Workshop Manual

Audi A4 2008 ➤ ,
Audi A5 Cabriolet 2009 ➤ ,
Audi A5 Coupé 2008 ➤ ,
Audi A5 Sportback 2010 ➤ ,
Audi Q5 2008 ➤ , Audi Q5 China 2010 ➤

Heating, air conditioning

Edition 11.2017

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List of Workshop Manual Repair Groups

Repair Group

00 - Technical data

80 - Heating

87 - Air conditioning system

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

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Contents

00 - Technical data 1
1 General notes 1
1.1 Type plates 2
1.2 Notes on odours in vehicles with air conditioner 4
1.3 Seat heating and seat ventilation (front) 5
1.4 Heated rear window 12
1.5 Notes on control of air conditioner (components in passenger compartment) 14
1.6 Notes on control of air conditioner (components not located in passenger compartment) 15
1.7 Notes on refrigerant circuit 19
1.8 Notes on heater and air conditioning unit (front) 23
1.9 Notes on operating and display unit 26
1.10 Overview - control motors of air conditioner 30
2 Safety precautions 33
2.1 Safety precautions when handling refrigerants 33
2.2 Safety precautions when working on high-voltage vehicles 36
2.3 Safety precautions when working on vehicles with start/stop system 43
2.4 Safety precautions when using testers and measuring instruments during a road test 43
2.5 Safety precautions when working on the cooling system 44
3 Repair instructions 45
3.1 Rules for cleanliness 45
3.2 General notes 45
3.3 General repair instructions 46
3.4 Contact corrosion 48
3.5 Checking electrical air conditioner components activated or evaluated via other control units 49
3.6 Checking air conditioner components - vehicles with high-voltage system 49
3.7 Checking heating output 52
3.8 Checking cooling output 71
3.9 Working on refrigerant circuit 103
3.10 Discharging refrigerant circuit 103
3.11 Notes on dust and pollen filter with activated charcoal filter insert 104
3.12 Paint repairs on vehicles with air conditioning system 105
3.13 Refrigerant circuit seals 106
4 Technical data 107
4.1 Refrigerant capacities 107
4.2 Approved refrigerant oils and refrigerant oil capacities 109
4.3 Oil distribution 113

80 - Heating 115
1 Overview of fitting locations - heater 115

87 - Air conditioning system 116
1 Overview of fitting locations - air conditioner 116
1.1 Overview of fitting locations - components not located in passenger compartment 116
1.2 Overview of fitting locations - components in passenger compartment (front) 130
2 Refrigerant circuit 145
2.1 System overview - refrigerant circuit 145
2.2 Overview of fitting locations - refrigerant lines 180
2.3 Exploded view - refrigerant lines 183
2.4 Checking cut-in signal for air conditioner compressor regulating valve N280 185
2.5 Checking activation of air conditioner compressor regulating valve N280 190
2.6 Removing and installing refrigerant pressure and temperature sender G395 190

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2.7 Checking refrigerant pressure and temperature sender G395 . . . 191
2.8 Checking pressure signal at refrigerant pressure and temperature sender G395 . . . 193
2.9 Removing and installing refrigerant lines to battery cooling module on vehicle floor (front) . . . 194
2.10 Removing and installing refrigerant lines to battery cooling module on vehicle floor (rear) . . . 197
2.11 Removing and installing leadthrough for refrigerant lines into luggage compartment . . . 201
2.12 Removing and installing refrigerant lines to battery cooling module in luggage compartment . . . 206
2.13 Detaching and attaching refrigerant lines at quick-release couplings . . . 211
2.14 Removing and installing refrigerant lines with internal heat exchanger . . . 217
2.15 Removing and installing expansion valve . . . 232
2.16 Removing and installing expansion valve (rear) with refrigerant shut-off valve 2 for hybrid battery N517 . . . 238
2.17 Detaching and attaching refrigerant lines at condenser . . . 242
2.18 Removing and installing condenser . . . 248
2.19 Removing and installing receiver . . . 256
2.20 Removing and installing desiccant bag/desiccant cartridge . . . 260
2.21 Differences in service connections depending on refrigerant (R134a or R1234yf) . . . 267
2.22 Removing and installing evacuating and charging valve (low-pressure and high-pressure sides) . . . 270
2.23 Starting up air conditioner after charging refrigerant circuit . . . 271

3 Air conditioner compressor . . . 276
3.1 Exploded view - drive unit for air conditioner compressor . . . 276
3.2 Exploded view - pulley . . . 279
3.3 Detaching and attaching air conditioner compressor at bracket . . . 286
3.4 Detaching and attaching refrigerant lines at air conditioner compressor . . . 301
3.5 Removing and installing air conditioner compressor . . . 314
3.6 Preparations for renewing pulley . . . 361
3.7 Removing and installing pulley . . . 361
3.8 Unfastening and securing air conditioner compressor drive shaft . . . 367
3.9 Removing and installing air conditioner compressor drive shaft . . . 367
3.10 Removing and installing drive plate with overload protection . . . 368
3.11 Checking and adjusting concentricity of drive plate with overload protection . . . 369
3.12 Removing and installing drive plate at air conditioner compressor . . . 369
3.13 Removing and installing drive plate with roller bearing . . . 370

4 Control motors . . . 372
4.1 Overview of fitting locations - control motors (front) . . . 372
4.2 Removing and installing temperature flap control motor V68 / rear temperature flap control motor V137 . . . 386
4.3 Removing and installing air flow flap control motor V71 . . . 390
4.4 Removing and installing centre vent control motor V102 . . . 392
4.5 Removing and installing defroster flap control motor V107 . . . 394
4.6 Removing and installing left footwell flap control motor V108 / footwell flap control motor V261 . . . 396
4.7 Removing and installing right footwell flap control motor V109 . . . 398
4.8 Removing and installing left centre vent control motor V110 . . . 400
4.9 Removing and installing right centre vent control motor V111 . . . 403
4.10 Removing and installing air recirculation flap control motor V113 . . . 405
4.11 Removing and installing left temperature flap control motor V158 . . . 407
4.12 Removing and installing right temperature flap control motor V159 . . . 411
4.13 Removing and installing air recirculation flap 1 control motor for hybrid battery V479 . . . 413
4.14 Removing and installing air recirculation flap 2 control motor for hybrid battery V480 . . . 416
4.15 Removing and installing retaining plate (left-side) with control motors V108 and V110 . . . 419
4.16 Removing and installing retaining plate (right-side) with control motors V109 and V111 . . . 423
4.17 Removing and installing retaining plate (left-side) with footwell flap control motor V261 . . . 425

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4.18 Dismantling and assembling retaining plate (left-side) with control motors V108 and V110 . . . 427
4.19 Dismantling and assembling retaining plate (right-side) with control motors V109 and V111 . . . 429
4.20 Dismantling and assembling retaining plate (left-side) with footwell flap control motor V261 . . . 430
5 Front heater and air conditioning unit . . . 431
5.1 Exploded view - attachments for heater and air conditioning unit and air intake box . . . 431
5.2 Exploded view - flaps and partitions in air distribution housing . . . 439
5.3 Exploded view - air intake box of heater and air conditioning unit . . . 442
5.4 Exploded view - evaporator housing . . . 447
5.5 Removing and installing evaporator . . . 451
5.6 Removing and installing evaporator housing . . . 468
5.7 Cleaning evaporator . . . 473
5.8 Checking auxiliary air heater element Z35 . . . 482
5.9 Removing and installing auxiliary air heater element Z35 . . . 487
5.10 Checking heating output of actuation of temperature flaps of air conditioner . . . 490
5.11 Removing and installing heater and air conditioning unit . . . 496
5.12 Removing and installing air intake box of heater and air conditioning unit . . . 512
5.13 Removing and installing heater housing (left-side, with temperature flaps) . . . 516
5.14 Removing and installing heater housing (right-side, with temperature flaps) . . . 520
5.15 Removing and installing dust and pollen filter . . . 531
5.16 Removing and installing fresh air blower V2 . . . 532
5.17 Removing and installing fresh air blower control unit J126 . . . 535
5.18 Preparations for removing heat exchanger . . . 537
5.19 Removing and installing heat exchanger . . . 543
5.20 Removing and installing condensation drain . . . 551
5.21 Checking condensation drain . . . 552
6 Air duct system . . . 554
6.1 Exploded view - routing of air flow and air distribution in passenger compartment . . . 554
6.2 Air intake and air outlet openings . . . 558
6.3 Removing and installing footwell vent (driver side) . . . 565
6.4 Removing and installing footwell vent (front passenger side) . . . 566
6.5 Installing plugs in air duct to centre vent . . . 566
6.6 Removing and installing forced ventilation vents in passenger compartment . . . 567
6.7 Checking forced ventilation vents in passenger compartment . . . 568
6.8 Removing and installing fresh air intake . . . 572
6.9 Removing and installing intake duct . . . 576
6.10 Removing and installing plenum chamber water drain . . . 577
6.11 Checking plenum chamber water drain . . . 579
6.12 Cleaning plenum chamber water drain . . . 583
6.13 Removing and installing dash panel vents and rear vent . . . 587
6.14 Connection for glove box cooling at air intake box . . . 587
6.15 Masking slots of air duct to vents (rear) . . . 588
7 Coolant circuit . . . 590
7.1 Layout, activation and operation of coolant shut-off valve N82 / N422 . . . 590
7.2 Layout, activation and operation of coolant circulation pump V50 (coolant pump V36) . . . 594
8 Operating and display unit . . . 600
8.1 Assignment of operating and display unit . . . 600
8.2 Removing and installing operating and display unit . . . 608
8.3 Removing and installing temperature sensor blower . . . 611
9 Further control components . . . 612
9.1 Removing and installing sunlight penetration photosensor G107 . . . 612
9.2 Operation of air quality sensor G238 . . . 614
9.3 Checking air quality sensor G238 . . . 617

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9.4 Removing and installing air quality sensor G238 / humidity sender in fresh air intake duct G657 . . . 627
9.5 Removing and installing ambient temperature sensor G17 . . . 631
9.6 Removing and installing centre vent temperature sender G191 . . . 632
9.7 Removing and installing footwell vent temperature sender G192 / left footwell vent temperature sender G261 . . . 632
9.8 Removing and installing right footwell vent temperature sender G262 . . . 633
9.9 Removing and installing evaporator output temperature sender G263 . . . 633
9.10 Removing and installing humidity sender G355 . . . 634
9.11 Removing and installing rain and light sensor G397 . . . 637
9.12 Removing and installing front left chest vent temperature sensor G385 . . . 638
9.13 Removing and installing front right chest vent temperature sensor G386 . . . 639
9.14 Operation of humidity sender in fresh air intake duct G657 . . . 640
9.15 Checking humidity sender in fresh air intake duct G657 . . . 641
10 Battery cooling module . . . 642
10.1 Overview of fitting locations - components not located in passenger compartment . . . 642
10.2 Overview of fitting locations - components in passenger compartment (rear) . . . 646
10.3 Exploded view - battery cooling module . . . 648
10.4 Air intake, air outlet and routing of air flow at battery cooling module . . . 651
10.5 Exploded view - air ducts . . . 653
10.6 Removing and installing refrigerant shut-off valve 1 for hybrid battery N516 . . . 656
10.7 Removing and installing air outlet duct (rear) for drive battery A2 . . . 659
10.8 Removing and installing air outlet duct (front) for drive battery A2 . . . 661
10.9 Removing and installing air inlet duct for drive battery A2 . . . 663
10.10 Removing and installing air ducts (left and right) at drive battery A2 . . . 665
10.11 Moving battery cooling module to service position . . . 667
10.12 Removing and installing battery cooling module . . . 669
10.13 Removing and installing battery fan 1 V457 . . . 672
10.14 Removing and installing temperature sensor before evaporator for hybrid battery G756 . . . 674
10.15 Removing and installing temperature sensor after evaporator for hybrid battery G757 . . . 676
10.16 Removing and installing condensation drain . . . 678
10.17 Checking condensation drain . . . 680

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00 – Technical data

1 General notes

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⇒ “1.1 Type plates”, page 2

⇒ “1.2 Notes on odours in vehicles with air conditioner”, page 4

⇒ “1.3 Seat heating and seat ventilation (front)”, page 5

⇒ “1.4 Heated rear window”, page 12

⇒ “1.5 Notes on control of air conditioner (components in passenger compartment)”, page 14

⇒ “1.6 Notes on control of air conditioner (components not located in passenger compartment)”, page 15

⇒ “1.7 Notes on refrigerant circuit”, page 19

⇒ “1.8 Notes on heater and air conditioning unit (front)”, page 23

⇒ “1.9 Notes on operating and display unit”, page 26

⇒ “1.10 Overview - control motors of air conditioner”, page 30

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.

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Note

- *The label indicates the type of refrigerant used and the quantity of refrigerant and refrigerant oil with which the system was charged during production.*
- *Symbols on the label indicate the hazards which may be encountered when handling the refrigerant or working on the refrigerant circuit.*
- *For all air conditioners up to 06/2016, the refrigerant circuit is charged with refrigerant R134a. From 06/2016 onwards (gradual introduction), refrigerant R134a or R1234yf may be used, depending on the country version and vehicle model ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 00 ; Laws and regulations .*
- *Standards and regulations may also be listed, such as certain SAE standards applicable in the USA. SAE J639 specifies the safety warnings for air conditioners in passenger cars. SAE J842 specifies that all components and materials must be approved for use with refrigerant R1234yf; SAE J2845 states that only trained and certified individuals may perform repairs and service on the refrigerant circuit of the air conditioner.*
- *Depending on the version and production period, the GWP (global warming potential) value may be included for the refrigerant used.*
- *The capacities and type of refrigerant oil listed on the label apply to the status at the time of the vehicle's production. Always refer to the vehicle-specific Workshop Manual for the current applicable values ⇒ “4 Technical data”, page 107 , ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .*

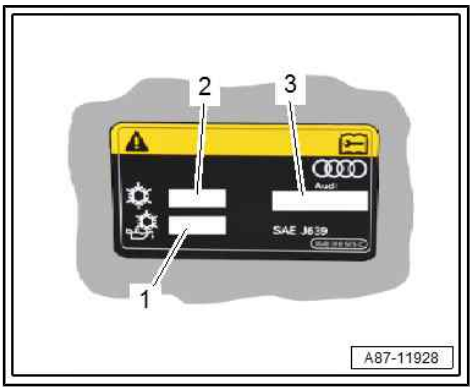
The type plate indicating the type of refrigerant and the refrigerant capacity is located on the bottom left of the bonnet.

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 109).

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 conditioners with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical and physical principles .

3 - Refrigerant capacity

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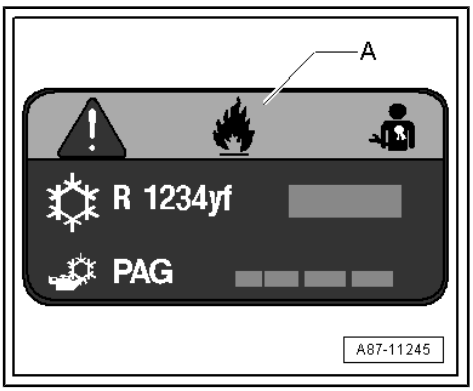
Note

- *For refrigerant R134a and refrigerant oil capacities, as well as approved refrigerant oils, refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils .*
- *For refrigerant R1234yf and refrigerant oil capacities as well as approved refrigerant oils, refer to ⇒ “4 Technical data”, page 107 , and ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 00 ; Technical data .*

Version 3



Note

Explanation of information on label -A- ⇒ page 3 .

1.2 Notes on odours in vehicles with air conditioner

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

Type of odour	Possible cause and remedy
Smell of burnt oil	♦ Usually originates in engine compartment due to leak(s) in engine or gearbox – Eliminate leak(s) in engine or gearbox.
Sulphurous smell of exhaust gas	♦ Leak(s) in exhaust system ♦ Exhaust gas entering passenger compartment (e.g. when reversing through a cloud of exhaust fumes) – Eliminate leak(s) in exhaust system.
Fishy smell of coolant	♦ Leak(s) in engine cooling system or air conditioner heat exchanger – If fishy odour occurs in both fresh air and air recirculation mode, check air conditioner heat exchanger for leaks.
Scorched clutch smell	♦ Clutch linings worn or clutch operated incorrectly – Check clutch.
Other odours	♦ Floor mats, retrofitted protective seat covers etc. – Check and renew or clean floor mats or protective covers.
Mouldy smell from front end of vehicle	♦ Water can enter fresh air intake via drip rail if plenum chamber cover is damaged or not installed properly. – Check fresh air intake of air conditioning unit ⇒ page 572 ♦ Deposits (leaves, pine needles etc.) may have accumulated in plenum chamber. – Check plenum chamber for deposits ⇒ page 579 . ♦ Water may not be able to drain out of plenum chamber. – Check water drains ⇒ page 579 .
Odour from air conditioning unit	♦ Too much water condensation in air conditioning unit – Check condensation drain ⇒ page 551 . ♦ Old or severely contaminated dust and pollen filter – Check dust and pollen filter ⇒ page 531 . ♦ Deposits on evaporator fins – Clean evaporator ⇒ page 473 .

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Note

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

– Select path:

Audi ServiceNet
Products
Maintenance and wear
Air conditioner cleaning

Or

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

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1.3 Seat heating and seat ventilation (front)

Note

Various electrical components in the vehicle (e.g. the heated rear window - Z1- and the heated seats), which do not form part of the air conditioner, are activated by the air conditioner operating and display unit (Climatronic control unit - J255-). For example, for the heated rear window - Z1- the activation request is transmitted via the convenience system central control unit - J393- which then activates the heated rear window - Z1- via the heated rear window relay - J9- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations. Perform electrical check of these components as described in Guided Fault Finding for air conditioner and for convenience system central control unit - J393- . ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding)

Components involved in activation of seat heating and seat ventilation

The air conditioner operating and display unit (Climatronic control unit - J255-) sends the request to switch on the seat heating/ ventilation over the data bus to the responsible control unit (control unit depending on model and vehicle equipment ⇒ Vehicle

diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") for the control unit concerned).

- On vehicles without seat and steering column adjustment control unit with memory - J136- , the onboard supply control unit - J519- activates the driver's seat heating directly. The seat ventilation (if fitted) is activated via the control unit for front left seat ventilation - J800- by the -J519- (different assignment of measured value blocks in -J519-).
- On vehicles without front passenger seat adjustment with memory control unit - J521- , the onboard supply control unit - J519- activates the passenger's seat heating directly. The seat ventilation (if fitted) is activated via the control unit for front right seat ventilation - J799- by the -J519- (different assignment of measured value blocks in -J519-).
- On vehicles with a driver's seat with Easy Entry facility and/or with memory function, the seat and steering column adjustment control unit with memory - J136- activates the driver's seat heating and seat ventilation (if fitted) directly (different assignment of measured value blocks in -J519-).
- On vehicles with a front passenger seat with electric Easy Entry facility, the front passenger seat adjustment with memory control unit - J521- activates the seat heating on the passenger side.
- From model year 2010 onwards, a start/stop system (optional equipment) is offered for this vehicle in combination with certain engines. On vehicles with start/stop system, the seat heating and ventilation might be switched off while the stop function is active (to protect the battery - A-). However, the setting for the activation of the seat heating (and ventilation) remains stored in the operating and display unit (Climatronic control unit - J255-). After the engine has been switched on again via the start function, the seat heating and ventilation is switched on again ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

- *The control unit for front right seat ventilation - J799- and the control unit for front left seat ventilation - J800- are activated by the onboard supply control unit - J519- via a local data bus ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *The activation of the seat heating and seat ventilation may vary between the Audi A5 and the Audi A4 ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *Depending on the model and vehicle equipment, the various pieces of information on the activation of the seat heating and the seat ventilation (setting transmitted by the air conditioner operating and display unit, Climatronic control unit - J255- , specified and actual seat temperature, etc.) are displayed in the various measured value blocks of the onboard supply control unit - J519- and / or the seat and steering column adjustment control unit with memory - J136- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *Depending on the production period and the vehicle version, the rear seat heating may be activated e.g. by the seat heating control unit - J882- installed at the rear right of the luggage compartment at the wheel housing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

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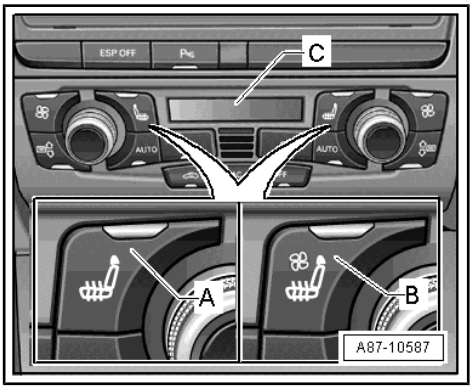

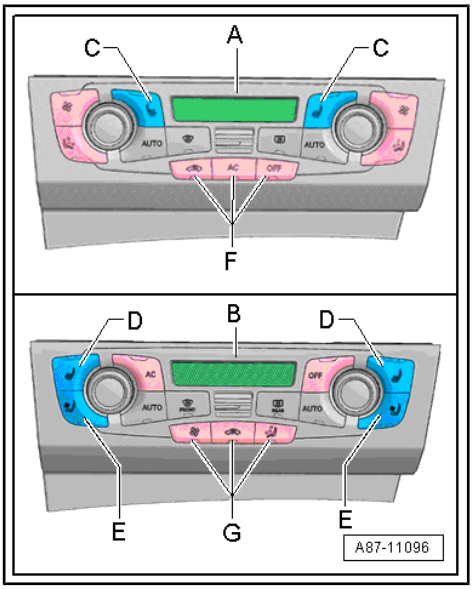

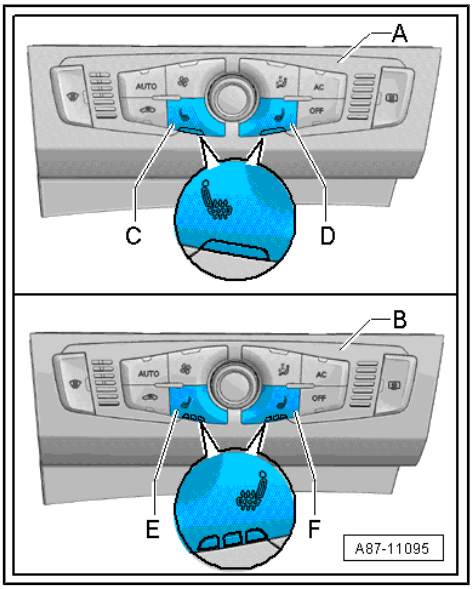

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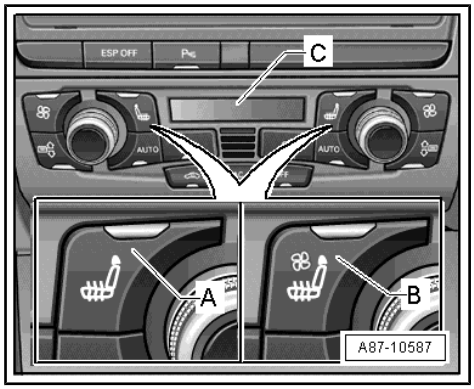

- If a condition prevails in which the heating or ventilation of the driver's seat or front passenger's seat cannot be activated (e.g. short circuit in connection to seat heating element, open circuit in power supply to corresponding control unit), this is stored as a fault in the onboard supply control unit - J519- , the seat and steering column adjustment control unit with memory - J136- or the front passenger seat adjustment with memory control unit - J521- (depending on model and vehicle equipment). On this vehicle, no information is currently transmitted via the data bus to the air conditioner operating and display unit (Climatronic control unit - J255-) indicating that the event memory in the relevant control unit or in the convenience system central control unit - J393- has to be read out ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . In the event of problems with seat heating or ventilation, the first step should therefore always be to read out the event memories of the control units which activate the seat heating and ventilation.
- The function test for the activation of the seat heating and the seat ventilation is detailed in the Guided Fault Finding for the corresponding control unit (onboard supply control unit - J519- , control unit for seat and steering column adjustment with memory - J136- or control unit for front passenger seat adjustment with memory - J521- depending on model and vehicle equipment)⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- If, for example, the voltage measured at the onboard supply control unit - J519- at terminal “30” drops below a value stored in the onboard supply control unit - J519- , the seat heating and ventilation power is reduced or is completely deactivated to reduce the load on the alternator - C- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- The seat heating or seat ventilation level is displayed in the measured value block of the air conditioner operating and display unit (Climatronic control unit - J255-). Depending on the version and the equipment of the vehicle, the activation of the seat heating and seat ventilation as well as the actual and specified temperatures in the seat and the actual current flowing via the seat heating etc. are displayed in the corresponding control unit, e.g. in the measured value block of the onboard supply control unit - J519- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Depending on the version of the vehicle, the heating or ventilation of the front passenger's seat may be deactivated after a certain period if the system detects that the seat is not occupied ⇒ Owner's Manual .
- There are different versions of the air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Electronic parts catalogue . You can identify the different versions, for example, by the symbols in the buttons -A- (for vehicles with optional “seat heating”) and -B- (for vehicles with optional “seat heating/ventilation”).
- This illustration shows the air conditioner operating and display unit (Climatronic control unit - J255- , “deluxe” version) fitted from the start of production onwards.
- From model year 2012 onwards, modified -J255- control units are being gradually introduced (introduction depending on model and version); note correct assignment ⇒ Electronic parts catalogue .

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- The modifications to the “deluxe” version discernible when fitted include the following: On the -J255- -A- fitted from the start of production onwards, the seat heating and seat ventilation are selected using the buttons -C- and the rotary pushbutton. On -J255- -B- gradually introduced from model year 2012 onwards, the seat heating and seat ventilation are activated using two separate buttons -D- and -E-. In addition, the seat heating/seat ventilation on version -B- only has 3 settings (instead of 6 on version -A-). The seat heating setting selected is also reduced by one stage after a certain period of time (for more details, refer to ⇒ Owner's Manual). Furthermore, the arrangement of certain buttons -F- and -G- is different on the two versions.
- On the “basic” version, the two versions -A- and -B- (when installed) can only be distinguished by the seat heating buttons (on vehicles without seat heating, there are no obvious visible differences between the versions when they are installed). On -J255- -A- fitted from the start of production onwards, the seat symbols in the buttons -C- and -D- face in different directions. On -J255- -B- fitted from model year 2012 onwards, the seat symbols in the buttons -C- and -D- face in the same direction. On -J255- (version -B-), the seat heating is activated in 3 stages only (instead of 6 on version -A-). The selected seat heating setting is also reduced by one stage after a certain period of time (for more details, refer to ⇒ Owner's Manual).
- When the seat heating is switched on (e.g. with -J255- fitted at the start of production), the function indicator lamp in button -A- or -B- is on (“red”) and the selected seat heating setting appears on the display of the air conditioner operating and display unit (Climatronic control unit - J255- -C-) and the MMI display for a certain period. On the -J255- fitted from model year 2012 onwards, the setting selected is displayed directly in the button (lamp lights up). On these versions, the seat heating and seat ventilation can also be selected separately ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual . Therefore pay attention to the correct assignment of -J255- to the vehicle ⇒ Electronic parts catalogue .
- The seat heating and seat ventilation level is set on the air conditioner operating and display unit (Climatronic control unit - J255-); this setting is then transmitted via data bus to the onboard supply control unit - J519- . The specified temperatures for the different seat heating and seat ventilation settings are stored in the onboard supply control unit - J519- . Depending on the version of the onboard supply control unit - J519- and the production period of the vehicle, the specified temperature for the seat heating and seat ventilation may be different even if the setting on the air conditioner operating and display unit (Climatronic control unit - J255-) is the same ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (for the onboard supply control unit - J519-).

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Please also observe the following notes regarding the operation of the seat ventilation:

- When the seat ventilation is switched on (-J255- fitted at the start of production), the function indicator lamp in button -B- is on (“blue”) and the selected seat ventilation setting appears on the display of the air conditioner operating and display unit (Climatronic control unit - J255- -C-) and the MMI display for a certain period. On a -J255- fitted from model year 2012 onwards (gradual introduction), the setting selected is displayed directly in the seat ventilation button (lamp lights up) ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual .

- The specified temperature for the seat depends on the selected seat ventilation level (approx. 33 °C at level 1 and approx. 18 °C at level 6). If the measured temperature in the seat is below the specification, the seat heating is activated until the specified temperature is reached ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (e.g. for onboard supply control unit - J519-).
- Depending on the seat temperature and the selected seat ventilation level, the seat heating can be activated automatically by the control unit. However, while the seat ventilation is operating, the seat heating will heat only the seat cushion and the heating for the side bolsters will not be switched on ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- The activation of the fans for the seat cushion and backrest (two fans in each) depends on the selected seat ventilation level (approx. 40 % of maximum power at level 1 and approx. 85 % at level 6). At seat temperatures below 15 °C, the fans fitted in the seat are not activated; the fans for the seat cushion and backrest are only activated when a temperature over 15 °C is measured for this seat (the seat is heated via the seat heating element when the seat ventilation is switched on) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (e.g. for onboard supply control unit - J519- , -J136- and -J521- , depending on the vehicle) and ⇒ General body repairs, interior; Rep. gr. 72 ; Front seats and ⇒ General body repairs, interior; Rep. gr. 74 ; Covers and padding on front seats (for location of components in seat).
- The activation of the seat heating depends on the version of -J255- (3-level or 6-level seat heating or seat ventilation), the selected seat heating level and the measured value of the temperature sensor in the seat cushion (activation at level 1 up to approx. 18 °C and at level 3 or 6 up to approx. 40 or 60 °C) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (e.g. for onboard supply control unit - J519- , -J136- and -J521- , depending on vehicle), ⇒ General body repairs, interior; Rep. gr. 72 ; Front seats and ⇒ General body repairs, interior; Rep. gr. 74 ; Covers and padding on front seats (for location of components in seat).
- In seat ventilation mode, additional heating is provided depending on the selected seat ventilation level and the measured seat temperature (measured value of temperature sensor in seat cushion). At low seat temperatures, the output of the fans integrated in the seat can be reduced additionally ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (e.g. for onboard supply control unit - J519- , -J136- and -J521- , depending on vehicle).

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- The seat ventilation is activated depending on the model and vehicle equipment via various control units. The air conditioner operating and display unit (Climatronic control unit - J255-) sends information on the selected seat ventilation setting via the convenience system data bus to the responsible control unit (depending on the vehicle equipment and version, to the seat and steering column adjustment control unit with memory - J136- , the front passenger seat adjustment with memory control unit - J521- and the onboard power supply control unit - J519-) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations. -J136- and -J521- then activate e.g. the various fans integrated in the seats directly. The onboard supply control unit - J519- initially activates the control unit for front right seat ventilation - J799- and, where appropriate, the control unit for front left seat ventilation - J800- via a LIN bus (depending on the vehicle equipment); -J799- and, where appropriate, -J800- then actuate e.g. the various fans integrated in the seats ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (for - J519- , -J136- and -J521-).

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1.4 Heated rear window

Note

- *Various electrical components in the vehicle (e.g. the heated rear window - Z1- and the heated seats), which do not form part of the air conditioner, are activated by the air conditioner operating and display unit (Climatronic control unit - J255-). For example, for the heated rear window - Z1- the activation request is transmitted via the data bus to the convenience system central control unit - J393- which then activates the heated rear window - Z1- via the heated rear window relay - J9- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations. Perform electrical check of these components as described in Guided Fault Finding for air conditioner and for convenience system central control unit - J393- . ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding)*
- *If the heated rear window cannot be switched on for some reason (short circuit in connection to heated rear window relay - J9- , open circuit in power supply to convenience system central control unit - J393- or similar), this is stored as a fault in the convenience system central control unit - J393- , and the air conditioner operating and display unit (Climatronic control unit - J255-) is informed via the data bus that the event memory in the convenience system central control unit - J393- must be read out ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . The activation of the heated rear window - Z1- is displayed in the measured value block of the convenience system central control unit - J393- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *If the voltage at the onboard supply control unit - J519- or the voltage measured at terminal “30” drops below a value stored in the onboard supply control unit - J519- or in the air conditioner operating and display unit (Climatronic control unit - J255-), the heated rear window is deactivated completely (or the power is reduced). The load on the alternator - C- is then reduced ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *If the heated rear window has to be shut off due to undervoltage, the lamp in the button for the rear window heating in the air conditioner operating and display unit (Climatronic control unit - J255-) stays on. However, if it is shut off for longer than approx. 150 sec., the air conditioner operating and display unit (Climatronic control unit - J255-) switches off the lamp.*
- *The measured value block of the air conditioner operating and display unit (Climatronic control unit - J255-) shows that the heated rear window is switched on or indicates why there is no activation although there is a corresponding request ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The procedure for checking the activation of the heated rear window is described in the Guided Fault Finding function of the convenience system central control unit - J393- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

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- *At ambient temperatures below 0 °C, the rear window heating remains switched on until the ignition is switched off (the heating can be switched off manually any time). If the temperature rises above 0 °C while you are driving, the rear window heating is deactivated after the operating period (approx. 10 minutes) stored in the air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Owner's Manual .*
- *At ambient temperatures above 0 °C, the heated rear window can be deactivated automatically by the air conditioner operating and display unit (Climatronic control unit - J255-) at the end of the operating period stored in the operating and display unit (approx. 10 minutes). The activation time depends on the coding and version of the operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *From model year 2010 onwards, a start/stop system (optional equipment) is offered for this vehicle in combination with certain engines. On vehicles with a start/stop system, the rear window heating can be deactivated while the stop function is active (to protect the battery - A-). However, the setting for the activation of the heated rear window - Z1- remains stored in the operating and display unit (Climatronic control unit - J255-). After the engine has been switched on again via the start function, the rear window heating is switched on again ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

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1.5 Notes on control of air conditioner (components in passenger compartment)

Note

- *If there is a fault in the air conditioner, first read out the event memory of the air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . If the display indicates that the event memory of another control unit should be read out, read out the event memory of this control unit as well (e.g. onboard supply control unit - J519- , convenience system central control unit - J393-). Certain air conditioner components (e.g. air conditioner compressor regulating valve - N280- , refrigerant pressure and temperature sender - G395-) are no longer activated directly by the air conditioner operating and display unit (Climatronic control unit - J255-), or their measured values are no longer evaluated directly by the air conditioner operating and display unit (Climatronic control unit - J255-).*
- *If no fault is displayed, read out the measured value block of the air conditioner operating and display unit (Climatronic control unit - J255-) and activate any faulty component via the "Final control diagnosis" function ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The "Electrical check" function is not described in this Workshop Manual. When performing the electrical check via the "Guided Fault Finding" function, information is provided on the functions to be checked. ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding)*
- *The temperature-dependent resistance values for the various temperature sensors are listed in tables which can be called up via the "Guided Fault Finding" function. ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding)*
- *The electrical check for the various control motors is described in Guided Fault Finding. ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding)*
- *How to service the refrigerant circuit is described from ⇒ page 145 onwards.*

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- Perform the following operations after completing the repair work ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") :

– Interrogate the event memory of the air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed.

– Check coding of air conditioner operating and display unit (Climatronic control unit - J255-).

– Check adaption of air conditioner operating and display unit (Climatronic control unit - J255-).

– Perform basic setting for air conditioner.

⇒ “1.2 Overview of fitting locations - components in passenger compartment (front)”, page 130

1.6 Notes on control of air conditioner (components not located in passenger compartment)

⇒ “1.6.1 Notes on components not located in passenger compartment - all versions”, page 15

⇒ “1.6.2 Notes on components not located in passenger compartment - vehicles with high-voltage system”, page 17

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1.6.1 Notes on components not located in passenger compartment - all versions

Note

- *If there is a fault in the air conditioner, first read out the event memory of the air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . If the display indicates that the event memory of another control unit must be read out, also read out the event memory of this control unit (e.g. onboard supply control unit - J519- , convenience system central control unit - J393-). Certain components of the air conditioner (e.g. air conditioner compressor regulating valve - N280- , refrigerant pressure and temperature sender - G395-) are no longer activated directly by the air conditioner operating and display unit (Climatronic control unit - J255-), or their measured values are no longer evaluated directly by the air conditioner operating and display unit (Climatronic control unit - J255-).*
- *If no fault is displayed, read out the measured value block of the air conditioner operating and display unit (Climatronic control unit - J255-) and activate any faulty component via the “Final control diagnosis” function ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The “Electrical check” function is not described in this Workshop Manual. When performing the electrical check via the “Guided Fault Finding” function, information is provided on the functions to be checked. ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding)*
- *The temperature-dependent resistance values for the various temperature sensors are listed in tables which can be called up via the “Guided Fault Finding” function. ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding)*
- *The electrical check of the various control motors is described in the Guided Fault Finding mode ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *How to service the refrigerant circuit is described from ⇒ page 145 onwards.*

- Perform the following work after completing the repairs:

– Interrogate the event memory of the air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Check encoding of the conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
– Check adaption of air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
– Perform basic setting for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

- *Components not located in the passenger compartment and only fitted on vehicles with a high-voltage system (hybrid vehicles) or differing from those in vehicles with no high-voltage system*
  ⇒ "10.1 Overview of fitting locations - components not located in passenger compartment", page 642
- *Detaching and attaching coolant hoses at connections to heat exchanger of air conditioning unit ⇒ page 543*
- *Incorporation of air conditioning unit heat exchanger into engine coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses*
- *Depending on the production period of the vehicle, certain models may be fitted with joints in the refrigerant lines (currently not implemented, introduction not yet finalised) ⇒ Electronic parts catalogue . As is the case with the connections at the various components, these joints should only be unfastened after discharging the refrigerant circuit ⇒ page 145 and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .*
- *Vehicles with a 6-cyl. petrol engine or with other engines in combination with certain optional extras (e.g. vehicles with a start/stop system) but without an auxiliary heater (optional extra) are fitted with a coolant circulation pump - V50- (coolant pump - V36-) ⇒ page 126 and ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly .*
- *Depending on the version of the air conditioner operating and display unit (Climatronic control unit - J255-), the coolant circulation pump - V50- may also be referred to as coolant pump - V36- in the Guided Fault Finding routine ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The version of the coolant circulation pump - V50- (coolant pump - V36-) and the activation of the pump(s) differ depending on the vehicle version and production period. From model year 2012 onwards and depending on the engine, the pumps fitted from the start of production onwards and activated via a 500 hertz signal (500 pulses per second) are gradually being replaced by pumps activated via a variable signal (100 ... 500 hertz). The pumps activated via a variable signal are equipped additionally with a diagnostic function and are generally activated via the corresponding engine control unit. Therefore it is important to observe the correct assignment (only the assigned pump can be activated) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Electronic parts catalogue .*

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1.6.2 Notes on components not located in passenger compartment - vehicles with high-voltage system

Note

- *If there is a fault in the air conditioner, first read out the event memory of the air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . If the display indicates that the event memory of another control unit must be read out, also read out the event memory of this control unit (e.g. onboard supply control unit - J519- , convenience system central control unit - J393-). Certain components of the air conditioner (e.g. air conditioner compressor regulating valve - N280- , refrigerant pressure and temperature sender - G395-) are no longer activated directly by the air conditioner operating and display unit (Climatronic control unit - J255-), or their measured values are no longer evaluated directly by the air conditioner operating and display unit (Climatronic control unit - J255-).*
- *If no fault is displayed, read out the measured value block of the air conditioner operating and display unit (Climatronic control unit - J255-) and activate any faulty component via the "Final control diagnosis" function ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The "Electrical check" function is not described in this Workshop Manual. When performing the electrical check via the "Guided Fault Finding" function, information is provided on the functions to be checked. ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding)*
- *The temperature-dependent resistance values for the various temperature sensors are listed in tables which can be called up via the "Guided Fault Finding" function. ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding)*
- *The electrical check of the various control motors is described in the Guided Fault Finding mode ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *How to service the refrigerant circuit is described from ⇒ page 145 onwards.*

- Perform the following work after completing the repairs:

– Interrogate the event memory of the air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Check encoding of the conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Check adaption of air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Perform basic setting for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles

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⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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1.7 Notes on refrigerant circuit

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

If work is necessary in the vicinity of high-voltage system components, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

If work is necessary on components of the high-voltage system, de-energise the high-voltage system ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system and note ⇒ Electrical

system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

Note

The control unit for air conditioning compressor - J842- integrated into the electrically driven air conditioner compressor regulates the speed and thus the output of the air conditioner compressor (electrical air conditioner compressor - V470-).

Vehicles without high-voltage system

Note

- *The air conditioner compressor without air conditioning system magnetic clutch - N25- is always driven when the engine is running. On vehicles with an air conditioner compressor without -N25- , it is therefore important not to 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. The internal heat generation is caused by the air conditioner compressor operating against a fixed resistance even at approximately 0 % delivery rate (sealed circuit).*
- *From model year 2012 onwards, air conditioner compressors with an additional air conditioning system magnetic clutch - N25- fitted are gradually being introduced for certain vehicles with 4-cyl. engines ⇒ page 365 . In certain air conditioner operating modes (e.g. “Econ” mode), the air conditioner compressor drive system is deactivated completely via this magnetic clutch. For -N25- to be activated by the operating and display unit (Climatronic control unit - J255-), the correct version of -J255- must be fitted and correctly encoded ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .*
- *To prevent the air conditioner compressor from being damaged irreparably when the refrigerant circuit is empty, it is designed so that delivery is reduced to roughly 0 % and lubrication is maintained via an internal oil circuit with the residual oil left in the air conditioner compressor.*

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All vehicles

Note

- *Do not top up refrigerant in refrigerant circuit (discharge, evacuate and re-charge circuit) ⇒ "4 Technical data", page 107 , ⇒ 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 conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .*
- *Replacement compressors contain the full quantity of refrigerant oil required for the refrigerant circuit ⇒ "4 Technical data", page 107 , ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .*
- *Different refrigerant oils are specified for Denso, Sanden and Zexel/Valeo air conditioner compressors ⇒ "4 Technical data", page 107 , ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a, refrigerant oil and approved refrigerant oils , ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data , and ⇒ Electronic parts catalogue .*
- *Lubricate O-rings lightly with refrigerant oil before fitting ⇒ page 106 .*
- *The specified O-ring diameters and the tightening torques also apply to the bolt connections of the refrigerant lines and refrigerant hoses between the individual components.*
- *Only fit O-rings approved for refrigerant R134a ⇒ page 106 , ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components and ⇒ Electronic parts catalogue .*
- *Checking cooling output ⇒ page 71*
- *Check pressures in 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 conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .*
- *For all other refrigerant circuit servicing and testing work not described in this Workshop Manual, refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .*
- *Start up air conditioner after charging refrigerant circuit ⇒ page 271 .*
- *From the start of production up to the conversion from model year 2012 onwards, evaporators with a width (block depth) of approx. 40 mm were fitted (air conditioning unit with part number "8K_ 820 005"). From model year 2012 onwards and depending on the vehicle version, evaporators with a width (block depth) of approx. 50 mm are being introduced gradually (air conditioning unit with part number "8T_ 820 005"). Pay attention to the correct assignment of the expansion valve to the evaporator (different versions) ⇒ Electronic parts catalogue .*

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1.8 Notes on heater and air conditioning unit (front)

Levers and connecting elements on air conditioning unit
⇒ page 24

Air conditioning unit and air distribution housing (deluxe versions)
⇒ page 25

Observe notes on control of components located in passenger compartment ⇒ page 14 .

There are different versions of the air conditioning unit (for left-hand drive or right-hand-drive vehicles, for vehicles with “deluxe” or “basic” air conditioners etc.) ⇒ Electronic parts catalogue .

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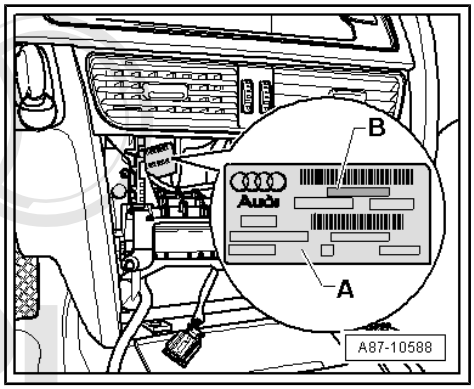
Note



- *The different versions of the air conditioning unit can be distinguished from the outside by the part number -B- on the label -A- ⇒ Electronic parts catalogue .*
- *The part number -B- on the label -A- can be read e.g. when the CD changer is removed (depending on vehicle equipment) ⇒ Communication; Rep. gr. 91 ; DVD/CD changer; Removing and installing CD changer .*
- ⇒ “4.1.1 Overview of fitting locations - control motors (front), basic version”, page 372
- ⇒ “4.1.2 Overview of fitting locations - control motors (front), deluxe version”, page 381

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Note

- *Routing of air flow in air conditioning unit and vehicle ⇒ page 554*
- *Removing and installing air conditioning unit ⇒ page 496*
- *Removing and installing air intake box of air conditioning unit ⇒ page 512*
- *On this vehicle, the various control motors at the air conditioning unit are adapted and activated via a data line. The various control motors are connected in series via this data line (LIN bus) to the air conditioner operating and display unit (Climatronic control unit - J255-). The sequence differs for the different versions of the air conditioning unit ⇒ page 30 and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *From 01.2008 onwards, air conditioning units with an additional connection for glove box cooling are being introduced gradually. This connection is sealed with a plug on vehicles without glove box cooling ⇒ page 587 .*
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*
- *From model year 2012 onwards (introduction depending on vehicle version), modified air conditioning units are gradually being introduced (air conditioning unit with part number “8T_820 005”). At the same time as this conversion, different control motors are introduced. Currently the various versions of the control motors can be fitted with both air conditioning unit versions (mixed installation is currently permissible) ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

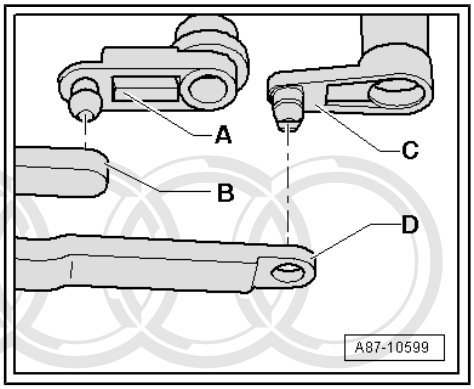
Note

Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .

Levers and connecting elements on air conditioning unit

Note

There are different versions of the levers and connecting elements at the air conditioning unit. Levers -A- with a solid pin and connecting rod -B- were fitted at the start of production. In model year 2008, a gradual change was made to levers -C- with a slotted pin and connecting rod -D-. Observe correct version when renewing ⇒ Electronic parts catalogue .

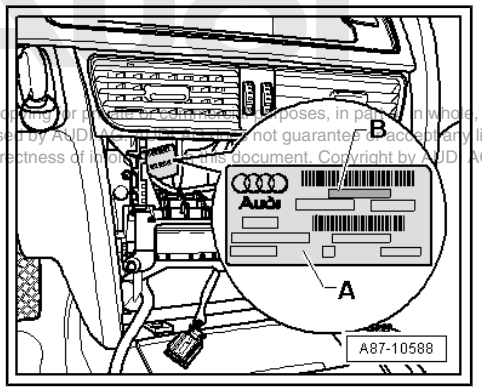


Air conditioning unit and air distribution housing (“deluxe” versions)

Different versions only fitted on vehicles with “deluxe” air conditioner (up to and from 08.2007 onwards, gradual conversion)

Note

- *No modifications were made in 2007 to the air conditioning unit and the air distribution housing of the “basic” air conditioner.*
- *From 08.2007 onwards, “deluxe” air conditioning units with air distribution housing with optimised routing of air flow are gradually being introduced (versions “2”) ⇒ Electronic parts catalogue . These two versions of the air conditioning unit can be distinguished from the outside by the part number -B- on the label -A-.*
- *The part number -B- on the label -A- can be read e.g. when the CD changer is removed (depending on vehicle equipment) ⇒ Communication; Rep. gr. 91 ; DVD/CD changer; Removing and installing CD changer .*
- *Pay attention to correct assignment and adaption of operating and display unit (Climatronic control unit - J255-) to air conditioning unit (version 1 or 2 with or without optimised routing of air flow in air distribution housing) ⇒ page 600 (Removing and installing Climatronic control unit - J255-).*



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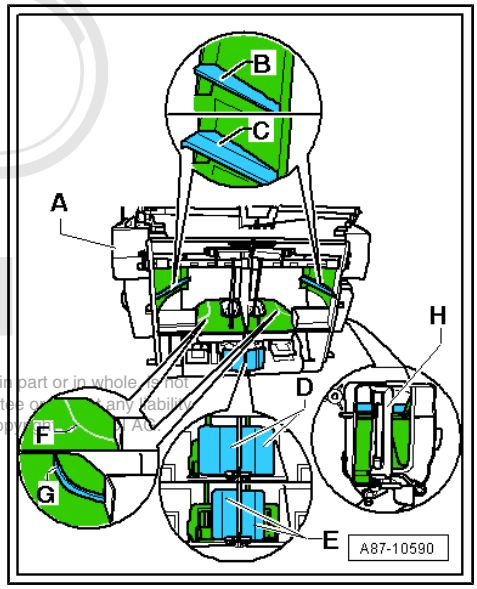
Versions of “deluxe” air conditioning unit:

- Air conditioning unit for left-hand drive vehicles (with part number “8K1 820 005”) and for right-hand drive vehicles (with part number “8K2 820 005”) up to index “S” in each case (version 1 without optimised routing of air flow in air distribution housing)
- Air conditioning unit for left-hand drive vehicles (with part number “8K1 820 005”) and for right-hand drive vehicles (with part number “8K2 820 005”) from index “AB” onwards in each case (version 2 with optimised routing of air flow in air distribution housing)
- The versions of the air conditioning unit (with or without optimised routing of air flow in air distribution housing) can be distinguished when installed in the vehicle, with the footwell vents removed and the footwell flap -H- (left or right) open, by the tear-off edge -G- (tear-off edge -G- on version 2 only.).
- Only version 2 (optimised routing of air flow) of the air distribution housing -A- is supplied as a replacement part ⇒ Electronic parts catalogue .



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Distinguishing features of versions 1 and 2 of the air distribution housing -A-

Air distribution housing -A- (version 1)

- Air duct -B- approx. 12 mm wide on both sides, no tear-off edge
- Partitions -D- in hot-air ducts to rear left and right footwell approx. 70 mm wide (together)
- Lower partitions -F- (left and right) without tear-off edge

Air distribution housing -A- (version 2)

- Air duct -C- approx 20 mm wide on both sides, additional tear-off edge
- Partitions -E- in hot-air ducts to rear left and right footwell approx. 35 mm wide (together)
- Lower partitions (left and right) with additional tear-off edge -G-

1.9 Notes on operating and display unit

– Removing and installing air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ page 608

Note

- *Currently operating and display units (Climatronic control unit - J255-) cannot be exchanged in the familiar manner (component protection active). The component protection (anti-theft protection) can only be cancelled by entering certain vehicle data ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *If an air conditioner operating and display unit (Climatronic control unit - J255-) with active component protection (anti-theft protection) is installed in a different vehicle, only the functions required for the safety of the vehicle can still be selected; the convenience functions can no longer be selected ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *When renewing an air conditioner operating and display unit (Climatronic control unit - J255-), It is important that you observe the exact assignment. Different versions for vehicles with “basic” or “deluxe” air conditioner, for left-hand-drive or right-hand-drive vehicles, with or without seat heating and/or seat ventilation button etc. ⇒ Electronic parts catalogue*
- *The seat heating and seat ventilation level is set on the air conditioner operating and display unit (Climatronic control unit - J255-); this setting is then transmitted via data bus to the onboard supply control unit - J519- . The specified temperatures for the different seat heating and seat ventilation settings are stored in -J519- . Depending on the version of the -J519- and the production period, the specified temperature for the seat heating and seat ventilation may be different even if the setting on the air conditioner operating and display unit (Climatronic control unit - J255-) is the same ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (for -J519-).*
- *If a new air conditioner operating and display unit (Climatronic control unit - J255-) has been installed and basic setting has not been performed, air conditioner control is restricted, and this is displayed as a fault in the event memory. Therefore, after installing air conditioner operating and display unit (Climatronic control unit - J255-), perform basic setting for air conditioner as specified ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The buttons, display and rotary controls of the air conditioner operating and display unit (Climatronic control unit - J255-) are illuminated by LEDs (cannot be renewed).*
- *The function indicator lamps in the buttons and rotary controls and the rotary controls and buttons cannot be renewed separately.*
- *If the dash panel temperature sensor - G56- measurements are incorrect, check the intake grille of the trim panel in the air conditioner operating and display unit (Climatronic control unit - J255- ; must not be closed off) as well as the operation of the temperature sensor blower - V42- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The functions selected are indicated by the function indicator lamps lighting up in the various buttons and rotary controls or in the display zones of the Climatronic control unit - J255- above the buttons/controls.*

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- *Depending on the version of the air conditioner operating and display unit (Climatronic control unit - J255-), the functions currently selected may only be indicated on the display of the Multi Media Interface (MMI, on “basic” version) or on the display of the air conditioner operating and display unit (Climatronic control unit - J255-) and on the display of the Multi Media Interface (MMI, on “deluxe” version). The duration of the display can be set via the “Adaption” function of the Guided Fault Finding of the air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *If no faults are stored and the air conditioner operating and display unit (Climatronic control unit - J255-) is not functioning properly, check the adaption (the function may have been deactivated by a particular setting). If necessary, reset adaption in all adaption channels to factory setting ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *If there is a condition in which heating or ventilation of the driver's seat or front passenger's seat cannot be activated, this is stored as a fault in the onboard supply control unit - J521- , the seat and steering column adjustment control unit with memory - J136- or the front passenger seat adjustment with memory control unit - J519- (depending on model and vehicle equipment). On this vehicle, no information is currently transmitted via the data bus to the air conditioner operating and display unit (Climatronic control unit - J255-) indicating that the event memory in the relevant control unit or in the convenience system central control unit - J393- has to be read out ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . In the event of problems with seat heating or ventilation, the first step should therefore always be to read out the event memories of the control units which activate the seat heating and ventilation.*
- *From model year 2010 onwards, a start/stop system (optional equipment) is offered for this vehicle in combination with certain engines. On vehicles with a start/stop system, the stop function is prevented depending on the setting on the operating and display 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. The same also applies if the difference between the selected required temperature and the calculated actual temperature exceeds a certain value in heating or cooling mode ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *On vehicles with a start/stop system, an additional coolant pump is installed for the stop function (depending on the vehicle equipment and the version of the vehicle) ⇒ page 126 , ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly and ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding") .*

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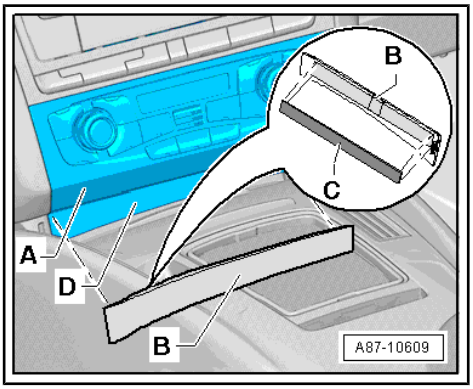
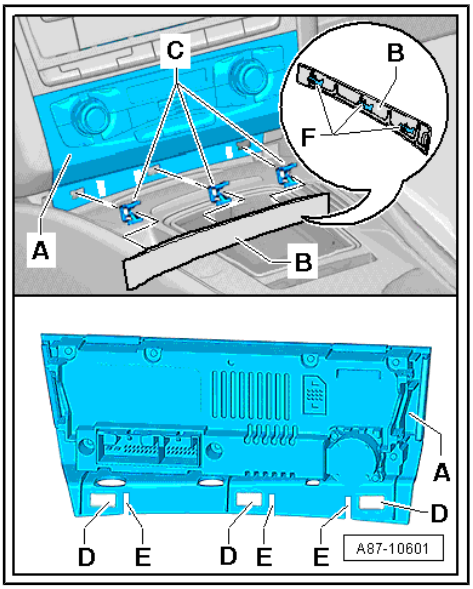
- On the Audi Q5, the operating and display unit (Climatronic control unit - J255-) -A- is fitted with an additional trim panel -B-.



Note

- *Replacement trim panels -B- are supplied with double-sided adhesive tape -C- already affixed ⇒ Electronic parts catalogue .*
- *If you want to re-use trim panel -B- when renewing the operating and display unit (Climatronic control unit - J255-) -A-, remove adhesive tape -C- from trim panel -B-. Clean bonding surface on trim panel -B- as described in usage and handling instructions for adhesive tape. Then stick a strip of double-sided adhesive tape -C- (dimensions: 204 mm x 10 mm, thickness approx. 1.2 mm; e.g. adhesive tape D 438 515 A1 ⇒ Electronic parts catalogue) onto the trim panel -B-.*
- *At the start of production, this trim panel -B- was secured with clips -C- in recesses -D- of the operating and display unit (Climatronic control unit - J255-) -A-. At a later date, a new version of the trim panel -B- is used which is secured with suitable two-sided adhesive tape. These trim panels -B- are then no longer provided with the retaining tabs -F- ⇒ Electronic parts catalogue .*
- *As it is not possible to make the recesses -D- and the slits -E- yourself, only the version of the trim panel -B- which is attached to the operating and display unit (Climatronic control unit - J255-) -A- with double-sided adhesive tape is supplied as a replacement part ⇒ Electronic parts catalogue .*



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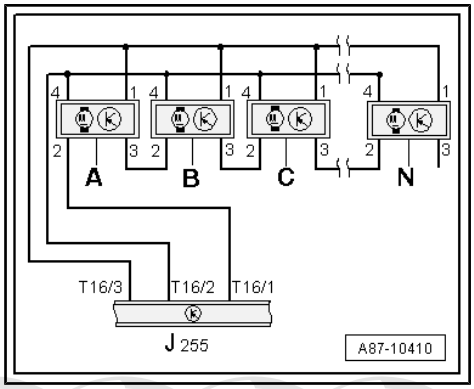
1.10 Overview - control motors of air conditioner



Note

- *From model year 2012 onwards (introduction depending on vehicle version), modified air conditioning units are gradually being introduced (air conditioning unit with part number "8T_ 820 005"). At the same time as this conversion, different control motors are introduced. Currently the various versions of the control motors can be fitted with both air conditioning unit versions (mixed installation is currently permissible) ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *On this vehicle, the various control motors (-A- to -N-) at the air conditioning unit are adapted and activated via a data line. The various control motors (-A- to -N-) are connected in series via this data line (LIN bus) to the air conditioner operating and display unit (Climatronic control unit - J255-). A fault in a control motor or in the wiring can lead to various entries with different types of fault in the event memory ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *The number of control motors at the air conditioning unit depends on the version of the air conditioner (6 control motors on "basic" version and 10 control motors on "deluxe" version) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *The sequence of the control motors in the wiring depends on the version of the air conditioner ("basic" or "deluxe") and on the vehicle model (left-hand or right-hand drive) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations. On left-hand drive vehicles with a "deluxe" air conditioner, e.g. position -A- is the fitting location of the left temperature flap control motor - V158- . On left-hand drive vehicles with a "basic" air conditioner, position -A- is the fitting location of the temperature flap control motor - V68- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

The effect of a fault and the type of fault stored in the event memory differ depending on the operating status or the "Guided Fault Finding" function of the air conditioner in which a specific fault occurs ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

- If there is a fault concerning the control motor sequence (two or more connectors or control motors interchanged during installation):

– These control motors will be adapted incorrectly in the basic setting function and the flaps will not be actuated correctly (incorrect assignment).

– Depending on the adjustment range for this control motor, an incorrect end stop will be detected during basic setting and stored as a fault in the event memory and basic setting will be terminated.

– The wrong flaps will be moved and the direction of air flow will be incorrect. Depending on the adjustment range of the control motor, this is not always recognised as a fault. Before unplugging, all connectors must therefore be marked and the basic setting must be performed after plugging the connectors back in again.

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- Faults which exist or occur during normal air conditioner operation may lead to the following event memory entries, depending on the type of fault:

– If there is a fault in the positive or earth connection to a control motor, this control motor can no longer exchange information with the air conditioner operating and display unit (Climatronic control unit - J255-) and the corresponding control motor is stored in the event memory.

– If there is a fault in the data line to a control motor (e.g. open circuit in connector to contact “2” of control motor -B-), this control motor and all the control motors (-C- to -N-) series-connected downstream of this control motor can no longer exchange information with the air conditioner operating and display unit (Climatronic control unit - J255-), and the corresponding control motor as well as those connected downstream of it are stored in the event memory.

– If there is a fault in the electronics of a control motor (e.g. in control motor -B-), control motor -B- may, depending on the type of fault, still be able to exchange information with the air conditioner operating and display unit (Climatronic control unit - J255-), but all control motors (-C- to -N-) connected downstream of this control motor are stored in the event memory.

- Faults which exist or occur during basic setting of the air conditioner may lead to the following event memory entries, depending on the type of fault:

– If there is a fault in the positive or earth connection to a control motor (e.g. control motor -B-), this control motor cannot exchange information with the air conditioner operating and display unit (Climatronic control unit - J255-) and is therefore not recognised during the basic setting function. As all control motors are re-assigned and re-adapted starting from the last control motor -N- during the basic setting function, this control motor is missing in the series. The air conditioner operating and display unit (Climatronic control unit - J255-) detects that a control motor is missing and stores the first control motor in the series circuit as missing (e.g. on left-hand drive vehicles with a “deluxe” air conditioner, the left temperature flap control motor - V158-). In addition, the fault “Automatic addressing not OK” is displayed and, on vehicles with certain control motors, possibly “Upper or lower limit value exceeded”.

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– If there is a fault in the data line to a control motor (e.g. open circuit in connector to contact “2” of control motor -C-), this control motor and all the control motors series-connected downstream of this control motor can no longer exchange information with the air conditioner operating and display unit (Climatronic control unit - J255-), and these control motors are therefore not recognised during the basic setting function. As all control motors are re-assigned and re-adapted starting from the last control motor -N- during the basic setting function, these control motors are missing in the series. The air conditioner operating and display unit (Climatronic control unit - J255-) detects that several control motors are missing (only control motors -B- and -A- are detected and assigned and adapted incorrectly as the air flow flap control motor - V71- and the air recirculation flap control motor - V113-). All other control motors (e.g. on left-hand drive vehicles with “deluxe” air conditioner from right footwell flap control motor - V109- to left temperature flap control motor - V158-) are stored as missing in the event memory and the entry “Automatic addressing faulty” is displayed.

– If there is a fault in the electronics of a control motor or if a fault occurs during the basic setting function (e.g. in control motor -C-), this control motor may, depending on the type of fault, still be able to exchange information with the air conditioner operating and display unit (Climatronic control unit - J255-), but will no longer be able to exchange data with any control motor (as far as control motor -N-) connected downstream of it. The air conditioner operating and display unit (Climatronic control unit - J255-) detects that several control motors are missing (only control motors -C- to -A- are assigned and adapted incorrectly as the air recirculation flap control motor - V113- , the air flow flap control motor - V71- and the right footwell flap control motor - V109-). All other control motors (e.g. on left-hand drive vehicles with “deluxe” air conditioner from right centre vent control motor - V111- to left temperature flap control motor - V158-) are stored as missing in the event memory and the entry “Automatic addressing faulty” is displayed.

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2 Safety precautions

⇒ “2.1 Safety precautions when handling refrigerants”, page 33

⇒ “2.2 Safety precautions when working on high-voltage vehicles”, page 36

⇒ “2.3 Safety precautions when working on vehicles with start/stop system”, page 43

⇒ “2.4 Safety precautions when using testers and measuring instruments during a road test”, page 43

⇒ “2.5 Safety precautions when working on the cooling system”, page 44

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 2 , and ⇒ “4 Technical data”, page 107 .

Refrigerant R134a

1.1.1.2 tetrafluoroethane (CF_3-CH_2F or CH_2F -CF_3)

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

Refrigerant R1234yf

2,3,3,3-tetrafluoropropene ($C_3H_2F_4$ or $CF_3CF = CH_2$)

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).

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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 conditioners 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.*

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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.*

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2.2 Safety precautions when working on high-voltage vehicles

⇒ “2.2.1 Working on vehicles with high-voltage system (hybrid vehicles)”, page 36

⇒ “2.2.2 Visual inspection of high-voltage components and wiring for damage”, page 41

2.2.1 Working on vehicles with high-voltage system (hybrid vehicles)

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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De-energising high-voltage system

DANGER!

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

- *The high-voltage system may only be de-energised by a suitably qualified person (Audi high-voltage technician).*
- *It must be definitely confirmed that the high-voltage system is de-energised. The system may only be de-energised using the vehicle diagnostic tester via "Guided Fault Finding".*
- *The qualified person (Audi high-voltage technician) confirms that the system is de-energised and uses the locking cap - T40262- to ensure that the system cannot be re-energised. As an additional precaution, the ignition key and the maintenance connector for high-voltage system - TW- are then stored in a safe place by the qualified person.*
- *The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.*

Note

- *De-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - De-energise high-voltage system (Rep. gr. 93)`

- The system must first be de-energised by a high-voltage technician before any work is done on the high-voltage system ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system .
- The types of work for which the high-voltage system has to be de-energised are indicated in the instructions for each procedure. For further information, see ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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Note

- *The high-voltage system must be de-energised before beginning any work on components of hybrid vehicles that are connected to the high-voltage system (e.g. the electrically driven air conditioner compressor).*
- *Work on the air conditioning system of hybrid vehicles that does not directly affect the high-voltage system (e.g. performing pressure test on refrigerant circuit, running Guided Fault Finding for air conditioner or control unit for air conditioning compressor - J842- etc.) must only be carried out by electrically instructed persons ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system and ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode for air conditioner and battery power regulation .*
- *For certain work on hybrid vehicle components that are installed near components of the high-voltage system (e.g. battery cooling module, expansion valve to air conditioning unit on Audi Q5 etc.), the high-voltage system must be de-energised prior to beginning work ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system .*

Re-energising high-voltage system

DANGER!

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

- *The high-voltage system may only be re-energised by a suitably qualified person (Audi high-voltage technician).*
- *The system may only be re-energised using the vehicle diagnostic tester via "Guided Fault Finding".*
- *The vehicle is then made ready for operation again by the qualified person (Audi high-voltage technician).*
- *The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.*

Note

- *Re-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - Re-energise high-voltage system (Rep. gr. 93)`

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Working with ignition switched on or high-voltage system active

DANGER!

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

Before switching on the ignition, perform the following steps:

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

Working on vehicles with a high-voltage system

- If work is necessary in the vicinity of high-voltage system components, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .
- If work is necessary on components of the high-voltage system, de-energise the high-voltage system ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .
- To minimise the number of automatic engine starts when the vehicle's drive system is active (READY) during test and measurement work, charge the vehicle batteries e.g. with the battery charger 60A - VAS 5904- in battery standby mode ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .
- For test and measurement work that requires the vehicle's drive system to be active (READY) or the ignition to be switched on, move the selector lever to position “P”, activate the parking brake and take care to keep well clear of the engine when it is running. Set up any tools needed so that they cannot come into contact with moving parts.

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Note

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

2.2.2 Visual inspection of high-voltage components and wiring for damage

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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Procedure: Performing visual inspection

- When performing the visual inspection of the engine compartment area, pay particular attention to the power and control electronics for electric drive, the high-voltage wiring for the battery and the air conditioner compressor and the high-voltage wiring for the electric drive motor.
- When performing a visual inspection of the vehicle underbody, pay attention to the high-voltage wiring and the corresponding covers.
- When performing the visual inspection at the rear of the vehicle, pay particular attention to the drive battery - A2- , the high-voltage wiring for the battery and the electronics box with the maintenance connector.

Check the following when performing the visual inspection:

- There must be no external damage on any high-voltage components.
- The insulation of the high-voltage wiring must be intact and undamaged.
- Check for unusual deformations of the high-voltage wiring.
- If you notice anything unusual or if anything is unclear, ask the responsible high-voltage technician or electrically skilled person.

- For further information on the high-voltage system, refer to ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Voltage levels in the high-voltage system of the hybrid vehicle constitute a safety hazard. Danger of electrocution!

- *It is very important to report any faults discovered to the high-voltage technician responsible immediately ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .*

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

WARNING

Risk of injury due to automatic engine start on vehicles with start/stop system.

- *On vehicles with activated start/stop system (indicated by a message in the instrument cluster), the engine may start automatically if it needs to.*
- *Therefore it is important to ensure that the start/stop system is deactivated when performing repairs (switch off ignition, if required switch on ignition again).*

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2.4 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.*

2.5 Safety precautions when working on the cooling system

Note the following when working on the cooling system:

WARNING

Risk of scalding due to hot steam and 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 45

⇒ “3.2 General notes”, page 45

⇒ “3.3 General repair instructions”, page 46

⇒ “3.4 Contact corrosion”, page 48

⇒ “3.5 Checking electrical air conditioner components activated or evaluated via other control units”, page 49

⇒ “3.6 Checking air conditioner components - vehicles with high-voltage system”, page 49

⇒ “3.7 Checking heating output”, page 52

⇒ “3.8 Checking cooling output”, page 71

⇒ “3.9 Working on refrigerant circuit”, page 103

⇒ “3.10 Discharging refrigerant circuit”, page 103

⇒ “3.11 Notes on dust and pollen filter with activated charcoal filter insert”, page 104

⇒ “3.12 Paint repairs on vehicles with air conditioning system”, page 105

⇒ “3.13 Refrigerant circuit seals”, page 106

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3.1 Rules for cleanliness

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

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

3.2 General notes

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

3.3 General repair instructions

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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Vehicles with start/stop system

WARNING

Risk of injury due to automatic engine start on vehicles with start/stop system.

- *On vehicles with activated start/stop system (indicated by a message in the instrument cluster), the engine may start automatically if it needs to.*
- *Therefore it is important to ensure that the start/stop system is deactivated when performing repairs (switch off ignition, if required switch on ignition again).*

All vehicles

WARNING

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

Note

Disconnect the battery - A- , second battery - A1- and drive battery - A2- before starting electric welding work on the vehicle. ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery

It is only permissible to discharge and open the air conditioner refrigerant circuit ⇒ page 103 (discharging refrigerant circuit) if this is required by the safety regulations ⇒ page 33 , or if components of the air conditioner refrigerant circuit must be renewed.

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

This Workshop Manual describes the servicing work which can be performed on the heater and air conditioner without opening the refrigerant circuit ⇒ page 145 (servicing refrigerant circuit), ⇒ page 116 (control components of air conditioner not located in passenger compartment) and ⇒ page 130 (control components of air conditioner in passenger compartment).

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 may therefore be renewed in any VW/Audi workshop without discharging the refrigerant circuit.

For a description of air conditioner servicing work for which the refrigerant circuit has to be discharged and which therefore cannot be performed at all VW/Audi workshops, refer to ⇒ page 145 (servicing refrigerant circuit). Specific tools are required when discharging the refrigerant circuit; moreover, such work may only be performed by qualified personnel. Therefore, if this type of maintenance is necessary, take the vehicle to a workshop which is equipped with the necessary tools, and where the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

3.4 Contact corrosion

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

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

Please note:

- If you have any doubts about whether certain parts can be reused, always use new components.
- We recommend the use of genuine replacement parts only as these have been checked and are compatible with aluminium ⇒ Electronic parts catalogue .
- We recommend using Audi Accessories ⇒ Electronic parts catalogue .

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

3.5 Checking electrical air conditioner components activated or evaluated via other control units

Note

- *Various air conditioner components are no longer activated directly by the air conditioner operating and display unit (Climatronic control unit - J255-). For example, the air conditioner compressor regulating valve - N280- is activated via the onboard supply control unit - J519- . The data are exchanged between the two control units via the data bus ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The measured values of various air conditioner components are no longer evaluated directly by the air conditioner operating and display unit (Climatronic control unit - J255-). For example, the pressure signal from the refrigerant pressure and temperature sender - G395- is evaluated by the onboard supply control unit - J519- , and the measured values are transmitted via the data bus to the air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *From model year 2010 onwards, a start/stop system (optional equipment) is offered for this vehicle in combination with certain engines. Depending on the setting on the operating and display unit (Climatronic control unit - J255-), the stop function can be prevented. 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. The same also applies if the difference between the selected required temperature and the calculated actual temperature exceeds a certain value in heating or cooling mode ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

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3.6 Checking air conditioner components - vehicles with high-voltage system

Hybrid vehicles

- Air conditioner (and refrigerant circuit) components which are identical on vehicles with and without a high-voltage system can be checked, removed and installed as described for vehicles with no high-voltage system (e.g. the control motors on the air conditioning unit) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding" for air conditioner) .
- Air conditioner components which are largely identical on vehicles with and without a high-voltage system, but which may differ for example in terms of their function, can be checked, removed and installed as described for vehicles with no high-voltage system (e.g. air conditioner operating and display unit, Climatronic control unit - J255-) ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding" for air conditioner) .
- Air conditioner (and refrigerant circuit) components which differ on vehicles with and without a high-voltage system (e.g. the electrical air conditioner compressor - V470- with the con-

trol unit for air conditioning compressor - J842-) should be checked, removed and installed as described for vehicles with a high-voltage system (e.g. -J842- with address word “40”) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . The control unit for air conditioning compressor - J842- (and thus the electrical air conditioner compressor - V470-) are supplied with power by the power and control electronics for electric drive - JX1- . Therefore - JX1- (address word “51”) must also be checked if there is a problem ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

- Air conditioner (and refrigerant circuit) components only fitted on vehicles with a high-voltage system (e.g. the electrical components of the battery cooling module, the refrigerant shut-off valve 1 for hybrid battery - N516- and the refrigerant shut-off valve 2 for hybrid battery - N517-) are removed and installed as described for vehicles with a high-voltage system. These components are not activated directly by the air conditioner operating and display unit (Climatronic control unit - J255-). They are activated e.g. via the battery regulation control unit - J840- (with address word “8C”) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

– To minimise the number of automatic engine starts when the vehicle's drive system is active (READY) during test and measurement work, charge the vehicle batteries e.g. with the battery charger 60A - VAS 5904- in battery standby mode ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

– Activate vehicle drive system (with ignition switched on, check "READY" display in control unit in dash panel insert - J285-).

Note

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

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3.7 Checking heating output

⇒ "3.7.1 Requirements for checking heating output and actuation of temperature flaps of air conditioner", page 52

⇒ "3.7.2 Checking heating output and actuation of temperature flaps of air conditioner", page 58

⇒ "3.7.3 Checking heating output and actuation of temperature flaps - basic version", page 61

⇒ "3.7.4 Checking heating output and actuation of temperature flaps - deluxe version", page 64

3.7.1 Requirements for checking heating output and actuation of temperature flaps of air conditioner

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

Working with ignition switched on or high-voltage system active

DANGER!

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

Before switching on the ignition, perform the following steps:

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

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– To minimise the number of automatic engine starts when the vehicle's drive system is active (READY) during test and measurement work, charge the vehicle batteries e.g. with the

battery charger 60A - VAS 5904- in battery standby mode ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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

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Note

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

All vehicles

Note

From 01.2008 onwards, air conditioning units with an additional connection for glove box cooling are being introduced gradually. This connection is sealed with a plug on vehicles without glove box cooling ⇒ page 587 . If the plug or the air duct are not properly fitted, cold air will be routed into the passenger's footwell, which may lead to customers complaining about poor heating output for the passenger's footwell.

- Coolant circuit bled as specified ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system
- Engine warm (coolant temperature above 80 °C)
- Radiator and condenser clean (clean if necessary)
- All air ducts, covers and seals OK and properly installed
- Air flow through dust and pollen filter not impeded by dirt ⇒ page 531
- Air intake (in fresh air and air recirculation mode) not impeded by dirt or retrofitted components
- Connection for glove box cooling sealed with a plug (on vehicles without “glove box cooling” as optional equipment), or air duct to glove box installed as specified (on vehicles with “glove box cooling” as optional equipment) ⇒ page 587
- Vehicle not exposed to direct sunlight
- Event memory of air conditioner operating and display unit (Climatronic control unit - J255-) interrogated and erased, basic setting performed and encoding of air conditioner operating and display unit (Climatronic control unit - J255-) checked ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")
- Adaption of air conditioner operating and display unit (Climatronic control unit - J255-) checked ⇒ Vehicle diagnostic,

testing and information system VAS 5051 ("Guided Fault Finding")

- All dash panel vents open
- Bonnet closed

Vehicles with high-voltage system (hybrid vehicles)

- Ignition on and drive system activated (READY); the engine only starts or runs if warmer coolant is required to attain the set temperature in the passenger compartment or e.g. the drive battery - A2- (hybrid battery) is not sufficiently charged.
- With ignition on and “warm” selected on air conditioner operating and display unit (Climatronic control unit - J255- , readout “HI” on display of air conditioner operating and display unit and Multi Media Interface)

DANGER!

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

Before switching on the ignition, perform the following steps:

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

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Vehicles without high-voltage system

- Engine running
- With engine running and “warm” selected on air conditioner operating and display unit (Climatronic control unit - J255- , readout “HI” on display of air conditioner operating and display unit and Multi Media Interface)

All vehicles

- With engine running (drive system active/READY on vehicles with high-voltage system) and “warm” selected on air conditioner operating and display unit (Climatronic control unit - J255- , readout “HI” on display of air conditioner operating and display unit and Multi Media Interface)

– Vehicles with Climatronic coolant shut-off valve - N422- / coolant shut-off valve - N82- ; if the valve is not activated, refer to ⇒ page 590 (valve not installed on all vehicles).

– On vehicles with a regulated coolant circuit (only fitted with certain engines from model year 2011 onwards), the related components must function and be activated properly ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly .

Note

-N489- / -N422- is currently not fitted in vehicles with an engine with regulated coolant circuit (e.g. vehicles with a regulated coolant pump and a coolant valve for cylinder head - N82-). On engines with a regulated coolant pump, the engine control unit activates the coolant pump to regulate coolant circulation ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly .

– If coolant circulation pump - V50- (coolant pump - V36-) is activated (this pump is not installed on all vehicles; it is installed e.g. on vehicles with 6-cyl. FSI engine, on vehicles with start/stop system without an auxiliary heater as optional equipment and on vehicles with high-voltage system), refer to ⇒ page 126 and ⇒ page 596 .
– If, on vehicles fitted with an auxiliary heater as an optional extra, the circulation pump - V55- for the auxiliary heater is activated and the heater coolant shut-off valve - N279- is not, refer to ⇒ Auxiliary/supplementary heater; Rep. gr. 82 ; Overview of fitting locations - auxiliary/supplementary heater; Overview of fitting locations - components not located in passenger compartment .

Note

Vehicles with auxiliary heater (optional equipment) are not fitted with -N422- / -N82- or -V50- (-V36-). On these vehicles the components of the auxiliary heater (heater coolant shut-off valve - N279- and circulation pump - V55-) assume this function ⇒ Auxiliary/supplementary heater; Rep. gr. 82 ; Overview of fitting locations - auxiliary/supplementary heater; Overview of fitting locations - components not located in passenger compartment .

The following is set on air conditioner operating and display unit (Climatronic control unit - J255-), “basic” version:

- “Auto” mode (indicator lamp in AUTO button on)
- “Cold” temperature setting (display “LO” on Multi Media Interface display)
- Air conditioner compressor switched on (lamp in AC/A/C button on)
- “Maximum speed” pre-selected for fresh air blower (speed “10” or higher indicated on Multi Media Interface display)

The following is set on air conditioner operating and display unit (Climatronic control unit - J255-), “deluxe” version:

- “Auto” mode (indicator lamps in both AUTO buttons on)
- “Cold” temperature setting for driver and front passenger side (display “LO” for driver and front passenger side on display of air conditioner operating and display unit and Multi Media Interface)
- Air conditioner compressor switched on (lamp in AC/A/C button on)
- “Maximum speed” pre-selected for fresh air blower (speed “10” or higher indicated on displays of air conditioner operating and display unit and Multi Media Interface)

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Note

- *The indicator lamp(s) in the AUTO button(s) goes/go out when the fresh air blower speed is altered manually.*
- *The maximum possible fresh air blower speed depends on various factors (coolant temperature, vehicle's electrical system voltage etc.).*

– On vehicles with a “deluxe” air conditioner, the potentiometer for rear temperature selection - G538- is set to “cold” (fitted in vent of rear centre console).

– On vehicles with “deluxe” air conditioner, vent in centre console (rear) is open.

– On vehicles with a diesel engine or a petrol engine with supplementary heater, the activation and operation of supplementary heater is OK.

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Note

- *The type of supplementary heater depends on the vehicle equipment. At the start of production, all vehicles with a diesel engine are fitted with an auxiliary air heater element - Z35- . At a later date, vehicles with an “auxiliary heater” (optional equipment) will no longer be fitted with an auxiliary air heater element - Z35- and the auxiliary heater will be activated as a supplementary heater.*
- *If there are problems with inadequate heating output at low ambient temperatures on vehicles with an auxiliary air heater element - Z35- , check the activation and operation of the supplementary heater ⇒ page 482 .*
- *In model year 2010, petrol engines designed for operation with bioethanol were introduced gradually (Flex Fuel Vehicle). These engines are currently also fitted with an auxiliary air heater element - Z35- ⇒ page 482 .*
- *Vehicles with a high-voltage system (hybrid vehicles) and petrol engine are currently equipped with an auxiliary air heater element - Z35- to provide a supplementary heating function ⇒ page 482 .*

Functions with engine running (not hybrid vehicles) / drive system/ READY activated (hybrid vehicles):

Note

On vehicles with a high-voltage system (hybrid vehicles) and vehicles with a start/stop system, the engine may only run if additional heating output is required to attain the set temperature.

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

Note

Depending on the version of the air conditioner operating and display unit (Climatronic control unit - J255-), the radiator fan(s) (radiator fan - V7- and radiator fan 2 - V177-) is/are only switched in when a certain pressure is reached in the refrigerant circuit (currently pressure of approx. 9 bar). The activation of the radiator fan(s) is displayed in the measured value block ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Fresh air blower - V2- running at maximum speed (speed “10” or higher)

Note

The maximum possible fresh air blower speed depends on various factors (coolant temperature, vehicle's electrical system voltage etc.).

– The air conditioner switches to air recirculation mode (approx. 1 minute after the engine is started or the drive system is activated (READY) on high-voltage vehicles, the air flow flap/ fresh air flap is closed and the air recirculation flap is opened; air is drawn in from the passenger compartment by the fresh air blower - V2- underneath the dash panel/behind the glove box).

Note

If any of these requirements are not met, interrogate the event memory, perform final control diagnosis and read out the measured value block ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

If the conditions listed above are met:

- Checking heating output and actuation of temperature flaps (“basic” air conditioner) ⇒ page 61
- Checking heating output and activation of temperature flaps (“deluxe” air conditioner) ⇒ page 64

3.7.2 Checking heating output and actuation of temperature flaps of air conditioner

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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Working with ignition switched on or high-voltage system active

DANGER!

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

Before switching on the ignition, perform the following steps:

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

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– To minimise the number of automatic engine starts when the vehicle's drive system is active (READY) during test and measurement work, charge the vehicle batteries e.g. with the battery charger 60A - VAS 5904- in battery standby mode ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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

Note

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

– Activate drive system (observe display in control unit in dash panel insert - J285-) ⇒ Owner's Manual .

All vehicles

⇒ “3.7.3 Checking heating output and actuation of temperature flaps - basic version”, page 61

⇒ “3.7.4 Checking heating output and actuation of temperature flaps - deluxe version”, page 64

3.7.3 Checking heating output and actuation of temperature flaps - “basic” version

Requirements satisfied ⇒ page 52

– Close bonnet.

– Close doors, windows, sun roof and rear lid.

– Open all dash panel vents.

– Switch on the ignition and activate the drive system (READY); the engine will start automatically if required (on vehicles with a high-voltage system).

– Start the engine (not on vehicles with a high-voltage system).

Set the following on the air conditioner operating and display unit (Climatronic control unit - J255-):

- “Auto” mode (indicator lamp in AUTO button on)
- “Cold” temperature setting (display “LO” on Multi Media Interface display)
- Air conditioner compressor switched on (lamp in AC/A/C button on)
- “Maximum speed” pre-selected for fresh air blower (speed “10” or higher indicated on Multi Media Interface display)
- Use rotary control to set air outflow direction on air conditioner operating and display unit to “footwell vents” and “dash panel vents” (indicated on display of Multi Media Interface).

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Note

- *The indicator lamp in the AUTO button goes out when the air flow direction and/or the fresh air blower speed is/are altered manually.*
- *The maximum possible fresh air blower speed depends on various factors (coolant temperature, vehicle's electrical system voltage etc.).*

– Start Guided Fault Finding for air conditioner and select “Read measured value block” function ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Allow air conditioner to run for several minutes at maximum cooling output (air conditioner compressor switched on, indicator lamp in AC or A/C button on).

– Compare measured value displayed for evaporator output temperature sender - G263- to measured values for centre vent temperature sender - G191- and footwell vent temperature sender - G192- .

Specifications:

- After 5 minutes, the measured values for -G191- and -G192- must not be more than 5 °C higher than the measured value for -G263- .

If the required values are not obtained, perform the fault finding measures to be taken in the event of an increase in temperature downstream of the evaporator ⇒ page 63 .

– Use a commercially available thermometer to measure the temperature of the air emerging from the dash panel vents (left, right and centre) and the front and rear footwell vents (left and right) and compare the measured values to those displayed for -G191- and -G192- .

Specifications:

♦ The values measured with the thermometer must not be more than 5 °C lower or higher than the measured values displayed for -G191- and -G192- .

If the required values are not obtained, perform the fault finding measures to be taken in the event of an increase in temperature downstream of the evaporator ⇒ page 63 .

– Use rotary control on air conditioner operating and display unit (Climatronic control unit - J255-) to select “warm” temperature setting (display “Hi” on Multi Media Interface display).

– Use a commercially available thermometer to measure the temperature of the air emerging from the dash panel vents (left, right and centre) and the front and rear footwell vents (left and right) and compare the measured values to those displayed for -G191- and -G192- .

Specifications:

♦ In the display zones the measured values displayed for -G191- and -G192- should increase to above 52 °C (depending on the current engine temperature).

♦ After 5 minutes, thermometer readings (temperature of air emerging from vents) must not be more than 5 °C below or above the measured values displayed for -G191- and -G192- .

Note

♦ *Depending on the engine (e.g. on vehicles with 8-cyl. engine), it may be necessary to increase the engine speed to between 1200 and 1500 rpm to attain the required temperature. At idle, the heating output of the engine or the volume of coolant conveyed through the heat exchanger is not sufficient with all engines to supply the heat exchanger with the heat energy required (e.g. on vehicles with 8-cyl. engine with idling speed of approx. 650 rpm).*

♦ *In the “warm” temperature setting, the specified outflow temperature at the evaporator is regulated to approx. 10 °C by the air conditioner operating and display unit (Climatronic control unit - J255-).*

♦ *On vehicles with a high-voltage system, reduce the speed of the fresh air blower - V2- if applicable. With the engine stopped and maximum fresh air blower speed, the delivery of the coolant circulation pump - V50- may not always be sufficient to attain the required heat output.*

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Check the following if results do not match specifications:

♦ Repeat heat output test at an engine speed of approx. 1500 to 2000 rpm (with a lower fresh air blower speed on vehicles with a high-voltage system). If the required heating output is attained at this speed (fresh air blower speed), the fault is not in the air conditioning unit, but in the coolant circuit (incorporation of air conditioner into coolant circuit, delivery rate of engine's coolant pump, flow of coolant through heat exchang-

er of air conditioning unit or similar ⇒ page 543 and ⇒ Rep. gr. 19 ; Cooling system/coolant).

- Coolant circuit properly bled ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
- Incorporation of heat exchanger for heater (in air conditioning unit) into coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses
- Activation and operation of temperature flap control motor - V68- and actuation of temperature flaps (via connecting rod) ⇒ page 563 , ⇒ page 386 and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")
- Foam seal at heat exchanger for heater of air conditioning unit ⇒ page 543
- Thermostat (engine coolant may not warm up properly if thermostat is defective) ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly .
- Check that engine coolant pump is functioning properly (if coolant pump is defective, amount of coolant flowing through heating system heat exchanger in air conditioning unit may not be sufficient) ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly
- On vehicles with a regulated coolant circuit (only fitted with certain engines from model year 2011 onwards), the related components (e.g. regulated coolant pump and coolant valve for cylinder head - N489-) must function and be activated properly ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly
- Activation and operation of coolant circulation pump - V50- (if the coolant pump is defective, there may not be enough coolant flowing through the heat exchanger in the air conditioning unit) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

Note

- *The coolant circulation pump - V50- is not installed on all vehicles (depending on model, engine and production period). On vehicles with auxiliary heater (optional equipment), the circulation pump - V55- assumes the function of -V50- . Depending on the vehicle version and the adaption of the auxiliary heater control unit - J364- , the circulation pump - V55- is also activated by -J364- in response to a request from the air conditioner operating and display unit (Climatronic control unit - J255-) at low engine speeds to assist the engine coolant pump ⇒ Vehicle diagnostic, testing and information system VAS 5051 (“Guided Fault Finding”) .*
- *On vehicles with start/stop system and vehicles with high-voltage system, the flow of coolant through the heating system heat exchanger in the air conditioning unit is maintained by the coolant circulation pump - V50- when the engine is stopped.*

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Fault Finding if temperature increases downstream of evaporator

– Use e.g. hose clamps up to 40 mm - 3093- to clamp off the two coolant hoses between engine and heat exchanger of air conditioning unit ⇒ page 543 .
– Check heating output and actuation of temperature flaps again ⇒ page 61 .
– Use a commercially available thermometer to measure the temperature of the air emerging from the dash panel vents (left, right and centre) and the front and rear footwell vents (left and right) and compare the measured values to those displayed for -G191- and -G192- .
– Do measured values coincide with values displayed and are the specified values attained?

↓ yes ↓	↓ no ↓
Detach hose clamps (up to 40 mm) - 3093- from the two coolant hoses. ↓	Check that the sender supplying the deviating measured value is installed correctly, and check the electrical connections for contact resistance ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
Check activation and operation of temperature flap control motor - V68- and actuation of temperature flaps (via connecting rod) ⇒ page 563 and ⇒ page 386 . ↓	Eliminate cause of incorrect measured value; renew defective sender if necessary.
• Activation and operation of temperature flap control motor - V68- OK, and connecting rod between left and right side temperature flaps installed correctly?	
↓ yes ↓	no ↓
Check operation of temperature flap causing increase in temperature and repair flap ⇒ page 563 . Check heating output and actuation of temperature flaps again ⇒ page 61 .	Eliminate cause of malfunction ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations. Check heating output and actuation of temperature flaps again ⇒ page 61 .

