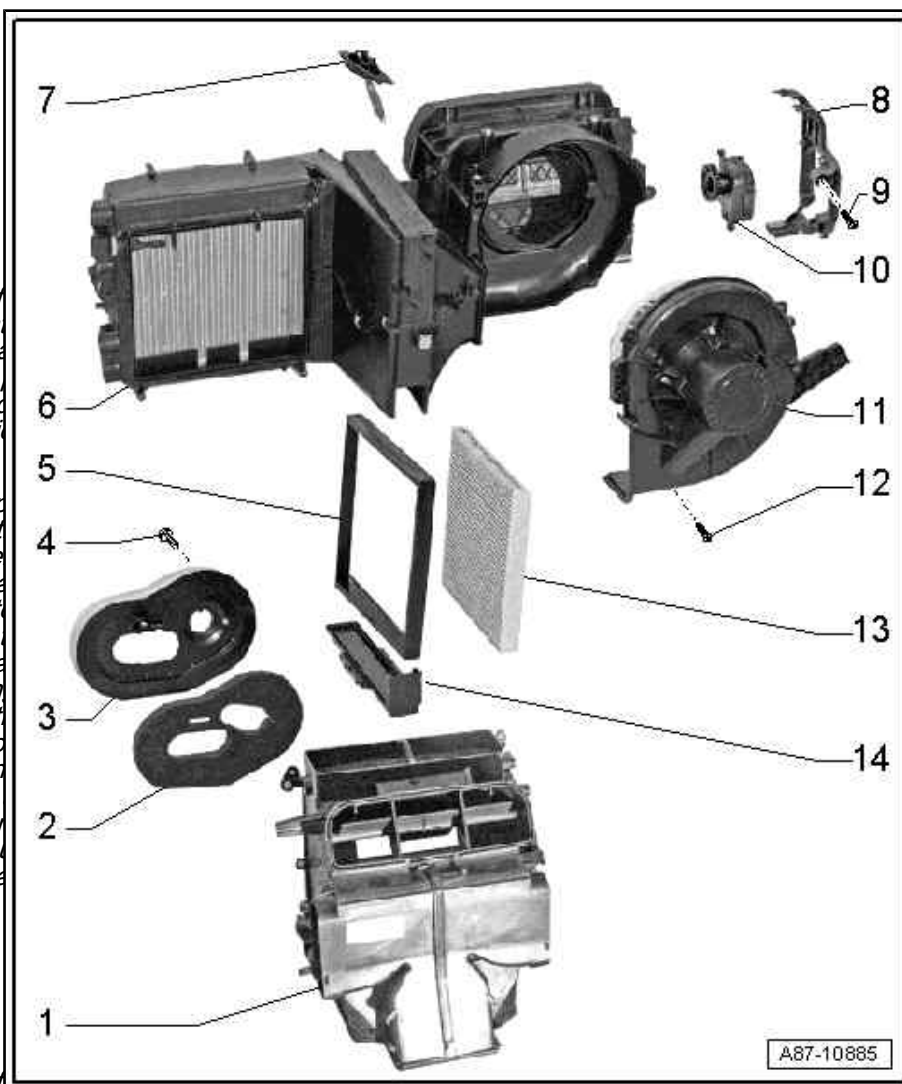
## 1 - Air distribution housing

- ❑ Removing and installing air conditioning unit  
⇒ [page 200](#)
- ❑ Exploded view  
⇒ [page 185](#)



### Note

- ◆ Different versions of conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue
- ◆ Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.



## 2 - Foam spacer



### Note

- ◆ Different versions of conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue
- ◆ Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.

## 3 - Sealing element

- ❑ For sealing off heat exchanger from bulkhead
- ❑ Renew if foam seal is damaged



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#### Note

- ◆ *Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue*
- ◆ *Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.*

#### 4 - Bolt

- ☐ 1.5 Nm

#### 5 - Filter frame

- ☐ For dust and pollen filter



#### Note

*Only necessary for certain version of dust and pollen filter, not always provided ⇒ [page 204](#)*

#### 6 - Air duct housing

- ☐ Exploded view ⇒ [page 185](#)

#### 7 - Fresh air blower series resistor with overheating fuse - N24-

- ☐ Removing, installing and checking ⇒ [page 209](#)

#### 8 - Mounting

- ☐ For control motor

#### 9 - Bolt

- ☐ 2x
- ☐ 1.5 Nm

#### 10 - Fresh air and air recirculation flap control motor - V154-

- ☐ Removing and installing ⇒ [page 159](#)
- ☐ Checking operation  
 ⇒ ["4.6.5 Checking air recirculation flap control motor V113 - automatically controlled air conditioner", page 167](#),  
 ⇒ ["4.6.6 Checking Climatronic control unit J255 and air recirculation flap control motor V113", page 169](#)

#### 11 - Fresh air blower - V2-

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 206](#)

## 12 - Bolt

- ☐ 4x
- ☐ 1.5 Nm

## 13 - Dust and pollen filter

- ☐ Different versions ⇒ [page 204](#) and ⇒ Electronic parts catalogue
- ☐ Observe replacement intervals ⇒ Maintenance tables
- ☐ Removing and installing ⇒ [page 204](#)

## 14 - Slot cover for dust and pollen filter

- ☐ Different versions (depending on version of dust and pollen filter) ⇒ [page 204](#) and ⇒ Electronic parts catalogue

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## 5.1.2 Exploded view - attachments for heater and air conditioning unit and air intake box, fresh air blower, dust and pollen filter - automatically controlled air conditioner

### 1 - Air distribution housing

- ☐ Removing and installing air conditioning unit ⇒ [page 200](#)
- ☐ Exploded view ⇒ [page 185](#)



#### Note

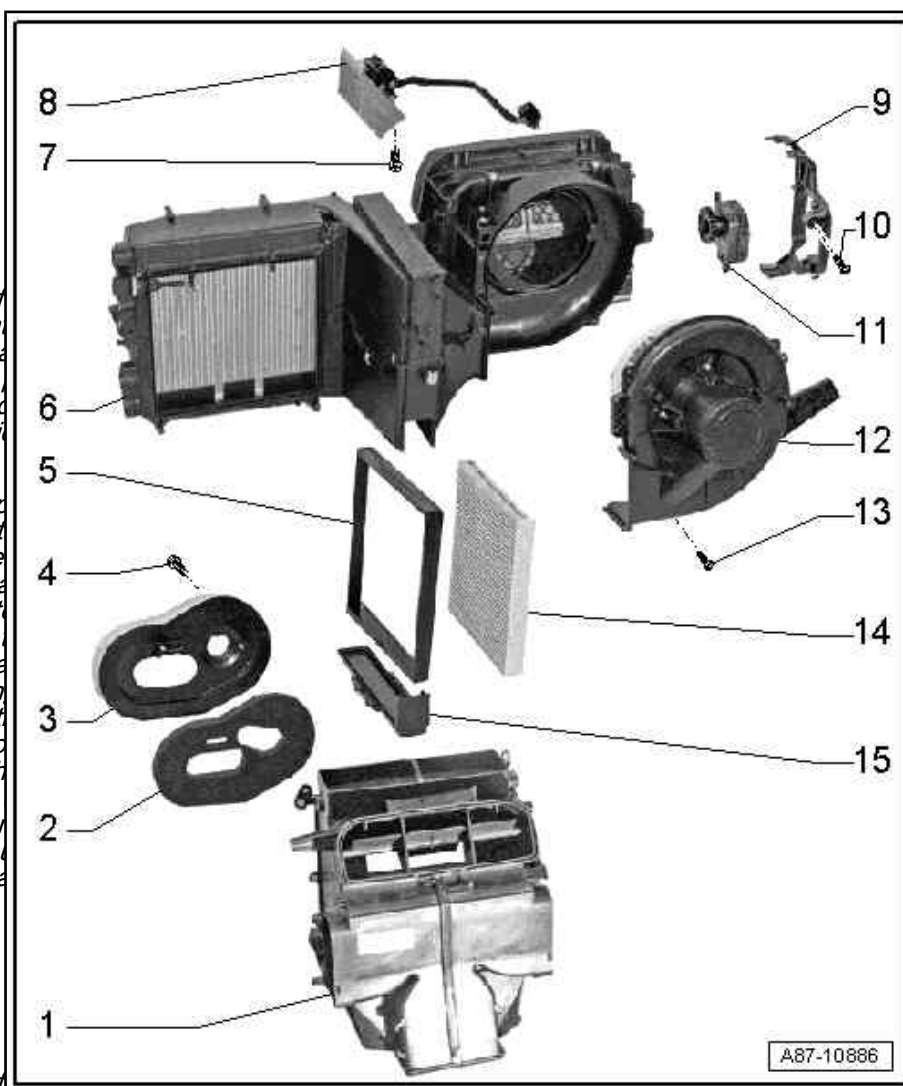
- ◆ Different versions of conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue
- ◆ Vehicles with the type "8XF" and "8XK" in the identification number with an expansion valve refrigerant lines bolted to the bottom. In addition, a mounting flange on the heater in the air conditioning unit, approx. 9 mm shorter than the flanges with the type code "8X0" and "8X1" in the vehicle identification number. The air distribution housing and control panel seals (incl. area around the expansion drain) are added accordingly.

### 2 - Foam spacer



#### Note

- ◆ Different versions of conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue



- ◆ Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.



### 3 - Sealing element

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- ☐ For sealing off heat exchanger from bulkhead
- ☐ Renew if foam seal is damaged



#### Note

- ◆ Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue
- ◆ Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.

### 4 - Bolt

- ☐ 1.5 Nm

### 5 - Filter frame

- ☐ For dust and pollen filter



#### Note

Only necessary for certain version of dust and pollen filter, not always provided ⇒ [page 204](#)

### 6 - Air duct housing

- ☐ Exploded view ⇒ [page 185](#)

### 7 - Bolt

- ☐ 1.5 Nm



#### 8 - Fresh air blower control unit - J126-

- ☐ Removing and installing ⇒ [page 210](#)

#### 9 - Mounting

- ☐ For control motor

#### 10 - Bolt

- ☐ 2x
- ☐ 1.5 Nm

#### 11 - Air recirculation flap control motor - V113-

- ☐ With potentiometer for air recirculation flap control motor - G143-
- ☐ Removing and installing ⇒ [page 157](#)

#### 12 - Fresh air blower - V2-

- ☐ Different versions ⇒ [Electronic parts catalogue](#)
- ☐ Removing and installing ⇒ [page 207](#)

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#### 13 - Bolt

- ☐ 4x
- ☐ 1.5 Nm

#### 14 - Dust and pollen filter

- ☐ Different versions ⇒ [page 204](#) and ⇒ [Electronic parts catalogue](#)
- ☐ Notes on version with activated charcoal filter insert ⇒ [page 47](#)
- ☐ Observe replacement intervals ⇒ [Maintenance tables](#)
- ☐ Removing and installing ⇒ [page 204](#)

#### 15 - Slot cover for dust and pollen filter

- ☐ Different versions (depending on version of dust and pollen filter) ⇒ [page 204](#) and ⇒ [Electronic parts catalogue](#)

### 5.1.3 Exploded view - attachments for heater and air conditioning unit and air intake box, heat exchanger, flap control - manually controlled air conditioner

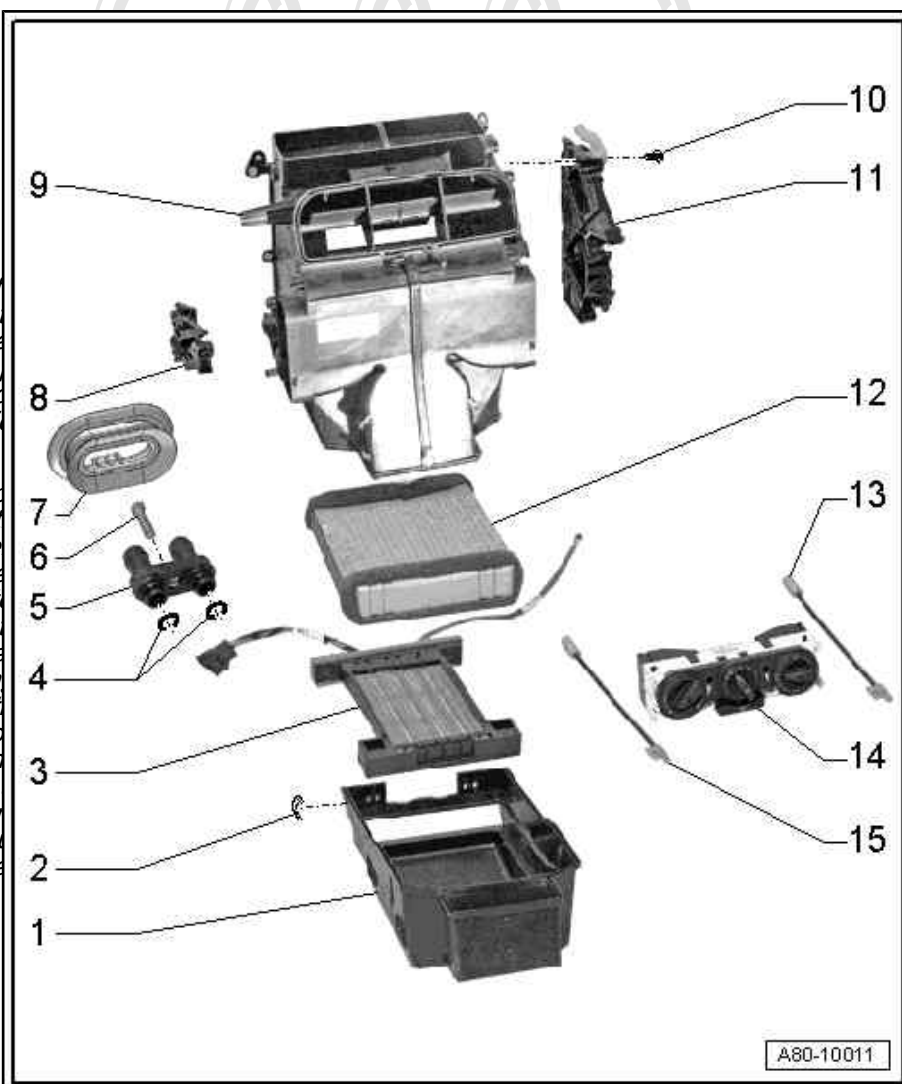
#### 1 - Air distribution housing (bottom section)

- ☐ Removing and installing  
⇒ ["5.14 Removing and installing heat exchanger", page 210](#)



#### Note

- ◆ Different versions of conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue
- ◆ Vehicles with the type "8XF" and "8XK" in the identification number have an expansion valve on the bottom. In addition, the mounting flange on the heater in the air conditioning unit is approx. 9 mm shorter than the flanges with the type code "8X1" in the vehicle identification number. The air distribution housing and cover seals (incl. area around the expansion drain) are adapted accordingly.



#### 2 - Clip

- ☐ 6x

#### 3 - Auxiliary air heater element - Z35-

- ☐ For vehicles with TDI engine and certain petrol engines from model year 2012 onwards (gradual introduction)
- ☐ Removing and installing ⇒ [page 199](#)
- ☐ Checking function ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode for engine

#### 4 - O-ring

- ☐ Renew

#### 5 - Adapter for coolant hoses

- ☐ For heat exchanger
- ☐ Different versions ⇒ Electronic parts catalogue



#### Note

- ◆ Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue

- ◆ *Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.*

#### 6 - Bolt

- ☐ 8 Nm

#### 7 - Grommet

- ☐ Functions as seal

#### 8 - Gear mechanism for temperature flap

- ☐ Removing and installing ⇒ [page 221](#)



#### Note

- ◆ *Flexible shaft rotates twice if rotary air conditioner control is turned once.*
- ◆ *Note installation position*  
⇒ [page 221](#).

#### 9 - Air distribution housing

- ☐ Removing and installing air conditioning unit ⇒ [page 200](#)
- ☐ Exploded view ⇒ [page 185](#)

#### 10 - Bolt

- ☐ 1.5 Nm

#### 11 - Gear mechanism for air distribution

- ☐ Removing and installing ⇒ [page 222](#)



#### Note

- ◆ *Flexible shaft rotates twice if rotary air conditioner control is turned once.*
- ◆ *Note installation position*  
⇒ [page 220](#).

#### 12 - Heat exchanger for heater

- ☐ Removing and installing ⇒ [page 210](#)
- ☐ Different versions ⇒ [page 210](#) and ⇒ Electronic parts catalogue



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#### Note

- ◆ Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ *Electronic parts catalogue*
- ◆ Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.

### 13 - Flexible shaft

- ☐ For gear mechanism for air distribution
- ☐ Removing and installing ⇒ [page 220](#)



#### Note

*Flexible shaft rotates twice if rotary air conditioner control is turned once.*

### 14 - Operating unit

- ☐ With air conditioning system control unit - J501 -
- ☐ Different versions ⇒ [page 6](#) and ⇒ *Electronic parts catalogue*
- ☐ Removing and installing ⇒ [page 236](#)



#### Note

*Flexible shaft rotates twice if rotary air conditioner control is turned once.*

### 15 - Flexible shaft

- ☐ For gear mechanism for temperature flap
- ☐ Removing and installing ⇒ [page 221](#)



#### Note

*Flexible shaft rotates twice if rotary air conditioner control is turned once.*

## 5.1.4 Exploded view - attachments for heater and air conditioning unit and air intake box, heat exchanger, flap control - automatically controlled air conditioner

### 1 - Air distribution housing (bottom section)

- ❑ Removing and installing ⇒ ["5.14 Removing and installing heat exchanger", page 210](#)



#### Note

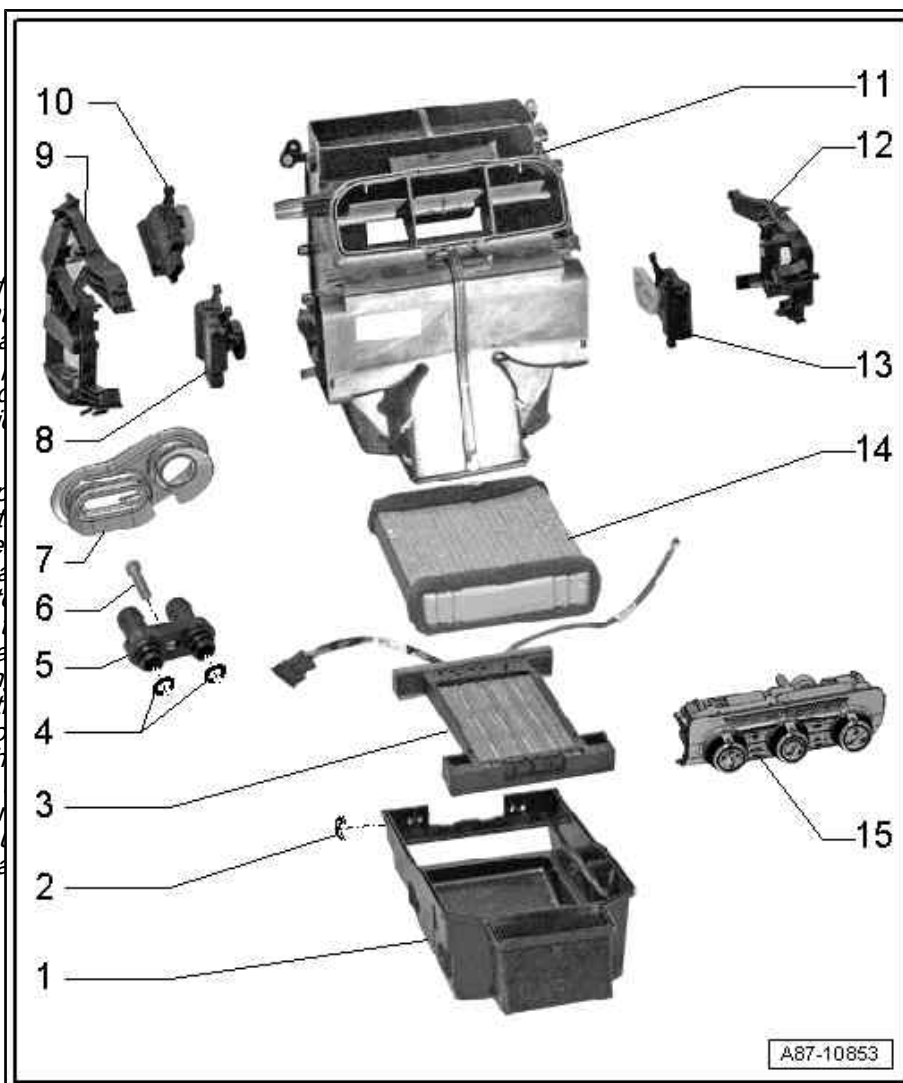
- ◆ Different versions of conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on model year, period and vehicle identification number ⇒ [Electronic Technical Data](#)
- ◆ Vehicles with the type "8XF" and "8XK" in the identification number have an expansion valve with refrigerant lines bolted to the bottom. In addition, a mounting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than for vehicles with the type code "8X1" in the vehicle identification number. The air distribution housing and cover seals (incl. area around the expansion drain) are adapted accordingly.