3.7.4 Checking heating output and actuation of temperature flaps - “deluxe” version

Requirements satisfied ⇒ page 52

– Close bonnet.

– Close doors, windows, sun roof and rear lid.

– Open all dash panel vents.

– Switch on the ignition and activate the drive system (READY); the engine will start automatically if required (on vehicles with a high-voltage system).

– Start the engine (not on vehicles with a high-voltage system).

Set the following on the air conditioner operating and display unit (Climatronic control unit - J255-):

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- “Auto” mode for driver's and passenger's side (indicator lamps in AUTO buttons on)
- “Cold” temperature setting for driver's and passenger's side (display “LO” on -J255- and Multi Media Interface)
- Air conditioner compressor switched on (lamp in AC/A/C button on)
- “Maximum speed” pre-selected for fresh air blower (speed “10” or higher indicated on display of -J255- and Multi Media Interface)
- Use rotary controls to set air outflow direction for driver's and passenger's side to “footwell” and “dash panel vents” on air conditioner operating and display unit (indicated on display of -J255- and Multi Media Interface).

Note

- *The indicator lamps in the two AUTO buttons go out when the air outflow direction and/or the fresh air blower speed is/are altered manually.*
- *The maximum possible fresh air blower speed depends on various factors (coolant temperature, vehicle's electrical system voltage etc.).*
- *Pressing and holding the rotary control for setting the temperature for the driver's side causes the setting for the driver's side to be adopted for the passenger's side.*

– Set potentiometer for rear temperature selection - G538- to “cold” (installed in vent in rear centre console).

– Open vent in rear centre console.

– Start Guided Fault Finding for air conditioner and select “Read measured value block” function ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Allow air conditioner to run for several minutes at maximum cooling output (air conditioner compressor switched on, indicator lamp in AC or A/C button on).

– Compare measured value for evaporator output temperature sender - G263- to measured values for front left chest vent temperature sensor - G385- , front right chest vent temperature sensor - G386- , left footwell vent temperature sender - G261- and right footwell vent temperature sender - G262- .

Specifications:

- After 5 minutes, the measured values for the temperature sensors downstream of the heat exchanger (-G385- , -G386- , -G261- and -G262-) must not be more than 5 °C above the value for -G263- .

If the specified values are not obtained, perform the fault finding measures to be taken in the event of an increase in temperature downstream of the evaporator ⇒ page 69 .

– Use a commercially available thermometer to measure the temperature of the air emerging from the rear centre console vents and the rear footwell vents (left and right, beneath front seats) and compare the measured values with the temperatures displayed in the measured value block.

Specifications:

- The measured values must not be more than 5 °C above the measured values displayed for the temperature sensors.

If the specified values are not obtained, perform the fault finding measures to be taken in the event of an increase in temperature downstream of the evaporator ⇒ page 69 .

– Use the rotary control on the air conditioner operating and display unit (Climatronic control unit - J255-) to select the “warm” temperature setting for the passenger's side (display “Hi” on - J255- and Multi Media Interface).

– Read off measured values displayed in measured value block for temperature sensors (-G263- , -G385- , -G386- , -G261- and -G262-).

– Use a commercially available thermometer to measure the temperature of the air emerging from the rear centre console vents (left and right).

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Specifications:

- At -G386- and -G262- , the temperature should increase to above 52 °C (depending on current engine temperature).
- At -G385- and -G261- , the temperature increases by less than 10 °C as compared to the measured value for -G263- .
- The temperature measured at the vents in the rear centre console increases by less than 20 °C.

Note

- *Depending on the engine (e.g. on vehicles with 8-cyl. engine), it may be necessary to increase the engine speed to between 1200 and 1500 rpm to attain the required temperature. At idle, the heating output of the engine or the volume of coolant conveyed through the heat exchanger is not sufficient with all engines to supply the heat exchanger with the heat energy required (e.g. on vehicles with 8-cyl. engine with idling speed of approx. 650 rpm).*
- *The temperature flaps for the rear vents are activated (by the rear temperature flap control motor - V137-) via a characteristic curve stored in the air conditioner operating and display unit (Climatronic control unit - J255-). If there is a considerable difference between the settings for the left and right side in - J255- and/or the setting for the potentiometer for rear temperature selection - G538- , the temperature flaps for the rear vents are no longer moved to the end stops. The temperature flaps for the temperature of the air from the rear vents are then only actuated such that this air tends to be slightly warmer or colder than for the front vents, depending on the setting on - G538- .*
- *On vehicles with a high-voltage system, reduce the speed of the fresh air blower - V2- if applicable. With the engine stopped and maximum fresh air blower speed, the delivery of the coolant circulation pump - V50- may not always be sufficient to attain the required heat output.*

Check the following if results do not match specifications:

- Repeat heat output test at an engine speed of approx. 1500 to 2000 rpm (with a lower fresh air blower speed on vehicles with a high-voltage system). If the required heating output is attained at this speed (fresh air blower speed), the fault is not in the air conditioning unit, but in the coolant circuit (incorporation of air conditioner into coolant circuit, delivery rate of engine's coolant pump, flow of coolant through heat exchanger of air conditioning unit or similar ⇒ page 543 and ⇒ Rep. gr. 19 ; Cooling system/coolant).
- Activation and operation of right temperature flap control motor - V159- and left temperature flap control motor - V158- and activation of front left and right temperature flaps ⇒ page 563 , ⇒ page 411 and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")
- Activation and operation of rear temperature flap control motor - V137- and actuation of rear left and right temperature flaps (via connecting rod) ⇒ page 563 , ⇒ page 386 and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Foam seal at heat exchanger for heater of air conditioning unit ⇒ page 543
- Foam seal at auxiliary air heater element - Z35- /honeycomb element ⇒ page 487

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- Coolant circuit properly bled ⇒ Rep. gr. 19 ; Cooling system/ coolant; Draining and filling cooling system .
- Incorporation of heat exchanger for heater (in air conditioning unit) into coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses
- Partitions in air distribution housing between left and right side and between rear and front sections ⇒ page 439
- Thermostat (engine coolant may not warm up properly if thermostat is defective) ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly
- Check that engine coolant pump is functioning properly (if coolant pump is defective, amount of coolant flowing through heating system heat exchanger in air conditioning unit may not be sufficient) ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly
- On vehicles with a regulated coolant circuit (only fitted with certain engines from model year 2011 onwards), the related components (e.g. regulated coolant pump and coolant valve for cylinder head - N489-) must function and be activated properly ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly
- Activation and operation of coolant circulation pump - V50- (if the coolant pump is defective, there may not be enough coolant flowing through the heat exchanger in the air conditioning unit) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

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Note

- *The coolant circulation pump - V50- is not installed on all vehicles (depending on model, engine and production period). On vehicles with the corresponding optional equipment, the circulation pump - V55- assumes the function of -V50- . Depending on the vehicle version and the adaption of the auxiliary heater control unit - J364- , the circulation pump - V55- is also activated by -J364- in response to a request from the air conditioner operating and display unit (Climatronic control unit - J255-) at low engine speeds to assist the engine coolant pump ⇒ Vehicle diagnostic, testing and information system VAS 5051 (“Guided Fault Finding”) .*
- *On vehicles with start/stop system and vehicles with high-voltage system, the flow of coolant through the heating system heat exchanger in the air conditioning unit is maintained by the coolant circulation pump - V50- when the engine is stopped.*

– Use the rotary control on the air conditioner operating and display unit (Climatronic control unit - J255-) to select the “warm” temperature setting for the driver's side (“Hi” displayed for driver's and passenger's side on -J255- and Multi Media Interface).

– Read off the measured values for the temperature sensors downstream of the heat exchanger (-G385- , -G386- , -G261- and -G262-).

– Use a commercially available thermometer to measure the temperature of the air emerging from the rear centre console vents (left and right).

Specifications:

- At -G385- and -G261- , the temperature should increase to above 52 °C within 5 minutes (depending on current engine temperature).

- Temperatures displayed in measured value block for temperature sensors (-G385- , -G386- , -G261- and -G262-) settle to approx. the same level within 5 minutes (temperature difference less than 5 °C, temperature above 52 °C in each case).
- The temperature measured at the vents (left and right) in the centre console (rear) increases, but does not reach the temperatures indicated for the temperature sensors (-G385- , -G386- , -G261- and -G262-) (the temperature tends to be cooler due to the setting at the potentiometer for rear temperature selection - G538-) ⇒ page 66 .

Note

- *Depending on the engine (e.g. on vehicles with 8-cyl. engine), it may be necessary to increase the engine speed to between 1200 and 1500 rpm to attain the required temperature. At idle, the heating output of the engine or the volume of coolant conveyed through the heat exchanger is not sufficient with all engines to supply the heat exchanger with the heat energy required (e.g. on vehicles with 8-cyl. engine with idling speed of approx. 650 rpm).*
- *In the “warm” temperature setting for the driver's and passenger's side, the specified outflow temperature at the evaporator is regulated to approx. 10 °C by the air conditioner operating and display unit (Climatronic control unit - J255-).*
- *On vehicles with a high-voltage system, reduce the speed of the fresh air blower - V2- if applicable. With the engine stopped and maximum fresh air blower speed, the delivery of the coolant circulation pump - V50- may not always be sufficient to attain the required heat output.*

Check the following if readout does not match specifications ⇒ page 66 .

Proceed as follows if the readout does match the specifications:

– Set potentiometer for rear temperature selection - G538- to “warm” (installed in vent of rear centre console).

– Use a commercially available thermometer to measure the temperature of the air emerging from the rear centre console vents and the rear footwell vents (left and right), and compare these values to the measured values displayed for the temperature sensors (-G385- , -G386- , -G261- and -G262-).

Specifications:

- The measured temperature of the air emerging from the vents in the rear centre console and the rear footwell vents (left and right) should increase and, within 5 minutes, reach a value which is less than 10 °C below the lowest value measured and displayed for the temperature sensors.
- The difference between the temperatures measured on the left and right sides must be less than 5 °C.

Check the following if results do not match specifications:

- Check activation and operation of rear temperature flap control motor - V137- and activation of rear left and right temperature flaps (via connecting rod) ⇒ page 563 , ⇒ page 386 and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Further checks if readouts do not match specifications ⇒ page 66

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Proceed as follows if the readout does match the specifications:

– Use the rotary control on the air conditioner operating and display unit (Climatronic control unit - J255-) to select the “cold” temperature setting for the passenger's side (display “Lo” on -J255- and Multi Media Interface).

– Compare measured value displayed for evaporator output temperature sender - G263- to measured values for -G386- and -G262- and read off measured values for -G385- and -G261- .

Specifications:

- At -G385- and -G261- there should only be a slight change in the temperatures measured and displayed; these should remain above 52 °C (depending on current engine temperature).
- At -G386- and -G262- the temperature decreases and, after 5 minutes at the latest, reaches a value which is not more than 10 °C higher than the value for the evaporator output temperature sender - G263- .

Note

- *Depending on the engine (e.g. on vehicles with 8-cyl. engine), it may be necessary to increase the engine speed to between 1200 and 1500 rpm to attain the required temperature. At idle, the heating output of the engine or the volume of coolant conveyed through the heat exchanger is not sufficient with all engines to supply the heat exchanger with the heat energy required (e.g. on vehicles with 8-cyl. engine with idling speed of approx. 650 rpm).*
- *In the “warm” temperature setting for the driver's and passenger's side, the specified outflow temperature at the evaporator is regulated to approx. 10 °C by the air conditioner operating and display unit (Climatronic control unit - J255-). If the “cold” temperature setting is selected for one side, the air conditioner operating and display unit (Climatronic control unit - J255-) reduces the specified outflow temperature at the evaporator, and the temperature is regulated to approx. 2 °C.*
- *On vehicles with a high-voltage system, reduce the speed of the fresh air blower - V2- if applicable. With the engine stopped and maximum fresh air blower speed, the delivery of the coolant circulation pump - V50- may not always be sufficient to attain the required heat output.*

Check the following if readout does not match specifications
⇒ page 66 .

Testing is complete if the readout matches the specifications.

Fault Finding if temperature increases downstream of evaporator

– Use e.g. hose clamps up to 40 mm - 3093- to clamp off the two coolant hoses between engine and heat exchanger of air conditioning unit ⇒ page 543 .

– Check heating output and actuation of temperature flaps again ⇒ page 64 .

– Use a commercially available thermometer to measure the temperature of the air emerging from the dash panel vents (left, right and centre) and the front footwell vents (left and right) and compare these values to the temperatures displayed in the measured value bock.

– Do measured values coincide with values displayed and are the specified values attained?

↓ yes ↓ | ↓ no ↓

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Detach hose clamps (up to 40 mm) - 3093- from the two coolant hoses. ↓	– Check that the sender supplying the deviating measured value is installed correctly, and check the electrical connections for contact resistance ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
Check the activation and operation of the left temperature flap control motor - V158- and the right temperature flap control motor - V159- and the activation of the corresponding temperature flap ⇒ page 563 . Check the activation and operation of the rear temperature flap control motor - V137- and the activation of the rear left and right temperature flaps (via connecting rod) ⇒ page 563 and ⇒ page 386 . ↓	– Eliminate cause of incorrect measured value; renew defective sender if necessary.
• Actuation and operation of temperature flaps OK? ↓ yes ↓	no ↓
Check operation of temperature flap causing increase in temperature ⇒ page 563 . Check heating output and actuation of temperature flaps again ⇒ page 64 .	Eliminate cause of malfunction ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations. Check heating output and actuation of temperature flaps again ⇒ page 64 .

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3.8 Checking cooling output

⇒ “3.8.1 Notes on checking cooling output - vehicles without high-voltage system”, page 71

⇒ “3.8.2 Requirements for checking cooling output of air conditioner - vehicles without high-voltage system”, page 73

⇒ “3.8.3 Checking cooling output - vehicles without high-voltage system”, page 75

⇒ “3.8.4 Fault finding if readout does not match specification (required cooling output is not attained) - vehicles without high-voltage system”, page 80

⇒ “3.8.5 Fault finding if ice forms at evaporator - vehicles without high-voltage system”, page 82

⇒ “3.8.6 Notes on checking cooling output - vehicles with high-voltage system”, page 84

⇒ “3.8.7 Requirements for checking cooling output of air conditioner - vehicles with high-voltage system”, page 87

⇒ “3.8.8 Checking cooling output - vehicles with high-voltage system”, page 90

⇒ “3.8.9 Fault finding if readout does not match specification (required cooling output is not attained) - vehicles with high-voltage system”, page 98

⇒ “3.8.10 Fault finding if ice forms at evaporator - vehicles with high-voltage system”, page 101

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3.8.1 Notes on checking cooling output - vehicles without high-voltage system

Vehicles with a mechanically driven air conditioner compressor only

Special tools and workshop equipment required

- Vehicle diagnostic, testing and information system - VAS 5051/- (or vehicle diagnostic and service information system - VAS 5052-) with corresponding connection lead
- Commercially available thermometer (for measuring temperature; if applicable use thermometer with 2 probes for simultaneous measurement of temperature e.g. on right and left)
- Requirements for checking cooling output of air conditioner ⇒ page 73
- Checking cooling output ⇒ page 75

Note

- *From model year 2010 onwards, a start/stop system (optional equipment) is offered for this vehicle in combination with certain engines. Depending on the setting on the operating and display unit (Climatronic control unit - J255-), the stop function can be prevented. 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. The same also applies if the difference between the selected required temperature and the calculated actual temperature exceeds a certain value in heating or cooling mode ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *On vehicles with a start/stop system, an additional coolant circulation pump - V50- (coolant pump - V36-) is installed for the stop function (depending on vehicle equipment and version) ⇒ page 126 , ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *Depending on the vehicle model, -V50- (-V36-) is not only activated when the “stop function” is active, but also when the engine is running, e.g. when the temperature is preset to “warm” on the air conditioner operating and display unit (Climatronic control unit - J255-) (“HI” displayed on air conditioner operating and display unit and Multi Media Interface). -V50- (-V36-) is then activated to support the engine's coolant pump ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The version of the coolant circulation pump - V50- (coolant pump - V36-) and the activation of the pump(s) differ depending on the vehicle version and production period. From model year 2012 onwards and depending on the engine, the pumps fitted from the start of production onwards and activated via a 500 hertz signal (500 pulses per second) are gradually being replaced by pumps activated via a variable signal (100 ... 500 hertz). The pumps activated via a variable signal are equipped additionally with a diagnostic function and are generally activated via the corresponding engine control unit. Therefore it is important to observe the correct assignment (only the assigned pump can be activated) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Electronic parts catalogue .*
- *From model year 2012 onwards and depending on the vehicle version, modified fresh air blower control units - J126- , fresh air blowers - V2- , air conditioner operating and display units (Climatronic control unit - J255-), evaporators, expansion valves, control motors and air conditioning units are introduced gradually ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . Observe notes on these components. ⇒ “4.1.1 Overview of fitting locations - control motors (front), basic version”, page 372*
- *From the start of production up to the conversion from model year 2012 onwards, evaporators with a width (block depth) of approx. 40 mm were fitted (air conditioning unit with part number “8K_ 820 005”). From model year 2012 onwards and depending on the vehicle version, evaporators with a width (block depth) of approx. 50 mm are being introduced gradually (air conditioning unit with part number “8T_ 820 005”). Pay attention to the correct assignment of the expansion valve to the evaporator (different versions) ⇒ Electronic parts catalogue .*

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⇒ “3.8.2 Requirements for checking cooling output of air conditioner - vehicles without high-voltage system”, page 73

⇒ “3.8.3 Checking cooling output - vehicles without high-voltage system”, page 75

3.8.2 Requirements for checking cooling output of air conditioner - vehicles without high-voltage system

Vehicles with a mechanically driven air conditioner compressor only

- Ambient temperature above 15 °C
- Radiator and condenser clean (clean if necessary)
- Poly V-belt for compressor drive OK and correctly tensioned, pulley actually driving air conditioner compressor (vehicles with 4-cyl. or 6-cyl. engine) ⇒ page 276 .
- Poly V-belt for compressor drive OK and correctly tensioned, air conditioning system magnetic clutch - N25- activated by Climatronic control unit - J255- and pulley actually driving air conditioner compressor (certain vehicles with air conditioner compressor with magnetic clutch only, introduction from model year 2012 onwards, e.g. on vehicles with certain 4-cyl. engines) ⇒ page 365 and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Drive unit of air conditioner compressor correctly installed, compressor actually being driven (vehicles with 8-cyl. engine) ⇒ page 278
- All air ducts, covers and seals OK and properly installed
- Air flow through dust and pollen filter not impeded by dirt ⇒ page 531
- Air intake (in fresh air and air recirculation mode) not impeded by dirt or retrofitted components
- Vehicle not exposed to direct sunlight
- Engine warm (coolant temperature above 80 °C)
- Event memory of air conditioner operating and display unit (Climatronic control unit - J255-) interrogated and erased, basic setting performed and encoding of air conditioner operating and display unit (Climatronic control unit - J255-) checked ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")
- Adaption of air conditioner operating and display unit (Climatronic control unit - J255-) checked ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")
- All dash panel vents open
- Bonnet closed
- Engine running

The following is set on air conditioner operating and display unit (Climatronic control unit - J255-), “basic” version:

- “Auto” mode (indicator lamp in AUTO button on)
- “Cold” temperature setting (display “LO” on Multi Media Interface display)
- Air conditioner compressor switched on (lamp in AC/A/C button on)

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- “Maximum speed” pre-selected for fresh air blower (speed “10” or higher indicated on Multi Media Interface display)

The following is set on air conditioner operating and display unit (Climatronic control unit - J255-), “deluxe” version:

- “Auto” mode (indicator lamps in both AUTO buttons on)
- “Cold” temperature setting for driver and front passenger side (display “LO” for driver and front passenger side on display of air conditioner operating and display unit and Multi Media Interface)
- Air conditioner compressor switched on (lamp in AC/A/C button on)
- “Maximum speed” pre-selected for fresh air blower (speed “10” or higher indicated on displays of air conditioner operating and display unit and Multi Media Interface)

Note

- *The indicator lamp(s) in the AUTO button(s) goes/go out when the fresh air blower speed is altered manually.*
- *The maximum possible fresh air blower speed depends on various factors (coolant temperature, vehicle's electrical system voltage etc.).*

– On vehicles with a “deluxe” air conditioner, the potentiometer for rear temperature selection - G538- is set to “cold” (fitted in vent of rear centre console).

– On vehicles with “deluxe” air conditioner, vent in centre console (rear) is open.

Functions with engine running:

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

Note

Depending on the version of the air conditioner operating and display unit (Climatronic control unit - J255-), the radiator fan(s) (radiator fan - V7- and radiator fan 2 - V177-) is/are only switched in when a certain pressure is reached in the refrigerant circuit (currently pressure of approx. 9 bar). The activation of the radiator fan(s) is displayed in the measured value block ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Fresh air blower - V2- running at maximum speed (speed “10” or higher)

Note

The maximum possible fresh air blower speed depends on various factors (coolant temperature, vehicle's electrical system voltage etc.).

– Air conditioner switches to air recirculation mode (approx. 1 minute after engine is started, air flow/fresh air flap is closed and air recirculation flap is opened; air is drawn in from pas-

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senger compartment by fresh air blower - V2- underneath dash panel/behind glove box).

Note

If any of these requirements are not met, interrogate the event memory, perform final control diagnosis and read out the measured value block ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

3.8.3 Checking cooling output - vehicles without high-voltage system

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Not on vehicles with high-voltage system (hybrid vehicles)

Vehicles with a mechanically driven air conditioner compressor only

- ♦ Requirements for checking cooling output met ⇒ page 73
- – Measure ambient temperature (it must be over 15 °C).
- – Close doors, bonnet, windows, sun roof and rear lid.
- – Open all dash panel vents.
- – Start engine.
- – Switch off air conditioner compressor (“ECON” mode set on air conditioner operating and display unit, Climatronic control unit - J255- , indicator lamp in AC or A/C button off).
- – Start Guided Fault Finding for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- – In “Read measured value block” function, select display group with measured values for activation of air conditioner compressor and pressure in refrigerant circuit and read out measured values ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- ♦ Air conditioner compressor is switched off, current of 0 A (amps) is displayed.
- ♦ Pressure in refrigerant circuit is identical to or above value in table below (depending on ambient temperature).

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

Note

- *On the absolute pressure scale, 0 bar corresponds to an absolute vacuum. Normal ambient pressure thus corresponds to approx. 1 bar absolute and 0 bar gauge pressure. On the scales of most pressure gauges, 0 bar gauge pressure corresponds to an absolute pressure of 1 bar (can be seen from -1 mark below 0).*
- *Depending on the version of the air conditioner operating and display unit (Climatronic control unit - J255-), the measured value block may only display values as whole numbers. The display fluctuates between two values if the measured pressure is between the two.*
- *The pressure in the refrigerant circuit depends on the ambient temperature. Due to the radiation of heat by components (e.g. radiator), the pressure displayed when the engine is warm is slightly higher than that given for the corresponding ambient temperature.*
- *If the pressure displayed is lower than that given in the table: Check the signal of the refrigerant pressure and temperature sender - G395- ⇒ Vehicle diagnostic, testing and information system VAS 5051 (“Guided Fault Finding”) . If no fault is found at -G395- , there is not enough refrigerant in the circuit. The vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations .*

If pressure in refrigerant circuit is OK:

– Switch on air conditioner compressor by selecting “Auto” mode on air conditioner operating and display unit (Climatronic control unit - J255-) (indicator lamps in AUTO button(s) and AC or A/C button on).
– Use rotary control(s) of air conditioner operating and display unit (Climatronic control unit - J255-) to set air conditioner to “cold” (for driver's and passenger's side).
– On vehicles with a “deluxe” air conditioner, set potentiometer for rear temperature selection - G538- to “cold” (fitted in vent of rear centre console).
– Use rotary control(s) of air conditioner operating and display unit (Climatronic control unit - J255-) to set air outflow direction to “dash panel vents” (for driver's and passenger's side).

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Note

- *The indicator lamp(s) in the AUTO button(s) goes/go out when the air flow direction and/or the fresh air blower speed is/are altered manually.*
- *The maximum possible fresh air blower speed depends on various factors (coolant temperature, vehicle's electrical system voltage etc.).*

– In the “Read measured value block” function, read out the specified current with which the air conditioner compressor regulating valve - N280- is activated (a specified current above 0.3 A is displayed, the air conditioner compressor should be switched on) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

The specified current is calculated by the air conditioner operating and display unit (Climatronic control unit - J255-). The request is transmitted via the data bus to the onboard supply control unit - J519- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– In the “Read measured value block” function, read out the actual current with which the air conditioner compressor regulating valve - N280- is activated (an actual current above 0.3 A is displayed, the air conditioner compressor is switched on) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

- *If the measured value block shows no or insufficient current, check activation of air conditioner compressor regulating valve - N280- ⇒ page 185 .*
- *The -N280- is activated by the air conditioner operating and display unit (Climatronic control unit - J255-) via the onboard supply control unit - J519- . The activation of -N280- is displayed in the measured value block of -J519- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The actual current flowing via the air conditioner compressor regulating valve - N280- is measured by the onboard supply control unit - J519- and transmitted via the data bus to the air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .*

– In the “Read measured value block” function, read out the pressure in the refrigerant circuit measured by the refrigerant pressure and temperature sender - G395- . The pressure displayed increases to above the value when the air conditioner compressor is switched off ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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Note

- *If pressure displayed in measured value block does not change and activation of air conditioner compressor is OK, refer to ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . Check again whether the air conditioner compressor is really being driven and the air conditioner compressor regulating valve - N280- is being activated. If the compressor is being driven and -N280- is being activated, there is a fault in the refrigerant circuit. The vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations . There may be problems with air conditioner compressor control; inform the workshop of the fault found.*
- *The air conditioner compressor regulating valve - N280- is activated by the air conditioner operating and display unit (Climatronic control unit - J255-) via -N280- 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 depending on the measured temperature, engine speed and electrical system voltage. As soon as the temperature measured by the evaporator output temperature sender - G263- approaches the specified value, activation is cancelled and the compressor output thus reduced.*
- *Under certain operating conditions, residual moisture in the refrigerant circuit may lead to the formation of ice at the air conditioner compressor regulating valve - N280- (and at the expansion valve). Such ice formation impedes the control of the air conditioner compressor. The evaporator is cooled down too much and ices up. An iced-up evaporator may cause various problems ⇒ page 82 .*

– Press button for air recirculation mode on air conditioner operating and display unit (Climatronic control unit - J255-); symbol for “air recirculation mode” in `air recirculation` button lights up.
– Set engine speed to 2000 rpm (start of time measurement).
– In “Read measured value block” function, read out measured value for evaporator output temperature sender - G263- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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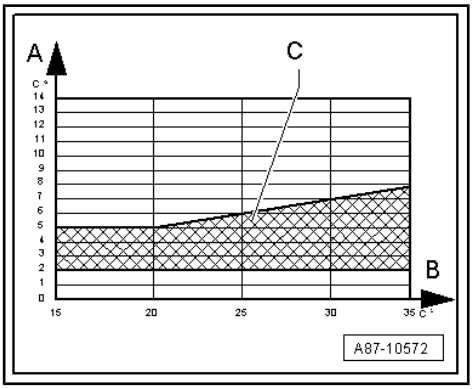
– Compare measured value displayed (for -G263-) to values in graph.



A - Air temperature (downstream of evaporator) measured by evaporator output temperature sender - G263-

B - Ambient temperature

C - Permissible tolerance range

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

Note

- *If required values are not attained, check measured value for evaporator output temperature sender - G263- . To do so, compare the measured value displayed for -G263- to the measured values of the centre vent temperature sender - G191- ("basic" version) / front left chest vent temperature sensor - G385- ("deluxe" version).*
- *If the measured value for -G263- differs only slightly from the measured value for -G191- / -G385- : Perform fault finding if readout does not match specification ⇒ page 80 .*
- *If the measured value for -G263- is higher than the measured value for -G191- or -G385- , check that the evaporator output temperature sender - G263- is properly installed ⇒ page 633 and perform the electrical checks for this sender ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *One way to check whether the air conditioner is working is by feeling the refrigerant lines: the "low-pressure side" refrigerant line (thick line between quick-release coupling and air conditioner compressor) cools down and the "high-pressure side" refrigerant line (thin line between condenser and quick-release coupling) becomes warm ⇒ page 146 .*

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

- If the measured value for the evaporator output temperature sender - G263- (and thus the cooling output of the air conditioner) is not OK, perform fault finding measures to be taken if readout does not match specification (required cooling output is not attained) ⇒ page 80 .
- If the measured value for the evaporator output temperature sender - G263- (and thus the cooling output of the air conditioner) is OK and there is a problem with excessively high or differing output temperatures, check the activation of the temperature flaps ⇒ page 58 .

3.8.4 Fault finding if readout does not match specification (required cooling output is not attained) - vehicles without high-voltage system

Not on vehicles with high-voltage system (hybrid vehicles)

- In the “Read measured value block” function, select the display group with the measured values for the activation of the air conditioner compressor and the pressure in the refrigerant circuit ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Repeat cooling output test ⇒ page 75 .
- Observe displays for compressor activation during cooling output test.
- Air conditioner compressor regulating valve - N280- deactivated during cooling output test (specified and/or actual control current drops below 0.50 A)?

↓ yes ↓

Continued ⇒ page 80 . Activation of air conditioner compressor is switched off.

↓ no ↓

- Is there an increase in pressure in refrigerant circuit during cooling output test?

↓ yes ↓

Continued ⇒ page 81 . Increase in pressure in refrigerant circuit

↓ no ↓

Check again whether compressor shaft is actually being driven and -N280- activated.

If the air conditioner compressor is being driven and -N280- activated, the vehicle is to be taken to a workshop equipped with the necessary tools where the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations .

Inform the workshop of the problem detected.

Continuation of check: “Activation of air conditioner compressor is deactivated”

- Air conditioner compressor regulating valve - N280- deactivated during cooling output test by air conditioner operating and display unit (Climatronic control unit - J255- ; specified current and actual current drop below 0.50 A)?

↓ yes ↓

- Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-).

↓ no ↓

- -N280- deactivated during cooling output test by onboard supply control unit - J519- (only the actual current drops below 0.50 A)?

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Eliminate faults displayed and erase event memory.

Read out the measured value block with the compressor shut-off criteria of the air conditioner operating and display unit (Climatronic control unit - J255-) and eliminate the cause of shut-off ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Repeat cooling output test ⇒ page 75 .

Interrogate event memory of -J519- , eliminate fault displayed and erase event memory. ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding)

In measured value block of -J519- , read out display groups in which measured values for activation of -N280- are indicated.

Check activation of -N280- by -J519- and eliminate cause of shut-off ⇒ page 185 .

Repeat cooling output test ⇒ page 75 .

Continuation of test: “Increase in pressure in refrigerant circuit”

– Open bonnet.

– Repeat cooling output test ⇒ page 75 .

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– Read out pressure in refrigerant circuit from measured value block for air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

- Radiator fan(s) (radiator fan - V7- and radiator fan 2 - V177-) running during cooling output test? Speed is governed by coolant temperature and pressure in refrigerant circuit (determined by engine control unit). Or are radiator fans switched in as soon as pressure in refrigerant circuit exceeds a pressure of approx. 9 bar?

↓ yes ↓

– Read out measured value blocks displaying “pressure in refrigerant circuit” and “activation of radiator fans” ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

- Radiator fan(s) running at a higher speed as pressure in refrigerant circuit increases (according to request from -J255-)?

↓ yes ↓

– 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 conditioners with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations .

– Inform this workshop of the problem detected.

↓ no ↓

– Check actuation of radiator fan(s), e.g. via “Final control diagnosis” function ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Service activation system for radiator fan(s).

– Repeat cooling output test ⇒ page 75 .

↓ no ↓

– Check activation of radiator fans, e.g. via “Final control diagnosis” function ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Service activation system for radiator fan(s).

– Repeat cooling output test ⇒ page 75 .

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Note

- *The pressure in the refrigerant circuit depends on various influencing factors. In general, however, the pressure should not exceed 20 bar at an ambient temperature of 20 to 25 °C. Under extreme usage conditions (e.g. in hot countries with high ambient temperatures, stop-and-go traffic, or high relative humidity), the extremely high cooling output involved may also result in pressures of up to 31 bar.*
- *At ambient temperatures below 25 °C, the pressure in the refrigerant circuit does not usually rise above 16 bar (radiator fan (s) running and cooling condenser).*
- *The operating and display unit (Climatronic control unit - G395-) uses the measured value of the refrigerant pressure and temperature sender - J255- to calculate the pressure in the refrigerant circuit, which it then displays ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *At absolute pressures of below approx. 1.8 bar and above approx. 32 bar, the operating and display unit (Climatronic control unit - J255-) does not switch on the air conditioner compressor (air conditioner compressor regulating valve - N280- is not activated). The air conditioner compressor is only re-activated once the absolute pressure has risen above 1.8 bar or dropped below 16 bar.*
- *For more information on the pressure in the refrigerant circuit, refer to Guided Fault Finding ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *To prevent the air conditioner compressor from being switched off abruptly if the pressure in the refrigerant circuit or the coolant temperature is too high, its output is limited by the air conditioner operating and display unit (Climatronic control unit - J255-) as soon as the pressure in the refrigerant circuit exceeds approx. 30 bar absolute (full compressor output is not restored again until pressure has dropped below 27 bar), or the temperature of the coolant exceeds 115 °C (compressor is switched off completely when coolant reaches 118 °C).*

3.8.5 Fault finding if ice forms at evaporator - vehicles without high-voltage system

Not on vehicles with high-voltage system (hybrid vehicles)

- The air conditioner compressor regulating valve - N280- is activated by the air conditioner operating and display unit (Climatronic control unit - 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 depending on the measured temperature, engine speed and electrical system voltage. As soon as the temperature measured by the evaporator output temperature sender - G263- approaches the specified value, activation is cancelled and the compressor output thus reduced.

Under certain operating conditions, residual moisture in the refrigerant circuit may lead to the formation of ice at the air conditioner compressor regulating valve - N280- (and at the expansion valve). Such ice formation impedes the control of the air conditioner compressor. The evaporator is cooled down too much and ices up. An iced-up evaporator may cause the following problems:

– The air conditioner fails repeatedly or sporadically (no cooling/ heating output) after extended driving; after the vehicle has been stopped, the air conditioner functions properly again (after a short wait).

– The windows mist up on the inside during long journeys; the windows are not de-misted even after pressing the “defrost” button on the air conditioner operating and display unit (Climatronic control unit - J255-); after the vehicle has been stopped (or the air conditioner has been switched off) and waiting a short while, the air conditioner functions properly again.

Remedy:

– In “Read measured value block” function, check measured value for evaporator output temperature sender - G263- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– If measured value for -G263- is too high under usage conditions described by customer (above e.g. 10 °C depending on ambient temperature) although air conditioner is functioning properly, check -G263- (incorrect measured value can cause evaporator to ice up).

– If the measured value for -G263- is too low under the usage conditions described by the customer (at ambient temperature above 0 °C, colder than 0 °C for lengthy period): The vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations . Inform the workshop of the problem detected.

– Check refrigerant line on low-pressure side (thick pipe between quick-release coupling and air conditioner compressor) ⇒ page 146 with engine running. If this line is severely iced up when the problem occurs (thin layer of ice is permissible), this also indicates that evaporator temperature is too low. The vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations . There may be problems with air conditioner compressor control; inform the workshop of the fault found.

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Note

Under extreme ambient conditions ice could form at the evaporator if certain settings are selected on the air conditioner, for example air outflow direction set to dash panel vents with these vents closed, maximum cooling output with minimum fresh air blower speed selected. When these settings are selected, air no longer flows through the evaporator, which means that the temperature measured by the evaporator output temperature sender - G263- is higher than the actual temperature at the evaporator. However, the air conditioner control system assumes that the measured value of -G263- corresponds to the actual evaporator temperature and continues to activate -N280- , with the result that the evaporator cools down too much.

3.8.6 Notes on checking cooling output - vehicles with high-voltage system

Vehicles with electrically driven air conditioner compressor only

Procedure for vehicles with a high-voltage system only (hybrid vehicles with electrically driven air conditioner compressor)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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Working with ignition switched on or high-voltage system active

DANGER!

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

Before switching on the ignition, perform the following steps:

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

– To minimise the number of automatic engine starts when the vehicle's drive system is active (READY) during test and measurement work, charge the vehicle batteries e.g. with the

battery charger 60A - VAS 5904- in battery standby mode ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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

Note

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

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Special tools and workshop equipment required

- Vehicle diagnostic, testing and information system - VAS 5051/- (or vehicle diagnostic and service information system - VAS 5052-) with corresponding connection lead
- Battery charger, 60A - VAS 5904-
- 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

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

Problems relating to poor or insufficient cooling output at the battery cooling module on vehicles with a high-voltage system when the cooling output at the evaporator in the air conditioning unit is OK may be caused by the following:

- Activation or operation of control motors at battery cooling module (air recirculation flap 1 control motor for hybrid battery - V479- and air recirculation flap 2 control motor for hybrid battery - V480- not OK; check activation) ⇒ Vehicle diagnostic, testing and information system ("Guided Fault Finding") (for battery regulation control unit - J840-).
- If activation or operation of refrigerant shut-off valve 2 for hybrid battery - N517- (part of expansion valve at battery cooling module) is not OK, check activation ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (for battery regulation control unit - J840-).

- Measured values of temperature sensors in battery cooling module not OK (temperature sensor before evaporator for hybrid battery - G756- , temperature sensor after evaporator for hybrid battery - G757-); check measured values ⇒ Vehicle diagnostic, testing and information system ("Guided Fault Finding") (for battery regulation control unit - J840-).
- Air routing from battery cooling module (to or from drive battery - A2-) or to or from battery cooling module (to vehicle's forced ventilation system) not OK; checking
⇒ “10.5 Exploded view - air ducts”, page 653 .

Note

- *This vehicle is fitted with 2 evaporators (one in the air conditioning unit and one in the battery cooling module). If the measured temperature corresponds to or is below the specified value at one evaporator but the required specified value is not attained at the other evaporator, the system is controlled as follows: The battery regulation control unit - J840- activates the electric air conditioner compressor at a higher speed via the power and control electronics for electric drive - JX1- and the control unit for air conditioning compressor - J842- . This causes the cooling output of the air conditioner to increase and the pressure on the low-pressure side and the evaporator temperature to drop. If the required temperature value is then not reached at one evaporator, -J840- activates the refrigerant shut-off valve 1 for hybrid battery - N516- or the refrigerant shut-off valve 2 for hybrid battery - N517- so that refrigerant no longer flows through the evaporator which is too cold ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode for air conditioner .*
- *As the cooling output of the evaporator in the battery cooling module is considerably less than that of the evaporator in the air conditioning unit, the required temperature may still be reached in the battery cooling module when there is insufficient refrigerant in the circuit, but the required temperature will no longer be reached at the evaporator in the air conditioning unit (although the air conditioner compressor is being activated at a higher speed).*

3.8.7 Requirements for checking cooling output of air conditioner - vehicles with high-voltage system

Vehicles with a high-voltage system only (hybrid vehicles with electrically driven air conditioner compressor), not for vehicles with mechanically driven air conditioner compressor

- Ambient temperature above 15 °C
- Radiator and condenser clean (clean if necessary)
- During this test the vehicle batteries are charged using a battery charger in battery back-up mode ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery .
- All air ducts, covers and seals OK and properly installed
- Air flow through dust and pollen filter not impeded by dirt
⇒ page 531
- Air intake (in fresh air and air recirculation mode) not impeded by dirt or retrofitted components
- Vehicle not exposed to direct sunlight
- Engine warm (coolant temperature above 80 °C)

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- No faults entered in event memory of power and control electronics for electric drive - JX1- , battery regulation control unit - J840- and control unit for air conditioning compressor - J842- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Event memory of air conditioner operating and display unit (Climatronic control unit - J255-) interrogated and erased, basic setting performed and encoding of air conditioner operating and display unit (Climatronic control unit - J255-) checked ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Adaption of air conditioner operating and display unit (Climatronic control unit - J255-) checked ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")
- All dash panel vents open
- Bonnet closed
- Ignition switched on and drive system activated (READY), engine running only if e.g. drive battery - A2- not sufficiently charged.

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DANGER!

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

Before switching on the ignition, perform the following steps:

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

– To minimise the number of automatic engine starts when the vehicle's drive system is active (READY) during test and measurement work, charge the vehicle batteries e.g. with the battery charger 60A - VAS 5904- in battery standby mode ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

Note

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

The following is set on air conditioner operating and display unit (Climatronic control unit - J255-), “basic” version:

- “Auto” mode (indicator lamp in AUTO button on)
- “Cold” temperature setting (display “LO” on Multi Media Interface display)
- Air conditioner compressor switched on (lamp in AC/A/C button on)
- “Maximum speed” pre-selected for fresh air blower (speed “10” or higher indicated on Multi Media Interface display)

The following is set on air conditioner operating and display unit (Climatronic control unit - J255-), “deluxe” version:

- “Auto” mode (indicator lamps in both AUTO buttons on)
- “Cold” temperature setting for driver and front passenger side (display “LO” for driver and front passenger side on display of air conditioner operating and display unit and Multi Media Interface)

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- Air conditioner compressor switched on (lamp in AC/A/C button on)
- “Maximum speed” pre-selected for fresh air blower (speed “10” or higher indicated on displays of air conditioner operating and display unit and Multi Media Interface)

Note

- *The indicator lamp(s) in the AUTO button(s) goes/go out when the fresh air blower speed is altered manually.*
- *The maximum possible fresh air blower speed depends on various factors (coolant temperature, vehicle's electrical system voltage etc.).*

– On vehicles with a “deluxe” air conditioner, the potentiometer for rear temperature selection - G538- is set to “cold” (fitted in vent of rear centre console).

– On vehicles with “deluxe” air conditioner, vent in centre console (rear) is open.

Functions with drive system active (READY):

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

Note

Depending on the version of the air conditioner operating and display unit (Climatronic control unit - J255-), the radiator fan(s) (radiator fan - V7- and radiator fan 2 - V177-) is/are only switched in when a certain pressure is reached in the refrigerant circuit (currently pressure of approx. 9 bar). The activation of the radiator fan(s) is displayed in the measured value block ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Fresh air blower - V2- running at maximum speed (speed “10” or higher)

Note

The maximum possible fresh air blower speed depends on various factors (coolant temperature, vehicle's electrical system voltage etc.).

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– The air conditioner switches to air recirculation mode (approx. 1 minute after the engine is started or the drive system is activated (READY), the air flow/fresh air flap is closed and the air recirculation flap is opened; air is drawn in from the passenger compartment by the fresh air blower - V2- underneath the dash panel/behind the glove box).

Note

If any of these requirements is not met, interrogate the event memory of the Climatronic control unit - J255- , perform final control diagnosis and read out the measured value block ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

3.8.8 Checking cooling output - vehicles with high-voltage system

Vehicles with a high-voltage system only (hybrid vehicles with electrically driven air conditioner compressor), not for vehicles with mechanically driven air conditioner compressor

◆ Requirements for checking cooling output met ⇒ page 87

– Measure ambient temperature (it must be over 15 °C).

– Close doors, bonnet, windows, sun roof and rear lid.

– Open all dash panel vents.

DANGER!

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

Before switching on the ignition, perform the following steps:

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

– To minimise the number of automatic engine starts when the vehicle's drive system is active (READY) during test and measurement work, charge the vehicle batteries e.g. with the battery charger 60A - VAS 5904- in battery standby mode ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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Note

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

– Ignition switched on and drive system active (READY), engine only starts or runs if e.g. drive battery - A2- is not sufficiently charged.

– Switch off air conditioner compressor ("ECON" mode set on air conditioner operating and display unit, Climatronic control unit - J255- , indicator lamp in AC or A/C button off).

– Start Guided Fault Finding for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– In "Read measured value block" function, select display groups with measured values for activation of air conditioner compressor and pressure in refrigerant circuit and read out measured values (on vehicles with electrical air conditioner compressor - V470- the values are displayed in different measured value blocks) ⇒ Vehicle diagnostic, testing and information system ("Guided Fault Finding") .

- The air conditioner compressor is deactivated, no compressor speed is displayed.

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

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

Note

- *On the absolute pressure scale, 0 bar corresponds to an absolute vacuum. Normal ambient pressure thus corresponds to approx. 1 bar absolute and 0 bar gauge pressure. On the scales of most pressure gauges, 0 bar gauge pressure corresponds to an absolute pressure of 1 bar (can be seen from -1 mark below 0).*
- *Depending on the version of the air conditioner operating and display unit (Climatronic control unit - J255-), the measured value block may only display values as whole numbers. The display fluctuates between two values if the measured pressure is between the two.*
- *The displays for the activation of the air conditioner compressor differ. For a mechanically driven air conditioner compressor, the tester displays the specified and actual current for activation of the air conditioner compressor regulating valve - N280- . For an electrical air conditioner compressor - V470- , the specified and actual speed of -V470- , which are transmitted by the control unit for air conditioning compressor - J842- , are displayed in a different measured value block ⇒ Vehicle diagnostic, testing and information system ("Guided Fault Finding") .*
- *The pressure in the refrigerant circuit depends on the ambient temperature. Due to the radiation of heat by components (e.g. radiator), the pressure displayed when the engine is warm is slightly higher than that given for the corresponding ambient temperature.*
- *If the pressure displayed is lower than that given in the table: Check the signal of the refrigerant pressure and temperature sender - G395- ⇒ Vehicle diagnostic, testing and information system VAS 5051 (“Guided Fault Finding”) . If no fault is found at -G395- , there is not enough refrigerant in the circuit. The vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations .*

If pressure in refrigerant circuit is OK:

– Switch on air conditioner compressor by selecting “Auto” mode on air conditioner operating and display unit (Climatronic control unit - J255-) (indicator lamps in AUTO button(s) and AC or A/C button on).
– Use rotary control(s) of air conditioner operating and display unit (Climatronic control unit - J255-) to set air conditioner to “cold” (for driver's and passenger's side).

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– On vehicles with a “deluxe” air conditioner, set potentiometer for rear temperature selection - G538- to “cold” (fitted in vent of rear centre console).

– Use rotary control(s) of air conditioner operating and display unit (Climatronic control unit - J255-) to set air outflow direction to “dash panel vents” (for driver's and passenger's side).

Note

- *The indicator lamp(s) in the AUTO button(s) goes/go out when the air flow direction and/or the fresh air blower speed is/are altered manually.*
- *The maximum possible fresh air blower speed depends on various factors (coolant temperature, vehicle's electrical system voltage etc.).*

– In the “Read measured value block” function, read out the speed at which the electrical air conditioner compressor - V470- is activated by the control unit for air conditioning compressor - J842- (the display will show a speed greater than 800 rpm: air conditioner compressor is running) ⇒ Vehicle diagnostic, testing and information system ("Guided Fault Finding") .

Note

- *The specified speed is calculated by the air conditioner operating and display unit (Climatronic control unit - J255-). The request is transmitted via the data bus to the control unit for air conditioning compressor - J842- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *When driving, the air conditioner compressor operates over a speed range of 800 to 8600 rpm.*
- *When the vehicle is stationary or only moving slowly (up to a speed of approx. 45 km/h), the air conditioner compressor is not activated at the maximum specified speed (of approx. 8500 rpm); the air conditioner compressor speed is limited to approx. 5000 rpm.*
- *At an air conditioner compressor speed of 5000 rpm, with a very high ambient temperature (in excess of 35° C) and a high fresh air blower speed (unfavourable ambient conditions), the output (delivery volume) of the air conditioner compressor is not always sufficient at first to reduce the temperature of the air downstream of the evaporator to the specified value. One way of checking the control action of the air conditioner compressor under these conditions is to activate the fresh air blower with only approx. 40 % of the maximum voltage and to check the temperature at reduced fresh air blower speed ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode for air conditioner and battery regulation .*
- *If an insufficient speed, or no speed at all, is displayed in the measured value block (a speed of less than 4000 rpm although the required temperature of the air downstream of the evaporator has still not been reached), check the activation of the electrical air conditioner compressor - V470- by the control unit for air conditioning compressor - J842- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

– In the “Read measured value block” function, read out the pressure in the refrigerant circuit measured by the refrigerant

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pressure and temperature sender - G395- . The pressure displayed increases to above the value when the air conditioner compressor is switched off ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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Note

- *If the pressure displayed in the measured value block does not change and the activation of the compressor is OK (⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")), there is a fault in the refrigerant circuit. The vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations . There may be problems with air conditioner compressor control; inform the workshop of the fault found.*
- *The air conditioner compressor is activated by the control unit for air conditioning compressor - J842- (when requested by the air conditioner operating and display unit, Climatronic control unit - J255-) in such a way that the temperature of the air downstream of the evaporator reaches the specified value (approx. 2 to 5 °C).*
- *After the engine is started, the air conditioner compressor is activated at a speed greater than 3000 rpm depending on the measured temperature, engine speed and electrical system voltage. As soon as the temperature measured by the evaporator output temperature sender - G263- approaches the specified value, activation is cancelled and the compressor output thus reduced.*
- *Under certain operating conditions, residual moisture in the refrigerant circuit may lead to the formation of ice at the expansion valve for the evaporator in the air conditioning unit. This ice formation can impair the control function of the expansion valve/air conditioner compressor. The evaporator is insufficiently or excessively cooled and may ice up. An iced-up evaporator may cause various problems ⇒ page 101 .*

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- *This vehicle is fitted with 2 evaporators (one in the air conditioning unit and one in the battery cooling module). If the measured temperature corresponds to or is below the specified value at one evaporator but the required specified value is not attained at the other evaporator, the system is controlled as follows: The battery regulation control unit - J840- activates the electric air conditioner compressor at a higher speed via the power and control electronics for electric drive - JX1- and the control unit for air conditioning compressor - J842- . This causes the cooling output of the air conditioner to increase and the pressure on the low-pressure side and the evaporator temperature to drop. If the temperature set value is then not reached at one evaporator, -J840- activates the refrigerant shut-off valve 1 for hybrid battery - N516- or the refrigerant shut-off valve 2 for hybrid battery - N517- such that refrigerant no longer flows through the evaporator which is too cold ⇒ Vehicle diagnostic tester, “Guided Fault Finding” function for air conditioner*
- *As the cooling output of the evaporator in the battery cooling module is considerably less than that of the evaporator in the air conditioning unit, the required temperature may still be reached in the battery cooling module when there is insufficient refrigerant in the circuit, but the required temperature will no longer be reached at the evaporator in the air conditioning unit (although the air conditioner compressor is being activated at a higher speed).*

– Press button for air recirculation mode on air conditioner operating and display unit (Climatronic control unit - J255-);

symbol for “air recirculation mode” in air recirculation button lights up.

– In “Read measured value block” function, read out measured value for evaporator output temperature sender - G263- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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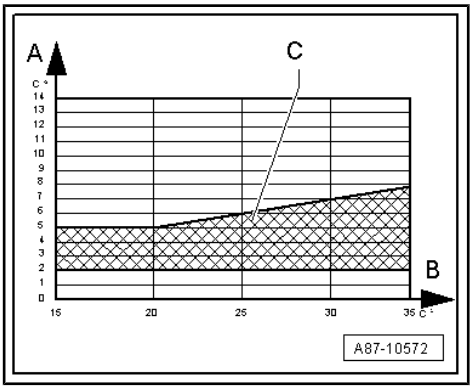
– Compare measured value displayed (for -G263-) to values in graph.

A - Air temperature (downstream of evaporator) measured by evaporator output temperature sender - G263-

B - Ambient temperature

C - Permissible tolerance range

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



Note

- *If required values are not attained, check measured value for evaporator output temperature sender - G263- . To do so, compare the measured value displayed for -G263- to the measured values of the centre vent temperature sender - G191- ("basic" version) / front left chest vent temperature sensor - G385- ("deluxe" version).*
- *If the measured value for -G263- differs only slightly from the measured value for -G191- / -G385- : Perform fault finding if readout does not match specification ⇒ page 98 .*
- *If the measured value for -G263- is higher than the measured value for -G191- or -G385- , check that the evaporator output temperature sender - G263- is properly installed ⇒ page 633 and perform the electrical checks for this sender ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *One way to check whether the air conditioner is working is by feeling the refrigerant lines: the "low-pressure side" refrigerant line (thick line between quick-release coupling and air conditioner compressor) cools down and the "high-pressure side" refrigerant line (thin line between condenser and quick-release coupling) becomes warm ⇒ page 154 .*

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

- If the measured value for the evaporator output temperature sender - G263- (and thus the cooling output of the air conditioner) is not OK, perform fault finding measures to be taken if readout does not match specification (required cooling output is not attained) ⇒ page 98 .
- If the measured value for the evaporator output temperature sender - G263- (and thus the cooling output of the air conditioner) is OK and there is a problem with excessively high or differing output temperatures, check the activation of the temperature flaps ⇒ page 58 .

Note

The refrigerant shut-off valve 1 for hybrid battery - N516- installed in the refrigerant line to the expansion valve upstream of the evaporator in the air conditioning unit is open when it is not activated. If this valve is activated or blocked, refrigerant cannot flow through to the expansion valve; check operation using ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (for -J840-).

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

- Check the activation and operation of the components of the battery cooling module by the battery regulation control unit - J840- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

The refrigerant shut-off valve 2 for hybrid battery - N517- attached to the expansion valve of the battery cooling module is closed when not activated; check operation using ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (for -J840-).

3.8.9 Fault finding if readout does not match specification (required cooling output is not attained) - vehicles with high-voltage system

Vehicles with high-voltage system (hybrid vehicles)

– In the “Read measured value block” function, select the display group with the measured values for the activation of the air conditioner compressor and the pressure in the refrigerant circuit ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Repeat cooling output test ⇒ page 90 .

– Observe displays for compressor activation during cooling output test.

– Is air conditioner compressor deactivated during cooling output test (specified speed drops below 1500 rpm)?

↓ yes ↓

Continued ⇒ page 99 . Activation of air conditioner compressor is switched off.

↓ no ↓

- Is there an increase in pressure in refrigerant circuit during cooling output test?

↓ yes ↓

↓ no ↓

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Continued ⇒ page 100 . Increase in pressure in refrigerant circuit

In the “Read measured values” function of the battery regulation control unit - J840- , select the display with the measured values for activation of the refrigerant shut-off valve 1 for hybrid battery - N516- using the ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

If -N516- is activated, rectify the condition that caused it to be activated.

If the air conditioner compressor is activated but -N516- is not activated, the vehicle is to be taken to a workshop equipped with the necessary tools where the 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 found (possibly insufficient refrigerant in circuit, -N516- is blocked or electrical air conditioner compressor - V470- is defective).

Continuation of check: “Activation of air conditioner compressor is deactivated”

– Is activation of air conditioner compressor cancelled by air conditioner operating and display unit (Climatronic control unit - J255-) by battery regulation control unit - J840- or control unit for air conditioning compressor - J842- during cooling output test; does specified speed drop to below 1500 rpm?

↓ yes

– Interrogate event memory of -J255- , -J840- and -J842- .

Eliminate faults displayed and erase event memory.

Read out measured value block with compressor shut-off criteria of -J255- and eliminate cause of deactivation ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Repeat cooling output test ⇒ page 90 .

↓ no

– Air conditioner compressor deactivated during cooling output test by -J840- or -J842- (only the actual speed drops below 1500 rpm)?

Interrogate event memory of -J840- and -J842- , eliminate fault displayed and erase event memory. ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding)

In measured value block -J840- and -J842- , read out displays indicating measured values for activation of electrical air conditioner compressor - V470- .

Check activation of -V470- by -J842- and eliminate cause of shut-off ⇒ page 185 .

Repeat cooling output test ⇒ page 90 .

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Continuation of test: “Increase in pressure in refrigerant circuit”

– Open bonnet.

– Repeat cooling output test ⇒ page 90 .

– Read out pressure in refrigerant circuit from measured value block for air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

• Radiator fan(s) (radiator fan - V7- and radiator fan 2 - V177-) running during cooling output test? Speed is governed by coolant temperature and pressure in refrigerant circuit (determined by engine control unit). Or are radiator fans switched in as soon as pressure in refrigerant circuit exceeds a pressure of approx. 9 bar?

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↓ yes ↓

– Read out measured value blocks displaying “pressure in refrigerant circuit” and “activation of radiator fans” ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

• Radiator fan(s) running at a higher speed as pressure in refrigerant circuit increases (according to request from -J255-)?

↓ yes ↓

– In the “Read measured values” function of the battery regulation control unit - J840- , select the display with the measured values for activation of the refrigerant shut-off valve 1 for hybrid battery - N516- using the ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– If -N516- is activated, rectify the condition that caused it to be activated.

– If the air conditioner compressor is activated but -N516- is not activated, the vehicle is to be taken to a workshop equipped with the necessary tools where the 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 found (possibly insufficient refrigerant in circuit, -N516- is blocked or electrical air conditioner compressor - V470- is defective).

↓ no ↓

– Check actuation of radiator fan(s), e.g. via “Final control diagnosis” function ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Service activation system for radiator fan(s).

– Repeat cooling output test ⇒ page 90 .

↓ no ↓

– Check activation of radiator fans, e.g. via “Final control diagnosis” function ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Service activation system for radiator fan(s).

– Repeat cooling output test ⇒ page 90 .

Note

- *The pressure in the refrigerant circuit depends on various influencing factors. In general, however, the pressure should not exceed 20 bar at an ambient temperature of 20 to 25 °C. Under extreme usage conditions (e.g. in hot countries with high ambient temperatures, stop-and-go traffic, or high relative humidity), the extremely high cooling output involved may also result in pressures of up to 31 bar.*
- *At ambient temperatures below 25 °C, the pressure in the refrigerant circuit does not usually rise above 16 bar (radiator fan (s) running and cooling condenser).*
- *The operating and display unit (Climatronic control unit - G395-) uses the measured value of the refrigerant pressure and temperature sender - J255- to calculate the pressure in the refrigerant circuit, which it then displays ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *At absolute pressures of less than approx. 1.8 bar and greater than approx. 32 bar, the operating and display unit (Climatronic control unit - J255-) does not switch on the air conditioner compressor (the control unit for air conditioning compressor - J842- and thus the electrical air conditioner compressor - V470- are not activated). The air conditioner compressor is only re-activated once the absolute pressure has risen above 1.8 bar or dropped below 16 bar.*
- *For more information on the pressure in the refrigerant circuit, refer to Guided Fault Finding ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *To prevent the air conditioner compressor from being switched off abruptly if the pressure in the refrigerant circuit or the coolant temperature is too high, its output is limited by the air conditioner operating and display unit (Climatronic control unit - J255-) as soon as the pressure in the refrigerant circuit exceeds approx. 30 bar absolute (full compressor output is not restored again until pressure has dropped below 27 bar), or the temperature of the coolant exceeds 115 °C (compressor is switched off completely when coolant reaches 118 °C).*

3.8.10 Fault finding if ice forms at evaporator - vehicles with high-voltage system

Vehicles with high-voltage system (hybrid vehicles)

- The electrical air conditioner compressor - V470- is activated via the control unit for air conditioning compressor - J842- by the air conditioner operating and display unit (Climatronic control unit - J255-) in such a way that the temperature of the air downstream of the evaporator reaches the specified value (approx. 2 to 5 °C).
- After the ignition is switched on, a value greater than 4000 rpm is displayed depending on the road speed, the measured temperature and the voltage of the vehicle's electrical system. As soon as the temperature measured by the evaporator output temperature sender - G263- approaches the specified value, activation is cancelled and the compressor output thus reduced.

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The following problems may be encountered if the measured value of the evaporator output temperature sender - G263- is incorrect (too high):

– The air conditioner fails repeatedly or sporadically (no cooling/ heating output) after extended driving; after the vehicle has

been stopped, the air conditioner functions properly again (after a short wait).

– The windows mist up on the inside during long journeys; the windows are not de-misted even after pressing the “defrost” button on the air conditioner operating and display unit (Climatronic control unit - J255-); after the vehicle has been stopped and waiting a short while, the air conditioner functions properly again.

Remedy:

– In “Read measured value block” function, check measured value for evaporator output temperature sender - G263- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– If measured value for -G263- is too high under usage conditions described by customer (above e.g. 10 °C depending on ambient temperature) although air conditioner is functioning properly, check -G263- (incorrect measured value can cause evaporator to ice up).

– If the measured value for -G263- is too low under the usage conditions described by the customer (at ambient temperature above 0 °C, colder than 0 °C for lengthy period), check activation of electrical air conditioner compressor - V470- and refrigerant shut-off valve 1 for hybrid battery - N516- by battery regulation control unit - J840- . If, for example, -N516- is not activated correctly when hybrid drive is active (no activation despite only drive battery - A2- cooling being required), the evaporator in the air conditioning unit may ice up.

– Check refrigerant line on low-pressure side (thick pipe between quick-release coupling and air conditioner compressor) ⇒ page 154 with engine/air conditioner compressor running. If this line is severely iced up when the problem occurs (thin layer of ice is permissible), this also indicates that evaporator temperature is too low. Check the measured value of the evaporator output temperature sender - G263- as well as the activation and operation of the electrical air conditioner compressor - V470- , the refrigerant shut-off valve 1 for hybrid battery - N516- , the refrigerant shut-off valve 2 for hybrid battery - N517- , the control unit for air conditioning compressor - J842- and the battery regulation control unit - J840- . If a fault is found at -V470- , -N516- , -N517- or -J842- , take the vehicle to a workshop equipped with the necessary tools where the work can be performed by appropriately qualified personnel ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ 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

Under extreme ambient conditions ice could form at the evaporator if certain settings are selected on the air conditioner, for example air outflow direction set to dash panel vents with these vents closed, maximum cooling output with minimum fresh air blower speed selected. When these settings are selected, air no longer flows through the evaporator, which means that the temperature measured by the evaporator output temperature sender - G263- is higher than the actual temperature at the evaporator. However, the air conditioner control system assumes that the measured value of -G263- corresponds to the actual evaporator temperature and continues to activate -N280- , with the result that the evaporator cools down too much.

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3.9 Working on refrigerant circuit

Always perform work on the refrigerant circuit in well ventilated areas. Make sure that there are no inspection pits, shafts or cellar entrances within a radius of 5 metres. Any available exhaust gas extractor systems must be switched on.

Reason:

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

Note

The mixture of gas and air which forms when refrigerant gas escapes must not be inhaled. It must be extracted using suitable exhaust gas extraction systems (workshop extractor).

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.

Reason:

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

Remedy:

Discharge refrigerant circuit ⇒ page 103 .

Note

Do not repair damaged or leaking parts of the air conditioner by welding or soldering; they should be renewed.

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

Reason:

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

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3.10 Discharging refrigerant circuit

Refrigerant must not be allowed to escape into the environment; it should be extracted from the refrigerant circuit with a suction unit or 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 .

Refrigerant must not be allowed to escape into the environment; it should be extracted from the refrigerant circuit with an air conditioner service station. The extracted refrigerant must then either be re-processed on site or returned to the manufacturer for proper

disposal. Different or additional regulations may apply in other countries. For this reason, the vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations .

Reason:

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

Note

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

After discharging air conditioner, unplug electrical connector 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 internal compressor components is guaranteed via an internal oil circuit (provided there is enough refrigerant oil in the air conditioner compressor).

3.11 Notes on dust and pollen filter with activated charcoal filter insert

- The dust and pollen filter is available in different versions (with or without active charcoal filter insert) ⇒ Electronic parts catalogue . Vehicles with a "deluxe" air conditioner are currently fitted with a dust and pollen filter with active charcoal filter insert; vehicles with a "basic" air conditioner are fitted with a dust and pollen filter without active charcoal filter insert.
- In model year 2012, a modified dust and pollen filter with ACF insert is gradually being introduced on vehicles with a "deluxe" air conditioner. This filter with an improved fine particulate filtration rate has approximately the same air resistance values as the filter fitted prior to the conversion and can therefore also be installed on vehicles manufactured prior to the conversion ⇒ Electronic parts catalogue .
- The dust and pollen filter with additional activated charcoal filter insert is installed on vehicles with a "deluxe" air conditioner. These vehicles are additionally fitted with an air quality sensor - G238- ⇒ page 614 .
- The filter with active charcoal filter insert works like a conventional dust and pollen filter, but it also filters out gaseous pollutants such as ozone, benzene and nitrogen dioxide from

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the air passing through. The main function of the activated charcoal layer in the dust and pollen filter is to keep peak concentrations away from the passenger compartment.

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

- Certain pollutants are firmly bound in the active charcoal layer.

- Other pollutants are converted into harmless compounds, as in a catalytic converter.

- For the rest of the pollutants the active charcoal functions like a capacitor. When the pollution increases, the activated charcoal initially absorbs pollutants until a certain level of saturation has been reached. If the pollutant level drops, the activated charcoal layer continuously emits these absorbed particles again.

- ♦ As the active charcoal layer permanently binds some of the gaseous particles in the air in addition to dust and pollen, we recommend renewing the dust and pollen filter earlier than specified under the following operating conditions:

– If the vehicle is driven in areas with a constantly high level of atmospheric pollution. The activated charcoal layer in the dust and pollen filter becomes saturated sooner than specified.

– When the “Automatic air recirculation” function is mostly turned off while the vehicle is moving.

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- ♦ On vehicles with an air quality sensor - G238- , the air conditioner should be operated in “automatic air recirculation” mode whenever possible. However, if it is necessary or desired to deactivate the function, note the following:

- The activated charcoal layer in the dust and pollen filter becomes saturated after a certain time.

- A saturated filter can no longer absorb pollutants; they will then pass through unfiltered.

- ♦ The main function of the active charcoal layer in the dust and pollen filter and the air quality sensor - G238- is to keep peak concentrations away from the passenger compartment. However, observe the following:

– If a vehicle is driven in an area with a relatively clean environment (with few gaseous pollutants in the air), the point at which the system switches from fresh air mode to air recirculation mode is different to that in areas with a high basic impact level (e.g. industrial estates).

– The air conditioner automatically switches from the fresh air ventilation mode to the air recirculation mode, independently of the basic pollution level, when the level of pollution increases, e.g. when driving through a cloud of exhaust fumes from a lorry run with diesel.

3.12 Paint repairs on vehicles with air conditioning system

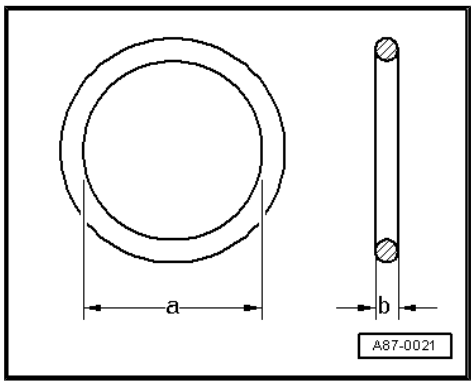
When performing paintwork repairs, object temperatures of 80 ° C must not be exceeded in drying booths or their preheating zones.

Reason:

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

3.13 Refrigerant circuit seals

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



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.*

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4 Technical data

⇒ “4.1 Refrigerant capacities”, page 107

⇒ “4.2 Approved refrigerant oils and refrigerant oil capacities”, page 109

⇒ “4.3 Oil distribution”, page 113

4.1 Refrigerant capacities

⇒ “4.1.1 Capacities for refrigerant R134a”, page 107

⇒ “4.1.2 Capacities for refrigerant R1234yf”, page 108

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 .

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

– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Note

- *The compressor version may differ depending on the production period and engine ⇒ Electronic parts catalogue .*
- *The specified refrigerant oil capacities for the refrigerant circuit may differ depending on the type of air conditioner compressor ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils .*
- *Always charge the refrigerant circuit as far as the upper tolerance limit (some refrigerant remains in filler hoses).*
- *For further information refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems .*

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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 Workshop Manual for all models ⇒ "4.2.3 Refrigerant oil capacities for refrigerant R1234yf", page 112 , and ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 00 ; Technical data .*
- *Note different capacities for refrigerant R1234yf in vehicles without rear air conditioning unit (with one evaporator) and vehicles with high-voltage system (with two evaporators).*
- *For additional notes on evacuating and charging the refrigerant circuit, refer to ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .*

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

– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Capacity for refrigerant R1234yf

Vehicle model	Production period	Capacity in grams	Differing characteristics of this refrigerant circuit
Audi Q5, Audi A5, Audi S5 (Coupé, Cabriolet and Sportback)	From 06.16 onwards	520 +/- 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 109

⇒ "4.2.2 Approved refrigerant oils for refrigerant R1234yf", page 110

⇒ "4.2.3 Refrigerant oil capacities for refrigerant R1234yf", page 112

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 271 , and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (before using air conditioner after it has been re-charged)

Caution

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

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

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

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

Risk of corrosion in refrigerant circuit.

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

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Important information:

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

Note

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

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.*

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Caution

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

- ***The refrigerant circuit must only be charged with approved refrigerant oils ⇒ Electronic parts catalogue . The correct refrigerant oil depends on the make and type of the air conditioner compressor fitted.***

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

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

Risk of corrosion in refrigerant circuit.

- ***Refrigerant oil absorbs moisture. Never use refrigerant oil from containers which have been open for a long period of time ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 00 ; Repair instructions; Refrigerant and refrigerant oil .***

Important information:

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

Note

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

- The refrigerant oils used with refrigerant R134a are not appropriate for use with refrigerant R1234yf ⇒ Electronic parts catalogue .
- The special refrigerant oil to be used exclusively for refrigerant circuits with refrigerant R1234yf is not always available on the refrigerant oil market ⇒ Electronic parts catalogue .
- Refrigerant oils intended specifically for a particular air conditioner compressor can therefore be obtained from the replacement parts range ⇒ Electronic parts catalogue .
- If a defective air conditioner compressor is replaced by a compressor from a different manufacturer, it is important to check whether the refrigerant oil already in the refrigerant circuit (from the removed compressor) is also approved for the new compressor. If a different refrigerant oil is approved for the new air conditioner compressor than for the removed compressor, the refrigerant circuit must be cleaned (flushed) ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .
- Using other refrigerant oils may cause the system to fail, as it cannot be guaranteed that they will mix and circulate with refrigerant R1234yf to lubricate the air conditioner compressor.
- There are different refrigerant oils for “Denso”, “Delphi/Mahle”, “Visteon” and “Sanden” air conditioner compressors ⇒ Electronic parts catalogue .
- The refrigerant oil (part no. G 055 535 M2, external designation ND 12) for use in refrigerant circuits with “Denso” air conditioner compressors is the same for mechanical and electric air conditioner compressors ⇒ Electronic parts catalogue .
- For refrigerant circuits with mechanically or electrically driven “Sanden”, “Delphi/Mahle” or “Visteon” air conditioner compressors, use refrigerant oil with part no. G 052 535 M2 (external designation SP A2) ⇒ Electronic parts catalogue .

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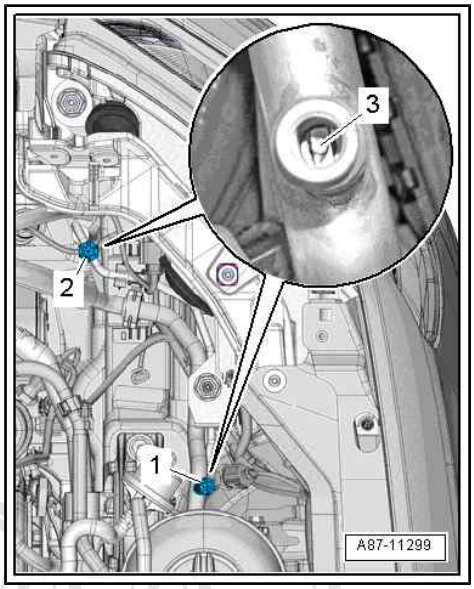

Note

- *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 conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station . This may be practical e.g. if the refrigerant oil specified for the refrigerant circuit is normally only rarely used. Always use fresh refrigerant oil ⇒ Electronic parts catalogue . Service connection -1- or -2- may be in a different location in the vehicle*
  ⇒ "1.1 Overview of fitting locations - components not located in passenger compartment", page 116 .

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⇒ "4.2.3 Refrigerant oil capacities for refrigerant R1234yf", page 112

4.2.3 Refrigerant oil capacities 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", "Visteon" and "Sanden" air conditioner compressors ⇒ "4.2.2 Approved refrigerant oils for refrigerant R1234yf", page 110 , 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 110
- Layout and characteristics of refrigerant circuit
  ⇒ "2.1 System overview - refrigerant circuit", page 145

Vehicle model	Production period	Total quantity of oil in refrigerant circuit in cm^3	Quantity of refrigerant oil in replacement compressor in cm^3	Differing characteristics of this refrigerant circuit
Audi A5, Audi S5, Audi Q5, Audi RS Q5	From 06.16 onwards	110 +/- 10	110 +/- 10	• Air conditioner compressor manufactured by “Denso”, type “6 SES 14” without magnetic clutch, or type “6 SAS 14” with magnetic clutch

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Note

- *The capacities also apply for the Audi S5, Audi SQ5 and Audi RS 5.*
- *The replacement compressor contains the full quantity of oil intended for the refrigerant circuit. If the air conditioner compressor is renewed, the quantity of oil in the compressor must therefore be adjusted accordingly ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .*
- *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 re-

newing 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 .

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80 – Heating

1 Overview of fitting locations - heater

- The Audi A4, Audi A5 and Audi Q5 are only available with an air conditioner. There is currently no provision for a heater separate from the air conditioner.
- All the information required for servicing the heating and air conditioning system can be found in
⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 116 and
⇒ “1.2 Overview of fitting locations - components in passenger compartment (front)”, page 130 .

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87 – Air conditioning system

1 Overview of fitting locations - air conditioner

⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 116

⇒ “1.2 Overview of fitting locations - components in passenger compartment (front)”, page 130

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

Group of components “1” ⇒ page 116

Group of components “2” ⇒ page 121

Group of components “3” ⇒ page 126

Group of components “1”

Note

The following illustrations show the positions of the components on an Audi A5 Coupé. The layout differs slightly on the Audi A5 Sportback, Audi A4, Audi Q5, etc. However, the components must be removed and installed in the same manner as described for the Audi A5 Coupé (unless indicated otherwise).

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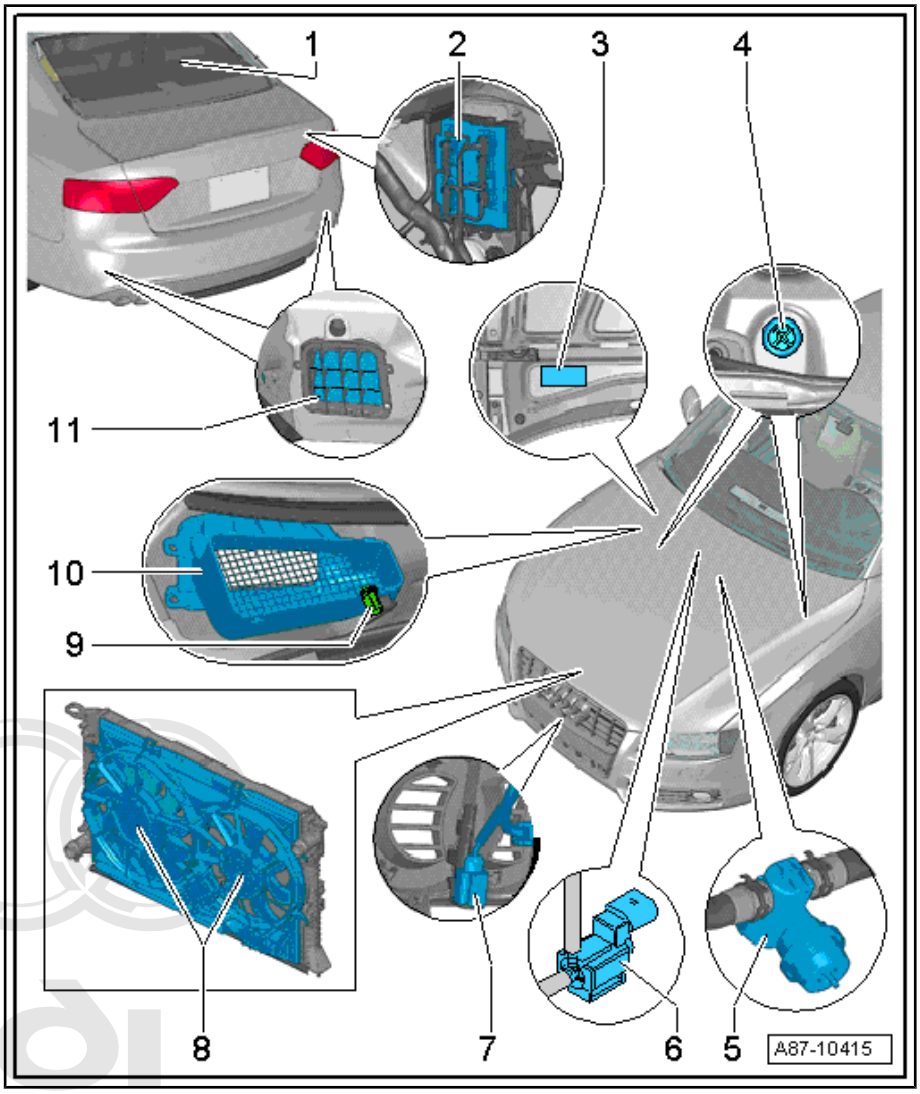

1 - Heated rear window - Z1-

- The request for rear window heating is transmitted from the air conditioner operating and display unit (Climatronic control unit - J255-) via the data bus to the convenience system central control unit - J393- . The heated rear window - Z1- is activated via the convenience system central control unit - J393- ⇒ Electrical system and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Notes on operation of heated rear window ⇒ page 12
- Removing and installing rear window ⇒ General body repairs, exterior; Rep. gr. 64 ; Rear window; Removing and installing rear window

2 - Convenience system central control unit - J393-

- Heated rear window - Z1- is activated via convenience system central control unit - J393- ⇒ Electrical system and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Removing and installing, checking ⇒ Electrical system and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

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3 - Label

- With information on the type of refrigerant and the specified capacity ⇒ “4 Technical data”, page 107 , ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils , and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .

4 - Plenum chamber water drains

- One water drain each is fitted on the left and right sides in the plenum chamber.
- Removing and installing ⇒ page 577
- Checking ⇒ page 579
- Cleaning ⇒ page 583

5 - Coolant shut-off valve

- Depending on engine, shut-off valve is fitted in supply line or return line for coolant from engine to heat exchanger of air conditioning unit.

– Currently the shut-off valve is only installed on vehicles with 4-cyl. or 6-cyl. petrol engine. Vehicles with these engines that are equipped with auxiliary heating as an optional extra are not fitted with a shut-off valve; this function is assumed by the heater coolant shut-off valve - N279- fitted in vehicles with auxiliary heating ⇒ Auxiliary/supplementary heater; Rep. gr. 82 ; Overview of fitting locations - auxiliary/supplementary heater; Overview of fitting locations - components not located in passenger compartment .

Note

- *On vehicles manufactured at the start of production, the shut-off valve is vacuum-actuated via the Climatronic coolant shut-off valve - N422- .*
- *Certain vehicles without an auxiliary heater (optional equipment) were fitted with vacuum-actuated coolant shut-off valves from the start of production onwards (depending on engine). At a later date, shut-off valves that are activated directly were gradually introduced ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *Depending on the engine version and the production period, this valve may be designated Climatronic coolant shut-off valve - N422- or coolant shut-off valve - N82- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

❑ Layout of coolant shut-off valve and Climatronic coolant shut-off valve - N422- at engine or in plenum chamber ⇒ page 590

6 - Coolant shut-off valve -N422- / -N82-

❑ The fitting location and the version of the Climatronic coolant shut-off valve - N422- vary. Depending on the engine and the vehicle model, it may be installed in the engine compartment or in the plenum chamber ⇒ page 590 .

– Currently the Climatronic coolant shut-off valve - N422- is only fitted on certain vehicles with 4-cyl. or 6-cyl. engine. Vehicles with these engines that are equipped with auxiliary heating as an optional extra are not fitted with -N422- ; this function is assumed by the heater coolant shut-off valve - N279- fitted in vehicles with auxiliary heating ⇒ Auxiliary/supplementary heater; Rep. gr. 82 ; Overview of fitting locations - auxiliary/supplementary heater; Overview of fitting locations - components not located in passenger compartment .

❑ Activation and operation ⇒ page 590

❑ Layout of coolant shut-off valve and Climatronic coolant shut-off valve - N422- in vehicle ⇒ page 590

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Note

- *Certain vehicles without an auxiliary heater (optional equipment) were fitted with vacuum-actuated coolant shut-off valves from the start of production onwards (depending on engine). At a later date, shut-off valves that are activated directly were gradually introduced ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

- *Depending on the engine version and the production period, this valve may be designated Climatronic coolant shut-off valve - N422- or coolant shut-off valve - N82- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The coolant shut-off valve - N422- / -N82- is not installed on all vehicle versions with a 4-cyl. or 6-cyl. engine. Whether it is installed on vehicles without "auxiliary heater" (optional extra) also depends e.g. on the country-specific version.*
- *-N489- / -N422- is currently not fitted in vehicles with an engine with regulated coolant circuit (e.g. vehicles with a regulated coolant pump and a coolant valve for cylinder head - N82-). On engines with a regulated coolant pump, the engine control unit activates the coolant pump to regulate coolant circulation ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly .*

7 - Ambient temperature sensor - G17-

- ❑ The measured value of the ambient temperature sensor - G17- is evaluated by the onboard supply control unit - J519- and transmitted via the data bus to the air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- ❑ Procedure if there are problems with an excessively high measured value for -G17- ⇒ page 631
- ❑ Removing and installing ⇒ page 631

8 - Radiator fan - V7- and radiator fan 2 - V177-

- ❑ Depending on vehicle equipment, different versions of radiator fan - V7- and radiator fan 2 - V177- are fitted. ⇒ Electronic parts catalogue
- ❑ The request for activation of the radiator fan(s) - V7- is transmitted by the air conditioner operating and display unit (Climatronic control unit - J255-) to the engine control unit via the data bus. The engine control unit then activates the fan(s) (radiator fan - V7- and radiator fan 2 - V177-) either directly or via the radiator fan control unit - J293- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Rep. gr. 19 ; Radiator/radiator fans; Exploded view - radiator/radiator fans .
- ❑ Checking activation of radiator fans by air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")
- ❑ The corresponding engine control unit switches e.g. the radiator fan - V7- and radiator fan 2 - V177- (directly or via radiator fan control unit - J293-) infinitely to the desired output (depending on type of engine) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

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9 - Air quality sensor - G238- / humidity sender in fresh air intake duct - G657-

- ❑ Different versions ⇒ Electronic parts catalogue

Note

- *Different versions are fitted depending on the production period of the vehicles and the version of the air conditioner (“basic” or “deluxe”). Until the gradual conversion of the vehicle version from model year 2012 onwards, “basic” air conditioners were not fitted with -G657- / -G238- . From this conversion onwards, -G657- without -G238- (black housing) is fitted. Until the gradual conversion of the vehicle version from model year 2012 onwards, “deluxe” air conditioners were fitted with -G238- without -G657- . From the conversion onwards, -G657- with -G238- (brown housing) is fitted.*
- *The air quality sensor - G238- without -G657- is only fitted on vehicles with a “deluxe” air conditioner (from start of production up to conversion) ⇒ page 600 ⇒ Electronic parts catalogue .*
- *From model year 2012 onwards, the version of the vehicles is gradually being converted, starting with the Audi A4 and Audi A5 ⇒ page 600 . On vehicles manufactured prior to the conversion, “deluxe” air conditioners are fitted with -G238- (not fitted on “basic” version). On vehicles manufactured after this conversion (and on the Audi Q5 hybrid), the “basic” version is fitted with -G657- and the “deluxe” version is fitted with -G657- with -G238- .*

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- ❑ Function ⇒ “9.2 Operation of air quality sensor G238 ”, page 614
- ❑ Function ⇒ “9.14 Operation of humidity sender in fresh air intake duct G657 ”, page 640
- ❑ Checking ⇒ “9.3 Checking air quality sensor G238 ”, page 617
- ❑ Checking ⇒ “9.15 Checking humidity sender in fresh air intake duct G657 ”, page 641
- ❑ Removing and installing ⇒ page 627
- ❑ The measured values for -G238- / -G657- are evaluated by the onboard supply control unit - J519- and transmitted via the data bus to the operating and display unit (Climatronic control unit - J255-). When it detects a request, the operating and display unit (Climatronic control unit - J255-) switches on air recirculation mode if there is no shut-off criterion ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

10 - Fresh-air intake with intake grille

- ❑ Check that cowl panel trim with cover for fresh-air intake is installed properly and is not damaged. Check that seals between cover for fresh-air intake, windscreen cross member and cowl panel trim are seated correctly and are not damaged. These seals prevent water from running between windscreen cross member and cowl panel trim into intake duct of air conditioning unit ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- ❑ Removing and installing ⇒ page 572 and ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover
- ❑ Check that intake grille is properly seated. Intake grille stops foreign matter (leaves etc.) entering intake duct of air conditioning unit.

- Depending on the version, a filter designed to stop the fresh air blower from drawing in dust and sand may be fitted instead of the intake grille for certain countries with a high dust level in the ambient air (e.g. for China) ⇒ Electronic parts catalogue .
- Removing and installing ⇒ page 572

Note

An additional cover with drip rail may be fitted at the fresh air intake duct depending on the vehicle version and the type of plenum chamber cover fitted ⇒ page 572 .

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11 - Forced ventilation vent

- One forced ventilation vent each is fitted on either side beneath rear bumper.
- Sealing lips of ventilation frame must move freely and close automatically.
- To ensure proper ventilation of passenger compartment, air ducts must not be blocked by luggage compartment lining.
- Checking ⇒ page 568

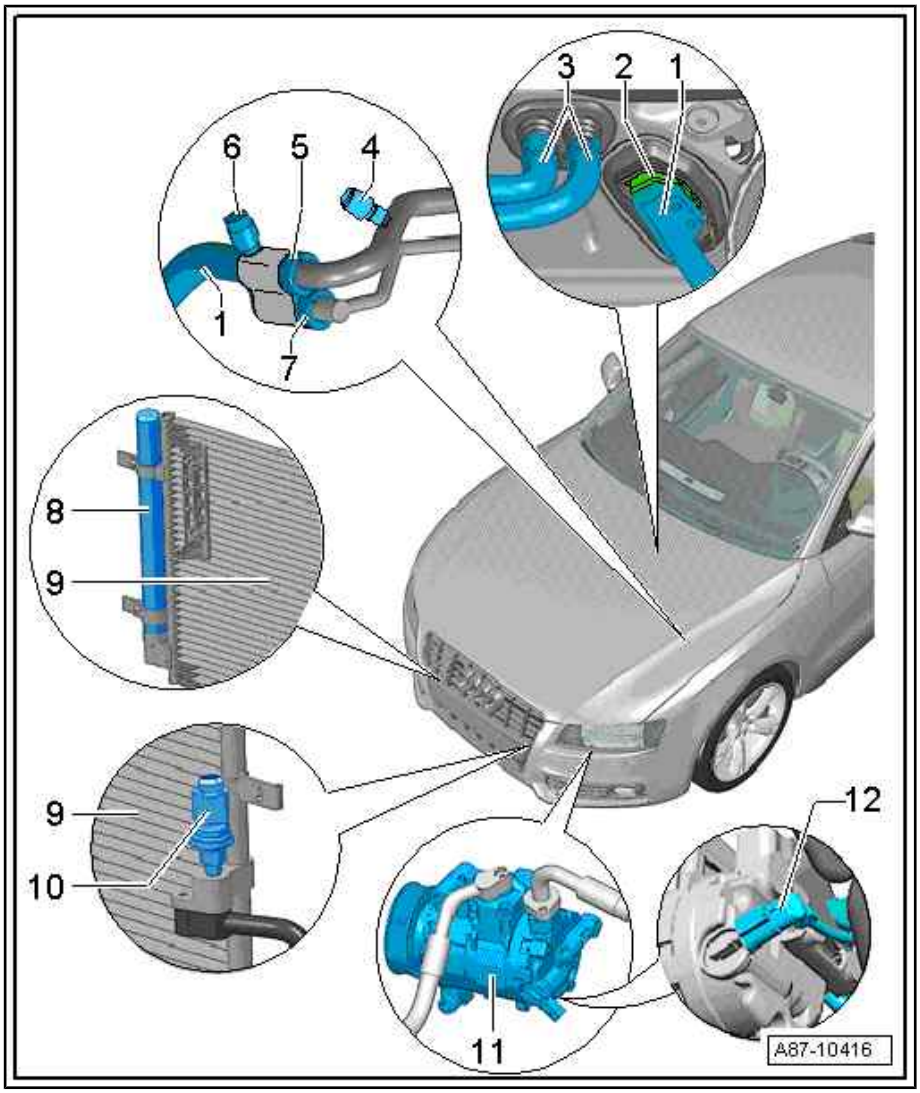
Group of components “2”

1 - Refrigerant line with internal heat exchanger

- In this refrigerant line, the hot liquid refrigerant flowing through the high-pressure side gives off energy to the cold refrigerant vapour flowing through the low-pressure side, thus enhancing the efficiency of the air conditioner
- Removing and installing refrigerant line ⇒ page 217
- Detaching and attaching refrigerant lines at quick-release coupling ⇒ page 211

2 - Expansion valve

- Detaching and attaching refrigerant line with internal heat exchanger ⇒ page 217
- Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue
- Removing and installing ⇒ page 232



Note

From the start of production up to the conversion from model year 2012 onwards, evaporators with a width (block depth) of approx. 40 mm were fitted (air conditioning unit with part number "8K_ 820 005"). From model year 2012 onwards and depending on the vehicle version, evaporators with a width (block depth) of approx. 50 mm are being introduced gradually (air conditioning unit with part number "8T_ 820 005"). Pay attention to the correct assignment of the expansion valve to the evaporator (different versions) ⇒ Electronic parts catalogue .

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3 - Coolant pipes to heat exchanger for heater in air conditioning unit

- ❑ Detaching and attaching coolant hoses, bleeding coolant circuit ⇒ page 543 (Removing and installing heat exchanger)

4 - Service connection (low-pressure side)

- ❑ For details on how to measure and discharge refrigerant circuit, refer to ⇒ 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 .

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 conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

- ❑ Cap with seal, always screw on
- ❑ Different versions (with primary sealing valve or Schrader valve) depending on refrigerant line; distinguishing features ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems
- ❑ Different versions depending on refrigerant (R134a or R1234yf)
  ⇒ "2.21 Differences in service connections depending on refrigerant (R134a or R1234yf)", page 267 and ⇒ Electronic parts catalogue

Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

5 - Quick-release coupling of refrigerant line (low-pressure side)

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WARNING

Only release and open the quick-release couplings after completely discharging the refrigerant circuit.

❑ Detaching and attaching refrigerant lines at quick-release coupling ⇒ page 211

6 - Service connection (high-pressure side)

❑ For details on how to measure, discharge and charge refrigerant circuit, refer to ⇒ 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 .

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 conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

- Cap with seal, always screw on
- Different versions (with primary sealing valve or Schrader valve) depending on refrigerant line; distinguishing features ⇒ 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 .
- Different versions depending on refrigerant (R134a or R1234yf)
  ⇒ "2.21 Differences in service connections depending on refrigerant (R134a or R1234yf)", page 267 and
  ⇒ Electronic parts catalogue

Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

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7 - Quick-release coupling of refrigerant line (high-pressure side)

WARNING

Only release and open the quick-release couplings after completely discharging the refrigerant circuit.

8 - Receiver

- Only remove after discharging the refrigerant circuit; take the vehicle to a workshop equipped with the necessary tools where the 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 .
- Receiver is attached directly to condenser ⇒ page 256 (Removing and installing receiver).
- Different versions ⇒ Electronic parts catalogue

Note

Depending on version of condenser, receiver may be attached to or integrated into condenser ⇒ page 256 and ⇒ page 260 .

- Removing and installing desiccant cartridge (for condenser with integrated receiver) ⇒ page 260

9 - Condenser

- Only remove after discharging the refrigerant circuit; take the vehicle to a workshop equipped with the necessary tools where the 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 .

- ❑ Different versions (depending on vehicle equipment) ⇒ Electronic parts catalogue
- ❑ Detaching and attaching refrigerant lines ⇒ page 242
- ❑ Removing and installing condenser ⇒ page 248

Note

Depending on the version of the radiator and condenser, it may be necessary (e.g. on the Audi RS 4, Audi SQ5 and Audi RS 5) to discharge the refrigerant circuit and disconnect the refrigerant lines from the condenser in order to remove the condenser from the front end or to remove the radiator ⇒ page 242 .

10 - Refrigerant pressure and temperature sender - G395-

- ❑ Removing and installing ⇒ page 190
- ❑ For checking signal, refer to ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .

Note

Refrigerant pressure and temperature sender - G395- uses data bus (“LIN bus”) to exchange information with onboard supply control unit - J519- ⇒ page 193 .

11 - Mechanically driven air conditioner compressor

- ❑ Detaching and attaching air conditioner compressor at bracket on vehicles with 4-cyl. engine or 6-cyl. TDI engine ⇒ page 286
- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

Note

- ♦ *On vehicles with a 6-cyl. petrol engine or an 8-cyl. FSI engine, the air conditioner compressor can only be detached from the bracket and removed after the refrigerant circuit has been discharged ⇒ page 314 (Removing and installing air conditioner compressor).*
- ♦ *The air conditioner compressors fitted at the start of production are manufactured by “Denso” (type “6 SEU 14” for vehicles with 4-cyl. and 6-cyl. engines and type “7 SEU 17” for vehicles with 8-cyl. FSI engines). Different makes of air conditioner compressor may also be fitted at a later date ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils , or ⇒ “4 Technical data”, page 107 and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .*

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- *For further notes see ⇒ page 145 .*

12 - Air conditioner compressor regulating valve - N280-

❑ Checking activation and function ⇒ page 185

Note

- *Only fitted on vehicles with a mechanically driven air conditioner compressor*
- *Certain malfunctions of -N280- (e.g. sticking valve or open circuit in coil) can lead to problems with air conditioner compressor (no cooling output from air conditioner, evaporator icing up etc.). If -N280- (and not 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 conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .*
- *-N280- is not available as a replacement part for all air conditioner compressors. If -N280- cannot be obtained separately for a particular air conditioner compressor (different versions available), the entire air conditioner compressor must be renewed if problems occur ⇒ Electronic parts catalogue .*

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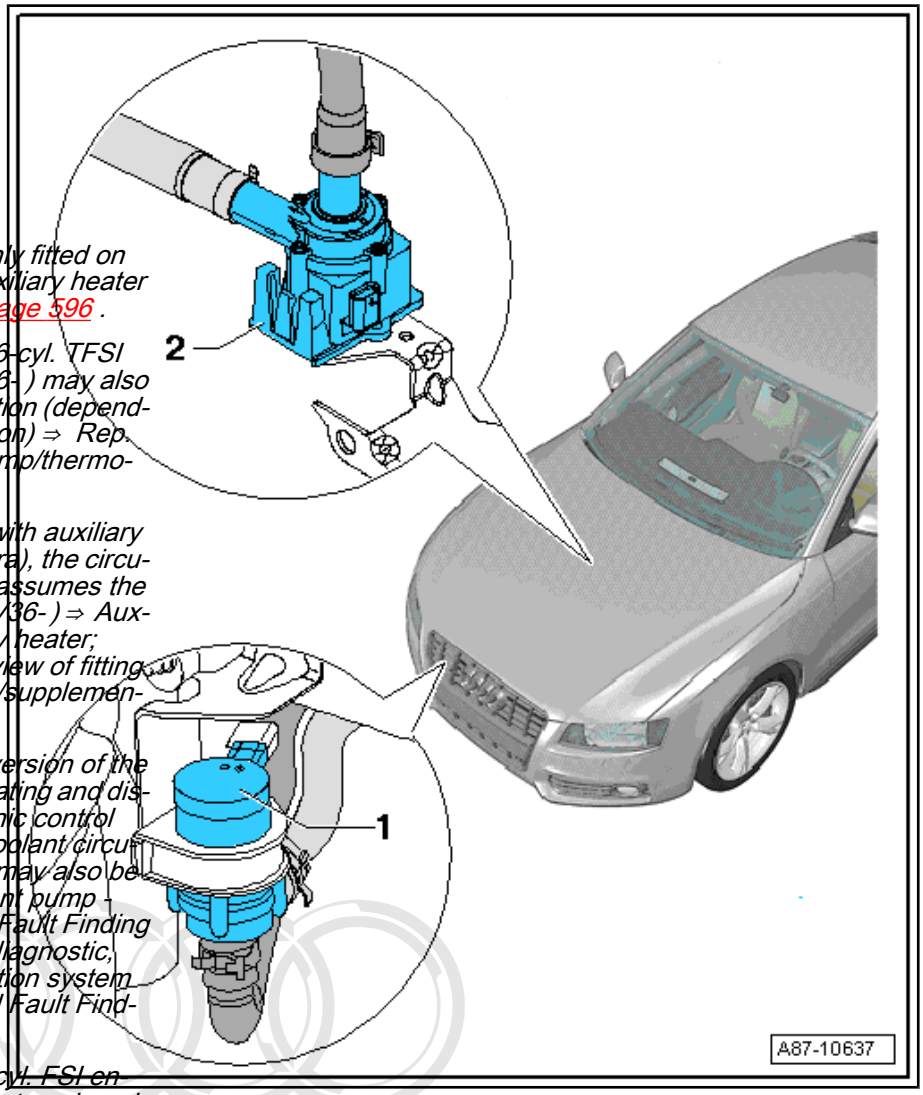
Group of components “3”

1 - Coolant circulation pump - V50- (coolant pump - V36-)

- ❑ Fitting location e.g. on vehicles with 6-cyl. FSI engine ⇒ page 596



Note

- *-V50- (-V36-) is only fitted on vehicles with no auxiliary heater (optional extra) ⇒ page 596 .*
- *On vehicles with a 6-cyl. TFSI engine, -V50- (-V36-) may also be fitted at this location (depending on vehicle version) ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly .*
- *On these vehicles with auxiliary heater (optional extra), the circulation pump - V55- assumes the function of -V50- (-V36-) ⇒ Auxiliary/supplementary heater; Rep. gr. 82 ; Overview of fitting locations - auxiliary/supplementary heater .*
- *Depending on the version of the air conditioner operating and display unit (Climatronic control unit - J255-), the coolant circulation pump - V50- may also be referred to as coolant pump - V36- in the Guided Fault Finding routine ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *Vehicles with an 8-cyl. FSI engine are currently not equipped with -V50- (introduction not yet finalised) ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly and ⇒ Electronic parts catalogue .*

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- *The version of the coolant circulation pump - V50- (coolant pump - V36-) and the activation of the pump(s) differ depending on the vehicle version and production period. From model year 2012 onwards and depending on the engine, the pumps fitted from the start of production onwards and activated via a 500 hertz signal (500 pulses per second) are gradually being replaced by pumps activated via a variable signal (100 ... 500 hertz). The pumps activated via a variable signal are equipped additionally with a diagnostic function and are generally activated via the corresponding engine control unit. Therefore it is important to observe the correct assignment (only the assigned pump can be activated) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Electronic parts catalogue .*
- *-V50- can be fitted in different locations. On vehicles with a 6-cyl. engine, -V50- may be fitted at the longitudinal member as shown, or it may be positioned between the plenum chamber partition panel and the engine ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly .*

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2 - Coolant circulation pump - V50- (coolant pump - V36-)

❑ Fitting location e.g. on vehicles with a 4-cyl. engine and on certain vehicles with a 6-cyl. engine ⇒ page 594

Note

- *-V50- (-V36-) is only installed on vehicles with start/stop system (optional extra), but without auxiliary heater (optional extra) from model year 2010 onwards ⇒ page 594 .*
- *On vehicles with start/stop system and auxiliary heater (optional extra), -V50- (-V36-) is not installed. On these vehicles the circulation pump - V55- assumes the function of -V50- (-V36-) ⇒ Auxiliary/supplementary heater; Rep. gr. 82 ; Overview of fitting locations - auxiliary/supplementary heater .*

- *Depending on the version of the air conditioner operating and display unit (Climatronic control unit - J255-), the coolant circulation pump - V50- may also be referred to as coolant pump - V36- in the Guided Fault Finding routine ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The version of the coolant circulation pump - V50- (coolant pump - V36-) and the activation of the pump(s) differ depending on the vehicle version and production period. From model year 2012 onwards and depending on the engine, the pumps fitted from the start of production onwards and activated via a 500 hertz signal (500 pulses per second) are gradually being replaced by pumps activated via a variable signal (100 ... 500 hertz). The pumps activated via a variable signal are equipped additionally with a diagnostic function and are generally activated via the corresponding engine control unit. Therefore it is important to observe the correct assignment (only the assigned pump can be activated) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Electronic parts catalogue .*
- *-V50- can be fitted in different locations. On most vehicles with a 4-cyl. engine and certain vehicles with a 6-cyl. engine, it is located between the plenum chamber partition panel and the engine.*
- *The activation of -V50- differs. On vehicles with high-voltage system (hybrid vehicles), the activation occurs after a request from -J255- via the corresponding engine control unit ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

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

Note

The following illustrations show the layout of the components on an Audi A5 Coupé. The layout may differ slightly on the Audi A5 Sportback, Audi A4, Audi Q5, etc. However, the components must be removed, installed and checked in the same manner as described for the Audi A5 Coupé (unless indicated otherwise).

Components on left side ⇒ page 130

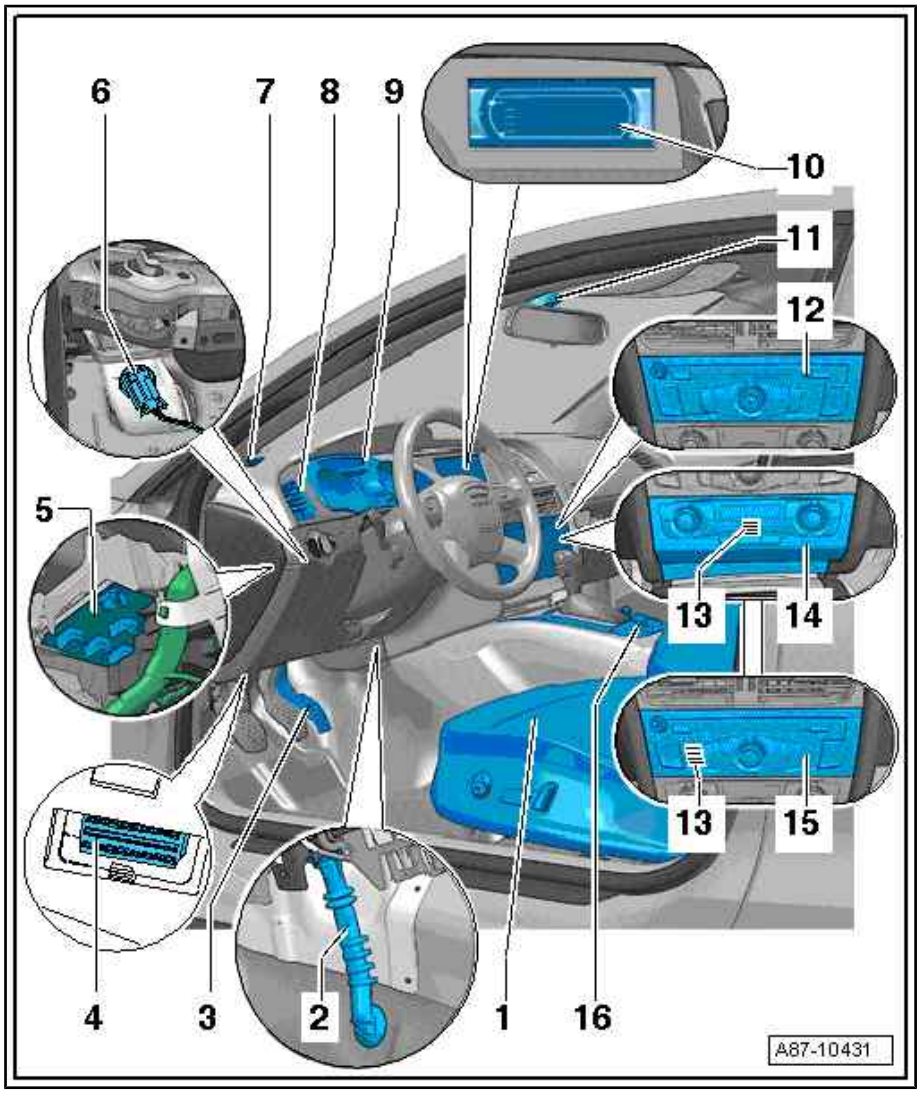
Components on right side ⇒ page 140

Components on left side

Note

The illustration shows the left side of the passenger compartment for a vehicle with left-hand drive.

1 - Seat, left-side (driver's seat) with components for seat heating and seat ventilation



- Components for seat heating (front left seat temperature sender - G344- , heated seat cushion for front left seat - Z45-) and seat ventilation (control unit and various fans) ⇒ General body repairs, interior; Rep. gr. 72 ; Front seats and ⇒ General body repairs, interior; Rep. gr. 74 ; Covers and padding on front seats
- Not all vehicles are equipped with seat heating and ventilation (optional extra).
- The seat heating and ventilation settings are selected on the air conditioner operating and display unit (Climatronic control unit - J255-). The activation of the seat heating and seat ventilation is indicated in the measured value block of the air conditioner operating and display unit (Climatronic control unit - J255-); checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Depending on the vehicle equipment and version, the seat heating and seat ventilation are activated via various control units ⇒ page 5 , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and

⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051 (for -J519- , -J136- and -J521- , depending on vehicle).

- ❑ Servicing seat heating and seat ventilation ⇒ General body repairs, interior; Rep. gr. 72 ; Front seats and ⇒ General body repairs, interior; Rep. gr. 74 ; Covers and padding on front seats
- ❑ Notes on operation of seat heating and ventilation ⇒ page 5

Note

- ♦ *If a condition prevails in which heating or ventilation of the driver's seat or front passenger's seat cannot be activated, this is stored as a fault in the onboard supply control unit - J521- , the seat and steering column adjustment control unit with memory - J136- or the front passenger seat adjustment with memory control unit - J519- (depending on model and vehicle equipment). On this vehicle, no information is currently transmitted via the data bus to the air conditioner operating and display unit (Climatronic control unit - J255-) indicating that the event memory in the relevant control unit or in the convenience system central control unit - J393- has to be read out ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . In the event of problems with seat heating or ventilation, the first step should therefore always be to read out the event memories of the control units which activate the seat heating and ventilation.*
- ♦ *The seat heating and seat ventilation level is set on the air conditioner operating and display unit (Climatronic control unit - J255-); this setting is then transmitted via data bus to the onboard supply control unit - J519- . The specified temperatures for the different seat heating and seat ventilation settings are stored in the onboard supply control unit - J519- . Depending on the version of the -J519- and the production period, the specified temperature for the seat heating and seat ventilation may be different even if the setting on the air conditioner operating and display unit (Climatronic control unit - J255-) is the same ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (for -J519-).*

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2 - Condensation drain, left-side (driver side)

- ❑ Removing and installing ⇒ page 551
- ❑ Checking ⇒ page 552

3 - Accelerator mechanism

- ❑ Kick-down deactivation of air conditioner compressor (via air conditioner compressor regulating valve - N280-) is performed when requested by engine control unit (data are exchanged via data bus). The current status of the activation of -J255- can be read off in the measured value block of the air conditioner operating and display unit (Climatronic control unit - N280-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (for air conditioner and, depending on engine, for injection and ignition system or diesel glow plug and injection system).

4 - Diagnostic connection

- ❑ Perform Guided Fault Finding for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

5 - Onboard supply control unit - J519-

- ❑ Various components such as the heated rear window - Z1- are activated via the convenience system central control unit - J393- ⇒ Electrical system and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- ❑ Removing and installing, checking ⇒ Electrical system

6 - Front left chest vent temperature sensor - G385-

- – Only fitted on vehicles with air conditioner version “deluxe”
- ❑ Removing and installing ⇒ page 638

7 - Defroster vent/side window (left-side)

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

8 - Dash panel vent (left-side)

- ❑ Removing and installing dash panel vents ⇒ page 587 and ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel vents

9 - Control unit in dash panel insert - J285-

- ❑ With ambient temperature indicator - G106- in driver information system (DIS)
- ❑ If there are problems with an excessively high display value for the ambient temperature indicator - G106- (caused by an excessively high -G17- measured value), refer to ⇒ page 631 .
- ❑ Checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

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

- ❑ Multi Media Interface (MMI) display
- ❑ Different versions and operation depending on type of MMI (“Infotainment” or “Basic”) and vehicle equipment ⇒ Infotainment/MMI Operating Manual
- ❑ The MMI display indicates the functions selected on the operating and display unit (Climatronic control unit - J255-) (and various additional functions of the air conditioner) ⇒ Infotainment/MMI Operating Manual .
- ❑ The “CAR” button of the radio - R- or the multimedia system operating unit - E380- (depending on vehicle equipment) can be used to call up various additional air conditioner functions and alter the setting ⇒ Infotainment/MMI Operating Manual .
- ❑ From model year 2009 onwards, Audi A5 Coupé and Audi A4 vehicles are gradually being fitted with modified operating and display units (Climatronic control unit - J255-); these were installed on the Audi Q5 right from the start of production ⇒ Item 14 (page 135) and ⇒ Electronic parts catalogue . On vehicles with such operating and display units and depending on the encoding and adaption, e.g. the screen display of the “MMI” (Multi Media Interface) is no longer switched to “Air conditioning” when the buttons and controls of the operating and display unit. The air conditioner functions selected are then indicated on the current display (different versions) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") , ⇒ Owner's Manual and ⇒ Operating Manual for “Infotainment/MMI” .

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Note

- *Pay attention to the correct assignment, encoding and adaption of the operating and display unit (Climatronic control unit - J255-) to the control unit for front display and information control panel - J523- / control unit 1 for information electronics - J794- (different versions depending on production period and vehicle equipment) ⇒ Electronic parts catalogue . If the assignment, encoding or adaption are incorrect, the various functions of the air conditioner cannot be displayed and selected on the MMI.*
- *From model year 2010 onwards, a start/stop system (optional equipment) is offered for this vehicle in combination with certain engines. On vehicles with a start/stop system, the stop function is prevented depending on the setting on the operating and display 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. The same also applies if the difference between the selected required temperature and the calculated actual temperature exceeds a certain value in heating or cooling mode ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *On vehicles with a start/stop system, an additional coolant pump is installed for the stop function (depending on the vehicle equipment and the version of the vehicle) ⇒ page 126 , ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly and ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding") .*
- *On vehicles with a start/stop system, only operating and display units (Climatronic control unit - J255-) with part number 8T1 820 043 from index "AG" onwards (for vehicles with left-hand drive) or 8T2 820 043 from index "AD" onwards (for vehicles with right-hand drive) or with part number 8K_ 820 043 may be installed ⇒ page 600 and ⇒ Electronic parts catalogue .*

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11 - Humidity sender - G355-

- ❑ Removing and installing ⇒ page 634
- – Not fitted on all vehicles (depending on production period and vehicle equipment)
- ❑ Checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

Note

- ♦ *At the start of production, the humidity sender - G355- was only fitted on vehicles with “deluxe” air conditioners.*
- ♦ *From model year 2012 onwards, the version of the vehicles is gradually being converted, starting with the Audi A4 and Audi A5 ⇒ page 600 . On vehicles manufactured following the conversion, “basic” air conditioners are also fitted with -G355- .*
- ♦ *On vehicles manufactured prior to the conversion, the measured value for -G355- is evaluated by the convenience system central control unit - J393- or the data bus diagnostic interface - J533- . On vehicles manufactured after the product conversion, the measured value for -G355- is evaluated by the onboard supply control unit - J519- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations, ⇒ Electrical system and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- ♦ *Depending on the production period (gradual introduction from model year 2012 onwards) and the vehicle version, the humidity sender - G355- may no longer be addressed as a component in the event memory. If there is a discrepancy for -G355- on such vehicles, the rain and light sensor - G397- is indicated as the location of the fault.*

12 - Radio - R-

- ❑ Depending on the equipment, the vehicle may be fitted with a multimedia system operating unit - E380- instead of a radio - R- .
- ❑ The “CAR” button can be used to call up various additional air conditioner functions and alter the setting ⇒ Infotainment/MMI Operating Manual .
- ❑ Checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

13 - Temperature sensor blower - V42- and dash panel temperature sensor - G56-

- ❑ Installed in air conditioner operating and display unit (Climatronic control unit - J255-)
- ❑ Removing and installing temperature sensor blower - V42- ⇒ page 611 .
- ❑ The dash panel temperature sensor - G56- is integrated into the air conditioner operating and display unit (Climatronic control unit - J255-) and cannot be renewed separately.

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Note

If the intermediate piece of the air guides to the rear footwell vents and of the air guide to the vent in the rear centre console is not correctly installed on vehicles with a “deluxe” air conditioner, hot or cold air may escape via the component joint and affect the control of the air conditioner. This air is drawn in by the temperature sensor blower - V42- , and the measured value of the dash panel temperature sensor - G56- will differ from the actual temperature in the passenger compartment.

14 - Operating and display unit (Climatronic control unit - J255-), “basic” version

- ❑ Different versions (for vehicles with or without seat heating, with left-hand or right-hand drive, depending on production period and vehicle equipment); for assignment, refer to ⇒ Item 15 (page 138) and ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ page 608
- ❑ The dash panel temperature sensor - G56- is integrated into the air conditioner operating and display unit (Climatronic control unit - J255-) and cannot be renewed separately.
- ❑ The temperature sensor blower - V42- is installed in the air conditioner operating and display unit (Climatronic control unit - J255-), but can be renewed separately ⇒ page 611 .
- ❑ Perform Guided Fault Finding for operating and display unit (Climatronic control unit - J255-) as described ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- ❑ Also observe additional notes on air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ page 26 .

Note

- *From model year 2009 onwards, Audi A5 Coupé and Audi A4 vehicles are gradually being fitted with operating and display units (Climatronic control unit - J255-) with part no. 8T1 820 043 from index “T” onwards (for left-hand drive vehicles) or 8T2 820 043 from index “Q” onwards (for right-hand drive vehicles). These were fitted right from the start of production on the Audi Q5 ⇒ Electronic parts catalogue and ⇒ Item 15 (page 138) .*
- *From model year 2010 onwards, a start/stop system will be offered as an optional extra for this vehicle in combination with certain engines; observe notes on this ⇒ Item 15 (page 138) and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

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- *On vehicles with a start/stop system, only operating and display units (Climatronic control unit - J255-) with part number 8T1 820 043 from index “AG” onwards (for vehicles with left-hand drive) or 8T2 820 043 from index “AD” onwards (for vehicles with right-hand drive) may be installed ⇒ Electronic parts catalogue .*

Note

- *From model year 2012 onwards and depending on the vehicle version, modified fresh air blower control units - J126- , fresh air blowers - V2- , air conditioner operating and display units (Climatronic control unit - J255-), onboard supply control units - J519- , convenience system central control units - J393- , air quality sensors - G238- and air conditioning units are introduced gradually. Pay attention to the correct version and assignment of these components ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *If the allocation or adaption of -J255- and -J126- (with part number 8K0 820 521 or 8T0 820 521) is not as specified, the fresh air blower - V2- is not controlled by -J126- . Although in this case the activation of -V2- is not OK, an entry is not always made in the event memory. Therefore it is important to pay attention to the correct adaption of -J255- ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *At the start of production, the humidity sender - G355- was only fitted on vehicles with “deluxe” air conditioners. Since the introduction of the start/stop system (from model year 2010 onwards), -G355- is also fitted on vehicles with “basic” air conditioners (vehicles with start/stop system as optional extra).*

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- *On vehicles manufactured prior to the conversion (excl. Audi Q5 hybrid), the measured value for -G355- is evaluated by the convenience system central control unit - J393- or the data bus diagnostic interface - J533- . On vehicles manufactured after the product conversion (and on Audi Q5 hybrid), the measured value for -G355- is evaluated by the onboard supply control unit - J519- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations, ⇒ Electrical system and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *Depending on the production period (gradual introduction from model year 2012 onwards) and the vehicle version, the humidity sender - G355- may no longer be addressed as a component in the event memory. If there is a discrepancy for -G355- on such vehicles, the rain and light sensor - G397- is indicated as the location of the fault.*
- *Different versions of -G657- / -G238- are fitted depending on the production period of the vehicle and the version of the air conditioner (“basic” or “deluxe”). Until the gradual conversion of the vehicle version from model year 2012 onwards, “basic” air conditioners were not fitted with e.g. -G657- / -G238- . From this conversion onwards, -G657- without -G238- (black housing) is fitted. Until the gradual conversion of the vehicle version from model year 2012 onwards, “deluxe” air conditioners were fitted with -G238- without -G657- . From the conversion onwards, -G657- with -G238- (brown housing) is fitted.*
- *The air quality sensor - G238- without -G657- is only fitted on vehicles with a “deluxe” air conditioner (from start of production up to conversion of version from model year 2012) ⇒ Electronic parts catalogue .*

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- *From model year 2012 onwards, the version of the vehicles is gradually being converted, starting with the Audi A4 and Audi A5 ⇒ page 600 . On vehicles manufactured prior to the conversion, “deluxe” air conditioners are fitted with -G238- (not fitted on “basic” version). On vehicles manufactured after this conversion (and on the Audi Q5 hybrid), the “basic” version is fitted with -G657- and the “deluxe” version is fitted with -G657- with -G238- .*
- *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 cannot be renewed separately.*

15 - Operating and display unit (Climatronic control unit - J255-), “deluxe” version

- Different versions (for vehicles with or without seat heating/seat ventilation, with left-hand or right-hand drive, depending on production period and vehicle equipment); for assignment, refer to ⇒ Electronic parts catalogue
- Removing and installing ⇒ page 608
- The temperature sensor - G56- is integrated into the operating and display unit (Climatronic control unit - J255-) and cannot be renewed separately.
- The temperature sensor blower - V42- is installed in the air conditioner operating and display unit (Climatronic control unit - J255-), but can be renewed separately ⇒ page 611 .
- Perform Guided Fault Finding for operating and display unit (Climatronic control unit - J255-) as described ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Also observe additional notes on air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ page 26 .
- The various buttons, display zones 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 cannot be renewed separately.
- From model year 2009 onwards, Audi A5 Coupé and Audi A4 vehicles are gradually being fitted with operating and display units (Climatronic control unit - J255-) with part no. 8T1 820 043 from index “T” onwards (for left-hand-drive vehicles) or 8T2 820 043 from index “Q” onwards (for right-hand-drive vehicles). These were fitted right from the start of production on the Audi Q5 ⇒ Electronic parts catalogue . On vehicles with such operating and display units and depending on the encoding and adaption, e.g. the screen display of the “MMI” (Multi Media Interface) is no longer switched to “Air conditioning” when the buttons and controls of the operating and display unit. The air conditioner functions selected are then indicated on the current display ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") , ⇒ Operating Manual for “Infotainment/MMI” and ⇒ Owner's Manual .⇒

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Note

- *Observe correct assignment, coding and adaption of operating and display unit (Climatronic control unit - J255-) for control unit for front display and information control panel - J523- / control unit 1 for information electronics - J794- ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . If the assignment, encoding or adaption are incorrect, the various functions of the air conditioning system cannot be displayed and selected on the MMI.*
- *Operating and display units (- J255-) with part number 8T1 820 043 up to index "S" (for left-hand drive vehicles) or 8T2 820 043 up to index "Q" (for right-hand drive vehicles) are fitted on vehicles with control unit for front display and information control panel - J523- .*
- *Operating and display units (- J255-) with part number 8T1 820 043 from index "T" onwards (for left-hand-drive vehicles) or 8T2 820 043 from index "Q" onwards (for right-hand-drive vehicles) may be fitted on vehicles with control unit 1 for information electronics - J794- . The various functions can only be displayed and selected if the encoding and adaption have been performed correctly for the vehicle equipment.*
- *Also observe the notes on the conversion of the vehicle version from model year 2012 onwards ⇒ Item 14 (page 135) .*

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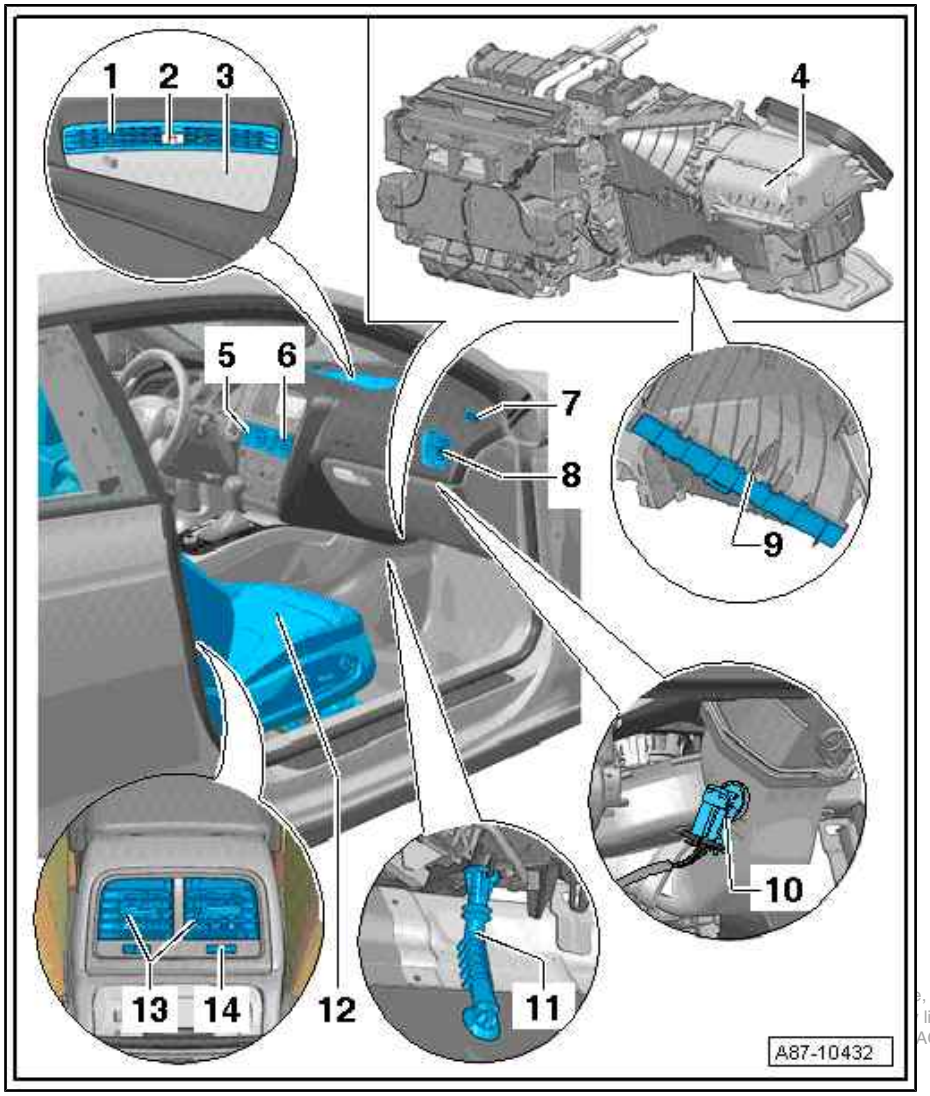
16 - Multimedia system operating unit - E380-

- ❑ Depending on the equipment, the vehicle may be fitted with a radio - R- instead of a multimedia system operating unit - E380- .
- ❑ The "CAR" button can be used to call up various additional air conditioner functions and alter the setting ⇒ Infotainment/MMI Operating Manual .
- ❑ Checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")
- ❑ The various air conditioner functions can only be selected on -E380- and indicated on the display unit for front information display and operating unit control unit - J685- if the correct version of the operating and display unit (Climatronic control unit - J255-) has been fitted, and this has been properly encoded and adapted ⇒ Item 15 (page 138) .

Components on right side

Note

Depending on the production period and the vehicle version, the rear seat heating may be activated e.g. by the seat heating control unit - J882- installed at the rear right of the luggage compartment at the wheel housing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.



1 - Defroster vent/windscreen

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

2 - Sunlight penetration photo-sensor - G107-

- Removing and installing ⇒ page 612 and ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel

3 - Indirect ventilation vent/ cover for centre dash panel loudspeaker

- Removing and installing vent ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel
- The indirect ventilation vent is only fitted on vehicles with the “deluxe” version of the air conditioner. On vehicles with a “basic” air conditioner, a cover is fitted and the opening in the air conditioning unit is sealed off (different versions of air conditioning unit and air duct behind dash panel).

4 - Air conditioning unit with evaporator and attachments

- Different versions depending on model and vehicle equipment ⇒ page 372 and ⇒ Electronic parts catalogue
- Routing of air flow in air conditioning unit and vehicle ⇒ page 554
- Components of air conditioning unit ⇒ page 372
- Cleaning air conditioner evaporator with ultrasound A/C cleaner - VAS 6189- ⇒ page 473
- Removing and installing air conditioning unit ⇒ page 496

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Note

From 01.2008 onwards, air conditioning units with an additional connection for glove box cooling are being introduced gradually. This connection is sealed with a plug on vehicles without glove box cooling ⇒ page 587 .

5 - Dash panel vent (centre left)

- ❑ Removing and installing dash panel vents ⇒ page 587 and ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel vents

6 - Dash panel vent (centre right)

- ❑ Removing and installing dash panel vents ⇒ page 587 and ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel vents

7 - Defroster vent/side window (right-side)

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

8 - Dash panel vent (right-side)

- ❑ Removing and installing dash panel vents ⇒ page 587 and ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel vents

9 - Dust and pollen filter (with or without ACF insert)

- ❑ Observe replacement intervals ⇒ Maintenance tables
- ❑ Different versions depending on model and vehicle equipment ⇒ Electronic parts catalogue
- – Vehicles with a “basic” air conditioner are not fitted with an active charcoal filter insert
- – Vehicles with a “deluxe” air conditioner are fitted with an active charcoal filter insert. These vehicles are also fitted with an air quality sensor - G238- ⇒ page 104 .
- ❑ Removing and installing ⇒ page 531

Note

- ♦ *In model year 2012, a modified dust and pollen filter with ACF insert is gradually being introduced on vehicles with a “deluxe” air conditioner. This filter with an improved fine particulate filtration rate has approximately the same air resistance values as the filter fitted prior to the conversion and can therefore also be installed on vehicles manufactured prior to the conversion ⇒ Electronic parts catalogue .*
- ♦ *If requested by the customer, vehicles with a “basic” air conditioner fitted with a dust and pollen filter with no activated charcoal filter insert at the factory can also be fitted with a dust and pollen filter with activated charcoal filter insert ⇒ Electronic parts catalogue .*

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10 - Front right chest vent temperature sensor - G386-

- ❑ Removing and installing ⇒ page 639
- ❑ Only fitted on vehicles with air conditioner version “deluxe”

11 - Condensation drain, right-side (front passenger's side)

- ❑ Removing and installing ⇒ page 551
- ❑ Checking ⇒ page 552

12 - Seat, right-side (front passenger's seat) with components for seat heating and seat ventilation

- ❑ Components for seat heating (front right seat temperature sender - G345- , heated seat cushion for front right seat - Z46-) and seat ventilation (control unit and various fans) ⇒ General body repairs, interior; Rep. gr. 72 ; Front seats and ⇒ General body repairs, interior; Rep. gr. 74 ; Covers and padding on front seats
- ❑ Not all vehicles are equipped with seat heating and ventilation (optional extra).
- ❑ The seat heating and ventilation settings are selected on the air conditioner operating and display unit (Climatronic control unit - J255-). The activation of the seat heating and seat ventilation is indicated in the measured value block of the air conditioner operating and display unit (Climatronic control unit - J255-); checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- ❑ Depending on the vehicle equipment and version, the seat heating and seat ventilation are activated via various control units ⇒ page 5 , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (for -J519- , -J136- and -J521- , depending on vehicle).
- ❑ Servicing seat heating and seat ventilation ⇒ General body repairs, interior; Rep. gr. 72 ; Front seats and ⇒ General body repairs, interior; Rep. gr. 74 ; Covers and padding on front seats
- ❑ Notes on operation of seat heating and ventilation ⇒ page 5

Note

- ♦ *If a condition prevails in which heating or ventilation of the driver's seat or front passenger's seat cannot be activated, this is stored as a fault in the onboard supply control unit - J521- , the seat and steering column adjustment control unit with memory - J136- or the front passenger seat adjustment with memory control unit - J519- (depending on model and vehicle equipment). On this vehicle, no information is currently transmitted via the data bus to the air conditioner operating and display unit (Climatronic control unit - J255-) indicating that the event memory in the relevant control unit or in the convenience system central control unit - J393- has to be read out ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . In the event of problems with seat heating or ventilation, the first step should therefore always be to read out the event memories of the control units which activate the seat heating and ventilation.*

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- ♦ *The seat heating and seat ventilation level is set on the air conditioner operating and display unit (Climatronic control unit - J255-); this setting is then transmitted via data bus to the on-board supply control unit - J519- . The specified temperatures for the different seat heating and seat ventilation settings are stored in -J519- . Depending on the version of the -J519- and the production period, the specified temperature for the seat heating and seat ventilation may be different even if the setting on the air conditioner operating and display unit (Climatronic control unit - J255-) is the same ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (for on-board supply control unit - J519-).*

13 - Vent in rear centre console

- ❑ Removing and installing ⇒ page 587 and ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Exploded view - centre console
- – Only fitted on vehicles with “deluxe” air conditioner (opening in centre console is sealed off on vehicles with “basic” air conditioner)

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14 - Potentiometer for rear temperature selection - G538-

- – Only fitted on vehicles with “deluxe” air conditioner (opening in centre console is sealed off on vehicles with “basic” air conditioner)
- ❑ The potentiometer for rear temperature selection - G538- is part of the vent and cannot be renewed separately ⇒ Electronic parts catalogue .
- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Exploded view - centre console
- ❑ Checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

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2 Refrigerant circuit

⇒ “2.1 System overview - refrigerant circuit”, page 145

⇒ “2.2 Overview of fitting locations - refrigerant lines”, page 180

⇒ “2.3 Exploded view - refrigerant lines”, page 183

⇒ “2.4 Checking cut-in signal for air conditioner compressor regulating valve N280 ”, page 185

⇒ “2.5 Checking activation of air conditioner compressor regulating valve N280 ”, page 190

⇒ “2.6 Removing and installing refrigerant pressure and temperature sender G395 ”, page 190

⇒ “2.7 Checking refrigerant pressure and temperature sender G395 ”, page 191

⇒ “2.8 Checking pressure signal at refrigerant pressure and temperature sender G395 ”, page 193

⇒ “2.9 Removing and installing refrigerant lines to battery cooling module on vehicle floor (front)”, page 194

⇒ “2.10 Removing and installing refrigerant lines to battery cooling module on vehicle floor (rear)”, page 197

⇒ “2.11 Removing and installing leadthrough for refrigerant lines into luggage compartment ”, page 201

⇒ “2.12 Removing and installing refrigerant lines to battery cooling module in luggage compartment”, page 206

⇒ “2.13 Detaching and attaching refrigerant lines at quick-release couplings”, page 211

⇒ “2.14 Removing and installing refrigerant lines with internal heat exchanger”, page 217

⇒ “2.15 Removing and installing expansion valve”, page 232

⇒ “2.16 Removing and installing expansion valve (rear) with refrigerant shut-off valve 2 for hybrid battery N517 ”, page 238

⇒ “2.17 Detaching and attaching refrigerant lines at condenser”, page 242

⇒ “2.18 Removing and installing condenser”, page 248

⇒ “2.19 Removing and installing receiver”, page 256

⇒ “2.20 Removing and installing desiccant bag/desiccant cartridge”, page 260

⇒ “2.21 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 267

⇒ “2.22 Removing and installing evacuating and charging valve (low-pressure and high-pressure sides)”, page 270

⇒ “2.23 Starting up air conditioner after charging refrigerant circuit”, page 271

2.1 System overview - refrigerant circuit

⇒ “2.1.1 System overview - refrigerant circuit: work not requiring refrigerant circuit to be opened, vehicles without high-voltage system”, page 146

⇒ “2.1.2 System overview - refrigerant circuit: work not requiring refrigerant circuit to be opened, vehicles with high-voltage system”, page 154

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⇒ “2.1.3 System overview - refrigerant circuit: work requiring refrigerant circuit to be opened, vehicles without high-voltage system”, page 160

⇒ “2.1.4 System overview - refrigerant circuit: work requiring refrigerant circuit to be opened, vehicles with high-voltage system”, page 171

2.1.1 System overview - refrigerant circuit: work not requiring refrigerant circuit to be opened, vehicles without high-voltage system

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Note

- *Servicing refrigerant circuit ⇒ page 145*
- *All parts marked 1) can be serviced and renewed at any workshop. All procedures marked 1) can be performed at any workshop. These components/procedures do not affect the refrigerant circuit.*
- *All parts that are not marked 1) cannot be serviced or renewed at every workshop. The same also applies to all refrigerant hoses and pipes. All parts that are not marked 1) can only be serviced and renewed at workshops which are equipped with the necessary tools. In these workshops, these procedures may only be performed by appropriately qualified personnel. The refrigerant circuit must be discharged for this purpose ⇒ 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 .*

HD = High-pressure side

ND = Low-pressure side

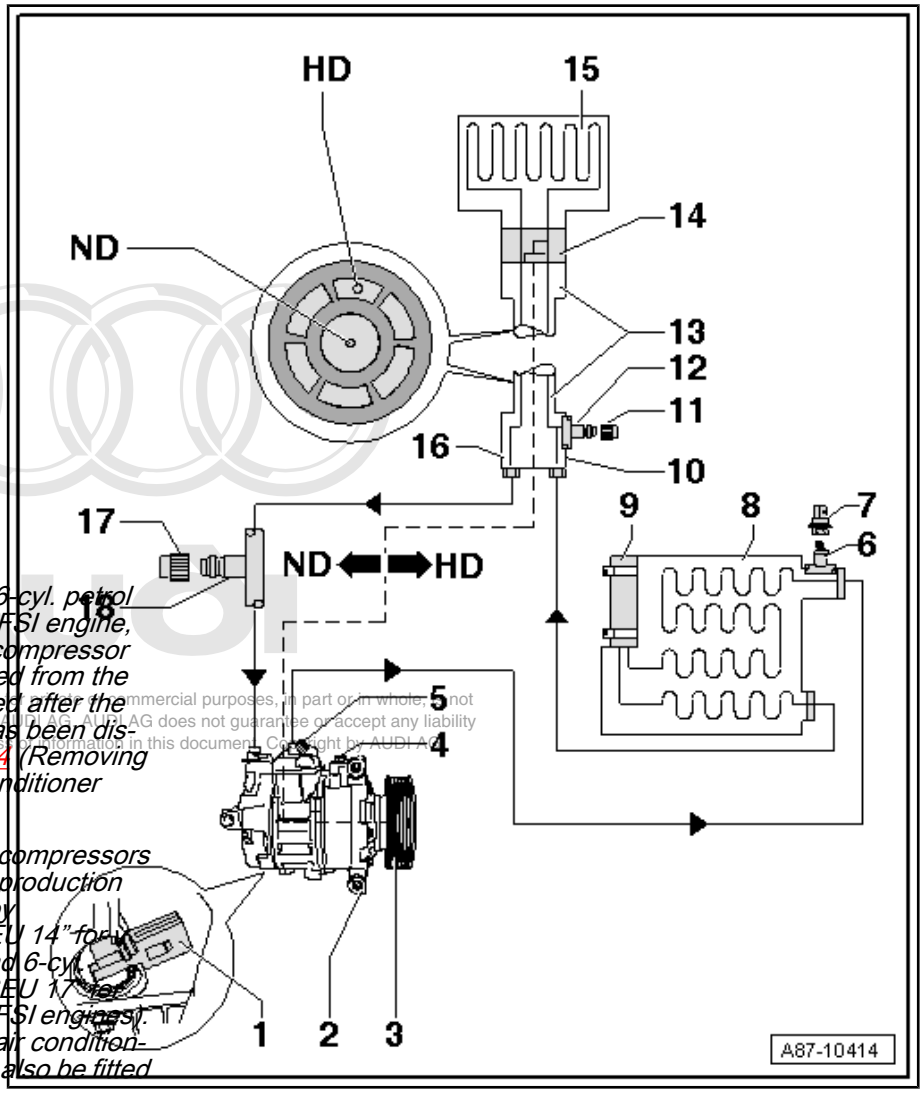
Arrows show direction of refrigerant flow.

1 - Air conditioner compressor regulating valve - N280-

- ❑ Checking activation and operation ⇒ page 185 1)

2 - Air conditioner compressor

- ❑ Detaching and attaching air conditioner compressor at bracket on vehicles with 4-cyl. engine or 6-cyl. TDI engine ⇒ page 286 1)
- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue



Note

- *On vehicles with a 6-cyl. petrol engine or an 8-cyl. FSI engine, the air conditioner compressor can only be detached from the bracket and removed after the refrigerant circuit has been discharged ⇒ page 314 (Removing and installing air conditioner compressor).*
- *The air conditioner compressors fitted at the start of production are manufactured by "Denso" (type "6 SEU 14" for vehicles with 4-cyl. and 6-cyl. engines and type "7 SEU 17" for vehicles with 8-cyl. FSI engines). Different makes of air conditioner compressor may also be fitted at a later date ⇒ "4.2 Approved refrigerant oils and refrigerant oil capacities", page 109 , ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils , or ⇒ "4 Technical data", page 107 , and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .*
- *The type of compressor may differ depending on the production period and engine. ⇒ Electronic parts catalogue*

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- *These air conditioner compressors are available as replacement parts with different oil capacities, so it is important to pay attention to the oil quantity in the air conditioner compressor and to check the exact part number ⇒ "4.2 Approved refrigerant oils and refrigerant oil capacities", page 109 , ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils , or ⇒ "4 Technical data", page 107 , and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .*
- *There may be different refrigerant oil capacities for the refrigerant circuit depending on the type of air conditioner compressor. The reason for the different oil quantities in the air conditioner compressor for an otherwise identical refrigerant circuit is the design of the actual compressor; please note the different oil quantities. Too much oil in the refrigerant circuit results in higher pressures and a reduction in the cooling output of the air conditioner. Insufficient oil can cause lubrication problems in the air conditioner compressor ⇒ "4.2 Approved refrigerant oils and refrigerant oil capacities", page 109 , ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils , or ⇒ "4 Technical data", page 107 and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .*
- *When installing the refrigerant lines and the corresponding brackets, make sure there is sufficient clearance between belt, bracket and pulley.*

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- *From model year 2012 onwards, air conditioner compressors with an additional air conditioning system magnetic clutch - N25- fitted are gradually being introduced for certain vehicles with 4-cyl. engines. In certain air conditioner operating modes (e.g. “Econ” mode), the air conditioner compressor drive system is deactivated completely via this magnetic clutch. For -N25- to be activated by the operating and display unit (Climatronic control unit - J255-), the correct version of -J255- must be fitted and correctly encoded ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .*

3 - Pulley / air conditioner compressor drive unit / pulley with magnetic clutch -N25-

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- ❑ Renewing air conditioner compressor pulley (applies to vehicles with 4-cyl. and 6-cyl. engine) [1] ⇒ page 276
- ❑ Removing and installing poly V-belt (applies to vehicles with 4-cyl- and 6-cyl. engine) [1] ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt
- ❑ Poly V-belt assignment (vehicles with 4-cyl. or 6-cyl. engine) ⇒ Electronic parts catalogue
- ❑ Renewing drive unit of air conditioner compressor (vehicles with 8-cyl. FSI engine) ⇒ page 278 (Removing air conditioner compressor ⇒ page 314)
- ❑ Renewing pulley with magnetic clutch -N25- (applies to certain vehicles with 4-cyl. engine from model year 2012 onwards) [1] ⇒ page 365

Note

- *An overload protection device is fitted between the pulley/drive unit and the drive shaft of the air conditioner compressor to protect the pulley/drive unit if the air conditioner compressor becomes jammed or stiff.*
- *If the air conditioner compressor is not operating smoothly, the overload protection device interrupts the power transmission to the air conditioner compressor.*
- *Rubber damper elements are fitted between the pulley/drive unit and the air conditioner compressor drive shaft to absorb any vibration occurring during compressor operation (damper function in the event of torque fluctuations).*
- *The air conditioner compressor is fitted with different pulleys depending on the type of compressor and engine ⇒ Electronic parts catalogue and ⇒ page 276 .*

- *From model year 2012 onwards, air conditioner compressors with an additional air conditioning system magnetic clutch - N25- fitted are gradually being introduced for certain vehicles with 4-cyl. engines. In certain air conditioner operating modes (e.g. “Econ” mode), the air conditioner compressor drive system is deactivated completely via this magnetic clutch. For -N25- to be activated by the operating and display unit (Climatronic control unit - J255-), the correct version of -J255- must be fitted and correctly encoded ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .*

4 - Oil drain plug

5 - High-pressure safety valve

6 - Connection with valve

7 - Refrigerant pressure and temperature sender - G395- 1)

- ❑ Removing and installing ⇒ page 190
- ❑ For checking signal, refer to ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .

Note

- *The refrigerant pressure and temperature sender - G395- uses a local data bus to exchange information with the onboard supply control unit - J519- . The -J519- transmits the data via the data bus to the operating and display unit (Climatronic control unit - J255-). This vehicle should therefore not be fitted with a high-pressure sender - G65- (only emits square-wave signals) ⇒ Electronic parts catalogue .*
- *Due to the version of the refrigerant pressure and temperature sender - G395- and its fitting location, the temperature measured by the -G395- differs from the actual temperature of the refrigerant in the refrigerant circuit. Currently this is therefore not evaluated and used for the control of the air conditioner.*

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8 - Condenser

- ❑ Different versions ⇒ Electronic parts catalogue

Note

Depending on the version of the radiator and condenser, it may be necessary (e.g. on the Audi RS 4, Audi SQ5 and Audi RS 5) to discharge the refrigerant circuit and disconnect the refrigerant lines from the condenser in order to remove the condenser from the front end or to remove the radiator ⇒ page 242 .

9 - Receiver

- ❑ Receiver is attached directly to condenser ⇒ page 256 (Removing and installing receiver)
- ❑ Different versions ⇒ Electronic parts catalogue

10 - Quick-release coupling of refrigerant line (high-pressure side)

WARNING

Only release and open the quick-release couplings after completely discharging the refrigerant circuit.

11 - Cap

- ❑ With seal
- ❑ Always screw on

12 - Service connection (high-pressure side)

- ❑ Different versions (with primary sealing valve or Schrader valve) depending on refrigerant line; distinguishing features ⇒ 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 .
- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ “2.21 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 267 and ⇒ Electronic parts catalogue
- ❑ For information on air conditioner service station for measuring pressure and for discharging and charging refrigerant circuit, refer to ⇒ 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 the engine version, components may have to be removed before connecting the service coupling.

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Caution

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

Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

13 - Refrigerant line with internal heat exchanger

- ❑ In this refrigerant line, the hot liquid refrigerant flowing through the high-pressure side gives off energy to the cold refrigerant vapour flowing through the low-pressure side, thus enhancing the efficiency of the air conditioner

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14 - Expansion valve

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

15 - Evaporator

16 - Quick-release coupling of refrigerant line (low-pressure side)

> **WARNING**
> *Only release and open the quick-release couplings after completely discharging the refrigerant circuit.*

17 - Cap

- With seal
- Always screw on
- Different versions depending on refrigerant (R134a or R1234yf)
  ⇒ “2.21 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 267 and
  ⇒ Electronic parts catalogue

18 - Service connection (low-pressure side)

- Different versions (with primary sealing valve or Schrader valve) depending on refrigerant line; distinguishing features ⇒ 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)
  ⇒ “2.21 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 267 and
  ⇒ Electronic parts catalogue
- For information on air conditioner service station for measuring pressure and for discharging refrigerant circuit, refer to ⇒ 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 the engine version, components may have to be removed before connecting the service coupling.

> **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 conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .*

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Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

2.1.2 System overview - refrigerant circuit: work not requiring refrigerant circuit to be opened, vehicles with high-voltage system

Note

The vehicles in this series with high-voltage systems are all fitted with refrigerant circuits charged with refrigerant R134a.

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ "2.2 Safety precautions when working on high-voltage vehicles", page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

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WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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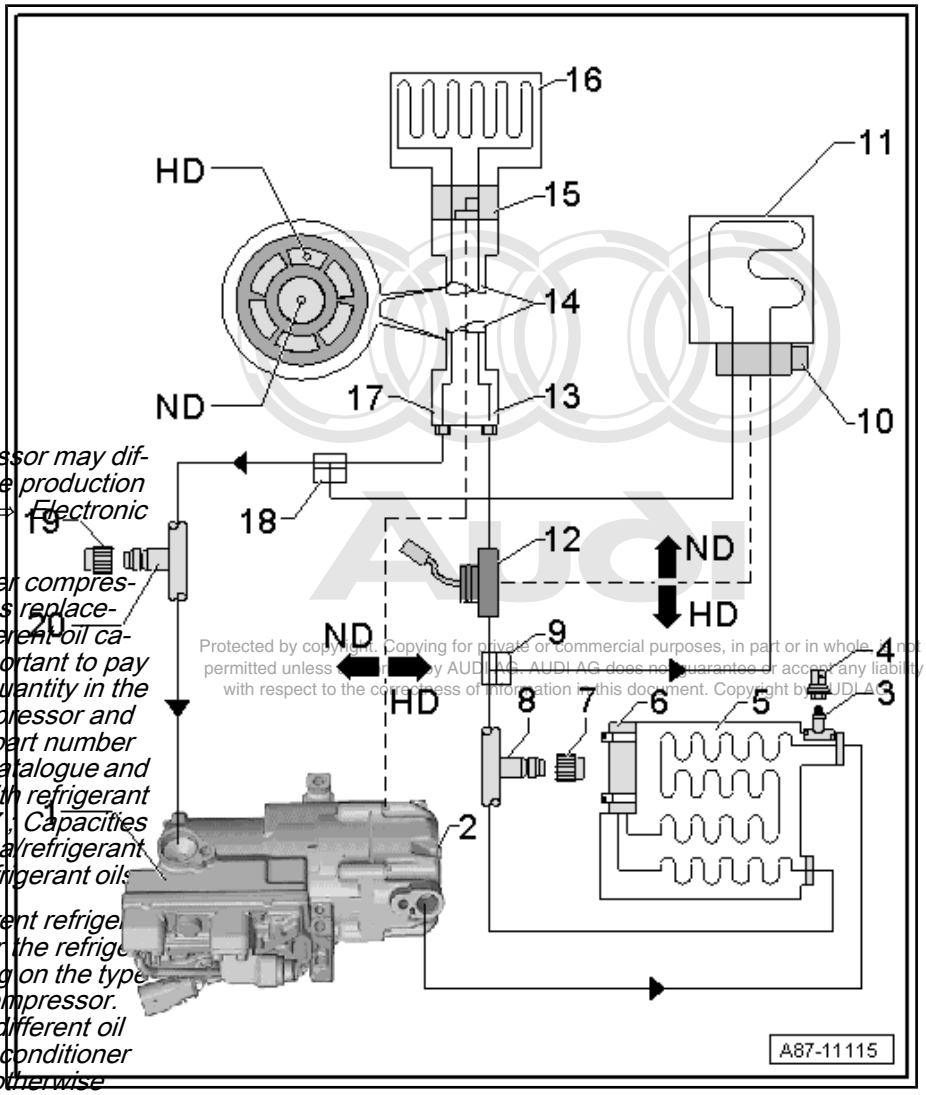
HD = High-pressure side

ND = Low-pressure side

Arrows show direction of refrigerant flow.

1 - Electrically driven air conditioner compressor

- With control unit for air conditioning compressor - J842- and electrical air conditioner compressor - V470-
- Detaching and attaching air conditioner compressor at bracket (vehicles with 4-cyl. engine) ⇒ page 292 1)



Note

- *The type of compressor may differ depending on the production period and engine. ⇒ Electronic parts catalogue*
- *These air conditioner compressors are available as replacement parts with different oil capacities, so it is important to pay attention to the oil quantity in the air conditioner compressor and to check the exact part number ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils*
- *There may be different refrigerant oil capacities for the refrigerant circuit depending on the type of air conditioner compressor. The reason for the different oil quantities in the air conditioner compressor for an otherwise identical refrigerant circuit is the design of the actual compressor; please note the different oil quantities. Too much oil in the refrigerant circuit results in higher pressures and a reduction in the cooling output of the air conditioner. Insufficient oil can cause lubrication problems ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Air conditioner with refrigerant R134a; Capacities for refrigerant R134a/ refrigerant oil and approved refrigerant oils .*
- *When fitting refrigerant lines and the corresponding retainers, make sure there is adequate clearance from other components (such as belts and engine pulleys).*

2 - High-pressure safety valve

3 - Connection with valve

4 - Refrigerant pressure and temperature sender - G395- 1)

- Removing and installing ⇒ page 190

❑ For checking signal, refer to ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .

Note

- *The refrigerant pressure and temperature sender - G395- uses a local data bus to exchange information with the on-board supply control unit - J519- . The -J519- transmits the data via the data bus to the operating and display unit (Climatronic control unit - J255-). This vehicle should therefore not be fitted with a high-pressure sender - G65- (only emits square-wave signals) ⇒ Electronic parts catalogue .*
- *Due to the version of the refrigerant pressure and temperature sender - G395- and its fitting location, the temperature measured by the -G395- differs from the actual temperature of the refrigerant in the refrigerant circuit. Currently this is therefore not evaluated and used for the control of the air conditioner.*

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5 - Condenser

❑ Different versions ⇒ Electronic parts catalogue

6 - Receiver

❑ Receiver is attached directly to condenser ⇒ page 256 (Removing and installing receiver)

❑ Different versions ⇒ Electronic parts catalogue

7 - Cap

❑ With seal

❑ Always screw on

8 - Service connection (high-pressure side)

❑ Different versions (with primary sealing valve or Schrader valve) depending on refrigerant line; distinguishing features ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems

❑ For air conditioner service station for measuring pressure and for discharging and charging refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station)

❑ Depending on the engine version, components may have to be removed before connecting the service coupling.

WARNING

Refrigerant circuit must be discharged before removing service connections (connection without valve).

Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

9 - Connection to evaporator in battery cooling module

- ❑ High-pressure side

WARNING

The refrigerant circuit must be discharged before slackening off the bolts at the connection point.

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10 - Expansion valve with refrigerant shut-off valve 2 for hybrid battery - N517-

- ❑ At evaporator in battery cooling module

Note

-N517- is activated if battery needs to be cooled (closed when not activated).

11 - Evaporator in battery cooling module

12 - Refrigerant shut-off valve 1 for hybrid battery - N516-

- ❑ Installed in area of left suspension turret in engine compartment

Note

-N516- is activated, for example, if the battery needs to be cooled but the air conditioner is not set to cooling mode for the passenger compartment (valve open when not activated).

13 - Quick-release coupling of refrigerant line (high-pressure side)

WARNING

Only release and open the quick-release couplings after completely discharging the refrigerant circuit.

14 - Refrigerant line with internal heat exchanger

- In this refrigerant line, the hot liquid refrigerant flowing through the high-pressure side gives off energy to the cold refrigerant vapour flowing through the low-pressure side, thus enhancing the efficiency of the air conditioner

15 - Expansion valve

- For evaporator in air conditioning unit

16 - Evaporator in air conditioning unit

17 - Quick-release coupling of refrigerant line (low-pressure side)

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WARNING

Only release and open the quick-release couplings after completely discharging the refrigerant circuit.

18 - Connection to evaporator in battery cooling module

- Low-pressure side

WARNING

The refrigerant circuit must be discharged before slackening off the bolts at the connection point.

19 - Cap

- With seal
- Always screw on

20 - Service connection (low-pressure side)

- Different versions (with primary sealing valve or Schrader valve) depending on refrigerant line; distinguishing features ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems
- For air conditioner service station for measuring pressure and discharging 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)
- Depending on the engine version, components may have to be removed before connecting the service coupling.

WARNING

Refrigerant circuit must be discharged before removing service connections (connection without valve).

Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

2.1.3 System overview - refrigerant circuit: work requiring refrigerant circuit to be opened, vehicles without high-voltage system

HD = High-pressure side

ND = Low-pressure side

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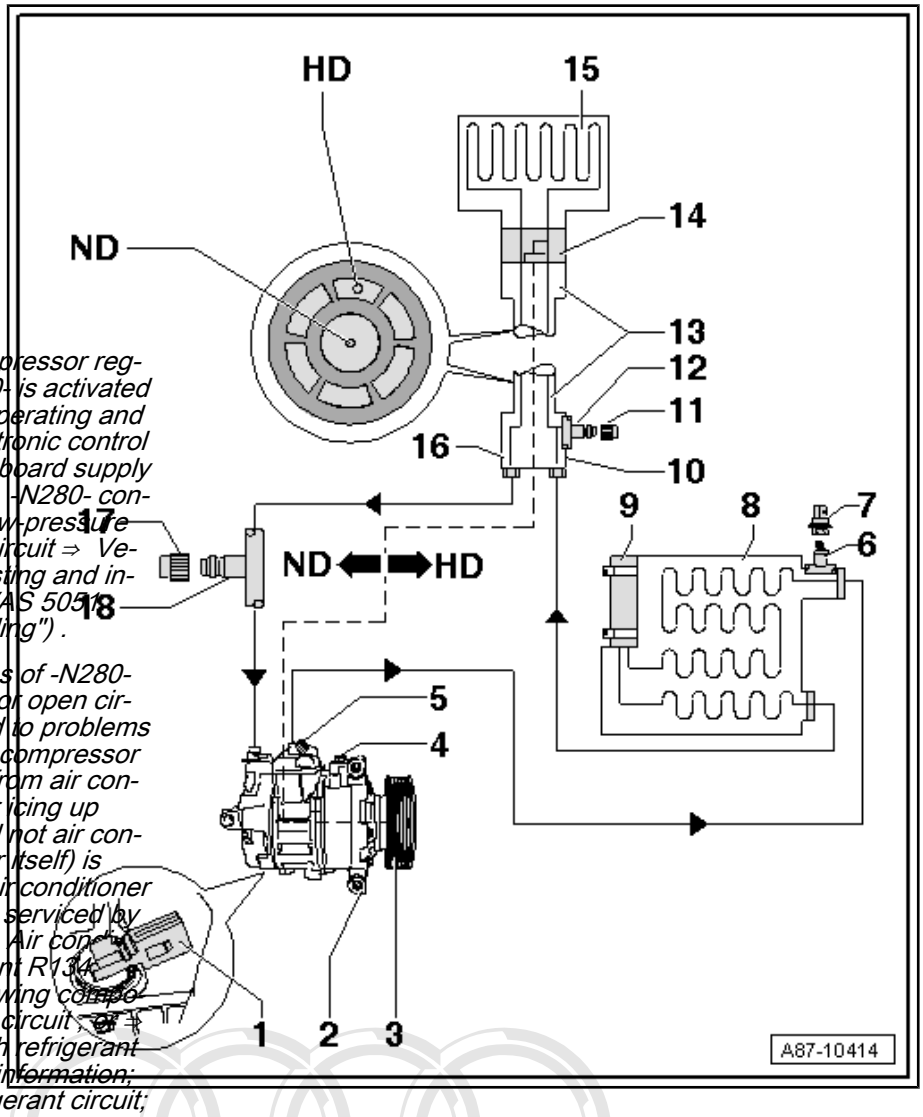
1 - Air conditioner compressor regulating valve - N280-

- ❑ Checking actuation and operation ⇒ page 185 and ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051



Note

- ♦ *Air conditioner compressor regulating valve - N280- is activated by air conditioner operating and display unit (Climatronic control unit - J255-) via onboard supply control unit - J519- . -N280- controls pressure on low-pressure side of refrigerant circuit ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- ♦ *Certain malfunctions of -N280- (e.g. sticking valve or open circuit in coil) can lead to problems with air conditioner compressor (no cooling output from air conditioner, evaporator icing up etc.). If -N280- (and not air conditioner compressor itself) is cause of problem, air conditioner compressor can be serviced by renewing -N280- ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit ; or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .*
- ♦ *-N280- is not available as a replacement part for all air conditioner compressors. If -N280- cannot be obtained separately for a particular air conditioner compressor (different versions available), the entire air conditioner compressor must be renewed if problems occur ⇒ Electronic parts catalogue .*

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2 - Air conditioner compressor

- ❑ Detaching and attaching air conditioner compressor at bracket on vehicles with 4-cyl. engine or 6-cyl. TDI engine ⇒ page 286
- ❑ Detaching and attaching refrigerant line at air conditioner compressor ⇒ page 301
- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

Note

- *When installing the refrigerant lines and the corresponding brackets, make sure there is sufficient distance between the belt, bracket, pulley and refrigerant lines.*
- *To protect the air conditioner compressor, the engine should only be started after the refrigerant circuit has been assembled completely.*

- ❑ Detaching poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt
- ❑ Removing and installing air conditioner compressor
  ⇒ “3.5 Removing and installing air conditioner compressor”, page 314

Note

- *On vehicles with 6-cyl. petrol engine or 8-cyl. FSI engine, the air conditioner compressor can only be detached from the bracket and removed with the refrigerant circuit empty*
  ⇒ “3.5 Removing and installing air conditioner compressor”, page 314 .
- *The air conditioner compressors fitted at the start of production are manufactured by “Denso” (type “6 SEU 14” for vehicles with 4-cyl. and 6-cyl. engines and type “7 SEU 17” for vehicles with 8-cyl. engines). Different makes of air conditioner compressor may also be fitted at a later date*
  ⇒ “4.2 Approved refrigerant oils and refrigerant oil capacities”, page 109 , *⇒ Electronic parts catalogue and ⇒ 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 .*
- *The compressor version may differ depending on the production period and engine ⇒ Electronic parts catalogue .*

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- *These air conditioner compressors are available as replacement parts with different oil capacities, so it is important to pay attention to the oil quantity in the air conditioner compressor and to check the exact part number ⇒ “4.2 Approved refrigerant oils and refrigerant oil capacities”, page 109 , ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .*
- *There may be different refrigerant oil capacities for the refrigerant circuit depending on the type of air conditioner compressor. The reason for the different oil quantities in the air conditioner compressor for an otherwise identical refrigerant circuit is the design of the actual compressor; please note the different oil quantities. Too much oil in the circuit results in higher pressures and a reduction in the cooling output of the air conditioner. Too little oil may lead to lubrication problems in the compressor ⇒ “4.2 Approved refrigerant oils and refrigerant oil capacities”, page 109 , ⇒ Electronic parts catalogue , ⇒ 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 .*
- *From model year 2012 onwards, air conditioner compressors with an additional air conditioning system magnetic clutch - N25- fitted are gradually being introduced for certain vehicles with 4-cyl. engines. In certain air conditioner operating modes (e.g. “Econ” mode), the air conditioner compressor drive system is deactivated completely via this magnetic clutch. For -N25- to be activated by the operating and display unit (Climatronic control unit - J255-), the correct version of -J255- must be fitted and correctly encoded ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .*

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- ❑ After installing a new air conditioner compressor or after pouring in fresh refrigerant oil (e.g. after cleaning the refrigerant circuit), turn the air conditioner compressor 10 times by hand before starting it up for the first time to prevent damage to the compressor.

3 - Pulley / air conditioner compressor drive unit / pulley with magnetic clutch -N25-

- ❑ Renewing air conditioner compressor pulley (vehicles with 4-cyl. or 6-cyl. engine) ⇒ page 276
- ❑ Removing and installing poly V-belt (vehicles with 4-cyl- and 6-cyl. engine) ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt
- ❑ Poly V-belt assignment (vehicles with 4-cyl. or 6-cyl. engine) ⇒ Electronic parts catalogue
- ❑ Renewing drive unit of air conditioner compressor (vehicles with 8-cyl. FSI engine) ⇒ page 278 and ⇒ “3.5 Removing and installing air conditioner compressor”, page 314
- ❑ Renewing pulley with magnetic clutch -N25- (applies to certain vehicles with 4-cyl. engine from model year 2012 onwards) ⇒ page 365

Note

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- ♦ *An overload protection device is fitted between the pulley/drive unit and the drive shaft of the air conditioner compressor to protect the belt should the air conditioner compressor become jammed or stiff.*
- ♦ *If the air conditioner compressor is not operating smoothly, the overload protection device interrupts the power transmission to the air conditioner compressor.*
- ♦ *Rubber damper elements are fitted between the pulley/drive unit and the air conditioner compressor drive shaft to absorb any vibration occurring during compressor operation (damper function in the event of torque fluctuations).*
- ♦ *The air conditioner compressor is fitted with different pulleys depending on the type of compressor and engine ⇒ Electronic parts catalogue and ⇒ page 276 .*
- ♦ *From model year 2012 onwards, air conditioner compressors with an additional air conditioning system magnetic clutch - N25- fitted are gradually being introduced for certain vehicles with 4-cyl. engines. In certain air conditioner operating modes (e.g. “Econ” mode), the air conditioner compressor drive system is deactivated completely via this magnetic clutch. For -N25- to be activated by the operating and display unit (Climatronic control unit - J255-), the correct version of -J255- must be fitted and correctly encoded ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .*

4 - Oil drain plug

- ❑ “Denso” air conditioner compressors are fitted with a seal which must always be renewed.
- ❑ Tightening torque for “Denso” compressor: 30 Nm
- ❑ Air conditioner compressor must be removed before unscrewing to drain refrigerant oil; when doing so, use the pulley to turn the air conditioner compressor (to help the refrigerant oil drain faster) ⇒ 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 .

5 - High-pressure safety valve

- ❑ Do not remove
- ❑ Tightening torque for “Denso” air conditioner compressor: 10 Nm
- ❑ With O-ring, “Denso” air conditioner compressor: 8.5 mm x 1.75 mm ⇒ page 106

6 - Connection with valve

- ❑ When removing and installing valve core with refrigerant circuit discharged, use a socket - T10364- or similar.

WARNING

The refrigerant circuit must always be discharged before removing the valve core.

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7 - Refrigerant pressure and temperature sender - G395-

- ❑ Removing and installing ⇒ page 190
- ❑ For checking signal, refer to ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .

Note

- ♦ *The refrigerant pressure and temperature sender - G395- uses the data bus (“LIN bus”) to exchange information with the onboard supply control unit - J519- . The -J519- transmits the data via the data bus to the operating and display unit (Climatronic control unit - J255-). This vehicle should therefore not be fitted with a high-pressure sender - G65- (only emits square-wave signals) ⇒ Electronic parts catalogue .*
- ♦ *Due to the version of the refrigerant pressure and temperature sender - G395- and its fitting location, the temperature measured by the -G395- differs from the actual temperature of the refrigerant in the refrigerant circuit. Currently this is therefore not evaluated and used for the control of the air conditioner.*

8 - Condenser

- ❑ Detaching and attaching refrigerant lines ⇒ page 242
- ❑ Removing and installing condenser ⇒ page 248
- ❑ Different versions ⇒ Electronic parts catalogue

Note

Depending on the version of the radiator and condenser, it may be necessary (e.g. on the Audi RS 4, Audi SQ5 and Audi RS 5) to discharge the refrigerant circuit and disconnect the refrigerant lines from the condenser in order to remove the condenser from the front end or to remove the radiator ⇒ page 242 .

9 - Receiver

- ❑ Receiver is attached directly to condenser.
- ❑ Removing and installing ⇒ page 256
- ❑ Different versions ⇒ Electronic parts catalogue

Note

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Depending on version of condenser, receiver may be attached to or integrated into condenser ⇒ page 256 and ⇒ page 260 .

- ❑ Removing and installing desiccant cartridge (for condenser with integrated receiver) ⇒ page 260

10 - Quick-release coupling of refrigerant line (high-pressure side)

WARNING

Only release and open the quick-release couplings after completely discharging the refrigerant circuit.

- ❑ Detaching and attaching refrigerant lines at quick-release couplings ⇒ page 211
- ❑ Renewing quick-release coupling together with O-ring and support ring ⇒ page 211 ; for version refer to ⇒ Electronic parts catalogue

Note

The Audi RS 4 and Audi RS 5 are fitted with a block connection instead of a quick-release coupling at this location; this block connection must be detached/attached in the same way as the block connection at the condenser ⇒ page 242 .

11 - Cap

- ❑ With seal
- ❑ Always screw on
- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ “2.21 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 267 and ⇒ Electronic parts catalogue

12 - Service connection (high-pressure side)

- ❑ Different versions (with primary sealing valve or Schrader valve) depending on refrigerant line; distinguishing features ⇒ 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 .

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 conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

- Different versions depending on refrigerant (R134a or R1234yf) ⇒ "2.21 Differences in service connections depending on refrigerant (R134a or R1234yf)", page 267 and ⇒ Electronic parts catalogue
- When removing and installing service connection or valve core with refrigerant circuit discharged, use a socket - T10364- or similar.
- For information on air conditioner service station for measuring pressure and for discharging and charging refrigerant circuit, refer to ⇒ 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 the engine version, components may have to be removed before connecting the service coupling.

Note

- *Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .*

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- *Depending on the vehicle version, the service connections may also be connected to the attached refrigerant line, and not to the refrigerant line with internal heat exchanger (e.g. on Audi RS 4 and Audi RS 5).*
- *On the Audi RS 4 and Audi RS 5, it may be necessary to lift the refrigerant line carefully and press it to the side slightly in order to connect the service coupling.*

13 - Refrigerant line with internal heat exchanger

- ❑ In this refrigerant line, the hot liquid refrigerant flowing through the high-pressure side gives off energy to the cold refrigerant vapour flowing through the low-pressure side, thus enhancing the efficiency of the air conditioner
- ❑ Removing and installing ⇒ page 217

14 - Expansion valve

- ❑ Detaching and attaching refrigerant line with internal heat exchanger ⇒ page 217
- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ page 232

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). If the air conditioner compressor is switched on, the pressure in the low-pressure side drops, the expansion valve is opened and the refrigerant can flow to the low-pressure side.*
- *From the start of production up to the conversion from model year 2012 onwards, evaporators with a width (block depth) of approx. 40 mm were fitted (air conditioning unit with part number "8K_ 820 005"). From model year 2012 onwards and depending on the vehicle version, evaporators with a width (block depth) of approx. 50 mm are being introduced gradually (air conditioning unit with part number "8T_ 820 005"). Pay attention to the correct assignment of the expansion valve to the evaporator (different versions) ⇒ Electronic parts catalogue .*

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15 - Evaporator

- ❑ Removing and installing air conditioning unit (with evaporator) ⇒ page 496

❑ Removing and installing evaporator with air conditioning unit installed ⇒ page 451

Note

- *From the start of production up to the conversion from model year 2012 onwards, evaporators with a width (block depth) of approx. 40 mm were fitted (air conditioning unit with part number "8K_ 820 005"). From model year 2012 onwards and depending on the vehicle version, evaporators with a width (block depth) of approx. 50 mm are being introduced gradually (air conditioning unit with part number "8T_ 820 005"). Pay attention to the correct assignment of the expansion valve to the evaporator (different versions) ⇒ Electronic parts catalogue .*
- *On vehicles which use refrigerant R1234yf, no separable connections in the refrigerant circuit (e.g. between the refrigerant lines and the evaporator) are permitted in the passenger compartment. On these vehicles, the air conditioning unit (with the evaporator housing) must therefore always be removed, and the evaporator must be renewed (as a complete unit) together with the refrigerant lines ⇒ Electronic parts catalogue and ⇒ page 496 .*

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16 - Quick-release coupling of refrigerant line (low-pressure side)

WARNING

Only release and open the quick-release couplings after completely discharging the refrigerant circuit.

❑ Detaching and attaching refrigerant lines at quick-release couplings ⇒ page 211

❑ Renewing quick-release coupling together with O-ring and support ring ⇒ page 211 ; for version refer to ⇒ Electronic parts catalogue

17 - Cap

❑ With seal

❑ Always screw on

❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ "2.21 Differences in service connections depending on refrigerant (R134a or R1234yf)", page 267 and ⇒ Electronic parts catalogue

18 - Service connection (low-pressure side)

❑ Different versions (with primary sealing valve or Schrader valve) depending on refrigerant line; distinguishing features ⇒ 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 .

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 conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

- Different versions depending on refrigerant (R134a or R1234yf)
⇒ “2.21 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 267 and
⇒ Electronic parts catalogue
- When removing and installing service connection or valve core with refrigerant circuit discharged, use a socket - T10364- or similar.
- For information on air conditioner service station for measuring pressure and for discharging refrigerant circuit, refer to ⇒ 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 the engine version, components may have to be removed before connecting the service coupling.

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Note

- *Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .*

- *Depending on the vehicle version, the service connections may also be connected to the attached refrigerant line, and not to the refrigerant line with internal heat exchanger (e.g. on Audi RS 4 and Audi RS 5).*

2.1.4 System overview - refrigerant circuit: work requiring refrigerant circuit to be opened, vehicles with high-voltage system

Note

The vehicles in this series with high-voltage systems are all fitted with refrigerant circuits charged with refrigerant R134a.

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- ***Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.***
- ***High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.***
- ***The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.***

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

If work is necessary in the vicinity of high-voltage system components, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

If work is necessary on components of the high-voltage system, de-energise the high-voltage system ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

Note

⇒ *"2.3 Exploded view - refrigerant lines", page 183*

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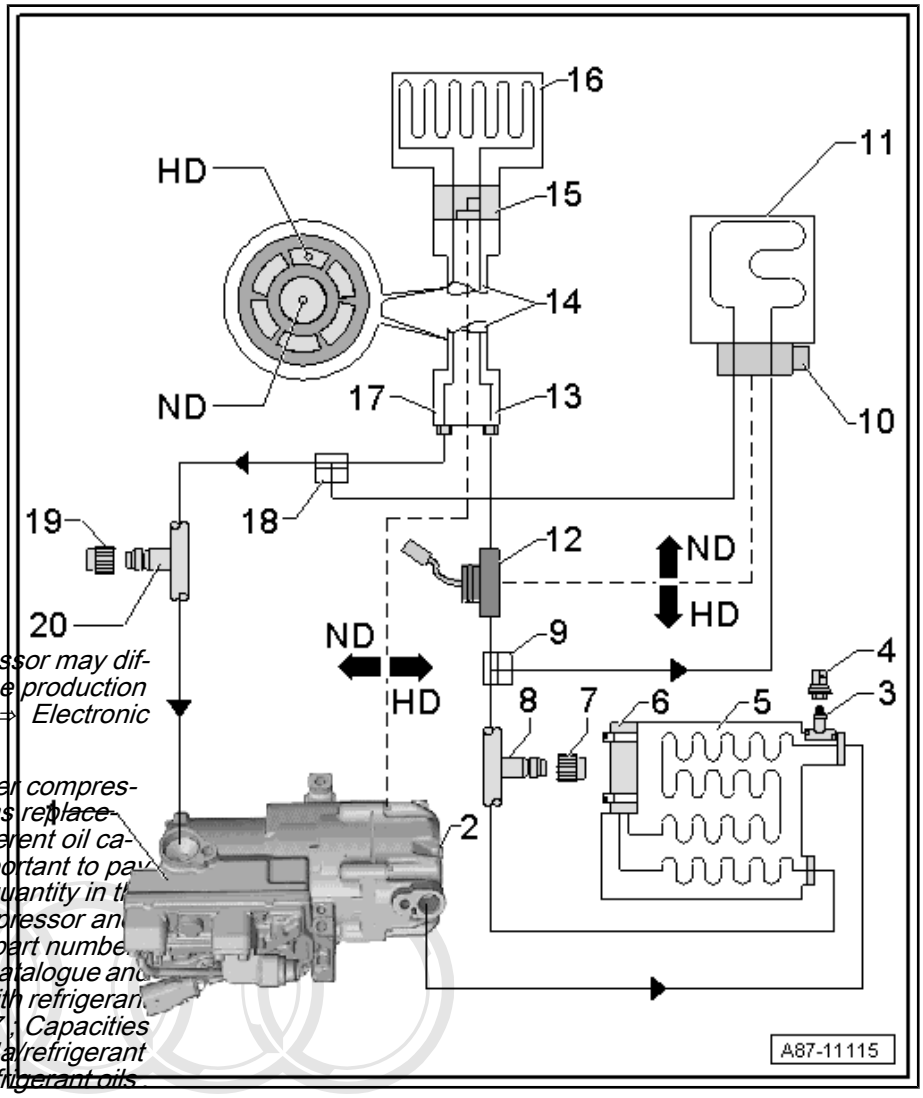
HD = High-pressure side

ND = Low-pressure side

Arrows show direction of refrigerant flow.

1 - Electrically driven air conditioner compressor

- ❑ With control unit for air conditioning compressor - J842- and electrical air conditioner compressor - V470-
- ❑ Detaching and attaching air conditioner compressor at bracket (vehicles with 4-cyl. engine) ⇒ page 292
- ❑ Detaching and attaching refrigerant line at air conditioner compressor ⇒ page 301
- ❑ Removing and installing air conditioner compressor ⇒ page 317



Note

- ♦ *The type of compressor may differ depending on the production period and engine. ⇒ Electronic parts catalogue*
- ♦ *These air conditioner compressors are available as replacement parts with different oil capacities, so it is important to pay attention to the oil quantity in the air conditioner compressor and to check the exact part number. ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils*
- ♦ *There may be different refrigerant oil capacities for the refrigerant circuit depending on the type of air conditioner compressor. The reason for the different oil quantities in the air conditioner compressor for an otherwise identical refrigerant circuit is the design of the actual compressor; please note the different oil quantities. Too much oil in the refrigerant circuit results in higher pressures and a reduction in the cooling output of the air conditioner. Insufficient oil can cause lubrication problems ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Air conditioner with refrigerant R134a; Capacities for refrigerant R134a/ refrigerant oil and approved refrigerant oils .*

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- *When fitting refrigerant lines and the corresponding retainers, make sure there is adequate clearance from other components (such as belts and engine pulleys).*
- *After installing the electrically driven air conditioner compressor and then charging the refrigerant circuit, first start up the compressor via the "Compressor run-in" function of the basic setting routine. Otherwise, the air conditioner compressor may be damaged if refrigerant oil has accumulated in the compression chamber of the air conditioner compressor due to inappropriate storage prior to installation ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode for air conditioner and battery regulation .*
- *An electrically driven air conditioner compressor may only be activated when the refrigerant circuit is charged. Running the air conditioner compressor with the refrigerant circuit empty can cause compressor damage ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems and ⇒ Vehicle diagnostic tester, "Guided Fault Finding" function for air conditioner and battery regulation .*

2 - High-pressure safety valve

- ❑ Do not remove
- ❑ Tightening torque for "Denso" air conditioner compressor: 10 Nm
- ❑ With O-ring, "Denso" air conditioner compressor: 8.5 mm x 1.75 mm ⇒ page 106

3 - Connection with valve

- ❑ When removing and installing valve core with refrigerant circuit discharged, use a socket - T10364- or similar.

WARNING

The refrigerant circuit must always be discharged before removing the valve core.

4 - Refrigerant pressure and temperature sender - G395- [1)]

- ❑ Removing and installing ⇒ page 190
- ❑ For checking signal, refer to ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .

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Note

- *The refrigerant pressure and temperature sender - G395- uses a local data bus to exchange information with the onboard supply control unit - J519- . The -J519- transmits the data via the data bus to the operating and display unit (Climatronic control unit - J255-). This vehicle should therefore not be fitted with a high-pressure sender - G65- (only emits square-wave signals) ⇒ Electronic parts catalogue .*
- *Due to the version of the refrigerant pressure and temperature sender - G395- and its fitting location, the temperature measured by the -G395- differs from the actual temperature of the refrigerant in the refrigerant circuit. Currently this is therefore not evaluated and used for the control of the air conditioner.*

5 - Condenser

- ❑ Detaching and attaching refrigerant lines ⇒ page 242
- ❑ Removing and installing condenser ⇒ page 248
- ❑ Different versions ⇒ Electronic parts catalogue

Note

Depending on the version of the radiator and condenser, it may be necessary to discharge the refrigerant circuit and disconnect the refrigerant lines from the condenser in order to remove the condenser from the front end or to remove the radiator ⇒ page 242 .

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6 - Receiver

- ❑ Receiver is attached directly to condenser.
- ❑ Removing and installing ⇒ page 256
- ❑ Different versions ⇒ Electronic parts catalogue

Note

Depending on version of condenser, receiver may be attached to or integrated into condenser ⇒ page 256 and ⇒ page 260 .

- ❑ Removing and installing desiccant cartridge (for condenser with integrated receiver) ⇒ page 260

7 - Cap

- ❑ With seal
- ❑ Always screw on

8 - Service connection (high-pressure side)

- ❑ Different versions (with primary sealing valve or Schrader valve) depending on refrigerant line; distinguishing features ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems

- For air conditioner service station for measuring pressure and for discharging and charging refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station)
- Depending on the engine version, components may have to be removed before connecting the service coupling.

WARNING

Refrigerant circuit must be discharged before removing service connections (connection without valve).

Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

9 - Connection to evaporator in battery cooling module

- High-pressure side
- Removing and installing refrigerant lines to battery cooling module on vehicle floor ⇒ page 183
- Removing and installing leadthrough for refrigerant lines into luggage compartment ⇒ page 201

WARNING

The refrigerant circuit must be discharged before slackening off the bolts at the connection point.

10 - Expansion valve with refrigerant shut-off valve 2 for hybrid battery - N517-

- Installed on evaporator in battery cooling module
- Removing and installing expansion valve with -N517- ⇒ page 238
- Removing and installing leadthrough for refrigerant lines into luggage compartment ⇒ page 201

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Note

-N517- is activated if battery needs to be cooled (closed when not activated).

11 - Evaporator in battery cooling module

- Component of battery cooling module
- Removing and installing refrigerant lines to battery cooling module in luggage compartment ⇒ page 206

- ❑ Removing and installing battery cooling module ⇒ page 669
- ❑ Detaching attachments from battery cooling module ⇒ “10.3 Exploded view - battery cooling module”, page 648
- ❑ ⇒ “10.11 Moving battery cooling module to service position”, page 667
- ❑ ⇒ “2.3 Exploded view - refrigerant lines”, page 183

12 - Refrigerant shut-off valve 1 for hybrid battery - N516-

- ❑ Installed in area of left suspension turret in engine compartment
- ❑ Removing and installing ⇒ page 656

Note

- ♦ *-N516- is activated, for example, if the battery needs to be cooled but the air conditioner is not set to cooling mode for the passenger compartment (valve open when not activated).*
- ♦ *Tightening torque for union nuts ⇒ page 656*

13 - Quick-release coupling of refrigerant line (high-pressure side)

WARNING

Only release and open the quick-release couplings after completely discharging the refrigerant circuit.

- ❑ Detaching and attaching refrigerant lines at quick-release couplings ⇒ page 211
- ❑ Renewing quick-release coupling together with O-ring and support ring ⇒ page 211 ; for version refer to ⇒ Electronic parts catalogue

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14 - Refrigerant line with internal heat exchanger

- ❑ In this refrigerant line, the hot liquid refrigerant flowing through the high-pressure side gives off energy to the cold refrigerant vapour flowing through the low-pressure side, thus enhancing the efficiency of the air conditioner
- ❑ Removing and installing ⇒ page 217

15 - Expansion valve

- ❑ For evaporator in air conditioning unit
- ❑ Detaching and attaching refrigerant line with internal heat exchanger ⇒ page 217
- ❑ Removing and installing ⇒ page 232

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). If the air conditioner compressor is switched on, the pressure in the low-pressure side drops, the expansion valve is opened and the refrigerant can flow to the low-pressure side.*
- *From the start of production up to the conversion from model year 2012 onwards, evaporators with a width (block depth) of approx. 40 mm were fitted (air conditioning unit with part number "8K_ 820 005"). From model year 2012 onwards and depending on the vehicle version, evaporators with a width (block depth) of approx. 50 mm are being introduced gradually (air conditioning unit with part number "8T_ 820 005"). Pay attention to the correct assignment of the expansion valve to the evaporator (different versions) ⇒ Electronic parts catalogue .*

16 - Evaporator in air conditioning unit

- ❑ Removing and installing air conditioning unit (with evaporator) ⇒ page 496
- ❑ Removing and installing evaporator with air conditioning unit installed ⇒ page 451

Note

From the start of production up to the conversion from model year 2012 onwards, evaporators with a width (block depth) of approx. 40 mm were fitted (air conditioning unit with part number "8K_ 820 005"). From model year 2012 onwards and depending on the vehicle version, evaporators with a width (block depth) of approx. 50 mm are being introduced gradually (air conditioning unit with part number "8T_ 820 005"). Pay attention to the correct assignment of the expansion valve to the evaporator (different versions) ⇒ Electronic parts catalogue .