### 2 - Clip

- ❑ 6x

### 3 - Auxiliary air heater element - Z35-

- ❑ For vehicles with TDI engine and certain petrol engines from model year 2012 onwards (gradual introduction)
- ❑ Removing and installing ⇒ [page 199](#)
- ❑ Checking function ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode for engine





## Note

*From model year 2012 onwards, -Z35- is also installed on vehicles with certain petrol engines (gradual introduction). The correct version of the operating unit ( Climatronic control unit - J255- , part number 8X0 820 043 from index "B" onwards) and the correct version of the engine control unit must be installed so that the operating unit -J255- and the corresponding engine control unit can activate -Z35- (via -J359- and -J360- ) ⇒ Vehicle diagnostic testerand ⇒ Electronic parts catalogue .*

## 4 - O-ring

- ☐ Renew

## 5 - Adapter for coolant hoses

- ☐ For heat exchanger
- ☐ Different versions ⇒ Electronic parts catalogue



## Note

- ◆ *Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue*
- ◆ *Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.*

## 6 - Bolt

- ☐ 8 Nm

## 7 - Grommet

- ☐ Functions as seal
- ☐ Different versions ⇒ Electronic parts catalogue

**Note**

- ◆ *Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue*
- ◆ *Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.*

**8 - Temperature flap control motor - V68-**

- ☐ With potentiometer for temperature flap control motor - G92-
- ☐ Removing and installing ⇒ [page 154](#)

**9 - Mounting**

- ☐ For control motors

**10 - Defroster flap control motor - V107-**

- ☐ With potentiometer for defroster flap control motor - G135-
- ☐ Removing and installing ⇒ [page 154](#)

**11 - Air distribution housing**

- ☐ Removing and installing air conditioning unit ⇒ [page 200](#)
- ☐ Exploded view ⇒ [page 185](#)

**12 - Mounting**

- ☐ For control motor

**13 - Centre flap control motor - V70-**

- ☐ With potentiometer for centre flap control motor - G112-
- ☐ Removing and installing ⇒ [page 156](#)

**14 - Heat exchanger for heater**

- ☐ Removing and installing ⇒ [page 210](#)
- ☐ Different versions ⇒ [page 210](#) and ⇒ [Electronic parts catalogue](#)

**Note**

- ◆ *Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue*

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- ◆ Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.

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## 15 - Operating unit

- ☐ With Climatronic control unit - J255-
- ☐ Different versions ⇒ [page 7](#) and ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 239](#)

## 5.2 Exploded view - evaporator housing

### 1 - Bolt

- ☐ 4x
- ☐ 1.5 Nm

### 2 - Bolt

- ☐ 2x
- ☐ 1.5 Nm

### 3 - Air duct housing (bottom section)

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 202](#)

### 4 - Condensation drain hose

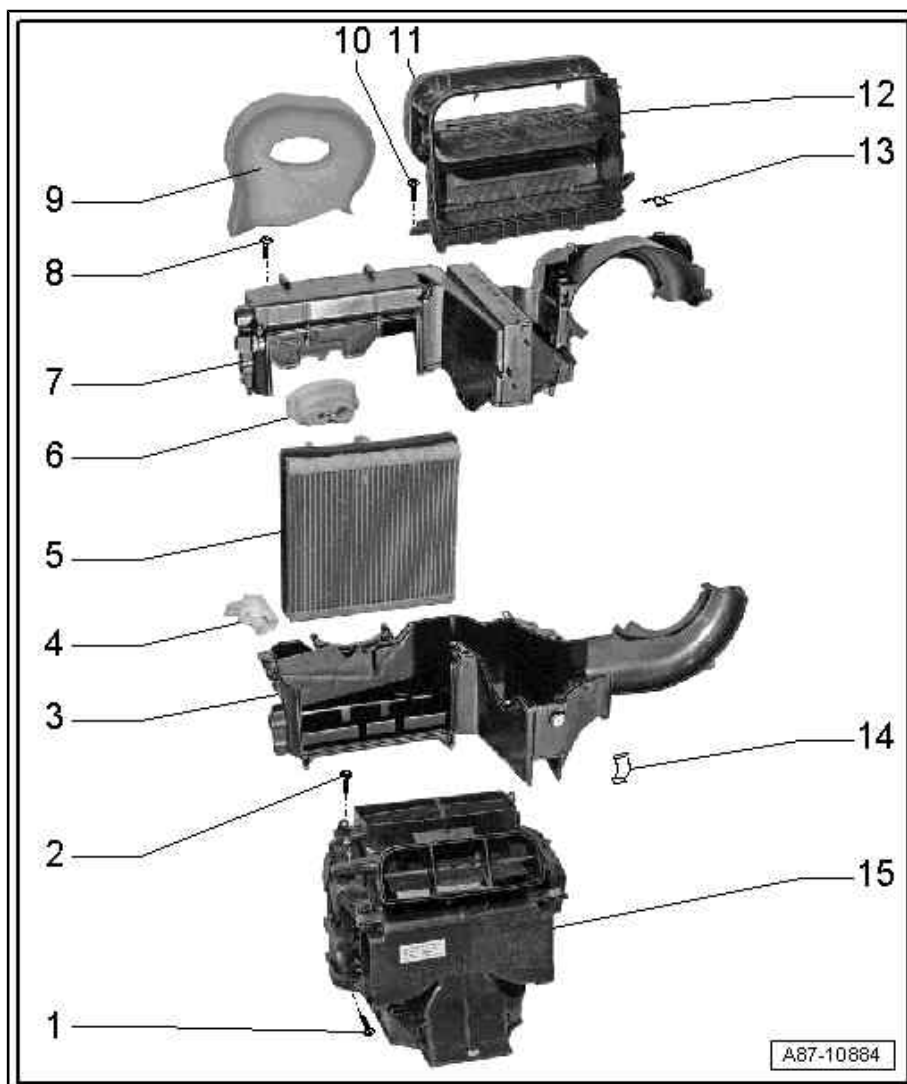
- ☐ Checking ⇒ [page 215](#)
- ☐ Removing and installing ⇒ [page 217](#)

### 5 - Evaporator

- ☐ Removing and installing ⇒ [page 188](#)

### 6 - Seal/insulation

- ☐ Different versions depending on expansion valve ⇒ [page 106](#) and ⇒ Electronic parts catalogue



**Note**

- ◆ *Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue*
- ◆ *Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.*

**7 - Air duct housing (top section)**

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 202](#)

**8 - Bolt**

- ☐ 2x
- ☐ 1.5 Nm

**9 - Foam spacer**

- ☐ For refrigerant lines
- ☐ For seal/insulation

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**Note**

- ◆ *Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue*
- ◆ *Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.*

## 10 - Bolt

- ☐ 1.5 Nm

## 11 - Foam seal

- ☐ Renew if damaged

## 12 - Intake duct

- ☐ With fresh air and air recirculation flap
- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 201](#)

## 13 - Clip

- ☐ 2x

## 14 - Clip

- ☐ 8x

## 15 - Air distribution housing

- ☐ Do not dismantle
- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 203](#)



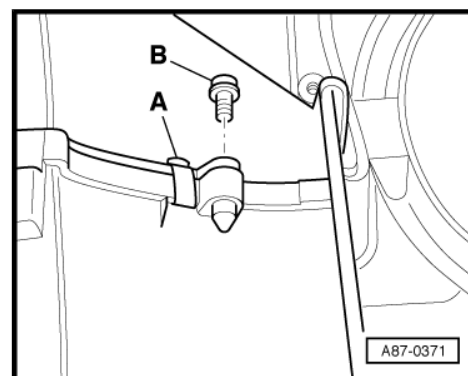
### Note

- ◆ *Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ [Electronic parts catalogue](#)*

- ◆ *Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.*

## Tightening torque for intake duct (top and bottom sections)

- Tighten bolt -B- to 1.5 Nm.



## 5.3 Removing and installing evaporator

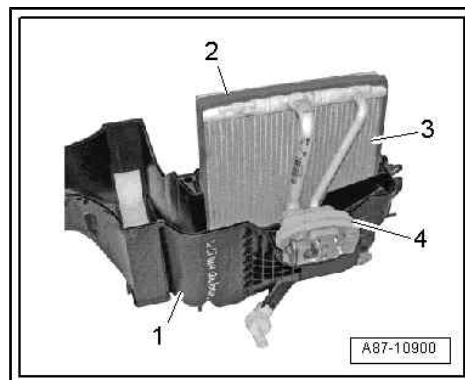
### Removing

- Remove air duct housing ⇒ [page 202](#) .
- Take evaporator -3- out of air duct housing (bottom section) -1-.

### Installing

Install in reverse order of removal; note the following:

- Clean air duct housing (bottom section) and condensation drain before inserting evaporator.
- Seal -2- attached to evaporator must be bonded on all around; check for damage.



#### Note

*The air conditioner output may be reduced if the seal is not bonded on properly.*

- Attach heat insulation -4- to expansion valve.



#### Note

*Different versions of heat insulation -4- depending on expansion valve ⇒ [page 106](#) and ⇒ *Electronic parts catalogue**

- Insert evaporator in air duct housing (bottom section), taking care not to damage seal.
- Install air duct housing ⇒ [page 202](#) .



#### Note

- ◆ *After assembling the two sections of the housing, check that the heat insulation is correctly seated on the expansion valve.*
- ◆ *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 of expansion valve due to heat radiation).*
- ◆ *When it has been removed, the evaporator contains refrigerant oil which must be returned to the refrigerant circuit (together with the new evaporator) ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87; Renewing components of refrigerant circuit, or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87; Refrigerant circuit; Renewing components .*

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## 5.4 Cleaning evaporator

⇒ [“5.4.1 Cleaning evaporator with an ultrasonic A/C cleaner”, page 189](#)

⇒ [“5.4.2 Cleaning evaporator using pressure-feed spray gun V.A.G 1538 and spray lance”, page 191](#)

### 5.4.1 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” (⇒ [page 4](#)).*

#### Special tools and workshop equipment required

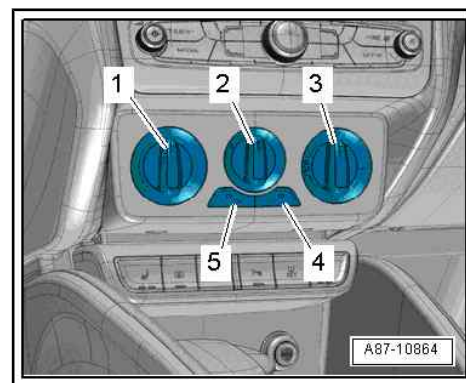
- ◆ Ultrasonic A/C cleaner - VAS 6189A- (for currently available ultrasonic A/C cleaners, refer to ⇒ Electronic parts catalogue)
- ◆ Cleaning fluid - VAS 6189/1-
- ◆ Suction nozzle - VAS 6288-
- ◆ Commercially available vacuum cleaner

#### Procedure

- Check whether the air conditioning unit evaporator is really the source of the odour by switching from fresh air to air recirculation mode  
⇒ [“1.3 Notes on odours in vehicles with air conditioner”, page 3](#).
- Check and if necessary clean plenum chamber water drain  
⇒ [page 233](#).
- Remove dust and pollen filter ⇒ [page 204](#).
- Clean installation slot for dust and pollen filter ⇒ [page 204](#).
- Seal opening for dust and pollen filter at air conditioning unit.
- Start engine.
- Open dash panel vents and close windows and sunroof.

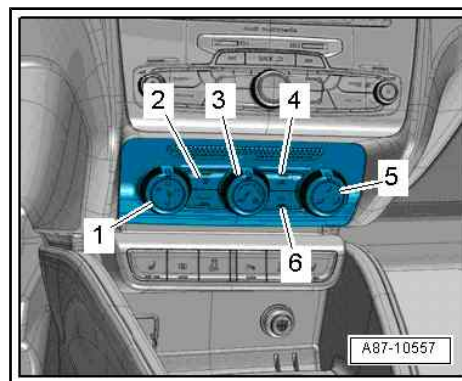
#### Vehicles with manually controlled air conditioner:

- Using rotary air distribution control -3-, 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 -5- is on.
  - Lamp in button -4- is off.
- Set lowest possible temperature.
  - Rotary temperature control -1- on “cold” stop
- Set rotary fresh air blower control -2- to speed “1”.



### 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 -4- is on.
- Lamp in button -6- is off.
- Set lowest possible temperature.
- Rotary temperature control -1- on “cold” stop
- Using rotary air distribution control -5-, set direction of air flow to “dash panel vents”.
- Set rotary fresh air blower control -3- to 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 204](#) .

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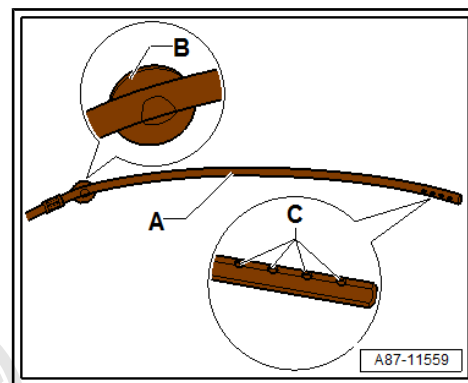
## 5.4.2 Cleaning evaporator using pressure-feed spray gun - V.A.G 1538- and spray lance

### 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" (⇒ [page 4](#)).*

### Special tools and workshop equipment required

- ◆ Pressure-feed spray gun - V.A.G 1538- (for currently available pressure-feed spray guns, refer to ⇒ Electronic parts catalogue)
- ◆ Probe for evaporator cleaning, straight - V.A.G 1538/5- -A- (short version: approx. 500 mm, curved or probe - VAS1538/9- as specified for this vehicle); for currently available probes, refer to ⇒ Electronic parts catalogue



- ◆ Cleaning solution for evaporator in air conditioner "D 600 100 A2" (for currently available cleaning fluids, refer to ⇒ Electronic parts catalogue)
- ◆ 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

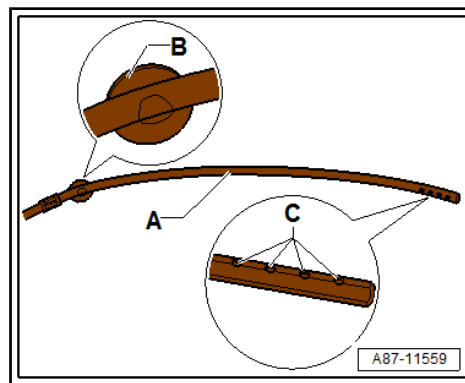
- ◆ *The vacuum cleaner is only required if dirt has accumulated in the plenum chamber or the intake shaft of the air conditioner, or if dirt has entered the evaporator housing through the dust and pollen filter.*
- ◆ *It is advisable to have several short and long spray lances at hand, as a straight 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.*

Recommended bend radius of spray lance VAG 1538/5 (short)  
-A- for this vehicle



### Note

- ◆ The guide washer -B- is fitted opposite the holes -C- on the spray lance; this allows you to identify the spray direction even when the spray lance is inserted.
- ◆ Spray lance V.A.G 1538/5 -A- with this bend radius is also compatible with the following additional vehicles, for example: Audi A4 from 2008 onwards, Audi A5 from 2008 onwards, Audi Q5 from 2010 onwards, Audi A3 from model year 2013 onwards, Audi A6 from 2011 onwards, Audi A7 from 2011 onwards and Audi A8 from 2010 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  
⇒ ["1.3 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).
- 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 204](#) .



### 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 204](#) .
- Check plenum chamber and water drain of plenum chamber and clean if necessary ⇒ [page 233](#) .

 **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 ⇒ [page 215](#) ).
- 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 192](#).
- 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.*

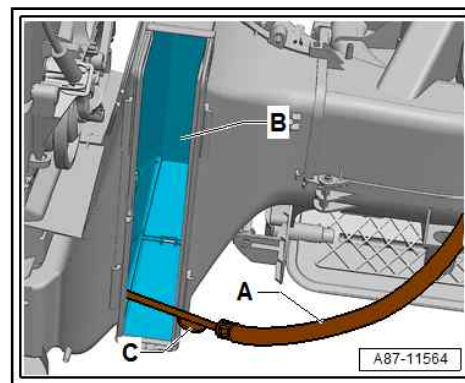
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- Connect pressure-feed spray gun VAS 1538 to compressed air supply.

- Insert spray lance -A- through opening for removed dust and pollen filter -B- and into evaporator housing with spray direction towards evaporator.

**i Note**

*The spray direction is fixed by the guide washer -C- on the spray lance -A-.*



**Caution**

**Ensure that no cleaning fluid escapes from the evaporator housing of the air conditioning unit into the passenger compartment during cleaning.**

- ◆ **Cover the area under the spray lance in the evaporator housing with absorbent paper.**
- ◆ **After spraying about 0.1 to 0.2 litres of cleaning fluid, check that it actually drains through the condensation drain and into the drip tray under the vehicle. If the fluid only drips out, the condensation drain must be cleaned before the cleaning process can continue ⇒ page 215 .**

- 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.

**i 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.

**i 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.

**i 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.

## 5.5 Checking auxiliary air heater element - Z35-

⇒ **“5.5.1 Checking activation of electric auxiliary air heater”, page 196**

⇒ **“5.5.2 Starting conditions for electric auxiliary air heater”, page 198**

### 5.5.1 Checking activation of electric auxiliary air heater



#### Note

- ◆ *Different versions of heater unit (e.g. different heat exchanger and seals) and of heater control unit -J65- (e.g. differences in pin assignment and function of -J65- ) depending on production period and vehicle identification number ⇒ **page 61** , ⇒ **page 74** and ⇒ *Electronic parts catalogue**
- ◆ *No self-diagnosis and “Guided Fault Finding” capability is provided for the heater control unit - J65- with part number “8X0 819 045”. The request for activation of the supplementary heater is transmitted to the corresponding engine control unit via a special output ⇒ *Current flow diagrams, Electrical fault finding and Fitting locations.**
- ◆ *Self-diagnosis is possible for the heater control unit J65 with part number “8XA 819 045” ⇒ *Vehicle diagnostic tester, “Guided Fault Finding”*. The request for activation of the supplementary heater is transmitted to the corresponding engine control unit via signal wires ⇒ *Current flow diagrams, Electrical fault finding and Fitting locations.**

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Installed on vehicles with TDI engine and certain petrol engines from model year 2012 onwards (gradual introduction)

#### Special tools and workshop equipment required

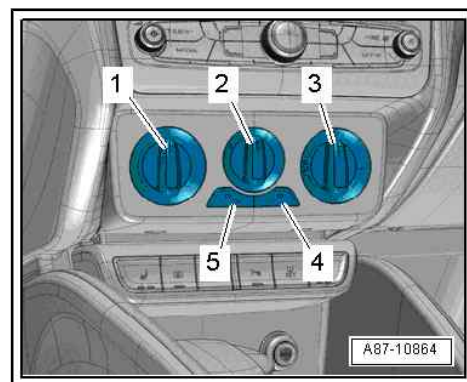
- ◆ Vehicle diagnostic tester
- ◆ Test box, 105-pin - V.A.G 1598/42-1- and test adapter - V.A.G 1598/47-

## Note

- ◆ *Heat energy is supplied to the air after leaving the heat exchanger when there is a request from the heater controls ( heater control unit - J65- ) in the engine control unit.*
- ◆ *The activation of the electric auxiliary air heater is checked in 3 stages; the checking procedure is described for the corresponding engine control unit in the "Guided Fault Finding" function ⇒ Vehicle diagnostic tester.*
- ◆ *On vehicles with a start/stop system, the auxiliary air heater element - Z35- is deactivated while the stop function is active (to protect the battery).*
- ◆ *The auxiliary air heater element - Z35- is activated again after the engine has been re-started by the automatic start function ⇒ Vehicle diagnostic tester, "Guided Fault Finding".*

### Checking activation signal from heater controls with heater control unit - J65-

- ◆ A switch is fitted in the heater control unit - J65- . This switch is activated (closed) via the rotary temperature control -1- in the range between approx. 3 o'clock and the "warm" stop position.
- When the supplementary heater switch is closed (via the rotary temperature control -1-) and the ignition is on, the electronics in the heater control unit - J65- (version with part number "8X0 819 045") switch an earth input through to the corresponding engine control unit via contact "7", or -J65- (version with part number "8XA 819 045") transmits the request for activation to the corresponding engine control unit via the data bus. The engine control unit detects that additional heating output is required and switches on the auxiliary air heater element - Z35- via the low heat output relay - J359- and the high heat output relay - J360- if the other cut-in criteria required for activation are also met ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic tester, "Guided Fault Finding" mode for engine.