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17 - Quick-release coupling of refrigerant line (low-pressure side)

WARNING

Only release and open the quick-release couplings after completely discharging the refrigerant circuit.

- Detaching and attaching refrigerant lines at quick-release couplings ⇒ page 211
- Renewing quick-release coupling together with O-ring and support ring ⇒ page 211 ; for version refer to ⇒ Electronic parts catalogue

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18 - Connection to evaporator in battery cooling module

- Low-pressure side

WARNING

The refrigerant circuit must be discharged before slackening off the bolts at the connection point.

19 - Cap

- With seal
- Always screw on

20 - Service connection (low-pressure side)

- Different versions (with primary sealing valve or Schrader valve) depending on refrigerant line; distinguishing features ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems
- When removing and installing service connection or valve core with refrigerant circuit discharged, use a socket - T10364- or similar.
- For air conditioner service station for measuring pressure and discharging 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)
- Depending on the engine version, components may have to be removed before connecting the service coupling.

WARNING

Refrigerant circuit must be discharged before removing service connections (connection without valve).

Note

- *Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).*
- *Depending on the vehicle version, the service connections may also be connected to the attached refrigerant line, and not to the refrigerant line with internal heat exchanger.*

2.2 Overview of fitting locations - refrigerant lines

Vehicles with high-voltage system (hybrid vehicles)

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Note

The vehicles in this series with high-voltage systems are all fitted with refrigerant circuits charged with refrigerant R134a.

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

WARNING

- *The refrigerant circuit must be discharged before slackening off the bolts at the connection point.*

Audi
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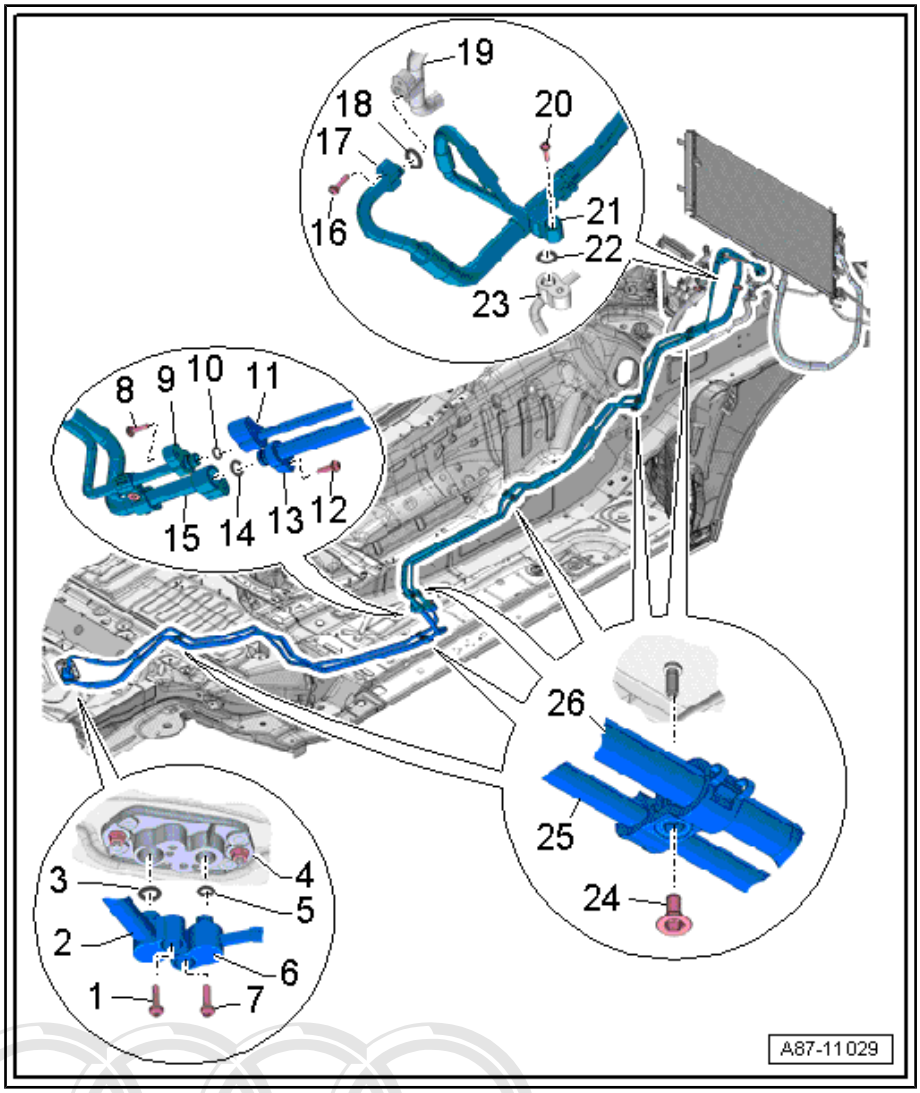

1 - Bolt

2 - Low-pressure refrigerant line

- ❑ On underbody (rear)

3 - O-ring

- ❑ Renew

4 - Leadthrough for refrigerant lines into luggage compartment

- ❑ Removing and installing ⇒ page 201

5 - O-ring

- ❑ Renew

6 - High-pressure refrigerant line

- ❑ On underbody (rear)

7 - Bolt

8 - Bolt

9 - High-pressure refrigerant line

- ❑ On underbody (front)

10 - O-ring

- ❑ Renew

11 - High-pressure refrigerant line

- ❑ On underbody (rear)

12 - Bolt

13 - Low-pressure refrigerant line

- ❑ On underbody (rear)

14 - O-ring

- ❑ Renew

15 - Low-pressure refrigerant line

- ❑ On underbody (front)

16 - Bolt

17 - Low-pressure refrigerant line

- ❑ On underbody (front)

18 - O-ring

- ❑ Renew

19 - Low-pressure refrigerant line

- ❑ In engine compartment

20 - Bolt

21 - High-pressure refrigerant line

- ❑ On underbody (front)

22 - O-ring

- ❑ Renew

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23 - High-pressure refrigerant line

- ❑ In engine compartment

24 - Speed nut

25 - High-pressure refrigerant line

- ❑ On underbody

26 - Low-pressure refrigerant line

- ❑ On underbody

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2.3 Exploded view - refrigerant lines

Note

The vehicles in this series with high-voltage systems are all fitted with refrigerant circuits charged with refrigerant R134a.

Vehicles with high-voltage system (hybrid vehicles)

1 - Refrigerant line (high-pressure side)

- ❑ In engine compartment

2 - O-ring

3 - Refrigerant line (low-pressure side)

- ❑ On vehicle floor (front)
- ❑ Removing and installing ⇒ page 194

4 - Bolt

- ❑ Tightening torque: 9 Nm (for bolts with M6 thread) / 25 Nm (for bolts with M8 thread)

5 - O-ring

6 - Refrigerant line (high-pressure side)

- ❑ On vehicle floor (front)
- ❑ Removing and installing ⇒ page 194

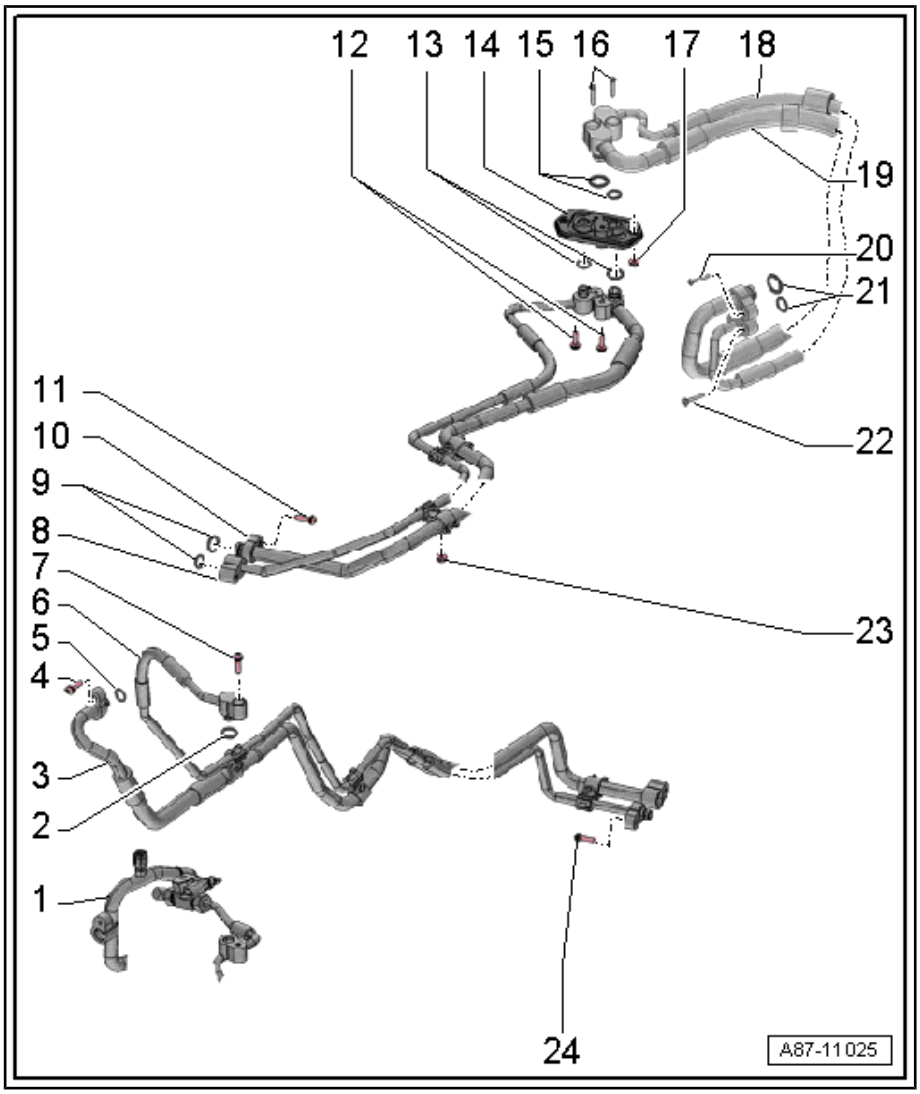
7 - Bolt

- ❑ Tightening torque: 9 Nm (for bolts with M6 thread) / 25 Nm (for bolts with M8 thread)

8 - Refrigerant line (high-pressure side)

- ❑ On vehicle floor (rear)
- ❑ Removing and installing ⇒ page 197

9 - O-rings



10 - Refrigerant line (low-pressure side)

- ❑ On vehicle floor (rear)
- ❑ Removing and installing ⇒ page 197

11 - Bolt

- ❑ Tightening torque: 9 Nm (for bolts with M6 thread) / 25 Nm (for bolts with M8 thread)

12 - Bolts

- ❑ Tightening torque: 9 Nm (for bolts with M6 thread) / 25 Nm (for bolts with M8 thread)

13 - O-rings

14 - Leadthrough for refrigerant lines into luggage compartment

- ❑ Removing and installing ⇒ page 201

15 - O-rings

16 - Bolts

- ❑ Tightening torque: 9 Nm (for bolts with M6 thread) / 25 Nm (for bolts with M8 thread)

17 - Nut

- ❑ Tightening torque: 9 Nm

18 - High-pressure refrigerant line

- ❑ To battery cooling module in luggage compartment
- ❑ Removing and installing ⇒ page 206

19 - Refrigerant line (low-pressure side)

- ❑ To battery cooling module in luggage compartment
- ❑ Removing and installing ⇒ page 206

20 - Bolt

- ❑ Tightening torque: 9 Nm (for bolts with M6 thread) / 25 Nm (for bolts with M8 thread)

21 - O-rings

22 - Bolt

- ❑ Tightening torque: 9 Nm (for bolts with M6 thread) / 25 Nm (for bolts with M8 thread)

23 - Speed nut

- ❑ Tightening torque: 2.5 Nm

24 - Bolt

- ❑ Tightening torque: 9 Nm (for bolts with M6 thread) / 25 Nm (for bolts with M8 thread)

25 - Refrigerant shut-off valve 1 for hybrid battery - N516-

- ❑ Removing and installing ⇒ page 656

Note

-N516- is installed in high-pressure side refrigerant line ⇒ Item 1 (page 183) and ⇒ page 656 (it is not numbered in this illustration).

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

Note

- *The following describes the procedure for checking a "Denso" air conditioner compressor (type "6 SEU 14") 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.*
- *In the following the checking procedure is described for vehicles with a 6-cyl. TDI engine; the procedure may differ for vehicles with a different engine (4-cyl., 6-cyl. or 8-cyl. engine).*
- *Not fitted on vehicles with an electrically driven air conditioner compressor* *⇒ page 292*
- *Certain malfunctions of -N280- (e.g. sticking valve or open circuit in coil) can lead to problems with air conditioner compressor (no cooling output from air conditioner, evaporator icing up etc.). If -N280- (and not 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 conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .*
- *If -N280- is not available as a replacement part for all air conditioner compressors. If -N280- cannot be obtained separately for a particular air conditioner compressor (different versions available), the entire air conditioner compressor must be renewed if problems occur ⇒ Electronic parts catalogue .*
- *On air conditioner compressors with -N25- , you may have to discard plug contacts from connector housing on -N280- before renewing -N280- ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Renewing components .*

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Preparations

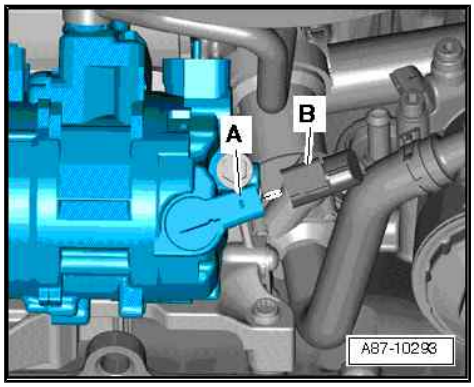
– Switch off ignition.

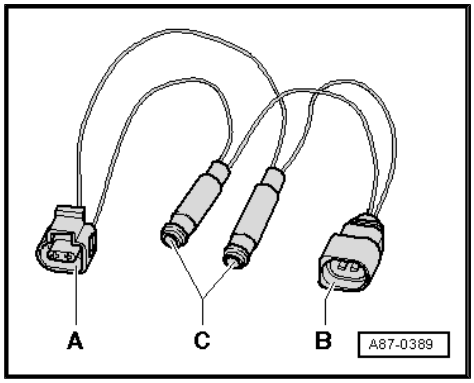
– Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .

Test sequence

– Unplug electrical connector -B- at air conditioner compressor regulating valve - N280- -A-.

– Use an adapter cable to re-connect connector -A- and connector -B- at air conditioner compressor regulating valve - N280- .





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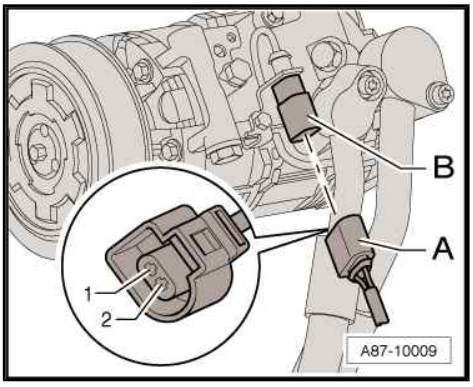

Note

- *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 -A- and connector -B- with components from the auxiliary measuring set - V.A.G 1594 C- .*
- *Alternatively, you can use an improvised adapter cable for this test. For this you will need e.g. one 2-pin connector each (-A- and -B-; part numbers 1J0 973 702 and 1J0 973 802 and the corresponding plug contacts), two commercially available sockets for banana plugs -C- and two cables (cross-section = 0.5 mm^2) for an air conditioner compressor without -N25- .*
- *The air conditioner compressor regulating valve - N280- is activated by the onboard supply control unit - J519- when requested by the air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *The top illustration shows an air conditioner compressor without -N25- on which the 2-pin connector -A- to the vehicle wiring harness is plugged in directly at the air conditioner compressor regulating valve - N280- (connector -B-). Depending on the version of the air conditioner compressor, the connector -B- may also be provided with a short wire.*
- *The activation of the air conditioner compressor regulating valve - N280- is displayed in the measured value block of the onboard supply control unit - J519- . The maximum control current depends on the version of the operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *The measured current flowing via the air conditioner compressor regulating valve - N280- is displayed in the measured value blocks of the air conditioner operating and display unit (Climatronic control unit - J255-) and the onboard supply control unit - J519- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *If the required actual current does not flow via the air conditioner compressor regulating valve - N280- , check the positive and earth connections of the onboard supply control unit - J519- and the wiring between -J519- and -N280- on the basis of the current flow diagram for open circuit, contact resistance and interchanged components ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

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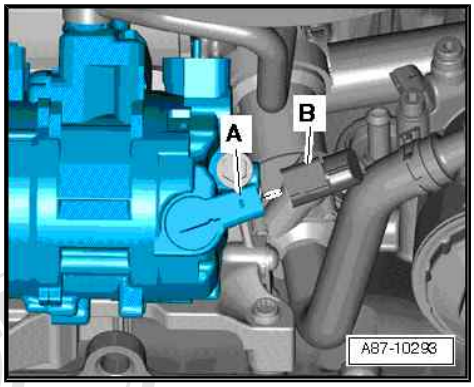
– Connect probe - VAS 5051/8- to adapter cables.
– Test lead (signal wire) to contact -2- of connector -B-
– Test lead (screen, earth) to contact -1- of connector -B-



Note

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.

– On vehicle diagnostic, testing and information system - VAS 5051/- , set testing mode DSO (Digital Storage Oscilloscope).
– Then select 5 V/div = 0.5 ms/div (5 V DC and 0.5 milliseconds per unit).
– Start engine.
– Set temperature on air conditioner operating and display unit (Climatronic control unit - J255-) to maximum cooling output.
– Press AC or A/C button (with lamp indicating when air conditioner compressor is switched on) on air conditioner operating and display unit (Climatronic control unit - J255-) to activate and deactivate air conditioner compressor regulating valve - N280- .

Depending on the setting of the air conditioner operating and display unit (Climatronic control unit - J255-), the display of the oscilloscope will show:

– In “OFF” or “AC off” mode (indicator lamp in “AC” or A/C button off), there is no square-wave signal (air conditioner compressor regulating valve - N280- is not activated).

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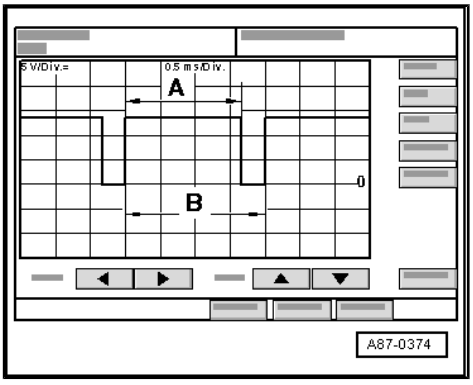
– In “Auto” or “AC on” mode (indicator lamps in buttons on) and with the temperature set to maximum cooling output, there is a square-wave signal with a pulse width -A- of between 75 % and 100 % (regulating valve is activated).



Note

- *The illustration shows a signal with a duty cycle of approx. 80 %.*
- *The pulse width -A- is governed by the required cooling output and 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 onboard supply control unit - J519- on the basis of the request from the air conditioner operating and display unit (Climatronic control unit - J255-).*
- *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 air conditioner operating and display unit (Climatronic control unit - J255-) and the measured ambient influences govern the pulse width of the square-wave signal (duty cycle between 30 % and 100 %, the air conditioner compressor regulating valve - N280- is activated so that the compressor output required to obtain the specified temperatures is achieved).

Note

- *In “Auto” and “AC on” mode (indicator lamps in buttons on) and with the temperature set to “Lo”, the air conditioner compressor regulating valve - N280- is activated so that the maximum permissible current of approx. 0.65 A flows via the - N280- (maximum compressor output).*
- *In control mode, the activation time is governed by the required cooling output and the voltage of the vehicle's electrical system, for example; however, it is always long enough to achieve a mean current of 0.3 A.*

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2.5 Checking activation of air conditioner compressor regulating valve - N280-

Note

- *Perform electrical check of activation of -N280- as described in Guided Fault Finding for air conditioning system ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *-N280- is activated by the onboard supply control unit - J519- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations. The request for the activation of -N280- and the current level required (for the control of the compressor output to obtain the desired temperature at the evaporator) are transmitted via the data bus from the air conditioner operating and display unit (Climatronic control unit - J255-) to the onboard supply control unit - J519- . -J519- then activates -N280- .*
- *If a fault is detected in the activation of -N280- , a fault is entered in the event memory of the onboard supply control unit - J519- and the air conditioner operating and display unit (Climatronic control unit - J255-). When reading out the event memory of the air conditioner operating and display unit (Climatronic control unit - J255-), you will be requested to interrogate the event memory of the onboard supply control unit - J519- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The activation of -N280- is displayed in the measured value block of the onboard supply control unit - J519- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

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

Note

- *The cooling output cannot be checked with the refrigerant pressure and temperature sender - G395- removed. The operating and display unit (Climatronic control unit - J255-) does not switch on the air conditioner compressor.*
- *The refrigerant circuit remains closed (connection with valve).*
- *This vehicle should only be fitted with a refrigerant pressure and temperature sender - G395- (data exchange via LIN bus) ⇒ Electronic parts catalogue .*
- *These vehicles should not be fitted with a high-pressure sender - G65- (only emits square-wave signals) ⇒ Electronic parts catalogue .*

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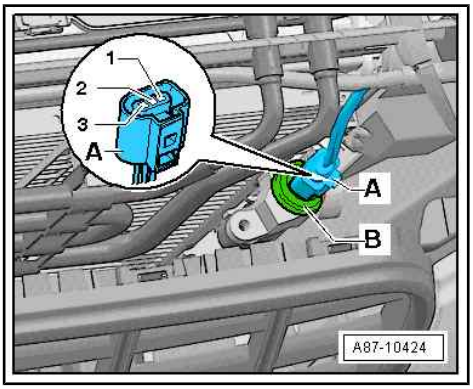
Removing

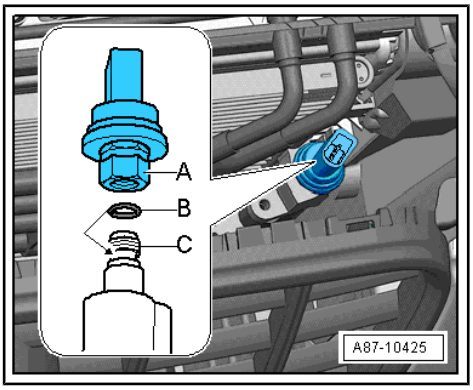
– Switch off ignition.

– Remove cover (top) for lock carrier ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .

– Unplug electrical connector -A-.



– Remove refrigerant pressure and temperature sender - G395- -A- from connection at condenser -C-.



Installing

Install in reverse order of removal; note the following:

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– Renew O-ring -B- ⇒ page 106 , for correct version refer to ⇒ Electronic parts catalogue .

– Secure refrigerant pressure and temperature sender - G395- -A-.

• Tightening torque: 5 Nm

– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

2.7 Checking refrigerant pressure and temperature sender - G395-

Checking signal from refrigerant pressure and temperature sender - G395-

Note

- *Check signal from refrigerant pressure and temperature sender - G395- as described in Guided Fault Finding for air conditioning system ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The signal from the refrigerant pressure and temperature sender - G395- is evaluated by the onboard supply control unit - J519- . It is transmitted via the data bus to the air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *If a fault is detected in the signal from the refrigerant pressure and temperature sender - G395- , a fault is entered in the event memory of the onboard supply control unit - J519- and the air conditioner operating and display unit (Climatronic control unit - J255-). When reading out the event memory of the air conditioner operating and display unit (Climatronic control unit - J255-), you will be requested to interrogate the event memory of the onboard supply control unit - J519- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The measured values of the refrigerant pressure and temperature sender - G395- are displayed in the measured value block of the onboard supply control unit - J519- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . . Currently the temperature value displayed is not used by the air conditioner operating and display unit (Climatronic control unit - J255-).*

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2.8 Checking pressure signal at refrigerant pressure and temperature sender - G395-

Note

- *The cooling output cannot be checked if the refrigerant pressure and temperature sender - G395- is removed; the operating and display unit (Climatronic control unit - J255-) does not switch on the air conditioner compressor ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .*
- *For checking measured values of refrigerant pressure and temperature sender -G395- , refer to ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .*
- *The refrigerant pressure and temperature sender - G395- uses a local data bus to exchange information with the on-board supply control unit - J519- . The -J519- transmits the data via the data bus to the operating and display unit (Climatronic control unit - J255-).*
- *Due to the version of the refrigerant pressure and temperature sender - G395- and its fitting location, the temperature measured by the refrigerant pressure and temperature sender - G395- differs from the actual temperature of the refrigerant. Currently this is therefore not evaluated and used for the control of the air conditioner.*
- *This vehicle may only be fitted with a refrigerant pressure and temperature sender - G395- ⇒ Electronic parts catalogue .*
- *After switching off the air conditioner compressor, it might take a relatively long period on this vehicle before the pressure in the high-pressure side drops (the expansion valve is cold and the pressure in the low-pressure side increases rapidly after the compressor is switched off, the expansion valve is closed and the refrigerant can flow to the low-pressure side only slowly).*

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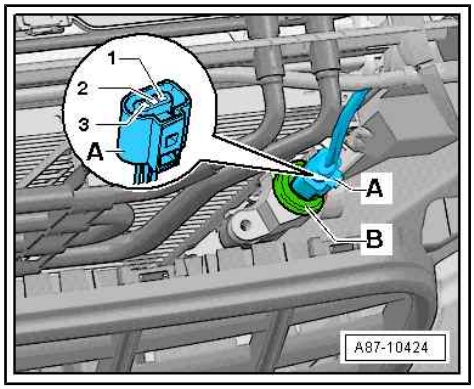
Preparations

– Switch off ignition.

– Remove cover (top) for lock carrier ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .

– Unplug electrical connector -A-.



Assignment of 3-pin connector at refrigerant pressure and temperature sender - G395- -A-

1 - Earth

2 - Signal output – to onboard supply control unit - J519- via local data bus

3 - Terminal “75” (positive)

Test sequence:

– Switch on ignition.

– Check earth and positive connection to connector -A-.

– Check connection and operation of refrigerant pressure and temperature sender - G395- as described in Guided Fault Finding ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .

Note

- *When the electrical connector -A- is unplugged, the air conditioner compressor (air conditioner compressor regulating valve - N280-) is not activated.*
- *The refrigerant pressure and temperature sender - G395- is an electronic control unit which exchanges information via a local data bus with the onboard supply control unit - J519- ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .*

2.9 Removing and installing refrigerant lines to battery cooling module on vehicle floor (front)

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Vehicles with high-voltage system (hybrid vehicles)

Note

The vehicles in this series with high-voltage systems are all fitted with refrigerant circuits charged with refrigerant R134a.

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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Special tools and workshop equipment required

- Removal lever - 80 - 200-

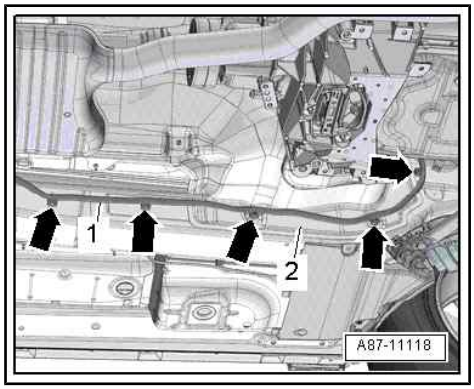
Removing

– Switch off ignition.

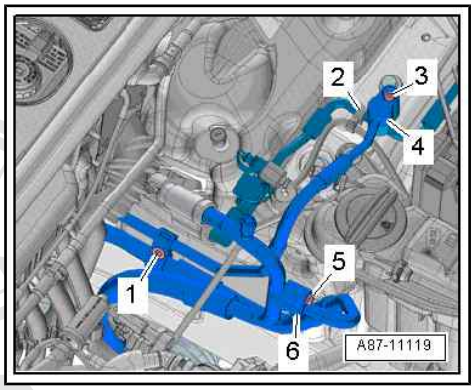
– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with

refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

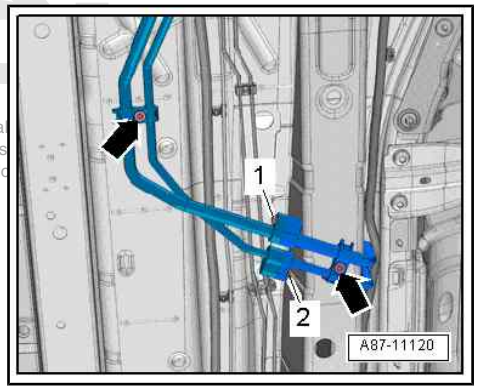
– Remove aerodynamic fairing (Cd panel, left-side) ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim .
– Move electrical wiring -1- clear -arrows- using removal lever - 80 - 200- .
– Press heat shield -2- slightly towards right side.



– Move electrical wiring harness -2- clear.
– Unscrew nut -1- and bolts -3 and 5- and disconnect refrigerant lines -4 and 6-.



– Unscrew nuts -arrows- and bolts -1 and 2- and disconnect refrigerant lines.



Note

Seal open lines and connections at refrigerant line with suitable caps (to prevent dirt and moisture from entering).

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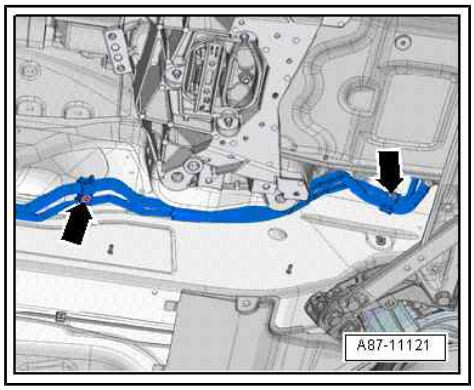
– Unscrew nuts -arrows- and detach refrigerant lines (front).



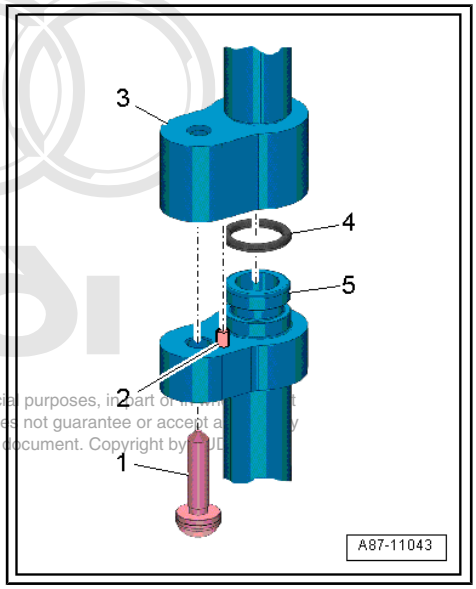
Installing

Install in reverse order of removal; note the following.

Note

- *Observe fitting instructions for O-rings ⇒ page 106 .*
- *After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.*

- Renew O-rings -4-; for correct version refer to ⇒ Electronic parts catalogue .
- Clean refrigerant line connections -3 and 5- and check for damage.
- Make sure that O-rings -4- are correctly seated in grooves of corresponding mounting.
- Check that dowel pin -2- (not fitted on all connections) is not damaged and is seated correctly.
- Tighten bolts -1-.
- Re-install remaining components (removed earlier).
- For electrical connections and routing, refer to ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).
- Switch on ignition.
- Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .
- Start up air conditioner after charging refrigerant circuit ⇒ page 271 .



Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (before using air conditioner after system has been re-charged).

2.10 Removing and installing refrigerant lines to battery cooling module on vehicle floor (rear)

Vehicles with high-voltage system (hybrid vehicles)

Note

The vehicles in this series with high-voltage systems are all fitted with refrigerant circuits charged with refrigerant R134a.

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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Removing

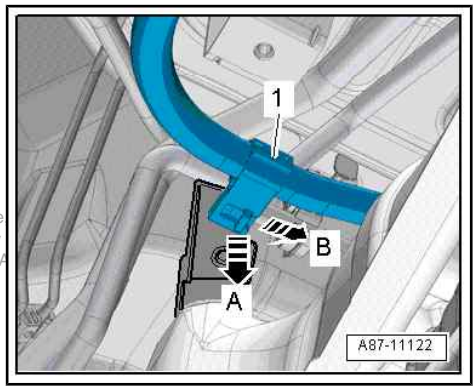
– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

– Remove aerodynamic fairing (Cd panel, left-side) ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim .

– Remove activated charcoal filter ⇒ Fuel supply system; Rep. gr. 20 ; Activated charcoal filter system; Removing and installing activated charcoal filter .

– Move line -1- clear at bracket; to do so, release catch -arrow A- and detach towards right side -arrow B-.



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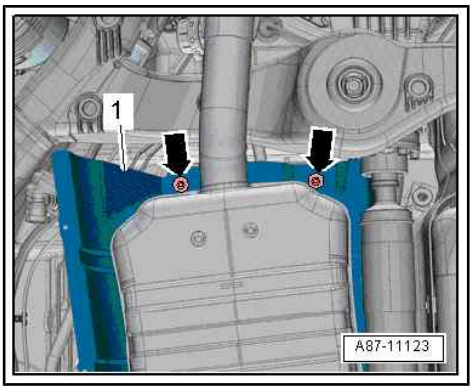
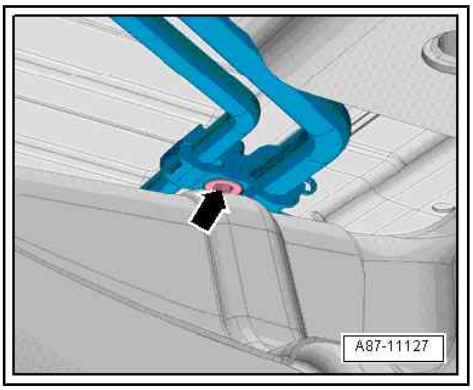
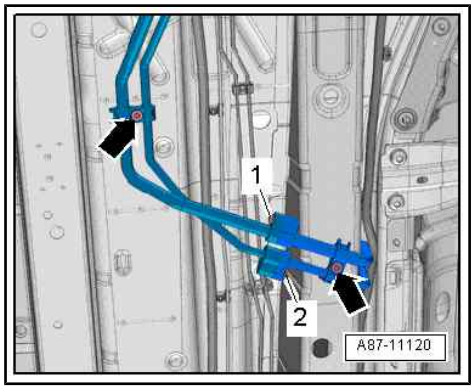
– Unscrew nuts -arrows- and press heat shield -1- slightly downwards.



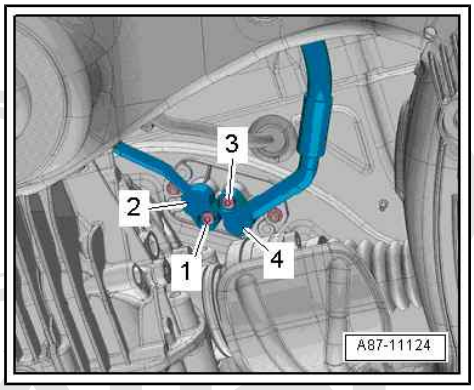
– Unscrew nut -arrow- at bracket for refrigerant lines.



– Unscrew nuts -arrows- and bolts -1 and 2- and disconnect refrigerant lines.



– Remove bolts -1 and 3- and disconnect and remove refrigerant lines -2 and 4-.



Note

Seal open lines and connections at refrigerant line with suitable caps (to prevent dirt and moisture from entering).

Installing

Install in reverse order of removal; note the following.

Note

- *Observe fitting instructions for O-rings ⇒ page 106 .*
- *After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.*

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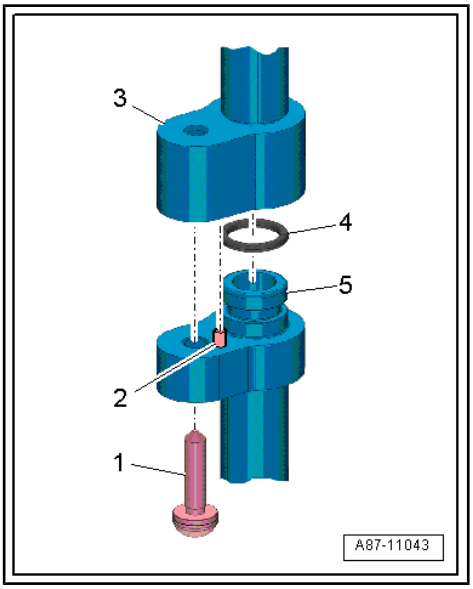
- Renew O-rings -4-; for correct version refer to ⇒ Electronic parts catalogue .
- Clean refrigerant line connections -3 and 5- and check for damage.
- Make sure that O-rings -4- are correctly seated in grooves of corresponding mounting.
- Check that dowel pin -2- (not fitted on all connections) is not damaged and is seated correctly.
- Tighten bolts -1-.
- Re-install remaining components (removed earlier).
- For electrical connections and routing, refer to ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).
- Switch on ignition.
- Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .
- Start up air conditioner after charging refrigerant circuit ⇒ page 271 .



Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (before using air conditioner after system has been re-charged).

2.11 Removing and installing leadthrough for refrigerant lines into luggage compartment

Vehicles with high-voltage system (hybrid vehicles)

Note

The vehicles in this series with high-voltage systems are all fitted with refrigerant circuits charged with refrigerant R134a.

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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As work on the high-voltage system is required for the following sequence of operations, de-energise the high-voltage system ⇒ page 36 , ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system . Pay particular attention to the “General warning instructions for work on the high-voltage system” ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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

De-energising high-voltage system

DANGER!

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

- ***The high-voltage system may only be de-energised by a suitably qualified person (Audi high-voltage technician).***
- ***It must be definitely confirmed that the high-voltage system is de-energised. The system may only be de-energised using the vehicle diagnostic tester via “Guided Fault Finding”.***
- ***The qualified person (Audi high-voltage technician) confirms that the system is de-energised and uses the locking cap - T40262- to ensure that the system cannot be re-energised. As an additional precaution, the ignition key and the maintenance connector for high-voltage system - TW- are then stored in a safe place by the qualified person.***
- ***The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.***

Note

- *De-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - De-energise high-voltage system (Rep. gr. 93)`

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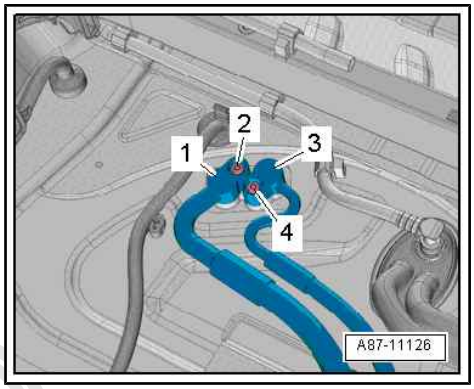
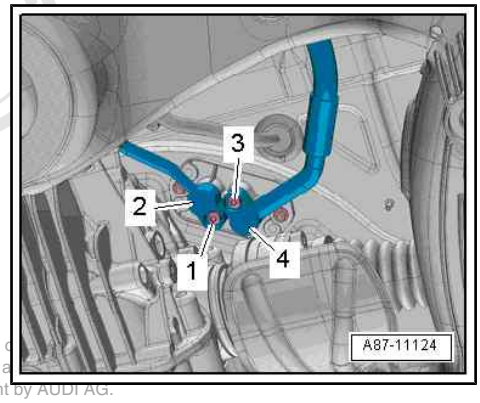
Removing

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

– Remove drive battery ⇒ Electrical system; Rep. gr. 93 ; High-voltage battery unit; Removing and installing high-voltage battery .
– Remove bolts -2 and 4- and detach refrigerant lines -1 and 3-.



– Remove bolts -1 and 3- and disconnect and remove refrigerant lines -2 and 4-.



Note

Seal open lines and connections at refrigerant line with suitable caps (to prevent dirt and moisture from entering).

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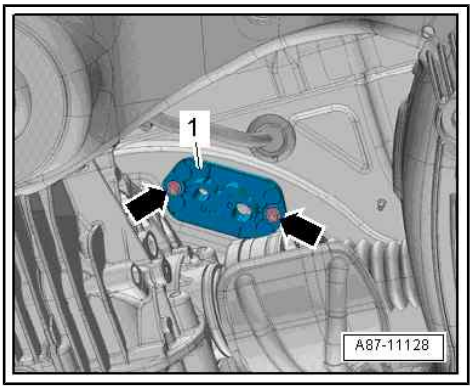
– Unscrew nuts -arrows- and detach leadthrough for refrigerant lines -1-.



Installing

Install in reverse order of removal; note the following.

Note

- *If seal in leadthrough is damaged, apply silicone adhesive sealant - D 176 001 A3- or similar at this location ⇒ Electronic parts catalogue .*
- *The bonding surface must be clean and free from grease when applying the silicone adhesive sealant.*

– Install refrigerant lines to battery cooling module on rear of underbody ⇒ page 197 .

– Install refrigerant lines to battery cooling module in luggage compartment ⇒ page 206 .

– Re-install remaining components (removed earlier).

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

– For electrical connections and routing, refer to ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

– Re-energise power supply of high-voltage system ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system .

Re-energising high-voltage system

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DANGER!

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

- ***The high-voltage system may only be re-energised by a suitably qualified person (Audi high-voltage technician).***
- ***The system may only be re-energised using the vehicle diagnostic tester via "Guided Fault Finding".***
- ***The vehicle is then made ready for operation again by the qualified person (Audi high-voltage technician).***
- ***The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.***

Note

- *Re-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - Re-energise high-voltage system (Rep. gr. 93)`

– Switch on ignition.

– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and control unit for air conditioning compressor - J842- and erase any faults displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .

– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems . Before using air conditioner after system has been re-charged.

2.12 Removing and installing refrigerant lines to battery cooling module in luggage compartment

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Vehicles with high-voltage system (hybrid vehicles)

Note

The vehicles in this series with high-voltage systems are all fitted with refrigerant circuits charged with refrigerant R134a.

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

As work on the high-voltage system is required for the following sequence of operations, de-energise the high-voltage system ⇒ page 36 , ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system . Pay particular attention to the “General warning instructions for work on the high-voltage system” ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

De-energising high-voltage system

DANGER!

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

- ***The high-voltage system may only be de-energised by a suitably qualified person (Audi high-voltage technician).***
- ***It must be definitely confirmed that the high-voltage system is de-energised. The system may only be de-energised using the vehicle diagnostic tester via “Guided Fault Finding”.***
- ***The qualified person (Audi high-voltage technician) confirms that the system is de-energised and uses the locking cap - T40262- to ensure that the system cannot be re-energised. As an additional precaution, the ignition key and the maintenance connector for high-voltage system - TW- are then stored in a safe place by the qualified person.***
- ***The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.***

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Note

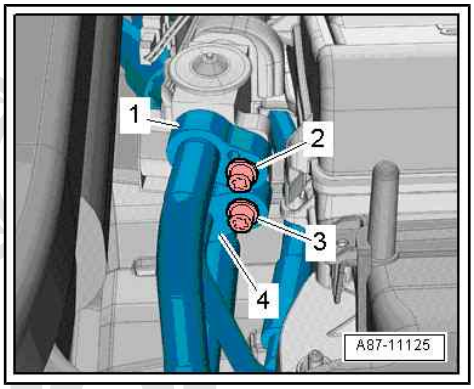
- *De-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - De-energise high-voltage system (Rep. gr. 93)`

Removing

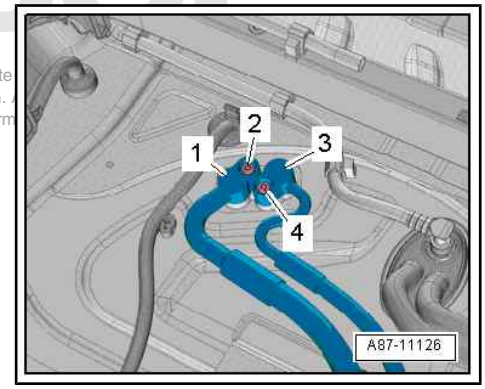
– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

– Remove high-voltage battery ⇒ Electrical system; Rep. gr. 93 ; High-voltage battery unit; Removing and installing high-voltage battery .
– Remove bolts -2 and 3- and detach refrigerant lines -1 and 4-.



– Remove bolts -2 and 4- and disconnect and remove refrigerant lines -1 and 3-.



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Note

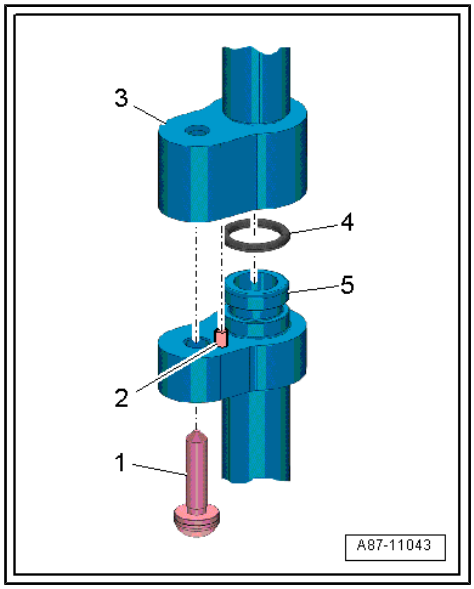
Seal open lines and connections at refrigerant line with suitable caps (to prevent dirt and moisture from entering).

Installing

Install in reverse order of removal; note the following.

Note

- *Observe fitting instructions for O-rings ⇒ page 106 .*
- *After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.*



- Renew O-rings -4-; for correct version refer to ⇒ Electronic parts catalogue .
- Clean refrigerant line connections -3 and 5- and check for damage.
- Make sure that O-rings -4- are correctly seated in grooves of corresponding mounting.
- Check that dowel pin -2- (not fitted on all connections) is not damaged and is seated correctly.
- Tighten bolts -1-.
- Re-install remaining components (removed earlier).
- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).
- For electrical connections and routing, refer to ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Re-energise power supply of high-voltage system ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system .

Re-energising high-voltage system

DANGER!

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

- ***The high-voltage system may only be re-energised by a suitably qualified person (Audi high-voltage technician).***
- ***The system may only be re-energised using the vehicle diagnostic tester via "Guided Fault Finding".***
- ***The vehicle is then made ready for operation again by the qualified person (Audi high-voltage technician).***
- ***The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.***

Note

- *Re-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - Re-energise high-voltage system (Rep. gr. 93)`

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– Switch on ignition.

– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and control unit for air conditioning compressor - J842- and erase any faults displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .

– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems . Before using air conditioner after system has been re-charged.

2.13 Detaching and attaching refrigerant lines at quick-release couplings

Special tools and workshop equipment required

- Release tools -T40149- (for refrigerant lines)
- Removal tool -T40232- (if connections cannot be released using -T40149-)

Removing

– Switch off ignition.

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

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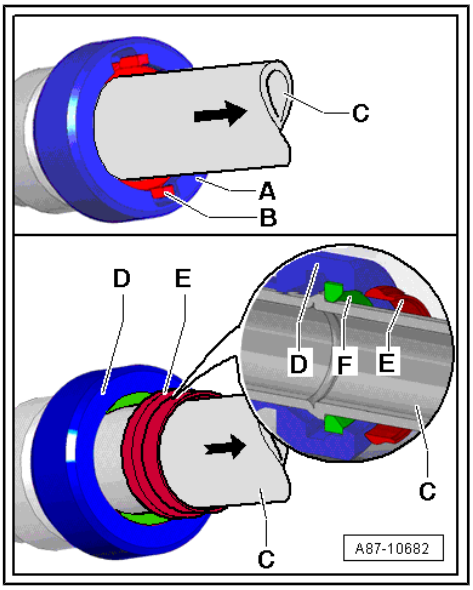

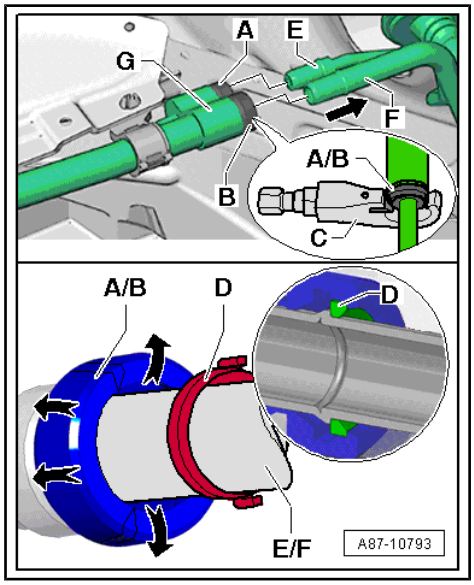

Note

- *Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (Air conditioner with refrigerant R134a; Refrigerant circuit; General information on air conditioning systems), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .*
- *There are different versions of the quick-release couplings -A- and -D-. With both versions of the quick-release couplings, the refrigerant lines -C- can be released and removed in the same way using release tool -T40149/1- .*
- *With the quick-release coupling -A- installed at the start of production, the pins -B- become visible after the refrigerant line -C- has been installed if you pull the locked refrigerant line -C- in the direction of the arrow after assembly.*
- *With the quick-release coupling -D- installed from model year 2010 onwards (gradual introduction), the refrigerant line -C- is installed in the same way as with the quick-release coupling -A-. If, on this version, the refrigerant line -C- is pulled in the direction of the arrow after it is assembled, the snap ring -E- emerges from the quick-release coupling -D-, showing that the retaining ring -F- is completely locked onto the refrigerant line -C-. Subsequently the snap ring -E- must be detached from the refrigerant line -C-.*
- *If quick-release couplings -A- and -B- cannot be released using -T40149- without damaging them irreparably, unfasten quick-release couplings -A- and -B- at three points on circumference using removal tool -T40232- -C- and then unfasten retaining ring -D- from quick-release couplings -A- and -B- and refrigerant lines -E- and -F-. Then remove refrigerant lines -E- and -F- from quick-release couplings -A- and -B-.*

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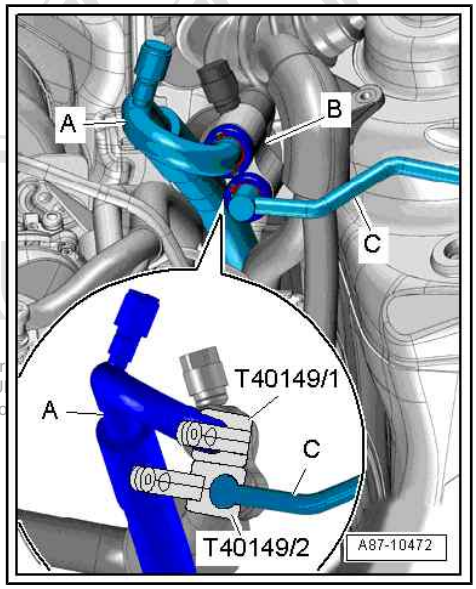
– Clean refrigerant lines -A- and -C- in area of quick-release couplings.

– Spray silicone-free lubricant onto refrigerant lines -A- and -C- in area of quick-release couplings.



Note

- *The refrigerant lines adhere to the O-ring while the air conditioner is operating. Detach the O-ring before inserting the release tools for refrigerant line, e.g. by pulling and pushing the refrigerant line. Be careful not to twist the refrigerant lines when doing so.*
- *The Audi RS 4 and Audi RS 5 are fitted with a block connection instead of a quick-release coupling at the refrigerant line (high-pressure side); this block connection must be detached/attached in the same way as the block connection at the condenser* ⇒ page 242 *.*

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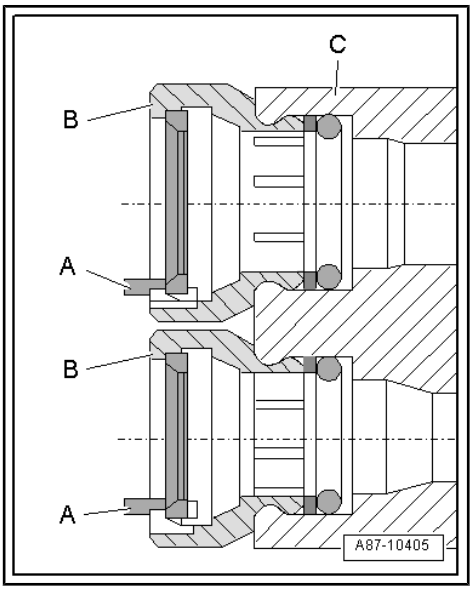
– Press refrigerant lines -A- and -C- by hand all the way into connecting piece -B- of refrigerant line with internal heat exchanger.

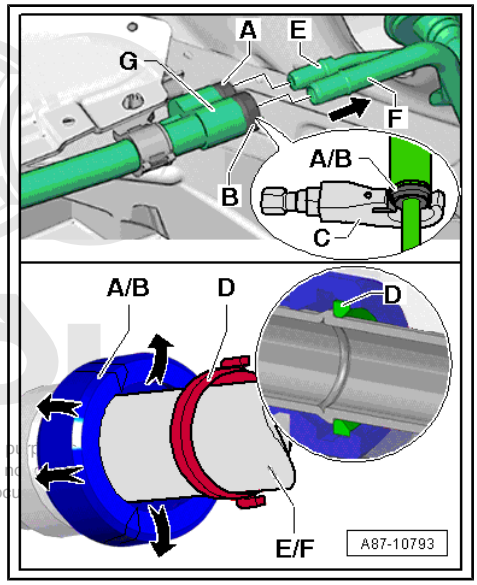
– Press release tool -T40149/1- as far as possible onto refrigerant line -A- (you will feel and hear retaining ring being released). This expands the retaining ring.

– Pull refrigerant line -A- out of connecting piece -B- of refrigerant line with internal heat exchanger using release tool.

– Press release tool -T40149/2- as far as possible onto refrigerant line -C- (you will hear and feel retaining ring being released). This expands the retaining ring.

– Pull refrigerant line -C- out of connecting piece -B- of refrigerant line with internal heat exchanger using release tool.





Note

- *If the refrigerant lines cannot be pulled out or pushed in, DO NOT twist them in the connection piece -C-.*
- *In such cases, the quick-release couplings -A- or -B- must be separated (or cut) using the removal tool -T40232- or similar; the retaining ring -D- must then be removed.*
- *When cutting, take care not to damage the connecting piece -A- of the refrigerant line with internal heat exchanger.*

Seal open lines and connections at refrigerant line with suitable caps (to prevent dirt and moisture from entering).

Unfastening connections at quick-release couplings with removal tool -T40232-

permitted unless authorised by AUDI AG. AUDI AG does not

– Apply removal tool -C- to quick-release coupling -A- or -B- and cut through quick-release coupling at three points on outside.

Note

- *When cutting through the quick-release couplings -A- and -B-, take care not to damage the connection area at the internal heat exchanger -G- and the refrigerant lines -E- and -F-.*
- *Only insert blade of removal tool -C- in quick-release coupling until you can hear and feel it break at cutting point.*

– Carefully bend open quick-release coupling -A- or -B- you have cut through (taking care not to damage refrigerant line) and remove retaining ring -D-.

– Spray silicone-free lubricant onto refrigerant lines in area of cut quick-release coupling.

Note

The refrigerant lines adhere to the O-ring while the air conditioner is operating. If lubricant is sprayed onto the refrigerant line, the line can then be detached from the connection by pulling and pushing the refrigerant line. Be careful not to twist the refrigerant lines when doing so.

– Pull refrigerant lines -E- and -F- out of connection.

– Seal open lines and connections at refrigerant line with internal heat exchanger with suitable caps (to prevent dirt and moisture from entering).

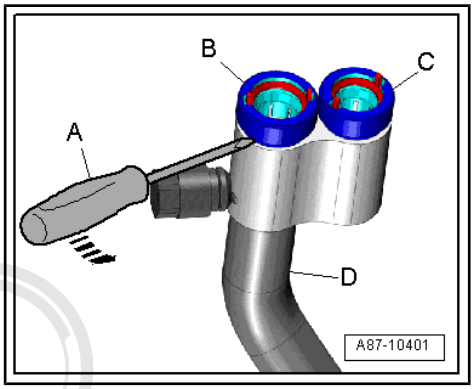
Installing

Install in reverse order of removal; note the following:

Caution

Risk of leaks!

- *The couplings -B- and -C- at the refrigerant line -D- with internal heat exchanger must always be renewed after opening up the refrigerant lines.*

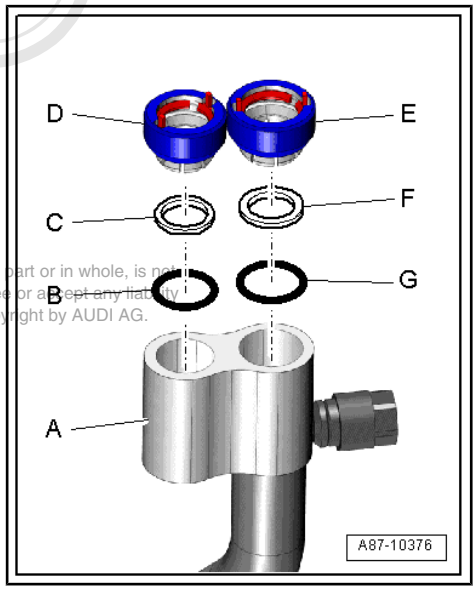


– Using a screwdriver -A-, prise couplings -B- and -C- out of refrigerant line -D- with internal heat exchanger -arrow-.

– Thoroughly clean all parts of the refrigerant line connections (e.g. with cleaning solution - D 009 401 04-).

– Check connecting piece -A- of refrigerant line with internal heat exchanger for damage.

– Renew O-rings -B, G-, support rings -C, F- and couplings -D, E-; for correct version, refer to ⇒ Electronic parts catalogue .



Note

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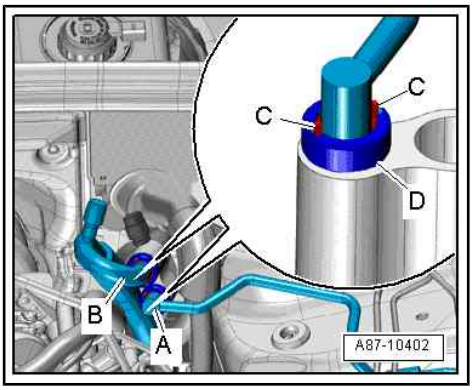
Observe fitting instructions for O-rings ⇒ page 106 .

– Lubricate O-rings lightly with refrigerant oil before installing ⇒ page 106 .

– Press couplings -D- and -E- into connecting piece -A- of refrigerant line with internal heat exchanger until they engage audibly.

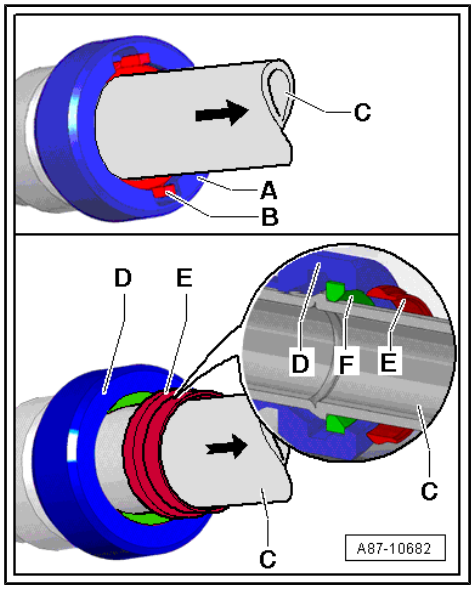


– Thoroughly clean connection area of refrigerant lines -A- and -B- and check for damage.

– Press refrigerant lines -A- and -B- on as far as possible, avoiding strain.

Check that refrigerant lines are installed correctly.

- Stop must be felt when attempting to detach refrigerant lines -A- and -B-.
- With version -A- of the quick-release coupling (installed at the start of production), the pins -B- on the retaining rings must become visible when the locked refrigerant line -C- is pulled in the direction of the arrow.
- With the quick-release coupling -D- (gradual introduction from model year 2010 onwards), the snap ring -E- must emerge from the quick-release coupling -D- if the locked refrigerant line -C- is pulled in the direction of the arrow after assembly. Subsequently the snap ring -E- must be detached from the refrigerant line -C-.



Note

- ♦ *Install refrigerant lines so that they are free of stress.*
- ♦ *Check installation position of refrigerant lines to quick-release couplings (they must not make contact with other components).*

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

– Switch on ignition.

– Re-install remaining components (removed earlier).

– Switch on ignition.

– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

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2.14 Removing and installing refrigerant lines with internal heat exchanger

⇒ "2.14.1 Removing and installing refrigerant lines with internal heat exchanger - all vehicles except RS models and Audi Q5 hybrid", page 217

⇒ "2.14.2 Removing and installing refrigerant lines with internal heat exchanger - RS models", page 220

⇒ "2.14.3 Removing and installing refrigerant lines with internal heat exchanger - Audi Q5 hybrid", page 223

2.14.1 Removing and installing refrigerant lines with internal heat exchanger - all vehicles except RS models and Audi Q5 hybrid

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Special tools and workshop equipment required

- Release tool -T40149- for refrigerant line or removal tool - T40232-
- Engine bung set - VAS 6122-

Removing

– Switch off ignition.

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

Note

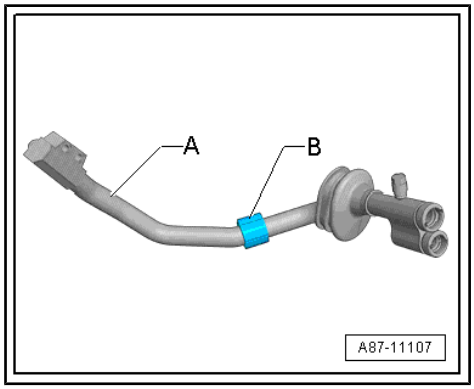
Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

– Remove plenum chamber cover and/or cowl panel trim (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

– Disconnect earth connection from battery - A- ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

Note

From model year 2010 onwards, certain vehicle versions are fitted with refrigerant lines with internal heat exchanger -A- with an additional weight (damper) -B- to reduce noise (depending on the engine). When installing the refrigerant lines with internal heat exchanger -A- and the plenum chamber partition panel, make sure that the weight -B- and the refrigerant lines -A- are not too close to or do not make contact with other components.

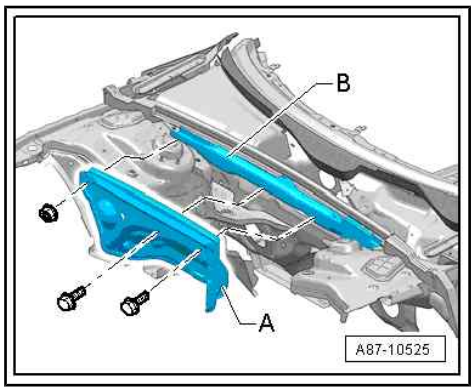


– Detach refrigerant line from quick-release couplings ⇒ page 211 .

Note

Seal open lines and connections at refrigerant line with suitable caps (to prevent dirt and moisture from entering).

– Unfasten plenum chamber partition panel -A- from vehicle ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .

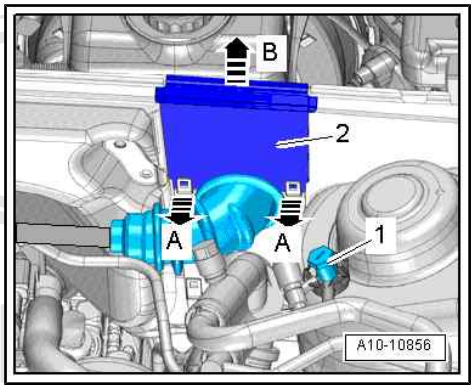


Note

- *On vehicles with a petrol engine or 4-cyl. TDI engine, the two coolant hoses to the heat exchanger are routed through the plenum chamber partition panel -A-. On these vehicles, detach grommet at both coolant hoses and move partition panel to one side (this avoids having to open the coolant circuit).*
- *When unfastening the plenum chamber partition panel, pay attention to the vacuum line to the brake servo to avoid damaging it.*

– On vehicles with 6-cyl. TDI engine, remove plenum chamber partition panel -A- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .

– Release fasteners -arrows A- and lift off top section of pipe gland -2- -arrow B-.



Note

-Item 1- can be disregarded.

– Unfasten wiring harness from bottom section of pipe lead-through -2- and remove bottom section.

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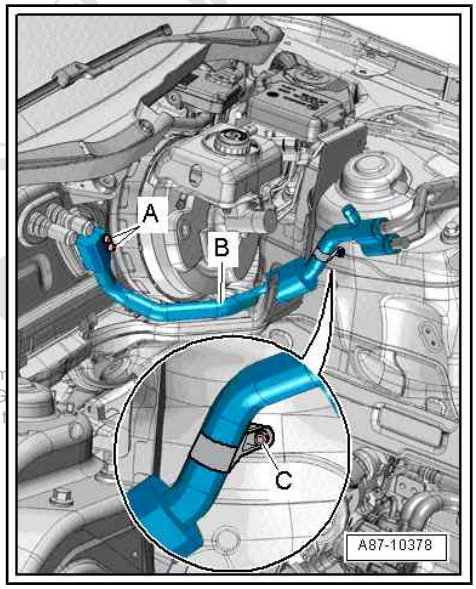
– Unscrew nut -C- at suspension turret.
– Unscrew bolts -A-.
– Detach refrigerant line -B- with internal heat exchanger from expansion valve.



Note

Seal open connections at refrigerant line and expansion valve with suitable caps (to prevent dirt and moisture from entering).

Installing

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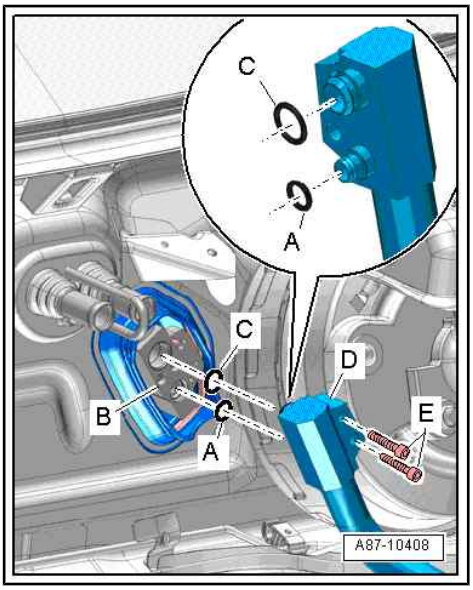
Install in reverse order of removal; note the following:

Note

For electrical connections and routing, refer to ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.



– Thoroughly clean all connections in expansion valve -B- and in refrigerant line -D- with internal heat exchanger.
– Check connections in expansion valve -B- and at refrigerant line -D- for damage.
– Renew quick-release couplings at refrigerant line with internal heat exchanger ⇒ page 211 .
– Renew O-rings -A- and -C-; for correct version, refer to ⇒ Electronic parts catalogue .

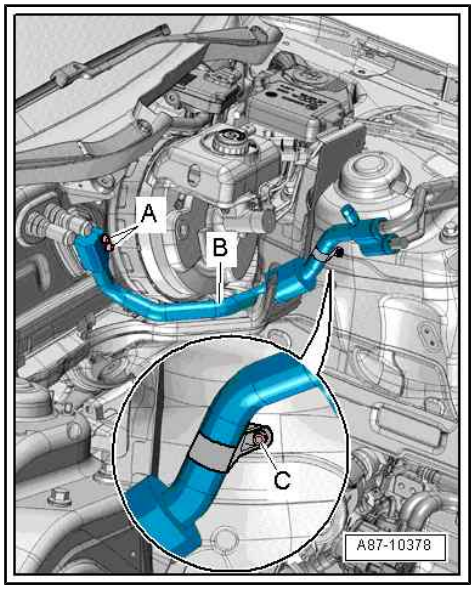
Note

Observe fitting instructions for O-rings ⇒ page 106 .

– Lubricate O-rings lightly with refrigerant oil before installing ⇒ page 106 .
– Make sure that O-rings are correctly positioned in grooves of refrigerant line connections at refrigerant line -D-.
– Tighten bolts -E- for refrigerant line -D- with internal heat exchanger.

• Tightening torque for bolts -E-: 10 Nm

– Tighten nut -C- for refrigerant line -B-.
– Install plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .



Note

- *Take care not to strain refrigerant line during installation.*
- *Check installation position of refrigerant line to expansion valve (it must not make contact with other components).*

– Attach refrigerant line to quick-release couplings ⇒ page 211 .
– Re-install remaining components (removed earlier).
– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
– Switch on ignition.
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

2.14.2 Removing and installing refrigerant lines with internal heat exchanger - RS models

Audi RS 4 and Audi RS 5

Special tools and workshop equipment required

- Engine bung set - VAS 6122-
- Release tool -T40149- for refrigerant line or removal tool -T40232-

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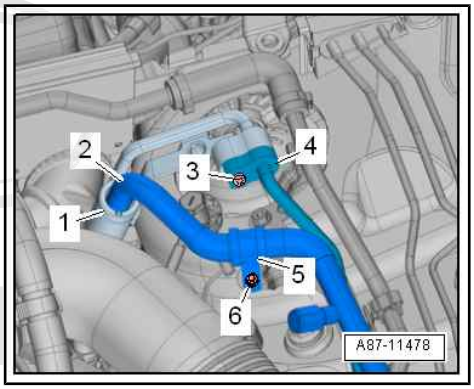
Removing

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).



– Remove nut -6- and release retaining clip -5-.

– Detach refrigerant line -2- from quick-release coupling -1- ⇒ page 211 .

– Remove bolt -3- and disconnect refrigerant line -4-.

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

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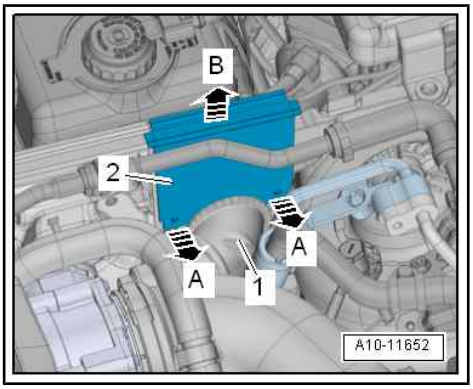
– Remove plenum chamber cover and/or cowl panel trim (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

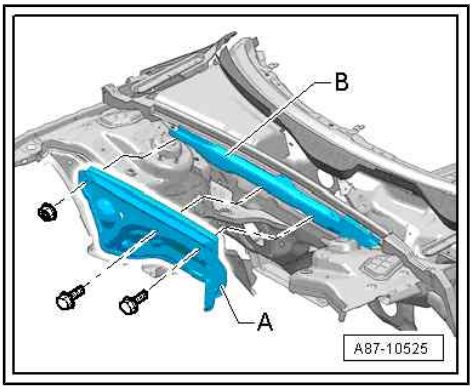
– Disconnect earth connection from battery - A- ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .



– Release fasteners -arrows A- and lift off top section of pipe gland -2- -arrow B-.

– Unfasten wiring harness -1- from bottom section of pipe lead-through and remove bottom section.

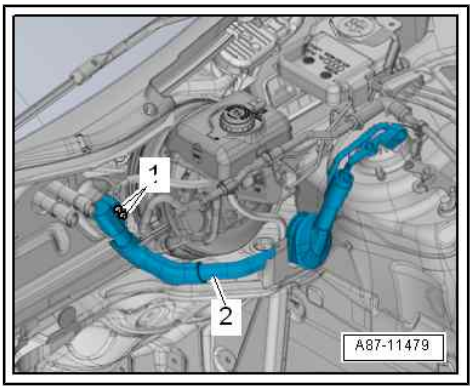
– Unfasten plenum chamber partition panel -A- from vehicle ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .



– Remove bolts -1-.

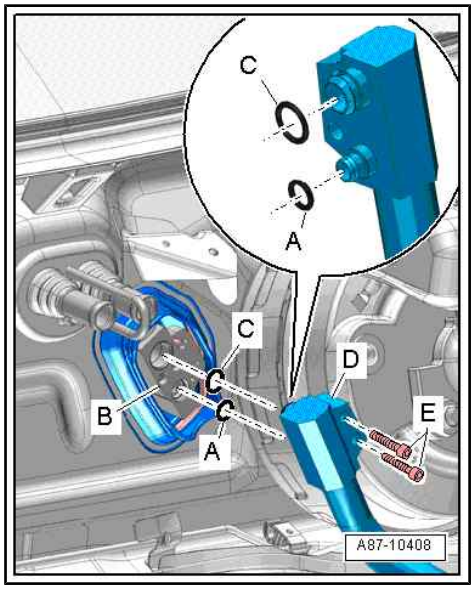
– Detach refrigerant line -2- with internal heat exchanger from expansion valve.

– 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:



Note

For electrical connections and routing, refer to ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

- Thoroughly clean all connections in expansion valve -B- and in refrigerant line -D- with internal heat exchanger.
- Check connections in expansion valve -B- and at refrigerant line -D- for damage.
- Renew quick-release coupling at refrigerant line with internal heat exchanger ⇒ page 211 .
- Renew O-rings -A- and -C-; for correct version, refer to ⇒ Electronic parts catalogue .

Note

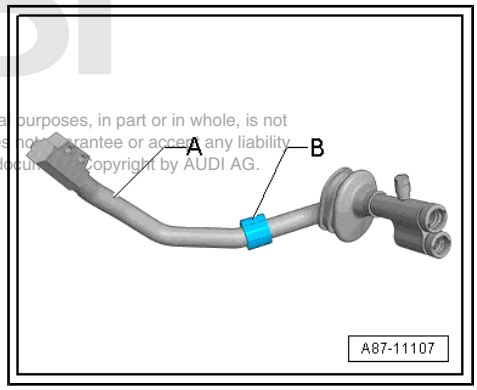
Observe fitting instructions for O-rings ⇒ page 106 .

- Lubricate O-rings lightly with refrigerant oil before installing ⇒ page 106 .
- Make sure that O-rings are correctly positioned in grooves of refrigerant line connections at refrigerant line -D-.
- Tighten bolts -E- for refrigerant line -D- with internal heat exchanger.

• Tightening torque for bolts -E-: 10 Nm

Note

On certain versions, there is an additional weight (damper) -B- on the refrigerant line with internal heat exchanger -A- to reduce noise. When installing the refrigerant lines with internal heat exchanger and the plenum chamber partition panel, make sure that the weight and the refrigerant line are not too close to or do not make contact with other components.



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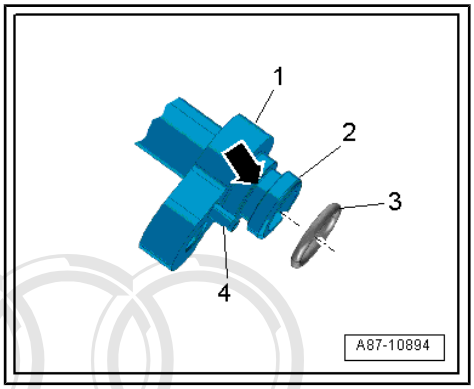
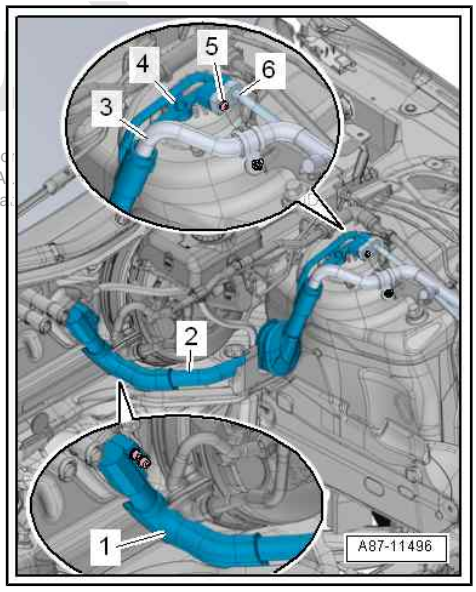
– Clean connections on refrigerant line and check for damage.
– If fitted, check that dowel pin -4- is not damaged and is seated correctly.
– Check guide ring -2- at refrigerant line connection for damage.



Note

- *Lubricate O-rings with refrigerant oil before installing* ⇒ page 106 .
- *Make sure O-rings are seated correctly in groove of corresponding refrigerant line.*

– Insert O-ring -3- in groove -arrow- in connection for refrigerant line -1-.



– Cover -1- must be seated correctly on refrigerant line -2-, as shown in illustration.
– Check that rubber bush -4- is correctly seated in mounting.
– Insert refrigerant line -6- at internal heat exchanger and tighten bolt -5-.

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• Tightening torque: 9 Nm

– Attach refrigerant line -3- to quick-release coupling ⇒ page 211 .

Note

- *Take care not to strain refrigerant line during installation.*
- *Check installation position of refrigerant line to expansion valve (it must not make contact with other components).*

– Re-install remaining components (removed earlier).
– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).
– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .
– Switch on ignition.
– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

2.14.3 Removing and installing refrigerant lines with internal heat exchanger - Audi Q5 hybrid

Note

The vehicles in this series with high-voltage systems are all fitted with refrigerant circuits charged with refrigerant R134a.

Special tools and workshop equipment required

- Release tool -T40149- for refrigerant line or removal tool - T40232-
- Engine bung set - VAS 6122-

Removing

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems .

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

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WARNING

Working on vehicles with high-voltage wiring:

- ***Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.***
- ***High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.***
- ***The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.***

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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As work on the high-voltage system is required for the following sequence of operations, de-energise the high-voltage system ⇒ page 36 , ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system . Pay particular attention to the “General warning instructions for work on the high-voltage system” ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

De-energising high-voltage system

DANGER!

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

- *The high-voltage system may only be de-energised by a suitably qualified person (Audi high-voltage technician).*
- *It must be definitely confirmed that the high-voltage system is de-energised. The system may only be de-energised using the vehicle diagnostic tester via "Guided Fault Finding".*
- *The qualified person (Audi high-voltage technician) confirms that the system is de-energised and uses the locking cap - T40262- to ensure that the system cannot be re-energised. As an additional precaution, the ignition key and the maintenance connector for high-voltage system - TW- are then stored in a safe place by the qualified person.*
- *The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.*

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Note

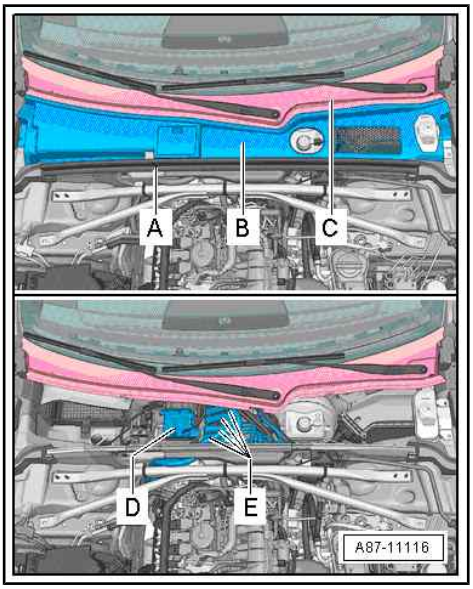
- *De-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - De-energise high-voltage system (Rep. gr. 93)`

– Remove rubber seal -A- and plenum chamber cover -B- (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

♦ After removing plenum chamber cover -B-, visually inspect high-voltage components -D- (in this case power and control electronics for electric drive - JX1-) and high-voltage wires -E- ⇒ page 41 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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

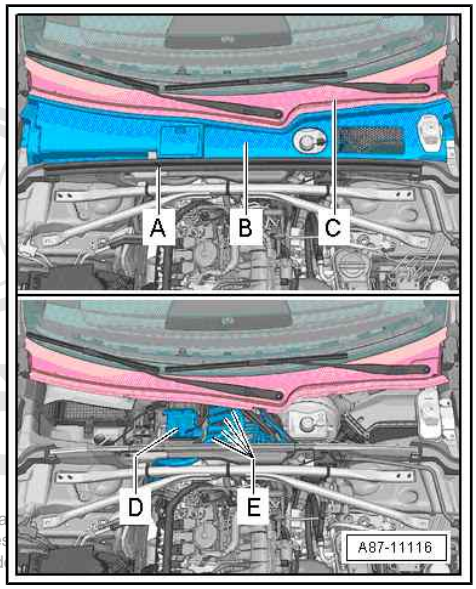
– Disconnect earth connection from battery - A- ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .



– Remove rubber seal -A- and plenum chamber cover -B- (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

♦ After removing plenum chamber cover -B-, visually inspect high-voltage components -D- (in this case power and control electronics for electric drive - JX1-) and high-voltage wires -E- ⇒ page 41 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

– Disconnect earth connection from battery - A- ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .



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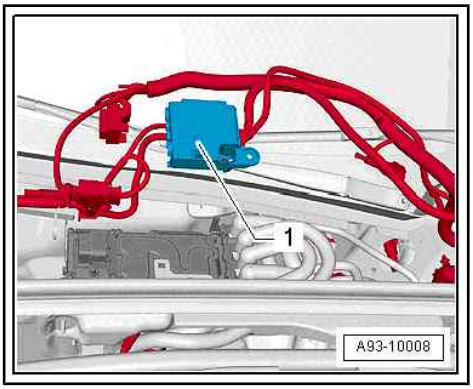
– Unfasten power distributor -1- and set it down together with wiring towards windscreen ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes

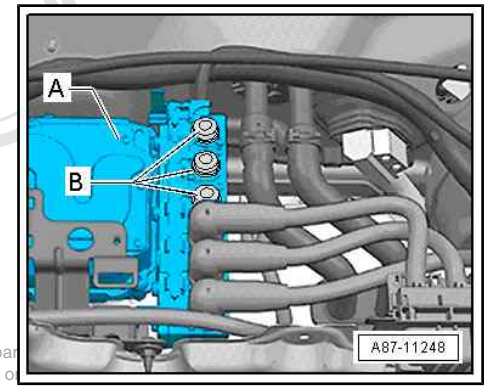
– Detach high-voltage wiring to -JX1- ⇒ Electrical system; Rep. gr. 93 ; High-voltage wires; Overview of fitting locations - high-voltage wires .

– Cover -JX1- and corresponding wiring to prevent damage or contamination ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .



Note

Use e.g. clean sealing plugs -B- (size 20) from engine bung set -JX1- for covering connections at -VAS 6122- -A-



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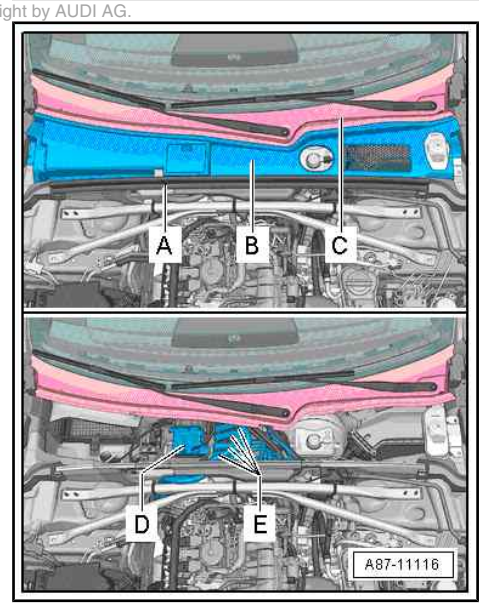
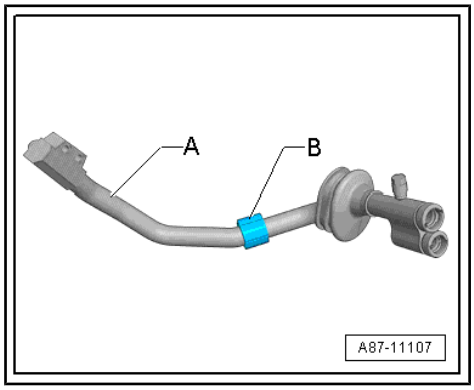
- When working in the vicinity of high-voltage components -D- and high-voltage wires -E-, always take care not to damage these components ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .



Note

- *Should it be necessary in order to be able to remove and install the refrigerant line with internal heat exchanger, remove the cowl panel trim -C- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .*
- *From model year 2010 onwards, certain vehicle versions are fitted with refrigerant lines with internal heat exchanger -A- with an additional weight (damper) -B- to reduce noise (depending on the engine). When installing the refrigerant lines with internal heat exchanger -A- and the plenum chamber partition panel, make sure that the weight -B- and the refrigerant lines -A- are not too close to or do not make contact with other components.*

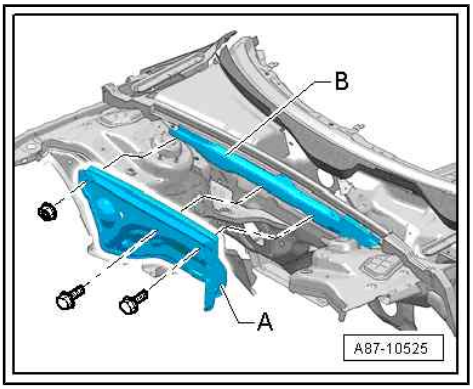


– Detach refrigerant line from quick-release couplings ⇒ page 211 .

Note

Seal open lines and connections at refrigerant line with suitable caps (to prevent dirt and moisture from entering).

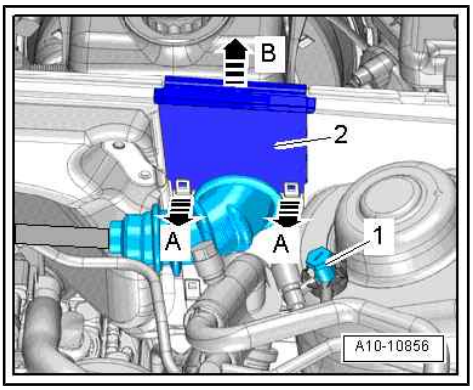
– Unfasten plenum chamber partition panel -A- from vehicle ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .



Note

- *On vehicles with a petrol engine or 4-cyl. TDI engine, the two coolant hoses to the heat exchanger are routed through the plenum chamber partition panel -A-. On these vehicles, detach grommet at both coolant hoses and move partition panel to one side (this avoids having to open the coolant circuit).*
- *When unfastening the plenum chamber partition panel, pay attention to the vacuum line to the brake servo to avoid damaging it.*

– Release fasteners -arrows A- and lift off top section of pipe gland -2- -arrow B-.



Note

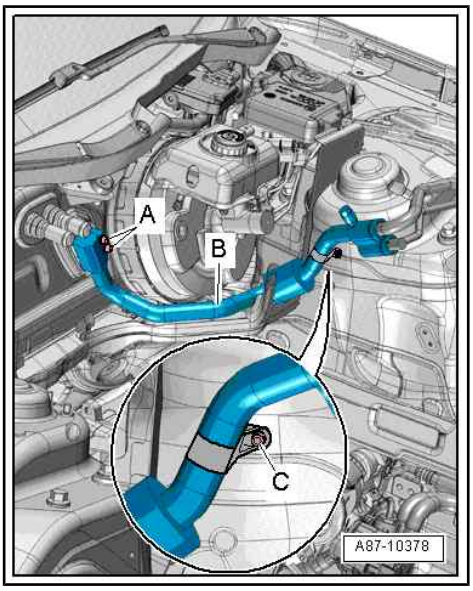
-Item 1- can be disregarded.

– Unfasten wiring harness from bottom section of pipe lead-through -2- and remove bottom section.

– Unscrew nut -C- at suspension turret.

– Unscrew bolts -A-.

– Detach refrigerant line -B- with internal heat exchanger from expansion valve.



Note

Seal open connections at refrigerant line and expansion valve with suitable caps (to prevent dirt and moisture from entering).

Installing

Install in reverse order of removal; note the following:

Note

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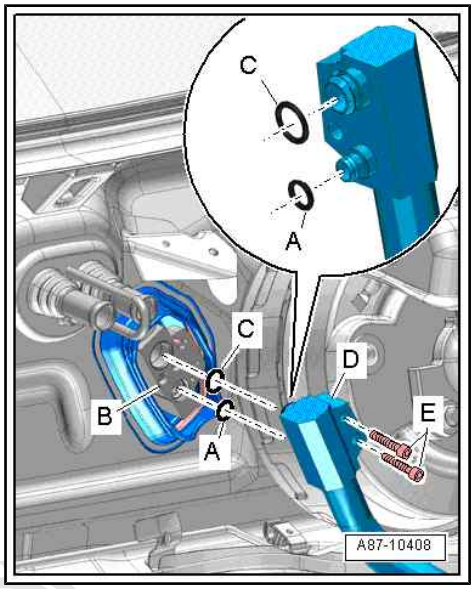
For electrical connections and routing, refer to ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

– Thoroughly clean all connections in expansion valve -B- and in refrigerant line -D- with internal heat exchanger.
– Check connections in expansion valve -B- and at refrigerant line -D- for damage.
– Renew quick-release couplings at refrigerant line with internal heat exchanger ⇒ page 211 .
– Renew O-rings -A- and -C-; for correct version, refer to ⇒ Electronic parts catalogue .



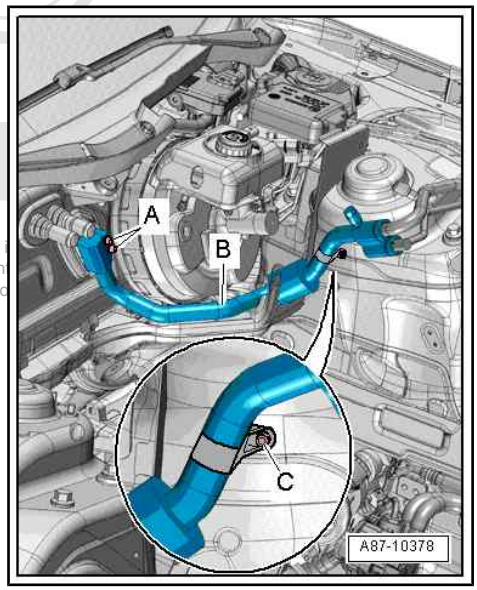
Note

Observe fitting instructions for O-rings ⇒ page 106 .

– Lubricate O-rings lightly with refrigerant oil before installing ⇒ page 106 .
– Make sure that O-rings are correctly positioned in grooves of refrigerant line connections at refrigerant line -D-.
– Tighten bolts -E- for refrigerant line -D- with internal heat exchanger.

• Tightening torque for bolts -E-: 10 Nm

– Tighten nut -C- for refrigerant line -B-.
– Install plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .



Note

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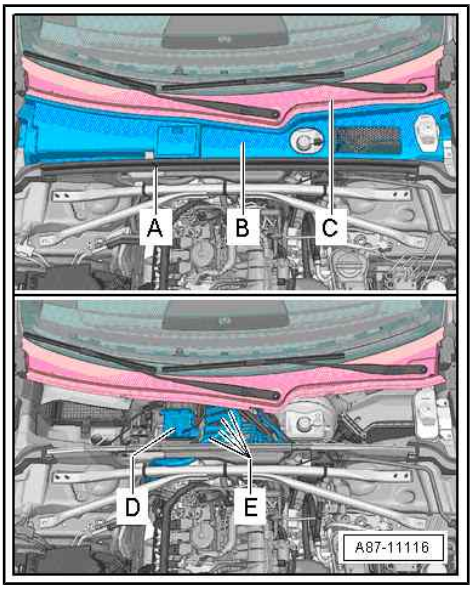
♦ *Take care not to strain refrigerant line during installation.*
♦ *Check installation position of refrigerant line to expansion valve (it must not make contact with other components).*

– Attach refrigerant line to quick-release couplings ⇒ page 211 .
– Re-install remaining components (removed earlier).
– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

After completing the work and before installing the plenum chamber cover -B-, visually inspect the high-voltage components -D- and the high-voltage wires -E- ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

– For electrical connections and routing, refer to ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

– Re-energise power supply of high-voltage system ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system .



Re-energising high-voltage system

DANGER!

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

- ***The high-voltage system may only be re-energised by a suitably qualified person (Audi high-voltage technician).***
- ***The system may only be re-energised using the vehicle diagnostic tester via "Guided Fault Finding".***
- ***The vehicle is then made ready for operation again by the qualified person (Audi high-voltage technician).***
- ***The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.***

Note

- *Re-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - Re-energise high-voltage system (Rep. gr. 93)`

– Switch on ignition.

– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

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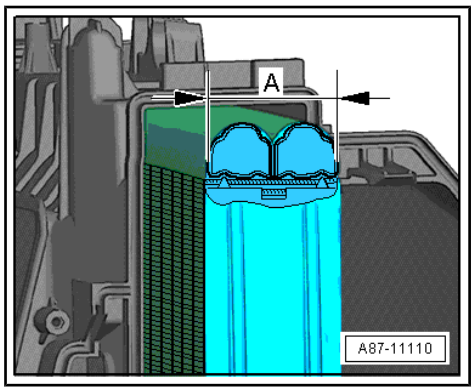
Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems . Before using air conditioner after system has been re-charged.

2.15 Removing and installing expansion valve



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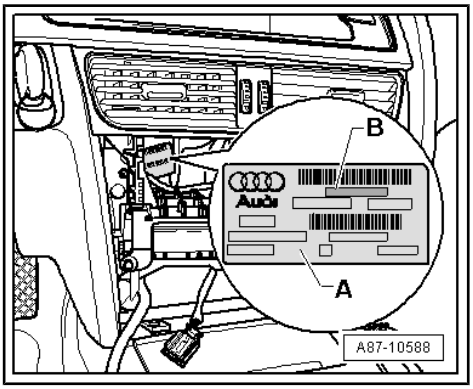

Note

- *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). If the air conditioner compressor is switched on, the pressure in the low-pressure side drops, the expansion valve is opened and the refrigerant can flow to the low-pressure side.*
- *Different versions of expansion valve depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue*
- *From the start of production up to the conversion from model year 2012 onwards, evaporators with a width (block depth) -A- of approx. 40 mm were fitted (air conditioning unit with part number "8K_ 820 005"). From model year 2012 onwards and depending on the vehicle version, evaporators with a width (block depth) -A- of approx. 50 mm are being introduced gradually (air conditioning unit with part number "8T_ 820 005"). Pay attention to the correct assignment of the expansion valve to the evaporator (different versions) ⇒ Electronic parts catalogue .*
- *The different versions of the air conditioning unit can be distinguished from the outside by the part number -B- on the label -A- ⇒ Electronic parts catalogue .*
- *The part number -B- on the label -A- can be read e.g. when the CD changer is removed (depending on vehicle equipment) ⇒ Communication; Rep. gr. 91 ; DVD/CD changer; Removing and installing CD changer .*

Removing

– Switch off ignition.

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

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Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (Air conditioner with refrigerant R134a; Refrigerant circuit; General information on air conditioning systems), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

As work on the high-voltage system is required for the following sequence of operations, de-energise the high-voltage system ⇒ page 36 , ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system . Pay particular attention to the "General warning instructions for work on the high-voltage system" ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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- De-energise high-voltage system ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system .
- Disconnect earth connection from battery - A- ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Remove refrigerant line with internal heat exchanger ⇒ page 217 .

Note

Should it be necessary in order to be able to remove and install the expansion valve, remove the cowl panel trim -C- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

Vehicles without high-voltage system

– Disconnect earth connection from battery - A- ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

– Remove plenum chamber cover and/or cowl panel trim (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

Vehicles with 6-cyl. TDI engine:

– Remove refrigerant line with internal heat exchanger ⇒ page 217 .

All models except vehicles with 6-cyl. TDI engine:

– Unfasten refrigerant line with internal heat exchanger from expansion valve and vehicle and move to one side (do not remove) ⇒ page 217 .

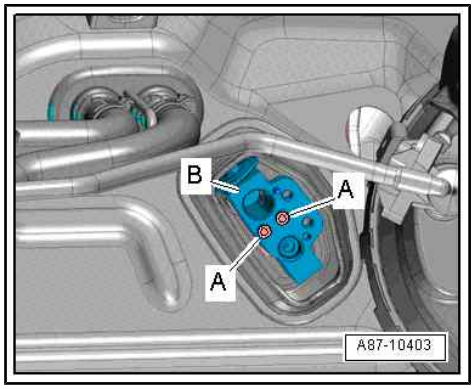
Note

- *On vehicles with a 6-cyl. TDI engine, there is not enough space to move the refrigerant line to the side due to the shape of the plenum chamber partition panel.*
- *On vehicles with a petrol engine or 4-cyl. TDI engine, the plenum chamber partition panel does not have to be unfastened or removed from the vehicle (there is sufficient space).*
- *When unfastening the plenum chamber partition panel, pay attention to the vacuum line to the brake servo to avoid damaging it.*

All vehicles

– Unscrew bolts -A-.

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



Note

Seal open lines and connections at evaporator with suitable caps (to prevent dirt and moisture from entering).

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Installing

Install in reverse order of removal; note the following:

– Clean connecting pipes -C- and -E- to evaporator as well as connections at expansion valve and check for damage.

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 .*
- *Different versions of expansion valve depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue*
- *Observe fitting instructions for O-rings ⇒ page 106 .*

– Renew O-rings -B- and -F-; for correct version refer to ⇒ Electronic parts catalogue .

– Lubricate O-rings lightly with refrigerant oil before installing ⇒ page 106 .

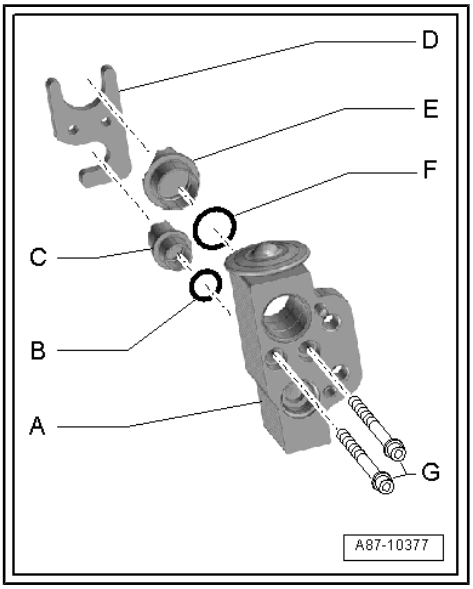
– Make sure retainer -D- is positioned correctly on connecting pipes -C- and -E- to evaporator.

– Tighten bolts -G-.

• Tightening torque: 10 Nm

– Install refrigerant line with internal heat exchanger ⇒ page 217 .

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



Vehicles with high-voltage system (hybrid vehicles)

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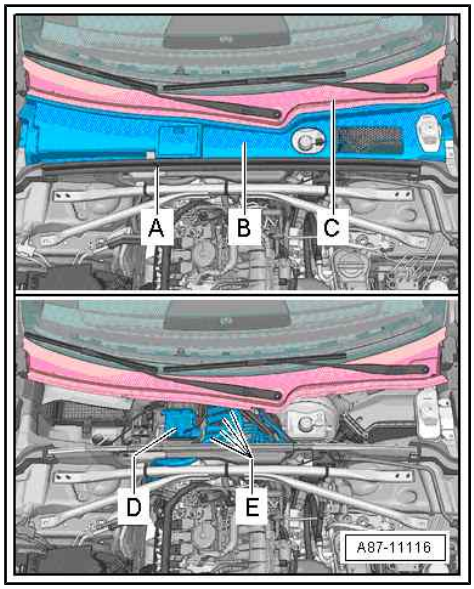
– After completing the work and before installing the plenum chamber cover -B-, visually inspect the high-voltage components -D- and the high-voltage wires -E- ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .
– For electrical connections and routing, refer to ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
– Re-energise power supply of high-voltage system ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system .



All vehicles

– Re-install remaining components (removed earlier).
– Switch on ignition.
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

2.16 Removing and installing expansion valve (rear) with refrigerant shut-off valve 2 for hybrid battery - N517-

Vehicles with high-voltage system (hybrid vehicles)

Note

The vehicles in this series with high-voltage systems are all fitted with refrigerant circuits charged with refrigerant R134a.

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

Audi
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WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

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Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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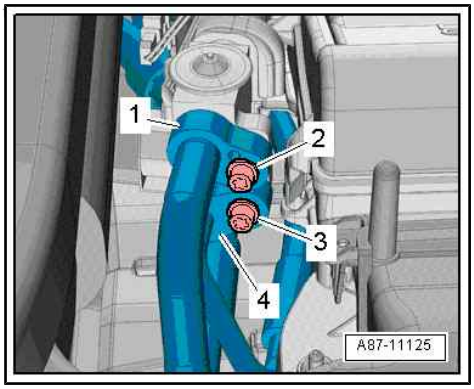
Removing

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

– Remove luggage compartment floor ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Exploded view - luggage compartment floor .

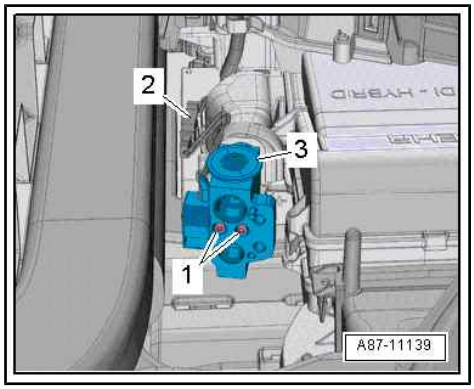
– Remove bolts -2 and 3- and detach refrigerant lines -1 and 4-.



– Take electrical connector -2- out of bracket and unplug.

– Remove bolts -1-.

– Remove refrigerant shut-off valve 2 for hybrid battery - N517- -item 3- from refrigerant lines to evaporator.



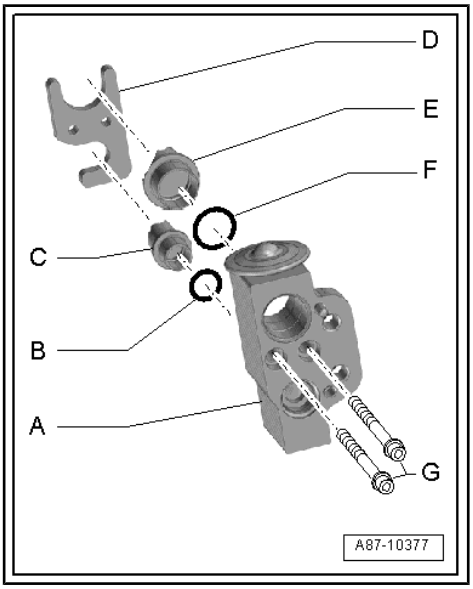
Note

Seal open lines and connections at refrigerant line with suitable caps (to prevent dirt and moisture from entering).

Installing

Install in reverse order of removal; note the following:

– Clean connecting pipes -C- and -E- to evaporator as well as connections at expansion valve and check for damage.



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 .*
- ♦ *Different versions of expansion valve depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue*
- ♦ *Observe fitting instructions for O-rings ⇒ page 106 .*

– Renew O-rings -B- and -F-; for correct version refer to ⇒ Electronic parts catalogue .

– Lubricate O-rings lightly with refrigerant oil before installing ⇒ page 106 .

– Make sure retainer -D- is positioned correctly on connecting pipes -C- and -E- to evaporator.

– Tighten bolts -G-.

• Tightening torque: 10 Nm

– Install refrigerant lines to battery cooling module in luggage compartment ⇒ page 206 .

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– Re-install remaining components (removed earlier).

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

– Switch on ignition.

– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .

– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (before using air conditioner after system has been re-charged).

2.17 Detaching and attaching refrigerant lines at condenser

⇒ "2.17.1 Detaching and attaching refrigerant lines at condenser - all vehicles except RS models", page 242

⇒ "2.17.2 Detaching and attaching refrigerant lines at condenser - RS models", page 246

2.17.1 Detaching and attaching refrigerant lines at condenser - all vehicles except RS models

Special tools and workshop equipment required

- Engine bung set - VAS 6122-

Note

- *There are different versions of the condenser. Check the correct version and allocation prior to installation ⇒ "2.18.1 Checking version of condenser", page 248 and ⇒ Electronic parts catalogue .*
- *Depending on the version of the radiator and condenser, it may be necessary to discharge the refrigerant circuit and disconnect the refrigerant lines from the condenser in order to remove the condenser from the front end or to remove the radiator ⇒ page 248 .*

Detaching

– Switch off ignition.

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

Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

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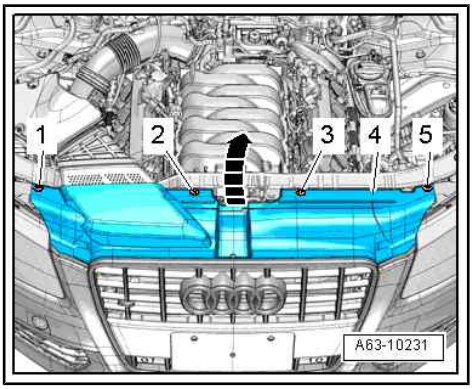
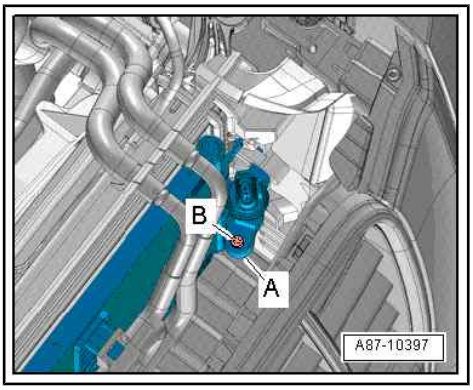
– Remove bolts (or clips) -1, 2, 3 and 5- ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .
– Lift cover -4- at lock carrier and disengage it at radiator grille ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .



– Remove bolt -B-.
– Detach refrigerant line -A- from condenser.



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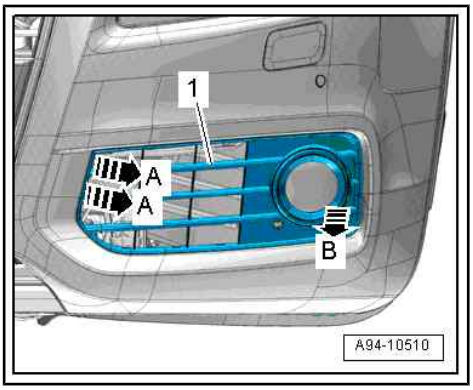
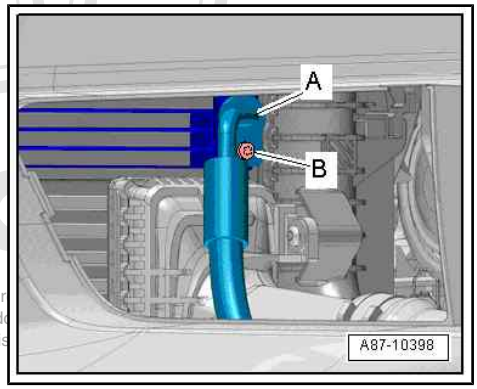
– Release retaining clips -arrows A- and detach air intake grille (left-side) -1- in bottom section of bumper cover -arrow B- ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .



– Remove bolt -B-.
– Detach refrigerant line -A- from condenser.



Note

- *Should bolt -B- not be accessible with the bumper cover (bottom left) removed (on certain vehicles, e.g. Audi SQ5), remove bumper cover completely ⇒ General body repairs, interior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .*
- *Seal open lines and connections at condenser with suitable caps (to prevent dirt and moisture from entering).*
- *On the Audi Q5 the refrigerant line is made up of two sections. Do not unfasten the connection between the two sections to remove the condenser (possible, but not necessary).*
- *If only one section of the refrigerant line has to be renewed on the Audi Q5, the tightening torque for the bolt at the connection is the same as that for the bolt at the condenser connection.*

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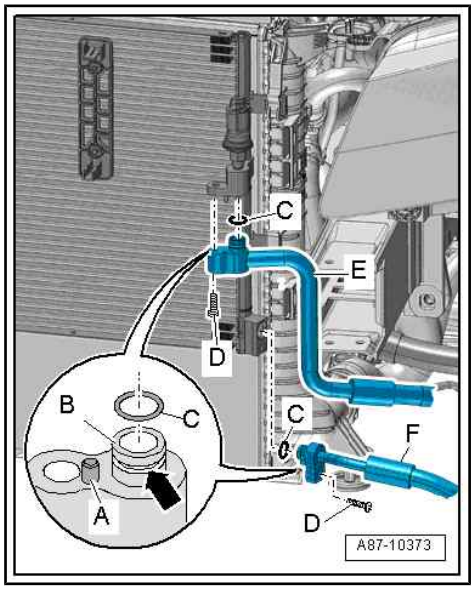
Attaching

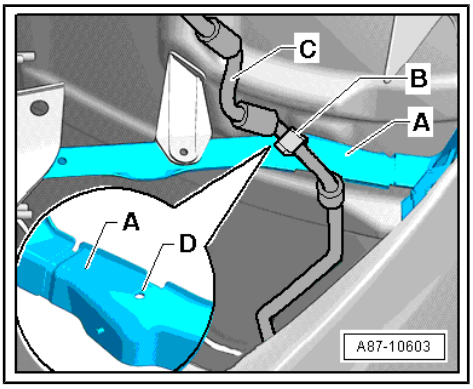
Attach in reverse order; note the following:

– Clean refrigerant line connections at condenser and refrigerant lines and check for damage.
– Renew O-rings -C-; for correct version, refer to ⇒ Electronic parts catalogue .

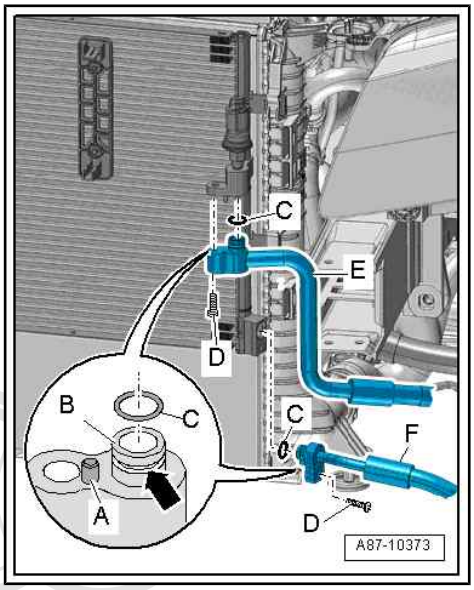


Note

- *Observe fitting instructions for O-rings ⇒ page 106 .*
- *After attachment the refrigerant lines to the condenser, check the routing of the refrigerant lines; they must be inserted in the brackets provided and should not make contact with other components.*
- *On vehicles from model year 2008 onwards, the refrigerant line -C- (from condenser to quick-release coupling at refrigerant line with internal heat exchanger) is gradually being provided with an additional clip -B- for securing it to the wing brace -A-. For this purpose, there is a hole -D- with a diameter of 6.5 mm in the wing brace -A-. On vehicles without a hole -D- in the wing brace -A- (or with a refrigerant line -C- without a clip -B-), the refrigerant line -C- must be secured to the wing brace -A- using e.g. a cable tie. To prevent damage caused by abrasion, wrap e.g. a foam section around the contact surfaces of the refrigerant line -C-.*



- Lubricate O-rings lightly with refrigerant oil before installing ⇒ page 106 .
- Make sure that O-rings are correctly seated in grooves -arrows- of corresponding mounting.
- Check dowel pin -A- (not fitted at all connections) and connection -B- of refrigerant lines -E- and -F- for damage and proper attachment.
- Tighten bolts -D-.
  - Tightening torque: 9 Nm
- Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .
- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
- Re-install remaining components (removed earlier).
- Switch on ignition.
- Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Start up air conditioner after charging refrigerant circuit ⇒ page 271 .



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Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

2.17.2 Detaching and attaching refrigerant lines at condenser - RS models

Audi RS 4 and Audi RS 5

Special tools and workshop equipment required

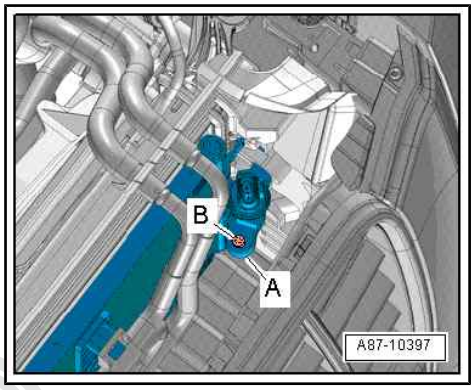
- Engine bung set - VAS 6122-

Note

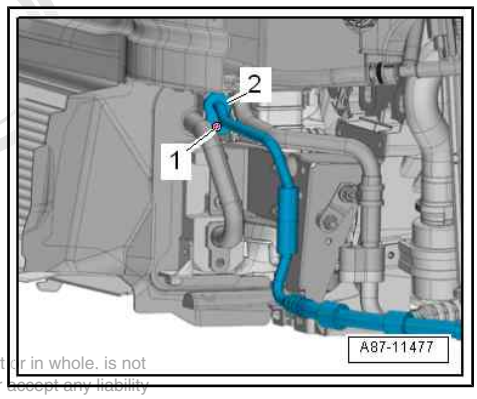
- *There are different versions of the condenser. Check the correct version and allocation prior to installation ⇒ "2.18.1 Checking version of condenser", page 248 and ⇒ Electronic parts catalogue .*
- *Depending on the version of the radiator and condenser, it may be necessary (e.g. on the Audi RS 4 and Audi RS 5) to discharge the refrigerant circuit and disconnect the refrigerant lines from the condenser in order to remove the condenser from the front end or to remove the radiator ⇒ page 248 .*
- *The design of the condenser fitted on the Audi RS 4 and Audi RS 5 is different to that of the other vehicles in this series. The length of the refrigerant lines may also differ from that on other vehicles. Pay attention to correct allocation and correct refrigerant R134a capacity ⇒ "4 Technical data", page 107 , or ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils , and ⇒ Electronic parts catalogue .*

Detaching

- Switch off ignition.
- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).
- Remove air duct for auxiliary radiator (left-side) ⇒ Rep. gr. 19 ; Radiator/radiator fans .
- Remove bolt -B-.
- Detach refrigerant line -A- from condenser.



- Remove bolt -1-.
- Detach refrigerant line -2- from condenser.
- Seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .



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Attaching

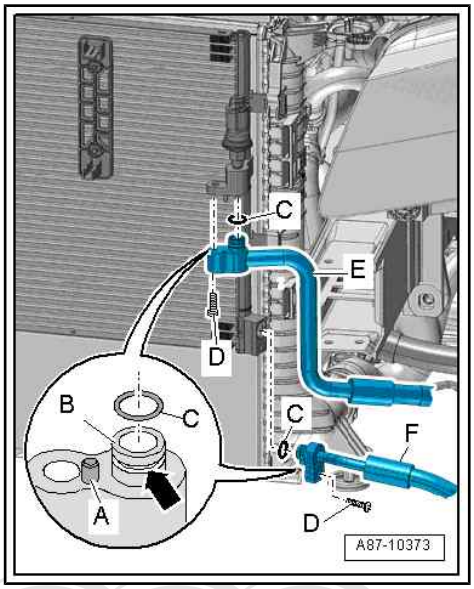
Attach in reverse order; note the following:

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

– If fitted, check that dowel pin -A- is not damaged and is seated correctly.

– Check guide ring -B- at refrigerant line connection for damage.

– Insert O-ring -C- in groove -arrow- in connection for refrigerant lines -E and F-.



Note

♦ *Lubricate O-rings with refrigerant oil before installing* *⇒ page 106* *.*

♦ *Make sure O-rings are seated correctly in groove of corresponding refrigerant line.*

– Tighten bolts -D-.

• Tightening torque: 9 Nm

Note

After attachment the refrigerant lines to the condenser, check the routing of the refrigerant lines; they must be inserted in the brackets provided and should not make contact with other components.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

– Re-install remaining components (removed earlier).

– Switch on ignition.

– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

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2.18 Removing and installing condenser

⇒ “2.18.1 Checking version of condenser”, page 248

⇒ “2.18.2 Removing and installing condenser - all vehicles except RS models”, page 250

⇒ “2.18.3 Removing and installing condenser - RS models”, page 254

2.18.1 Checking version of condenser

Note

- *Different condensers are installed in these vehicles depending on the production period, vehicle version and engine ⇒ Electronic parts catalogue . The distinguishing features of these condensers are the internal design and the internal volume. This means that the capacity of the refrigerant circuit varies depending on the condenser. Therefore it is important to observe the version of the condenser when determining the refrigerant capacity.*
- *Currently condensers by different manufacturers (“Denso” and “Showa/Keihin”) are installed; they can be identified by certain features.*
- *The design of condensers by one manufacturer can also vary; from the outside this can only be identified by the part number. Due to the differences in design (flow distribution, internal volume), the refrigerant capacity for the refrigerant circuit varies ⇒ page 107 .*

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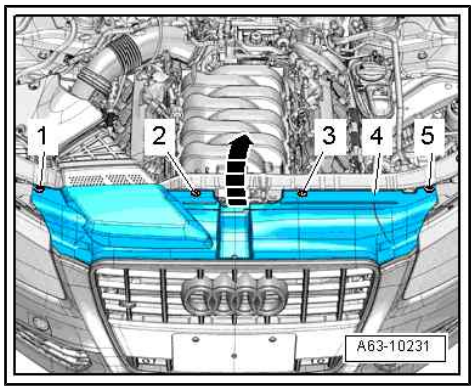
Checking

– Remove bolts (or clips) -1, 2, 3 and 5- ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .

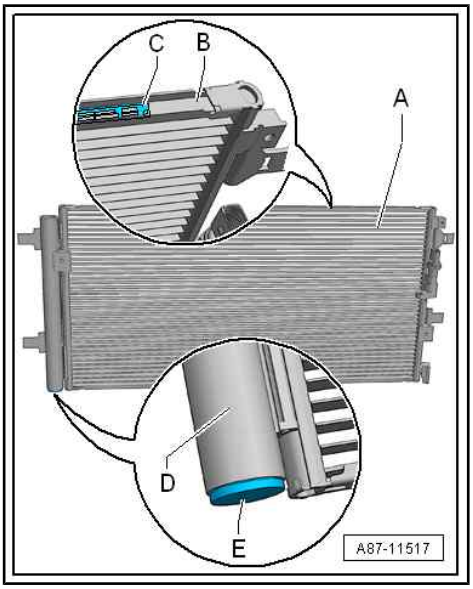
– Lift cover -4- at lock carrier and disengage it at radiator grille ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .



Distinguishing features of condensers

Features of a condenser manufactured by “Denso” -A-

- End strip (top) -B-: U-profile
- Part number and data of condenser manufacturer -C- (currently printed on directly); allocation ⇒ Electronic parts catalogue
- Receiver -D- integrated in condenser (desiccant cartridge can be renewed after removing plastic plug ⇒ page 260).

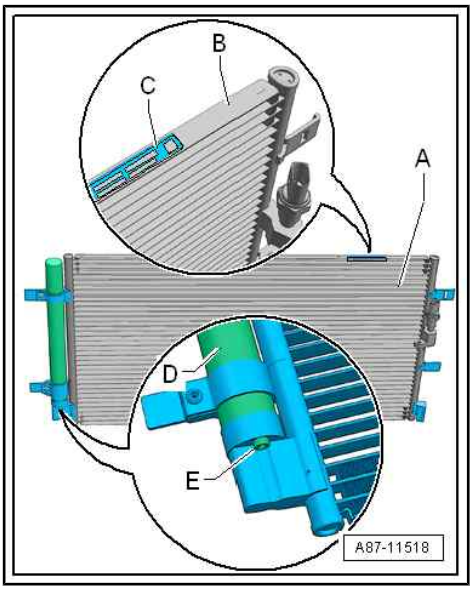


Note

- *This condenser is available in different versions with different designs and with different capacities for refrigerant R134a (can be identified e.g. by part numbers 8K0 xxx xxx or 8T0 xxx xxx) ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils ; for the correct version refer to ⇒ Electronic parts catalogue .*
- *For capacities and additional information on refrigerant R1234yf, refer to ⇒ “4 Technical data”, page 107 , and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .*

Features of a condenser manufactured by “Showa/Keihin” -A-

- End strip (top) -B-: flat profile
- Part number and data of condenser manufacturer -C- (currently on a label bonded on); allocation ⇒ Electronic parts catalogue
- Receiver -D- attached to condenser (receiver can be renewed ⇒ page 256)



Note

- *This condenser is available in different versions with different designs and with different capacities for refrigerant R134a (can be identified e.g. by part numbers 8K0 xxx xxx or 8T0 xxx xxx) ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils ; for the correct version refer to ⇒ Electronic parts catalogue .*
- *For capacities and additional information on refrigerant R1234yf, refer to ⇒ “4 Technical data”, page 107 , and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .*

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2.18.2 Removing and installing condenser - all vehicles except RS models

Note

- *Even if fitted correctly, there may be slight pressure marks on the radiator and condenser fins. This does not mean that the components are damaged. If the fins are only very slightly distorted, this does not justify renewal of the radiator or the condenser.*
- *If the condenser and radiator are no longer parallel as a result of slight deformation at the securing lugs on the sides of the condenser (e.g. following an accident), this can be remedied by bending the lugs back into position, provided that the condenser (refrigerant circuit) 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 (refrigerant circuit) is still functioning properly and there is no leakage. If there are slight deformations, the condenser does not have to be renewed.*
- *There are different condenser versions depending on the vehicle version ⇒ "2.18.1 Checking version of condenser", page 248 and ⇒ Electronic parts catalogue .*
- *Depending on the version of the radiator and condenser, it may be necessary to discharge the refrigerant circuit and disconnect the refrigerant lines from the condenser in order to remove the condenser from the front end or to remove the radiator ⇒ page 242 .*

Removing

– Switch off ignition.

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

Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

– Detach refrigerant lines from condenser ⇒ page 242 .

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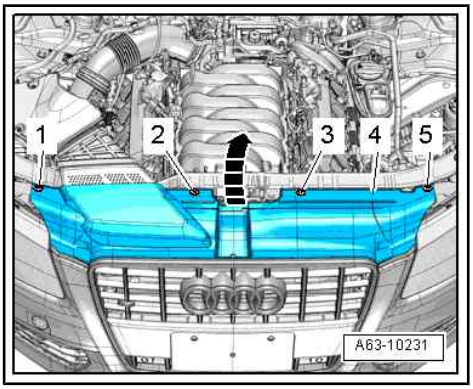
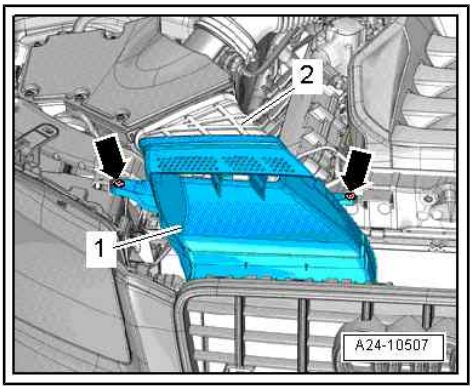
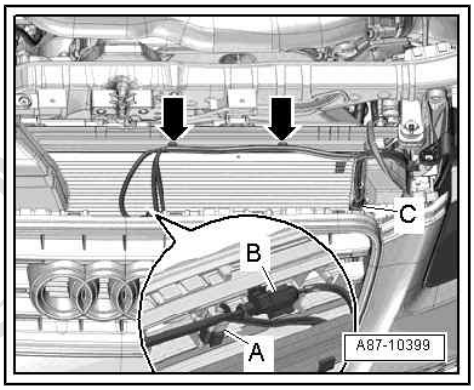
– Remove bolts (or clips) -1, 2, 3 and 5- ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .
– Lift cover -4- at lock carrier and disengage it at radiator grille ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .



– Remove bolts -arrows-.
– Detach air duct -1- at intermediate flange -2- for air cleaner housing.



– Unplug electrical connector -C- at refrigerant pressure and temperature sender - G395- .
– Unplug electrical connector -B- to front parking aid senders and electrical connector to ambient temperature sensor - G17- -item A-.



Note

Different fitting locations for -G17- (this illustration shows the layout for model year 2008 vehicles) *⇒ page 631*

– Remove closure plate for front bumper cover (depending on vehicle version; currently not always necessary e.g. on Audi Q5) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .

Note

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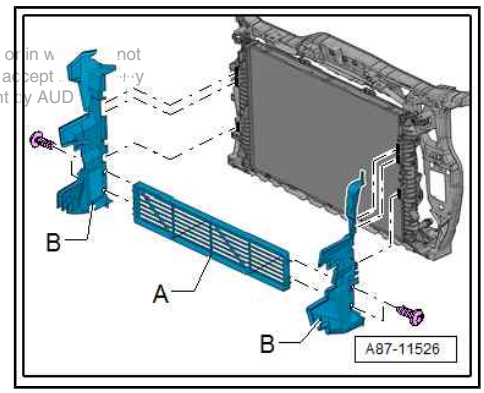
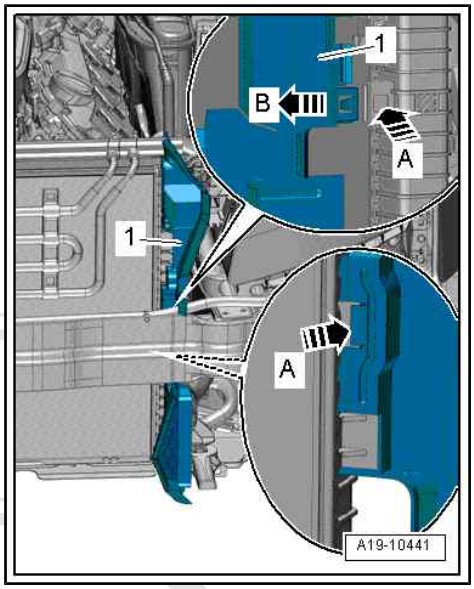
On vehicles with a protective grille -A- (with protection against gravel and grit on certain vehicles only), the front bumper cover and the protective grille -A- must be removed to be able to swivel and remove the air duct -B-.



– Release retaining tabs -arrows A- (two on each air duct - one on top and one on bottom) and swivel air ducts -1- (left and right) towards centre of vehicle -arrow B-.



Vehicles with power steering fluid cooler:

– Release retaining clips -arrow A- and swivel power steering cooling pipe -1- towards front -arrow B-.

– Lift cooling pipe of power steering fluid cooler off condenser and set it down on engine.

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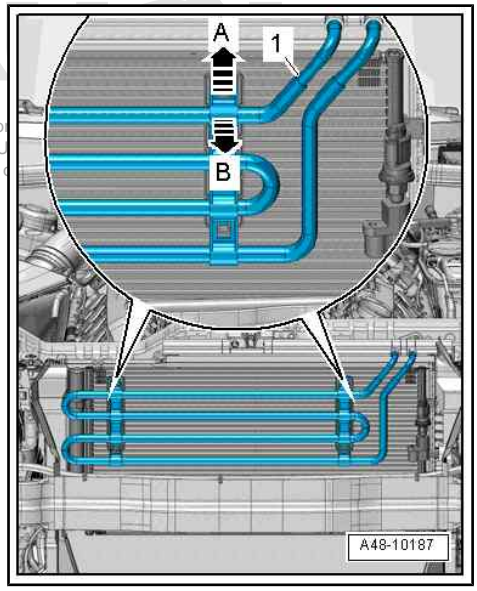
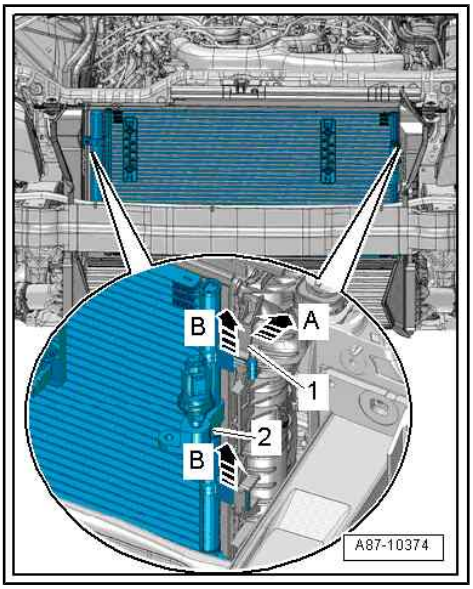


Note

For greater clarity, the installation position is shown with the bumper cover removed.

All vehicles:

– Release retaining clips -1- in direction of -arrow A- and lift condenser -2- out of mountings at radiator -arrows B-.



Note

The bumper cover has been removed in the illustration.

Installing

Install in reverse order of removal; note the following:

Note

- *When it has been removed, the condenser contains refrigerant oil which must be returned to the refrigerant circuit (together with the new condenser) ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Renewing components .*
- *There are different versions of the condenser. Check the correct version and allocation prior to installation ⇒ "2.18.1 Checking version of condenser", page 248 and ⇒ Electronic parts catalogue .*
- *The refrigerant circuit capacity for refrigerant R134a differs depending on the design of the condenser; refer to ⇒ "4 Technical data", page 107 and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils .*
- *For capacities and additional information on refrigerant R1234yf, refer to ⇒ "4 Technical data", page 107 , and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .*

– Attach refrigerant lines to condenser ⇒ page 242 .

Vehicles with power steering fluid cooler:

– Install cooling pipe of power steering fluid cooler ⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Exploded view - hydraulic lines, reservoir .

All vehicles:

– Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .

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

– Re-install remaining components (removed earlier).

– Switch on ignition.

– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

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Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

2.18.3 Removing and installing condenser - RS models

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Audi RS 4 and Audi RS 5

Note

- *Even if fitted correctly, there may be slight pressure marks on the radiator and condenser fins. This does not mean that the components are damaged. If the fins are only very slightly distorted, this does not justify renewal of the radiator or the condenser.*
- *If the condenser and radiator are no longer parallel as a result of slight deformation at the securing lugs on the sides of the condenser (e.g. following an accident), this can be remedied by bending the lugs back into position, provided that the condenser (refrigerant circuit) 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 (refrigerant circuit) is still functioning properly and there is no leakage. If there are slight deformations, the condenser does not have to be renewed.*
- *There are different condenser versions depending on the vehicle version ⇒ "2.18.1 Checking version of condenser", page 248 and ⇒ Electronic parts catalogue .*
- *The Audi RS 4 and Audi RS 5 are fitted with a different type of condenser to that used for other vehicles in this series. Pay attention to the correct assignment and refrigerant capacity for this vehicle ⇒ "2.18.1 Checking version of condenser", page 248 , ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils .*
- *Depending on the version of the radiator and condenser, it may be necessary (e.g. on the Audi RS 4 and Audi RS 5) to discharge the refrigerant circuit and disconnect the refrigerant lines from the condenser in order to remove the condenser from the front end or to remove the radiator ⇒ page 242 .*

Removing

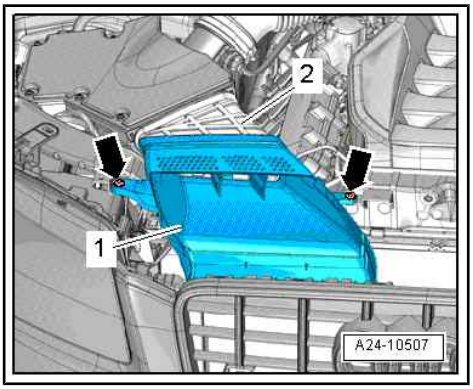
– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

– Detach refrigerant lines from condenser ⇒ page 242 .

– Remove bolts -arrows-.

– Detach air duct -1- at intermediate flange -2- for air cleaner housing (both sides).



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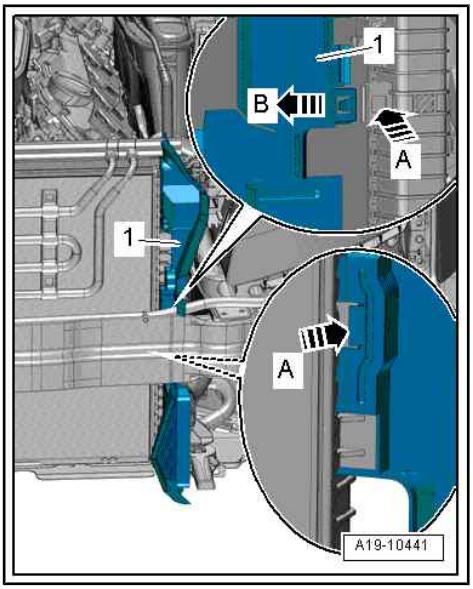
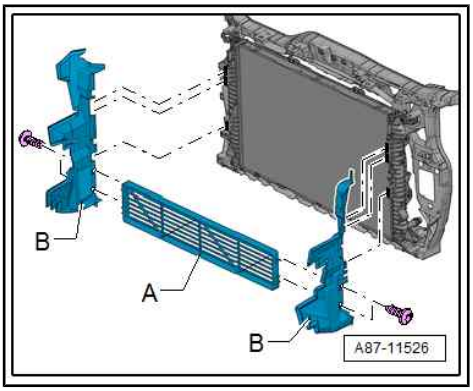
– Release retaining tabs -arrows A- (two on each air duct - one on top and one on bottom) and swivel air ducts -1- (left and right) towards centre of vehicle -arrow B-.

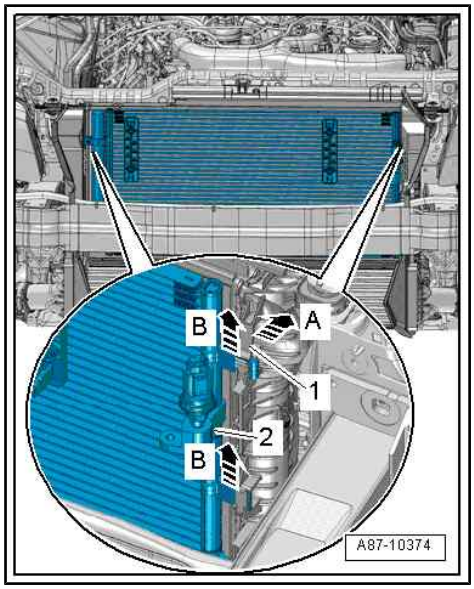


Note

On vehicles with a protective grille -A- (with protection against gravel and grit on certain vehicles only), the front bumper cover and the protective grille -A- must be removed to be able to swivel and remove the air duct -B-.



– Release retaining clips -1- in direction of -arrow A- and lift condenser -2- out of mountings at radiator -arrows B-.



Installing

Install in reverse order of removal; note the following:

Note

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

– Attach refrigerant lines to condenser ⇒ page 242 .
– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).
– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .
– Re-install remaining components (removed earlier).
– Switch on ignition.
– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

2.19 Removing and installing receiver

Note

- *There are different versions of the receiver and condenser. For correct version refer to ⇒ “2.18.1 Checking version of condenser”, page 248 and ⇒ Electronic parts catalogue .*
- *Depending on the version of the condenser, the receiver may be attached to or integrated into the condenser. Renew desiccant cartridge (for condenser with integrated receiver) ⇒ page 260 .*

When it has been removed, the receiver contains refrigerant oil which must be returned to the refrigerant circuit (together with the new receiver). The adjustment of the oil quantity depends on the nature of the complaint ⇒ 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 .

- If e.g. the receiver (or condenser) has been damaged in an accident (no loss of refrigerant, no moisture or dirt entering into refrigerant circuit), allow the refrigerant oil to drain out of the removed receiver (and the damaged condenser). Fill the refrigerant circuit (e.g. condenser) with the amount of refrigerant oil drained off plus 10 cm^3 of fresh refrigerant oil. This enables the refrigerant circuit to be serviced without the need for extensive repair work ⇒ 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 .
- If an indeterminate amount of refrigerant oil has escaped or if dirt and moisture have entered the refrigerant circuit in an ac-

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cident, the refrigerant circuit must be flushed ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Cleaning refrigerant circuit .

Removing

– Switch off ignition.

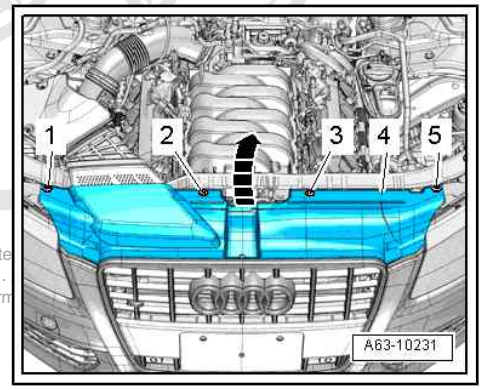
– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working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

Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

– Remove bolts (or clips) -1, 2, 3 and 5- ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .

– Lift cover -4- at lock carrier and disengage it at radiator grille ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .



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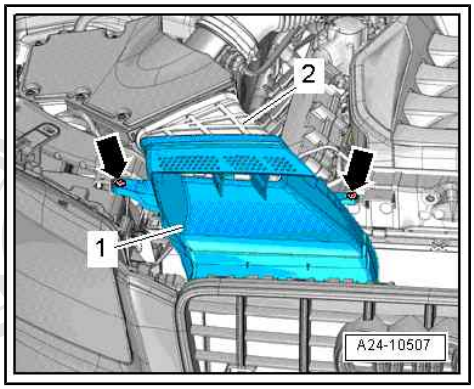
– Remove bolts -arrows-.

– Detach air duct -1- at intermediate flange -2- for air cleaner housing.

– Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .



Note

Depending on the version of the vehicle, it may be necessary to remove the front bumper cover to make it possible to remove the noise insulation (e.g. on Audi A4 allroad) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .

Vehicles with charge air cooler or engine oil cooler (installed underneath condenser):

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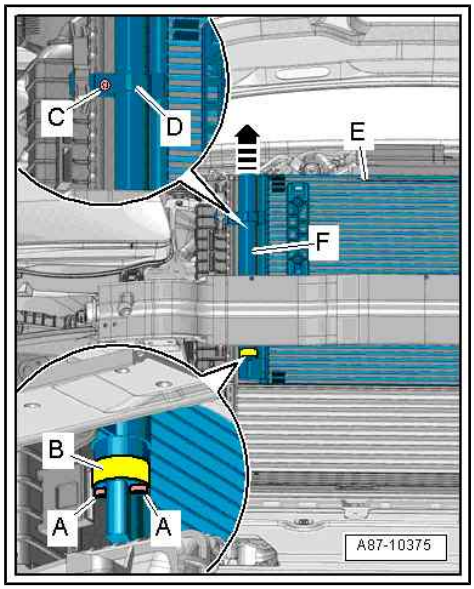
– Remove condenser ⇒ page 248.

All vehicles:

– Unscrew bolts -A-.

– Unscrew bolt -C- and lift off bracket -D-.

– Pull receiver -F- upwards out of condenser -E- -arrow-.



Note

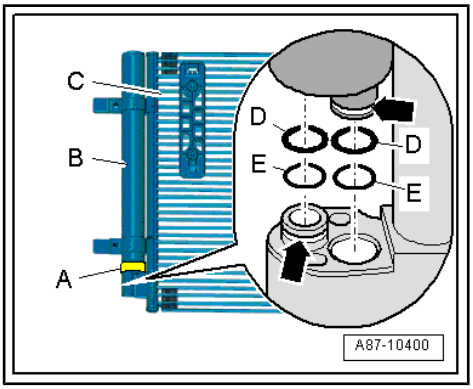
- *Make sure that the rubber grommet -B- is not lost when detaching the receiver.*
- *Seal the open connections at the receiver and condenser with suitable caps (to prevent dirt and moisture from entering).*

Installing

Install in reverse order of removal; note the following:

Note

- *Observe fitting instructions for O-rings ⇒ page 106 .*
- *Keep receiver closed for as long as possible. Only remove the caps immediately before installation (the receiver contains a desiccant cartridge which soon becomes saturated with moisture and thus unusable when the receiver is open).*



– Clean contact surface of condenser -C-.
– Check connections at condenser and receiver for damage.
– Renew seals -D- and O-rings -E-; for correct version, refer to ⇒ Electronic parts catalogue .
– Lubricate O-rings lightly with refrigerant oil before installing ⇒ page 106 .
– Make sure that O-rings are correctly seated in grooves -arrows- of corresponding mounting.
– Position receiver -B- on condenser and tighten bolts.
• Tightening torque: 10 Nm
– Fit protective collar -A- over connection point.

Vehicles with charge air cooler (installed underneath condenser):

– Install condenser ⇒ page 248 .

All vehicles:

– Install noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .

Note

Depending on the version of the vehicle, it may be necessary to remove the front bumper cover to make it possible to remove the noise insulation (e.g. on Audi A4 allroad) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .

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– Fit air duct at intermediate flange for air cleaner housing ⇒ Rep. gr. 23 ; Air cleaner; Exploded view - air cleaner housing (vehicles with diesel engine) or ⇒ Rep. gr. 24 ; Air cleaner; Exploded view - air cleaner housing (vehicles with petrol engine).
– Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .
– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
– Re-install remaining components (removed earlier).
– Switch on ignition.
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

2.20 Removing and installing desiccant bag/ desiccant cartridge

⇒ "2.20.1 Removing and installing desiccant bag/desiccant cartridge - all vehicles except RS models", page 260

⇒ "2.20.2 Removing and installing desiccant bag/desiccant cartridge - RS models", page 264

2.20.1 Removing and installing desiccant bag/ desiccant cartridge - all vehicles except RS models

Note

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- *There are different versions of the condenser and the integrated desiccant cartridge. For the correct versions refer to ⇒ "2.18.1 Checking version of condenser", page 248 and ⇒ Electronic parts catalogue .*
- *Depending on the version of the condenser, the receiver may be attached to or integrated into the condenser. For instructions on how to renew an attached receiver, see ⇒ page 256 .*

Removing

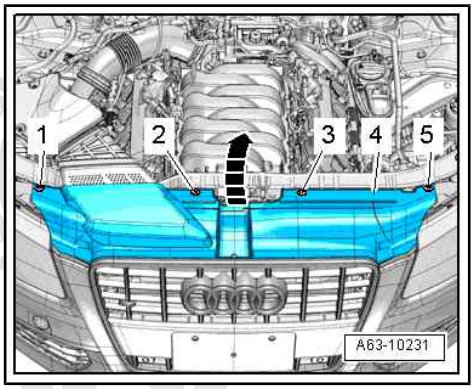
– Switch off ignition.

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

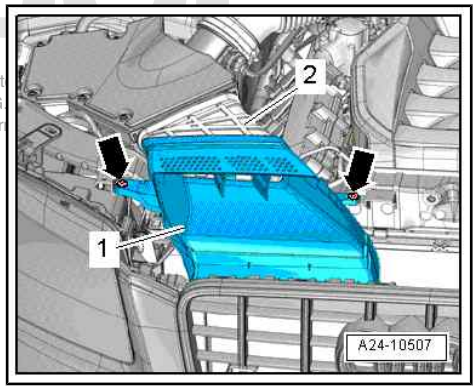
Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

– Remove bolts (or clips) -1, 2, 3 and 5- ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .
– Lift cover -4- at lock carrier and disengage it at radiator grille ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .



– Remove bolts -arrows-.
– Detach air duct -1- at intermediate flange -2- for air cleaner housing.
– Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .



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Note

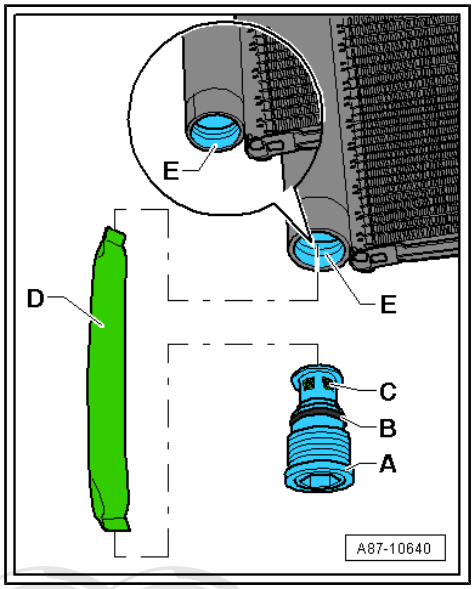
Depending on the version of the vehicle, it may be necessary to remove the front bumper cover to make it possible to remove the noise insulation (e.g. on Audi A4 allroad) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .

– Remove closure plate for front bumper cover (depending on vehicle version; currently not necessary e.g. on Audi Q5) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .

Vehicles with charge air cooler or engine oil cooler (installed underneath condenser):

– Remove condenser ⇒ page 248 .

Vehicles in which condenser is not removed for removal of desiccant cartridge -D-:



WARNING

- *Before removing the plastic screw plug -A-, the refrigerant must be extracted from the refrigerant circuit. Renewed evaporation may create pressure in the refrigerant circuit if the plastic screw plug -A- is then not removed within 10 minutes. Extract refrigerant again.*

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

WARNING

Only remove the plastic screw plug -A- if the pressure in the refrigerant circuit is equal to or less than the atmospheric pressure.

All vehicles:

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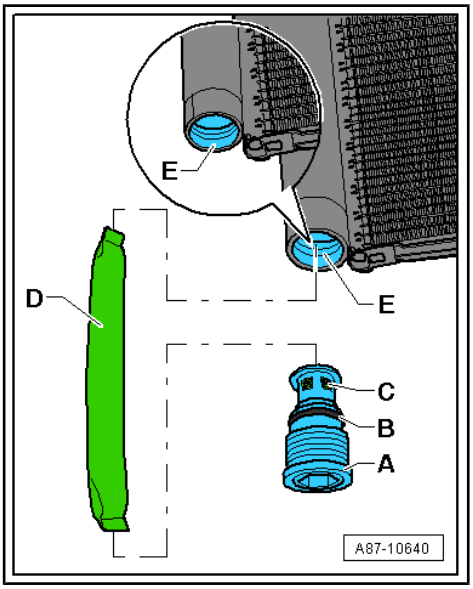
– Remove plastic screw plug -A- with filter element -C- (tightening torque: 2 Nm).
– Pull desiccant cartridge -D- downwards out of condenser.



Note

Seal the open connection at the condenser with the plastic screw plug -A- (to prevent dirt and moisture from entering).

Installing

Install in reverse order of removal; note the following:

- Check receiver at condenser for contamination via opening -E-.
- Check thread -E- in receiver at condenser for contamination or damage.
- Renew plastic screw plug -A- (with filter element -C-), desiccant cartridge -D- and O-ring -B-.
- Lubricate O-ring -B- lightly with refrigerant oil before fitting ⇒ page 106 .
- Make sure O-ring -B- is seated correctly in groove of plastic screw plug -A-.
- Keep bag with air-tight seal containing desiccant cartridge -D- 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 -D- out of transportation bag.
– Insert desiccant cartridge -D- in receiver of condenser.
– Screw in plastic screw plug -A- with filter element -C- (tightening torque: 2 Nm).
– Install condenser ⇒ page 248 .
– Install closure plate for front bumper cover, etc. (depending on version of vehicle) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover
– Install noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .

Note

Depending on the version of the vehicle, it may be necessary to remove the front bumper cover to make it possible to remove the noise insulation (e.g. on Audi A4 allroad) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
– Re-install remaining components removed before.
– Switch on ignition.

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– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

2.20.2 Removing and installing desiccant bag/ desiccant cartridge - RS models

Note

- *There are different versions of the condenser and the integrated desiccant cartridge. For the correct versions refer to ⇒ "2.18.1 Checking version of condenser", page 248 and ⇒ Electronic parts catalogue .*
- *Depending on the version of the condenser, the receiver may be attached to or integrated into the condenser. For instructions on how to renew an attached receiver, see ⇒ page 256 .*

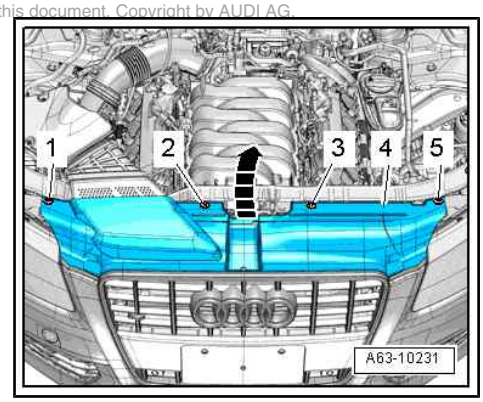
Removing

– Switch off ignition.

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

– Remove bolts (or clips) -1, 2, 3 and 5- ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .

– Lift cover -4- at lock carrier and disengage it at radiator grille ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .



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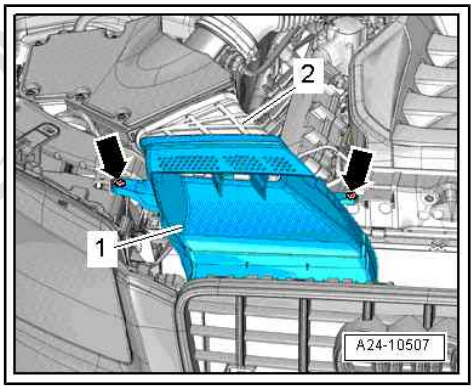
– Remove bolts -arrows-.

– Remove oil cooler (front) ⇒ Rep. gr. 17 ; Engine oil cooler; Exploded view - engine oil cooler .



– Detach air duct -1- at intermediate flange -2- for air cleaner housing (both sides).

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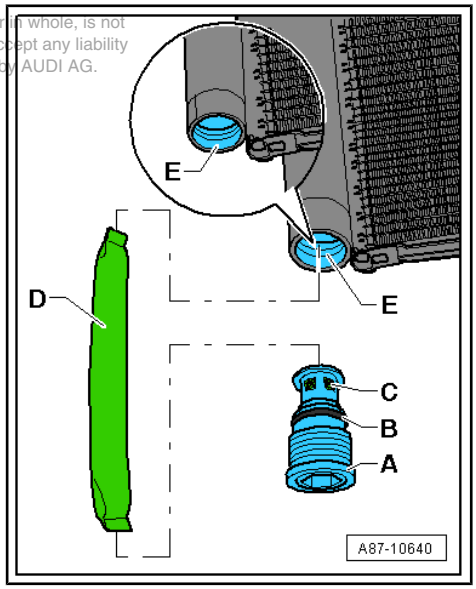
WARNING

- *Before removing the plastic screw plug -A-, the refrigerant must be extracted from the refrigerant circuit. Renewed evaporation may create pressure in the refrigerant circuit if the plastic screw plug -A- is then not removed within 10 minutes. Extract refrigerant again.*



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

WARNING

Only remove the plastic screw plug -A- if the pressure in the refrigerant circuit is equal to or less than the atmospheric pressure.

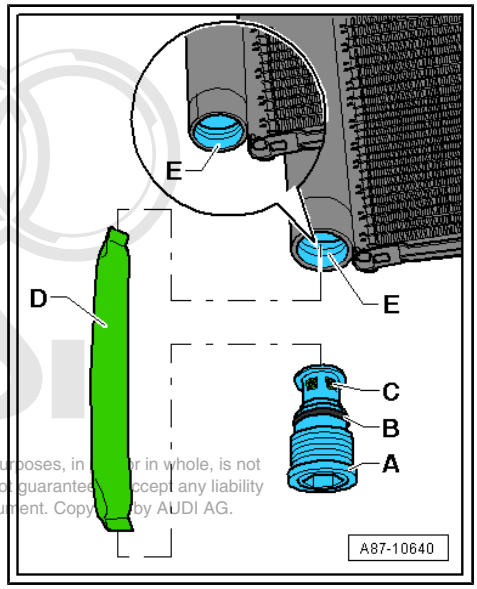
– Remove plastic screw plug -A- with filter element -C-.
– Pull desiccant cartridge -D- downwards out of condenser.
– Seal open receiver with plastic screw plug -A- to prevent dirt and moisture from entering.

Installing

Install in reverse order of removal; note the following:

♦ Check threads and sealing surfaces of receiver at condenser for contamination or damage via opening.
♦ Renew plastic screw plug -A- (with filter element -C-), desiccant cartridge -D- and O-ring -B-.
♦ Lubricate O-ring -B- lightly with refrigerant oil before fitting ⇒ page 106 .
♦ Make sure O-ring -B- is seated correctly in groove of plastic screw plug -A-.
♦ Keep bag with air-tight seal containing desiccant cartridge -D- 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 -D- out of transportation bag.
– Insert desiccant cartridge -D- in receiver of condenser.
– Screw in plastic screw plug -A- with filter element -C- (tightening torque: 2 Nm).
– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .
– Re-install remaining components (removed earlier).
– Switch on ignition.
– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).



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2.21 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 116 and ⇒ "2.1 System overview - refrigerant circuit", page 145*
- *There are different connections (outer diameter) for high and low-pressure sides.*
- *Discharge refrigerant circuit before removing valves or valve cores ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .*
- *Removing and installing valve from service connection (low and high-pressure sides) ⇒ page 270 .*
- *Always screw on sealing caps with seal.*

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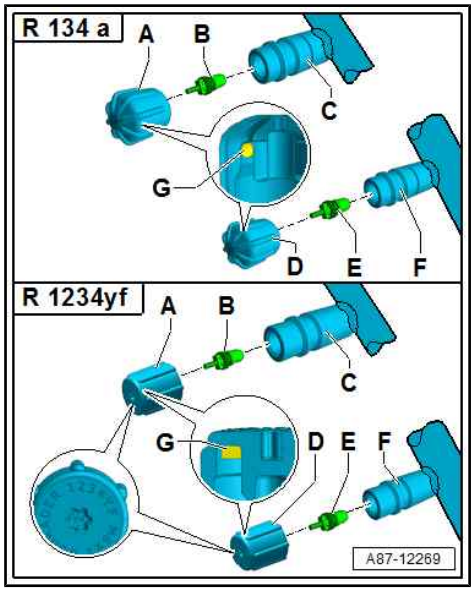
Service connections (refrigerant R134a and R1234yf)

WARNING

Before removing valves -B, E-, connect the air conditioner service station and extract refrigerant. Refrigerant circuit must be empty; danger of injury ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .



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

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Note

- *Service connections -C, F- for refrigerant R134a and R1234yf are available in different versions (depending on manufacturer), with different sealing caps -A, D- and valves -B, E-. Ensure correct assignment ⇒ Electronic parts catalogue .*
- *Sealing caps -A, D- for the service connections on the R134a refrigerant circuit are currently black. The sealing caps for the service connections on the R1234yf refrigerant circuit are currently grey. The refrigerant type (e.g. "R1234yf") may also be printed on the sealing caps.*
- *After connecting, carefully screw the handwheel of the service coupling into the quick-release coupling adapter only to the extent required to reliably open the valve -B, E- in the service connection (observe the pressure gauge; do not open the valve -B, E- too far).*
- *The service connections -C, F- for R134a and R134yf refrigerant circuits are designed such that only the service couplings specified for the corresponding refrigerant can be connected (different dimensions ⇒ page 269).*
- *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 270 .*
- *Take care when tightening the valves -B, E- (low torque) ⇒ page 270 .*
- *There are different versions of these valves; therefore tightening torques may vary. Tightening torque for valve core -C- with a VG5 thread (5.2 x 0.7 mm tyre valve): 0.4 Nm +- 0.1 Nm; tightening torque for valve core with an M6 x 0.75 mm thread: 0.9 mm +- 0.1 Nm; tightening torque for valve core with M8 x 1.0 mm thread: 2.0 Nm +- 0.2 Nm ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .*
- *There are different versions of valve caps -A, D-; therefore tightening torques vary. Tightening torque for valve cap with M8 x 1 mm or M10 x 1 mm thread: 0.4 Nm +- 0.1 Nm.*

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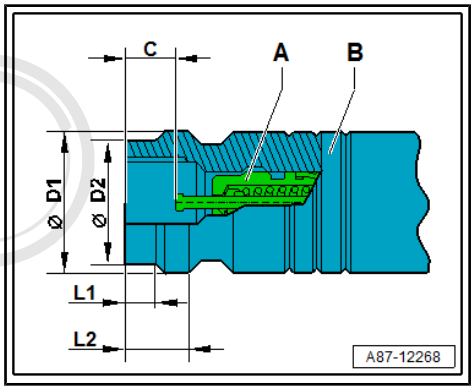
Dimensions of service connections

- Valve core -A- (different versions) ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , and ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .
- Service connection -B- (different versions on high-pressure and low-pressure side depending on refrigerant)



Dimensions of service connections -B-	Service connection (refrigerant R134a)		Service connection (refrigerant R1234yf)	
	High-pressure side	**Low-pressure side**	**High-pressure side**	**Low-pressure side**
Outer diameter -D1-	16.0 mm	13.0 mm	17.0 mm	14.0 mm
Outer diameter -D2-	14.0 mm	11.0 mm	13.0 mm	12.0 mm
Offset -L1-	4.6 mm	6.15 mm	9.0 mm	4.75 mm
Offset -L2-	8.16 mm	9.16 mm	12.5 mm	7.2 mm
Installation position of valve (not actuated) -C-	6.1 - 7.1 mm	6.1 - 7.1 mm	8.3 - 9.3 mm	8.3 - 9.3 mm

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2.22 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.***

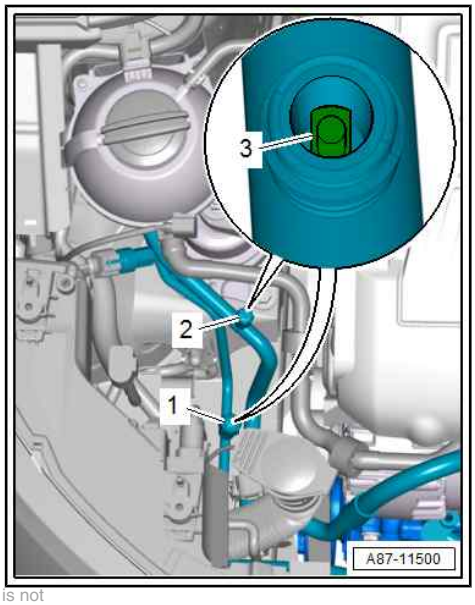
Note

- *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 conditioners with refrigerant R1234yf - General information; Rep. gr. 00 ; Laws and regulations .*
- *Different versions depending on refrigerant (R134a or R1234yf)*
  ⇒ "2.21 Differences in service connections depending on refrigerant (R134a or R1234yf)", page 267 and ⇒ Electronic parts catalogue

Special tools and workshop equipment required

♦ Socket - T10364-

Removing



– Unscrew caps (with seal) -1- or -2-.
– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
– Remove service connection -3- using socket - T10364- and a suitable adapter.

Note

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

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Installing

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

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .
– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

2.23 Starting up air conditioner after charging refrigerant circuit

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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Caution

- *After installing the electrically driven air conditioner compressor and then charging the refrigerant circuit, first start up the compressor via the "Compressor run-in" function of the basic setting routine. Otherwise, the compressor can be damaged by refrigerant oil that may have accumulated in the compression chamber if the compressor has not been stored properly prior to installation ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode for air conditioner and battery regulation .⇒*
- *An electrically driven air conditioner compressor may only be activated when the refrigerant circuit is charged. Running the air conditioner compressor with the refrigerant circuit empty could lead to compressor damage ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode for air conditioner and battery regulation .⇒*

- All components removed have been re-installed.
- The refrigerant circuit is charged ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

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– Switch on ignition.
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
– Start up electrical air conditioner compressor - V470- via "Compressor run-in" function ⇒ Vehicle diagnostic tester ("Guided Fault Finding" for air conditioner and battery regulation) .

Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

Vehicles without high-voltage system

Note

- *Do not start the engine until the refrigerant circuit has been assembled.*
- *If possible, only start the engine with the refrigerant circuit full.*
- *Do not start the engine during evacuation or after evacuating the refrigerant circuit, as this could cause damage to the 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 .*
- *The air conditioner compressor without air conditioning system magnetic clutch - N25- is always driven when the engine is running. On vehicles with an air conditioner compressor without -N25- , it is therefore important not to 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. The internal heat generation is caused by the air conditioner compressor operating against a fixed resistance even at approximately 0 % delivery rate (sealed circuit).*
- *From model year 2012 onwards, air conditioner compressors with an additional air conditioning system magnetic clutch - N25- fitted are gradually being introduced for certain vehicles with 4-cyl. engines ⇒ page 365 . In certain air conditioner operating modes (e.g. “Econ” mode), the air conditioner compressor drive system is deactivated completely via this magnetic clutch. For -N25- to be activated by the operating and display unit (Climatronic control unit - J255-), the correct version of -J255- must be fitted and correctly encoded ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .*
- *The air conditioner compressor without -N25- is always driven by the pulley or the drive shaft. To prevent damage to the compressor while it runs at idle, the compressor lubrication is maintained via an internal oil circuit.*
- *The air conditioner compressor is equipped with an internal oil circuit to prevent damage if the refrigerant circuit is empty. This internal lubrication is only possible if there is still a residual quantity of refrigerant oil in the air conditioner compressor.*
- *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.*
- *The air conditioner compressor regulating valve - N280- is not activated if the refrigerant circuit is empty and the air conditioner compressor runs at idle with the engine. However, as there is no refrigerant in the circuit, the oil required for the lubrication of the air conditioner compressor is not transported to the compressor.*

- All components removed have been re-installed.
- The refrigerant circuit is charged ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air

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conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

Should it be necessary to start the engine with an empty refrigerant circuit, please observe the following:

- The refrigerant circuit must have been assembled completely.
- There must not be any vacuum in the refrigerant circuit.
- There must be at least a quarter of the amount of refrigerant oil specified for this refrigerant circuit in the air conditioner compressor.
- Engine speed must not exceed 2500 rpm.
- The engine should only run as long as absolutely necessary.

Proceed as follows when starting the engine for the first time after charging the refrigerant circuit:

– Switch on ignition.

– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Start engine with air conditioner compressor switched off (“Econ” mode set, indicator lamp in AC/A/C button not on) and wait for engine idling speed to stabilise.

– Open all dash panel vents.

– Set air conditioner to “cold” temperature setting (for driver's and passenger's side) on air conditioner operating and display unit (Climatronic control unit - J255-).

– Switch on air conditioner compressor by pressing AC/A/C button (“Auto” mode selected and lamp in AC or A/C button on) and allow compressor to run for at least 5 minutes with engine idling.

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Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

3 Air conditioner compressor

⇒ “3.1 Exploded view - drive unit for air conditioner compressor”, page 276

⇒ “3.2 Exploded view - pulley”, page 279

⇒ “3.3 Detaching and attaching air conditioner compressor at bracket”, page 286

⇒ “3.4 Detaching and attaching refrigerant lines at air conditioner compressor”, page 301

⇒ “3.5 Removing and installing air conditioner compressor”, page 314

⇒ “3.6 Preparations for renewing pulley”, page 361

⇒ “3.7 Removing and installing pulley”, page 361

⇒ “3.8 Unfastening and securing air conditioner compressor drive shaft”, page 367

⇒ “3.9 Removing and installing air conditioner compressor drive shaft”, page 367

⇒ “3.10 Removing and installing drive plate with overload protection”, page 368

⇒ “3.11 Checking and adjusting concentricity of drive plate with overload protection”, page 369

⇒ “3.12 Removing and installing drive plate at air conditioner compressor”, page 369

⇒ “3.13 Removing and installing drive plate with roller bearing”, page 370

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3.1 Exploded view - drive unit for air conditioner compressor

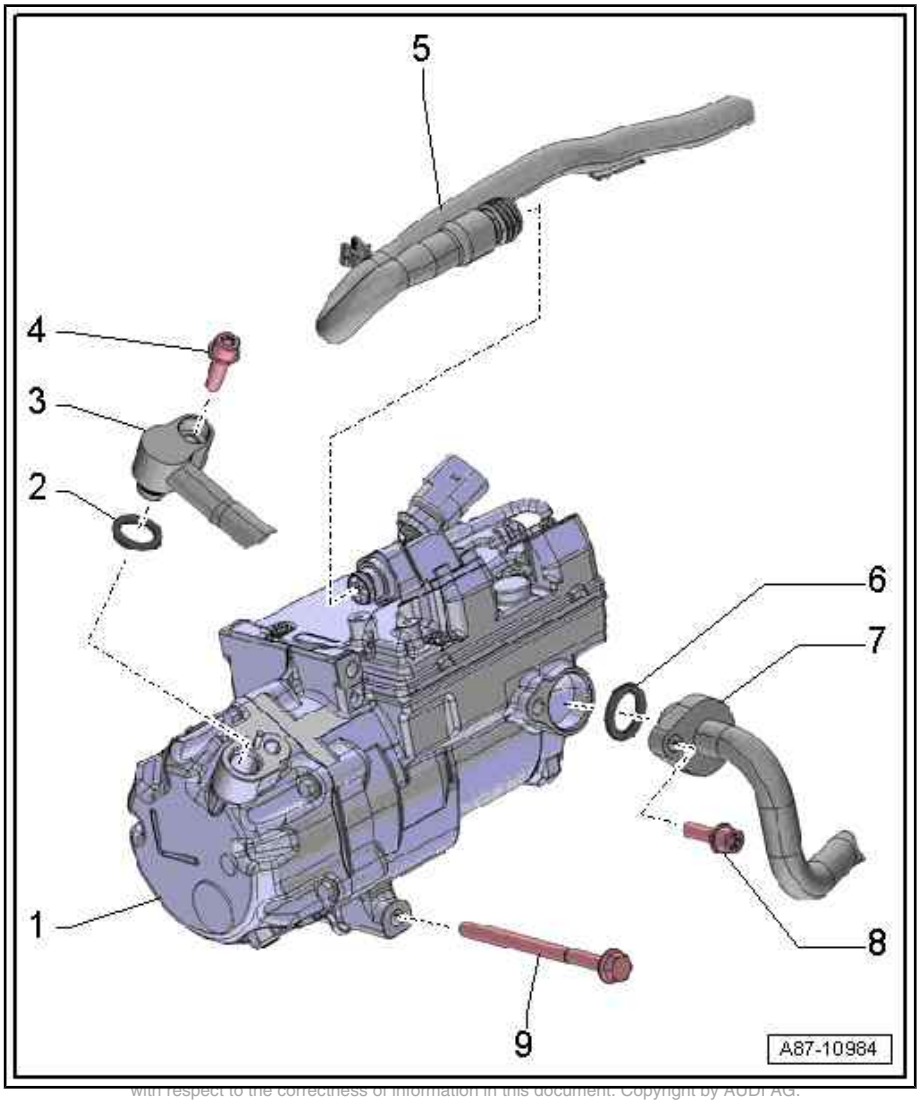
⇒ “3.1.1 Exploded view - drive unit for electrically driven air conditioner compressor”, page 276

⇒ “3.1.2 Exploded view - drive unit for air conditioner compressor, vehicles with 8-cyl. engine”, page 278

3.1.1 Exploded view - drive unit for electrically driven air conditioner compressor

Note

- *The vehicles in this series with high-voltage systems are all fitted with refrigerant circuits charged with refrigerant R134a.*
- *With control unit for air conditioning compressor - J842- and electrical air conditioner compressor - V470-*
- *If the control unit for air conditioning compressor - J842- is defective, the amount of refrigerant oil in the new air conditioner compressor must be adjusted. It is not necessary to flush the refrigerant circuit with refrigerant R134a to do so ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems .*
- *For further information on the air conditioner compressor, refer to ⇒ page 292 and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems .*



1 - Electrically driven air conditioner compressor

- ❑ With control unit for air conditioning compressor - J842- and electrical air conditioner compressor - V470-
- ❑ ⇒ “3.3.3 Detaching and attaching air conditioner compressor at bracket (electrically driven)”, page 292
- ❑ ⇒ “3.5.2 Removing and installing air conditioner compressor (electrically driven) - vehicles with 4-cyl. engine”, page 317

2 - O-ring

- ❑ Renew

3 - Refrigerant line

- ❑ High-pressure side

4 - Bolt

- ❑ Tightening torque: 9 Nm (for bolts with M6 thread) / 25 Nm (for bolts with M8 thread)

5 - High-voltage wire to power and control electronics for electric drive - JX1-

6 - O-ring

- ❑ Renew

7 - Refrigerant line

- ❑ Low-pressure side

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8 - Bolt

- ❑ Tightening torque: 9 Nm (for bolts with M6 thread) / 25 Nm (for bolts with M8 thread)

9 - Bolt

- ❑ Different tightening torques depending on type of bolt
  ⇒ “3.3.3 Detaching and attaching air conditioner compressor at bracket (electrically driven)”, page 292

3.1.2 Exploded view - drive unit for air conditioner compressor, vehicles with 8-cyl. engine

Note

If the overload protection of the drive plate has been triggered, check that the air conditioner compressor can rotate freely before renewing the drive unit. If the air conditioner compressor does not rotate freely, renew the complete unit.

1 - Drive shaft of air conditioner compressor

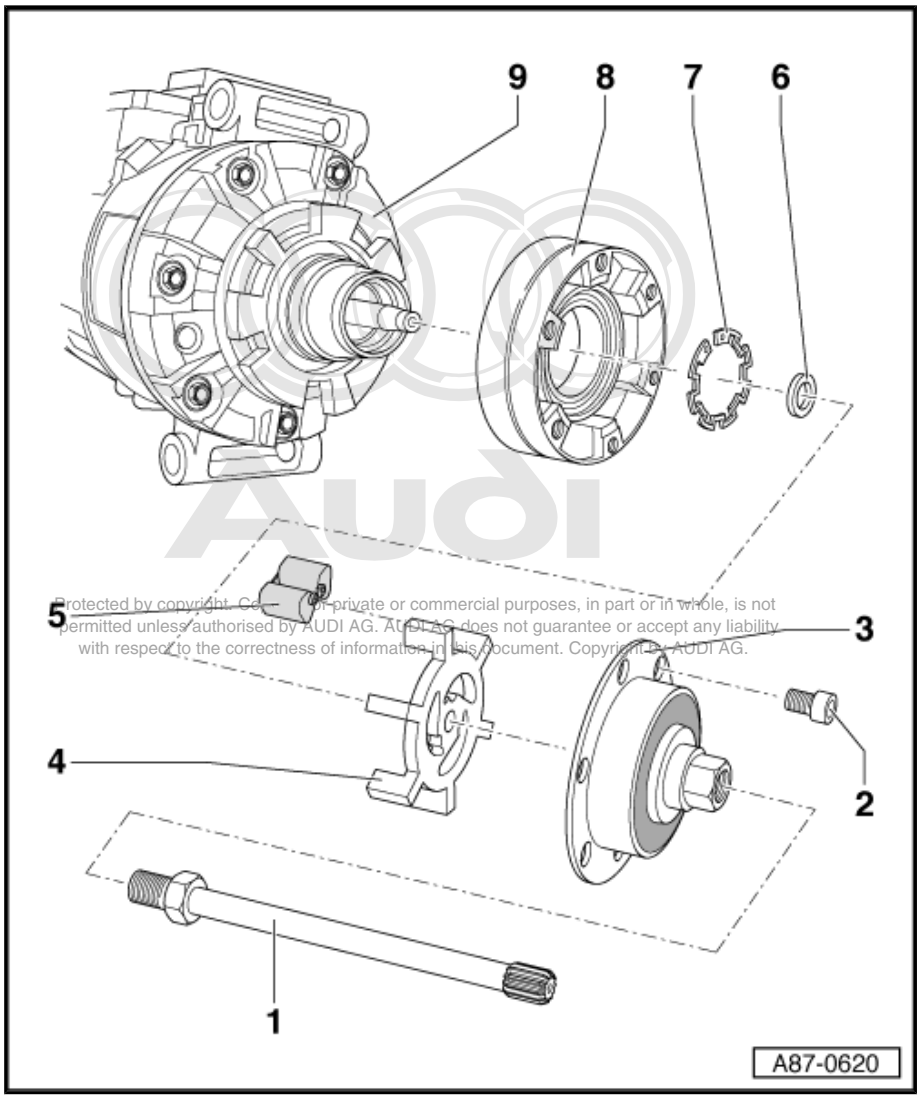
- ❑ Check; after tightening bolt connection, drive shaft must engage snugly in splines of drive gear on engine ⇒ page 367
- ❑ Tightening torque: 60 Nm
- ❑ Loosening and tightening ⇒ page 367
- ❑ Removing and installing ⇒ page 367
- ❑ Lubricate splines for drive gear e.g. with grease - G 000 100- ⇒ Electronic parts catalogue

2 - Hexagon socket head bolt

- ❑ Tightening torque: 10 Nm

3 - Drive plate

- ❑ With overload protection device; triggered if torque is too great (e.g. if air conditioner compressor cannot rotate freely) causing drive shaft to free-wheel without driving air conditioner compressor
- ❑ Checking concentricity and adjusting



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⇒ page 369

- ❑ Detaching and attaching ⇒ page 368

4 - Drive plate

- ❑ Screwed onto compressor shaft
- ❑ With overload protection device; triggered if torque is too great (e.g. if air conditioner compressor cannot rotate freely) causing drive shaft to free-wheel without driving air conditioner compressor
- ❑ Tightening torque: 30 Nm
- ❑ Detaching and attaching ⇒ page 369

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5 - Rubber element

- ❑ Isolates drive unit, damping vibration and noise
- ❑ When installing, coat rubber elements slightly with soap solution or similar to provide lubrication
- ❑ Detaching and attaching ⇒ page 369

6 - Spacer

- ❑ Original spacer must be fitted
- ❑ Dimensions: 17.5 x 10 x 3 mm

7 - Circlip

- ❑ Renew
- ❑ Ensure correct installation position (flat side facing air conditioner compressor)
- ❑ Removing and installing ⇒ page 370

8 - Drive plate

- ❑ With roller bearing
- ❑ Detaching and attaching ⇒ page 370
- ❑ Clean air conditioner compressor flange before fitting drive plate.

9 - Air conditioner compressor

- ❑ Different versions may be fitted, depending on engine type and country-specific version of vehicle ⇒ Electronic parts catalogue

Note

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

3.2 Exploded view - pulley

⇒ “3.2.1 Exploded view - Denso air conditioner compressor pulley, version 1”, page 279

⇒ “3.2.2 Exploded view - Denso air conditioner compressor pulley, version 2”, page 281

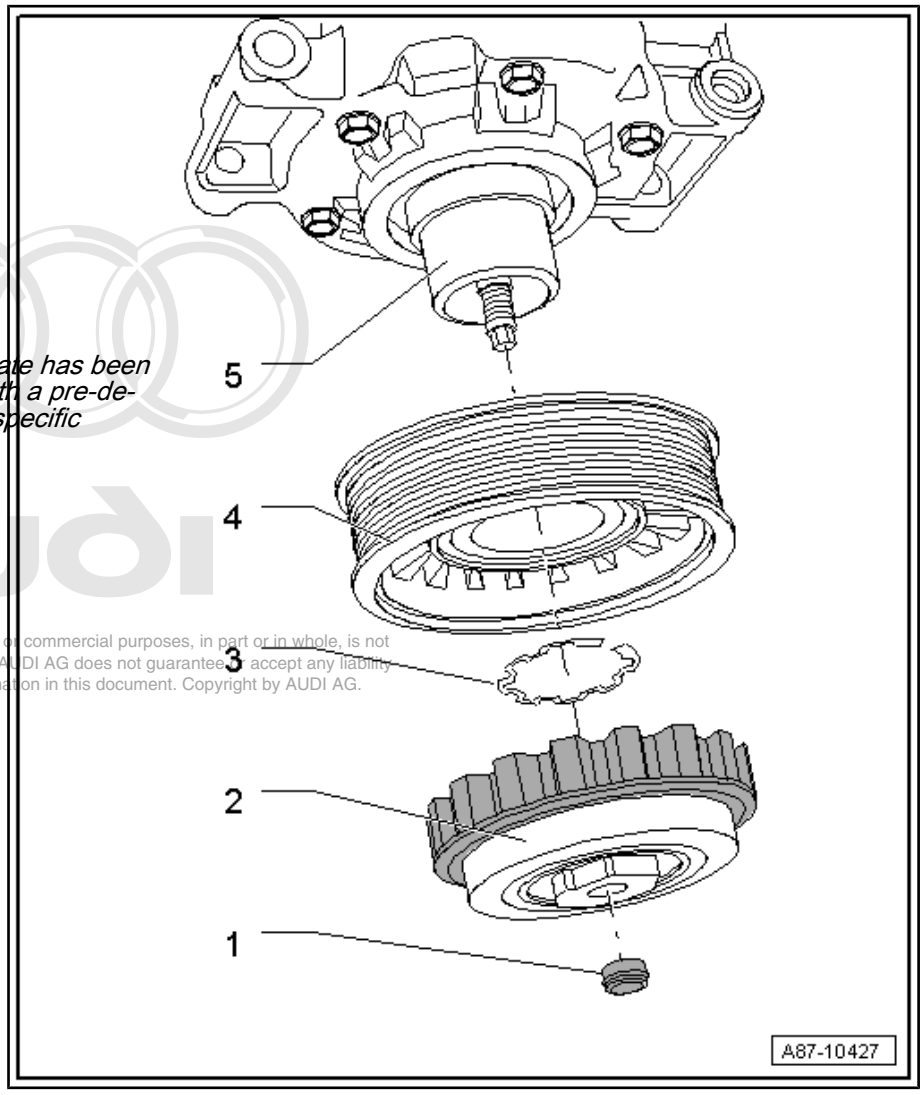
⇒ “3.2.3 Exploded view - pulley, air conditioner compressor with air conditioning system magnetic clutch N25 ”, page 284

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

Air conditioner compressor without air conditioning system magnetic clutch - N25-

Note

- *If the pulley overload protection device has been triggered, check that the air conditioner compressor can rotate freely before renewing the pulley. If the air conditioner compressor does not rotate freely, renew the complete unit.*
- *It is not always necessary to unfasten the air conditioner compressor from the engine to detach the pulley ⇒ page 286 . Depending on the engine version, however, there may not be enough space to detach the pulley; in this case, detach the air conditioner compressor from the engine or remove it, or unfasten the lock carrier from the vehicle and pull it forwards slightly to make some space (whichever is more practical based on the vehicle version) ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Performing service position and resetting .*
- *Various pulley versions with differing diameters may be fitted depending on the type of air conditioner compressor and the engine version ⇒ Electronic parts catalogue .*
- *The pulley with drive plate and cap is available as a replacement part (single part number). The pulley and the drive plate are held together by a bolt (bolt is not required; can be disposed of). This bolt is used during manufacturing to insert a pre-determined amount of a specific grease into the thread of the drive plate (sufficient for fitting the drive plate onto the compressor shaft once; do not re-use a drive plate that has been unscrewed) ⇒ Electronic parts catalogue .*
- *Detaching and attaching pulley at air conditioner compressor ⇒ page 361*



1 - Cap

2 - Drive plate

- ❑ Renew
- ❑ Bolted to drive shaft of air conditioner compressor; clean thread of compressor shaft before fitting drive plate

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 pulley from drive shaft of air conditioner compressor and for dampening vibrations and noise
- ❑ Before installation, coat rubber elements slightly with lubricant (e.g. tyre fitting paste or soap solution).
- ❑ Detaching and attaching ⇒ page 361

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- ❑ Tightening torque: 30 Nm

3 - Circlip

- ❑ Renew
- ❑ Ensure correct installation position (flat side facing air conditioner compressor)
- ❑ Removing and installing ⇒ page 361

4 - Pulley

- ❑ Pulley is made of plastic, is sensitive to impact and should be treated with special care.
- ❑ Different versions (depending e.g. on type of engine) ⇒ Electronic parts catalogue
- ❑ Detaching and attaching ⇒ page 361

5 - Air conditioner compressor

- ❑ Different versions may be fitted, depending on engine type and country-specific version of vehicle ⇒ Electronic parts catalogue .
- ❑ Clean air conditioner compressor flange before fitting pulley.
- ❑ Clean thread of compressor shaft and apply a small quantity of grease to thread.