## Note

*From model year 2012 onwards, -Z35- is also installed on vehicles with certain petrol engines (gradual introduction). The correct version of the engine control unit must be installed so that it can activate -Z35- (via -J359- and -J360-) ⇒ Vehicle diagnostic tester and ⇒ Electronic parts catalogue .*

- ◆ Cut-in criteria for electric auxiliary air heater, activation of auxiliary air heater element - Z35- by engine control unit ⇒ Vehicle diagnostic tester, "Guided Fault Finding" function for engine.

## Note

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*Certain criteria must be met in the corresponding engine control unit for the engine control unit to activate the 3-stage 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" function for engine.*

## 5.5.2 Starting conditions for electric auxiliary air heater

### Cut-in criteria for activation of electric auxiliary air heater

- Engine control unit activates auxiliary air heater element - J359- via low heat output relay - J360- and high heat output relay - Z35- if the following conditions are met:
- ◆ Heater control unit - J65- applying earth signal to 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
- ◆ Electrical system voltage above 12.2 V and onboard supply control unit - J519- not transmitting any request preventing activation
- ◆ No entry stored in engine control unit and load of alternator - C- below 70 % (depending on engine speed)



#### Note

*On vehicles with a 3-stage auxiliary air heater element - Z35- the engine control unit activates both supplementary heating system relays so that the load of the alternator - C- does not exceed 95 % ⇒ Vehicle diagnostic tester, "Guided Fault Finding" (for engine control unit) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations. The next stage is only switched on if the load of the alternator - C- is below 30 ... 77 %, depending on the engine speed.*

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### Shut-off criteria for activation of supplementary heater



#### Note

*On vehicles without air conditioner, activation is disabled as soon as one of the cut-in criteria is no longer met in the engine control unit or one of the shut-off criteria is detected.*

- ◆ One of the cut-in criteria no longer met
- ◆ The calculated ambient temperature is above 11 °C.
- ◆ Load of alternator - C- above 95 %
- ◆ Heater control unit - J65- no longer applying earth signal to engine control unit

## 5.6 Removing and installing auxiliary air heater element - Z35-

### Note

- ◆ Different versions of air conditioning unit/heater (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ *Electronic parts catalogue*
- ◆ Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.

### Removing

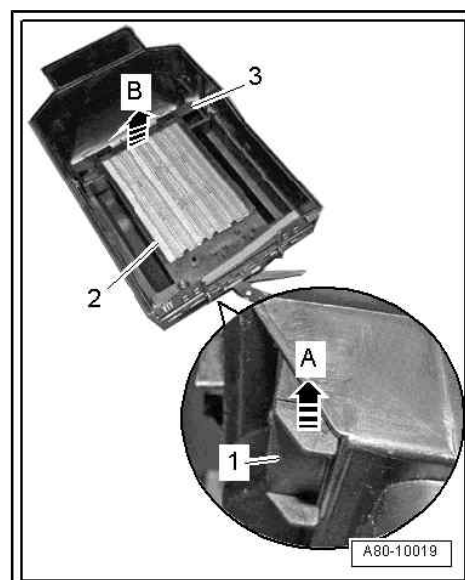
- Remove heat exchanger and take heat exchanger out of air distribution housing (bottom section) ⇒ [page 210](#).
- Press retaining elements -1- on outside (left and right) upwards slightly -arrow A-.
- Take heating element -2- on front out of air duct housing (bottom section) -3- -arrow B-.

### Installing

Install in reverse order of removal; note the following:

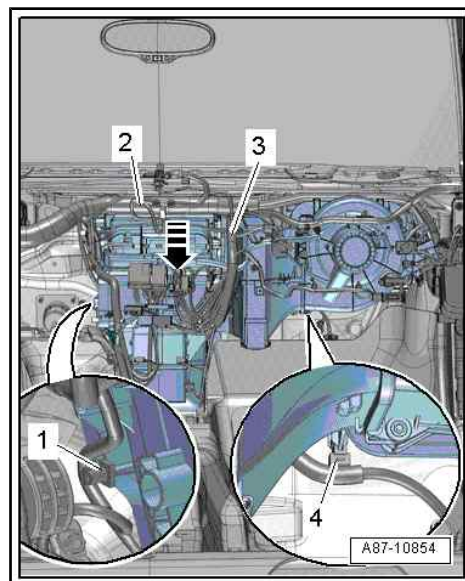
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Pay attention to correct version and allocation of air distribution housing -2- ⇒ *Electronic parts catalogue*.

- Install heat exchanger ⇒ [page 210](#).
- Check function ⇒ Vehicle diagnostic tester, "Guided Fault Finding" function for engine.



## 5.7 Removing and installing heater and air conditioning unit

- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
- Detach refrigerant lines from expansion valve ⇒ [page 104](#) .
- Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
- Removing heat exchanger ⇒ [page 210](#)
- Remove central tube ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel .
- Disengage electrical wiring harness -2- at top of air conditioning unit by sliding it towards rear out of guides -arrow-.
- Cut through cable ties -1 and 4- and move electrical wiring harness clear.



### Caution

**Risk of irreparable damage to air conditioning unit and fresh air blower.**

- ◆ **If the cable tie brackets are detached from the mounting pins on the air conditioning unit or fresh air blower, the pins may break off.**
- ◆ **If the mounting pins are broken off, the air conditioning unit or fresh air blower must be renewed.**

- Swivel air conditioning unit -3- 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

- ◆ **Before installing, check all seals at air conditioning unit for damage and renew damaged seals.**
- ◆ **Check that the sealing element at connections for coolant hoses is seated properly and check condition of corresponding seal.**
- Insert air conditioning unit and engage central tube at mountings (left and right).
- Bolt air conditioner to central tube.
- Install central tube ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel .
- Install heat exchanger ⇒ [page 210](#) .
- Attach refrigerant lines at expansion valve ⇒ [page 104](#) .
- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .



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- Start up air conditioner after charging refrigerant circuit  
   ⇒ [page 123](#) .
- 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.
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

## 5.8 Dismantling and assembling heater and air conditioning unit

⇒ ["5.8.1 Removing and installing intake duct", page 201](#)

⇒ ["5.8.2 Dismantling and assembling heater and air conditioning unit", page 202](#)

### 5.8.1 Removing and installing intake duct

#### Removing

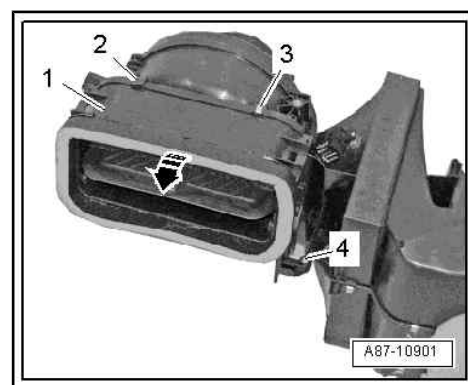
- Remove heater/air conditioning unit: heater ⇒ [page 67](#) , air conditioner ⇒ [page 200](#) .
- Remove fresh air/air recirculation flap control motor: heater/ manually controlled air conditioner ⇒ [page 159](#) , automatically controlled air conditioner ⇒ [page 157](#) .
- Remove bolt -4-.
- Unfasten clips -2 and 3-.
- Detach intake duct -1- towards front -arrow-.

#### Installing

Install in reverse order.

#### Tightening torques

- ◆ ⇒ ["5.2 Exploded view - evaporator housing", page 185](#) .



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## 5.8.2 Dismantling and assembling heater and air conditioning unit

### Removing

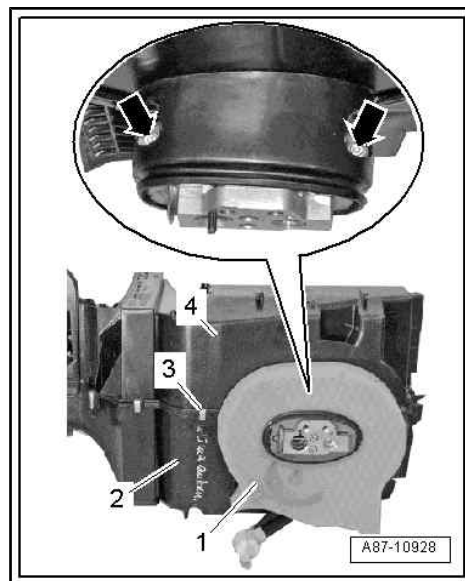
- Remove heater/air conditioning unit: heater ⇒ [page 67](#) , air conditioner ⇒ [page 200](#) .
- Remove air distribution housing ⇒ [page 203](#) .
- Remove intake duct ⇒ [page 201](#) .
- Remove fresh air blower: heater, manually controlled air conditioner ⇒ [page 206](#) , automatically controlled air conditioner ⇒ [page 207](#) .

### Vehicles with air conditioner:

- Detach foam spacer -1-.
- Remove bolts -arrows-.

### All vehicles (continued):

- Prise off clips -3-.
- Separate top section -4- and bottom section -2- by pulling them apart.



### Installing

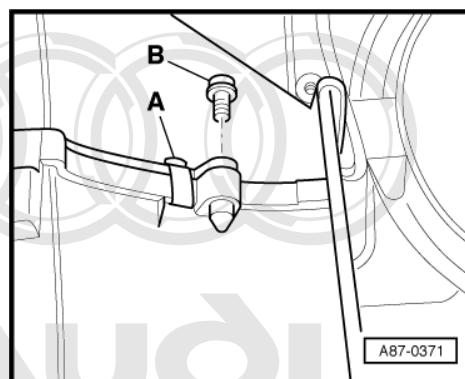
Install in reverse order of removal; note the following:

- Fit clips -A- at locations provided.



### Note

Several locations have bolted connections all around; these can be used to secure the air ducts to each other if necessary. Use the same type of bolt -B- as fitted for the other bolted connections on the air conditioner unit.



### Tightening torques

- ◆ ⇒ [Fig. "Tightening torque for intake duct \(top and bottom sections\)" , page 187](#)
- ◆ ⇒ ["5.2 Exploded view - evaporator housing", page 185](#)

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## 5.9 Removing and installing air distribution housing

### Removing

- Remove heater/air conditioning unit: heater ⇒ [page 67](#) , air conditioner ⇒ [page 200](#) .
- Mark connectors before unplugging them.
- If fitted, unplug electrical connectors -1, 2, 4, 5- and move wiring harness -3- clear.



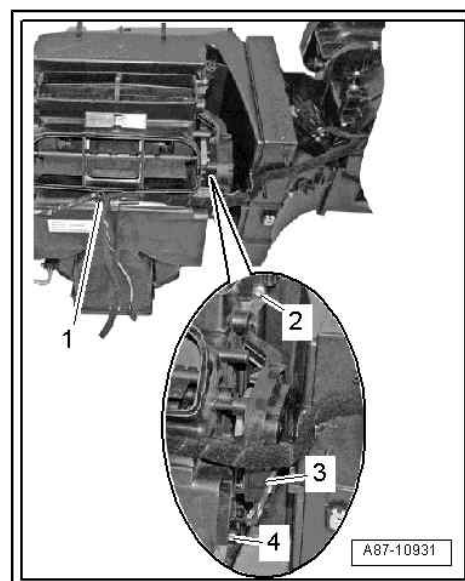
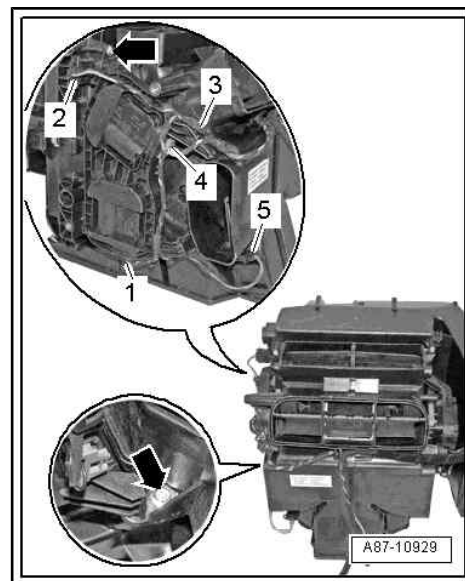
#### Caution

**Risk of irreparable damage to air distribution housing.**

- ◆ **If cable tie bracket is detached from mounting pin on air distribution housing, pin may break off.**
- ◆ **If the mounting pin is broken off, the air distribution housing must be renewed.**

- Remove bolts -arrows-.
- Cut through cable tie -1-.
- If fitted, unplug electrical connector -3- and move wiring harness clear.
- Remove bolts -2 and 4-.

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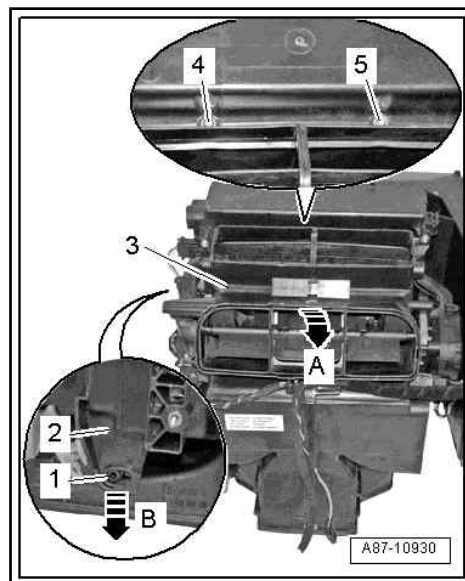
- Remove bolts -4 and 5-.
- Swivel air distribution housing -3- slightly in direction of -arrow A-, then guide retaining pin -1- out of guide -2- -arrow B- and disengage.
- Detach air distribution housing.

### Installing

Install in reverse order.

### Tightening torques

- ♦ ⇒ [“5.2 Exploded view - evaporator housing”, page 185](#) .



## 5.10 Removing and installing dust and pollen filter

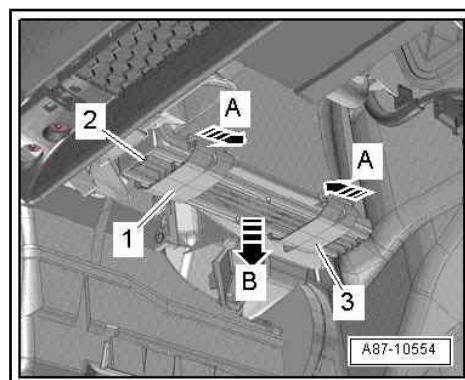


### Note

*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 (supplied together with equipment for driving school vehicles).*

### Removing

- Protect floor covering in front passenger's footwell beneath dust and pollen filter with paper (to catch any dirt).
- Press sliders -1, 3- together -arrows A- all the way to centre.
- Detach slot cover -2- downwards -arrow B-.



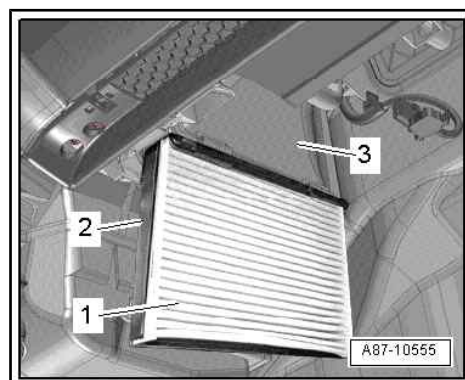
- Pull dust and pollen filter -1- (with or without filter frame -2-) out of slot in heater/air conditioning unit -3-.
- Detach dust and pollen filter -1- from filter frame -2- (if fitted).

### Installing

Install in reverse order of removal; note the following:

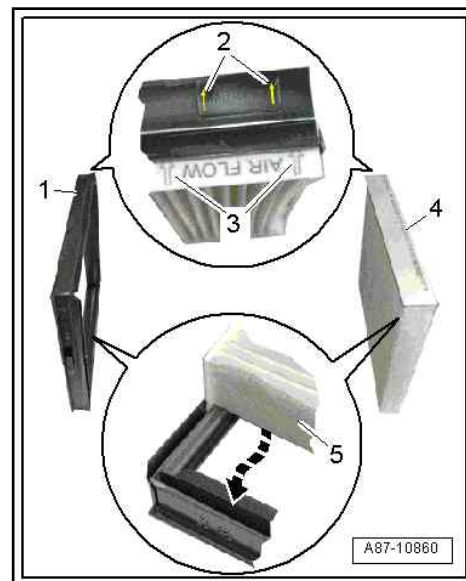
- Before installing a new filter, clean area around dust and pollen filter in slot in heater/air conditioning unit, e.g. with a vacuum cleaner.

Dust and pollen filter with filter frame



- When inserting dust and pollen filter -4- in filter frame -1-, pay attention to direction of air flow (arrows on filter or first layer of filter paper).
- The direction of air flow is indicated by “arrows” on the dust and pollen filter -3- (or by the folds of the filter paper) and the filter frame -2-.
- Insert dust and pollen filter so that first layer of filter paper -5- engages in filter frame at top and bottom.
- Insert dust and pollen filter with filter frame in slot in heater/air conditioning unit; note direction of air flow (arrows -2-) or folds of filter paper -3- (arrow -4- can be ignored here; it points to fresh air blower - V2- , i.e. in direction opposite to air flow).

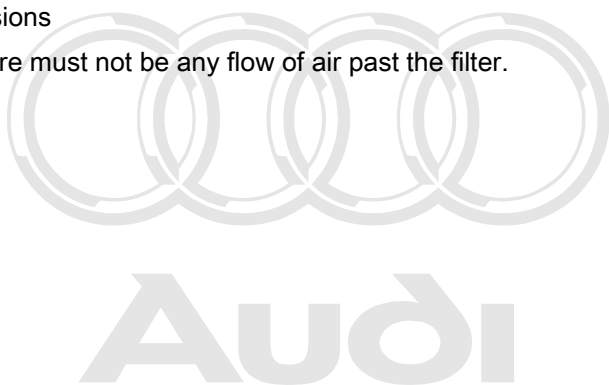
Dust and pollen filter without filter frame



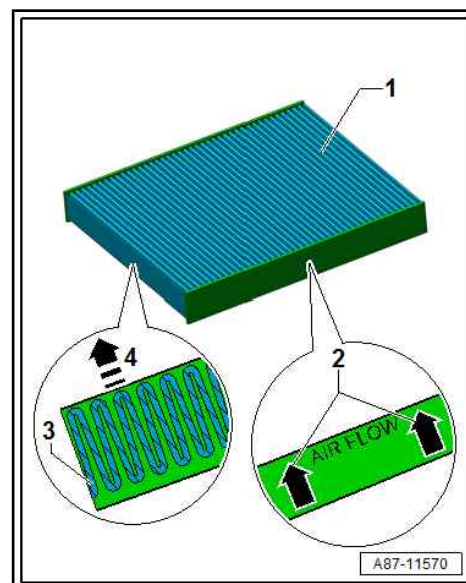
- Insert dust and pollen filter in slot in heater/air conditioning unit; note direction of air flow (arrows -2- or folds of filter paper -3- and arrow -4-).

All versions

- There must not be any flow of air past the filter.



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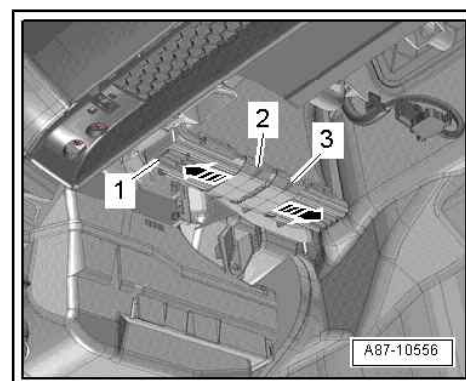


- Apply slot cover -1- and press sliders -2 and 3- outwards as far as they will go -arrows-.