Note

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

3.2.2 Exploded view - “Denso” air conditioner compressor pulley, version 2

Air conditioner compressor without air conditioning system magnetic clutch - N25-

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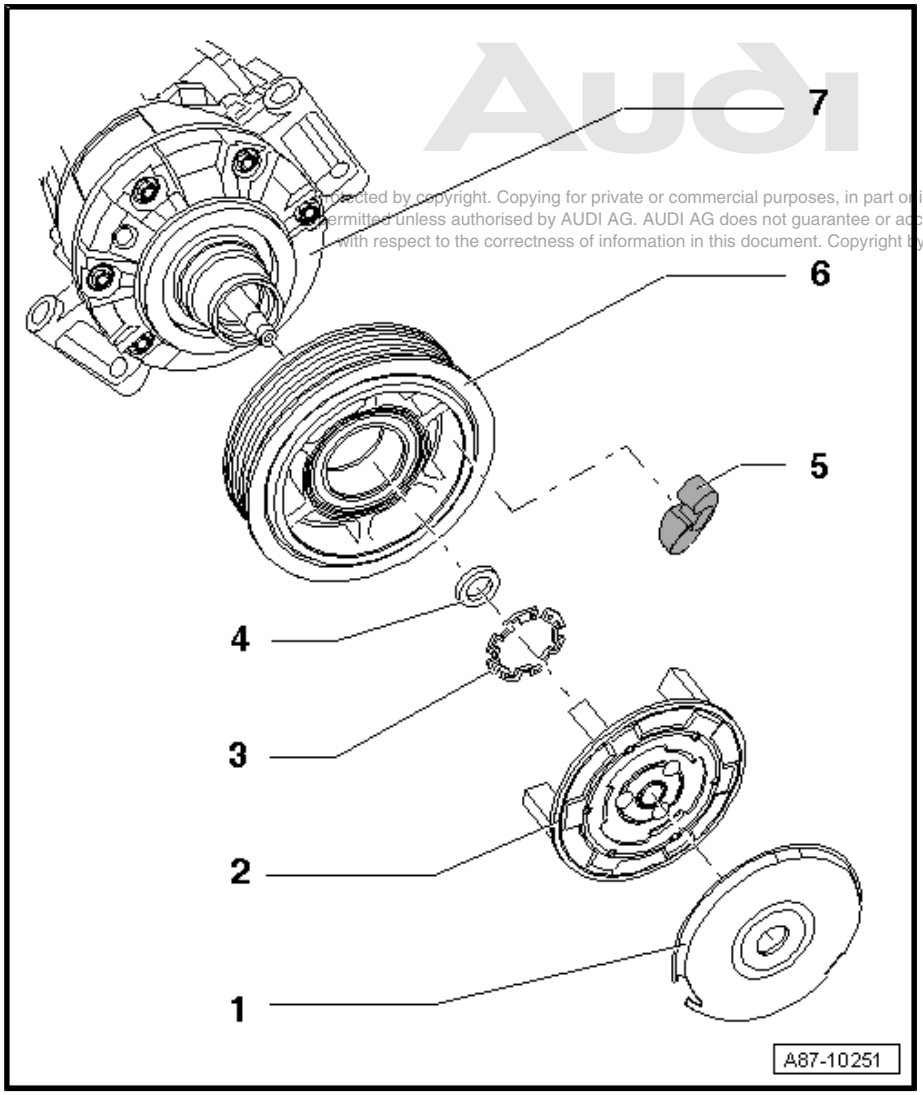
Note

- *If the pulley overload protection device has been triggered, check that the air conditioner compressor can rotate freely before renewing the pulley. If the air conditioner compressor does not rotate freely, renew the complete unit.*
- *Depending on the engine version, the air conditioner compressor might have to be detached from the engine before removing the pulley ⇒ page 286 .*
- *Various pulley versions may be fitted depending on the type of air conditioner compressor and the engine version ⇒ Electronic parts catalogue .*
- *Detaching and attaching pulley at air conditioner compressor ⇒ page 361*



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1 - Circlip with rubber disc

- Remove carefully using a small screwdriver or long-nose pliers (paying particular attention to pulley)
- Detaching and attaching ⇒ page 363
- Vulcanised rubber disc provides noise insulation when compressor output is low and engine is idling

2 - Drive plate

- Screwed onto compressor shaft
- Different versions ⇒ Electronic parts catalogue
- With overload protection device; triggered if torque is too great (e.g. if air conditioner compressor cannot rotate freely) causing pulley to free-wheel without driving air conditioner compressor
- Detaching and attaching ⇒ page 363
- Tightening torque: 35 Nm

3 - Circlip

- Renew
- Ensure correct installation position (flat side facing air conditioner compressor)
- Removing and installing ⇒ page 363

4 - Spacer

- Dimensions: 17.5 x 10 x 3 mm

5 - Rubber elements

- 6x, ensure correct installation ⇒ page 363
- Decouples pulley from drive shaft of air conditioner, damping vibration and noise
- Before installation, coat rubber elements slightly with lubricant (e.g. tyre fitting paste or soap solution).

6 - Pulley

- Pulley is made of plastic, is sensitive to impact and should be treated with special care.
- Different versions ⇒ Electronic parts catalogue
- Detaching and attaching ⇒ page 363

7 - Air conditioner compressor

- Different versions may be fitted, depending on engine type and country-specific version of vehicle ⇒ Electronic parts catalogue .
- Clean air conditioner compressor flange before fitting pulley.

Note

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

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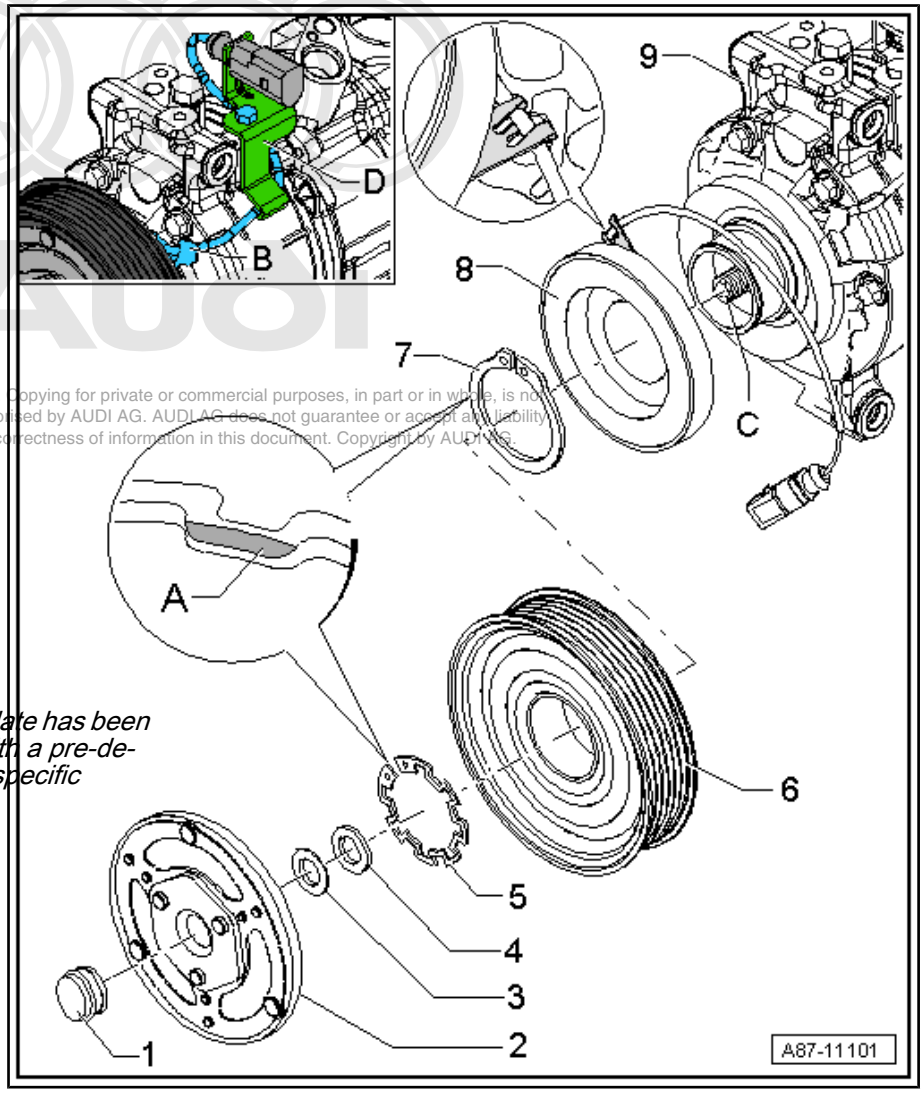
3.2.3 Exploded view - pulley, air conditioner compressor with air conditioning system magnetic clutch - N25-

Note

- *If the pulley overload protection device has been triggered, check that the air conditioner compressor can rotate freely before renewing the pulley. If the air conditioner compressor does not rotate freely, renew the complete unit.*
- *It is not always necessary to unfasten the air conditioner compressor from the engine to detach the pulley ⇒ page 286 . Depending on the engine version, however, there may not be enough space to detach the pulley; in this case, detach the air conditioner compressor from the engine or remove it, or unfasten the lock carrier from the vehicle and pull it forwards slightly to make some space (whichever is more practical based on the vehicle version) ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Performing service position and resetting .*
- *Various pulley versions with differing diameters may be fitted depending on the type of air conditioner compressor and the engine version ⇒ Electronic parts catalogue .*
- *The pulley and magnetic clutch are available as a replacement part (single part number). The pulley and the drive plate may be held together by a bolt (bolt is not required; can be disposed of). This bolt is used during manufacturing to insert a pre-determined amount of a specific grease into the thread of the drive plate (sufficient for fitting the drive plate onto the compressor shaft once; do not re-use a drive plate that has been unscrewed) ⇒ Electronic parts catalogue .*



1 - Cap

- ❑ Not always fitted

2 - Clutch plate

- ❑ Renew
- ❑ Screwed onto compressor shaft
  - – Clean contact surfaces of clutch plate and pulley before attaching.
  - – Clean thread of compressor shaft before screwing on clutch plate.
  - – After tightening, check gap width between pulley and clutch plate and correct if necessary ⇒ page 365 .

Note

Thread of new clutch 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

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free-wheel without driving air conditioner compressor when magnetic clutch -N25- is activated

Detaching/attaching

– To detach, hold compressor shaft -C- in position and use a suitable tool to turn clutch plate in direction of -arrow- (anti-clockwise) as described for drive plate on an air conditioner compressor without magnetic clutch ⇒ page 361 .

❑ Tightening torque: 30 Nm

3 - Disc

4 - Spacer

❑ For adjusting gap between clutch plate and pulley

❑ Checking gap ⇒ page 366

5 - Circlip

❑ Renew

❑ Ensure correct installation position (flat side facing air conditioner compressor)

❑ When fitting circlip, take care not to bend it open more than necessary.

– Ensure that circlip is fitted correctly (bevelled side -A- faces away from air conditioner compressor; flat side faces compressor).

6 - Pulley

❑ Pulley is sensitive to impact and should therefore be treated with care.

❑ Clean air conditioner compressor flange before fitting pulley.

❑ Different versions (depending e.g. on type of engine) ⇒ Electronic parts catalogue

❑ If pulley cannot be detached from air conditioner compressor flange by hand, refer to ⇒ page 365 .

7 - Circlip

❑ Renew

❑ Ensure correct installation position (flat side facing air conditioner compressor)

❑ When fitting circlip, take care not to bend it open more than necessary.

– Ensure that circlip is fitted correctly (bevelled side -A- faces away from air conditioner compressor; flat side faces compressor).

8 - Solenoid

❑ When installing, make sure retainer for cable -B- is positioned correctly.

❑ Depending on version, connector -D- may be attached to air conditioner compressor with a bracket.

9 - Air conditioner compressor

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❑ Different versions may be fitted, depending on engine type and country-specific version of vehicle ⇒ Electronic parts catalogue .

❑ Clean air conditioner compressor flange before fitting pulley.

❑ Clean thread of compressor shaft and apply a small quantity of grease to thread.

Note

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

3.3 Detaching and attaching air conditioner compressor at bracket

⇒ “3.3.1 Detaching and attaching air conditioner compressor at bracket (mechanically driven air conditioner compressor) - vehicles with 4-cyl. engine”, page 286

⇒ “3.3.2 Detaching and attaching air conditioner compressor at bracket (mechanically driven air conditioner compressor) - vehicles with 6-cyl. TDI engine”, page 289

⇒ “3.3.3 Detaching and attaching air conditioner compressor at bracket (electrically driven)”, page 292

3.3.1 Detaching and attaching air conditioner compressor at bracket (mechanically driven air conditioner compressor) - vehicles with 4-cyl. engine

Note

- *At the start of production, vehicles with 4-cyl. or 6-cyl. engine are fitted only with air conditioner compressors manufactured by “Denso” (type “6 SEU 14”). Depending on the engine and production period, air conditioner compressors produced by other manufacturers or a different version may be installed at a later date ⇒ Electronic parts catalogue .*
- *On vehicles with 4-cyl. engine or 6-cyl. TDI engine, the air conditioner compressor can be detached from the bracket and re-attached without opening the refrigerant lines.*
- *On vehicles with 6-cyl. petrol engine or 8-cyl. FSI engine, the air conditioner compressor can only be detached from the bracket and removed with the refrigerant circuit opened ⇒ “3.5 Removing and installing air conditioner compressor”, page 314 and ⇒ “3.5.4 Removing and installing air conditioner compressor - vehicles with 6-cyl. petrol engine”, page 331 .*
- *On vehicles with 8-cyl. FSI engine, the air conditioner compressor is driven via a drive shaft that can only be removed and renewed if the compressor has been removed first ⇒ page 278 .*
- *The procedures for detaching and attaching the air conditioner compressor are described in the following for vehicles with 4-cyl. TDI engine or 6-cyl. TDI engine with a “Denso” compressor (type “6 SEU 14”). There may be differences for vehicles with 4-cyl. engine or a different type of air conditioner compressor (depending on the engine, it may also be necessary to remove or unfasten certain ancillaries or leave them in position).*
- *Do not discharge the refrigerant circuit when detaching the air conditioner compressor from the bracket. Do not detach refrigerant hoses and refrigerant lines from the compressor.*
- *Do not unfasten the refrigerant lines and corresponding clamps.*
- *After detaching the air conditioner compressor, secure it to the vehicle, e.g. with a piece of wire. Do not leave it hanging from the refrigerant lines.*
- *Before removal, mark direction of rotation of poly V-belt with chalk or felt-tipped pen. Running a used pulley in the opposite direction could damage it irreparably.*

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- *Depending on the engine and the country-specific version, different air conditioner compressors may be installed ⇒ Electronic parts catalogue.*

Detaching

Proceed as follows:

– Switch off ignition.

– Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .

– Mark direction of poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

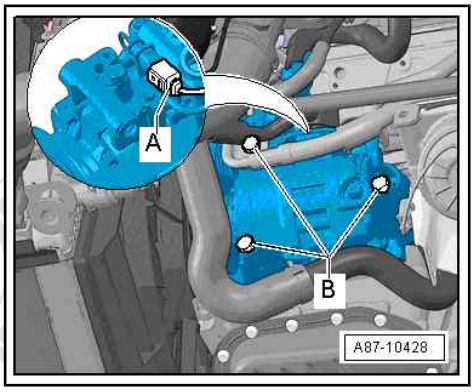
– Detach poly V-belt -A- ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

– Unplug electrical connector -A-.

– Unscrew bolts -B- for air conditioner compressor.

– Detach air conditioner compressor and swivel it away from engine as far as possible without kinking or straining refrigerant hoses.

– Attach air conditioner compressor to vehicle (e.g. with a piece of wire) so that refrigerant hoses are not kinked or strained.



Caution

Risk of damage to refrigerant lines and hoses.

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

Note

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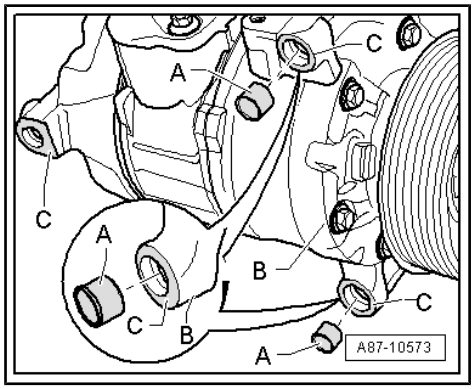
- *If the air conditioner compressor cannot be swivelled far enough away from the engine, the compressor must be removed completely ⇒ page 314 .*

- *Depending on the engine (petrol or diesel), the air conditioner compressor must be removed from the top or bottom. If the air conditioner compressor is removed from the top, it may be necessary to unfasten the coolant expansion tank from the vehicle and release the coolant lines from the brackets (do not open coolant circuit) and swivel them to the side slightly ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pipes .*

Attaching

Install in reverse order of removal; note the following:

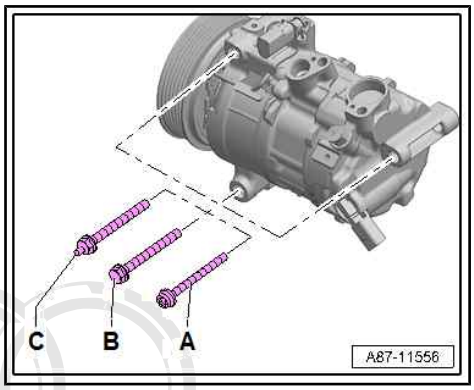
– Before securing air conditioner compressor, check position of both dowel sleeves -A- in bracket or compressor -B-.



Note

- *There are different versions of the dowel sleeves -A- (different length); for correct version refer to ⇒ Electronic parts catalogue .*
- *Make sure that bushes -A- are correctly positioned and contact surfaces are clean. Incorrectly fitted bushes or dirty/damaged contact surfaces -C- at the bracket or air conditioner compressor could lead to misalignment between the compressor and engine. After a period of operation, misalignment can cause damage to the poly V-belt or the air conditioner compressor.*

– Fit bolts -A-, -B- or -C-.



Caution

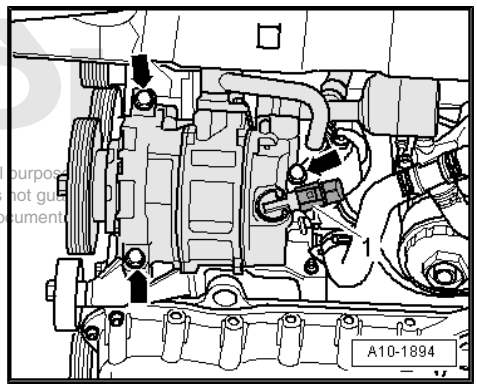
Different bolts and different tightening torques (depending on engine and production period)

- ***Ensure correct allocation ⇒ Electronic parts catalogue .***
- ***Use aluminium bolts only once; they must always be renewed (in this case: item -A-).***
- ***Tightening torque for aluminium bolts (in this case item -A-): 8 Nm +180°***
- ***Tightening torque for steel bolts (in this case -B- and -C-): 25 Nm***

– Tighten bolts -arrows-.

– Plug in electrical connector -1- at air conditioner compressor regulating valve - N280- .

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



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Note

- *After attaching air conditioner compressor, check routing of refrigerant lines. They must be inserted in the brackets provided (if fitted, depends on engine).*
- *Check that refrigerant lines and corresponding brackets have adequate clearance to other components, ensuring sufficient distance between belt, bracket and pulley.*

– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

3.3.2 Detaching and attaching air conditioner compressor at bracket (mechanically driven air conditioner compressor) - vehicles with 6-cyl. TDI engine

Note

- *At the start of production, vehicles with 4-cyl. or 6-cyl. engine are fitted only with air conditioner compressors manufactured by "Denso" (type "6 SEU 14"). Depending on the engine and production period, air conditioner compressors produced by other manufacturers or a different version may be installed at a later date ⇒ Electronic parts catalogue .*
- *On vehicles with 4-cyl. engine or 6-cyl. TDI engine, the air conditioner compressor can be detached from the bracket and re-attached without opening the refrigerant lines.*
- *On vehicles with 6-cyl. petrol engine or 8-cyl. FSI engine, the air conditioner compressor can only be detached from the bracket and removed with the refrigerant circuit opened ⇒ "3.5 Removing and installing air conditioner compressor", page 314 and ⇒ "3.5.4 Removing and installing air conditioner compressor - vehicles with 6-cyl. petrol engine", page 331 .*
- *On vehicles with 8-cyl. FSI engine, the air conditioner compressor is driven via a drive shaft that can only be removed and renewed if the compressor has been removed first ⇒ page 278 .*
- *The procedures for detaching and attaching the air conditioner compressor are described in the following for vehicles with 4-cyl. TDI engine or 6-cyl. TDI engine with a "Denso" compressor (type "6 SEU 14"). There may be differences for vehicles with 4-cyl. engine or a different type of air conditioner compressor (depending on the engine, it may also be necessary to remove or unfasten certain ancillaries or leave them in position).*
- *Do not discharge the refrigerant circuit when detaching the air conditioner compressor from the bracket. Do not detach refrigerant hoses and refrigerant lines from the compressor.*
- *Do not unfasten the refrigerant lines and corresponding clamps.*
- *After detaching the air conditioner compressor, secure it to the vehicle, e.g. with a piece of wire. Do not leave it hanging from the refrigerant lines.*
- *Before removal, mark direction of rotation of poly V-belt with chalk or felt-tipped pen. Running a used pulley in the opposite direction could damage it irreparably.*
- *Depending on the engine and the country-specific version, different air conditioner compressors may be installed ⇒ Electronic parts catalogue.*

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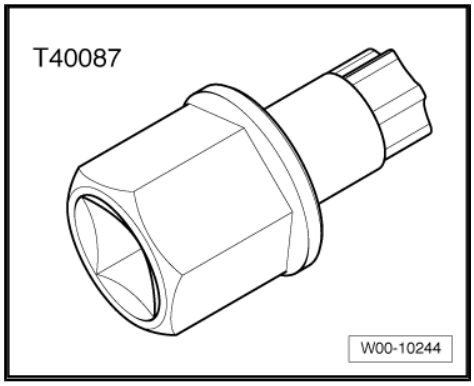
Special tools and workshop equipment required

♦ Socket Torx T60 - T40087-



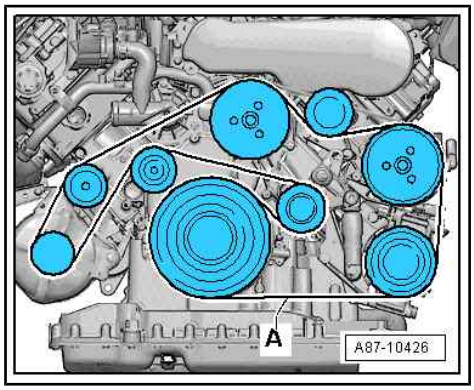
Detaching

Proceed as follows:

– Switch off ignition.

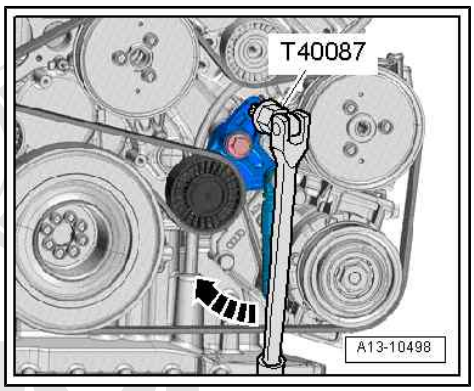
– Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .

– Mark direction of poly V-belt -A- ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .



– To slacken off poly V-belt, swivel tensioner with socket Torx T 60 - T40087- in direction of -arrow- ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

– Detach poly V-belt from poly V-belt pulley of air conditioner compressor and slacken off tensioner ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .



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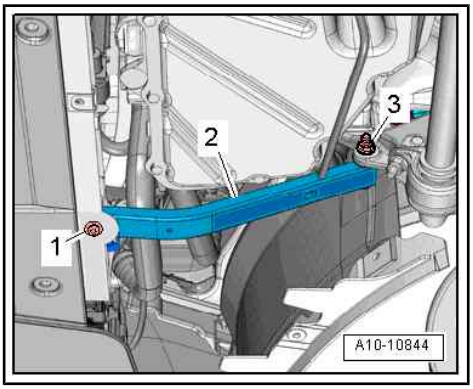
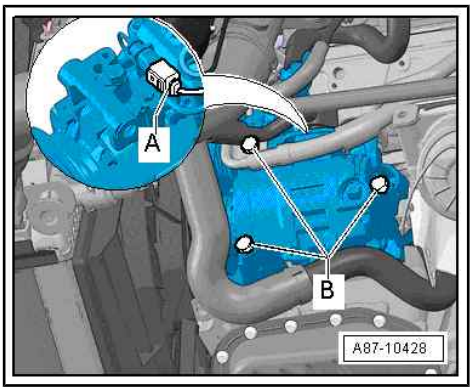
– On left side, unscrew bolt -1-, unscrew nut -3- and detach longitudinal strut -2-.
– If fitted, detach power steering pump from bracket (not always necessary on vehicles with a flexible pressure pipe to power steering pump) (⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Removing and installing power steering pump), swivel to side and attach to engine, e.g. with a piece of wire.



Note

- *When doing so, take care not to bend, kink or strain the pipes leading to the power steering pump.*
- *There are different versions of the pressure pipe to the power steering pump (rigid or flexible).*
- *The pressure pipe and the power steering pump are only fitted on vehicles without electromechanical power steering ⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Exploded view - power steering pump .*

– Unplug electrical connector -A-.
– Unscrew bolts -B- for air conditioner compressor.
– Detach air conditioner compressor and swivel it as far as possible away from engine without kinking or straining refrigerant hoses.
– Attach air conditioner compressor to vehicle (e.g. with a piece of wire) so that refrigerant hoses are not kinked or strained.



Caution

Risk of damage to refrigerant lines and hoses.

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

Note

- *If the air conditioner compressor cannot be swivelled far enough away from the engine, the compressor must be removed completely ⇒ page 324 .*
- *Depending on the engine version it may be necessary to additionally unfasten the lock carrier from the vehicle and pull it forwards slightly (to create some space) ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Performing service position and resetting .*

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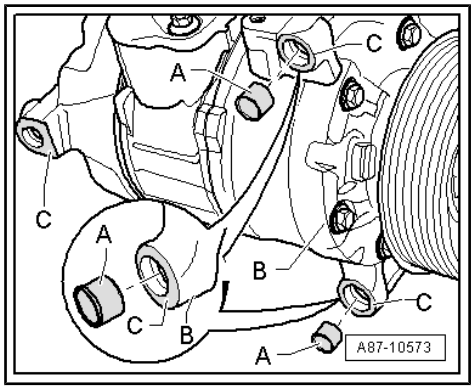
Attaching

Install in reverse order of removal; note the following:

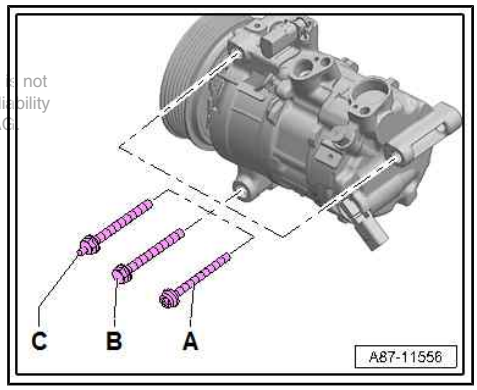
– Before securing air conditioner compressor, check position of both dowel sleeves -A- in bracket or compressor -B-.



Note

- *There are different versions of the dowel sleeves -A- (different length); for correct version refer to ⇒ Electronic parts catalogue .*
- *Make sure that bushes -A- are correctly positioned and contact surfaces are clean. Incorrectly fitted bushes or dirty/damaged contact surfaces -C- at the bracket or air conditioner compressor could lead to misalignment between the compressor and engine. After a period of operation, misalignment can cause damage to the poly V-belt or the air conditioner compressor.*

– Fit bolts -A-, -B- or -C-.



Caution

Different bolts and different tightening torques (depending on engine and production period)

- ***Ensure correct allocation ⇒ Electronic parts catalogue .***
- ***Use aluminium bolts only once; they must always be renewed (in this case: item -A-).***
- ***Tightening torque for aluminium bolts (in this case item -A-): 8 Nm +180°***
- ***Tightening torque for steel bolts (in this case -B- and -C-): 25 Nm***

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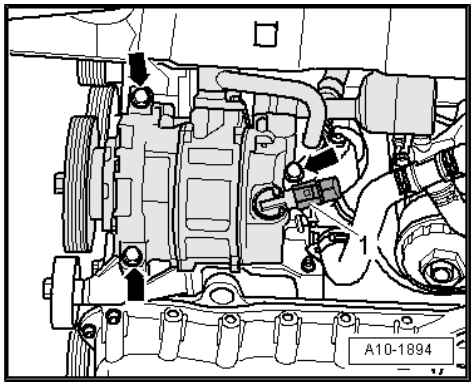
– Tighten bolts -arrows-.

– Plug in electrical connector -1- at air conditioner compressor regulating valve - N280- .

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



Note

- *After attaching air conditioner compressor, check routing of refrigerant lines. They must be inserted in the brackets provided (if fitted, depends on engine).*
- *Check that refrigerant lines and corresponding brackets have adequate clearance to other components, ensuring sufficient distance between belt, bracket and pulley.*

– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

3.3.3 Detaching and attaching air conditioner compressor at bracket (electrically driven)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles

⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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Note

- *With control unit for air conditioning compressor - J842- and electrical air conditioner compressor - V470-*
- *The electric motor of the air conditioner compressor is supplied with power by the power and control electronics for electric drive - JX1- .*
- *The control unit for air conditioning compressor - J842- integrated in the air conditioner compressor regulates the speed and thereby the output of the air conditioner compressor (electrical air conditioner compressor - V470-) based on the request received via the data bus ⇒ Vehicle diagnostic tester, "Guided Fault Finding" function for air conditioner and battery regulation .*
- *The electrically driven air conditioner compressor is not fitted with an air conditioner compressor regulating valve - N280- . The output of the air conditioner compressor is regulated externally via the air conditioner compressor speed ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode for air conditioner and battery regulation .*
- *At present, the electrically driven air conditioner compressor operates on the principle of a scroll-type supercharger (similar to the "G-Lader" supercharger).*
- *The control unit for air conditioning compressor - J842- and the electrical air conditioner compressor - V470- form one component and cannot be separated at present.*

As work on the high-voltage system is required for the following sequence of operations, de-energise the high-voltage system ⇒ page 36 , ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system . Pay particular attention to the "General warning instructions for work on the high-voltage system" ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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Note

- *On vehicles with 4-cyl. engine, the air conditioner compressor can be detached from the bracket and re-attached without opening the refrigerant lines.*
- *Do not discharge the refrigerant circuit when detaching the air conditioner compressor from the bracket. Do not detach refrigerant hoses and refrigerant lines from the compressor.*
- *Do not unfasten the refrigerant lines and corresponding clamps.*
- *Leave the high-voltage system wire connected to the air conditioner compressor. Do not release the high-voltage system connector at the air conditioner compressor.*
- *After detaching the air conditioner compressor, secure it to the vehicle, e.g. with a piece of wire. Do not leave it hanging from the refrigerant lines.*
- *Depending on the engine and the country-specific version, different air conditioner compressors may be installed ⇒ Electronic parts catalogue.*

Detaching

As work on the high-voltage system is required for the following sequence of operations, de-energise the high-voltage system ⇒ page 36 , ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system . Pay particular attention to the “General warning instructions for work on the high-voltage system” ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

– Switch off ignition.

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

De-energising high-voltage system

DANGER!

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High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

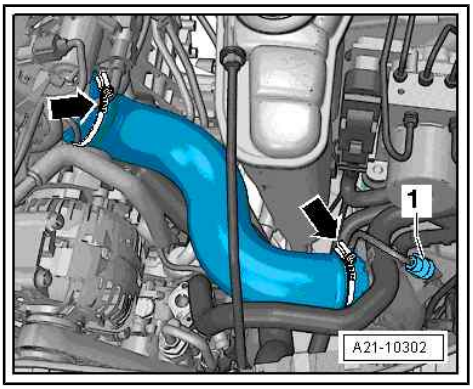
- *The high-voltage system may only be de-energised by a suitably qualified person (Audi high-voltage technician).*
- *It must be definitely confirmed that the high-voltage system is de-energised. The system may only be de-energised using the vehicle diagnostic tester via “Guided Fault Finding”.*
- *The qualified person (Audi high-voltage technician) confirms that the system is de-energised and uses the locking cap - T40262- to ensure that the system cannot be re-energised. As an additional precaution, the ignition key and the maintenance connector for high-voltage system - TW- are then stored in a safe place by the qualified person.*
- *The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.*

Note

- *De-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - De-energise high-voltage system (Rep. gr. 93)`

– Detach engine cover panel ⇒ Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

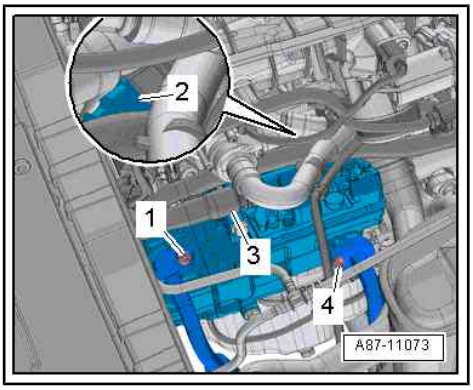
– Unfasten hose clips -arrows- and detach air hose.



Note

-Item 1- can be disregarded.

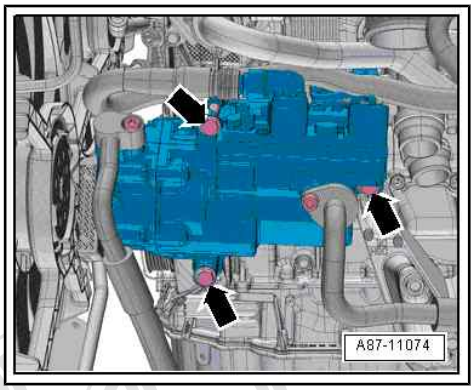
– Move clear electrical connector -3- for high-voltage system at engine.
– Unplug electrical connector -2- (for low voltage on air conditioner compressor).



Note

Disregard items -1 and 4-.

– Unscrew bolts -arrows- for air conditioner compressor.



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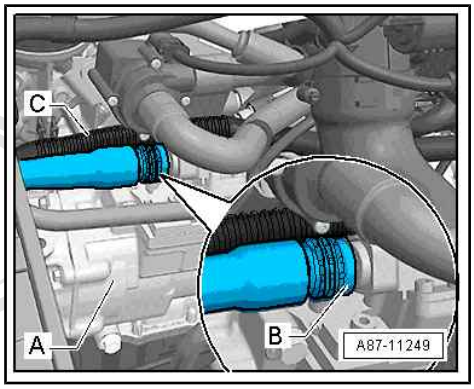
– Detach air conditioner compressor -A- and swivel it to the left away from the engine as far as possible without kinking or straining the cable of the high-voltage system -C- or the refrigerant hoses.



Caution

Risk of damaging cable or connector of high-voltage system

- ***Take care not to twist or bend the connector of the high-voltage system -B-.***
- ***Take care not to twist, strain, kink or bend the cable of the high-voltage system -C-.***

– Attach the air conditioner compressor to the vehicle (e.g. with a piece of wire) such that neither the high-voltage system cable nor the refrigerant hoses are kinked or strained.

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Caution

Risk of damage to high-voltage system wire or refrigerant lines and hoses.

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

Note

If the air conditioner compressor cannot be swivelled far enough away from the engine, the compressor must be removed completely ⇒ page 317 .

Attaching

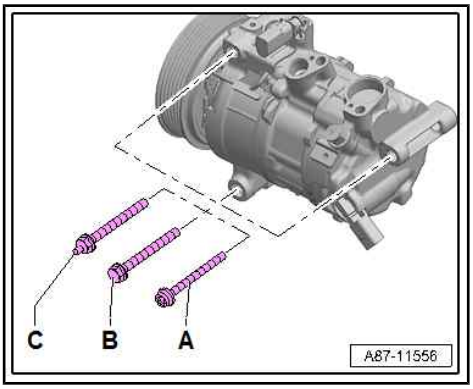
Install in reverse order of removal; note the following:

- Prior to installation, check the air conditioner compressor and bracket attachment points. The contact surfaces must be clean and free from rust and grease. If this is not the case, treat the contact surfaces accordingly with the contact surface cleaning set - VAS 6410- ⇒ Electrical system; General information; Rep. gr. 97 ; Cleaning contact surfaces .

Note

- *After re-installing the electrically driven air conditioner compressor (if removed) and then charging the refrigerant circuit, first start up the compressor via the "Compressor run-in" function of the basic setting routine. Otherwise, the air conditioner compressor may be damaged if refrigerant oil has accumulated in the compression chamber of the air conditioner compressor on account of inappropriate storage prior to installation ⇒ page 317 and ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode for air conditioner and battery regulation .*
- *An electrically driven air conditioner compressor may only be activated when the refrigerant circuit is charged. Running the air conditioner compressor with the refrigerant circuit empty could lead to compressor damage ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode for air conditioner and battery regulation .*

– Fit bolts -A-, -B- or -C-.



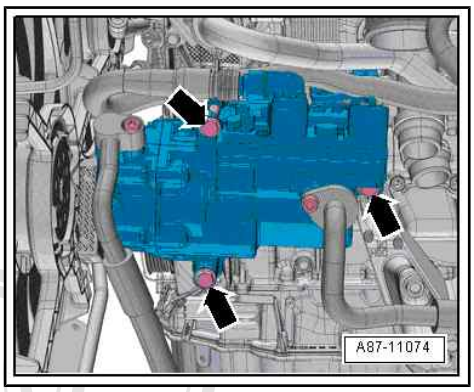
Caution

Different bolts and different tightening torques (depending on engine and production period)

- *Ensure correct allocation ⇒ Electronic parts catalogue .*
- *Use aluminium bolts only once; they must always be renewed (in this case: item -A-).*
- *Tightening torque for aluminium bolts (in this case item -A-): 8 Nm +180°*
- *Tightening torque for steel bolts (in this case -B- and -C-): 25 Nm*

– Tighten bolts -arrows-.

– Plug in connector for vehicle electrical system.



Note

- *After attaching air conditioner compressor, check routing of refrigerant lines. They must be inserted in the brackets provided (if fitted, depends on engine).*
- *Check that refrigerant lines and corresponding brackets have adequate clearance to other components, ensuring sufficient distance between belt, bracket and pulley.*

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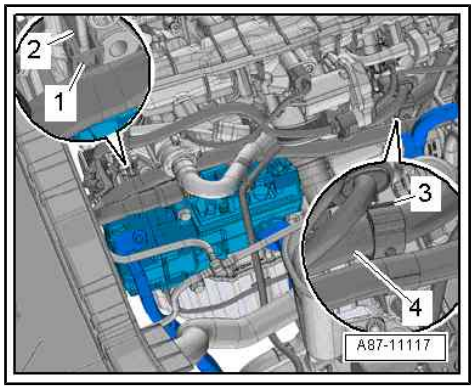
– Attach the high-voltage system wire at the specified positions on the engine.
– Secure clip -1- at engine -2- and retainer -3- at wiring harness -4- as shown in illustration.
– Install air hoses with screw-type clips ⇒ Rep. gr. 21 ; Charge air system; Exploded view - charge air system .
– Re-install remaining components (removed earlier).
– Re-energise power supply of high-voltage system ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system .



Re-energising high-voltage system

DANGER!

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

- ***The high-voltage system may only be re-energised by a suitably qualified person (Audi high-voltage technician).***
- ***The system may only be re-energised using the vehicle diagnostic tester via "Guided Fault Finding".***
- ***The vehicle is then made ready for operation again by the qualified person (Audi high-voltage technician).***
- ***The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.***

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Note

- *Re-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - Re-energise high-voltage system (Rep. gr. 93)`

– Switch on ignition.
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and control unit for air conditioning compressor - J842- and erase any faults displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .

3.4 Detaching and attaching refrigerant lines at air conditioner compressor

⇒ "3.4.1 Detaching and attaching refrigerant lines at air conditioner compressor - vehicles with 4-cyl. engine", page 301

⇒ "3.4.2 Detaching and attaching refrigerant lines at air conditioner compressor - vehicles with 6-cyl. engine", page 306

⇒ "3.4.3 Detaching and attaching refrigerant lines at air conditioner compressor - vehicles with 8-cyl. FSI engine", page 310

3.4.1 Detaching and attaching refrigerant lines at air conditioner compressor - vehicles with 4-cyl. engine

Note

- *The air conditioner compressor without air conditioning system magnetic clutch - N25- is always driven when the engine is running. On vehicles with an air conditioner compressor without -N25- , it is therefore important not to 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. The internal heat generation is caused by the air conditioner compressor operating against a fixed resistance even at approximately 0 % delivery rate (sealed circuit).*
- *From model year 2012 onwards, air conditioner compressors with an additional air conditioning system magnetic clutch - N25- fitted are gradually being introduced for certain vehicles with 4-cyl. engines ⇒ page 365 . In certain air conditioner operating modes (e.g. "Econ" mode), the air conditioner compressor drive system is deactivated completely via this magnetic clutch. For -N25- to be activated by the operating and display unit (Climatronic control unit - J255-), the correct version of -J255- must be fitted and correctly encoded ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .*
- *Seal the open lines and connections at the air conditioner compressor with suitable caps (to prevent dirt and moisture from entering).*

Detaching

– Switch off ignition.

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

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Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

Vehicles with high-voltage system (hybrid vehicles)

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For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- ***Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.***
- ***High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.***
- ***The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.***

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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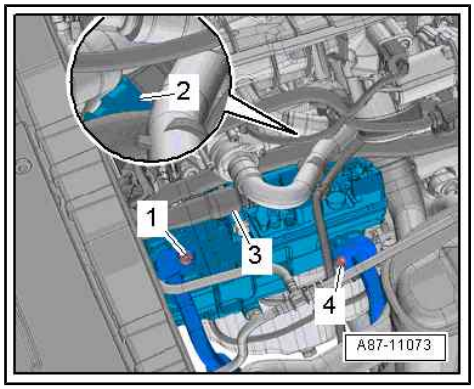
– Remove bolts -1- and -4-.

– Detach refrigerant lines.



Vehicles without high-voltage system

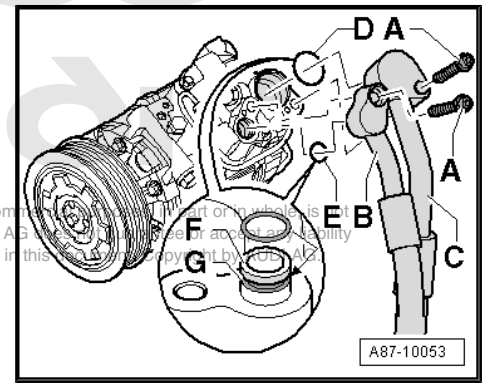
- Detach air conditioner compressor from bracket (only if refrigerant lines cannot be detached with compressor attached) ⇒ page 286 .

Note

- *On vehicles with 4-cyl. engine, it is not always necessary to detach the air conditioner compressor from the bracket to remove the refrigerant lines. Depending on the version of the power steering pump, it may be possible to detach the refrigerant lines from the air conditioner compressor with the compressor attached to the bracket.*
- *The power steering pump is only fitted on vehicles without electromechanical power steering ⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Exploded view - power steering pump .*
- *On vehicles with 4-cyl. engine on which the bolts at the refrigerant line connections at the air conditioner compressor are not accessible, the compressor must be detached from the bracket ⇒ page 286 .*
- *If the refrigerant line on the low-pressure side (from refrigerant line with internal heat exchanger to air conditioner compressor) is to be removed, the number of components that must be removed depends on the routing of the refrigerant line (routing depends on engine).*

– Remove bolts -A-.

– Detach refrigerant lines -B- and -C-.



All vehicles

Caution

Risk of damage to refrigerant lines and hoses.

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

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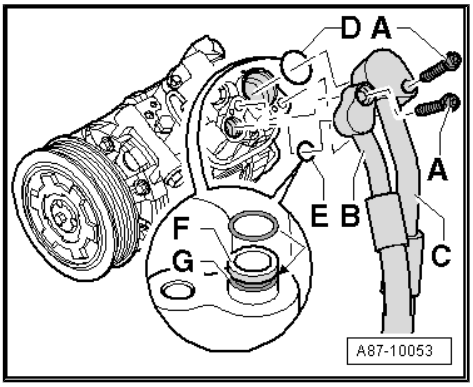
Note

Seal the open lines and connections at the air conditioner compressor with suitable caps (to prevent dirt and moisture from entering).

Attaching

Install in reverse order of removal; note the following:



- Renew O-rings -D- and -E-; for correct version refer to ⇒ Electronic parts catalogue.
- Check guide ring -F- at connections of both refrigerant lines -B- and -C- for damage.
- Clean connections of refrigerant lines and connections at air conditioner compressor and check them for damage.
- Lubricate O-rings lightly with refrigerant oil before installing ⇒ page 106 .
- Insert appropriate O-ring -D- and -E- in groove -G- at connections of both refrigerant lines -B- and -C-.

Note

- *Do not use O-rings from caps of replacement compressor connections.*
- *Make sure O-rings are positioned correctly in groove -G- of corresponding refrigerant line.*

- Insert both refrigerant lines -B- and -C- in corresponding connections at air conditioner compressor.
- Tighten bolts -A- to 9 Nm (bolts with M6 thread) / 25 Nm (bolts with M8 thread).

Note

After attaching the refrigerant lines to the air conditioner compressor (and after installing the compressor) check the routing of the lines. They must be inserted in the brackets provided and must not make contact with other components.

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- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
- Re-install remaining components (removed earlier).
- Switch on ignition.
- Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

3.4.2 Detaching and attaching refrigerant lines at air conditioner compressor - vehicles with 6-cyl. engine

Note

- *The air conditioner compressor without air conditioning system magnetic clutch - N25- is always driven when the engine is running. On vehicles with an air conditioner compressor without -N25- , it is therefore important not to 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. The internal heat generation is caused by the air conditioner compressor operating against a fixed resistance even at approximately 0 % delivery rate (sealed circuit).*
- *Seal the open lines and connections at the air conditioner compressor with suitable caps (to prevent dirt and moisture from entering).*
- *The following description of the procedure for detaching and attaching the refrigerant lines refers to a vehicle with 6-cyl. TDI engine. There might be slight differences on vehicles with a 6-cyl. petrol engine; however, the refrigerant lines must be detached and attached in the same manner.*

Detaching

– Switch off ignition.

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

Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), 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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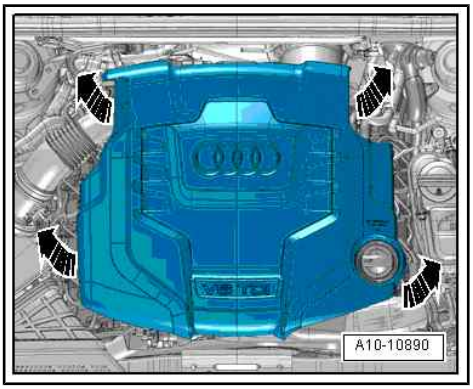
– Detach engine cover panel -arrows-.



– Remove dipstick -1- (if fitted).

– Unfasten hose clamp -3- and detach air hose.

– Unplug electrical connector -4-.

– Unscrew bolts -2- and detach throttle valve module - J338- .

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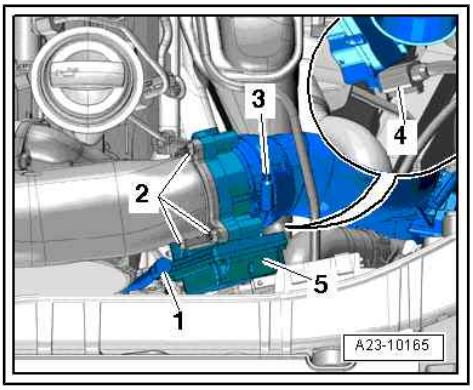
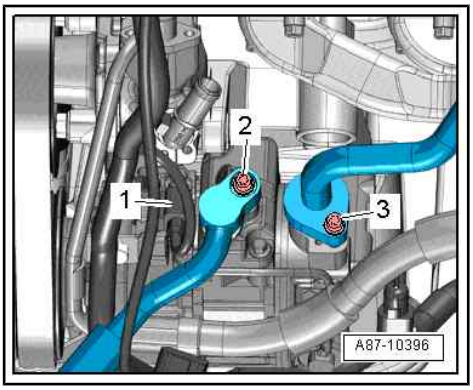


– Unplug electrical connector -1- for air conditioner compressor regulating valve - N280- .



Caution

Risk of damage to refrigerant lines and hoses.

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

– Unscrew bolts -2- and -3- and detach refrigerant lines from air conditioner compressor.

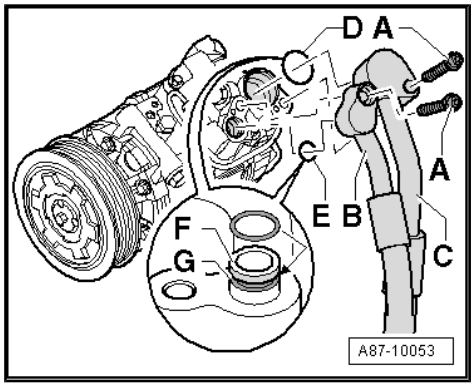
Note

- *Seal the open lines and connections at the air conditioner compressor with suitable caps (to prevent dirt and moisture from entering).*
- *Vehicles with petrol engine and dynamic steering: Depending on the installation position of the suction hose at the steering hydraulics pump (power steering pump) and the other work steps required, a commercially available long screwdriver bit (with ball head if available) must be used to loosen and tighten bolt -2- of the refrigerant line. When doing so, carefully press the suction hose slightly to the side (⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Exploded view - hydraulic lines, reservoir), or unfasten the air conditioner compressor from the bracket in order to detach the refrigerant lines ⇒ page 331 .*

Attaching

Install in reverse order of removal; note the following:

– Renew O-rings -D- and -E-; for correct version, refer to ⇒ Electronic parts catalogue .
– Check guide ring -F- at connections of both refrigerant lines -B- and -C- for damage.
– Clean connections of refrigerant lines and connections at air conditioner compressor and check them for damage.



Note

- *Do not use the O-rings from the caps of the replacement air conditioner compressor connections.*
- *Observe fitting instructions for O-rings* *⇒ page 106* .

– Lubricate O-rings lightly with refrigerant oil before installing ⇒ page 106 .
– Insert appropriate O-ring -D- and -E- in groove -G- at connections of both refrigerant lines -B- and -C-.

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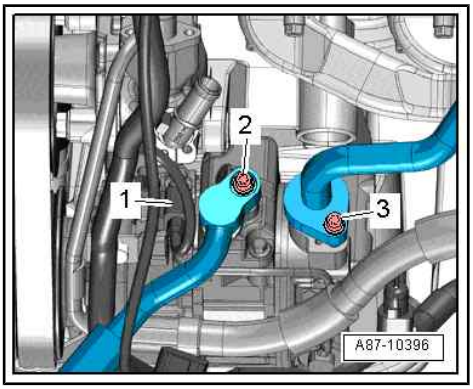

– Insert both refrigerant lines in corresponding connection at air conditioner compressor.
– Tighten bolts -2- and -3-.
• Tightening torque: 9 Nm (for bolts with M6 thread) / 25 Nm (for bolts with M8 thread).

Note

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.

– Plug in electrical connector -1- at air conditioner compressor regulating valve - N280- .
– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
– Re-install remaining components (removed earlier).
– Switch on ignition.
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

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3.4.3 Detaching and attaching refrigerant lines at air conditioner compressor - vehicles with 8-cyl. FSI engine

Note

- *The air conditioner compressor without air conditioning system magnetic clutch - N25- is always driven when the engine is running. On vehicles with an air conditioner compressor without -N25- , it is therefore important not to 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. The internal heat generation is caused by the air conditioner compressor operating against a fixed resistance even at approximately 0 % delivery rate (sealed circuit).*
- *Seal the open lines and connections at the air conditioner compressor with suitable caps (to prevent dirt and moisture from entering).*

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Detaching

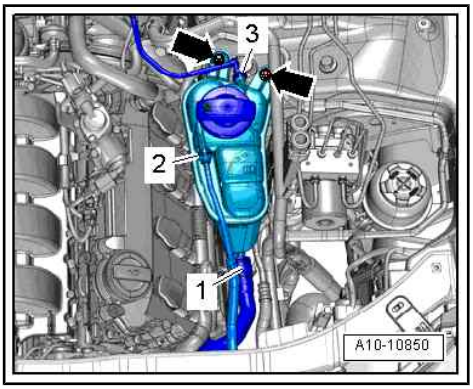
– Switch off ignition.

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

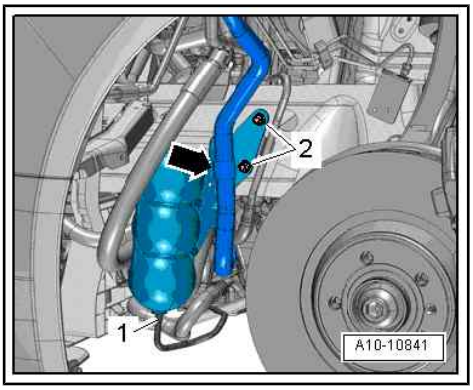
Note

- *Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .*
- *In contrast to other vehicles, on the Audi RS 4 and Audi RS 5 the coolant expansion tank does not have to be unfastened to remove the air conditioner compressor, but rather the air cleaner (left-side) must be removed ⇒ Rep. gr. 24 ; Air cleaner; Exploded view - air cleaner housing .*

– Detach coolant hose -3- from coolant expansion tank ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses (not on Audi RS 4 and Audi RS 5).
– Remove bolts -arrows- and move coolant expansion tank to side with coolant hoses -1- and -2- attached ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses (not on Audi RS 4 and Audi RS 5).
– Completely remove air cleaner (left-side) ⇒ Rep. gr. 24 ; Air cleaner; Exploded view - air cleaner housing (Audi RS 4 and Audi RS 5 only).
– Remove wheel housing liner (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .



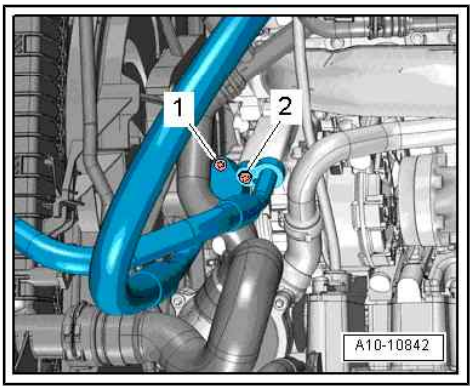
– Disconnect vacuum hose -1- and move clear hydraulic fluid hose -arrow- at bracket.
– Unscrew nuts -2- and detach vacuum reservoir.



Caution

Risk of damage to refrigerant lines and hoses.

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



– Remove bolt -2- and disconnect refrigerant line from air conditioner compressor.
– Remove bolt -1- and disconnect refrigerant line from air conditioner compressor.

Note

Seal the open lines and connections at the air conditioner compressor with suitable caps (to prevent dirt and moisture from entering).

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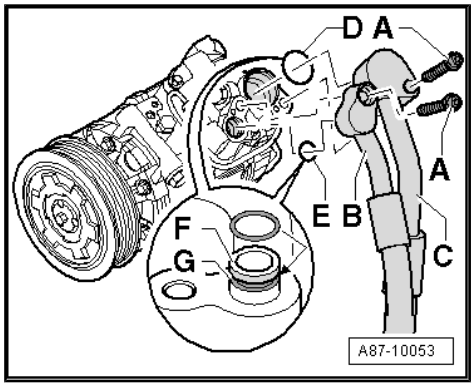
Attaching

Install in reverse order of removal; note the following:

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



Note

- *Do not use the O-rings from the caps of the replacement air conditioner compressor connections.*
- *Observe fitting instructions for O-rings ⇒ page 106 .*

– Check guide ring -F- at connections of both refrigerant lines -B- and -C- for damage.

– Clean connections of refrigerant lines and connections at air conditioner compressor and check them for damage.

– Lubricate O-rings lightly with refrigerant oil before installing ⇒ page 106 .

– Insert appropriate O-ring -D- and -E- in groove -G- at connections of both refrigerant lines -B- and -C-.

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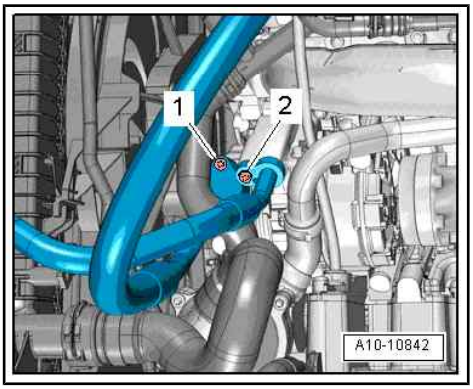
– Insert both refrigerant lines in corresponding connection at air conditioner compressor.
– Tighten bolts -1- and -2-.
• Tightening torque: 9 Nm (for bolts with M6 thread) / 25 Nm (for bolts with M8 thread).



Note

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.

– Install wheel housing liner (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
– Re-install remaining components (removed earlier).
– Switch on ignition.
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

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Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

3.5 Removing and installing air conditioner compressor

⇒ “3.5.1 Removing and installing air conditioner compressor (mechanically driven) - vehicles with 4-cyl. engine”, page 314

⇒ “3.5.2 Removing and installing air conditioner compressor (electrically driven) - vehicles with 4-cyl. engine”, page 317

⇒ “3.5.3 Removing and installing air conditioner compressor - vehicles with 6-cyl. TDI engine”, page 324

⇒ “3.5.4 Removing and installing air conditioner compressor - vehicles with 6-cyl. petrol engine”, page 331

⇒ “3.5.5 Removing and installing air conditioner compressor - vehicles with 8-cyl. FSI engine except RS models”, page 337

⇒ “3.5.6 Removing and installing air conditioner compressor - vehicles with 8-cyl. FSI engine, RS models”, page 350

3.5.1 Removing and installing air conditioner compressor (mechanically driven) - vehicles with 4-cyl. engine

Note

- *The compressor version may differ depending on production period and engine ⇒ page 145 and ⇒ Electronic parts catalogue*
- *The air conditioner compressors fitted at the start of production on vehicles without high-voltage system are manufactured by “Denso” (type “6 SEU 14” for vehicles with 4-cyl. and 6-cyl. engines and type “7 SEU 17” for vehicles with 8-cyl. engines). Different makes of air conditioner compressor may also be fitted at a later date ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils , or ⇒ “4 Technical data”, page 107 and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .*
- *Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue*
- *These air conditioner compressors are available as replacement parts with different oil capacities, so it is important to pay attention to the oil quantity in the air conditioner compressor and to check the exact part number ⇒ “4 Technical data”, page 107 , ⇒ 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 , and ⇒ Electronic parts catalogue .*
- *There are different refrigerant oil capacities for the refrigerant circuit depending on the type of air conditioner compressor. The reason for the different oil quantities in the air conditioner compressor for an otherwise identical refrigerant circuit is the design of the actual compressor; please note the different oil quantities. Too much oil in the 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.*

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- *After installing a new mechanically driven air conditioner compressor or filling up these air conditioner compressors with new refrigerant oil (e.g. after flushing the refrigerant circuit), turn the air conditioner compressor 10 turns by hand before using the air conditioner (this helps prevent damage to the 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 ; Refrigerant circuit; Renewing components .*

Removing

– Switch off ignition.

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

Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

– Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .

– Detach refrigerant lines from air conditioner compressor ⇒ page 301 .

Note

- *The sequence differs depending on the engine and the power steering pump. Depending on the version of the power steering pump, it may be necessary to detach the air conditioner compressor from the bracket in order to be able to detach the refrigerant lines.*
- *The power steering pump is only fitted on vehicles without electromechanical power steering ⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Exploded view - power steering pump .*
- *Depending on the engine (petrol or diesel), the air conditioner compressor must be removed from the top or bottom. If the air conditioner compressor is removed from the top, it may be necessary to unfasten the coolant expansion tank from the vehicle and release the coolant lines from the brackets (do not open coolant circuit) and swivel them to the side slightly ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pipes*

– Detach air conditioner compressor from bracket ⇒ page 286 .

Installing

Install in reverse order of removal; note the following.

Note

When it is removed, the air conditioner compressor contains an indeterminate amount of refrigerant oil. For this reason it is important to observe the notes on renewing the compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

Before installing air conditioner compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (Air conditioner with refrigerant R134a; General information on air conditioning systems), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

– Before fitting poly V-belt, turn air conditioner compressor 10 times via pulley in direction of rotation (to prevent damage to compressor on initial activation).
– Attach air conditioner compressor to bracket ⇒ page 286 .
– Attach refrigerant lines to air conditioner compressor ⇒ page 301 .

Note

- *Lubricate O-rings lightly with refrigerant oil before fitting ⇒ page 106 .*
- *Cranking prevents damage to the air conditioner compressor, which could be caused by refrigerant oil in the compression chamber on initial start-up of the engine.*

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
– Re-install remaining components (removed earlier).
– Switch on ignition.
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

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Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

3.5.2 Removing and installing air conditioner compressor (electrically driven) - vehicles with 4-cyl. engine

Note

- *The vehicles in this series with high-voltage systems are all fitted with refrigerant circuits charged with refrigerant R134a.*
- *The compressor version may differ depending on production period and engine ⇒ page 145 and ⇒ Electronic parts catalogue*
- *There are different refrigerant oil capacities for the refrigerant circuit depending on the type of air conditioner compressor. The reason for the different oil quantities in the air conditioner compressor for an otherwise identical refrigerant circuit is the design of the actual compressor; please note the different oil quantities. Too much oil in the 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.*
- *After installing a new electrically driven air conditioner compressor (electrical air conditioner compressor - V470-) or pouring in fresh refrigerant oil, start up this compressor via "Compressor run-in" function ⇒ Vehicle diagnostic tester ("Guided Fault Finding" for air conditioner and battery regulation) .*

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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As work on the high-voltage system is required for the following sequence of operations, de-energise the high-voltage system ⇒ page 36 , ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system . Pay particular attention to the “General warning instructions for work on the high-voltage system” ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

– Switch off ignition.

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

De-energising high-voltage system

DANGER!

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

- ***The high-voltage system may only be de-energised by a suitably qualified person (Audi high-voltage technician).***
- ***It must be definitely confirmed that the high-voltage system is de-energised. The system may only be de-energised using the vehicle diagnostic tester via "Guided Fault Finding".***
- ***The qualified person (Audi high-voltage technician) confirms that the system is de-energised and uses the locking cap - T40262- to ensure that the system cannot be re-energised. As an additional precaution, the ignition key and the maintenance connector for high-voltage system - TW- are then stored in a safe place by the qualified person.***
- ***The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.***

Note

- *De-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - De-energise high-voltage system (Rep. gr. 93)`

Removing

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

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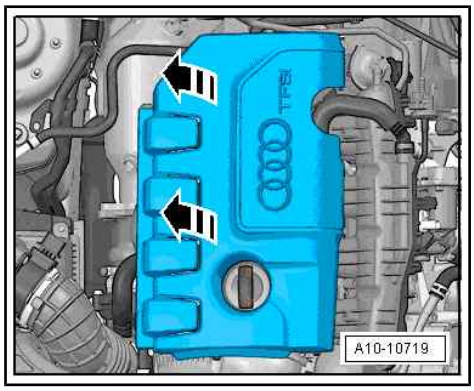
Note

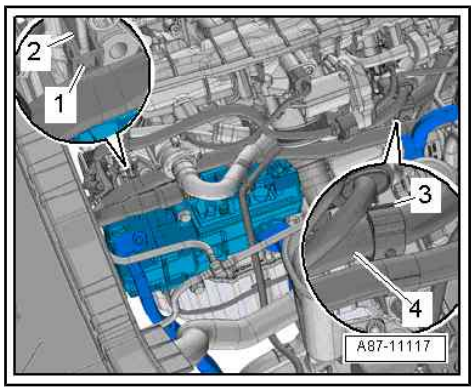
Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

– Detach engine cover panel -arrows- ⇒ Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



– Move clear attachment points -1- and -3- of high-voltage system cable at engine -2- and wiring harness -4-.

Release and detach high-voltage system connector -3- at air conditioner compressor.



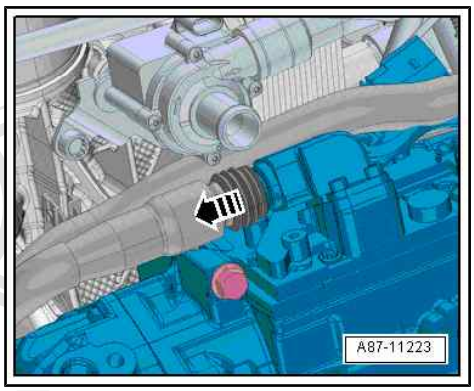
Caution

- *Take care not to bend high-voltage wires.*
- *After releasing the connector, make sure it is horizontal when unplugging it. Do NOT turn the connector.*

– Pull locking element in direction of -arrow-.

– Unplug connector from air conditioner compressor; connector must be horizontal and must not be turned.

– Cover high-voltage wire connector and mating plug at air conditioner compressor to prevent damage and contamination (e.g. with clean plugs from engine bung set - VAS 6122-).



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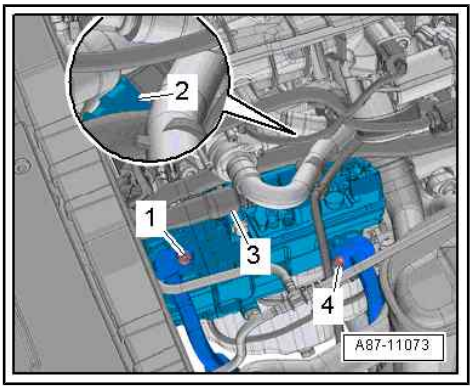
– Unplug electrical connector -2- (for low voltage on air conditioner compressor).

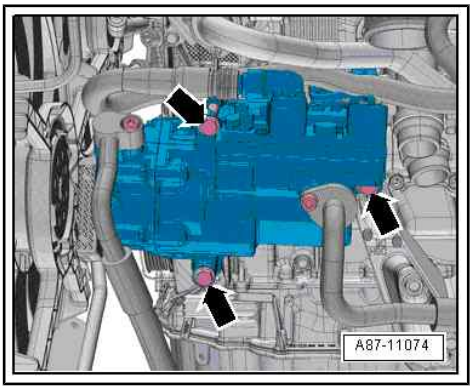


Note

Disregard items -1 and 4-.

– Detach refrigerant lines from air conditioner compressor ⇒ page 301 .

– Detach air conditioner compressor from bracket ⇒ page 292 .



Installing

Install in reverse order of removal; note the following.

Before installing air conditioner compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems .

Note

When it is removed, the air conditioner compressor contains an indeterminate amount of refrigerant oil. For this reason it is important to observe the notes on renewing the compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit .

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– Attach air conditioner compressor to bracket ⇒ page 292 .

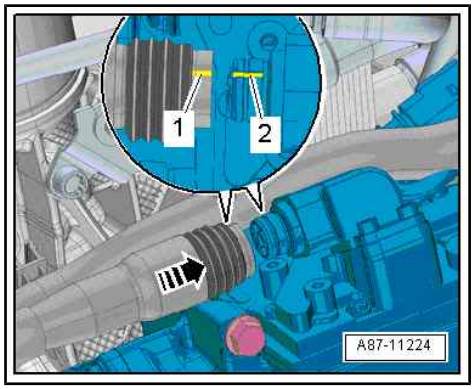
– Attach refrigerant lines to air conditioner compressor ⇒ page 301 .

Note

- *Lubricate O-rings lightly with refrigerant oil before fitting ⇒ page 106 .*
- *After installing the electrically driven air conditioner compressor and then charging the refrigerant circuit, first start up the compressor via the "Compressor run-in" function of the basic setting routine. Otherwise, the compressor can be damaged by refrigerant oil that may have accumulated in the compression chamber if the compressor has not been stored properly prior to installation ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode for air conditioner and battery regulation .⇒*
- *An electrically driven air conditioner compressor may only be activated when the refrigerant circuit is charged. Running the air conditioner compressor with the refrigerant circuit empty could lead to compressor damage ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode for air conditioner and battery regulation .*

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

– Plug in and lock high-voltage system connector at air conditioner compressor.



Caution

- *Take care not to bend high-voltage wires.*
- *Always plug the connector in at the air conditioner compressor in the specified position (connector coding). Do NOT turn the connector.*

– Check connector for dirt and damage.

– Plug in connector at air conditioner compressor.

• Marks -1- and -2- on connector and air conditioner compressor must align.

– Fasten locking element in direction of -arrow-.

– Re-install remaining components removed in reverse order.

– Re-energise power supply of high-voltage system ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system .

Re-energising high-voltage system

DANGER!

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

- *The high-voltage system may only be re-energised by a suitably qualified person (Audi high-voltage technician).*
- *The system may only be re-energised using the vehicle diagnostic tester via "Guided Fault Finding".*
- *The vehicle is then made ready for operation again by the qualified person (Audi high-voltage technician).*
- *The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.*

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Note

- *Re-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - Re-energise high-voltage system (Rep. gr. 93)`

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– Switch on ignition.

– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Start up electrical air conditioner compressor - V470- via “Compressor run-in” function ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner and battery regulation) .

– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems . Before using air conditioner after system has been re-charged.

3.5.3 Removing and installing air conditioner compressor - vehicles with 6-cyl. TDI engine

Note

- *The compressor version may differ depending on production period and engine ⇒ page 145 and ⇒ Electronic parts catalogue*
- *The air conditioner compressors fitted at the start of production on vehicles without high-voltage system are manufactured by "Denso" (type "6 SEU 14" for vehicles with 4-cyl. and 6-cyl. engines and type "7 SEU 17" for vehicles with 8-cyl. engines). Different makes of air conditioner compressor may also be fitted at a later date ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils , or ⇒ "4 Technical data", page 107 and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .*
- *Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue*
- *These air conditioner compressors are available as replacement parts with different oil capacities, so it is important to pay attention to the oil quantity in the air conditioner compressor and to check the exact part number ⇒ "4 Technical data", page 107 , ⇒ 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 , and ⇒ Electronic parts catalogue .*

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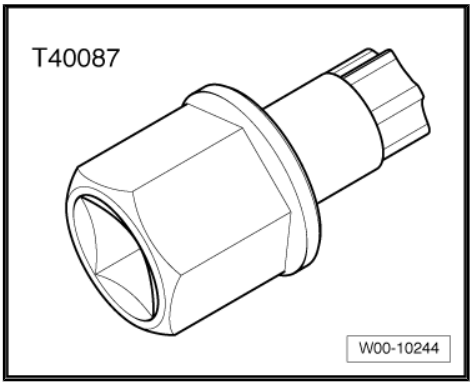
- *There are different refrigerant oil capacities for the refrigerant circuit depending on the type of air conditioner compressor. The reason for the different oil quantities in the air conditioner compressor for an otherwise identical refrigerant circuit is the design of the actual compressor; please note the different oil quantities. Too much oil in the 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.*
- *After installing a new mechanically driven air conditioner compressor or filling up these air conditioner compressors with new refrigerant oil (e.g. after flushing the refrigerant circuit), turn the air conditioner compressor 10 turns by hand before using the air conditioner (this helps prevent damage to the 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 ; Refrigerant circuit; General description of refrigerant circuit components .*

Special tools and workshop equipment required

- Socket Torx T60 - T40087-



Removing

– Switch off ignition.

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

Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

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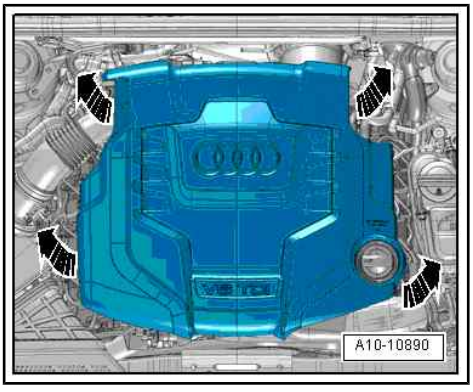
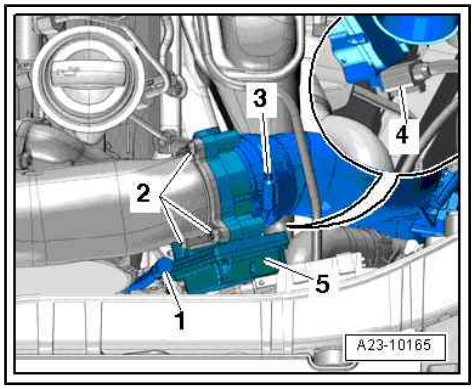
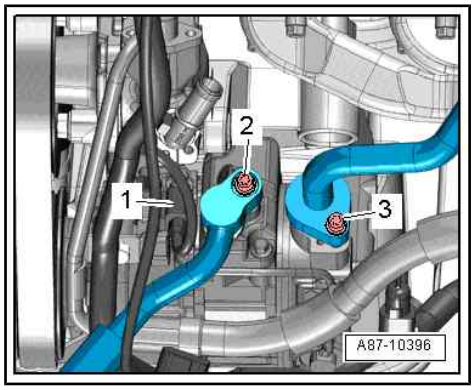
– Detach engine cover panel -arrows-.



– Remove dipstick -1- (if fitted).
– Unfasten hose clamp -3- and detach air hose.
– Unplug electrical connector -4-.
– Unscrew bolts -2- and detach throttle valve module - J338- .
– Detach coolant expansion tank and tilt it to one side ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .



– Unplug electrical connector -1- for air conditioner compressor regulating valve - N280- .



Caution

Risk of damage to refrigerant lines and hoses.

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

– Unscrew bolts -2- and -3- and detach refrigerant lines from air conditioner compressor ⇒ page 306 (Removing and installing refrigerant lines at air conditioner compressor).

Note

Seal the open lines and connections at the air conditioner compressor with suitable caps (to prevent dirt and moisture from entering).

– Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .

Note

Depending on the version of the vehicle, it may be necessary to remove the front bumper cover to make it possible to remove the noise insulation (e.g. on Audi A4 allroad) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .

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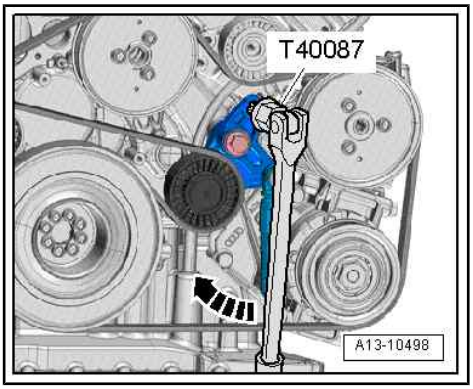
Caution

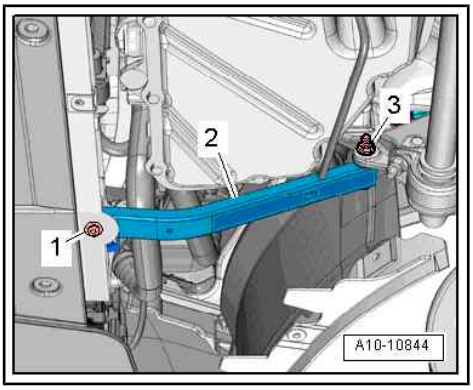
Wrong direction of rotation for a used poly V-belt can lead to irreparable damage.

- ***Before removing the poly V-belt mark the direction of rotation with chalk or a felt-tip pen for re-installation.***

– To slacken off poly V-belt, swivel tensioner with socket Torx T 60 - T40087- in direction of -arrow-.
– Detach poly V-belt from poly V-belt pulley of air conditioner compressor and slacken off tensioner.

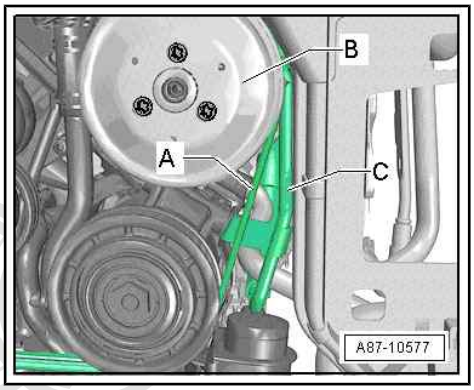


– On left side, unscrew bolt -1-, unscrew nut -3- and detach longitudinal strut -2-.
– If fitted, detach power steering pump from bracket (not always necessary on vehicles with a flexible pressure pipe to power steering pump) (⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Removing and installing power steering pump), swivel to side and attach to engine, e.g. with a piece of wire.



Note

- *The pressure pipe to the power steering pump -C- is attached to the air conditioner compressor via the bracket with the securing bolt. When detaching the air conditioner compressor, take care not to bend the pressure pipe to the power steering pump -C- more than absolutely necessary (max. 5 mm).*
- *Should it be necessary to bend the pressure pipe to the power steering pump -C- of the power steering system -A- by more than max. 5 mm to remove the air conditioner compressor, unfasten the power steering pump with the bracket from the engine and pull it forwards (⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Removing and installing power steering pump), swivel it aside and attach it to the engine with e.g. a piece of wire. When swivelling the power steering pump to the side, take care not to bend, kink or strain the pipes to the power steering pump.*
- *There are different versions of the pressure pipe to the power steering pump (rigid or flexible).*
- *The pressure pipe and the power steering pump are only fitted on vehicles without electromechanical power steering ⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Exploded view - power steering pump .*



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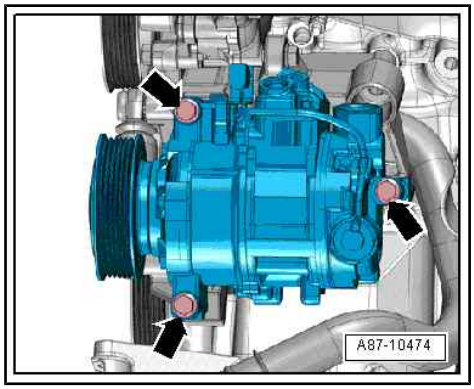
– Unscrew bolts -arrows- and detach air conditioner compressor.



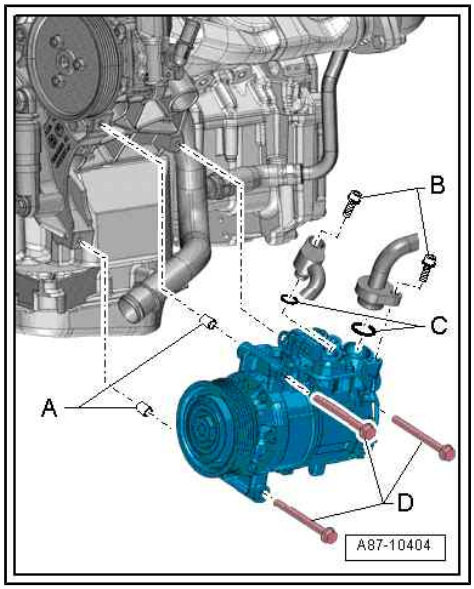
Installing

Install in reverse order of removal; note the following:

Note

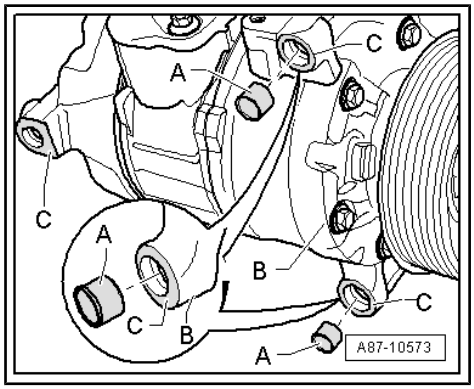
When it is removed, the air conditioner compressor contains an indeterminate amount of refrigerant oil. For this reason it is important to observe the notes on renewing the compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

– If necessary, remove dowel sleeves -A- from air conditioner compressor.
– Thoroughly clean contact surfaces on air conditioner compressor.
– Install dowel sleeves -A- 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 air conditioner compressor and engine. After a period of operation, misalignment can cause damage to the poly V-belt or the air conditioner compressor.*
- *There are different versions of the dowel sleeves -A- (different length), for correct version refer to ⇒ Electronic parts catalogue .*
- *Make sure that bushes -A- are correctly positioned and contact surfaces are clean. Incorrectly fitted bushes or dirty/damaged contact surfaces -C- at the bracket or air conditioner compressor could lead to misalignment between the compressor and engine. After a period of operation, misalignment can cause damage to the poly V-belt or the air conditioner compressor.*



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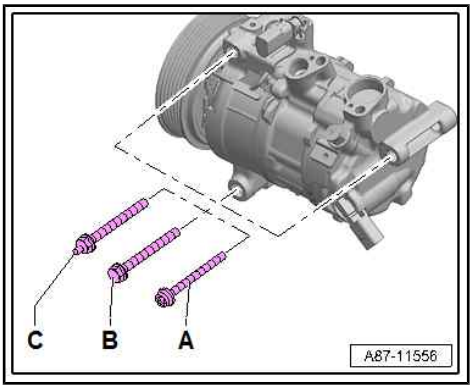
– Fit bolts -A-, -B- or -C-.

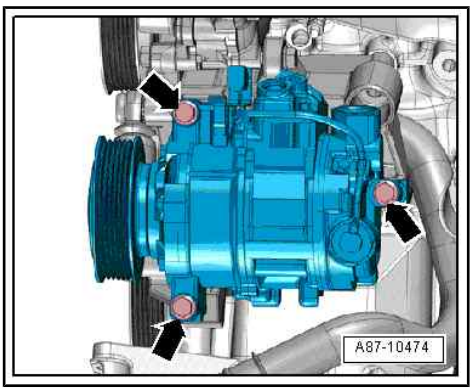


Caution

Different bolts and different tightening torques (depending on engine and production period)

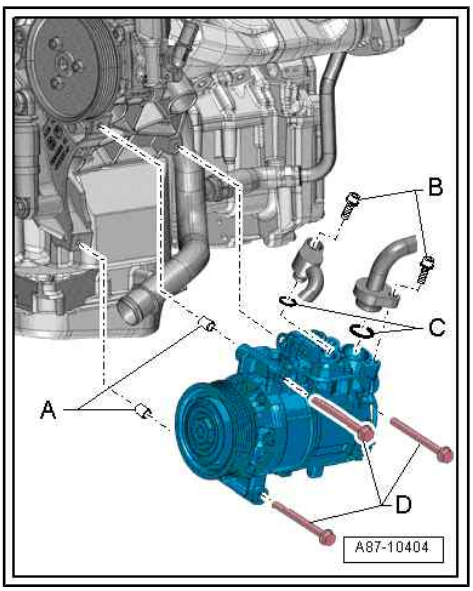
- *Ensure correct allocation ⇒ Electronic parts catalogue .*
- *Use aluminium bolts only once; they must always be renewed (in this case: item -A-).*
- *Tightening torque for aluminium bolts (in this case item -A-): 8 Nm +180°*
- *Tightening torque for steel bolts (in this case -B- and -C-): 25 Nm*

– Tighten bolts -arrows-.



– Attach refrigerant lines to air conditioner compressor. For tightening torque of bolts -B-, dimensions of O-rings -C- and additional information, refer to ⇒ page 306 and ⇒ Electronic parts catalogue .

– Before fitting poly V-belt, turn air conditioner compressor 10 times via pulley in direction of rotation (to prevent damage to compressor on initial activation).



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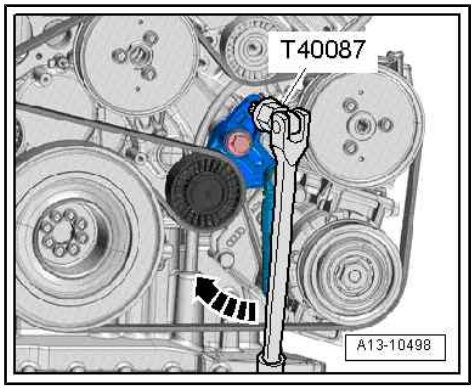
– To fit poly V-belt, swivel tensioner with socket Torx T 60 - T40087- in direction of -arrow- ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
– Install throttle valve module - J338- ⇒ Rep. gr. 23 ; Intake manifold; Removing and installing throttle valve module - J338- .
– Install longitudinal strut ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .



Note

- *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue .*
- *To ensure that the charge air hoses can be secured properly at their connections, spray rust remover onto the screws of used screw-type clips before fitting.*
- *After attaching the air conditioner compressor and the refrigerant line, check the routing of the refrigerant lines. They must be inserted in the brackets provided (if fitted, depends on engine).*
- *Check that refrigerant lines and corresponding brackets have adequate clearance to other components, ensuring sufficient distance between belt, bracket and pulley.*

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
– Re-install remaining components (removed earlier).
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

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3.5.4 Removing and installing air conditioner compressor - vehicles with 6-cyl. petrol engine

Note

- *The compressor version may differ depending on production period and engine ⇒ page 145 and ⇒ Electronic parts catalogue*
- *On vehicles with a 6-cyl. petrol engine or an 8-cyl. FSI engine, the air conditioner compressor can only be detached from the bracket and removed after the refrigerant circuit has been discharged ⇒ page 314 (Removing and installing air conditioner compressor).*
- *The air conditioner compressors fitted at the start of production on vehicles without high-voltage system are manufactured by "Denso" (type "6 SEU 14" for vehicles with 4-cyl. and 6-cyl. engines and type "7 SEU 17" for vehicles with 8-cyl. engines). Different makes of air conditioner compressor may also be fitted at a later date ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils , or ⇒ "4 Technical data", page 107 and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .*
- *Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue*
- *These air conditioner compressors are available as replacement parts with different oil capacities, so it is important to pay attention to the oil quantity in the air conditioner compressor (⇒ "4 Technical data", page 107 , ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils , or ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils) and to check the exact part number (⇒ Electronic parts catalogue).*
- *There are different refrigerant oil capacities for the refrigerant circuit depending on the type of air conditioner compressor. The reason for the different oil quantities in the air conditioner compressor for an otherwise identical refrigerant circuit is the design of the actual compressor; please note the different oil quantities. Too much oil in the 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.*
- *After installing a new mechanically driven air conditioner compressor or filling up these air conditioner compressors with new refrigerant oil (e.g. after flushing the refrigerant circuit), turn the air conditioner compressor 10 turns by hand before using the air conditioner (this helps prevent damage to the 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 ; Refrigerant circuit; General description of refrigerant circuit components .*

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Removing

– Switch off ignition.

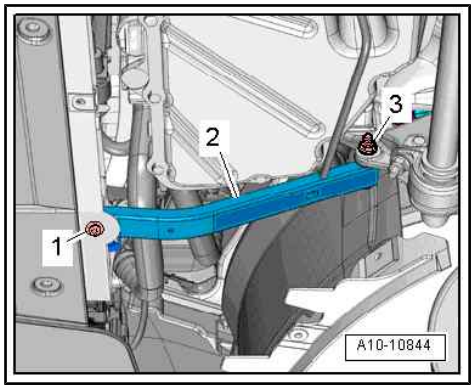
– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with

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

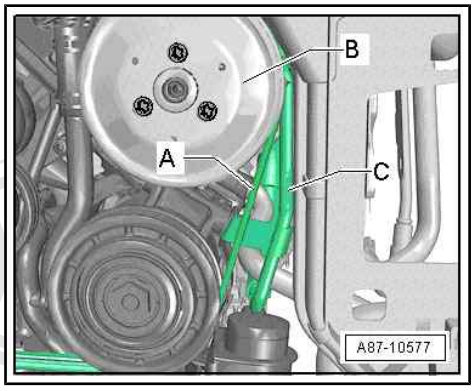
Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

– Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .
– Unscrew bolts -1- and nuts -3- and detach longitudinal strut (left-side) -2- ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .
– Take off front left wheel and remove front left wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .



– Mark direction of poly V-belt -A- ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
– Detach poly V-belt -A- ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
– If fitted, clamp off supply line (suction hose) for power steering pump -B- using hose clamps up to 25 mm - 3094- ⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Exploded view - hydraulic lines, reservoir .
– If necessary, detach pressure line -C- from power steering pump -B- ⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Exploded view - hydraulic lines, reservoir .



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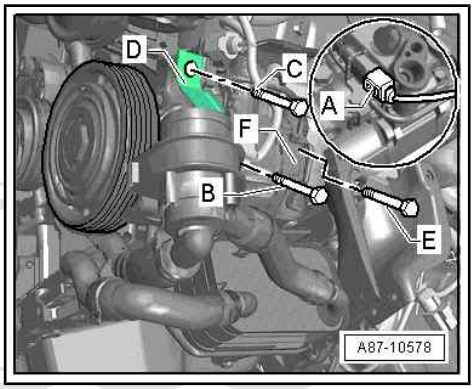
Note

- *When swivelling the pressure pipe to the side, take care not to bend, kink or strain the pipe to the power steering pump.*
- *Do not detach the power steering pump -B- from the bracket to remove the air conditioner compressor.*
- *The pressure pipe and the power steering pump are only fitted on vehicles without electromechanical power steering ⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Exploded view - power steering pump .*
- *The pressure pipe to the power steering pump -C- (see top illustration) is attached to the air conditioner compressor by the bolt -C- (see bottom illustration) on the bracket.*



– Detach refrigerant lines from air conditioner compressor ⇒ page 306 .

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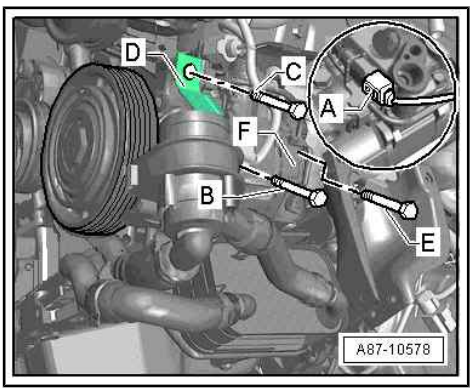
Note

- *The refrigerant lines are detached from above.*
- *Vehicles with petrol engine and dynamic steering: Depending on the installation position of the suction hose at the steering hydraulics pump/power steering pump, first unfasten the air conditioner compressor from the bracket; only then should the refrigerant lines be disconnected from the air conditioner compressor ⇒ page 306 .*

– Unplug electrical connector -A-.
– Remove bolt -B- (and bolt -C-).

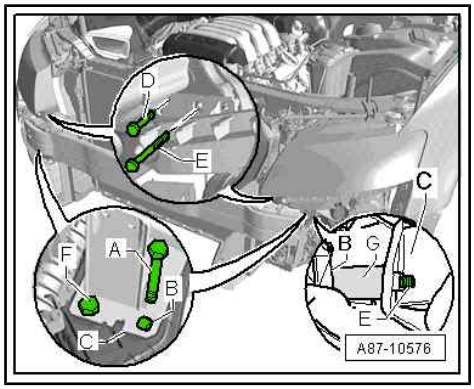


Note

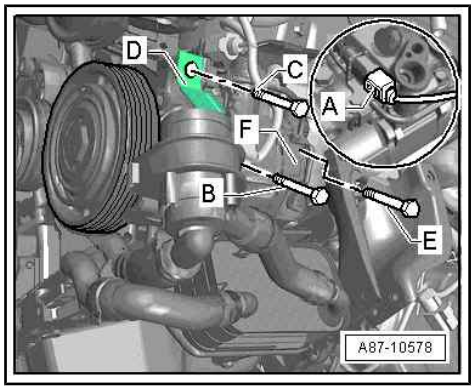
- *On vehicles with a power steering pump, bolt -C- is already removed when the pressure pipe going to the power steering pump is detached.*
- *The pressure pipe and the power steering pump are only fitted on vehicles without electromechanical power steering ⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Exploded view - power steering pump .*
- *This illustration shows the air conditioner compressor in a vehicle with a continued coolant circulation pump - V51- (not fitted with all versions). Depending on the rest of the vehicle equipment, it may be necessary to discharge the coolant and remove -V51- before removing the air conditioner compressor (for description of discharging coolant and removing -V51- , refer to ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly).*
- *Depending on the versions of the air conditioner compressor and the vehicle (different radiator fans, radiators and hoses to -V51-) it may also be necessary to move the lock carrier to the service position (so that the air conditioner compressor can be swivelled out downwards) ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Performing service position and resetting .*

Notes on service position of lock carrier:

- First unscrew bolts -A- and only then mark the position of the lock carrier -B- (through holes on left and right) at the longitudinal member -C- e.g. with a water-proof pen; this makes it possible to re-install it in exactly the same position.
- If you remove the two bolts -D- and screw in longer bolts -E- instead (e.g. M10 x 100 bolts), you can pull the lock carrier forwards by approx. 60 mm after removing the bolts -F-.
- The sleeves -G- (or a suitable block with a side length of approx. 60 mm) can be used to prevent the lock carrier -C- from sliding back.



– Detach bracket -D-.
– Remove bolt -E-.
– Unfasten air conditioner compressor -F- from bracket, pull forwards and swivel out downwards.



Installing

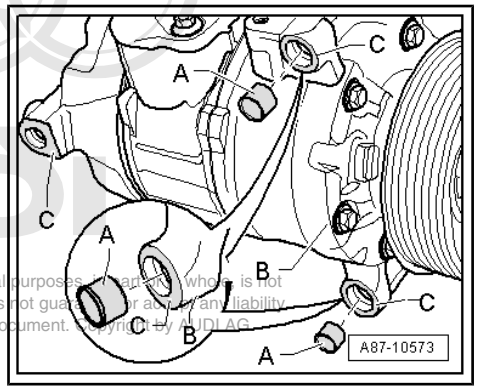
Install in reverse order of removal; note the following.

Note

When it is removed, the air conditioner compressor contains an indeterminate amount of refrigerant oil. For this reason it is important to observe the notes on renewing the compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

Before installing air conditioner 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 .

– Before securing air conditioner compressor, check position of both dowel sleeves -A- in bracket or compressor -B-.



Note

- *There are different versions of the dowel sleeves -A- (different length); for correct version refer to ⇒ Electronic parts catalogue .*
- *Make sure that bushes -A- are correctly positioned and contact surfaces are clean. Incorrectly fitted bushes or dirty/damaged contact surfaces -C- at the bracket or air conditioner compressor could lead to misalignment between the compressor and engine. After a period of operation, misalignment can cause damage to the poly V-belt or the air conditioner compressor.*

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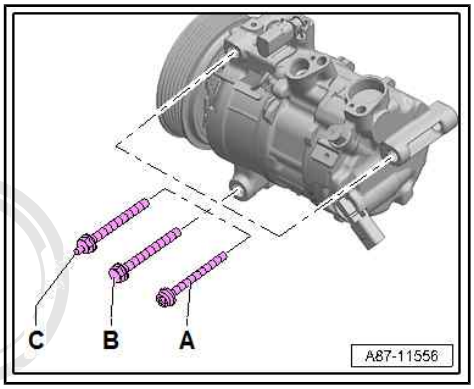
– Fit bolts -A-, -B- or -C-.



Caution

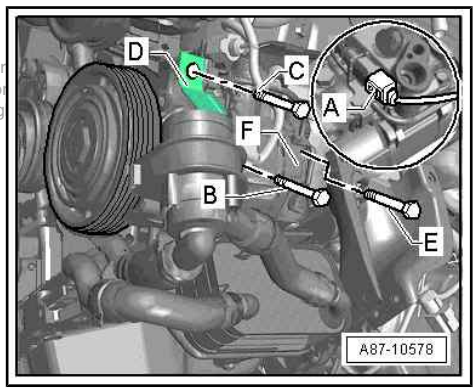
Different bolts and different tightening torques (depending on engine and production period)

- *Ensure correct allocation ⇒ Electronic parts catalogue .*
- *Use aluminium bolts only once; they must always be renewed (in this case: item -A-).*
- *Tightening torque for aluminium bolts (in this case item -A-): 8 Nm +180°*
- *Tightening torque for steel bolts (in this case -B- and -C-): 25 Nm*

– Tighten bolts -B- and -C- (and bolt -E-).

– Before fitting poly V-belt, turn air conditioner compressor 10 times via pulley in direction of rotation (to prevent damage to compressor on initial activation).

– Install pressure pipe to power steering pump ⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Exploded view - hydraulic lines, reservoir .



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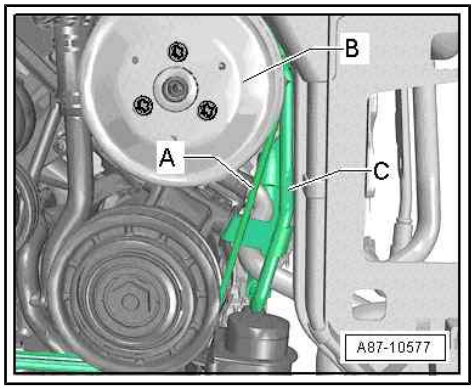
– Place poly V-belt -A- in position ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
– Attach refrigerant lines to air conditioner compressor ⇒ page 306 .



Note

- *Lubricate O-rings lightly with refrigerant oil before fitting ⇒ page 106 .*
- *Cranking prevents damage to the air conditioner compressor, which could be caused by refrigerant oil in the compression chamber on initial start-up of the engine.*
- *After attaching the air conditioner compressor and the refrigerant line, check the routing of the refrigerant lines. They must be inserted in the brackets provided (if fitted, depends on engine).*
- *Check that refrigerant lines and corresponding brackets have adequate clearance to other components, ensuring sufficient distance between belt, bracket and pulley.*

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
– Re-install remaining components (removed earlier).
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

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3.5.5 Removing and installing air conditioner compressor - vehicles with 8-cyl. FSI engine except RS models

Note

- *The compressor version may differ depending on production period and engine ⇒ page 145 and ⇒ Electronic parts catalogue*
- *On vehicles with a 6-cyl. petrol engine or an 8-cyl. FSI engine, the air conditioner compressor can only be detached from the bracket and removed after the refrigerant circuit has been discharged ⇒ page 314 (Removing and installing air conditioner compressor).*
- *The air conditioner compressors fitted at the start of production on vehicles without high-voltage system are manufactured by "Denso" (type "6 SEU 14" for vehicles with 4-cyl. and 6-cyl. engines and type "7 SEU 17" for vehicles with 8-cyl. engines). Different makes of air conditioner compressor may also be fitted at a later date ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils , or ⇒ "4 Technical data", page 107 and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .*
- *Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue*
- *These air conditioner compressors are available as replacement parts with different oil capacities, so it is important to pay attention to the oil quantity in the air conditioner compressor and to check the exact part number ⇒ "4 Technical data", page 107 , ⇒ 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 , and ⇒ Electronic parts catalogue .*
- *There are different refrigerant oil capacities for the refrigerant circuit depending on the type of air conditioner compressor. The reason for the different oil quantities in the air conditioner compressor for an otherwise identical refrigerant circuit is the design of the actual compressor; please note the different oil quantities. Too much oil in the 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.*
- *After installing a new mechanically driven air conditioner compressor or filling up these air conditioner compressors with new refrigerant oil (e.g. after flushing the refrigerant circuit), turn the air conditioner compressor 10 turns by hand before using the air conditioner (this helps prevent damage to the 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 ; Refrigerant circuit; Renewing components .*

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Special tools and workshop equipment required

- Support bracket - 10- 222 A-
- Engine support supplement set - T40093-
- Engine and gearbox jack - V.A.G 1383 A-

Removing

– Bring front wheels into straight-ahead position.

– Switch off ignition.

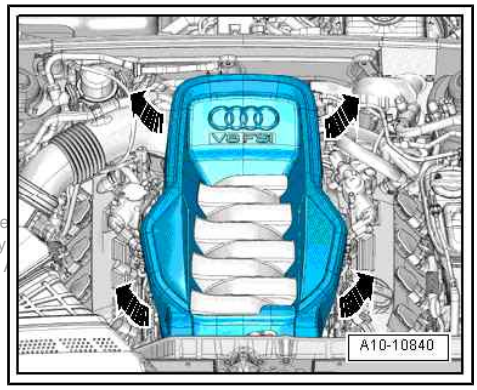
Caution

Risk of irreparable damage to electronic components.

- *Observe notes on procedure for disconnecting the battery.*

– Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

– Detach engine cover panel -arrows-.



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

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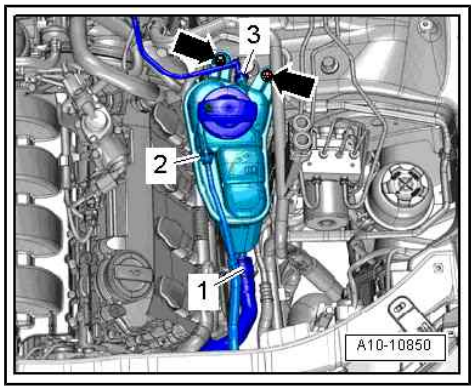
Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

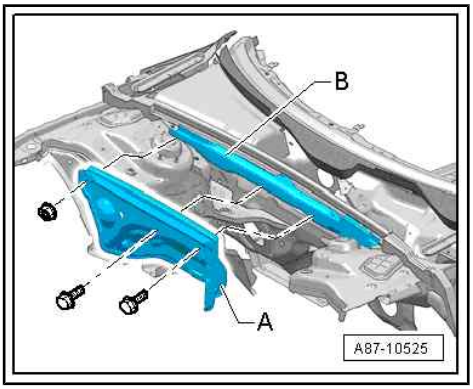
– Detach coolant hose -3- from coolant expansion tank ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .



– Remove bolts -arrows- and move coolant expansion tank to side with coolant hoses -1- and -2- attached ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .

– Drain cooling system ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

– Remove plenum chamber partition panel -A- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .

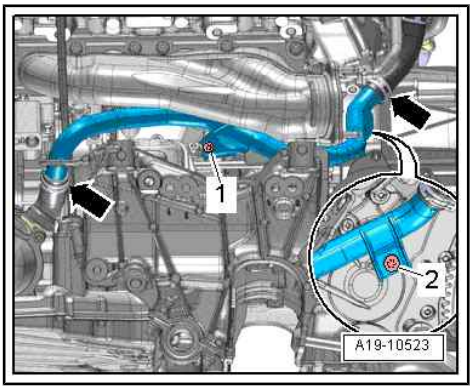


– Detach coolant hose (top) -right arrow- from engine.

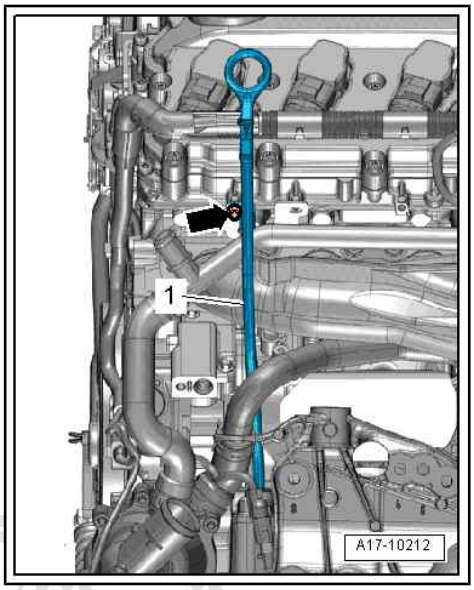
Note

This coolant hose is removed together with the coolant pipe.

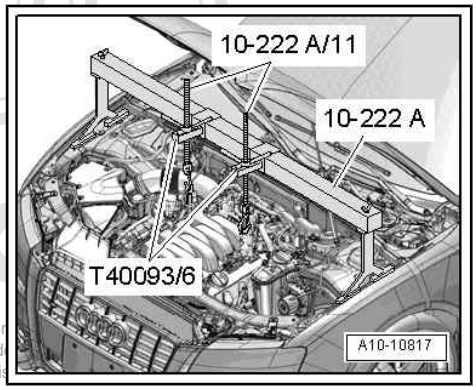
– Remove bolt -2-.



– Remove bolt -arrow-.
– Pull dipstick guide tube -1- out of sump (top section).



– Position support bracket - 10- 222 A- with adapters -T40093/6- on suspension turrets (left and right) as shown.
– Engage spindles -10- 222 A /11- at engine lifting eyes.
– Partly take up weight of engine with spindles.
– Remove both front wheels (for fitting wheels refer to ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheel alignment).
– Remove wheel housing liners (left and right) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
– Remove drive shafts (left and right) from gearbox flange shafts ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .



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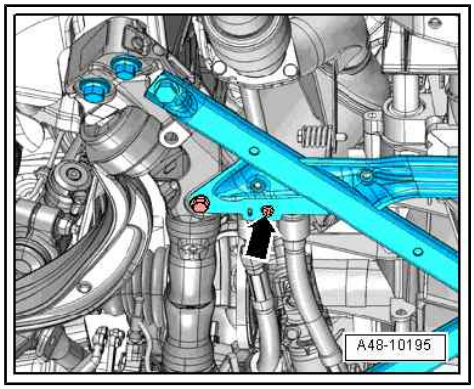
– Remove bolt -arrow- for hydraulic fluid pressure pipe for power steering ⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Exploded view - hydraulic lines, reservoir .



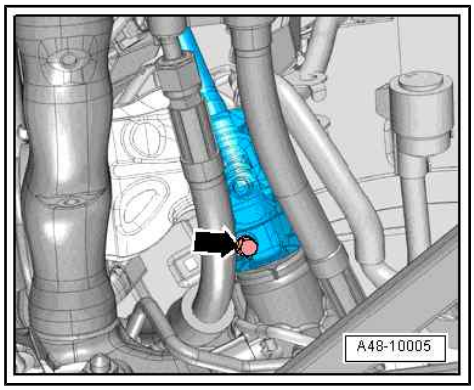
Caution

Risk of damage to airbag coil connector.

- *Only separate the universal joint from the steering rack with the front wheels in straight-ahead position.*
- *The steering wheel and steering rack positions must then no longer be altered (fix the steering wheel in position with adhesive tape if necessary).*

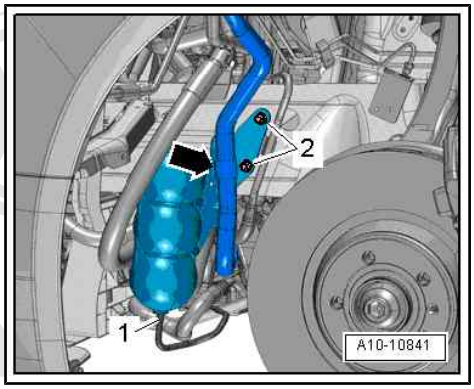
– Remove bolt -arrow- for universal joint ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing intermediate steering shaft .

– Press universal joint off steering rack and slide it upwards as far as it will go.



– Disconnect vacuum hose -1- and move clear power steering hydraulic fluid hose -arrow- at bracket ⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Exploded view - hydraulic lines, reservoir .

– Unscrew nuts -2- and detach vacuum reservoir.



– Unplug electrical connector -1- at steering rack and move it clear.

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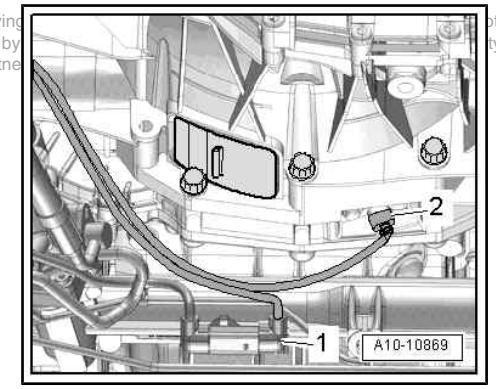
Note

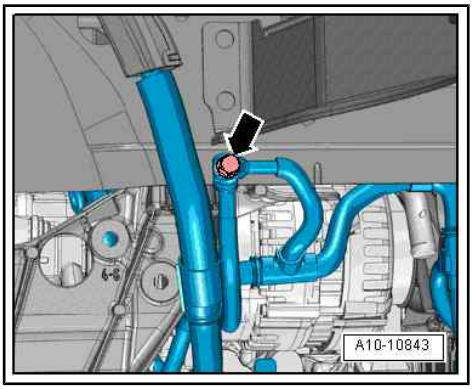
-Item 2- can be disregarded.

– Move clear hydraulic fluid hose for power steering on left of subframe.

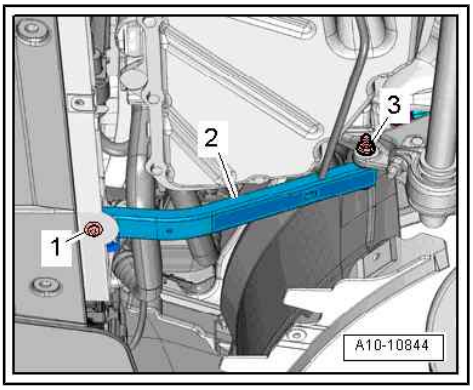
– Move clear electrical wiring on right of subframe.



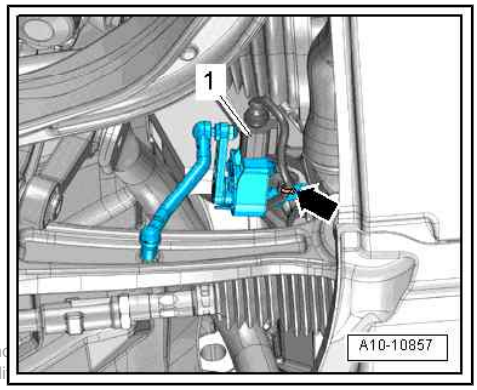
– Unbolt earth wires -arrow- from longitudinal member (right-side).



– Remove bolts -1-, unscrew nuts -3- and detach longitudinal struts -2- (both sides) ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .



– Unplug electrical connector at front left vehicle level sender - G78- and move clear electrical wiring -arrow-.



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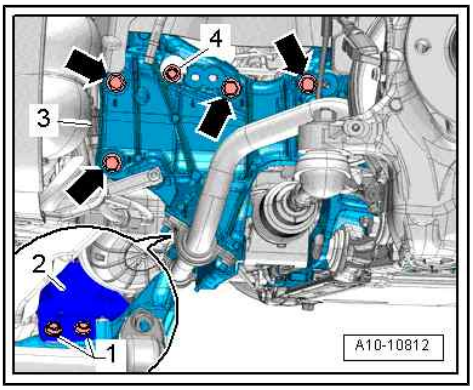
– Unplug electrical connector -3- for left electrohydraulic engine mounting solenoid valve - N144- .

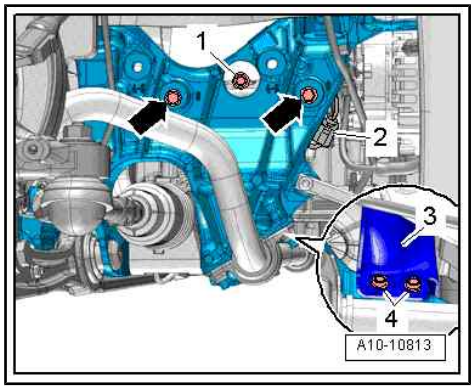
– Remove bolt -4- for engine mounting (left-side).



Note

Disregard -items 1 and 2- and -arrows-.

– Unplug electrical connector -2- for right electrohydraulic engine mounting solenoid valve - N145- .
– Remove bolt -1- for engine mounting (right-side) ⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings .



Note

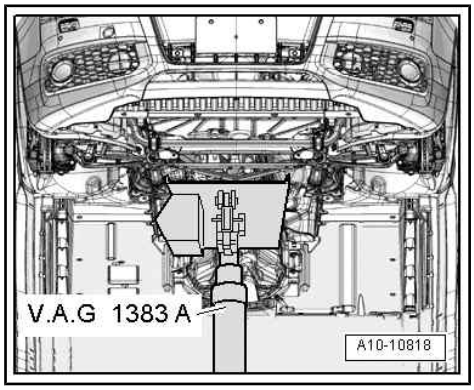
Disregard -items 3 and 4- and -arrows-.

Caution

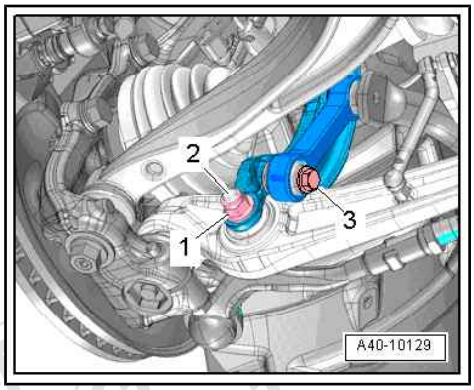
Accident risk if the subframe is not secured.

- ***Always provide support for the subframe when pulling out the subframe bolts.***

– Support subframe with engine and gearbox jack - V.A.G 1383 A- as shown ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe without steering box .



– Unscrew bolts -3- for anti-roll bar (left and right) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Exploded view - subframe .
– Unscrew nuts -1- (left and right) and pull out suspension strut bolts -2- ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Exploded view - subframe .



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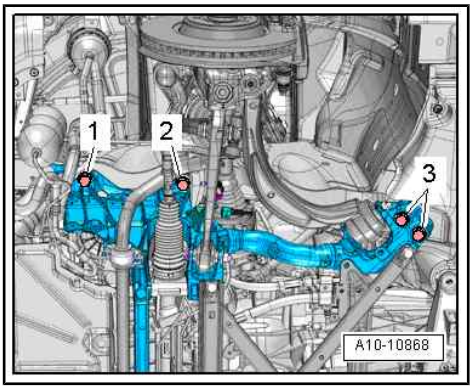
– Unscrew bolts -1 ... 3- on left and right in stages.



Caution

Risk of damage to components of running gear.

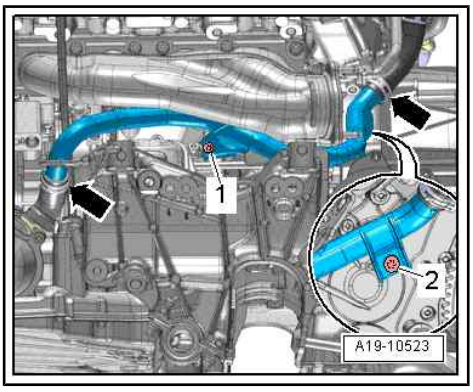
- *If the vehicle is to be set down on its wheels, the entire subframe mounting, the steering rack and the cross brace for the subframe must be fitted correctly.*
- *Do NOT support the vehicle at the subframe or the cross brace for the subframe (using a trolley jack or similar).*

– Carefully lower subframe with engine and gearbox jack - V.A.G 1383 A- , observing clearance of hydraulic fluid hoses on left and wiring on right ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe without steering box .

– Leave subframe hanging from lower transverse links.

– Move clear electrical wiring at coolant pipe (bottom left).

– Unscrew bolts -1- (and if not yet done, remove bolt -2-) and detach coolant pipe (bottom left) from coolant hose -left arrow-.

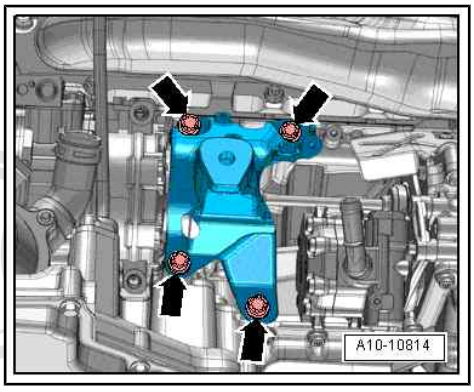


Note

Depending on the design of the mounting bracket of the flange shaft (left-side) it may be necessary to detach the mounting bracket from the gearbox and to rotate it (do not remove mounting bracket) to remove the coolant pipe ⇒ Rep. gr. 39 ; Oil seals; Overview of fitting locations - oil seals .

– Remove coolant pipe ⇒ Rep. gr. 19 ; Coolant pipes; Exploded view - coolant pipes .

– Remove bolts -arrows- and detach engine support (left-side).



Note

Depending on the engine version, it might be necessary to use an M12 screwdriver bit (multi-point bit) with ball head or similar to remove the upper bolts for the engine support.

– Remove engine mounting (left-side) ⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings .

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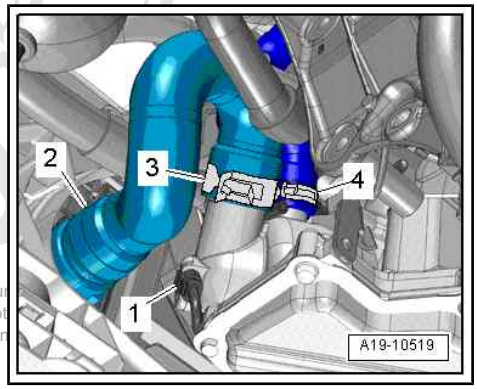
– Remove coolant hose by releasing spring-type clip -3- and pulling out retaining clip -2- slightly ⇒ Rep. gr. 19 ; Cooling system/coolant .



Note

-Items 1, 4- can be disregarded.

Caution

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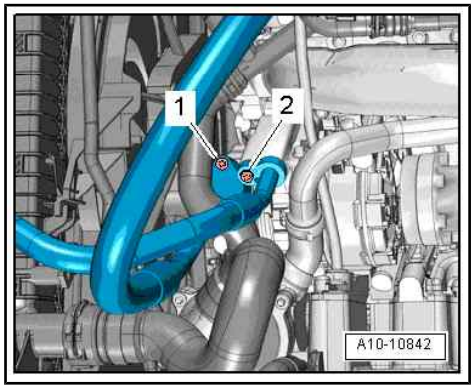
Risk of damage to refrigerant lines and hoses.

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

– Remove coolant pump housing ⇒ Rep. gr. 19 ; Coolant pump/ thermostat assembly .

– Remove bolts -1- and -2- ⇒ page 310 (Removing and installing refrigerant lines at air conditioner compressor).

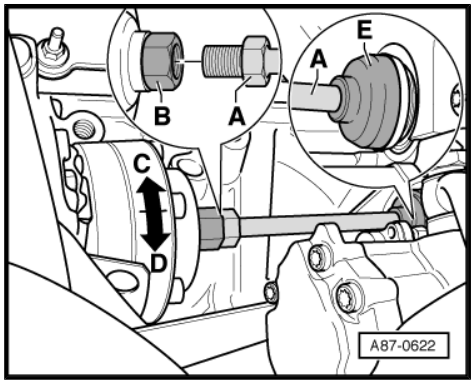
– Detach refrigerant lines from air conditioner compressor.



Note

Seal the open lines and connections at the air conditioner compressor with suitable caps (to prevent dirt and moisture from entering).

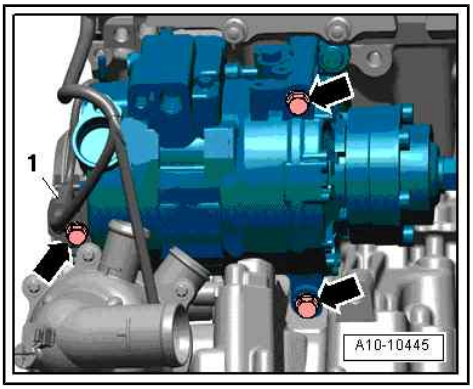
– Hold air conditioner compressor drive shaft -A- with an open-end spanner and turn air conditioner compressor drive unit -B- in direction of -arrow C-.



Note

- *Do not turn air conditioner compressor drive shaft -A-.*
- *After unfastening the thread, the air conditioner compressor drive shaft -A- can be pushed into the drive gear through boot -E-.*

– Mark electrical connector -1- for air conditioner compressor regulating valve - N280- (to avoid possible interchange with other identical connectors).



Note

The connectors for air conditioner compressor regulating valve - N280- and the electrical engine mounting are identical. If the connectors are interchanged, no entry is made in the event memory, but the air conditioner compressor is constantly activated and the evaporator may ice up.

– Remove electrical connector -1- for air conditioner compressor regulating valve - N280- from bracket and unplug it.
– Unscrew bolts -arrows- and detach air conditioner compressor.
– Carefully press subframe down and remove air conditioner compressor to rear (between longitudinal member and subframe).

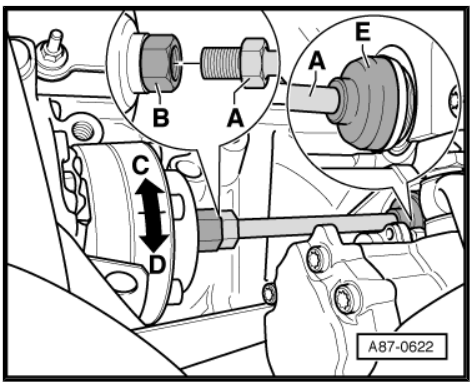
Installing

Install in reverse order of removal; note the following:

Note

When it is removed, the air conditioner compressor contains an indeterminate amount of refrigerant oil. For this reason it is important to observe the notes on renewing the compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

– If necessary, install air conditioner compressor drive shaft -A- (in drive gear on engine) and check that it is attached properly and check corresponding boot -E-.



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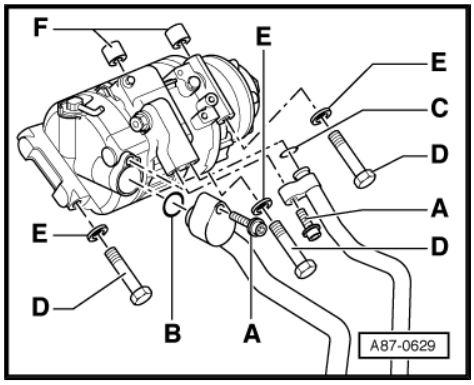
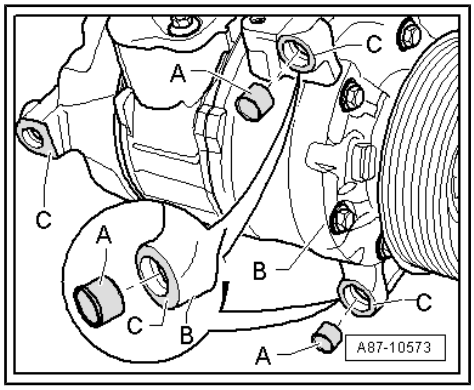
Note

- *The boot -E- is secured in position on the auxiliary drive flange with a clamp to prevent it from slipping ⇒ Rep. gr. 13 ; Auxiliary drive; Exploded view - auxiliary drive and ⇒ Electronic parts catalogue .*
- *This illustration shows the layout of the components on a vehicle with power steering pump. The power steering pump is only fitted on vehicles without electromechanical power steering ⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Exploded view - power steering pump .*

– If necessary, remove dowel sleeves -F- from air conditioner compressor.
– Thoroughly clean contact surfaces on air conditioner compressor and bracket.
– Fit dowel sleeves -F- in bracket or air conditioner compressor.



– Before securing air conditioner compressor, check position of both dowel sleeves -A- in bracket or compressor -B-.



Note

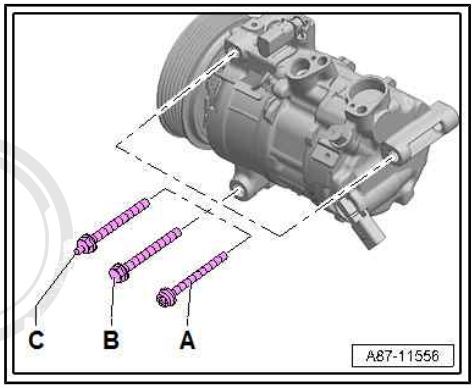
- *There are different versions of the dowel sleeves -A- (different length); for correct version refer to ⇒ Electronic parts catalogue .*
- *Make sure that bushes -A- are correctly positioned and contact surfaces are clean. If the bushes are not installed correctly or the contact surfaces -C- at the bracket or air conditioner compressor are dirty or damaged, this could lead to misalignment between the air conditioner compressor and the engine. After a period of operation, misalignment may cause damage to the drive unit or the air conditioner compressor.*

– Fit bolts -A-, -B- or -C-.

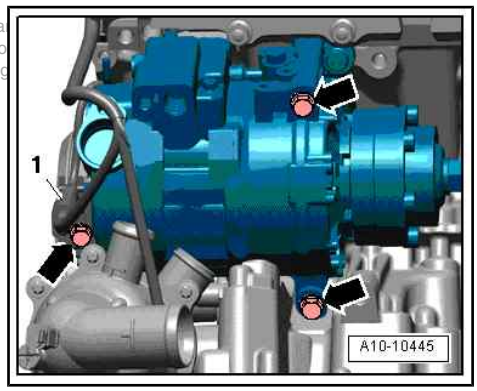
Caution

Different bolts and different tightening torques (depending on engine and production period)

- ***Ensure correct allocation ⇒ Electronic parts catalogue .***
- ***Use aluminium bolts only once; they must always be renewed (in this case: item -A-).***
- ***Tightening torque for aluminium bolts (in this case item -A-): 8 Nm +180°***
- ***Tightening torque for steel bolts (in this case -B- and -C-): 25 Nm***



– Tighten bolts -arrows-.
– Plug in electrical connector -1- at air conditioner compressor regulating valve - N280- .
– Check connections of air conditioner compressor and refrigerant lines for damage or dirt ⇒ page 310 .



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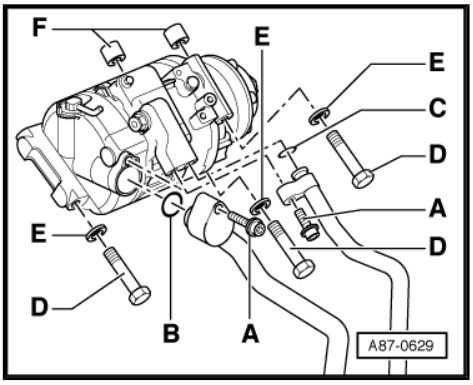
– Attach refrigerant lines to air conditioner compressor. For tightening torque of bolts -A-, dimensions of O-rings -B- and -C- and additional information, refer to ⇒ page 310 and ⇒ Electronic parts catalogue .



Note

Check that there is sufficient clearance between the refrigerant lines and the corresponding brackets and the other components. Lubricate O-rings lightly with refrigerant oil before fitting ⇒ page 106 .

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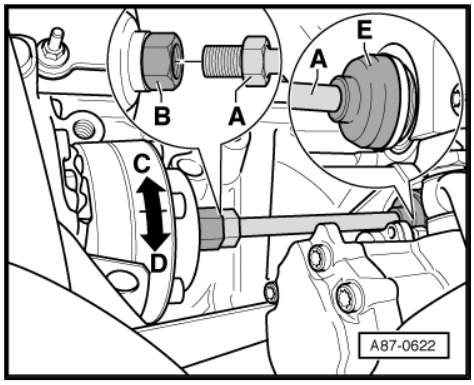
– To avoid damaging the compressor when activating it for the first time, turn the air conditioner compressor drive unit -B- 10 turns by hand in direction of -arrow C- at the air conditioner compressor before screwing in the air conditioner compressor drive shaft -A-.



Note

Any refrigerant oil which may have collected in the compression chamber of the air conditioner compressor after removing the compressor or after pouring in fresh refrigerant oil (e.g. after blowing out refrigerant circuit) will be forced out of the compression chamber by cranking the compressor.

– Hold air conditioner compressor drive shaft -A- with an open-end spanner and turn air conditioner compressor drive unit -B- in direction of -arrow D-.

- Tightening torque: 60 Nm

Note

- *Do not turn air conditioner compressor drive shaft -A- when tightening.*
- *After installation, check position of boot -E- on drive gear.*
- *After fitting drive shaft -A-, check installation position of boot -E-.*

– Install engine support with engine mounting (left-side) ⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings .

– Install coolant pipe (bottom left) ⇒ Rep. gr. 19 ; Coolant pipes; Exploded view - coolant pipes .

– Install subframe ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe without steering box .

– Secure suspension strut to track control link ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Exploded view - subframe .

– Install anti-roll bar ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing anti-roll bar .

– Attach universal joint to steering rack ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing intermediate steering shaft .

– Install power steering hydraulic fluid pressure pipe ⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Exploded view - hydraulic lines, reservoir .

– Install longitudinal struts ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .

Note

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Renew seal, self-locking nuts and O-ring for dipstick guide tube.

– Install dipstick guide tube ⇒ Rep. gr. 13 ; Crankshaft; Exploded view - crankshaft .

- Top up coolant and bleed coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (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 .
- Re-install remaining components (removed earlier).
- Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

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3.5.6 Removing and installing air conditioner compressor - vehicles with 8-cyl. FSI engine, RS models

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Note

- *The compressor version may differ depending on production period and engine ⇒ page 145 and ⇒ Electronic parts catalogue*
- *On vehicles with a 6-cyl. petrol engine or an 8-cyl. FSI engine, the air conditioner compressor can only be detached from the bracket and removed after the refrigerant circuit has been discharged ⇒ page 314 (Removing and installing air conditioner compressor).*
- *The air conditioner compressors fitted at the start of production on vehicles without high-voltage system are manufactured by "Denso" (type "6 SEU 14" for vehicles with 4-cyl. and 6-cyl. engines and type "7 SEU 17" for vehicles with 8-cyl. engines). Different makes of air conditioner compressor may also be fitted at a later date ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils , or ⇒ "4 Technical data", page 107 and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .*
- *Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue*
- *These air conditioner compressors are available as replacement parts with different oil capacities, so it is important to pay attention to the oil quantity in the air conditioner compressor and to check the exact part number ⇒ "4 Technical data", page 107 , ⇒ 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 , and ⇒ Electronic parts catalogue .*
- *There are different refrigerant oil capacities for the refrigerant circuit depending on the type of air conditioner compressor. The reason for the different oil quantities in the air conditioner compressor for an otherwise identical refrigerant circuit is the design of the actual compressor; please note the different oil quantities. Too much oil in the 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.*
- *After installing a new mechanically driven air conditioner compressor or filling up these air conditioner compressors with new refrigerant oil (e.g. after flushing the refrigerant circuit), turn the air conditioner compressor 10 turns by hand before using the air conditioner (this helps prevent damage to the 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 ; Refrigerant circuit; General description of refrigerant circuit components .*

Special tools and workshop equipment required

- Support bracket - 10- 222 A-
- Engine and gearbox jack - V.A.G 1383 A-
- Engine support supplement set - T40093-

Removing

– Bring front wheels into straight-ahead position.

– Switch off ignition.

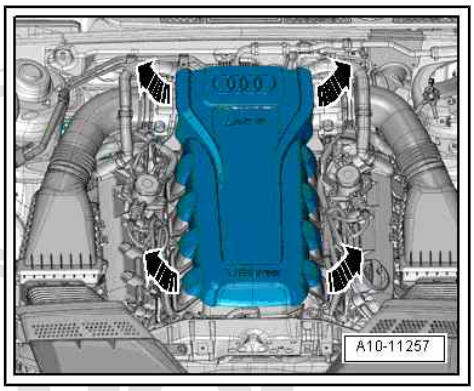
Caution

Risk of irreparable damage to electronic components.

- *Observe notes on procedure for disconnecting the battery.*

– Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

– Detach engine cover panel -arrows-.



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

– Remove air cleaner housing (left-side) ⇒ Rep. gr. 24 ; Air cleaner; Exploded view - air cleaner housing .

– Remove bolt -arrow-.

– Detach guide tube -1- for oil dipstick.

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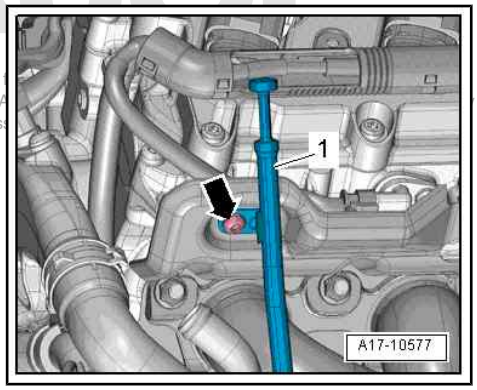
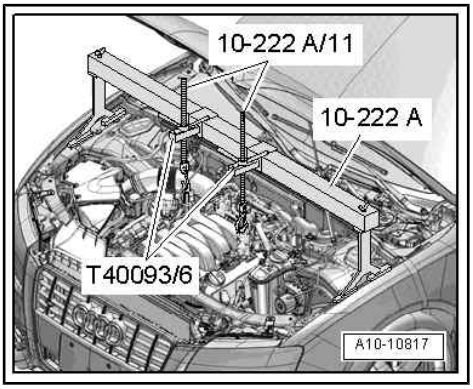


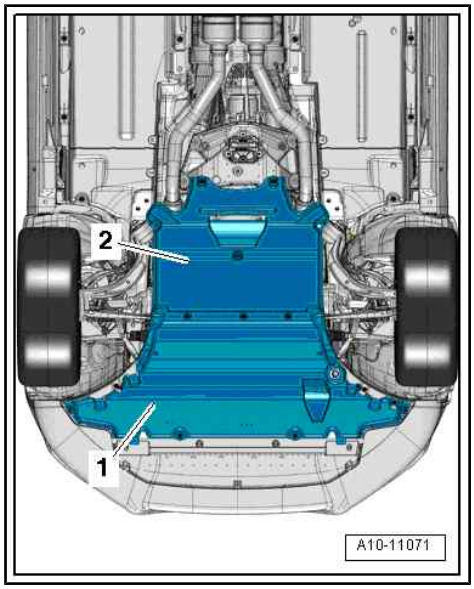
– Position support bracket - 10- 222 A- with adapters -T40093/6- on suspension turrets (left and right) as shown.

– Engage spindles -10- 222 A /11- at engine lifting eyes.

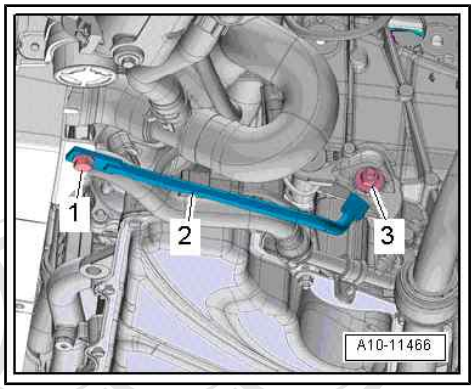
– Partly take up weight of engine with spindles.



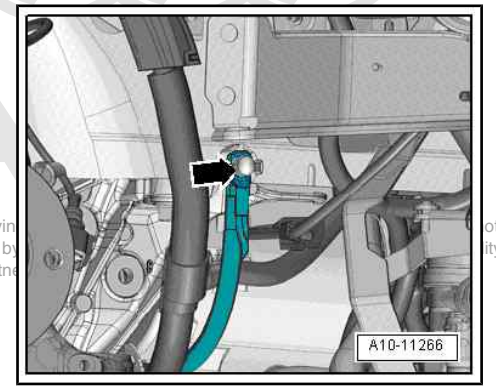
– Remove noise insulation panels -1- and -2- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .
– Remove both front wheels (for fitting wheels refer to ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheel alignment).
– Remove both front wheel housing liners ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
– Remove drive shafts (left and right) from gearbox flange shafts ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .
– Drain cooling system ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .



– Unscrew bolt -1-, unscrew nut -3- and detach longitudinal strut -2- (both sides).



– Unscrew nut -arrow- on longitudinal member (right-side) and move earth wiring clear.



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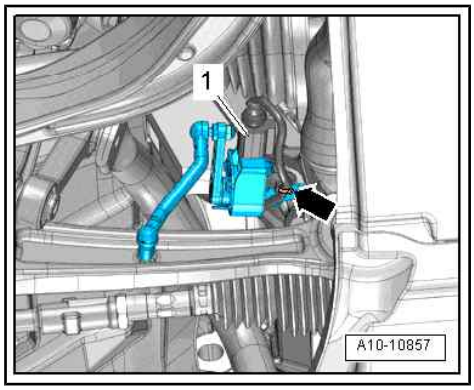
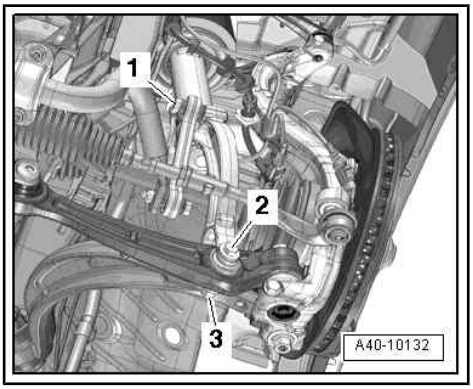
– Unplug electrical connector -1- at headlight range control sender 1 - G233- and move wiring clear -arrow-.



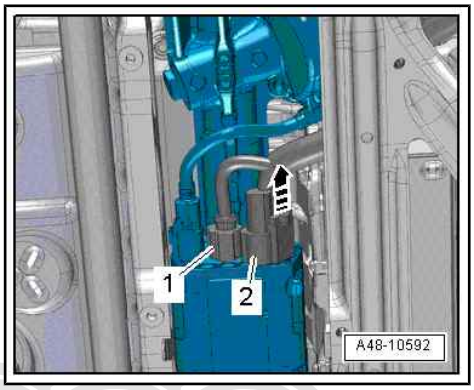
– Unscrew bolt -1- for anti-roll bar (left and right).



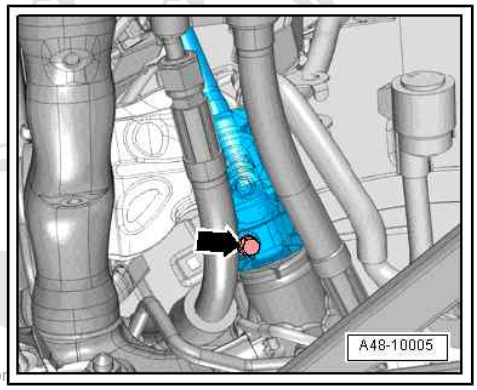
Note

Disregard -items 2 and 3-.

– Unplug electrical connector -2- at steering rack by releasing locking element -arrow- and pressing release catch downwards.
– Unplug connector -1-.
– Move electrical wiring harness clear.



– Remove intermediate steering shaft from steering rack and slide together upwards (telescope) ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing intermediate steering shaft .



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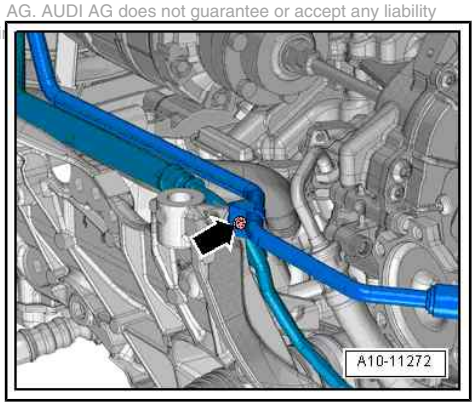
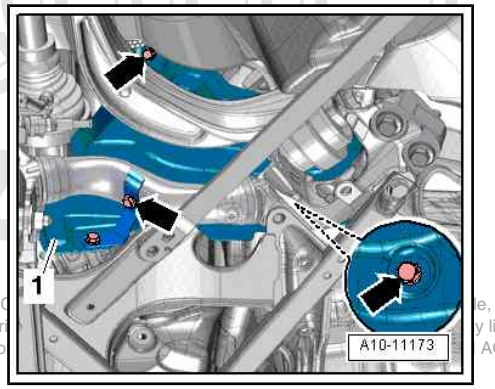
– Remove bolt -arrow- for ATF lines.



– Unscrew bolts -arrows- (left and right); leave heat shield -1- in installation position.



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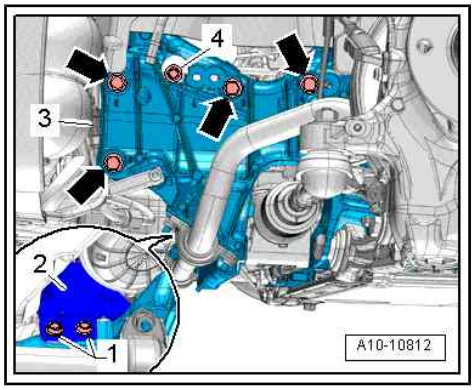
– Unplug electrical connector -3- for left electrohydraulic engine mounting solenoid valve - N144- .



Note

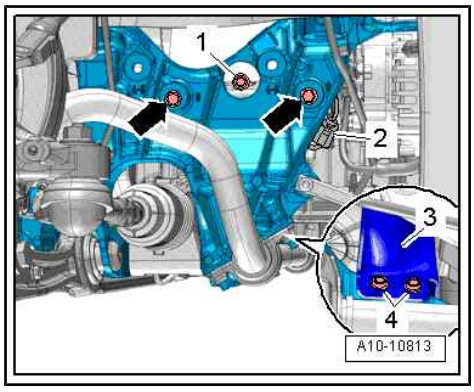
The connectors for air conditioner compressor regulating valve - N280- and the electrical engine mounting are identical. If the connectors are interchanged, no entry is made in the event memory, but the air conditioner compressor is constantly activated and the evaporator may ice up.

– Remove bolt -4- for engine mounting (left-side).

Note

Disregard -items 1 and 2- and -arrows-.

– Unplug electrical connector -2- for right electrohydraulic engine mounting solenoid valve - N145- .
– Unscrew bolt -1- for engine mounting (right-side).



Note

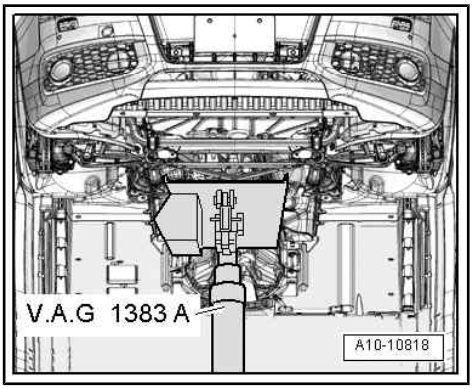
Disregard -items 3 and 4- and -arrows-.

Caution

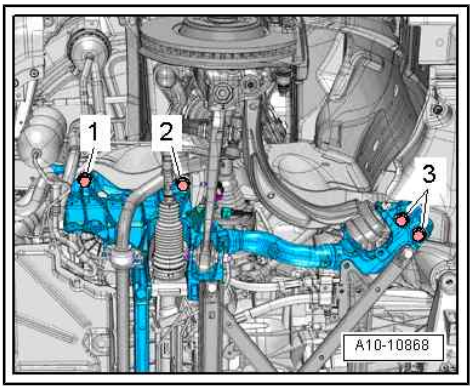
Accident risk if the subframe is not secured.

- ***Always provide support for the subframe when pulling out the subframe bolts.***

– Support subframe with engine and gearbox jack - V.A.G 1383 A- as shown ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe without steering box .



– Unscrew bolts -1 ... 3- on left and right in stages.



Caution

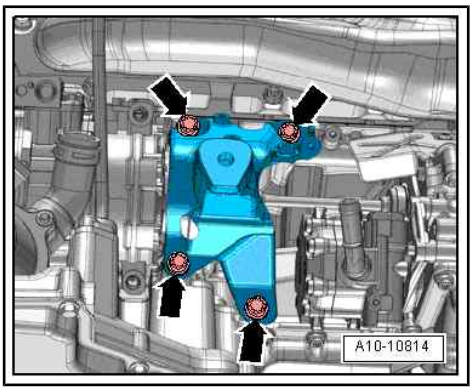
Risk of damage to components of running gear.

- *If the vehicle is to be set down on its wheels, the entire subframe mounting, the steering rack and the cross brace for the subframe must be fitted correctly.*
- *Do NOT support the vehicle at the subframe or the cross brace for the subframe (using a trolley jack or similar).*

– Carefully lower subframe with engine and gearbox jack - V.A.G 1383 A- , observing clearance of ATF lines on left and wiring on right ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe without steering box .

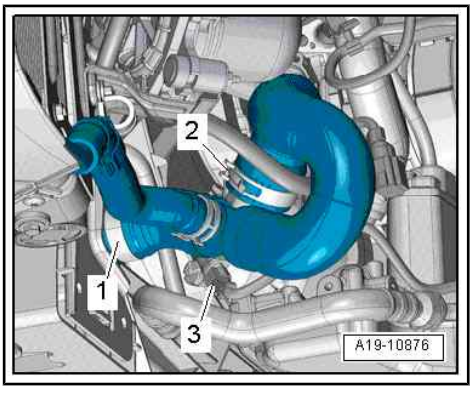
– Leave subframe hanging from lower transverse links.

– Remove bolts -arrows- and detach engine support (left-side).



– Lift retaining clip -1-, release hose clip -2- and remove coolant hose.

– Push coolant hose to the side.



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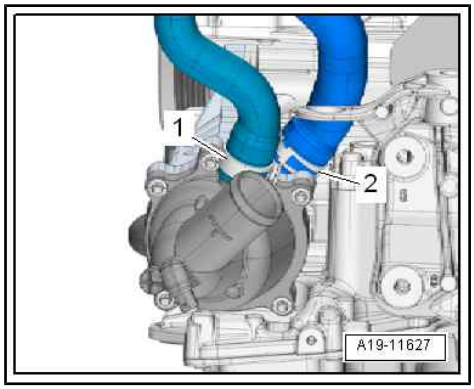
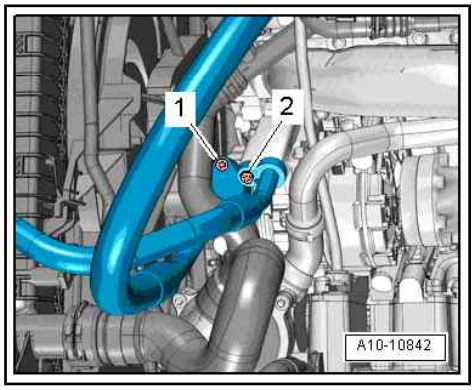
– Release hose clips -1 and 2- and disconnect coolant hoses.
– Push coolant hoses to the side.
– Remove coolant pump housing ⇒ Rep. gr. 19 ; Coolant pump/ thermostat assembly .



Caution

Risk of damage to refrigerant lines and hoses.

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

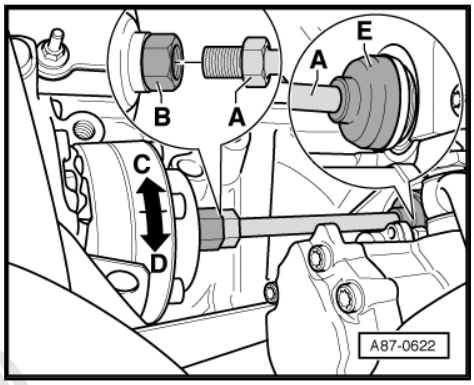


– Remove bolts -1- and -2- ⇒ page 310 (Removing and installing refrigerant lines at air conditioner compressor).
– Detach refrigerant lines from air conditioner compressor.

Note

Seal the open lines and connections at the air conditioner compressor with suitable caps (to prevent dirt and moisture from entering).

– Hold air conditioner compressor drive shaft -A- with an open-end spanner and turn air conditioner compressor drive unit -B- in direction of -arrow C-.



Note

- *Do not turn air conditioner compressor drive shaft -A-.*
- *After unfastening the thread, the air conditioner compressor drive shaft -A- can be pushed into the drive gear through boot -E-.*

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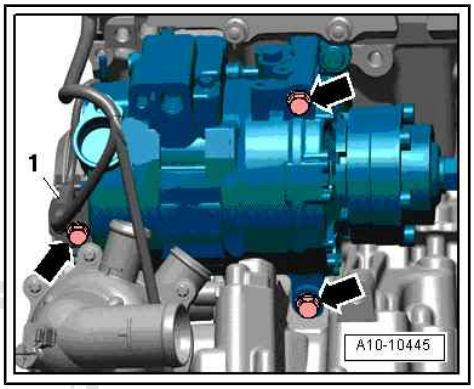
– Mark electrical connector -1- for air conditioner compressor regulating valve - N280- (to avoid possible interchange with other identical connectors).



Note

The connectors for air conditioner compressor regulating valve - N280- and the electrical engine mounting are identical. If the connectors are interchanged, no entry is made in the event memory, but the air conditioner compressor is constantly activated and the evaporator may ice up.

– Remove electrical connector -1- for air conditioner compressor regulating valve - N280- from bracket and unplug it.
– Unscrew bolts -arrows- and detach air conditioner compressor.
– Carefully press subframe down and remove air conditioner compressor to rear (between longitudinal member and subframe).

Installing

Install in reverse order of removal; note the following:

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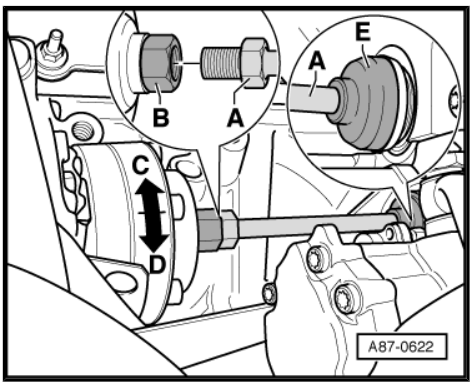
Note

When it is removed, the air conditioner compressor contains an indeterminate amount of refrigerant oil. For this reason it is important to observe the notes on renewing the compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

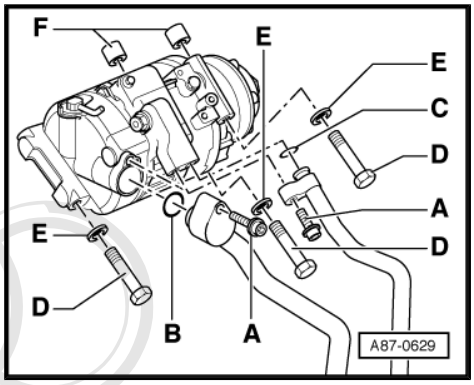
– If necessary, install air conditioner compressor drive shaft -A- (in drive gear on engine) and check that it is attached properly and check corresponding boot -E-.



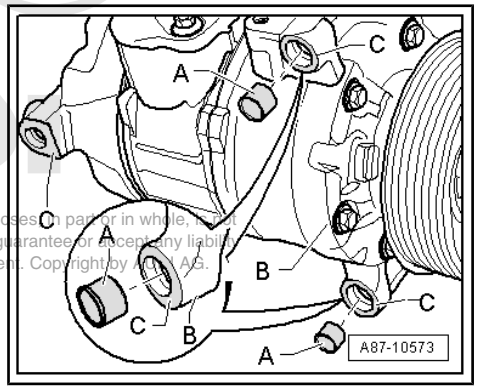
Note

- *The boot -E- is secured in position on the auxiliary drive flange with a clamp to prevent it from slipping ⇒ Rep. gr. 13 ; Auxiliary drive; Exploded view - auxiliary drive and ⇒ Electronic parts catalogue .*
- *This illustration shows the layout of the components on a vehicle with power steering pump. The power steering pump is only fitted on vehicles without electromechanical power steering ⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Exploded view - power steering pump .*

– If necessary, remove dowel sleeves -F- from air conditioner compressor.
– Thoroughly clean contact surfaces on air conditioner compressor and bracket.
– Fit dowel sleeves -F- in bracket or air conditioner compressor.



– Before securing air conditioner compressor, check position of both dowel sleeves -A- in bracket or compressor -B-.



Note

- *There are different versions of the dowel sleeves -A- (different length); for correct version refer to ⇒ Electronic parts catalogue .*
- *Make sure that bushes -A- are correctly positioned and contact surfaces are clean. If the bushes are not installed correctly or the contact surfaces -C- at the bracket or air conditioner compressor are dirty or damaged, this could lead to misalignment between the air conditioner compressor and the engine. After a period of operation, misalignment may cause damage to the drive unit or the air conditioner compressor.*

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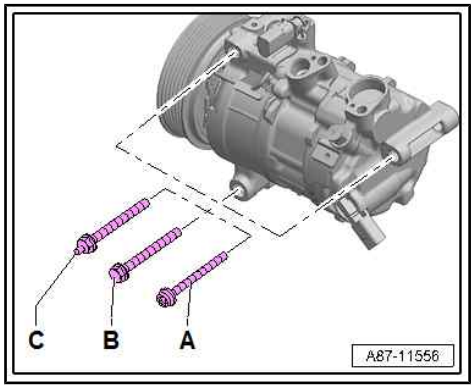
– Fit bolts -A-, -B- or -C-.

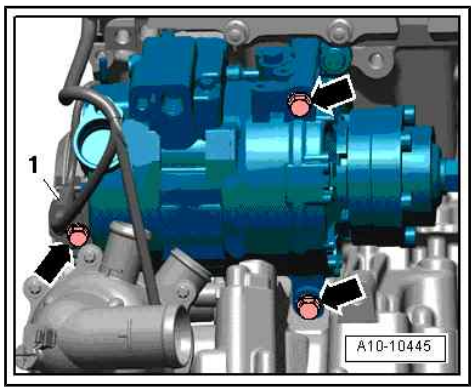
Caution

Different bolts and different tightening torques (depending on engine and production period)

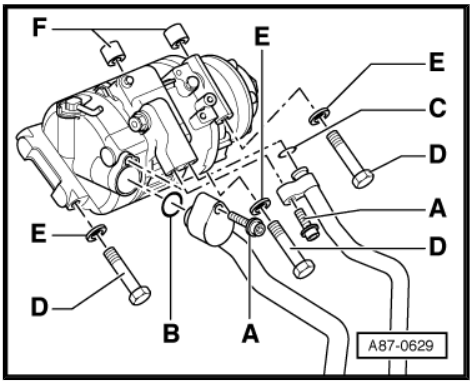
- ***Ensure correct allocation ⇒ Electronic parts catalogue .***
- ***Use aluminium bolts only once; they must always be renewed (in this case: item -A-).***
- ***Tightening torque for aluminium bolts (in this case item -A-): 8 Nm +180°***
- ***Tightening torque for steel bolts (in this case -B- and -C-): 25 Nm***



– Tighten bolts -arrows-.
– Plug in electrical connector -1- at air conditioner compressor regulating valve - N280- .
– Check connections of air conditioner compressor and refrigerant lines for damage or dirt ⇒ page 310 .



– Attach refrigerant lines to air conditioner compressor. For tightening torque of bolts -A-, dimensions of O-rings -B- and -C- and additional information, refer to ⇒ page 310 and ⇒ Electronic parts catalogue .



Note

Check that there is sufficient clearance between the refrigerant lines and the corresponding brackets and the other components. Lubricate O-rings lightly with refrigerant oil before fitting ⇒ page 106 .

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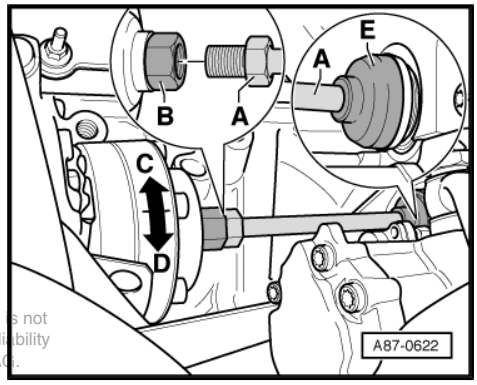
– To avoid damaging the compressor when activating it for the first time, turn the air conditioner compressor drive unit -B- 10 turns by hand in direction of -arrow C- at the air conditioner compressor before screwing in the air conditioner compressor drive shaft -A-.



Note

Any refrigerant oil which may have collected in the compression chamber of the air conditioner compressor after removing the compressor or after pouring in fresh refrigerant oil (e.g. after blowing out refrigerant circuit) will be forced out of the compression chamber by cranking the compressor.

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– Hold air conditioner compressor drive shaft -A- with an open-end spanner and turn air conditioner compressor drive unit -B- in direction of -arrow D-.

- Tightening torque: 60 Nm

Note

- *Do not turn air conditioner compressor drive shaft -A- when tightening.*
- *After installation, check position of boot -E- on drive gear.*
- *After fitting drive shaft -A-, check installation position of boot -E-.*

– Install engine support with engine mounting (left-side) ⇒ Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings .

– Install subframe ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe without steering box .

– Install anti-roll bar ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing anti-roll bar .

– Attach universal joint to steering rack ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing intermediate steering shaft .

– Install ATF lines ⇒ Rep. gr. 34 ; ATF circuit; Removing and installing ATF lines .

– Install longitudinal struts ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .

Note

Renew seal, self-locking nuts and O-ring for dipstick guide tube.

– Install dipstick guide tube ⇒ Rep. gr. 13 ; Crankshaft; Exploded view - crankshaft .

– Top up coolant and bleed coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

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

– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

3.6 Preparations for renewing pulley

– Switch off ignition.

– Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

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– Mark direction of the poly V-belt (always observe routing of poly V-belt in relevant Workshop Manual for specific engine)

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

– Slacken off and detach poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

Note

Before removing, mark direction of rotation of poly V-belt with chalk or felt-tip pen. Running a used pulley in the opposite direction could damage it irreparably.

3.7 Removing and installing pulley

⇒ “3.7.1 Removing and installing pulley - Denso air conditioner compressor, version 1”, page 361

⇒ “3.7.2 Removing and installing pulley - Denso air conditioner compressor, version 2”, page 363

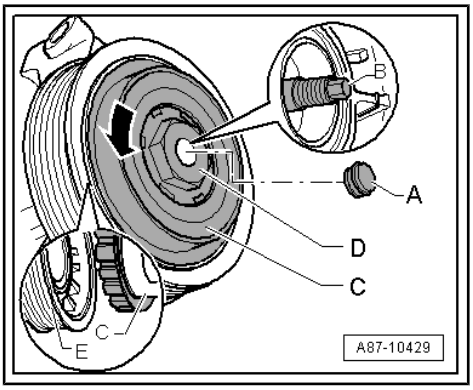
⇒ “3.7.3 Removing and installing pulley, air conditioner compressor with air conditioning system magnetic clutch N25 ”, page 365

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

Air conditioner compressor without air conditioning system magnetic clutch - N25-

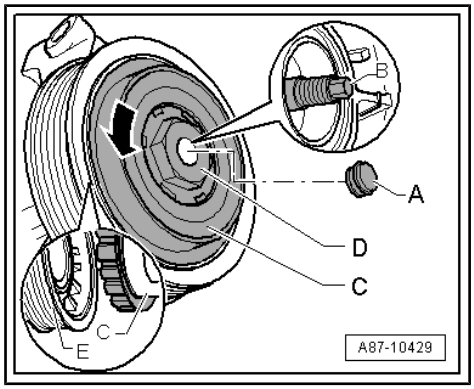
Note

- *Observe notes on renewing pulley -E- ⇒ page 279 .*
- *Perform same preliminary work as when removing pulley ⇒ page 361 .*
- *Pulley is made of plastic, is sensitive to impact and should be treated with special care.*
- *If the overload protection device of the drive plate -C- has been triggered, the pulley -E- can rotate together with the outer section of the drive plate -C- without the compressor shaft -B- and the hexagonal bolt -D- attached to the drive plate (inner section of drive plate -C-) rotating simultaneously.*



Removing

– Remove cap -A-.
– Hold air conditioner compressor drive shaft -B- e.g. with a commercially available hexagon socket wrench (7 mm) and turn drive plate -C- with pulley -E- in direction of -arrow-.

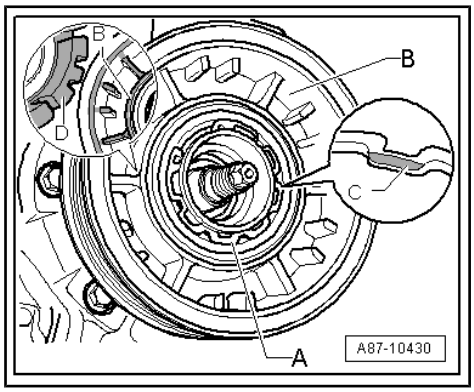


Note

The torque for driving the air conditioner compressor is applied to the compressor shaft via the threaded connection between the drive plate -C- and the compressor shaft. If the drive plate -C- has become so firmly attached to the air conditioner compressor shaft that it can no longer be loosened (the 7 mm hexagon socket wrench -B- can no longer transmit the necessary torque), the compressor must be renewed.

– Detach drive plate -C-.

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



Installing

Note

Renew circlip -A-.

Clean flange of air conditioner compressor before fitting pulley -B-.

When fitting circlip -A-, take care not to bend it open more than necessary.

– Install pulley -B-.
– Ensure that circlip -A- is fitted correctly (bevelled side -C- faces away from air conditioner compressor; flat side faces compressor).
– Clean thread of compressor shaft.

Note

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

– Before installing drive plate, coat rubber elements -D- lightly with lubricant (e.g. tyre fitting paste or soap solution).
– Insert rubber elements -D- in pulley -B- as shown.

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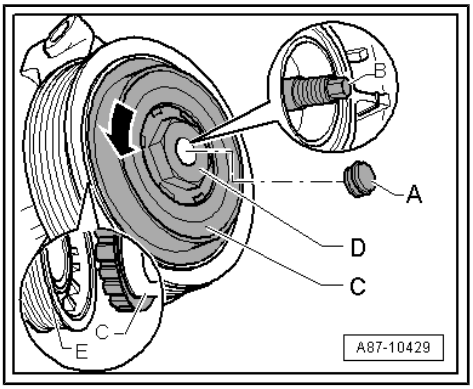
– Press rubber element of drive plate -C- into pulley -E- until drive plate -C- makes contact with thread of air conditioner compressor shaft -B-.
– Secure drive plate -C- to compressor shaft -B- by turning in direction opposite to -arrow-.
– Hold air conditioner compressor drive shaft -B- e.g. with a commercially available hexagon socket wrench (7 mm) and turn drive plate -C- with pulley -E- in direction opposite to that of -arrow- (tightening torque: 30 Nm).

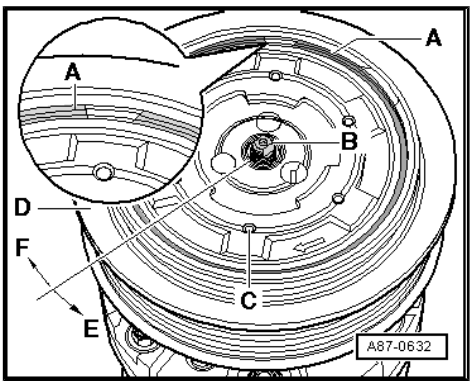


3.7.2 Removing and installing pulley - “Denso” air conditioner compressor, version 2

Air conditioner compressor without air conditioning system magnetic clutch - N25-

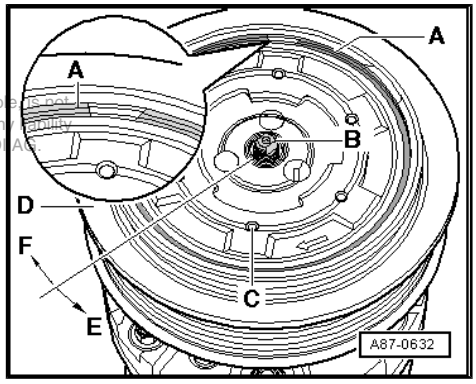
Note

- *Observe notes on renewing pulley ⇒ page 281 .*
- *Perform same preliminary work as when removing pulley ⇒ page 361 .*
- *Pulley is made of plastic, is sensitive to impact and should be treated with special care.*
- *If overload protection device of drive plate -C- has been triggered, remove circlip -A- and then prise drive plate off pulley -D-.*
- *Circlip -A- with a vulcanised rubber disc is fitted to minimise noise ⇒ page 281 and ⇒ Electronic parts catalogue .*



Removing

– Use e.g. a small screwdriver or long-nose pliers to carefully remove circlip -A- (with vulcanised rubber disc ⇒ page 281), taking particular care not to damage pulley.
– Hold drive shaft -B- of air conditioner compressor using a standard hexagon socket wrench (commercially available) and turn drive plate -C- with pulley -D- in direction of arrow -E- (tightening torque: 35 Nm).
– Detach drive plate -C-.



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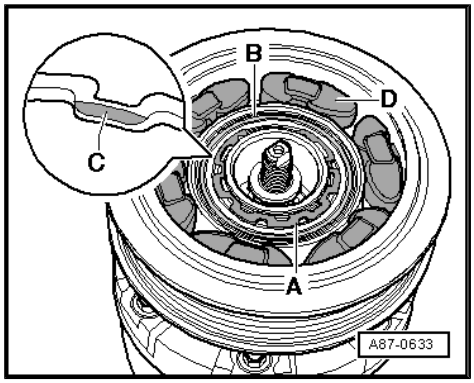
– Remove circlip -A-.
– Detach pulley -B-.



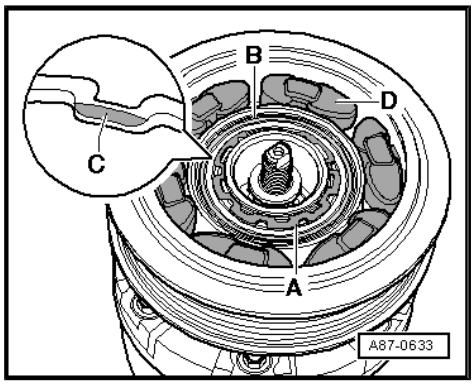
Installing

Note

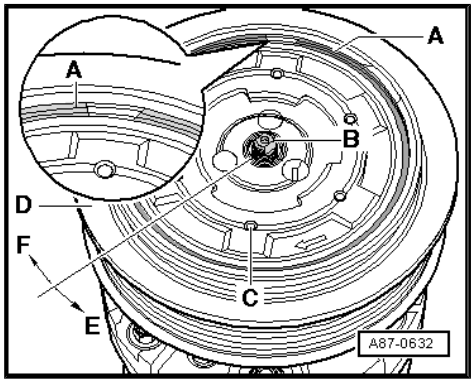
Renew circlip -A-.

Clean air conditioner compressor flange before attaching pulley.

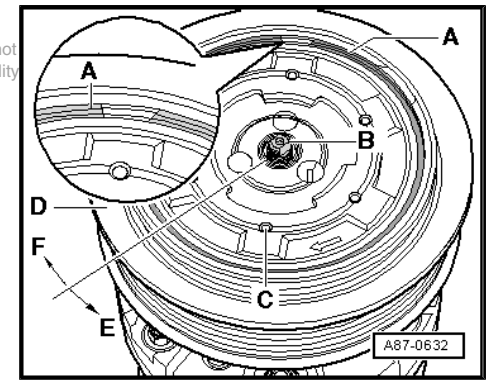
When fitting circlip -A-, take care not to bend it open more than necessary.



– Install pulley -B-.
– Ensure that circlip -A- is fitted correctly. Bevelled side -C- faces away from air conditioner compressor (flat side faces compressor).
– Insert rubber elements -D- into pulley -B- as shown.
– Before installing drive plate, coat rubber elements -D- lightly with lubricant (e.g. tyre fitting paste or soap solution).
– Insert drive plate -C- in rubber elements -D- (refer to top illustration) until it makes contact with shaft of air conditioner compressor -B-.



– Screw drive plate -C- onto compressor shaft -B- by turning in direction of arrow -F-.
– Tighten drive plate -C- (via pulley -D-) to 35 Nm by turning in direction of arrow -F- with a commercially available strap wrench (with fabric strap); hold compressor shaft -B- in position with a standard hexagon socket wrench (commercially available).
– Fit circlip -A- (with vulcanised rubber disc).



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

Note

- *It is not always necessary to unfasten the air conditioner compressor from the engine to detach the pulley ⇒ page 286 . Depending on the engine version, however, there may not be enough space to detach the pulley; in this case, detach the air conditioner compressor from the engine or remove it, or unfasten the lock carrier from the vehicle and pull it forwards slightly to make some space (whichever is more practical based on the vehicle version) ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Performing service position and resetting .*
- *To remove the pulley on vehicles with 4-cylinder 2.0 ltr. TDI engine and a cross member for the torque reaction support, it is advisable e.g. to remove the air conditioner compressor ⇒ 4-cylinder TDI engine (2.0 ltr. 4-valve common rail - generation II); Rep. gr. 10 ; Assembly mountings .*

Detaching and attaching clutch plate ⇒ page 365

Detaching pulley ⇒ page 365

Checking gap between pulley and clutch plate ⇒ page 366

Detaching and attaching clutch plate

– Switch off ignition.

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Vehicles without cross member for torque reaction support

– Perform preparations for renewing pulley ⇒ page 361 .

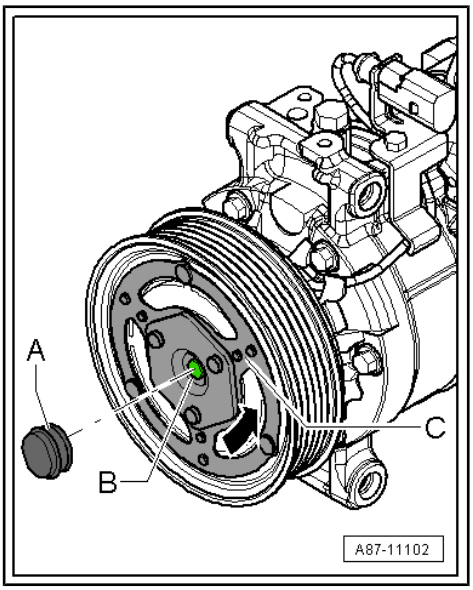
Vehicles with cross member for torque reaction support (e.g. with 4-cylinder 2.0 ltr. TDI engine with cross member for torque reaction support)

– Remove air conditioner compressor ⇒ “3.5 Removing and installing air conditioner compressor”, page 314 .

All vehicles

– Remove cap -A-.

– Hold air conditioner compressor drive shaft -B- e.g. with a commercially available hexagon socket wrench (7 mm) and turn clutch plate -C- in direction of -arrow-.



Note

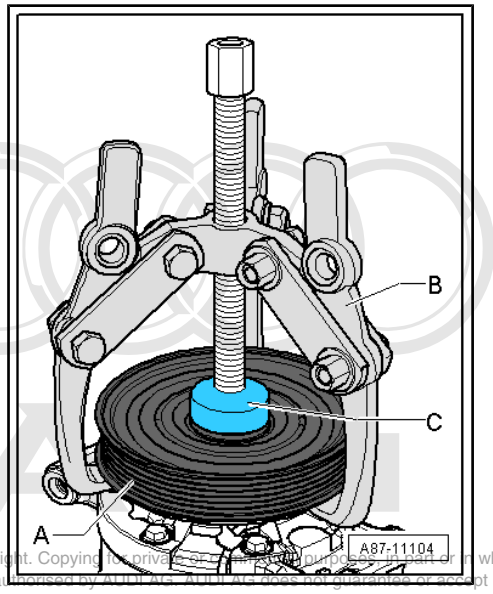
The torque for driving the air conditioner compressor is applied to the compressor shaft via the threaded attachment of the clutch plate -C-. If the clutch plate -C- has become so firmly screwed onto to the air conditioner compressor shaft -B- that it can no longer be loosened (the 7 mm hexagon flats can no longer transmit the necessary torque), the compressor must be renewed.

Detaching pulley

Note

- *If the pulley -A- cannot be detached by hand from the flange of the air conditioner compressor after removing the circlip (e.g. because of dirt), detach it carefully as described below.*
- *If the pulley -A- is supposed to be re-used, the arms of the puller must be applied so that the outside of the pulley is not squashed.*

– Carefully detach pulley -A- using a puller (with 3 arms) -B-.



Note

- *Do not support spindle of puller -B- on compressor shaft when detaching pulley -A-.*
- *To support spindle of puller -B- at compressor flange, use a sleeve -C- (e.g. sleeve V.A.G 1719/1 from magnetic clutch puller - V.A.G 1719-).*
- *After detaching pulley -A-, thoroughly clean compressor flange; it must be possible to slide pulley -A- on by hand.*

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Checking gap between pulley and clutch plate

Note

- *The gap must be within the permissible range around the entire circumference.*
- *The gap can also be measured when the air conditioner compressor is installed.*
- *If the gap is outside the permissible range, detach the clutch plate and adjust the gap to the correct dimension by removing or inserting spacers.*

– Switch off ignition.

– Perform preparations for renewing pulley ⇒ page 361 .

• Clutch plate -C- tightened to correct torque (30 Nm) on shaft of air conditioner compressor -E-.

– Use a depth gauge -F- to measure dimension “1” between pulley -B- and clutch plate -C- at 3 points on circumference of clutch plate -C-; note down measured values.

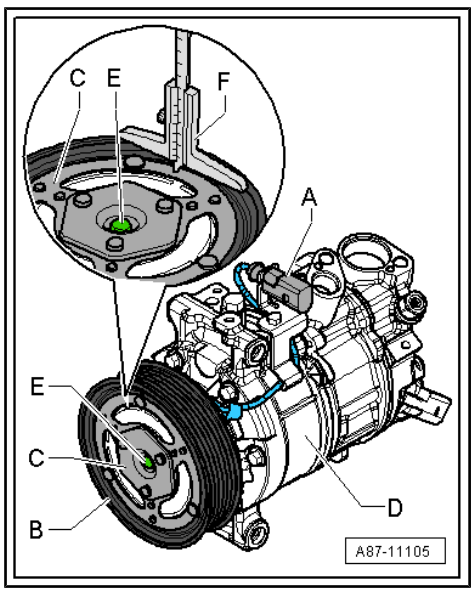
– Apply voltage of 12 V to 1-pin connector -A-.

– Apply earth to compressor housing -D-.

– Use a depth gauge -F- to measure dimension “2” between pulley -B- and clutch plate -C- at 3 points on circumference of clutch plate -C-; note down measured values.

– Calculate gap based on measured values (dimensions “1” and “2”).

Gap specification: 0.4 ... 0.6 mm (up to 0.8 mm with a used magnetic clutch)



3.8 Unfastening and securing air conditioner compressor drive shaft

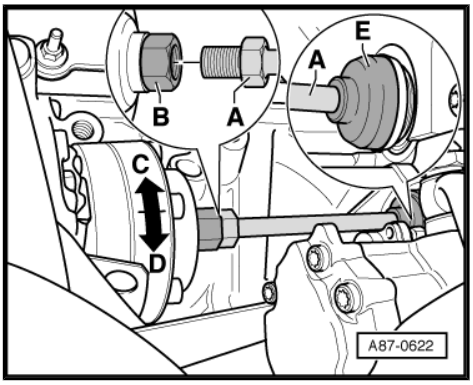
Note

- *Extensive preparation is required before the drive shaft of the air conditioner compressor can be slackened ⇒ page 314 (Removing and installing air conditioner compressor on vehicles with 8-cyl. FSI engine).*
- *The drive shaft can also be checked and tightened without opening the refrigerant circuit ⇒ page 314 (Removing and installing air conditioner compressor on vehicles with 8-cyl. FSI engine).*

Slackening drive shaft

– Remove components impeding access to drive shaft ⇒ page 314 (Removing and installing air conditioner compressor on vehicles with 8-cyl. FSI engine).

– Use an open-ended wrench to hold drive shaft -A- of air conditioner compressor in position and turn compressor drive unit -B- in direction of -arrow C-.



Note

- *Drive shaft -A- must not be turned.*
- *After unfastening bolt connection, drive shaft -A- can be pushed through grommet -E- into drive gear.*
- *After fitting drive shaft -A-, check installation position of boot -E-.*

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Tightening drive shaft

– Use an open-ended wrench to hold drive shaft -A- of air conditioner compressor in position and turn compressor drive unit -B- in direction of -arrow D- (tightening torque: 60 Nm).

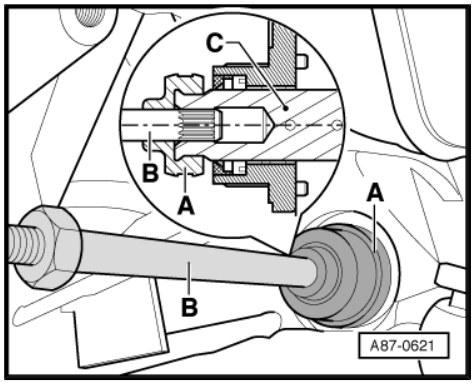
– After tightening drive shaft of air conditioner compressor, check installation position of grommet -E-.

3.9 Removing and installing air conditioner compressor drive shaft

Removing drive shaft

– Remove air conditioner compressor ⇒ “3.5 Removing and installing air conditioner compressor”, page 314 .

– Detach grommet -A-.
– Pull drive shaft -B- out of splines of drive gear -C-.



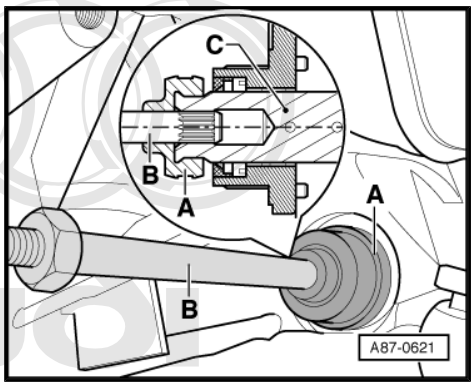
Note

Currently, boot -A- is secured in position at flange of drive gear -C- with a clamp to prevent it from slipping.

Installing drive shaft

Install in reverse order of removal; note the following.

– Check drive shaft -B-; splines must not show signs of wear and must engage snugly in splines of drive gear -C-.
– Before inserting, coat splines of drive shaft -B- e.g. with grease - G 000 100- ⇒ Electronic parts catalogue .
– Before installing air conditioner compressor, insert drive shaft -B- and slide it into drive gear -C- as far as stop.
– After fitting air conditioner compressor, check installation position of boot -A-.



Note

The boot -A- is secured in position on the auxiliary drive flange with a clamp to prevent it from slipping ⇒ Rep. gr. 13 ; Auxiliary drive; Exploded view - auxiliary drive and ⇒ Electronic parts catalogue .

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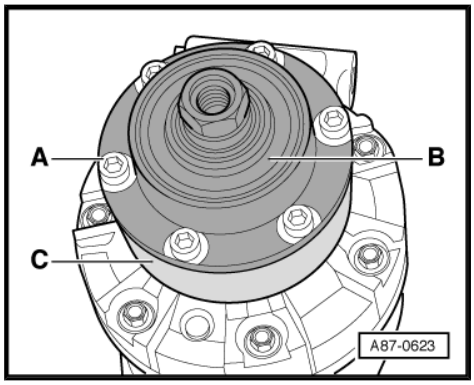
3.10 Removing and installing drive plate with overload protection

– Remove air conditioner compressor ⇒ page 314 (Removing and installing air conditioner compressor - vehicles with 8-cyl. FSI engine).

Detaching drive plate

– Remove bolts -A-.



Note

Use commercially available strap wrench (with fabric strap) to counterhold drive plate -C-.

Attaching drive plate

– Attach drive plate with overload protection -B- to drive plate -C-.
– Insert and hand-tighten bolts -A-.
– Check concentricity of drive plate -B- ⇒ page 369 .
– Tighten bolts -A- (tightening torque: 10 Nm).
– Check concentricity of drive plate -B- again ⇒ page 369 .

3.11 Checking and adjusting concentricity of drive plate with overload protection

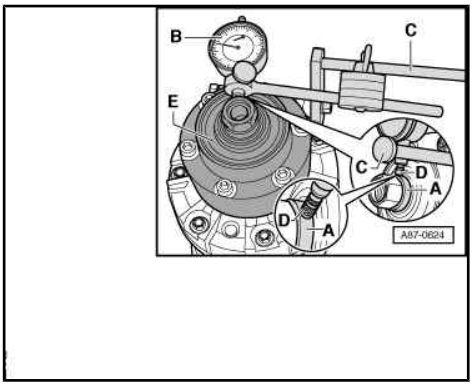
– Remove air conditioner compressor ⇒ “3.5 Removing and installing air conditioner compressor”, page 314 .

– Clean flange at drive plate -A-.

– Attach a dial gauge -B- to air conditioner compressor with dial gauge bracket -C- (e.g. universal dial gauge bracket - VW 387-).

– Apply probe of dial gauge -D- to flange of drive plate -A- with a preload of approx. 1.0 mm.

– Turn drive unit -E- of air conditioner compressor several times.



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Specification:

Eccentricity less than 0.21 mm (dial gauge deflection, difference between lowest and highest measured value max. 0.2 mm)

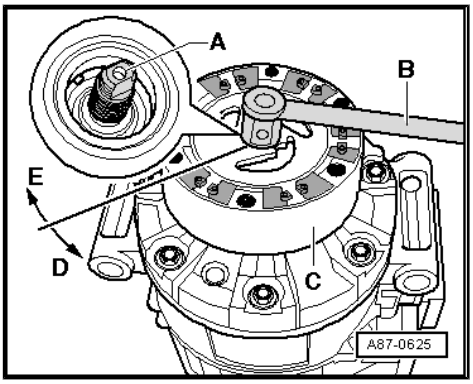
– If eccentricity exceeds 0.2 mm, slacken off bolts at drive plate ⇒ page 368 and re-adjust drive plate.

3.12 Removing and installing drive plate at air conditioner compressor

– Detach drive plate with overload protection ⇒ page 368 .

Unbolting drive plate

– Unscrew drive plate -C- by turning it with a commercially available strap wrench (with fabric strap) in direction of -arrow D-. When doing so, provide support for compressor shaft -A- by applying a counterhold -B- to compressor shaft -A-.