#### Note

*The slot cover is not positioned correctly in its mounting or the filter frame is not installed correctly if one of the sliders cannot be pressed into its end position.*



## 5.11 Removing and installing fresh air blower - V2-

⇒ [“5.11.1 Removing and installing fresh air blower V2 - heater, manually controlled air conditioner”, page 206](#)

⇒ [“5.11.2 Removing and installing fresh air blower V2 - automatically controlled air conditioner”, page 207](#)

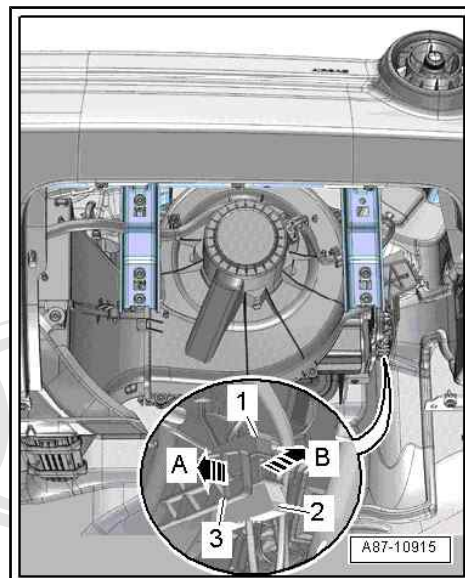
### 5.11.1 Removing and installing fresh air blower - V2- - heater, manually controlled air conditioner

There are different versions of the fresh air blower. For correct version refer to ⇒ Electronic parts catalogue .

Operation of the fresh air blower - V2- is not monitored by the self-diagnosis. Check operation e.g. by activating rotary fresh air blower control at heater/air conditioner controls ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

#### Removing

- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- If fitted, remove headlight range control unit ⇒ Electrical system; Rep. gr. 94 ; Automatic headlight range control; Removing and installing headlight range control unit .
- If fitted, remove entry and start authorisation control unit ⇒ Electrical system; Rep. gr. 94 ; Entry and start authorisation; Removing and installing entry and and start authorisation control unit - J518- .
- Unplug electrical connector -2-.
- Remove electrical connector -1- from bracket by pressing bracket -3- in direction of -arrow A- and unplugging connector in direction of -arrow B-.



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- Unplug electrical connector -6-.
- Cut through cable tie -5- and move wiring harness clear.

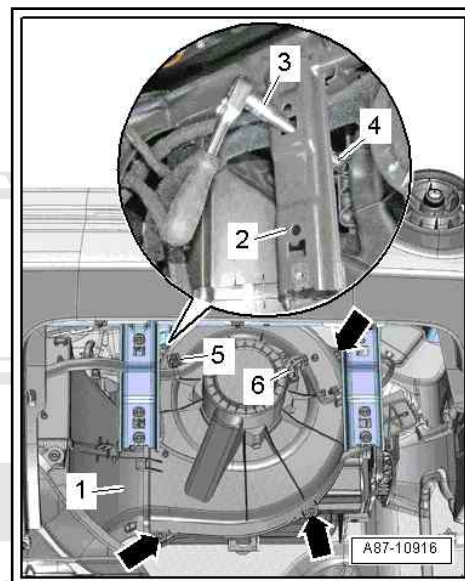


#### Caution

**Risk of irreparable damage to fresh air blower.**

- ◆ *If the cable tie brackets are detached from the mounting pins on the fresh air blower, the pins may break off.*
- ◆ *If the mounting pins are broken off, the fresh air blower must be renewed.*

- Remove bolts -arrows-.
- Unscrew bolt -4- through opening in central tube -2- with extension piece -3- and joint.
- Pull fresh air blower -1- towards rear (as seen in direction of travel) out of air conditioning unit.



#### 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 of removal; note the following:

- Check operation of fresh air blower.

### Tightening torques

- ◆ ⇒ ["5.1 Exploded view - attachments for heater and air conditioning unit and air intake box", page 173](#).

## 5.11.2 Removing and installing fresh air blower - V2- - automatically controlled air conditioner

There are different versions of the fresh air blower. For correct version refer to ⇒ Electronic parts catalogue.

## Removing

- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- If fitted, remove headlight range control unit ⇒ Electrical system; Rep. gr. 94 ; Automatic headlight range control; Removing and installing headlight range control unit .
- If fitted, remove entry and start authorisation control unit ⇒ Electrical system; Rep. gr. 94 ; Entry and start authorisation; Removing and installing entry and and start authorisation control unit - J518- .
- Unplug electrical connector -6-.
- Cut through cable tie -5- and move wiring harness clear.

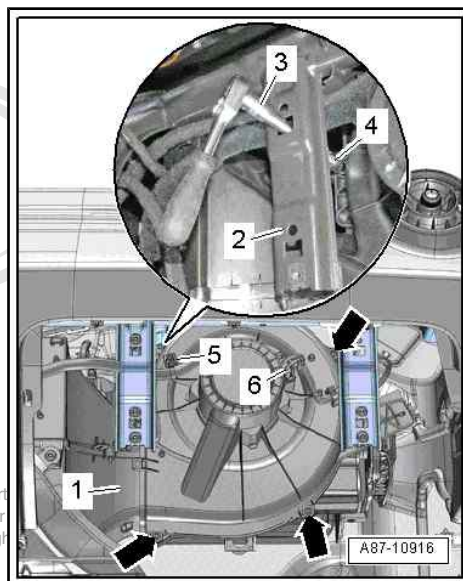


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#### **Risk of irreparable damage to fresh air blower.**

- ◆ *If the cable tie brackets are detached from the mounting pins on the fresh air blower, the pins may break off.*
- ◆ *If the mounting pins are broken off, the fresh air blower must be renewed.*



- Remove bolts -arrows-.
- Unscrew bolt -4- through opening in central tube -2- with extension piece -3- and joint.
- Pull fresh air blower -1- towards rear (as seen in direction of travel) out of air conditioning unit.



### 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 of removal; note the following:

- Check operation of fresh air blower.

## Tightening torques

- ◆ ⇒ [“5.1 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 173](#) .

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

### Note

- ◆ The following description applies for vehicles with heater/manually controlled air conditioner.
- ◆ The resistance value between contacts 2 and 4 of -N24- is approx. 1.8 ohms (between contacts 3 and 4 approx. 0.7 ohms and between contacts 1 and 4 approx. 0.1 ohms).
- ◆ Upstream of contact 4, -N24- is fitted with a temperature-sensitive fuse which is triggered in the event of a fault at the fresh air blower - V2-.



### 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.

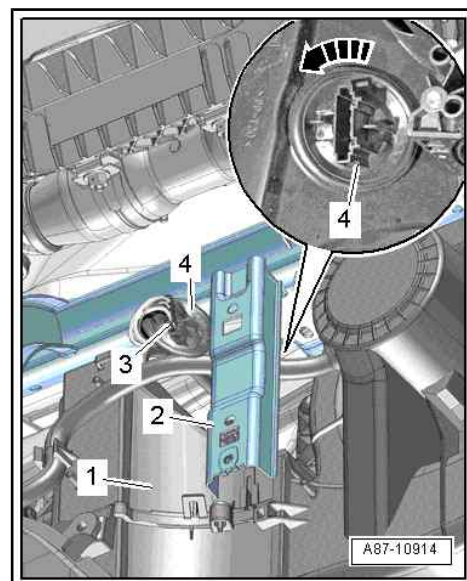
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### Removing

- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- If fitted, remove headlight range control unit ⇒ Electrical system; Rep. gr. 94 ; Automatic headlight range control; Removing and installing headlight range control unit .
- Sever cable tie on fresh air blower.
- Turn series resistor -4- in direction of -arrow- and lift out.
- Take out series resistor between air duct -1- and central tube -2-.
- Unplug electrical connector -3-.

### Installing

Install in reverse order.



## 5.13 Removing and installing fresh air blower control unit - J126-

### Removing

- Remove fresh air blower ⇒ [page 206](#) .
- Unplug electrical connector -2-.
- Remove dust and pollen filter ⇒ [page 204](#) .
- Remove bolt -4-.



### WARNING

#### Risk of burns.

- ◆ *The heat sink at the fresh air blower control unit - J126- may be hot.*

- Press fresh air blower control unit - J126- -item 3- inwards and take it out through opening for fresh air blower -1- -arrow-.

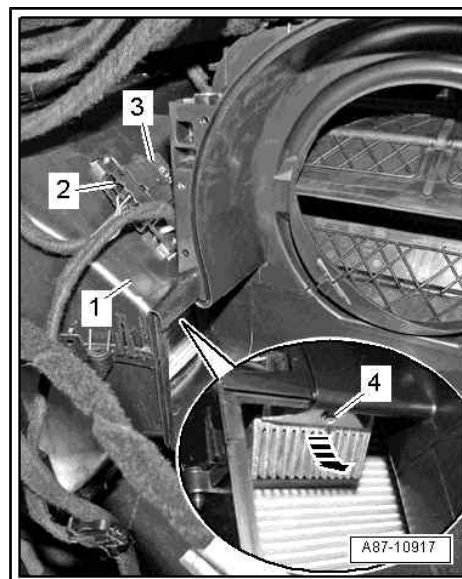
### Installing

Install in reverse order of removal; note the following:

- Tighten bolt -4- to 1.5 Nm.
- Check operation of fresh air blower control unit - J126- .

After completing the repairs, perform the following work on the operating unit ( Climatronic control unit - J255- ) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

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



## 5.14 Removing and installing heat exchanger

### Special tools and workshop equipment required

- ◆ Hose clamps up to 25 mm - 3094-
- ◆ Engine bung set - VAS 6122-
- ◆ Drip tray for workshop hoist - VAS 6208-
- ◆ Hose clip pliers - VAS 6362-



### Note

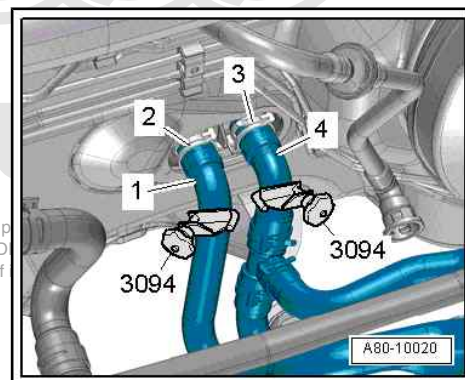
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- ◆ *Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue*
- ◆ *Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.*

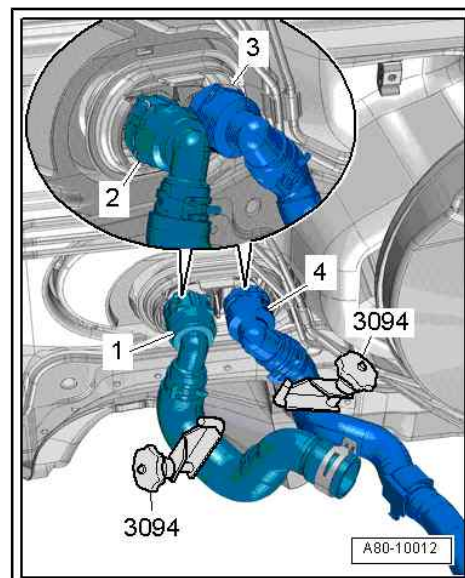
## Removing

- Place drip tray for workshop hoist - VAS 6208- beneath engine.
- Depending on engine version, remove components impeding access to coolant hose connections (e.g. on vehicles with 4-cylinder TDI engine: remove air cleaner housing and intake hose to turbocharger ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .
- Mark arrangement of coolant hoses.
- If fitted, remove heat insulation for expansion valve.
- Depending on engine version (e.g. on vehicles with petrol engine): Clamp off coolant hoses -1- and -4- with hose clamps -3094- , release hose clips -2, 3- and detach coolant hoses from heat exchanger.

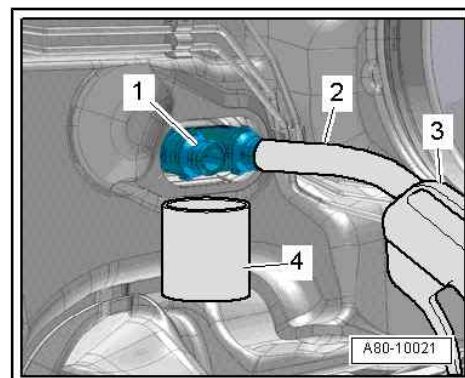
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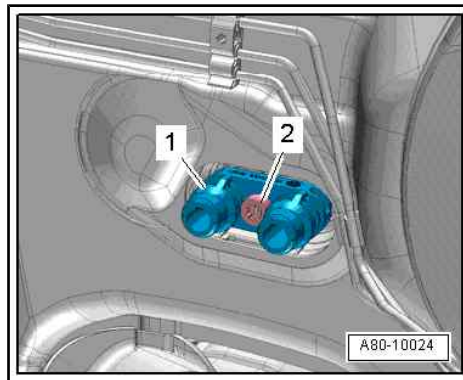
- Depending on engine version (e.g. on vehicles with 4-cyl. TDI engine): Clamp off coolant hoses -1- and -4- with hose clamps -3094- , release retaining clips -2, 3- and detach coolant hoses from heat exchanger.



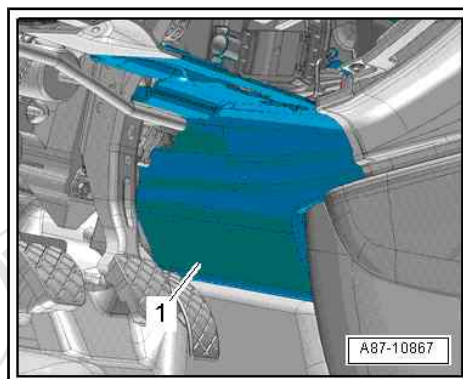
- Fit a short hose -2- to one connection.
- Insert compressed-air gun -3- in end of hose.
- Hold a container -4- under second connection -1- and use compressed air gun to carefully blow coolant out of heat exchanger.



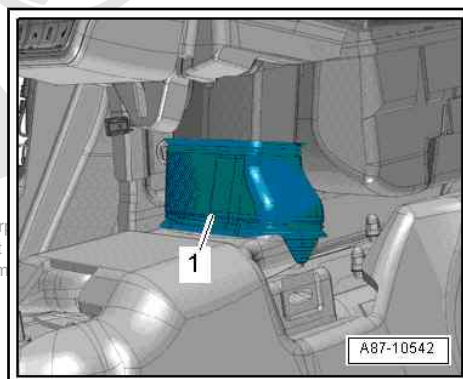
- Remove bolt -2-.
- Detach adapter -1- from connections of heat exchanger.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .



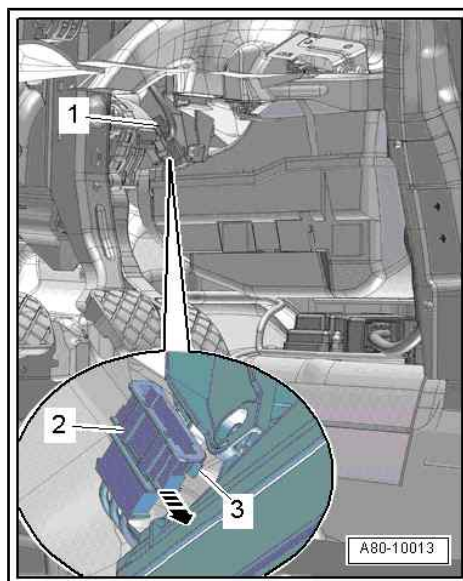
- Move front seats as far back as they will go.
- Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .
- If fitted, detach insulation -1-.



- Detach connecting collar -1- to rear footwell vent.

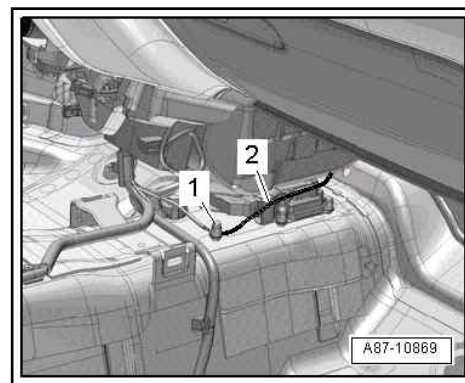


- Vehicles with auxiliary air heater element - Z35- : Unplug electrical connector -1- and remove from bracket. To do so, press retaining tab -3- to side and pull connector -2- out of bracket in direction of -arrow-.

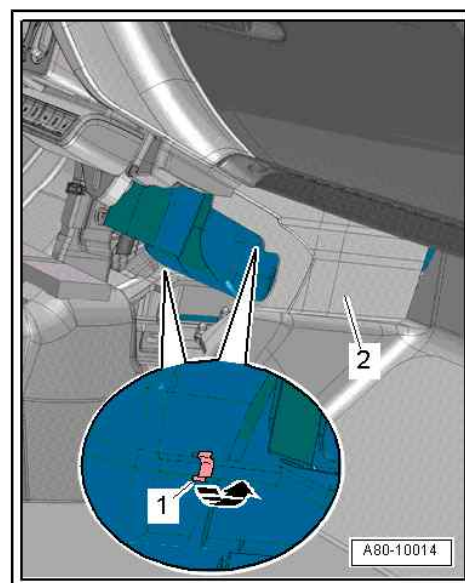


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- Unscrew nut -1- and move earth wire -2- clear.



- Protect floor covering in area beneath heat exchanger with waterproof sheeting and absorbent paper.
- If fitted, unfasten cover -2- from velcro strip.
- Prise off retaining clips -1- -arrow- all round.



- Release bottom section -1- at air distribution housing -2- downwards and take out towards right -arrow-.
- Take heat exchanger -3- out of bottom section.

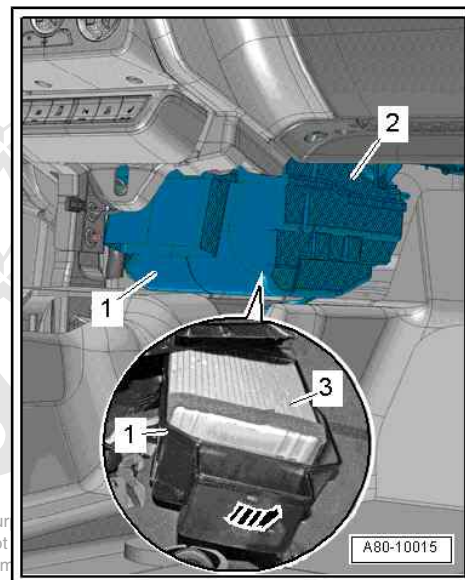
### Installing

Install in reverse order of removal; note the following:

- Pay attention to the correct version and assignment of the heat exchanger and the corresponding components (air distribution housing -2-, grommets etc.) ⇒ Electronic parts catalogue .

### Tightening torques

- ◆ Bolt at adapter for coolant hoses: 8 Nm  
⇒ ["5.1 Exploded view - attachments for heater and air conditioning unit and air intake box", page 173](#)
- ◆ Bolt at earth connection to auxiliary air heater element - Z35- : 9 Nm ⇒ Current flow diagrams, Electrical fault finding and Fitting locations (fitting locations)

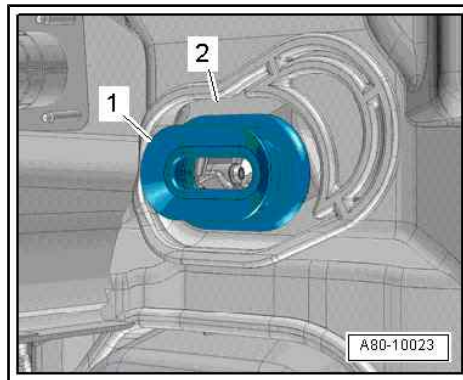


### Note

Renew O-rings.

### Vehicles with heater:

- Make sure that grommet -1- is correctly seated in bulkhead -2-.

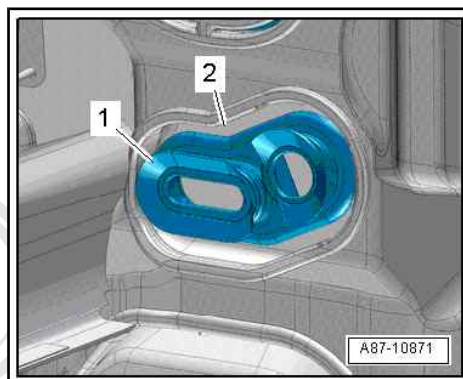


### Vehicles with air conditioner:

- Make sure that grommet -1- is correctly seated in bulkhead -2-.

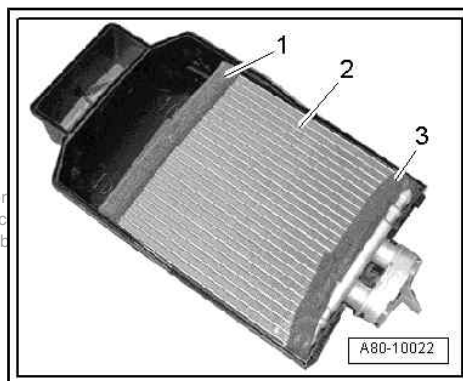
### All vehicles (continued):

- Check heater slot for dirt (heat exchanger removed).
- Remove any dirt or residual coolant.
- Vehicles with TDI engine and certain petrol engines from model year 2012 onwards (gradual introduction): Check auxiliary air heater element - Z35- for dirt and clean if necessary  
⇒ [page 199](#).
- Check foam seals -1 and 3- attached to heat exchanger -2- for damage and renew if necessary.



### Note

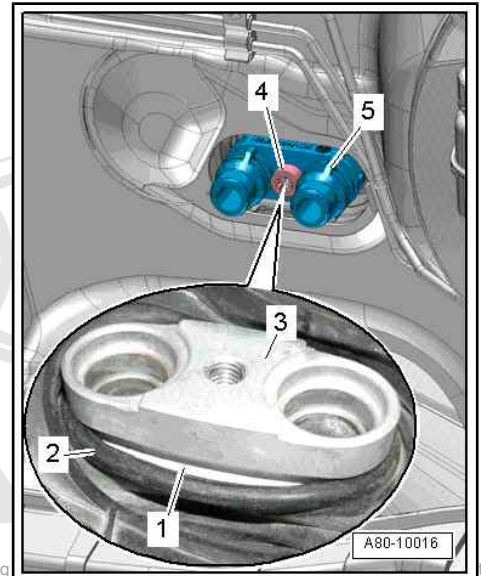
- ♦ *The foam seal may curl up when it is inserted if it has not been bonded on properly.*
- ♦ *Cold air may flow past the heat exchanger if the foam seal is damaged or not properly fitted.*
- Insert heat exchanger correctly in bottom section (connections for adapter to coolant hoses must be positioned centrally in recess in bottom section).
- Position bottom section on heater/air conditioning unit and secure with retaining clips.



- Make sure that grommet -2- is seated in groove -1- on heat exchanger -3-.
- Press on adapter -5- with new O-rings at heat exchanger connections.
- Tighten bolt -4-.

**i** Note

- ◆ Check that grommet and heat exchanger are correctly seated at leadthrough in bulkhead.
- ◆ Water will ingress into passenger compartment if grommet is damaged or not fitted correctly.
- Top up coolant and bleed coolant circuit as specified ⇒ Engine, mechanics; Rep. gr. 19; Cooling system/coolant; Draining and filling cooling system .



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**i** 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 ⇒ [page 18](#)
- ◆ 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.
- Check operation of heater/air conditioner.

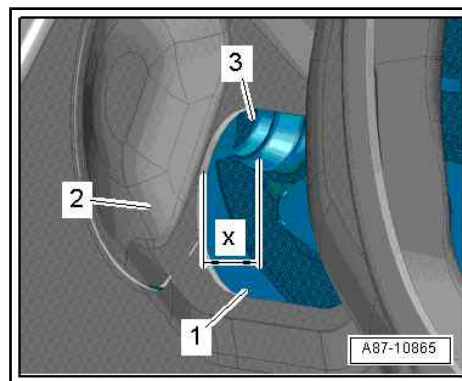
## 5.15 Checking condensation drain

**i** Note

- ◆ Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue
- ◆ Vehicles with the type codes "8XF" and "8XK" in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes "8XA" and "8X1" in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.

## Procedure

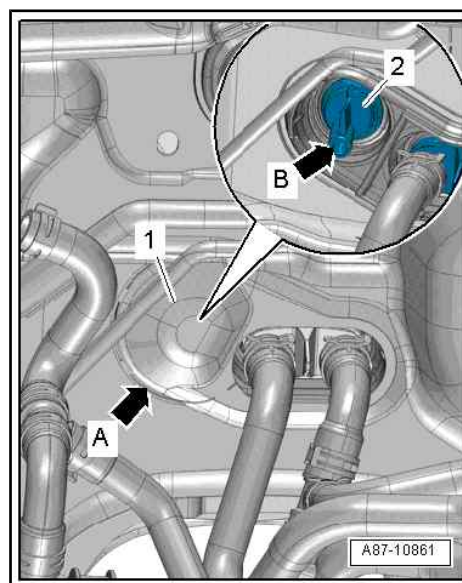
- Starting at opening for coolant hoses, check distance between noise insulation mat -2- and bulkhead -1-.
- The clearance (dimension -x-) must be sufficient to allow condensate to drain out of condensation drain opening -3-.
- There is no flap at the outlet opening; the condensation drains off via the rubber lip.



- Depending on engine version (e.g. on vehicles with a 4-cyl. TDI engine): Remove air cleaner housing and intake hose to turbocharger ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing .
- Separate noise insulation mat -1- at perforation -arrow A-.
- Check for dirt in condensation drain -2- of air conditioning unit and clean with a piece of wire if necessary.
- The cross-section -arrow B- 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 233](#) .
- Check that plenum chamber cover is installed correctly and not damaged ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber cover .
- Dust and pollen filter for dirt and correct installation ⇒ [page 204](#) .
- Forced ventilation vents in luggage compartment ⇒ [page 230](#) .
- 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”).

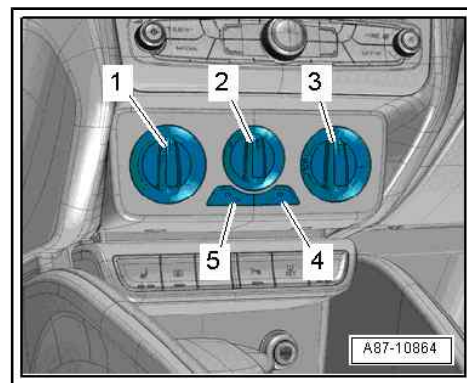
- Read out measured value for evaporator output temperature sender - G263 -

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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:

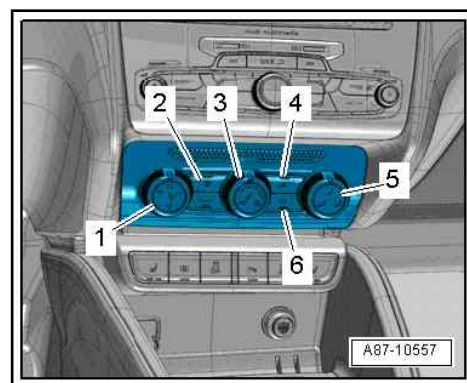
#### Vehicles with manually controlled air conditioner:

- Settings on operating unit (air conditioning system control unit - J301-):
- A/C compressor switched on (lamp in **AC/A/C** button -4- lit), rotary switch for temperature setting -1- on “Cold” stop.
- Lowest possible fresh air blower speed set (rotary fresh air blower speed switch -2- in setting “1”), fresh air mode (lamp in **air recirculation** button -5- is not lit), dash panel vents open.



#### Vehicles with automatically controlled air conditioner:

- Settings on operating unit (Climatronic control unit - J255-):
- “AUTO” mode, air conditioner compressor switched on (lamp in **AC/A/C** button -6- lit), rotary switch for temperature setting -1- on “Cold” stop.
- Medium fresh air blower speed with a voltage of approx. 7 V at fresh air blower - V2-, fresh air mode (lamp in **air recirculation** button -4- not lit), dash panel vents open.



#### All vehicles (continued):

- 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 29](#).

## 5.16 Removing and installing condensation drain



#### Note

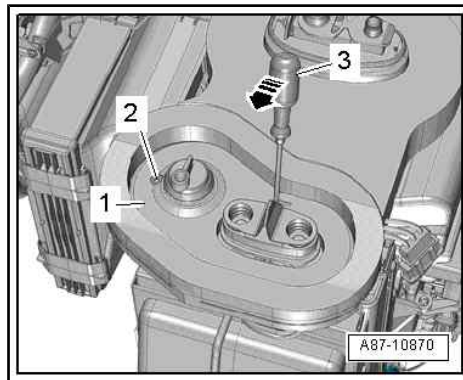
- ◆ Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ *Electronic parts catalogue*
- ◆ Vehicles with the type codes “8XF” and “8XK” in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes “8XA” and “8X1” in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.

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## Removing

- Remove air conditioning unit ⇒ [page 200](#) .
- Detach grommet for bulkhead.
- Remove bolt -2-.
- Insert a screwdriver -3- in opening, release fastener -arrow- and detach sealing element -1-.



- Detach condensation drain hose -1- from air conditioning unit -3-.

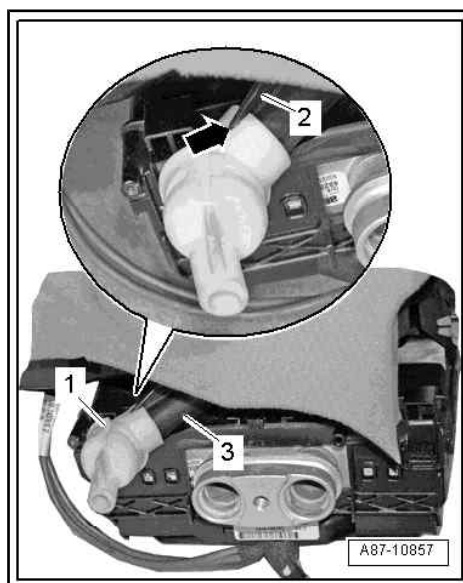
## Installing

Install in reverse order of removal; note the following:

- Push condensation drain hose at air conditioning unit onto condensation drain as far as it will go.
- Recess -arrow- must be opposite web -2-.

## Tightening torques

- ◆ ⇒ [“5.1 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 173](#)



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## 5.17 Removing and installing flexible shafts

⇒ **"5.17.1 Removing and installing flexible temperature adjustment shaft - heater, manually controlled air conditioner", page 219**

⇒ **"5.17.2 Removing and installing flexible air distribution shaft - heater, manually controlled air conditioner", page 220**

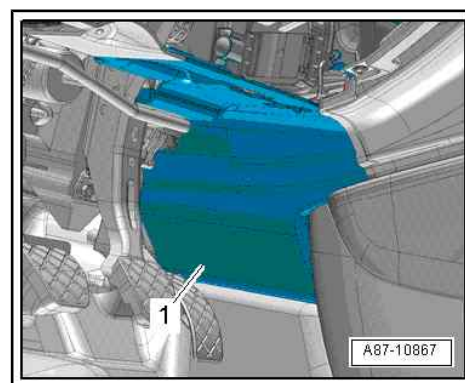
⇒ **"5.17.3 Removing and installing gear mechanism for temperature flap", page 221**

⇒ **"5.17.4 Removing and installing gear mechanism for air distribution", page 222**

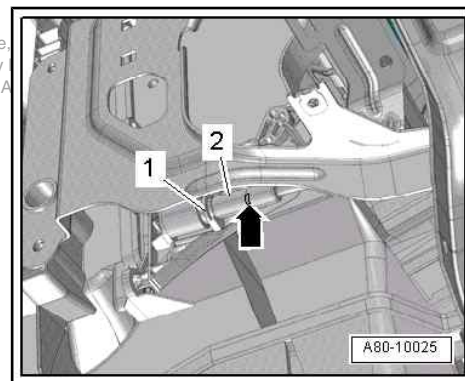
### 5.17.1 Removing and installing flexible temperature adjustment shaft - heater, manually controlled air conditioner

#### 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) .
- If fitted, detach insulation -1-.



- Set rotary temperature control to "cold" stop.
- Press retaining tab  and detach flexible shaft  -2- from gear mechanism for temperature flap -1-.



- Vehicles with heater: Pull heater controls slightly out of dash panel ⇒ [page 74](#) .



### Note

*Flexible shaft rotates twice if rotary heater/air conditioner control is turned once.*

- Vehicles with manually controlled air conditioner: Pull operating unit slightly out of dash panel ⇒ [page 236](#) .
- Press retainer -3- -arrow A- and detach flexible shaft -4- from operating unit -5- -arrow B-.
- Disengage flexible shaft from mounting on inside of dash panel.

### Installing

Install in reverse order of removal; note the following:

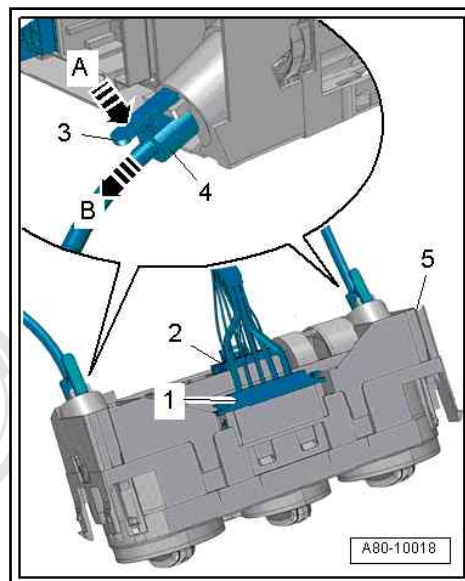


### Note

*Flexible shaft must not be bent or kinked; otherwise it must be renewed.*

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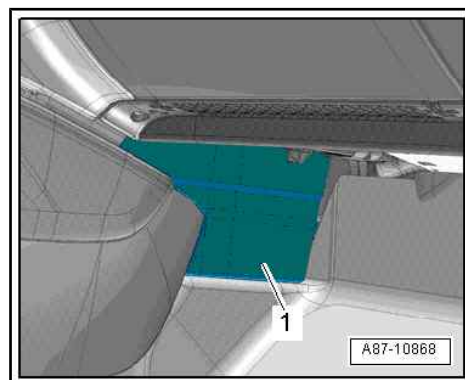
- Install operating unit: heater ⇒ [page 74](#) , manually controlled air conditioner ⇒ [page 236](#) .



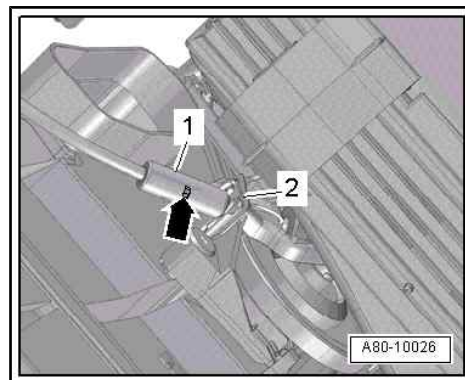
## 5.17.2 Removing and installing flexible air distribution shaft - heater, manually controlled air conditioner

### Removing

- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- If fitted, unfasten cover -1- from velcro strip.



- Set rotary control for direction of air flow to “windscreen/foot-well” position.
- Press retaining tab -arrow- and detach flexible shaft -1- from gear mechanism for air distribution -2-.



- Vehicles with heater: Pull heater controls slightly out of dash panel ⇒ [page 74](#) .

**i Note**

*Flexible shaft rotates twice if rotary heater/air conditioner control is turned once.*

- Vehicles with manually controlled air conditioner: Pull operating unit slightly out of dash panel ⇒ [page 236](#) .
- Press retainer -3- -arrow A- and detach flexible shaft -4- from operating unit -5- -arrow B-.

**Installing**

Install in reverse order of removal; note the following:

**i Note**

*Flexible shaft must not be bent or kinked; otherwise it must be renewed.*

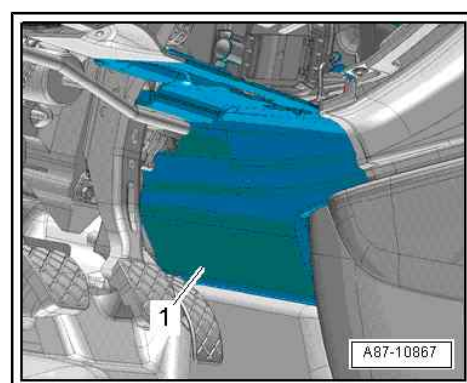
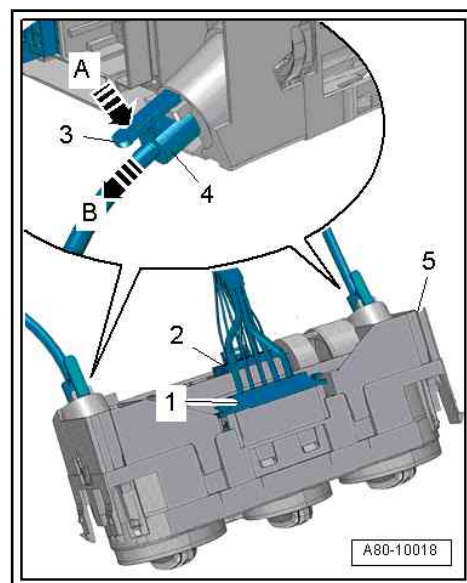
- Install operating unit: heater ⇒ [page 74](#) , manually controlled air conditioner ⇒ [page 236](#) .

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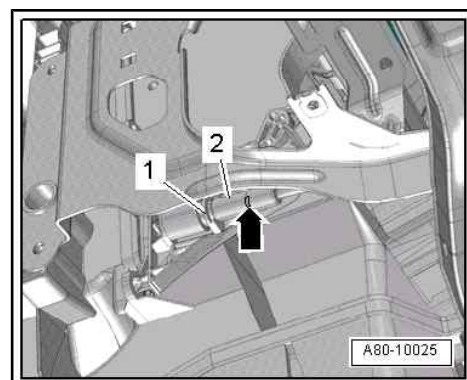
## 5.17.3 Removing and installing gear mechanism for temperature flap

**Removing**

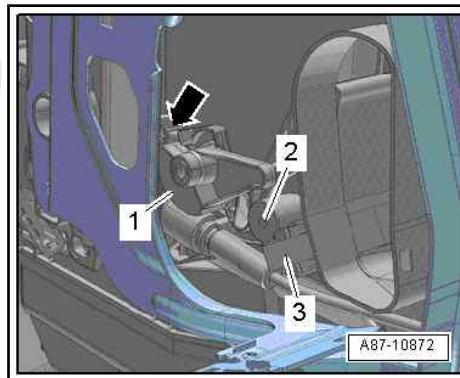
- Remove air duct for footwell vent (driver side) ⇒ [page 228](#) .
- If fitted, detach insulation -1-.



- Set rotary temperature control to “cold” stop.
- Press retaining tab -arrow- and detach flexible shaft -2- from gear mechanism for temperature flap -1-.



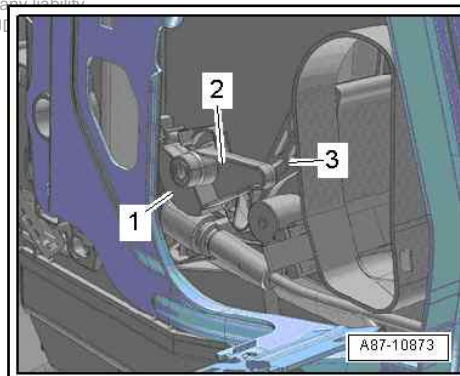
- Release retainer -3- and disengage gear mechanism -1- for temperature flap at housing -arrow-.
- Remove gear mechanism -2-.



## Installing

Install in reverse order of removal; note the following:

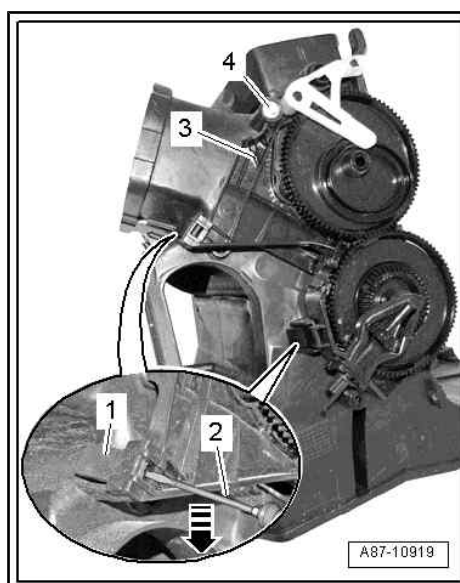
- Insert gear mechanism -1- at housing, making sure that lever -2- engages in lever -3-.
- Press gear mechanism on until it engages audibly.
  - The gear mechanism must be easy to press on.
- Check gear mechanism for proper operation and freedom of movement.
  - The temperature flap moves.
- Check operation of temperature flap.
  - The temperature flap must move audibly from one stop to the other.
  - Rotary control must move from “cold” to “warm” position.
- If rotary control cannot be moved from “cold” to “warm” position, detach flexible shaft, turn rotary control and re-attach flexible shaft.



## 5.17.4 Removing and installing gear mechanism for air distribution

### Removing

- Remove air distribution housing ⇒ [page 203](#) .
- Remove bolt -4-.
- Release catches -1- by inserting a screwdriver -2- in opening and pressing carefully in direction of -arrow-.
- Remove gear mechanism -3-.



## Installing

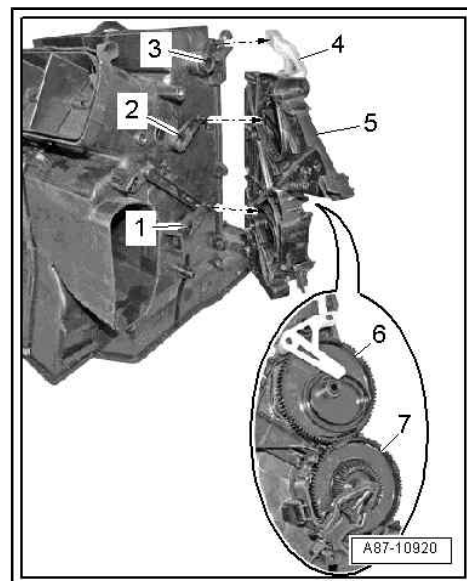
Install in reverse order of removal; note the following:

Install in reverse order of removal; note the following:

- Insert gear mechanism -5- at housing, making sure that lever -3- engages in lever -4-.
- Lever -2- must engage in guide for cam plate of gear wheel -6-.
- Lever -1- must engage in guide for cam plate of gear wheel -7-.
- Press gear mechanism on until it engages audibly.
- The gear mechanism must be easy to press on.
- Check that gear mechanism moves freely by turning the gear wheels.
- The air distribution flaps move.

## Tightening torques

- ◆ ⇒ ["5.1 Exploded view - attachments for heater and air conditioning unit and air intake box", page 173](#).



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## 6 Air duct system

⇒ [“6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 224](#)

⇒ [“6.2 Removing and installing air duct for defroster vent”, page 227](#)

⇒ [“6.3 Removing and installing air duct for dash panel vent \(centre\)”, page 227](#)

⇒ [“6.4 Removing and installing footwell vent \(driver side\)”, page 228](#)

⇒ [“6.5 Removing and installing footwell vent \(passenger side\)”, page 228](#)

⇒ [“6.6 Removing and installing rear footwell vent”, page 229](#)

⇒ [“6.7 Removing and installing air ducts”, page 229](#)

⇒ [“6.8 Checking forced ventilation vents in passenger compartment”, page 230](#)

⇒ [“6.9 Removing and installing forced ventilation vents in passenger compartment”, page 231](#)

⇒ [“6.10 Removing and installing fresh air intake”, page 232](#)

⇒ [“6.11 Checking plenum chamber water drain”, page 232](#)

⇒ [“6.12 Cleaning plenum chamber water drain”, page 233](#)

### 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”, page 224](#)

⇒ [“6.1.2 Routing of air flow and air distribution in passenger compartment”, page 226](#)

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



#### Note

- ◆ *Different versions of air conditioning unit (different heat exchanger, seals, expansion valve etc.), depending on production period and vehicle identification number ⇒ Electronic parts catalogue*
- ◆ *Vehicles with the type codes “8XF” and “8XK” in the vehicle identification number are fitted with an expansion valve with two refrigerant lines bolted on at the bottom. In addition, the connecting flange on the heat exchanger in the air conditioning unit is approx. 9 mm shorter than on vehicles with the type codes “8XA” and “8X1” in the vehicle identification number. The air distribution housing and corresponding seals (incl. area around condensation drain) are adapted accordingly.*

**1 - Air inlet from plenum chamber**

- ☐ Fresh air mode

**2 - Air inlet from passenger compartment**

- ☐ Air recirculation mode

**3 - Heater or air conditioning unit**

**4 - To footwell vents (rear)**

**5 - To footwell vent (left-side)**

**6 - 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)

**7 - To dash panel vents (centre)**

**8 - Auxiliary air heater element - Z35-**

- ☐ For vehicles with TDI engine and certain petrol engines from model year 2012 onwards (gradual introduction)

**9 - Heat exchanger**

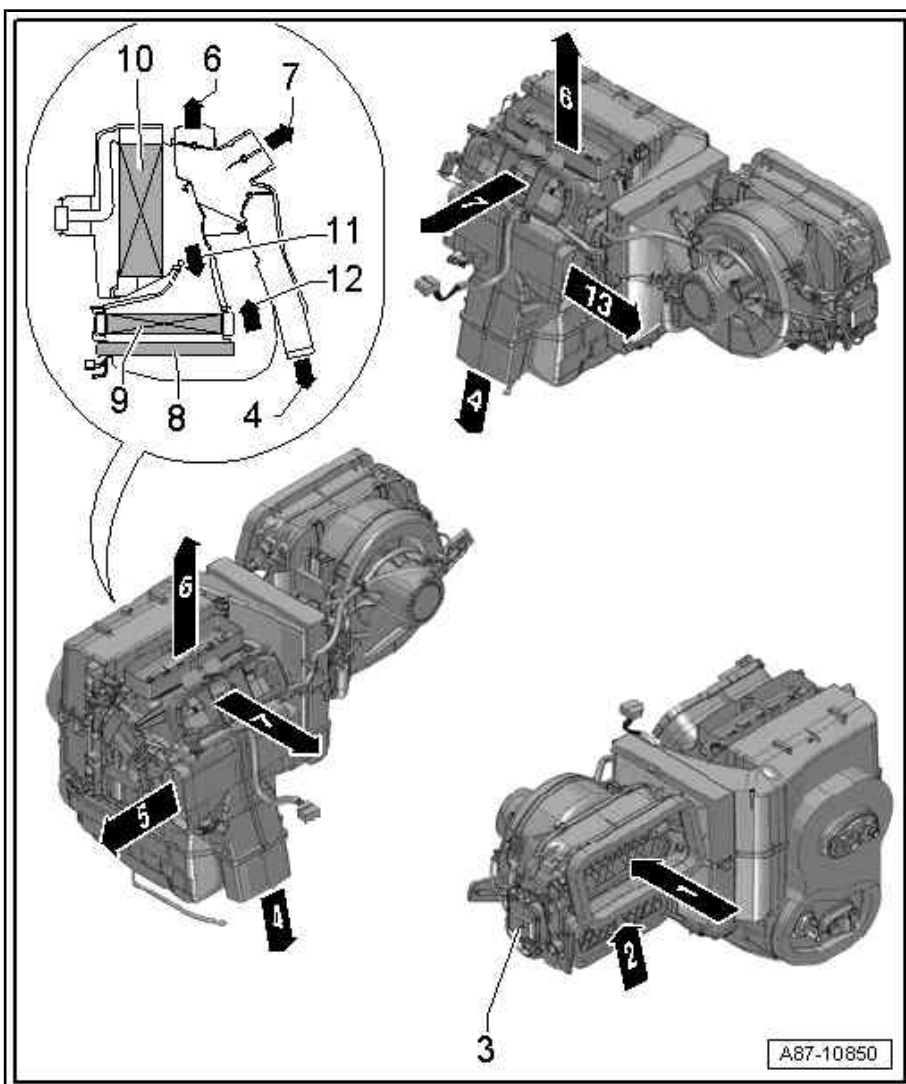
**10 - Evaporator**

**11 - To heat exchanger**

- ☐ Flows through evaporator, heat exchanger and auxiliary air heater element - Z35- (if fitted)

**12 - To vents**

**13 - To footwell vent (right-side)**



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## 6.1.2 Routing of air flow and air distribution in passenger compartment

### 1 - Air duct

- ☐ For footwell vent (rear)
- ☐ Removing and installing ⇒ [page 229](#)

### 2 - Connecting collar

- ☐ To air duct for footwell vent (rear)

### 3 - Bolt

- ☐ 1.5 Nm

### 4 - Air duct for footwell vent (driver side)

- ☐ Removing and installing ⇒ [page 228](#)

### 5 - Heater or air conditioning unit

- ☐ Routing of air flow in air duct and air conditioning unit ⇒ [page 224](#)
- ☐ Removing and installing ⇒ [page 200](#)

### 6 - Air duct for defroster vent

- ☐ Air flow to windscreen will be uneven or insufficient if foam seal is squashed
- ☐ Removing and installing ⇒ [page 227](#)

### 7 - Air duct

- ☐ To defroster vents and dash panel 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

### 8 - Dash panel

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

### 9 - Bolt

- ☐ 1.5 Nm

### 10 - Air duct to footwell vent (passenger side)

- ☐ Removing and installing ⇒ [page 228](#)

### 11 - Air duct to centre dash panel vent

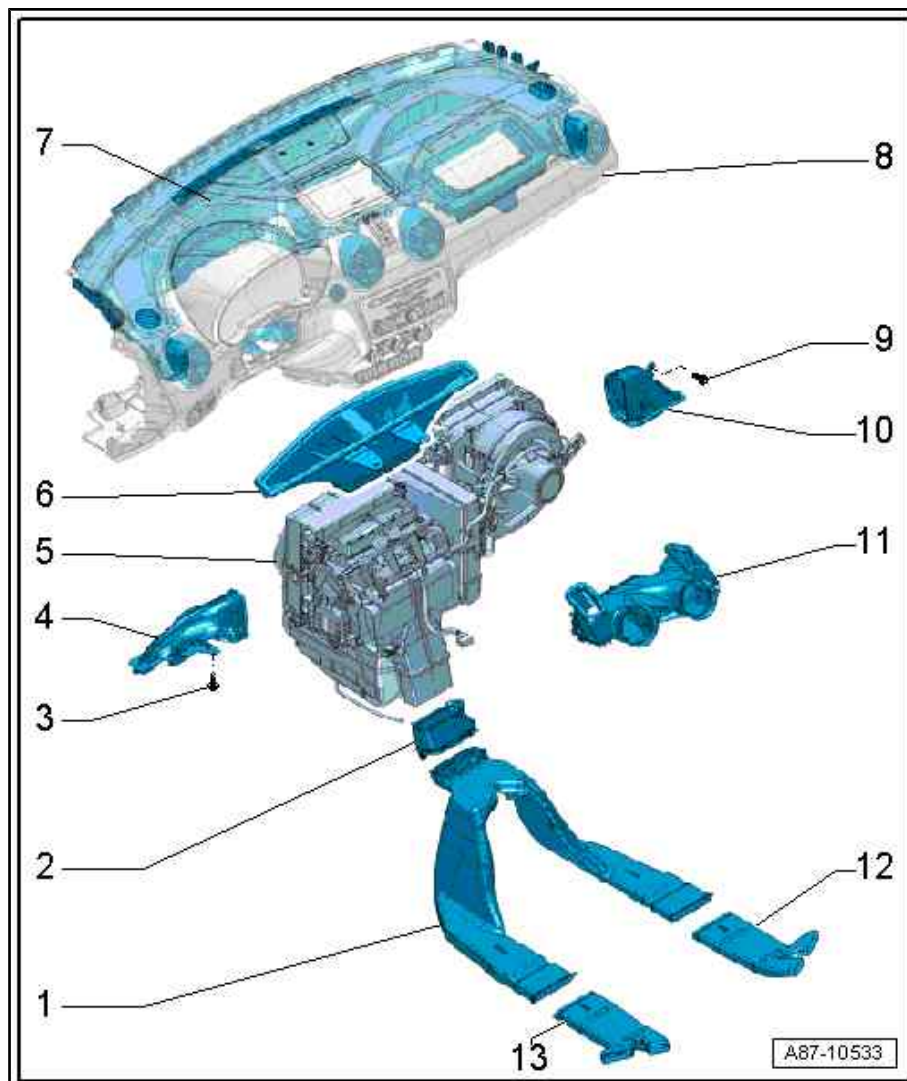
- ☐ Removing and installing ⇒ [page 227](#)

### 12 - Footwell vent (rear right)

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

### 13 - Footwell vent (rear left)

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



## 6.2 Removing and installing air duct for defroster vent

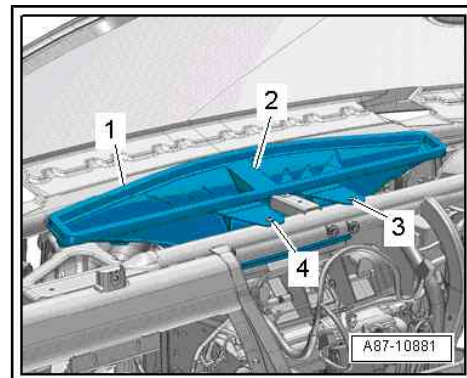
### Removing

- Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
- Pull out fasteners -3 and 4-.
- Lift out air duct for defroster vent -2-.

### Installing

Install in reverse order of removal; note the following:

- Renew foam seal -1- if damaged or defective.



### 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.*

## 6.3 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 .
- Unplug electrical connector -1-.
- Detach air duct for centre dash panel vent -4-.

### Installing

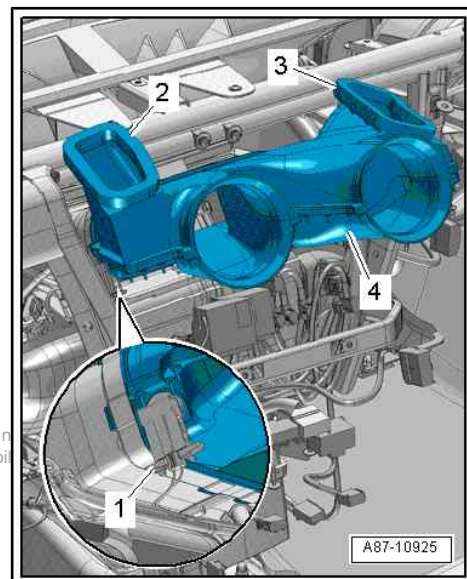
Install in reverse order of removal; note the following:

- Renew damaged or defective foam seals -2, 3-.
- Make sure that guides at air duct are correctly positioned in mountings.



### Note

- ◆ *Make sure that the retaining tabs on the air duct for dash panel vent (centre) -4- engage correctly in the outlet from the heater/ air conditioning unit (whistling noises if retaining tabs are not engaged correctly).*
- ◆ *Due to tolerance overlaps it might be necessary to use a little more force on air ducts for dash panel vent (centre) -4- installed up to model year 2014 in order to make the four retaining tabs on the air duct -4- engage; if necessary, carefully rework the retaining tabs.*
- ◆ *From model year 2014 onwards, air ducts for dash panel vent (centre) -4- with modified retaining tabs are installed (gradual introduction) to make them engage more easily in the vent.*



## 6.4 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) .



#### Caution

#### *Risk of damage to dash panel*

- ◆ *The dash panel could be damaged if it is pressed to the side to unscrew bolt -2-.*
- ◆ *Dash panel must be renewed if it is damaged.*

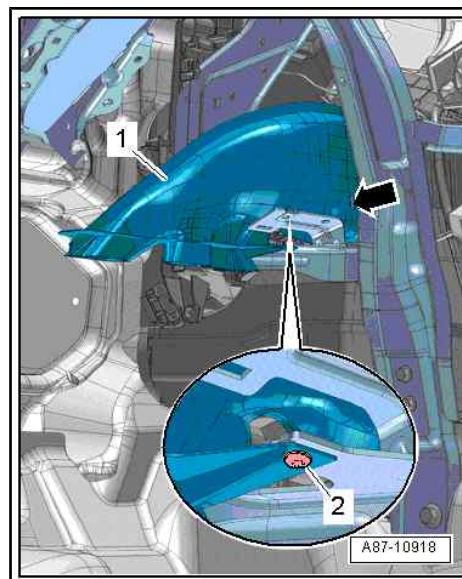
- Carefully press dash panel to one side (only as far as absolutely necessary).
- Remove bolt -2-.
- Release and carefully detach footwell vent -1- -arrow-.

### Installing

Install in reverse order.

### Tightening torques

- ◆ ⇒ ["6.1.2 Routing of air flow and air distribution in passenger compartment", page 226](#) .



## 6.5 Removing and installing footwell vent (passenger side)

### Removing

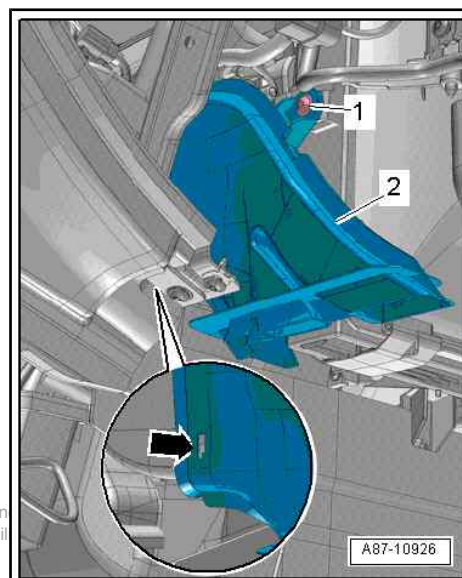
- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- Remove bolt -1-.
- Remove control unit: heater ⇒ [page 74](#) , manually controlled air conditioner ⇒ [page 236](#) , automatically controlled air conditioner ⇒ [page 239](#) .
- Release footwell vent -2- -arrow-, carefully pull it off and detach it downwards between brace for central tube and heater/ air conditioning unit.

### Installing

Install in reverse order.

### Tightening torques

- ◆ ⇒ ["6.1.2 Routing of air flow and air distribution in passenger compartment", page 226](#) .



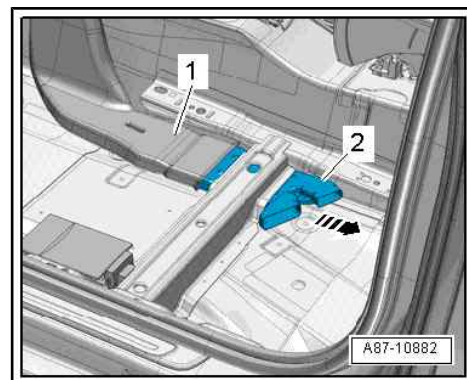
## 6.6 Removing and installing rear footwell vent

### Removing

- Remove floor covering ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .
- Detach footwell vent (rear) -2- from air duct -1- -arrow-.

### Installing

Install in reverse order.



## 6.7 Removing and installing air ducts

⇒ **"6.7.1 Removing and installing air duct for footwell vent (rear)", page 229**

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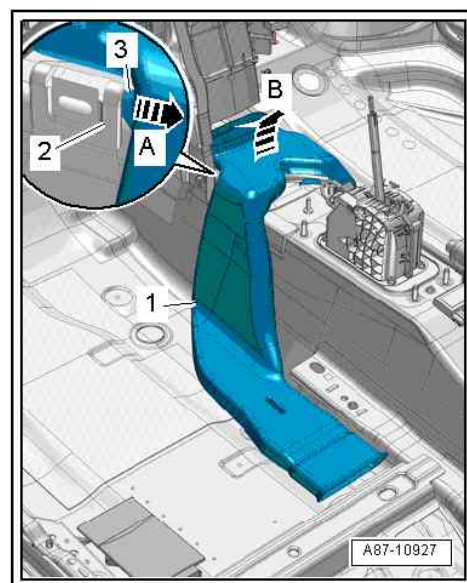
### 6.7.1 Removing and installing air duct for footwell vent (rear)

#### Removing

- Remove footwell vent (rear) ⇒ [page 229](#) .
- Slide air duct -1- towards rear -arrow A- until retaining pin -3- at mounting -2- is disengaged.
- Swivel up and detach air duct -arrow B-.

#### Installing

Install in reverse order.



## 6.8 Checking forced ventilation vents in passenger compartment

⇒ **"6.8.1 Checking ventilation slots in luggage compartment", page 230**

⇒ **"6.8.2 Checking forced ventilation frame from outside", page 230**

### 6.8.1 Checking ventilation slots in luggage compartment

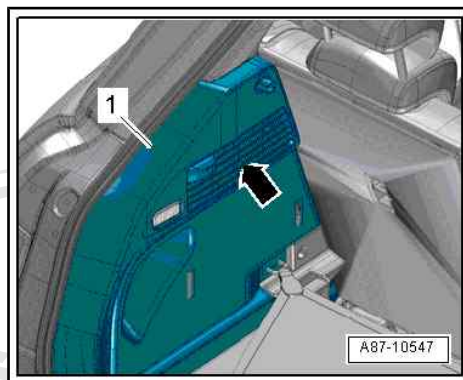
#### Test sequence

- 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.*

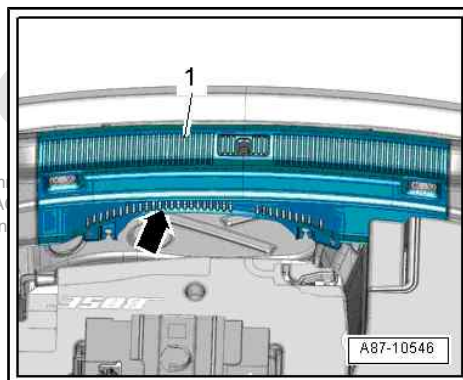


- Lift luggage compartment floor covering and check flow of air through ventilation openings -arrow- in rear cross panel trim -1-.



#### Note

*If the air ducts to the forced ventilation frames are blocked or obstructed, the windows may mist up.*



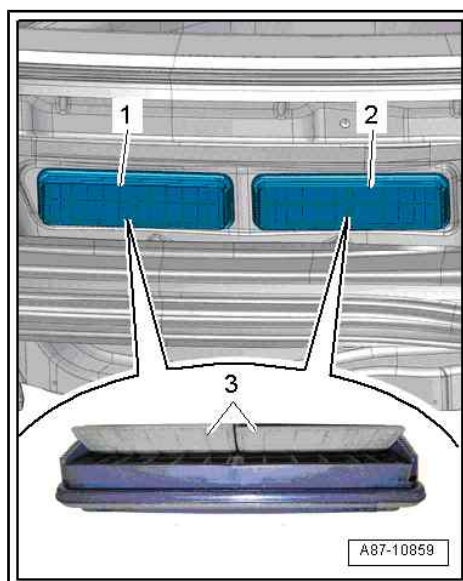
### 6.8.2 Checking forced ventilation frame from outside

#### Test sequence

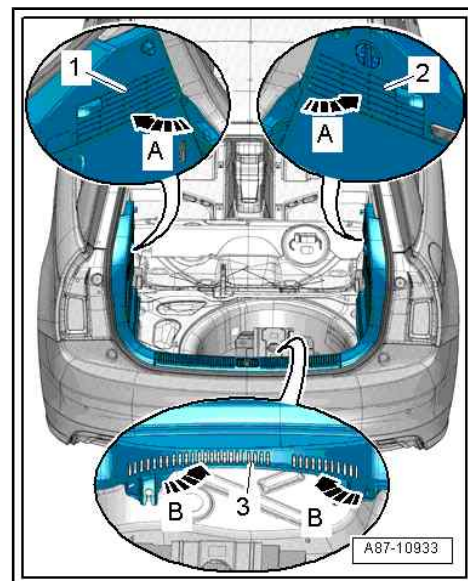


#### Note

- ♦ *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.*
- Remove rear cross panel trim ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Removing and installing lock carrier trim .
- Check that ventilation frames -1- and -2- are not blocked, and check that sealing lips -3- are functioning properly.



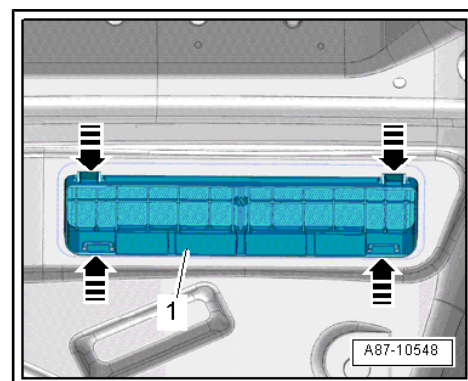
- To ensure proper ventilation of passenger compartment, ventilation openings in luggage compartment must not be blocked.
- It must be possible for the air -arrows A- to flow to the outside -arrow B- via ventilation openings -1 and 2- in the luggage compartment side trim beneath the luggage compartment floor covering to the forced ventilation frames behind the rear cross panel trim -3-.



## 6.9 Removing and installing forced ventilation vents in passenger compartment

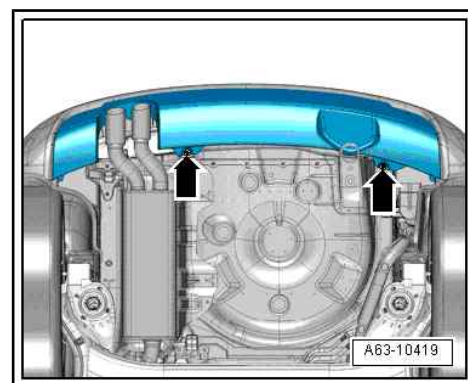
### Removing

- Remove rear cross panel trim ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Removing and installing lock carrier trim .
- Release retaining clips -arrows- and press forced ventilation frame -1- outwards.



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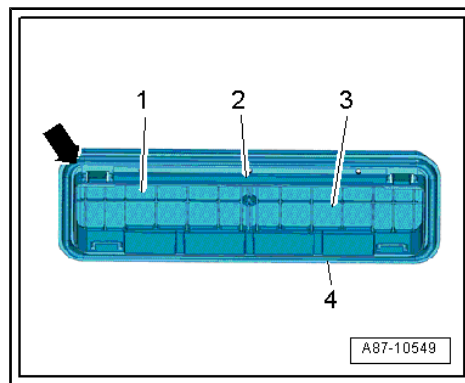
- **Remove bolts -arrows- from bumper cover (bottom section).**
- Reach behind bumper cover from underneath and take out ventilation frame.



## Installing

Install in reverse order of removal; note the following:

- Check seal -4- for damage.
- The sealing lips -1 and 3- only close properly if the ventilation frame -2- has been installed in the correct position.
- The smaller radius -arrow- is at the top.
- When installing, press ventilation frame into opening at body until all the retaining tabs engage properly.
- Install bumper cover (rear) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (rear); Removing and installing bumper cover .



## 6.10 Removing and installing fresh air intake

### Removing

- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Unscrew bolt -1- and nuts -4, 5-.
- Detach fresh air intake grille -3- with drip rail -2-.

### Installing

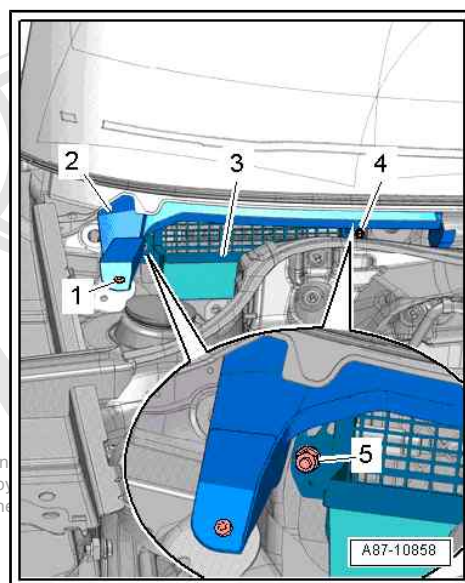
Install in reverse order of removal; note the following:

- Tighten bolt -1- and nuts -4, 5- to 3.5 Nm.

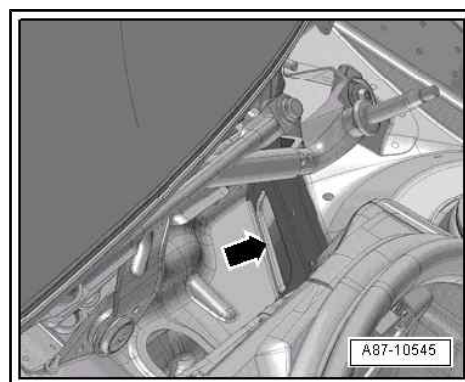


### Note

Water may flow into the fresh air intake duct if the plenum chamber 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.

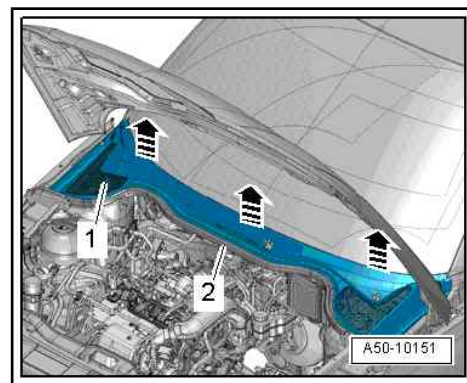


## 6.11 Checking plenum chamber water drain



## Note

- ◆ Drainage of water out of the plenum chamber may be obstructed by deposits such as leaves and needles accumulating in the water drain (left and right) -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 if the plenum chamber cover -1- 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.



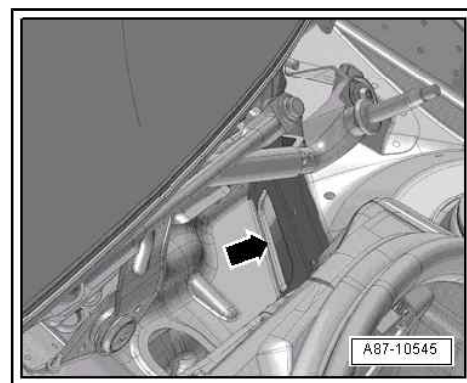
## 6.12 Cleaning plenum chamber water drain

### Procedure

- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Check that there is no dirt in water drains (left and right) -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 dirty.



## 7 Coolant circuit

⇒ **"7.1 Removing and installing electric coolant pump ( V51 / V488 )", page 234**

⇒ **"7.2 Removing and installing coolant shut-off valve N82 ", page 234**

### 7.1 Removing and installing electric coolant pump ( -V51- / -V488- )

Continued coolant circulation pump - V51- or auxiliary pump for heating - V488-



#### Note

- ◆ -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.
- ◆ An electric pump which assists the engine coolant pump is installed e.g. on vehicles with a 3-cylinder TDI engine. There are different designations for this coolant pump ( continued coolant circulation pump - V51- / auxiliary pump for heating - V488- ), depending on the engine version ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant .

If fitted: Operation of electric coolant pump ( -V51- or auxiliary pump for heating - V488- ) and coolant shut-off valve -N82- OK.

Removing and installing ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing electric coolant pump

### 7.2 Removing and installing coolant shut-off valve - N82-

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#### Note

*Depending on the engine version, the coolant shut-off valve - N82- is installed in the coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

Removing and installing ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant valves

## 8 Operating and display unit

⇒ [“8.1 Overview - operating and display unit”, page 235](#)

⇒ [“8.2 Removing and installing operating and display unit”, page 236](#)

⇒ [“8.3 Removing and installing temperature sensor blower”, page 241](#)

### 8.1 Overview - operating and display unit

⇒ [“8.1.1 Overview - operating and display unit \( air conditioning system control unit J301 \), manually controlled air conditioner”, page 235](#)

⇒ [“8.1.2 Overview - operating and display unit \( Climatronic control unit J255 \), automatically controlled air conditioner”, page 236](#)

#### 8.1.1 Overview - operating and display unit ( air conditioning system control unit - J301- ), manually controlled air conditioner

General notes

⇒ [“1.7.1 General notes on operating unit \( air conditioning system control unit J301 \) - manually controlled air conditioner”, page 6](#)

1 - Operating unit ( air conditioning system control unit - J301- )

2 - Rotary temperature control

3 - Rotary control for fresh air blower - V2-

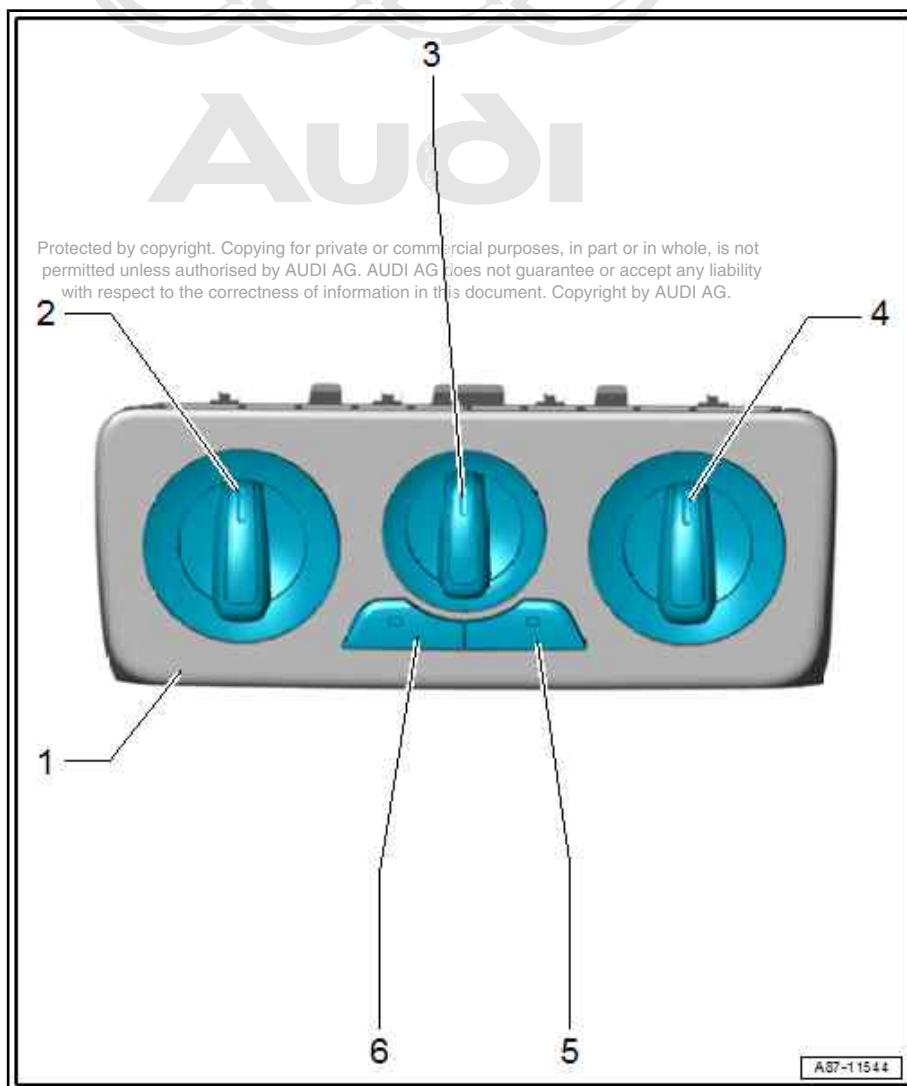
4 - Rotary control for setting air distribution

5 - **AC** or **A/C** button for air conditioner compressor

- ☐ If LED lights up, “air conditioner compressor on” is selected

6 - 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)



## 8.1.2 Overview - operating and display unit ( Climatronic control unit - J255- ), automatically controlled air conditioner

### General notes

⇒ [“1.7.2 General notes on operating unit \( Climatronic control unit J255 \) - automatically controlled air conditioner”, page 7](#)

#### 1 - Operating unit ( Climatronic control unit - J255- )

#### 2 - Rotary temperature control

#### 3 - Button for defrost mode

- ☐ If LED lights up, “defrost mode” is selected

#### 4 - Rotary control for fresh air blower - V2-

#### 5 - Button for air recirculation mode

- ☐ If LED lights up, “air recirculation mode” is selected
- ☐ The “air recirculation mode” function is cancelled on pressing the button for defrost mode (air to windscreen)

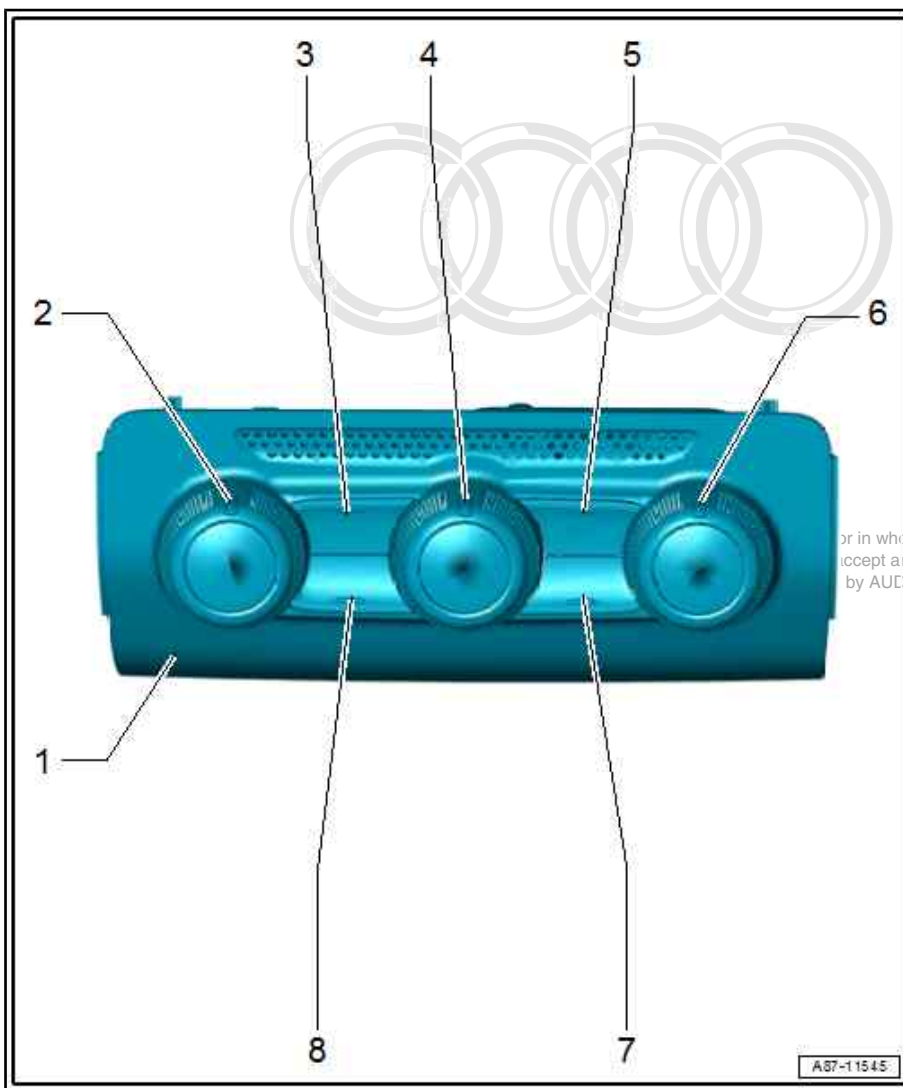
#### 6 - Rotary control for setting air distribution

#### 7 - **[AC]** or **[A/C]** button for air conditioner compressor

- ☐ If LED lights up, “air conditioner compressor on” is selected

#### 8 - **[Auto]** button for automatic air conditioner control

- ☐ If LED lights up, “automatic control” is selected



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## 8.2 Removing and installing operating and display unit

⇒ [“8.2.1 Removing and installing operating unit \( air conditioning system control unit J301 \) - manually controlled air conditioner”, page 236](#)

⇒ [“8.2.2 Removing and installing operating unit \( Climatronic control unit J255 \) - automatically controlled air conditioner”, page 239](#)

⇒ [“8.2.3 Removing and installing frame for operating unit \( air conditioning system control unit J301 \) - manually controlled air conditioner”, page 241](#)

### 8.2.1 Removing and installing operating unit ( air conditioning system control unit -

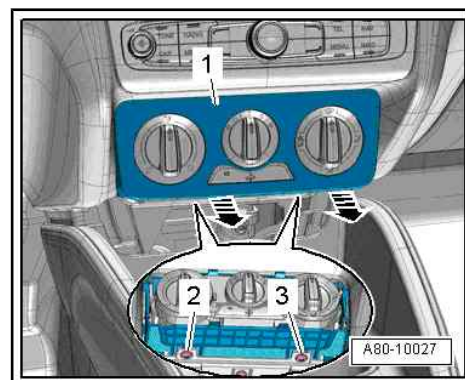
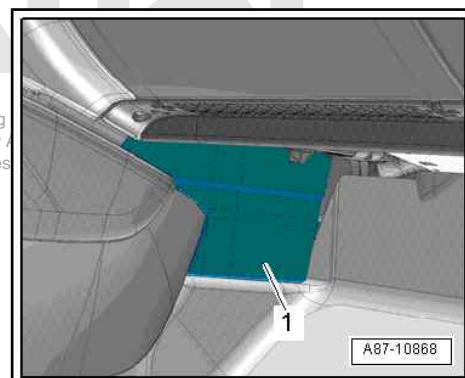
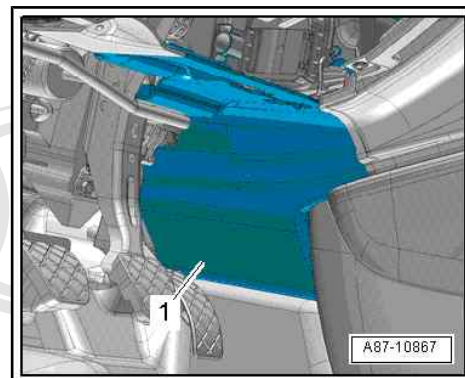
## J301- ) - manually controlled air conditioner

### Note

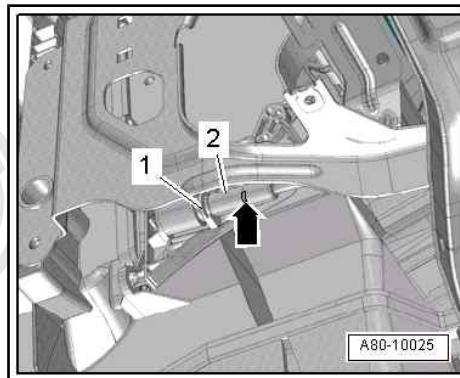
- ◆ The text on the button for switching the air conditioner on and off on the operating unit ( air conditioning system control unit - J301- ) varies. Depending on the production period, the text on the button will read **AC** or **A/C** ⇒ [page 6](#) and ⇒ *Electronic parts catalogue* .
- ◆ There are different versions of the operating unit -J301- (with different part numbers). Components with part number "8X0 820 045" are installed e.g. in vehicles with type codes "8XA" and "8X1" in the vehicle identification number. Components with part number "8XA 820 045" are installed e.g. in vehicles with type codes "8XF" and "8XK" in the vehicle identification number ⇒ *Electronic parts catalogue* .

### Removing

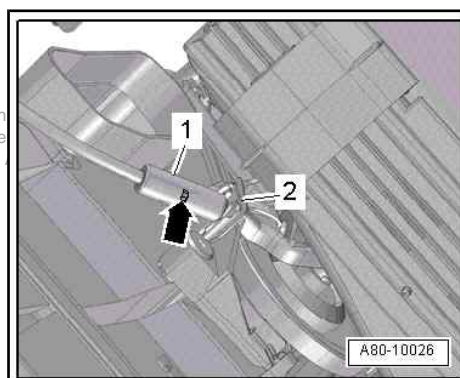
- Observe general notes ⇒ [page 6](#) .
- Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing dash panel cover (driver side) .
- If fitted, detach insulation -1-.
- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Shelves / trim panels; Removing and installing glove box .
- If fitted, unfasten cover -1- from velcro strip.
- Remove mounting for switch unit (bottom) ⇒ **Electrical system**; Rep. gr. 96 ; Controls; Removing and installing switches in dash panel .
- Detach trim -1- for operating unit ( air conditioning system control unit - J301- ) -arrows-.
- Remove bolts -2 and 3-.



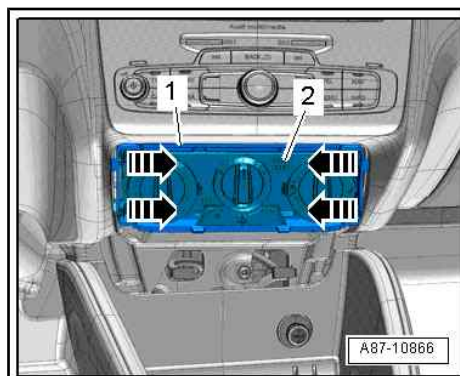
- Set rotary temperature control to “cold” stop.
- Press retaining tab -arrow- and detach flexible shaft -2- from gear mechanism for temperature flap -1-.



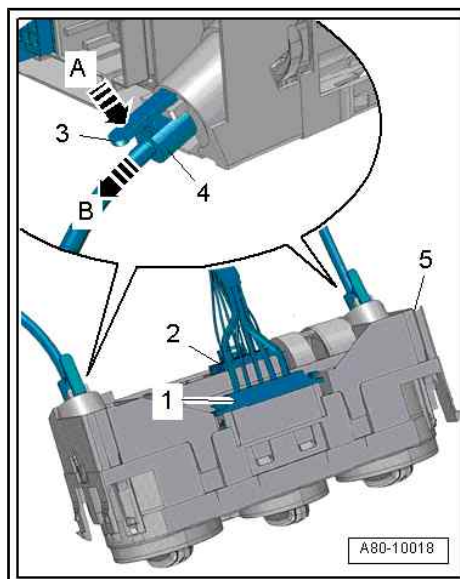
- Set rotary control for direction of air flow to “windscreen/footwell” position.
- Press retaining tab -arrow- and detach flexible shaft -1- from gear mechanism for air distribution -2-.



- Carefully release fasteners -arrows- and pull heater controls -2- out of frame -1-.



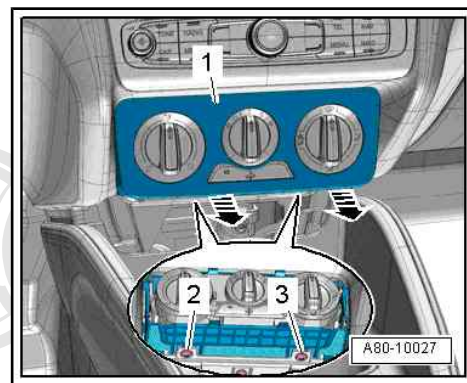
- Press retainer -3- -arrow A- and detach flexible shaft -4- from controls -5- -arrow B-.
- Unplug electrical connectors -1, 2-.
- Detach operating unit ( air conditioning system control unit - J301- ).



## Installing

Install in reverse order of removal; note the following:

- It is important to observe the correct version and assignment  
 ⇒ Electronic parts catalogue .
- Tighten bolts -2 and 3- to 1.5 Nm.
- Install flexible shafts ⇒ [page 219](#) .
- Check operation of temperature flap.
- The temperature flap must move audibly from one stop to the other.
- Rotary control must move from “cold” to “warm” position.
- If rotary control cannot be moved from “cold” to “warm” position, detach flexible shaft, turn rotary control and re-attach flexible shaft.
- Check operation of air distribution flaps.
- The air distribution flaps must be set to the same positions as the rotary control on heater/air conditioner.
- Check corresponding vents by hand.
- If flap positions do not correspond to rotary control for heater/air conditioner, detach flexible shaft, turn rotary control and re-attach flexible shaft.



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## 8.2.2 Removing and installing operating unit ( Climatronic control unit - J255- ) - automatically controlled air conditioner

Special tools and workshop equipment required

- ◆ Removal wedge - 3409-



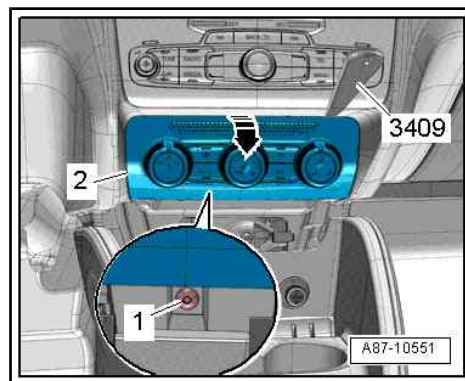
### Note

*There are different versions of the operating unit ( Climatronic control unit - J255- ) with different part numbers. Components with part number “8X0 820 043” are installed e.g. in vehicles with type codes “8XA” and “8X1” in the vehicle identification number. Components with part number “8XA 820 043” are installed e.g. in vehicles with type codes “8XF” and “8XK” in the vehicle identification number ⇒ Electronic parts catalogue .*

## Removing

- If the operating unit ( Climatronic control unit - J255- ) is renewed, select “Replace control unit” ⇒ Vehicle diagnostic tester (“Guided Fault Finding” or “Guided Functions”).
- Observe general notes ⇒ [page 7](#) .

- Remove mounting for switch unit (bottom) ⇒ Electrical system; Rep. gr. 96 ; Controls; Removing and installing switches in dash panel .
- Remove bolt -1-.
- Using removal wedge - 3409- , release operating unit -2- at top -arrow- and pull it out of guides.

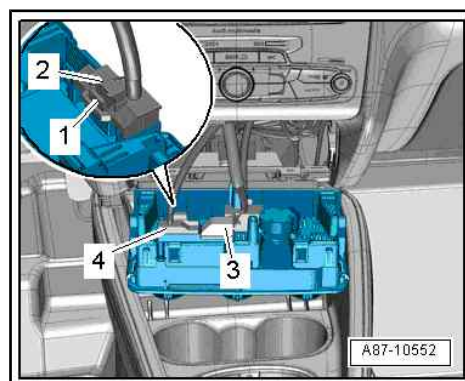


- Unplug electrical connector -4- by sliding locking element -2- upwards and pressing catch -1- inwards.
- Unplug electrical connector -3-.



### Note

If the measured value for the dash panel temperature sensor - G56- is incorrect, check the intake grille of the operating unit ( Climatronic control unit - J255- ) (must not be closed off) and check the operation of the temperature sensor blower -V42- .

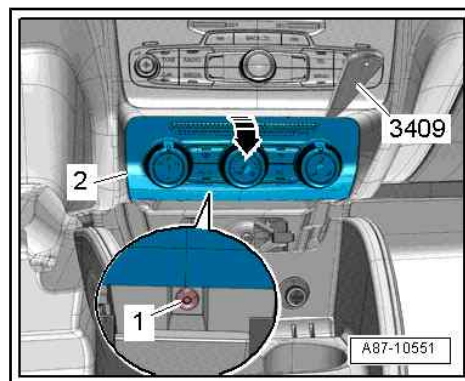


## Installing



### Note

From model year 2012 onwards, -Z35- is also installed on vehicles with certain petrol engines (gradual introduction). The correct version of the operating unit ( Climatronic control unit - J255- , part number 8X0 820 043 from index "B" onwards) and the correct version of the engine control unit must be installed so that the operating unit -J255- and the corresponding engine control unit can activate -Z35- ⇒ Vehicle diagnostic tester and ⇒ Electronic parts catalogue .



Install in reverse order of removal; note the following:

- It is important to observe the correct version and assignment ⇒ Electronic parts catalogue .
- When renewing the operating unit ( Climatronic control unit - J255- ), take care to select the correct version ⇒ Electronic parts catalogue .
- Tighten bolt -1- to 1.5 Nm.

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.
- Interrogate event memory (and eliminate cause of any entries displayed).
- Check adaption.
- Perform final control diagnosis if applicable.

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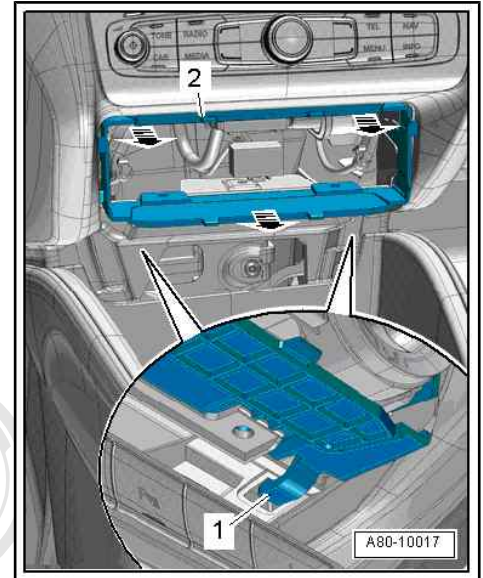
### 8.2.3 Removing and installing frame for operating unit ( air conditioning system control unit - J301- ) - manually controlled air conditioner

#### Removing

- Remove controls for the operating unit ( air conditioning system control unit - J301- ) ⇒ [page 236](#) .
- Release fasteners -1-.
- Detach frame -2- -arrows-.

#### Installing

Install in reverse order.



### 8.3 Removing and installing temperature sensor blower

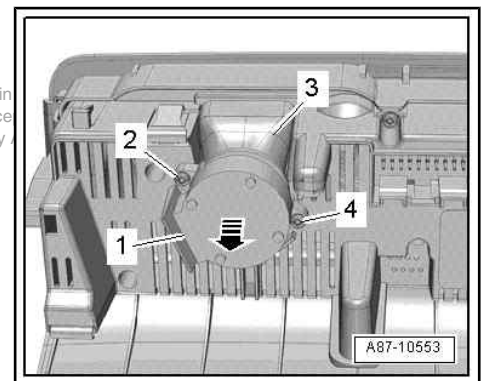
#### Removing

- Remove operating unit ( Climatronic control unit - J255- ) ⇒ [page 7](#) .
- Remove bolts -2 and 4-.
- Pull temperature sensor blower - V42- -item 1- out of operating unit ( Climatronic control unit - J255- ) -item 3- -arrow-.



#### Note

*When installing the temperature sensor blower -V42- , do not press down on the motor, but hold the blower at its housing.*



#### Installing

Install in reverse order.

#### Tightening torques

- ◆ Blower to operating unit: 0.8 Nm

## 9 Further control components

⇒ ["9.1 Removing and installing sunlight penetration photosensor G107", page 242](#)

⇒ ["9.2 Removing and installing ambient temperature sensor G17", page 242](#)

⇒ ["9.3 Removing and installing centre vent temperature sender G191", page 243](#)

⇒ ["9.4 Removing and installing footwell vent temperature sender G192", page 243](#)

⇒ ["9.5 Removing and installing evaporator output temperature sender G263", page 244](#)

⇒ ["9.6 Removing and installing humidity sender G355", page 245](#)

### 9.1 Removing and installing sunlight penetration photosensor - G107-



#### Note

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

#### Removing

- Carefully pull sunlight penetration photosensor - G107- -item 2- out of dash panel -arrow-.



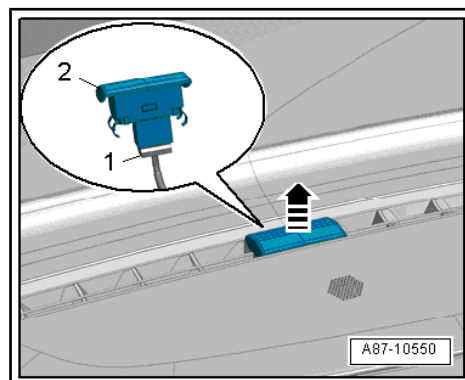
#### Note

*If necessary, prise component out with a small screwdriver, taking care not to damage dash panel.*

- Unplug electrical connector -1-.

#### Installing

Install in reverse order.



### 9.2 Removing and installing ambient temperature sensor - G17-



#### Note

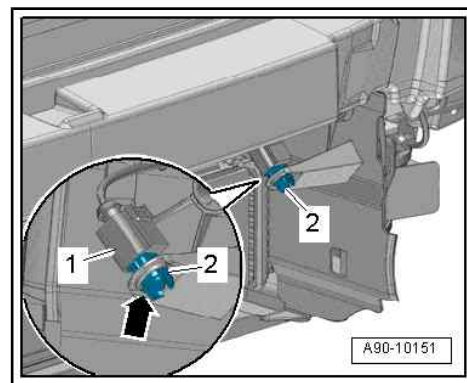
- ◆ *"Read measured values" ⇒ Vehicle diagnostic tester in "Guided Fault Finding" function for dash panel insert.*
- ◆ *An incorrect measured value for ambient temperature sensor - G17- may lead to problems with the air conditioner control function ⇒ Vehicle diagnostic tester ("Guided Fault Finding" for dash panel insert).*

## Removing

- Remove bumper cover (front) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .
- Carefully compress retaining clips -arrow- and pull ambient temperature sensor - G17- -item 2- upwards out of bracket.
- Unplug electrical connector -1-.

## Installing

Install in reverse order.



## 9.3 Removing and installing centre vent temperature sender - G191-



### Note

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

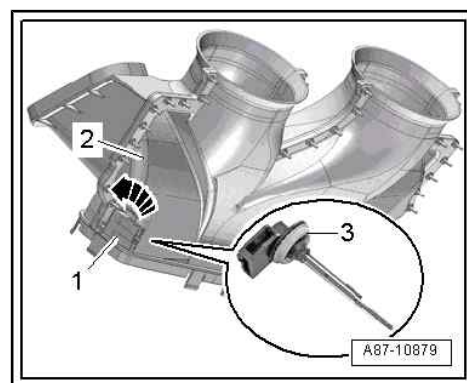
## Removing

- Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
- Remove air duct for dash panel vent (centre) ⇒ [page 227](#) .
- Turn vent temperature sender -1- anti-clockwise -arrow- and pull it out of air duct -2-.

## Installing

Install in reverse order of removal; note the following:

- Renew seal -3- if damaged or defective.
- Install air duct for dash panel vent (centre) ⇒ [page 227](#) .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).



## 9.4 Removing and installing footwell vent tempering sender - G192-



### Note

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

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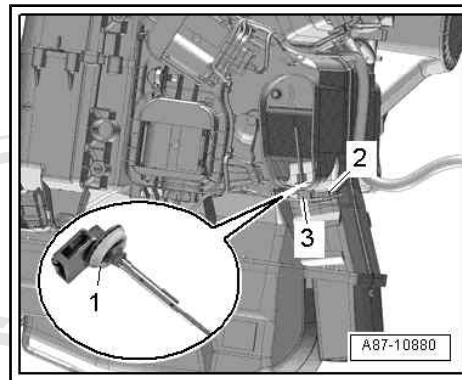
## Removing

- Remove central tube ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel .
- Unplug electrical connector -2-.
- Turn vent temperature sender -3- anti-clockwise and pull it out of housing.

## Installing

Install in reverse order of removal; note the following:

- Renew seal -1- if damaged or defective.
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



## 9.5 Removing and installing evaporator output temperature sender - G263-

### Removing

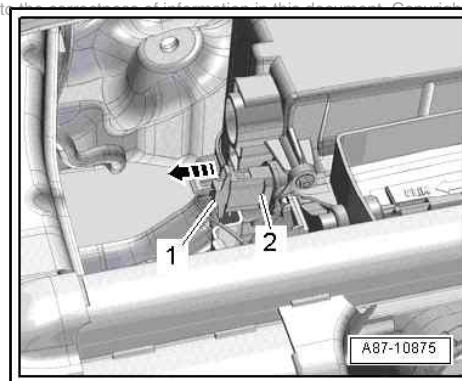
- Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
- Unplug electrical connector -1-.
- Pull evaporator output temperature sender - G263- -item 2- out of air conditioning unit -arrow-.



### Caution

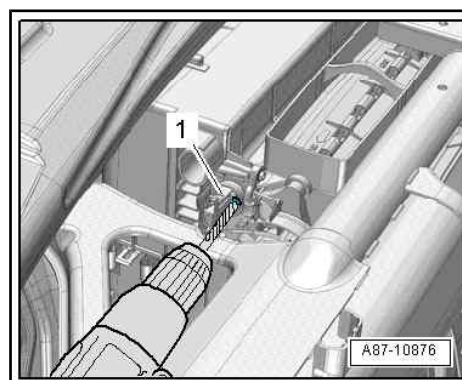
**Risk of damage to air conditioning unit.**

- ◆ **ONLY drill into evaporator output temperature sender - G263- .**
- ◆ **The air conditioning unit must be renewed if it has been damaged by drilling.**



### Note

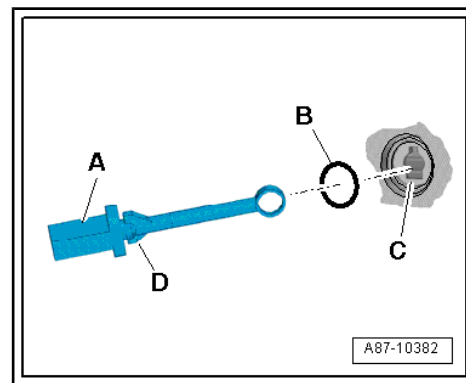
- ◆ If evaporator output temperature sender - G263- -item 1- cannot be pulled out, drill a hole using a  $\varnothing 3$  mm bit, as shown.
- ◆ Spray lubricant spray through hole and pull out evaporator output temperature sender - G263- . For lubricant spray, refer to ⇒ Electronic parts catalogue .
- ◆ Different versions ⇒ Electronic parts catalogue



## Installing

Install in reverse order of removal; note the following:

- Renew seal -B- if damaged or defective.
- When inserting, make sure that wide guide -D- on evaporator output temperature sender - G263- -A- is opposite mounting -C- on housing.
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



## 9.6 Removing and installing humidity sender - G355-

The humidity sender is integrated in the rain and light sensor - G397- and cannot be renewed separately in the event of a fault. Renewing ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system



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