Note

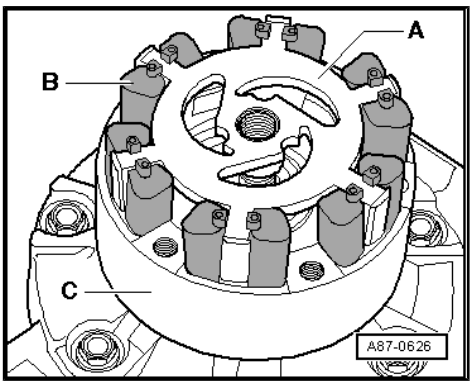
Depending on the type of air conditioner compressor (the compressor shaft differs), use either a ring spanner, a socket wrench - T10001/10- from shock absorber set - T10001- or counterhold tool - 3079- to counterhold the compressor shaft.

Bolting on drive plate

– When installing, coat rubber elements -B- with e.g. a small quantity of soap solution to provide lubrication

– Insert rubber elements -B- in drive plate -A- as shown.

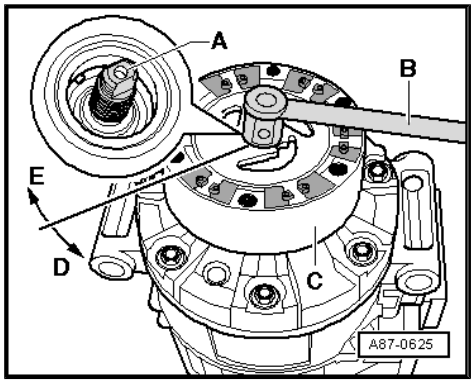
– Insert drive plate -A- with rubber elements -B- in drive plate -C- (as shown) until it makes contact with air conditioner compressor shaft.



Note

This illustration shows rubber elements -B-, version 1. Rubber elements -B- (version 2) are connected at the top.

– Attach drive plate -C- to compressor shaft -A- by turning it in direction of -arrow E-.
– Tighten drive plate -C- to 30 Nm by turning it with a commercially available strap wrench (with fabric strap) in direction of -arrow E-. Provide support for compressor shaft -A- by applying a counterhold -B- to compressor shaft -A-.



Note

Depending on the type of air conditioner compressor (the compressor shaft differs), use either a ring spanner, a socket wrench - T10001/10- from shock absorber set - T10001- or counterhold tool - 3079- to counterhold the compressor shaft.

3.13 Removing and installing drive plate with roller bearing

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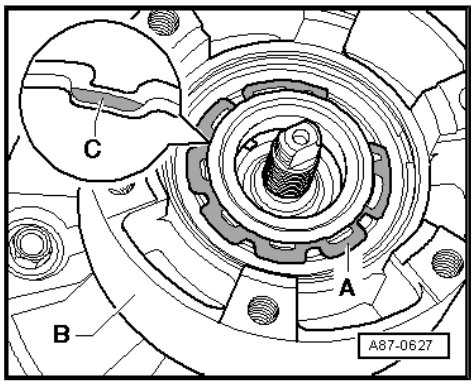
– Detach drive plate from compressor shaft ⇒ page 369 .
– Remove circlip -A-.
– Detach drive plate -B-.



Note

- *Renew circlip -A-.*
- *Clean air conditioner compressor flange before attaching drive plate.*
- *When fitting circlip -A-, take care not to bend it open more than necessary.*
- *Ensure that circlip -A- is fitted correctly. Bevelled side -C- faces away from air conditioner compressor (flat side faces compressor).*

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4 Control motors

⇒ “4.1 Overview of fitting locations - control motors (front)”, page 372

⇒ “4.2 Removing and installing temperature flap control motor V68 / rear temperature flap control motor V137 ”, page 386

⇒ “4.3 Removing and installing air flow flap control motor V71 ”, page 390

⇒ “4.4 Removing and installing centre vent control motor V102 ”, page 392

⇒ “4.5 Removing and installing defroster flap control motor V107 ”, page 394

⇒ “4.6 Removing and installing left footwell flap control motor V108 / footwell flap control motor V261 ”, page 396

⇒ “4.7 Removing and installing right footwell flap control motor V109 ”, page 398

⇒ “4.8 Removing and installing left centre vent control motor V110 ”, page 400

⇒ “4.9 Removing and installing right centre vent control motor V111 ”, page 403

⇒ “4.10 Removing and installing air recirculation flap control motor V113 ”, page 405

⇒ “4.11 Removing and installing left temperature flap control motor V158 ”, page 407

⇒ “4.12 Removing and installing right temperature flap control motor V159 ”, page 411

⇒ “4.13 Removing and installing air recirculation flap 1 control motor for hybrid battery V479 ”, page 413

⇒ “4.14 Removing and installing air recirculation flap 2 control motor for hybrid battery V480 ”, page 416

⇒ “4.15 Removing and installing retaining plate (left-side) with control motors V108 and V110 ”, page 419

⇒ “4.16 Removing and installing retaining plate (right-side) with control motors V109 and V111 ”, page 423

⇒ “4.17 Removing and installing retaining plate (left-side) with footwell flap control motor V261 ”, page 425

⇒ “4.18 Dismantling and assembling retaining plate (left-side) with control motors V108 and V110 ”, page 427

⇒ “4.19 Dismantling and assembling retaining plate (right-side) with control motors V109 and V111 ”, page 429

⇒ “4.20 Dismantling and assembling retaining plate (left-side) with footwell flap control motor V261 ”, page 430

4.1 Overview of fitting locations - control motors (front)

⇒ “4.1.1 Overview of fitting locations - control motors (front), basic version”, page 372

⇒ “4.1.2 Overview of fitting locations - control motors (front), deluxe version”, page 381

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4.1.1 Overview of fitting locations - control motors (front), “basic” version

Note

From model year 2012 onwards (introduction depending on vehicle version), modified air conditioning units are gradually being introduced (air conditioning unit with part number "8T_ 820 005"). At the same time as this conversion, different control motors are introduced. Currently the various versions of the control motors can be fitted with both air conditioning unit versions (mixed installation is currently permissible) ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

1 - Air intake box

- ❑ Removing and installing ⇒ page 512
- ❑ Dismantling and assembling ⇒ page 442
- ❑ Different versions (with or without connection for glove box cooling)
- ❑ Connection for glove box cooling at air intake box ⇒ page 587

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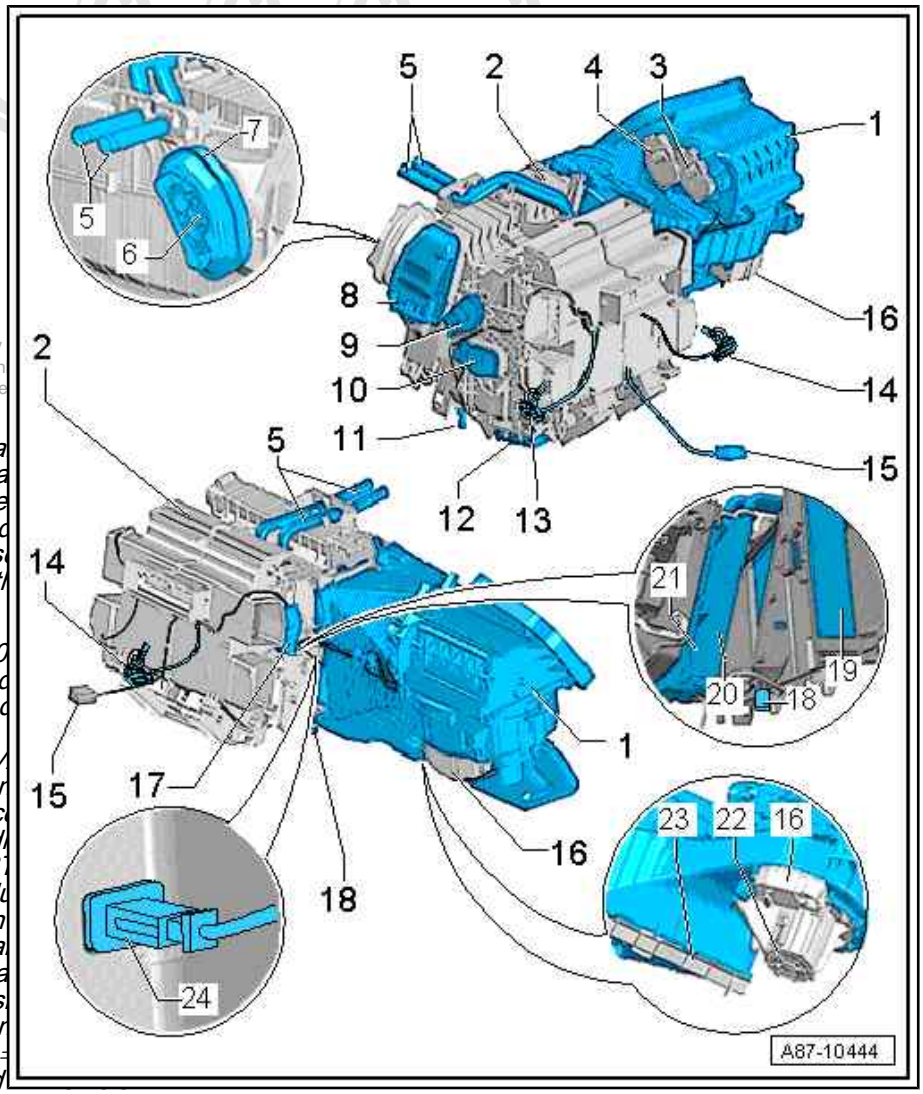

Note

- ♦ *From 01.2008 onwa ditioning units with a connection for glove are being introduced This connection is s plug on vehicles wit box cooling.*
- ♦ *From model year 20 (introduction depend cle version) modifie blower control units fresh air blowers - V ditioner operating ar units (Climatronic c J255-) and air condi with part number "8 are introduced gradu intake box has been gether with -J126- a conditioning unit. Pa that the correct vers and that the compon combined correctly parts catalogue and diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

2 - Air conditioning unit with evaporator ("basic" version)

- ❑ Only remove after discharging the refrigerant circuit; take the vehicle to a workshop equipped with the necessary tools where the 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 .
- ❑ Removing and installing evaporator with air conditioning unit installed (vehicles from start of production up to model year 2012) ⇒ page 451

Note

- *From model year 2012 onwards (introduction depending on vehicle version), modified air conditioning units and evaporators are gradually introduced (air conditioning unit with part number "8T_ 820 005"). On these air conditioning units, the evaporator can no longer be renewed with the air conditioning unit installed. Before starting work, check whether the replacement evaporator is available as an installation kit without the evaporator housing or only together with the evaporator housing ⇒ Electronic parts catalogue . If the evaporator is only available together with the evaporator housing, the air conditioning unit must be removed and the evaporator must be renewed together with the evaporator housing ⇒ page 468 .*
- *From the start of production up to the conversion from model year 2012 onwards, evaporators with a width (block depth) of approx. 40 mm were fitted (air conditioning unit with part number "8K_ 820 005"). From model year 2012 onwards and depending on the vehicle version, evaporators with a width (block depth) of approx. 50 mm are being introduced gradually (air conditioning unit with part number "8T_ 820 005"). Pay attention to the correct assignment of the expansion valve to the evaporator (different versions) ⇒ Electronic parts catalogue .*
- *On vehicles which use refrigerant R1234yf, no separable connections in the refrigerant circuit (e.g. between the refrigerant lines and the evaporator) are permitted in the passenger compartment. On these vehicles, the air conditioning unit (with the evaporator housing) must therefore always be removed, and the evaporator must be renewed (as a complete unit) together with the refrigerant lines ⇒ Electronic parts catalogue and ⇒ page 496 .*

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- ❑ Removing and installing evaporator with evaporator housing ⇒ page 468
- ❑ Removing and installing air conditioning unit with evaporator ⇒ page 496
- ❑ Dismantling and assembling air conditioning unit ⇒ page 431
- ❑ Cleaning air conditioner evaporator with ultrasound A/C cleaner - VAS 6189- ⇒ page 473

Note

From model year 2012 onwards (introduction depending on vehicle version), modified air conditioning units are gradually being introduced (air conditioning unit with part number "8T_ 820 005"). At the same time as this conversion, different control motors are introduced. Currently the various versions of the control motors can be fitted with both air conditioning unit versions (mixed installation is currently permissible) ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

3 - Air recirculation flap control motor - V113-

- ❑ Removing and installing ⇒ page 405

4 - Air flow flap control motor - V71-

- ❑ Removing and installing ⇒ page 390

5 - Coolant pipes to heat exchanger

6 - Expansion valve

- ❑ Detaching and attaching refrigerant line with internal heat exchanger ⇒ page 217
- ❑ Removing and installing ⇒ page 232

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Note

- *From the start of production up to the conversion from model year 2012 onwards, evaporators with a width (block depth) of approx. 40 mm were fitted (air conditioning unit with part number "8K_ 820 005"). From model year 2012 onwards and depending on the vehicle version, evaporators with a width (block depth) of approx. 50 mm are being introduced gradually (air conditioning unit with part number "8T_ 820 005"). Pay attention to the correct assignment of the expansion valve to the evaporator (different versions) ⇒ Electronic parts catalogue .*
- *Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue*

7 - Grommet

- ❑ For sealing opening for refrigerant lines through plenum chamber back wall

8 - Cover for refrigerant pipes to evaporator

- ❑ Removing and installing ⇒ page 451

9 - Defroster flap control motor - V107-

- ❑ Removing and installing ⇒ page 394

10 - Footwell flap control motor - V261-

- ❑ Removing and installing ⇒ page 396

- ❑ Removing and installing retaining plate (left-side) with footwell flap control motor - V261- ⇒ page 425

11 - Connection for left condensation drain (driver side)

- ❑ Removing and installing condensation drain hose ⇒ page 551
- ❑ Checking condensation drain ⇒ page 552

12 - Temperature flap control motor - V68-

- ❑ Removing and installing ⇒ page 386

13 - Footwell vent temperature sender - G192-

- ❑ Removing and installing ⇒ page 632
- ❑ Footwell vent temperature sender - G192- is installed in footwell vent (left-side).

14 - Centre vent temperature sender - G191-

- ❑ Removing and installing ⇒ page 632
- ❑ Centre vent temperature sender - G191- is installed in air duct to dash panel vent (centre).

15 - Connection to air conditioner operating and display unit (Climatronic control unit - J255-) at wiring harness for air conditioning unit

16 - Fresh air blower control unit - J126-

- ❑ Removing and installing ⇒ page 535
- ❑ Checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

Note

- *In model year 2010, petrol engines designed for operation with bioethanol were introduced gradually (Flex Fuel Vehicle). These engines are currently also fitted with an auxiliary air heater element - Z35- ⇒ page 482 .*
- *Vehicles with a high-voltage system (hybrid vehicles) and petrol engine are currently equipped with an auxiliary air heater element - Z35- to provide a supplementary heating function ⇒ page 482 .*
- *On vehicles with a petrol engine, the electric supplementary heater (auxiliary air heater element - Z35-) is activated by a signal from the operating and display unit (Climatronic control unit - J255-) via the local data bus (via the same output by which the fresh air blower control unit - J126- is activated) to the auxiliary air heater control unit - J604- . In the event of problems with the fresh air blower control unit - J126- or the fresh air blower - V2- on these vehicles, also check the auxiliary air heater control unit - J604- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *Checking operation of auxiliary air heater element - Z35- ⇒ page 482*

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- *From model year 2012 onwards (introduction depending on vehicle version) modified fresh air blower control units - J126- (and fresh air blowers - V2- , air conditioner operating and display units (Climatronic control unit - J255-) and air conditioning units with part number “8T_ 820 005”) are introduced gradually. The air intake box has been modified together with -J126- and the air conditioning unit. Pay attention that the correct version is used and that the components are combined correctly ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *If the allocation or adaption of -J255- and -J126- (with part number 8K0 820 521 or 8T0 820 521) is not as specified, the fresh air blower - V2- is not controlled by -J126- . Although in this case the activation of -V2- is not OK, an entry is not always made in the event memory. Therefore it is important to pay attention to the correct adaption of -J255- ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

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17 - Centre vent control motor - V102-

- ❑ Removing and installing ⇒ page 392

18 - Connection for right condensation drain (passenger side)

- ❑ Removing and installing condensation drain hose ⇒ page 551
- ❑ Checking condensation drain ⇒ page 552

19 - Evaporator

- ❑ Removing and installing air conditioning unit with evaporator ⇒ page 496
- ❑ Removing and installing evaporator with air conditioning unit installed (vehicles from start of production up to model year 2012) ⇒ page 451

Note

- *From model year 2012 onwards (introduction depending on vehicle version), modified air conditioning units and evaporators are gradually introduced (air conditioning unit with part number "8T_ 820 005"). On these air conditioning units, the evaporator can no longer be renewed with the air conditioning unit installed. Before starting work, check whether the replacement evaporator is available as an installation kit without the evaporator housing or only together with the evaporator housing ⇒ Electronic parts catalogue . If the evaporator is only available together with the evaporator housing, the air conditioning unit must be removed and the evaporator must be renewed together with the evaporator housing ⇒ page 468 .*
- *From the start of production up to the conversion from model year 2012 onwards, evaporators with a width (block depth) of approx. 40 mm were fitted (air conditioning unit with part number "8K_ 820 005"). From model year 2012 onwards and depending on the vehicle version, evaporators with a width (block depth) of approx. 50 mm are being introduced gradually (air conditioning unit with part number "8T_ 820 005"). Pay attention to the correct assignment of the expansion valve to the evaporator (different versions) ⇒ Electronic parts catalogue .*
- *On vehicles which use refrigerant R1234yf, no separable connections in the refrigerant circuit (e.g. between the refrigerant lines and the evaporator) are permitted in the passenger compartment. On these vehicles, the air conditioning unit (with the evaporator housing) must therefore always be removed, and the evaporator must be renewed (as a complete unit) together with the refrigerant lines ⇒ Electronic parts catalogue and ⇒ page 496 .*

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❑ Removing and installing evaporator with evaporator housing ⇒ page 468

20 - Heat exchanger for heater

❑ Removing and installing heat exchanger with air conditioning unit installed ⇒ page 543

21 - Auxiliary air heater element - Z35- /honeycomb element

- ❑ The auxiliary air heater element - Z35- is installed on vehicles with a diesel engine and vehicles with certain petrol engines ⇒ page 482 .
- ❑ Vehicles with petrol engine (without auxiliary air heater element - Z35-) are fitted with a honeycomb element as spacer element in the unused space (this ensures identical flow conditions in air conditioning unit with and without auxiliary air heater element - Z35-).
- ❑ If, on vehicles with diesel engine, an auxiliary heater fitted as optional extra is activated as a supplementary heater, there is no auxiliary air heater element - Z35- but only a honeycomb element (introduction not yet finalised) ⇒ page 482 .
- ❑ Checking operation of auxiliary air heater element - Z35- ⇒ page 482
- ❑ Removing and installing auxiliary air heater element - Z35- /honeycomb element with air conditioning unit installed ⇒ page 487

Note

- ♦ *In model year 2009, a modified version of the auxiliary air heater element - Z35- with slightly smaller heating elements is gradually being introduced; observe the correct version and assignment ⇒ Electronic parts catalogue .*
- ♦ *In model year 2010, petrol engines designed for operation with bioethanol were introduced gradually (Flex Fuel Vehicle). These engines are currently also fitted with an auxiliary air heater element - Z35- ⇒ page 482 .*
- ♦ *Vehicles with a high-voltage system (hybrid vehicles) and petrol engine are currently equipped with an auxiliary air heater element - Z35- to provide a supplementary heating function ⇒ page 482 .*

22 - Fresh air blower - V2-

- ❑ Removing and installing ⇒ page 532
- ❑ Checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

Note

- ♦ *Different versions ⇒ page 532*
- ♦ *In model year 2010, petrol engines designed for operation with bioethanol were introduced gradually (Flex Fuel Vehicle). These engines are currently also fitted with an auxiliary air heater element - Z35- ⇒ page 482 .*
- ♦ *Vehicles with a high-voltage system (hybrid vehicles) and petrol engine are currently equipped with an auxiliary air heater element - Z35- to provide a supplementary heating function ⇒ page 482 .*

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- *On vehicles with a petrol engine, the electric supplementary heater (auxiliary air heater element - Z35-) is activated by a signal from the operating and display unit (Climatronic control unit - J255-) via the local data bus (via the same output by which the fresh air blower control unit - J126- is activated) to the auxiliary air heater control unit - J604- . In the event of problems with the fresh air blower control unit - J126- or the fresh air blower - V2- on these vehicles, also check the auxiliary air heater control unit - J604- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *Checking operation of auxiliary air heater element - Z35- ⇒ page 482*
- *From model year 2012 onwards and depending on the vehicle version, modified fresh air blower control units - J126- , fresh air blowers - V2- , air conditioner operating and display units (Climatronic control unit - J255-) and air conditioning units with part number “8T_ 820 005” are introduced gradually. Pay attention that the correct version is used and that the components are combined correctly ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *If the allocation or adaption of -J255- and -J126- (with part number 8K0 820 521 or 8T0 820 521) is not as specified, the fresh air blower - V2- is not controlled by -J126- . Although in this case the activation of -V2- is not OK, an entry is not always made in the event memory. Therefore it is important to pay attention to the correct adaption of -J255- ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

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23 - Dust and pollen filter

- ❑ Removing and installing ⇒ page 531
- ❑ Observe replacement intervals ⇒ Maintenance tables
- ❑ Different versions (with or without activated charcoal filter insert) ⇒ page 104 and ⇒ Electronic parts catalogue

24 - Evaporator output temperature sender - G263-

- ❑ Removing and installing ⇒ page 633

4.1.2 Overview of fitting locations - control motors (front), “deluxe” version

Note

From model year 2012 onwards and depending on the vehicle version, modified fresh air blower control units - J126- , fresh air blowers - V2- , air conditioner operating and display units (Climatronic control unit - J255-), evaporators, expansion valves, control motors and air conditioning units are introduced gradually ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . Observe notes on these components
⇒ “4.1.1 Overview of fitting locations - control motors (front), basic version”, page 372 .

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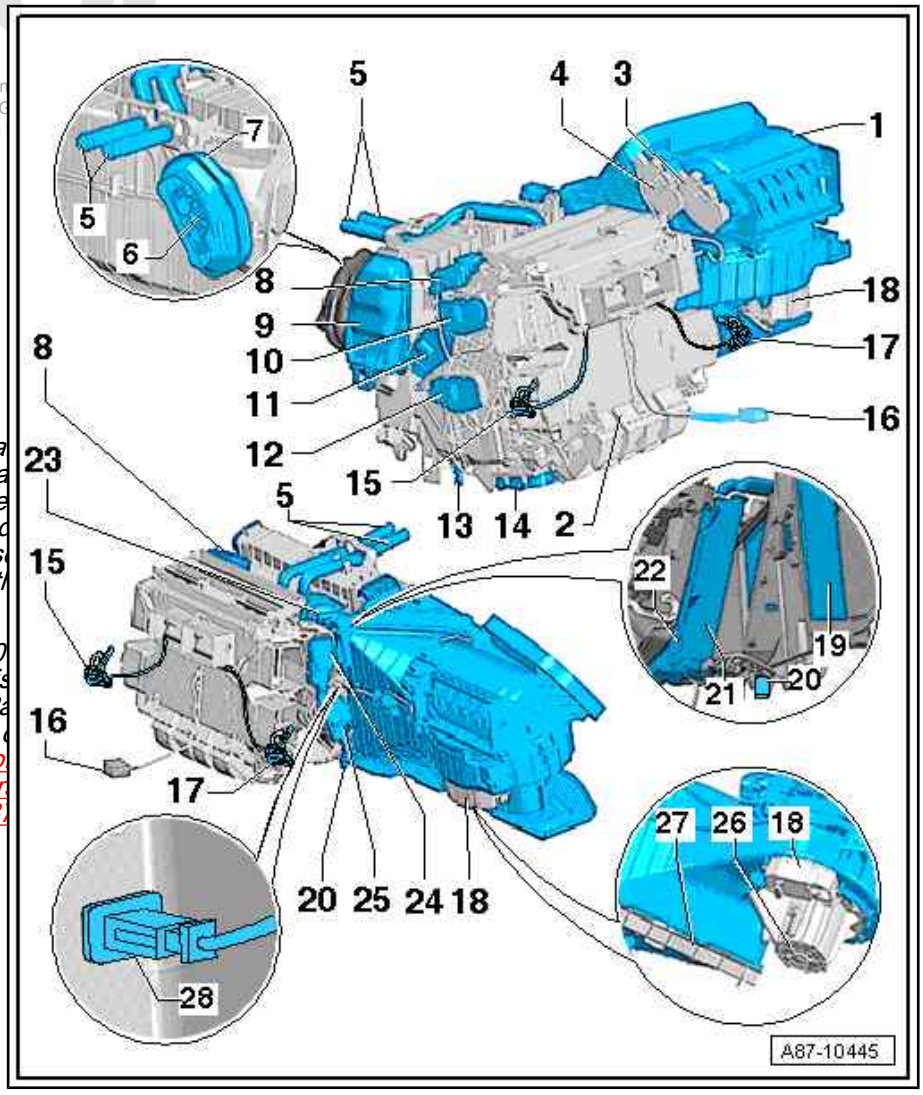
1 - Air intake box

- ❑ Removing and installing ⇒ page 512
- ❑ Dismantling and assembling ⇒ page 442
- ❑ Different versions (with or without connection for glove box cooling)
- ❑ Connection for glove box cooling at air intake box ⇒ page 587

Note

- ♦ *From 01.2008 onwa ditioning units with a connection for glove are being introduced This connection is s plug on vehicles wit box cooling.*
- ♦ *From model year 20 a modified version is being introduced. Pa to the notes on this ⇒ “4.1.1 Overview o tions - control motor sic version”, page 3*



2 - Air conditioning unit with evaporator (“deluxe” version)

- ❑ Only remove after discharging the refrigerant circuit; take the vehicle to a workshop equipped with the necessary tools where the 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 .
- ❑ Removing and installing evaporator with air conditioning unit installed (vehicles from start of production up to model year 2012) ⇒ page 451

Note

From model year 2012 onwards, a modified version is gradually being introduced. Pay attention to the notes on this component ⇒ "4.1.1 Overview of fitting locations - control motors (front), basic version", page 372 .

- ❑ Removing and installing evaporator with evaporator housing ⇒ page 468
- ❑ Removing and installing air conditioning unit with evaporator ⇒ page 496
- ❑ Dismantling and assembling air conditioning unit ⇒ page 431
- ❑ Cleaning air conditioner evaporator with ultrasound A/C cleaner - VAS 6189- ⇒ page 473

3 - Air recirculation flap control motor - V113-

- ❑ Removing and installing ⇒ page 405

4 - Air flow flap control motor - V71-

- ❑ Removing and installing ⇒ page 390

5 - Coolant pipes to heat exchanger

6 - Expansion valve

- ❑ Detaching and attaching refrigerant lines ⇒ page 217
- ❑ Removing and installing ⇒ page 232

Note

- ♦ *From model year 2012 onwards, a modified version is gradually being introduced. Pay attention to the notes on this component ⇒ "4.1.1 Overview of fitting locations - control motors (front), basic version", page 372 .*
- ♦ *Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue*

7 - Grommet

- ❑ For sealing opening for refrigerant lines through plenum chamber back wall

8 - Left temperature flap control motor - V158-

- ❑ Removing and installing ⇒ page 407

9 - Cover for refrigerant pipes to evaporator

- ❑ Removing and installing ⇒ page 451

10 - Left centre vent control motor - V110-

- ❑ Removing and installing ⇒ page 400
- ❑ Removing and installing retaining plate (left-side) with control motors -V108- and -V110- ⇒ page 419
- ❑ Removing and installing left centre vent control motor - V110- ⇒ page 400

11 - Defroster flap control motor - V107-

- ❑ Removing and installing ⇒ page 394

12 - Left footwell flap control motor - V108-

- ❑ Removing and installing ⇒ page 396
- ❑ Removing and installing retaining plate (left-side) with control motors -V108- and -V110- ⇒ page 419

13 - Connection for left condensation drain (driver side)

- ❑ Removing and installing condensation drain hose ⇒ page 551

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- ❑ Checking condensation drain ⇒ page 552

14 - Rear temperature flap control motor - V137-

- ❑ Removing and installing ⇒ page 386

15 - Left footwell vent temperature sender - G261-

- ❑ Removing and installing ⇒ page 632
- ❑ Left footwell vent temperature sender - G261- is installed in footwell vent (left-side).

16 - Connection to air conditioner operating and display unit (Climatronic control unit - J255-) at wiring harness for air conditioning unit

17 - Right footwell vent temperature sender - G262-

- ❑ Removing and installing ⇒ page 633
- ❑ Right footwell vent temperature sender - G262- is installed in footwell vent (right-side).

18 - Fresh air blower control unit - J126-

- ❑ Removing and installing ⇒ page 535
- ❑ Checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

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Note

- *Different versions ⇒ page 532*
- *In model year 2010, petrol engines designed for operation with bioethanol were introduced gradually (Flex Fuel Vehicle). These engines are currently also fitted with an auxiliary air heater element - Z35- ⇒ page 482 .*
- *Vehicles with a high-voltage system (hybrid vehicles) and petrol engine are currently equipped with an auxiliary air heater element - Z35- to provide a supplementary heating function ⇒ page 482 .*
- *On vehicles with a petrol engine, the electric supplementary heater (auxiliary air heater element - Z35-) is activated by a signal from the operating and display unit (Climatronic control unit - J255-) via the local data bus (via the same output by which the fresh air blower control unit - J126- is activated) to the auxiliary air heater control unit - J604- . In the event of problems with the fresh air blower control unit - J126- or the fresh air blower - V2- on these vehicles, also check the auxiliary air heater control unit - J604- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *Checking operation of auxiliary air heater element - Z35- ⇒ page 482*

- *From model year 2012 onwards, a modified version is gradually being introduced. Pay attention to the notes on this component ⇒ "4.1.1 Overview of fitting locations - control motors (front), basic version", page 372 .*

19 - Evaporator

- ❑ Removing and installing air conditioning unit with evaporator ⇒ page 496
- ❑ Removing and installing evaporator with air conditioning unit installed (vehicles from start of production up to model year 2012) ⇒ page 451

Note

From model year 2012 onwards, a modified version is gradually being introduced. Pay attention to the notes on this component ⇒ "4.1.1 Overview of fitting locations - control motors (front), basic version", page 372 .

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- ❑ Removing and installing evaporator with evaporator housing ⇒ page 468

20 - Connection for right condensation drain (passenger side)

- ❑ Removing and installing condensation drain hose ⇒ page 551
- ❑ Checking condensation drain ⇒ page 552

21 - Heat exchanger for heater

- ❑ Removing and installing heat exchanger with air conditioning unit installed ⇒ page 543

22 - Auxiliary air heater element - Z35- /honeycomb element

The auxiliary air heater element - Z35- is installed on vehicles with a diesel engine and vehicles with certain petrol engines ⇒ page 482 .

Vehicles with petrol engine (without auxiliary air heater element - Z35-) are fitted with a honeycomb element as spacer element in the unused space (this ensures identical flow conditions in air conditioning unit with and without auxiliary air heater element - Z35-).

- ❑ If, on vehicles with diesel engine, an auxiliary heater fitted as optional extra is activated as a supplementary heater, there is no auxiliary air heater element - Z35- but only a honeycomb element (introduction not yet finalised) ⇒ page 482 .
- ❑ Checking operation of auxiliary air heater element - Z35- ⇒ page 482
- ❑ Removing and installing auxiliary air heater element - Z35- /honeycomb element with air conditioning unit installed ⇒ page 487

Note

- *In model year 2009, a modified version of the auxiliary air heater element - Z35- with slightly smaller heating elements is gradually being introduced; observe the correct version and assignment ⇒ Electronic parts catalogue .*
- *In model year 2010, petrol engines designed for operation with bioethanol were introduced gradually (Flex Fuel Vehicle). These engines are currently also fitted with an auxiliary air heater element - Z35- ⇒ page 482 .*

- *Vehicles with a high-voltage system (hybrid vehicles) and petrol engine are currently equipped with an auxiliary air heater element - Z35- to provide a supplementary heating function ⇒ page 482 .*

23 - Right temperature flap control motor - V159-

- ❑ Removing and installing ⇒ page 411

24 - Right centre vent control motor - V111-

- ❑ Removing and installing ⇒ page 403
- ❑ Removing and installing retaining plate (right-side) with control motors -V109- and -V111- ⇒ page 423

25 - Right footwell flap control motor - V109-

- ❑ Removing and installing ⇒ page 398
- ❑ Removing and installing retaining plate (right-side) with control motors -V109- and -V111- ⇒ page 423

26 - Fresh air blower - V2-

- ❑ Removing and installing ⇒ page 532
- ❑ Checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

Note

- *Different versions ⇒ page 532*
- *From model year 2012 onwards, a modified version is gradually being introduced. Pay attention to the notes on this component ⇒ "4.1.1 Overview of fitting locations - control motors (front), basic version", page 372 .*

27 - Dust and pollen filter

- ❑ Removing and installing ⇒ page 531
- ❑ Observe replacement intervals ⇒ Maintenance tables
- ❑ Different versions (with or without activated charcoal filter insert) ⇒ page 104

28 - Evaporator output temperature sender - G263-

- ❑ Removing and installing ⇒ page 633

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4.2 Removing and installing temperature flap control motor - V68- / rear temperature flap control motor - V137-

The temperature flap control motor - V68- is fitted on vehicles with “basic” air conditioner.

The rear temperature flap control motor - V137- is fitted on vehicles with “deluxe” air conditioner.

Note

- *There are different designations and functions depending on the version of the air conditioner ⇒ page 554 (routing of air flow in air conditioning unit and vehicle).*
- *On vehicles with a “deluxe” air conditioner, the rear temperature flap control motor - V137- actuates the temperature flaps for the rear footwell vents and the vent in the rear centre console (not fitted on vehicles with “basic” air conditioner).*
- *On vehicles with a “basic” air conditioner, the temperature flap control motor - V68- actuates the temperature flaps for the left and right side.*
- *Currently all the control motors on this vehicle are identical. While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*

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Removing

– Move driver's seat to rearmost position.

– Switch off ignition.

– Remove storage compartment beneath dash panel (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel trim (driver side) .

Note

The control motor is fitted on the left of the air conditioning unit in the area of the centre tunnel ⇒ page 372 .

– Remove bolts -B-.

– Pull control motor with corresponding bracket -H- in direction of -arrow- out of mountings -C- and -D-.

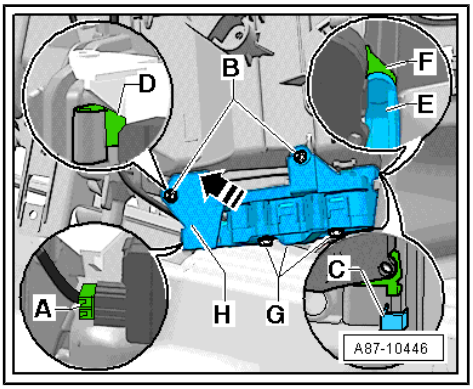
– Mark connector -A- (to prevent interchange with other connectors if several connectors are unplugged at the same time).

– Unplug connector -A-.

– Unfasten connecting rod -E- from toothed segment -F-.

– Remove control motor with corresponding bracket.

– Remove bolts -G- and separate control motor from bracket -H-.

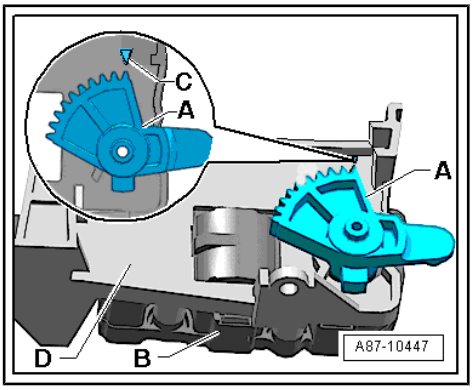


– Unfasten toothed segment -A- from shaft of control motor -B-.

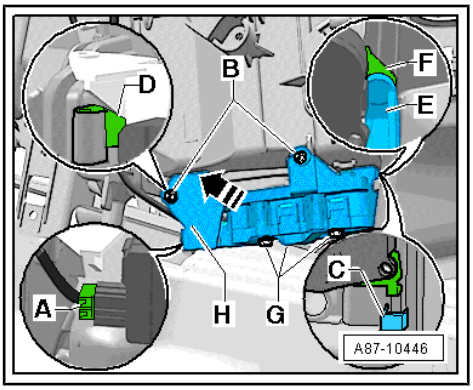
Installing

Install in reverse order of removal; note the following.

– Install control motor -B- in bracket -D-.



– Fit bolts -G-.



– Attach toothed segment -A- to shaft of control motor -B-, as shown.

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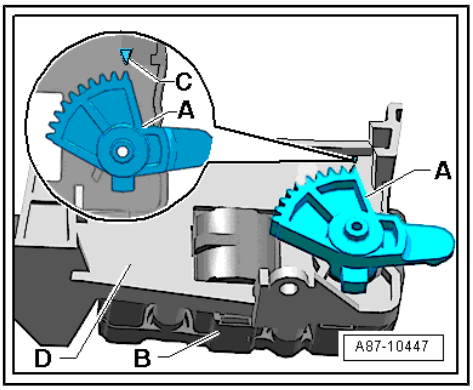
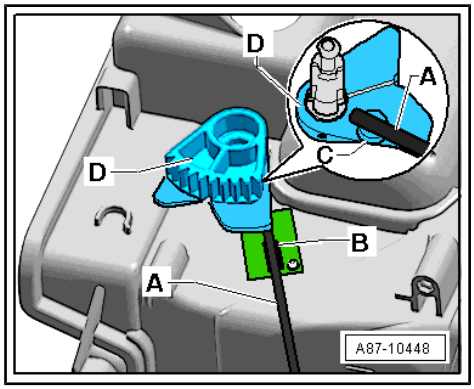
Note

The control motor has no stop; therefore the toothed segment -A- can be attached to the shaft of the control motor in any position. However, to ensure proper operation, the toothed segment -A- must be correctly positioned with respect to the mark on the bracket following assembly.



– Check position of toothed segment -A-. The first tooth must be positioned as shown in relation to mark -C-.



Note

- *With a new replacement control motor, the shaft should always be positioned so that the toothed segment -A- can be attached as shown. If the control motor shaft is positioned so that the first tooth is not located as shown with respect to mark -C- when attaching the toothed segment -A- (e.g. in the case of a control motor which has already been installed), the control motor must be connected to the vehicle's electrical system, and the temperature setting on the air conditioner operating and display unit (Climatronic control unit - J255-) must be altered with the ignition switched on so that the control motor changes position and moves the toothed segment -A- to the correct position.*
- *This control motor cannot be moved by applying voltage; it only moves when it is activated by the air conditioner operating and display unit (Climatronic control unit - J255-).*
- *The toothed segment -A- (see top illustration), which is attached to the shaft of the control motor, has a larger tooth which, during operation, must make contact with the deeper tooth gap at the toothed segment -D- attached to the shaft of the temperature flap.*
- *Depending on the production period, there are different toothed segments -A- (different version of connecting element to connecting rod for temperature flaps, right-side)* *⇒ page 24* *and ⇒ Electronic parts catalogue .*

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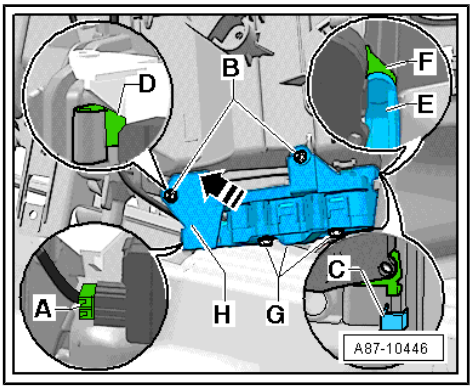
– Fix toothed segment -D- of temperature flap in position with a pin -A- (diameter 4 mm) via guide -B- and mounting -C-.



– Clip in connecting rod -E- at toothed segment -F-.
– Plug in connector -A-.
– Insert control motor with corresponding bracket -H- in mountings -C- and -D- in direction opposite to -arrow-.
– Route wiring harness to connector -A- so that it cannot come into contact with moving components (e.g. lever).
– Fit bolts -B-.
– Re-install all other components removed in reverse order.
– Switch on ignition.
– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

♦ *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

♦ *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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4.3 Removing and installing air flow flap control motor - V71-

Note

- *After installing control motor, perform basic setting for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .⇒*
- *If necessary, activation of electrical components of the air conditioner can be checked via "Final control diagnosis" and "Basic setting" functions (e.g. to check for interchange) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")*
- *Currently all the control motors on this vehicle are identical. While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*
- *After installing a new control motor, check activation by air conditioner operating and display unit (Climatronic control unit - J255-) and operation of control motor (correct position of air recirculation flap and air flow/fresh air flap) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .⇒*
- *Operation of air flow flap control motor - V71- ⇒ page 391*

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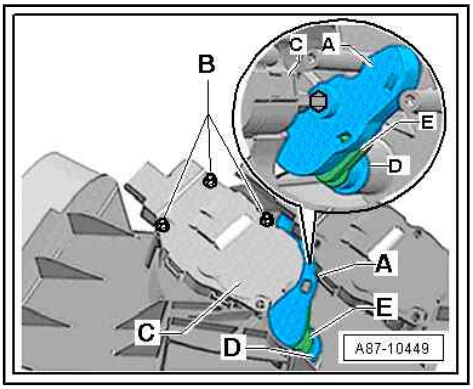
Removing

– Set front passenger seat to rearmost position.

– Switch off ignition.

– Remove air intake box ⇒ page 512 .

– Detach intake duct from air intake box ⇒ page 576 .



– Remove bolts -B-.
– Provide support at cam plate -A- and detach control motor -C- from cam plate -A-.

Installing

Install in reverse order of removal; note the following.

– Check levers to air flow flap -D- and fresh air flap -E-; they must be inserted correctly in cam plate -A-.
– Insert shaft of control motor -C- in mounting of cam plate -A-.

Note

The control motor has no stop; therefore the shaft of the control motor -C- can be inserted into the mounting of the cam plate -A- in any position.

– Fit bolts -B-.
– Re-install all parts removed in reverse order.
– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Operation of air flow flap control motor - V71-

- With air recirculation flap closed, the position of the fresh air and the air flow flap can be seen via the air intake opening in the plenum chamber (if necessary, remove cowl panel trim and cover over fresh-air intake ⇒ page 572).
- For the control of the air flow, the fresh air intake duct is partially closed via the air flow flap at higher speeds (above approx. 80 km/h) by the air conditioner operating and display unit (Climatronic control unit - J255-) (position of air recirculation flap is specified by operating and display unit, Climatronic control unit - J255-).
- To reduce the change in the noise level of the fresh air blower - V2- caused by differences in the air intake when switching from fresh air mode to air recirculation mode or vice versa, the air flow flap control motor - V71- and the air recirculation flap control motor - V113- are activated as follows:

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– When switching from fresh air mode to air recirculation mode, the air recirculation flap is opened first and the fresh-air intake duct is then closed via the air flow/fresh air flap.
– When switching from air recirculation mode to fresh air mode, the fresh-air intake duct is opened first via the air flow/fresh air flap and the air recirculation flap is then closed.
– In partial air recirculation mode, air recirculation flap -E- is opened and air flow/fresh air flap is moved to centre position by air conditioner operating and display unit (Climatronic control unit - J255-) (fresh air and air recirculation intake ducts are simultaneously opened slightly). This results in an improved cooling effect in certain temperature ranges and at the same time causes the intake of a certain proportion of fresh air.

4.4 Removing and installing centre vent control motor - V102-

Note

- *The centre vent control motor - V102- is only fitted on vehicles with "basic" air conditioner.*
- *Currently all the control motors on this vehicle are identical. While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

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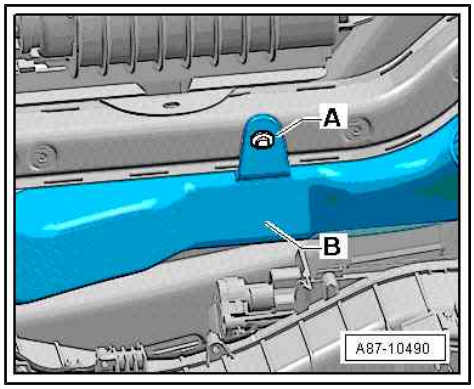
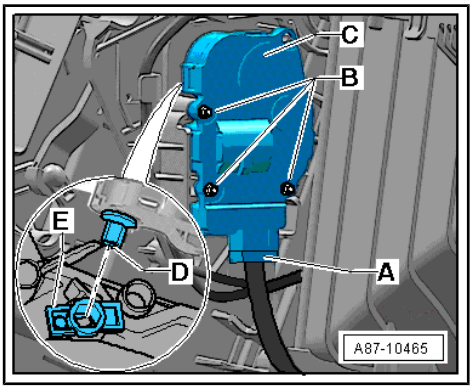
Removing

– Set front passenger seat to rearmost position.
– Switch off ignition.
– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .
– Remove right footwell vent (front passenger side) ⇒ page 566 .
– Remove bolts -A-.
– Remove air duct -B- to right dash panel vent (passenger's side).





– Mark connector -A- (to prevent interchange if several connectors are unplugged at the same time).
– Unplug connector -A-.
– Remove bolts -B-.
– Detach shaft -D- of control motor -C- from shaft of centre vent flap -E-.

Installing

Install in reverse order of removal; note the following.

– Insert shaft -D- of control motor -C- in shaft of centre vent flap -E-.

Note

The control motor has no stop; therefore the shaft of the control motor can be inserted in the shaft of the centre vent flap -E- in any position.

– Fit bolts -B-.
– Plug in connector -A-.
– Route wiring harness so that it cannot come into contact with moving components (e.g. lever).
– Re-install all other components removed in reverse order.
– Switch on ignition.
– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

♦ *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

♦ *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

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– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

4.5 Removing and installing defroster flap control motor - V107-

Note

Currently all the control motors on this vehicle are identical. While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly
⇒ "1.10 Overview - control motors of air conditioner", page 30 .

Removing

– Move driver's seat to rearmost position.

– Switch off ignition.

– Remove storage compartment beneath dash panel (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel trim (driver side) .

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– Remove left footwell vent (driver side) ⇒ page 565 .

– Remove accelerator pedal module ⇒ Rep. gr. 20 ; Accelerator mechanism; Removing and installing accelerator pedal module with accelerator position sender -G79- / -G185- .

– Mark connector -D- (to prevent interchange if several connectors are unplugged at the same time).
– Unplug connector -D-.
– Remove bolts -C-.

Note

The bolts -C- can also be removed using the ratchet wrench - T40083- .

– Unfasten shaft -A- (at control motor -B-) from actuating arm -E- and remove control motor.

Installing

Install in reverse order of removal; note the following.

– Check position of actuating arm -E- in guide at air conditioning unit -F- (pay attention to both stops -G-).
– Insert shaft -A- (at control motor -B-) in actuating arm -E-.

Note

The control motor has no stop; therefore the shaft -A- can be inserted in the actuating arm -E- in any position.

– Fit bolts -C-.
– Plug in connector -D-.
– Route wiring harness so that it cannot come into contact with moving components (e.g. lever).
– Re-install all other components removed in reverse order.
– Switch on ignition.
– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

4.6 Removing and installing left footwell flap control motor - V108- / footwell flap control motor - V261-

The footwell flap control motor - V261- is fitted on vehicles with “basic” air conditioner.

The left footwell flap control motor - V108- is fitted on vehicles with “deluxe” air conditioner.

Note

- *There are different designations and functions depending on the version of the air conditioner ⇒ page 554 (routing of air flow in air conditioning unit and vehicle).*
- *On vehicles with a “deluxe” air conditioner, the left footwell flap control motor - V108- actuates the flaps for the left dash panel vent, the left footwell vent and the rear left footwell vent (beneath the driver's seat).*
- *On vehicles with a “basic” air conditioner, the footwell flap control motor - V261- actuates the flaps for the left and right dash panel vents, the left and right footwell vents and the rear left and right footwell vents (beneath the front seats). The various flaps for the left and right side are connected in the air conditioning unit via connecting rods.*
- *Currently all the control motors on this vehicle are identical. While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*
- *Removing and installing retaining plate (left-side) with footwell flap control motor - V261- ⇒ page 425*
- *Removing and installing retaining plate (left-side) with control motors -V108- and -V110- ⇒ page 419*

Removing

– Move driver's seat to rearmost position.

– Switch off ignition.

– Remove storage compartment beneath dash panel (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel trim (driver side) .

– Remove left footwell vent (driver side) ⇒ page 565 .

– Remove accelerator pedal module ⇒ Rep. gr. 20 ; Accelerator mechanism; Removing and installing accelerator pedal module with accelerator position sender -G79- / -G185- .

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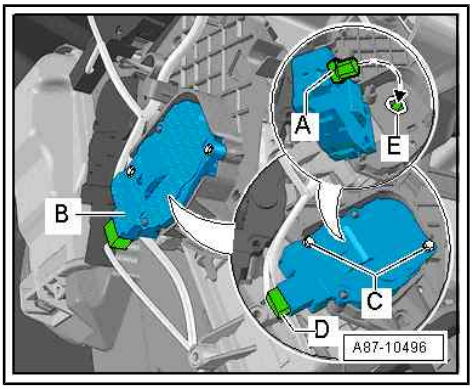

– Mark connector -D- (to prevent interchange if several connectors are unplugged at the same time).
– Unplug connector -D-.
– Remove bolts -C-.

Note

The bolts -C- can also be removed using the ratchet wrench - T40083- .

– Release shaft -A- (at control motor -B-) from cam plate -E- and remove control motor.

Installing

Install in reverse order of removal; note the following.

– Insert shaft -A- (at control motor -B-) in mounting of cam plate -E-.

Note

The control motor has no stop; therefore the shaft -A- can be inserted in the mounting of the cam plate -E- in any position.

– Fit bolts -C-.
– Plug in connector -D-.
– Route wiring harness so that it cannot come into contact with moving components (e.g. lever).
– Re-install all other components removed in reverse order.
– Switch on ignition.
– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

4.7 Removing and installing right footwell flap control motor - V109-

Note

- *The right footwell flap control motor - V109- is only fitted on vehicles with “deluxe” air conditioner.*
- *Currently all the control motors on this vehicle are identical. While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly* *⇒ page 30* *(overview of air conditioner control motors).*
- *Removing and installing retaining plate (right-side) with control motors -V109- and -V111-* *⇒ page 423*

Removing

– Set front passenger seat to rearmost position.

– Switch off ignition.

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove right footwell vent (front passenger side) ⇒ page 566 .

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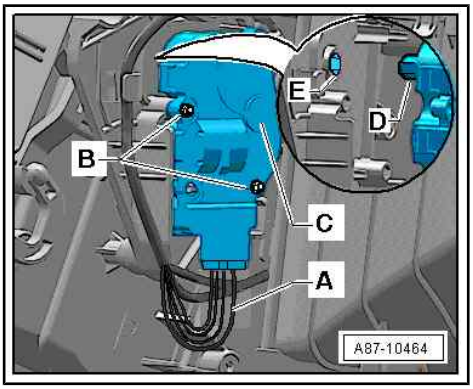

– Mark connector -A- (to prevent interchange if several connectors are unplugged at the same time).
– Unplug connector -A-.
– Remove bolts -B-.
– Detach shaft -D- of control motor -C- from cam plate -E-.

Installing

Install in reverse order of removal; note the following.

– Insert shaft -D- of control motor -C- in cam plate -E-.

Note

The control motor has no stop; therefore the shaft of the control motor can be inserted in the cam plate -E- in any position.

– Fit bolts -B-.
– Plug in connector -A-.
– Route wiring harness so that it cannot come into contact with moving components (e.g. lever).
– Re-install all other components removed in reverse order.
– Switch on ignition.
– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

♦ *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

♦ *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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4.8 Removing and installing left centre vent control motor - V110-

Note

- *The left centre vent control motor - V110- is only fitted on vehicles with “deluxe” air conditioner.*
- *Currently all the control motors on this vehicle are identical. While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*
- *Removing and installing retaining plate (left-side) with control motors -V108- and -V110- ⇒ page 419*
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*

Removing

– Move driver's seat to rearmost position.

– Switch off ignition.

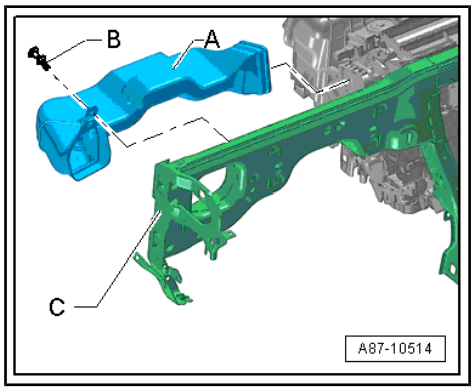
– Remove storage compartment beneath dash panel (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel trim (driver side) .

– Remove left footwell vent (driver side) ⇒ page 565 .

– Remove accelerator pedal module ⇒ Rep. gr. 20 ; Accelerator mechanism; Removing and installing accelerator pedal module with accelerator position sender -G79- / -G185- .

Note

- *For greater clarity, the following illustrations show the positions of the control motor and the retaining plate for this control motor on the left side of the air conditioning unit with the air duct to the left dash panel vent -A- removed.*
- *The air duct to the left dash panel vent -A- is attached with a fastener or a bolt -B- to the dash panel cross member -C-. This fastener or bolt can only be removed after taking out the dash panel fascia.*



– Carefully detach air duct to left dash panel vent -A- from vent of air conditioning unit.

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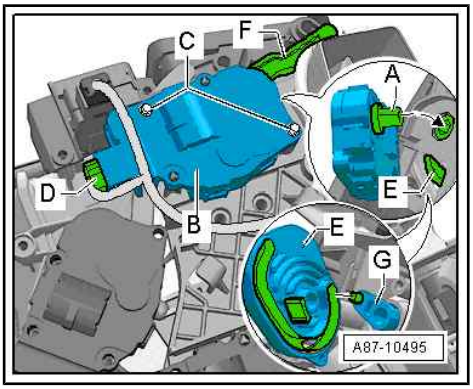
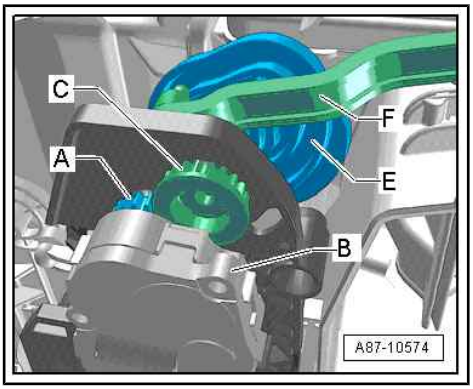
– Mark connector -D- (to prevent interchange if several connectors are unplugged at the same time).
– Unplug connector -D-.
– Remove bolts -C-.



Note

The bolts -C- can also be removed using the ratchet wrench - T40083- .

– Press cam plate -E- towards air conditioning unit and detach shaft -A- (of control motor -B-) from cam plate -E-.



Note

- *The left centre vent control motor - V110- activates the connecting rod -F- (and with it the left indirect ventilation flap) via the cam plate -E- and the centre left dash panel vent flap via the lever -G-. If the pin of lever -G- is released from the guide slot of the cam plate -E- when the control motor is removed, the dash panel vent flap (left-side) is not actuated.*
- *On right-hand drive vehicles, the cam plate -E- is not driven directly via the shaft of the control motor -B-. On such vehicles, the cam plate -E- is activated via two additional gear wheels -A- and -C-.*
- *In model year 2008, modified gear wheels -A- and appropriately adapted brackets (modified collar at gear wheel and corresponding hole) are gradually introduced. Make sure the gear wheel is correctly assigned to the bracket (these components are supplied together as a replacement part) ⇒ Electronic parts catalogue .*
- *The connecting rod -F- actuates the flap in the left centre vent.*

Installing

Install in reverse order of removal; note the following.

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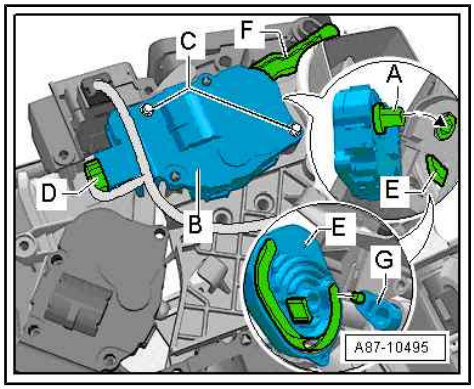
– Check that pin of lever -G- and pin of connecting rod -F- are correctly positioned in corresponding guide slots of cam plate -E-.
– Insert shaft -D- of control motor -B- in cam plate -E-.



Note

The control motor has no stop; therefore the shaft of the control motor can be inserted in the cam plate -E- in any position.

– Fit bolts -C-.
– Plug in connector -D-.
– Route wiring harness so that it cannot come into contact with moving components (e.g. lever).
– Re-install all other components removed in reverse order.
– Switch on ignition.
– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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4.9 Removing and installing right centre vent control motor - V111-

Note

- *The right centre vent control motor - V111- is only fitted on vehicles with "deluxe" air conditioner.*
- *Currently all the control motors on this vehicle are identical. While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*
- *Removing and installing retaining plate (right-side) with control motors -V109- and -V111- ⇒ page 423*

Removing

– Set front passenger seat to rearmost position.

– Switch off ignition.

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove bolts -A-.

– Remove air duct -B- to right dash panel vent (passenger's side).

– Remove air intake box ⇒ page 512.

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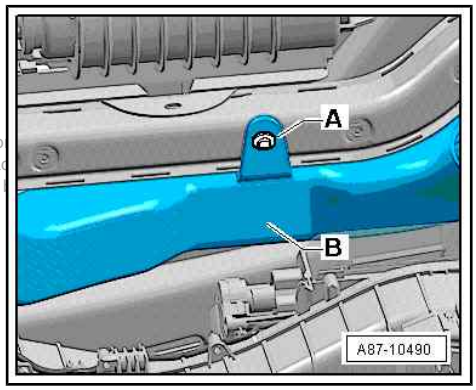
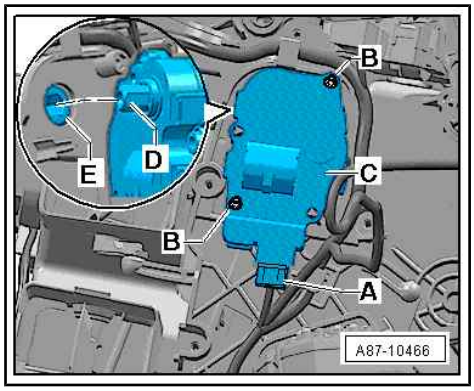


– Mark connector -A- (to prevent interchange if several connectors are unplugged at the same time).
– Unplug connector -A-.
– Remove bolts -B-.
– Detach shaft -D- of control motor -C- from cam plate -E-.



Installing

Install in reverse order of removal; note the following.

– Insert shaft -D- of control motor -C- in cam plate -E-.

Note

The control motor has no stop; therefore the shaft of the control motor can be inserted in the cam plate -E- in any position.

– Fit bolts -B-.
– Plug in connector -A-.
– Route wiring harness so that it cannot come into contact with moving components (e.g. lever).
– Re-install all other components removed in reverse order.
– Switch on ignition.
– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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

Note

- *After installing control motor, perform basic setting for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .⇒*
- *If necessary, activation of electrical components of the air conditioner can be checked via “Final control diagnosis” and “Basic setting” functions (e.g. to check for interchange) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")*
- *If there are problems due to moisture in the passenger compartment, also check the air recirculation flap (must close completely).*

Removing

– Set front passenger seat to rearmost position.

– Switch off ignition.

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

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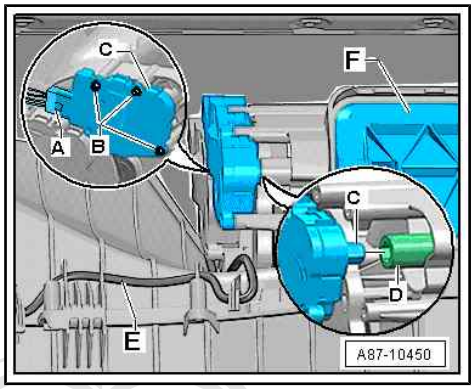

– Detach wiring harness -E- from air intake box.
– Remove bolts -B-.
– Detach shaft of control motor -C- from shaft of air recirculation flap -D-.
– Mark connector -A- (to prevent interchange if several connectors are unplugged at the same time).
– Unplug connector -A-.

Installing

Install in reverse order of removal; note the following.

– Plug in connector -A-.
– Insert shaft of control motor -C- in shaft of air recirculation flap -D-.

Note

The control motor has no stop; therefore the shaft of the control motor -C- can be inserted in the shaft of the air recirculation flap -D- in any position.

– Fit bolts -B-.
– Route wiring harness -E- so that it cannot come into contact with moving components (e.g. lever).
– Re-install all other components removed in reverse order.
– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

– Switch on ignition.
– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

4.11 Removing and installing left temperature flap control motor - V158-

Note

- *The left temperature flap control motor - V158- is only fitted on vehicles with "deluxe" air conditioner.*
- *Currently all the control motors on this vehicle are identical. While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly*
  ⇒ "1.10 Overview - control motors of air conditioner", page 30 .
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*

Removing

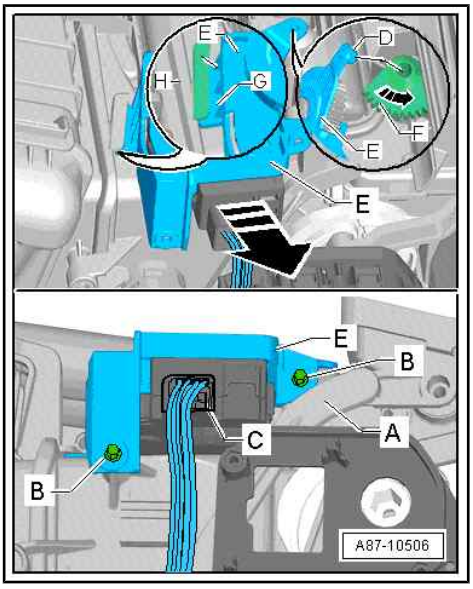
– Switch on ignition.

– Move driver's seat to rearmost position.

– On air conditioner operating and display unit (Climatronic control unit - J255-), set direction of air flow for driver's and passenger's side to footwell vents.

Note

In the "air to footwell vents" setting, the defroster flap control motor - V107- moves the connecting rod -A- to a position in which the bolt -B- is accessible. If the defroster flap control motor - V107- does not move the connecting rod -A- to the required position, it may be necessary to remove the control motor ⇒ page 394 .



– Switch off ignition.

– Remove storage compartment beneath dash panel (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel trim (driver side) .

Note

Right-hand drive vehicles: Remove storage compartment beneath dash panel (driver's side) and air intake box ⇒ page 512 .

– Remove left footwell vent (driver side) ⇒ page 565 .

– Remove steering column ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing steering column .

– Remove pedal cluster and accelerator pedal module ⇒ Brake system; Rep. gr. 46 ; Brake pedal; Removing and installing mounting bracket and ⇒ Rep. gr. 20 ; Accelerator mechanism; Removing and installing accelerator pedal module with accelerator position sender -G79- / -G185- .

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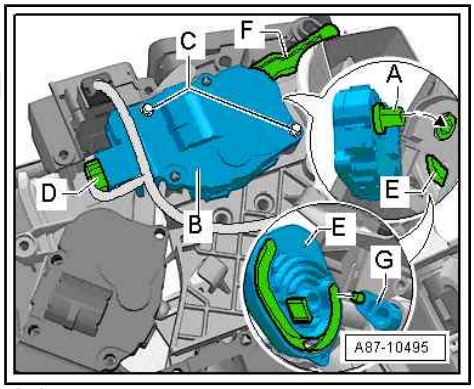
– Remove left centre vent control motor - V110- -B- ⇒ page 400 .



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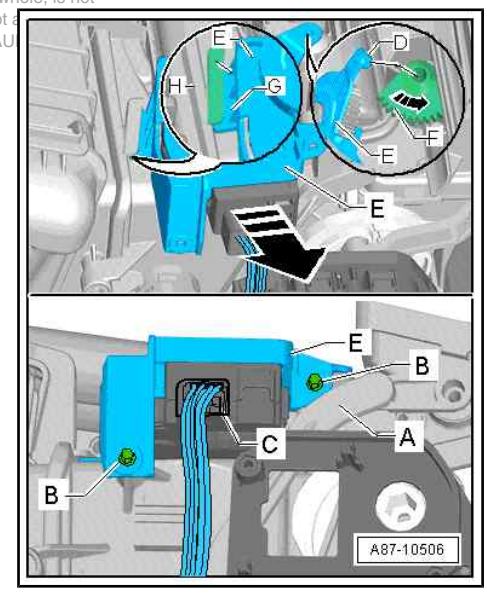
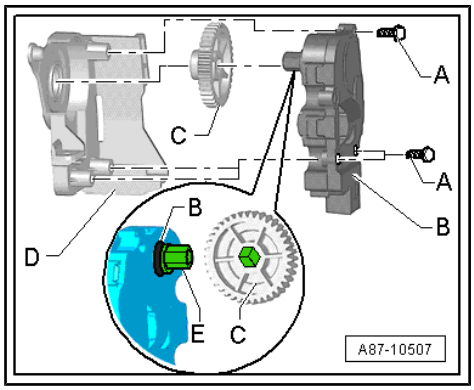
– Mark connector -C- to prevent interchange.
– Unplug connector -C-.
– Remove bolts -B-.
– Release pin -D- (at bracket of control motor -E-) from toothed segment -F- (of temperature flap shaft) and remove bracket -E- (with control motor) in direction of arrow.

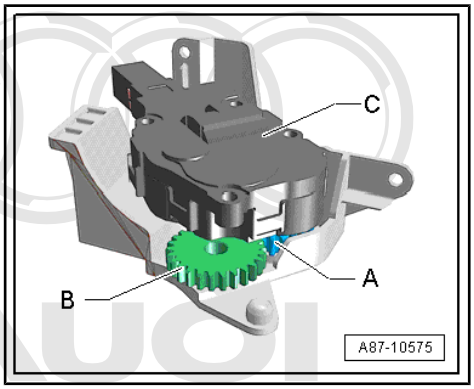


– Remove bolts -A- and detach control motor -B- from bracket -D-.
– Detach gear wheel -C- from shaft -D- of control motor.



Note

- *On right-hand drive vehicles, the temperature flap is not actuated directly via the gear wheel -C- attached to the shaft -D- of the control motor (as it is on left-hand drive vehicles).*
- *On right-hand drive vehicles, the temperature flap is not actuated via the gear wheel -A- attached to the shaft of the control motor -C-. These vehicles are fitted with a second gear wheel -B- (diameter of gear wheels -A- and -B- is slightly smaller than that of single gear wheel on left-hand drive version). The gear wheel -B- then actuates the temperature flap via the toothed segment inserted in the shaft.*



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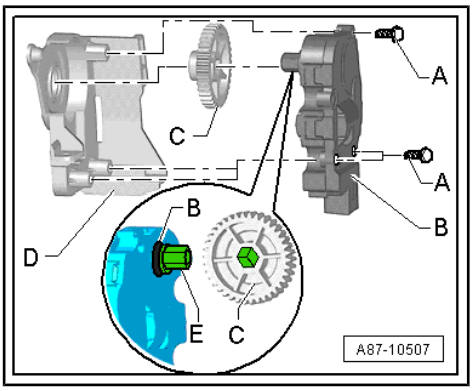
Installing

Install in reverse order of removal; note the following.

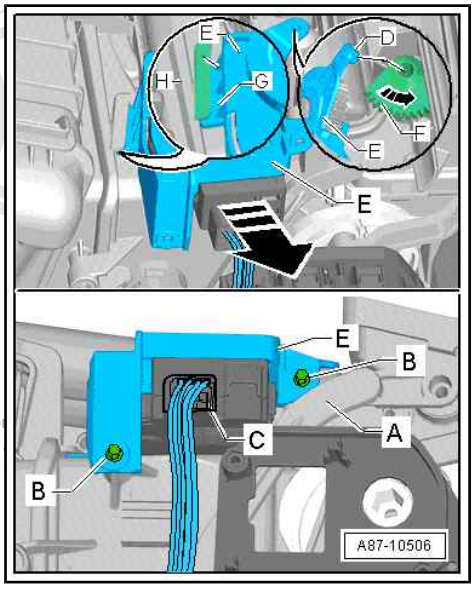
– Attach gear wheel -C- to shaft -E- of control motor -B-.

Note

The control motor has no stop; therefore the gear wheel -C- can be attached to the shaft of the control motor in any position.



– By turning in direction of arrow, turn toothed segment -F- (of temperature flap shaft) as far as it will go into position shown.
– Insert guide -G- (at bracket -E- with control motor) in mounting -H- (at air conditioning unit).
– Slide bracket -E- in direction opposite to arrow towards toothed segment -F- and insert pin -D- (at bracket of control motor -E-) in toothed segment -F- (of temperature flap shaft).



Note

The control motor and the gear wheel -J- have no stop; therefore the gear wheel -J- and the toothed segment -F- (of the temperature flap shaft) can be assembled in any position.

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– Fit bolts -B-.
– Plug in connector -C-.
– Route wiring harness so that it cannot come into contact with moving components (e.g. lever).
– Re-install all other components removed in reverse order.
– Switch on ignition.
– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

4.12 Removing and installing right temperature flap control motor - V159-

Note

- *The right temperature flap control motor - V159- is only fitted on vehicles with "deluxe" air conditioner.*
- *Currently all the control motors on this vehicle are identical. While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly* *⇒ page 30* *(overview of air conditioner control motors).*

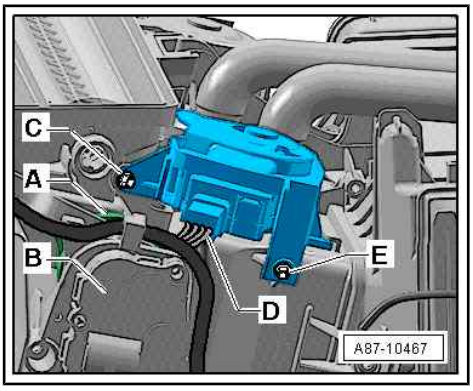
Removing

– Switch on ignition.

– On air conditioner operating and display unit (Climatronic control unit - J255-), set direction of air flow for driver's and passenger's side to dash panel vents.

Note

In the "air to dash panel vents" setting, the right centre vent control motor - V111- -B- moves the cam plate -A- to a position in which the bolt -C- is accessible. If the right centre vent control motor - V111- -B- does not move the cam plate -A- to the required position, it may be necessary to remove the control motor *⇒ page 403* *and move the cam plate by hand.*



– Set front passenger seat to rearmost position.

– Switch off ignition.

– Remove air intake box ⇒ page 512 .

– Mark connector -D- to prevent interchange with other connectors.

– Unplug connector -D-.

– Remove bolts -C- and -E-.

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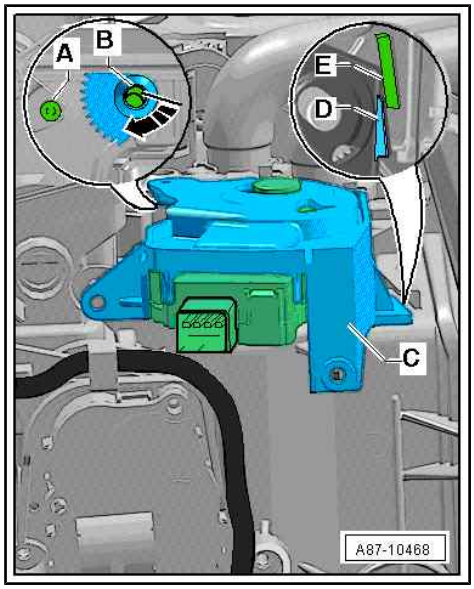
– Release pin -A- (at bracket for control motor -C-) from toothed segment -B- (of temperature flap shaft) and remove bracket -C- (with control motor) in direction of arrow.



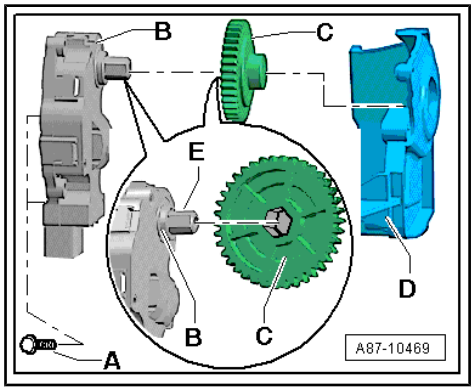
– Remove bolts -A- and detach control motor -B- from bracket -D-.

– Detach gear wheel -C- from shaft -D- of control motor.

Installing

Install in reverse order of removal; note the following.

– Attach gear wheel -C- to shaft -E- of control motor -B-.



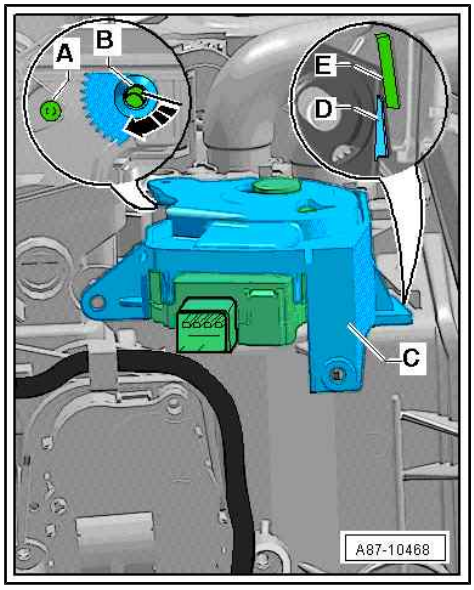
Note

The control motor has no stop; therefore the gear wheel -C- can be attached to the shaft of the control motor in any position.

– By turning in direction of arrow, turn toothed segment -B- (of temperature flap shaft) as far as it will go into position shown.

– Insert guide -D- (at bracket -C- with control motor) in mounting -E- (at air conditioning unit).

– Slide bracket -C- in direction opposite to arrow towards toothed segment -B- and insert pin -A- (at bracket of control motor) in toothed segment -B- (of temperature flap shaft).



Note

The control motor and the gear wheel -C- have no stop; therefore the gear wheel -C- and the toothed segment -B- (of the temperature flap shaft) can be assembled in any position.

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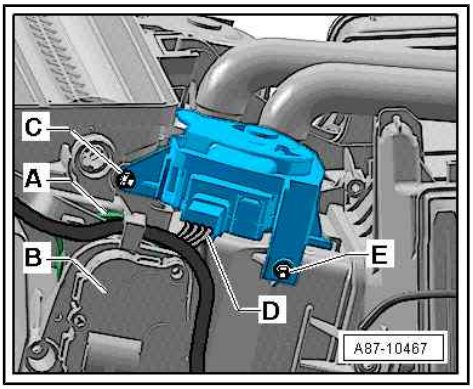

– Fit bolts -C- and -E-.
– Plug in connector -D-.
– Route wiring harness so that it cannot come into contact with moving components (e.g. lever).
– Re-install all other components removed in reverse order.
– Switch on ignition.
– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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4.13 Removing and installing air recirculation flap 1 control motor for hybrid battery - V479-

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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Note

- *On this vehicle, the two control motors (-V479- and -V480-) at the battery cooling module are activated by the battery regulation control unit - J840- via a data line. The two control motors are connected via this data line (LIN bus) to -J840- . If an incorrect control motor has been fitted, if the control motors at the battery cooling module have been interchanged or if there is a fault at one of the control motors or in the wiring, this can result in different entries in the event memory with different types of fault ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *The control motors at the battery cooling module are identical to those at the air conditioning unit. However, since -J840- cannot perform addressing for the control motors, it is important to fit only control motors on the battery cooling module that already have the correct address. For this reason, take care to select the correct version (part number) when renewing and note the correct fitting location when installing ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode and ⇒ Electronic parts catalogue .*
- *Please note that in vehicle diagnosis differing designations are used for the control motors -V479- and -V480- : air recirculation flap 1 control motor for hybrid battery - V479- is referred to as “valve 1 for air supply to hybrid battery”; air recirculation flap 2 control motor for hybrid battery - V480- is referred to as“valve 2 for air supply to hybrid battery”.*

Caution

Pay attention to correct assignment of the control motors.

- ***The two control motors (-V479- and -V480-) are identical. The only difference is the assignment stored in the electronics (address).***
- ***If the control motors are interchanged on installation, activation of the flaps in the battery cooling module will be incorrect and problems with the drive battery - A2- will be encountered due to incorrect air routing.***
- ***Prior to removal, mark the control motor and the fitting location at the battery cooling module.***
- ***On installation, pay attention to the marking and check the part number of the control motor if necessary ⇒ Electronic parts catalogue .***

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Note

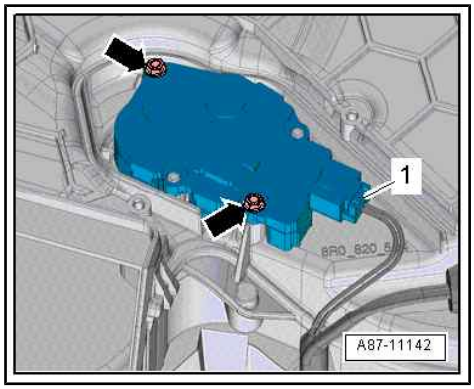
At the start of production, the part number of -V479- for example is “8R0 820 504” and that of -V480- is “8R0 820 510”. Take care to select the correct version ⇒ Electronic parts catalogue .

Removing

– Switch off ignition.

– Remove luggage compartment floor ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Exploded view - luggage compartment floor .

– Unplug electrical connector -1-.
– Remove bolts -arrows- and detach air recirculation flap 1 control motor for hybrid battery - V479- .



Installing

Install in reverse order of removal; note the following.

– Re-install remaining components (removed earlier).
– Switch on ignition.
– After installation, interrogate event memory of operating and display unit (Climatronic control unit - J255-) and battery regulation control unit - J840- and erase any faults displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .
– To check function after installation (if necessary) perform final control diagnosis of both control motors on battery cooling module via battery regulation control unit - J840- ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .

4.14 Removing and installing air recirculation flap 2 control motor for hybrid battery - V480-

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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Note

- *On this vehicle, the two control motors (-V479- and -V480-) at the battery cooling module are activated by the battery regulation control unit - J840- via a data line. The two control motors are connected via this data line (LIN bus) to -J840- . If an incorrect control motor has been fitted, if the control motors at the battery cooling module have been interchanged or if there is a fault at one of the control motors or in the wiring, this can result in different entries in the event memory with different types of fault ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *The control motors at the battery cooling module are identical to those at the air conditioning unit. However, since -J840- cannot perform addressing for the control motors, it is important to fit only control motors on the battery cooling module that already have the correct address. For this reason, take care to select the correct version (part number) when renewing and note the correct fitting location when installing ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode and ⇒ Electronic parts catalogue .*
- *Please note that in vehicle diagnosis differing designations are used for the control motors -V479- and -V480- : Air recirculation flap 1 control motor for hybrid battery - V479- is referred to as "valve 1 for air supply to hybrid battery"; air recirculation flap 2 control motor for hybrid battery - V480- is referred to as "valve 2 for air supply to hybrid battery".*

Caution

Pay attention to correct assignment of the control motors.

- ***The two control motors (-V479- and -V480-) are identical. The only difference is the assignment stored in the electronics (address).***
- ***If the control motors are interchanged on installation, activation of the flaps in the battery cooling module will be incorrect and problems with the drive battery - A2- will be encountered due to incorrect air routing.***
- ***Prior to removal, mark the control motor and the fitting location at the battery cooling module.***
- ***On installation, pay attention to the marking and check the part number of the control motor if necessary ⇒ Electronic parts catalogue .***

Note

At the start of production, the part number of -V479- for example is "8R0 820 504" and that of -V480- is "8R0 820 510". Take care to select the correct version ⇒ Electronic parts catalogue .

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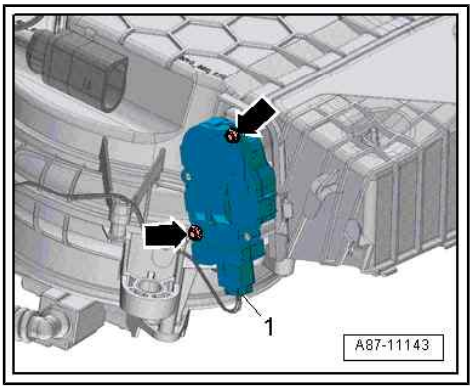
Removing

– Switch off ignition.

– Remove luggage compartment floor ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Exploded view - luggage compartment floor .



– Remove bolts -arrows-.

– Detach air recirculation flap 2 control motor for hybrid battery - V480- and unplug electrical connector -1-.

Installing

Install in reverse order of removal; note the following.

– Re-install remaining components (removed earlier).

– Switch on ignition.

– After installation, interrogate event memory of operating and display unit (Climatronic control unit - J255-) and battery regulation control unit - J840- and erase any faults displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .

– To check function after installation (if necessary) perform final control diagnosis of both control motors on battery cooling module via battery regulation control unit - J840- ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .

4.15 Removing and installing retaining plate (left-side) with control motors -V108- and -V110-

The left footwell flap control motor - V108- and the left centre vent control motor - V110- are fitted on vehicles with “deluxe” air conditioner.

Note

- *The retaining plate with the left footwell flap control motor - V108- and the left centre vent control motor - V110- is only fitted on vehicles with “deluxe” air conditioner.*
- *Dismantling and assembling retaining plate with control motors -V108- and -V110-* *⇒ page 427*
- *Currently all the control motors on this vehicle are identical. While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly* *⇒ “1.10 Overview - control motors of air conditioner”, page 30* .
- *On right-hand drive vehicles, the cam plate is not driven directly via the shaft of the control motor. On such vehicles, the cam plate is actuated via two additional gear wheels* *⇒ page 400* .
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit* *⇒ page 24* *and ⇒ Electronic parts catalogue .*

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Removing

– Move driver's seat to rearmost position.

– Switch off ignition.

– Remove storage compartment beneath dash panel (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel trim (driver side) .

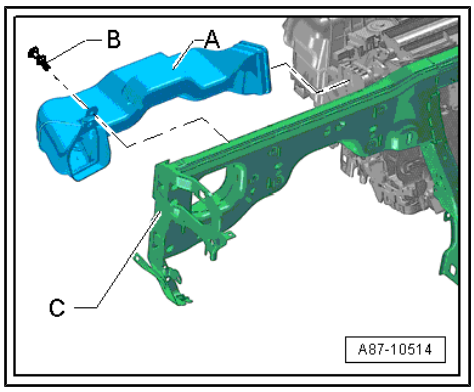
– Remove left footwell vent (driver side) ⇒ page 565 .

– Remove steering column ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing steering column .

– Remove pedal cluster and accelerator pedal module ⇒ Brake system; Rep. gr. 46 ; Brake pedal; Removing and installing mounting bracket and ⇒ Rep. gr. 20 ; Accelerator mechanism; Removing and installing accelerator pedal module with accelerator position sender -G79- / -G185- .

Note

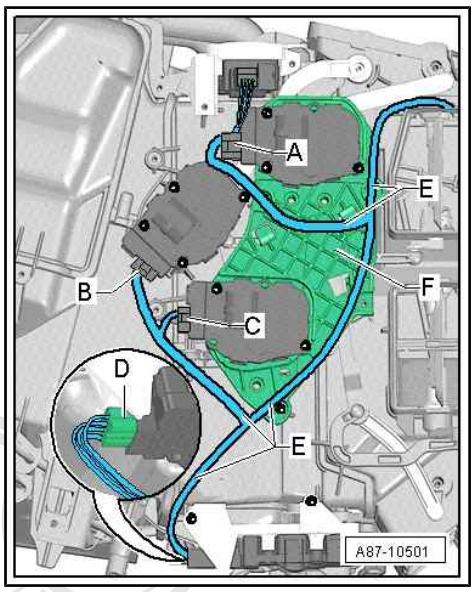
- *For greater clarity, the following illustrations show the positions of the control motor and the retaining plate for this control motor on the left side of the air conditioning unit with the air duct to the left dash panel vent -A- removed.*
- *The air duct to the left dash panel vent -A- is attached with a fastener or a bolt -B- to the dash panel cross member -C-. This fastener or bolt can only be removed after taking out the dash panel fascia.*



– To avoid interchange, mark the connectors -A- (to the left centre vent control motor - V110-), -B- (to the defroster flap control motor - V107-), -C- (to the left footwell flap control motor - V108-) and -D- (to the rear temperature flap control motor - V137-).

– Unplug connectors -A- to -D-.

– Unfasten wiring -E- from attachment points at retaining plate -F-.



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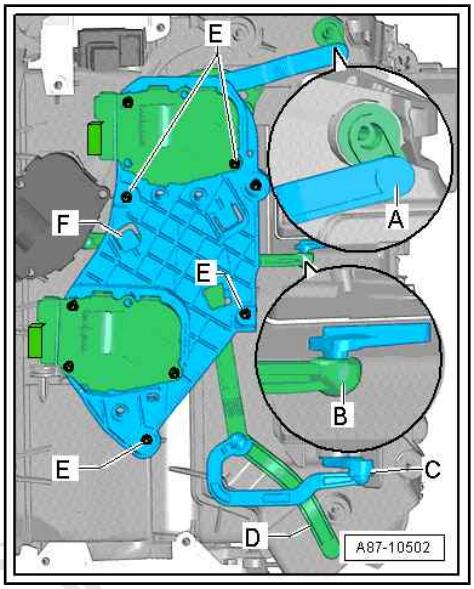
– Carefully unclip all relevant connecting rods (-A- to -D-) from levers on corresponding flaps.



Note

- *The connecting rods (-A- to -D-) are clipped in at the levers. Unclip them carefully to avoid damaging the lever.*
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*

– Remove bolts -E-.

– Detach retaining plate -F- (with control motors, levers, cam plates and connecting rods) from air conditioning unit.

Installing

Install in reverse order of removal; note the following.

– Lubricate guides of cam plates and pins on flap levers using e.g. small quantity of grease - G 000 150- ⇒ Electronic parts catalogue .

– Check that levers, cam plates and connecting rods on retaining plate -A- are properly assembled ⇒ page 427 .

– When fitting retaining plate -A-, insert pins of retaining plate -B- in mountings -C-, and insert pins of cam plates -D- and -F- in mountings -E-.

– When fitting retaining plate -A-, insert pins on lever -G- in guide slot of cam plates -F-.

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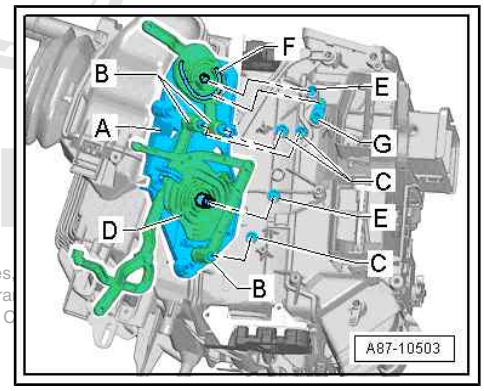
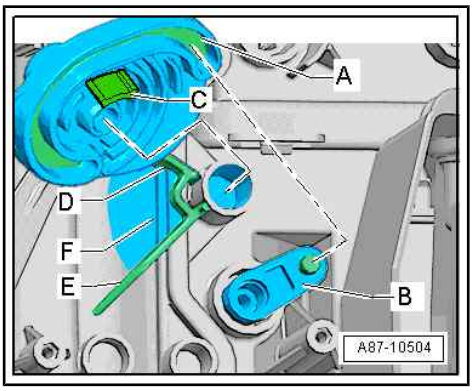
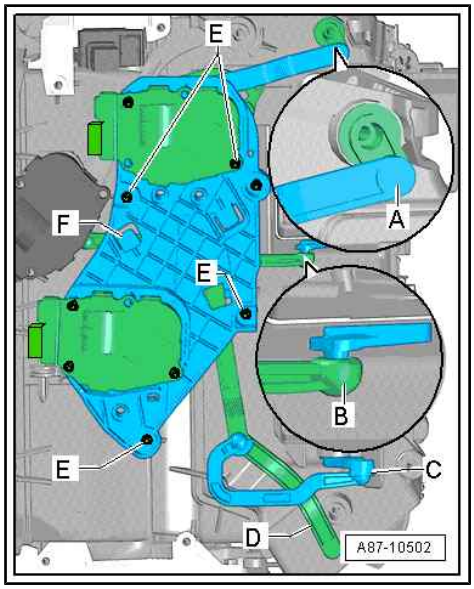


Note

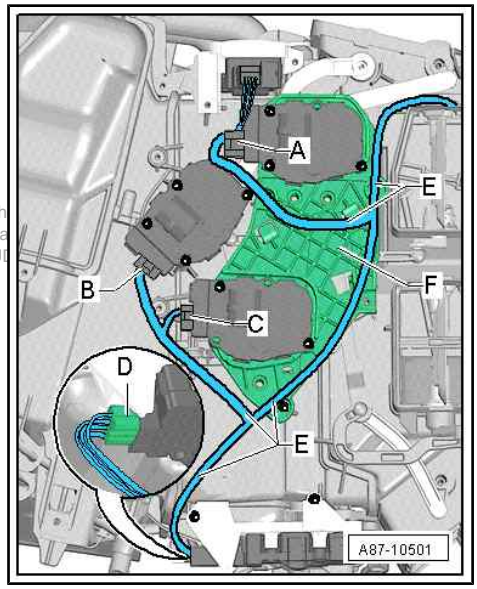
- *When fitting, make sure stop of cam plate -C- is not inserted in area -F- (between the two stops of air conditioning unit -D- and -E-).*
- *The cam plate -A- moves indirect ventilation flap (left-side/ driver's side) via lever -B-.*



– Fit bolts -E-.
– Carefully clip in the various connecting rods (-A- to -D-) at levers of corresponding flaps.



– Route wiring harness -E- as shown and secure it in attachment points on retaining plate -F-.
– Plug in connectors -A- to -D- in accordance with markings.
– Check routing of wiring harness -E-; it must not come into contact with moving components (e.g. lever).
– Re-install all other components removed in reverse order.
– Switch on ignition.
– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .



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Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
– Adjust different settings for air outflow direction to different vents on air conditioner operating and display unit (Climatronic control unit - J255-) and check whether the volume of air blown out of the vent changes in accordance with the different settings.

4.16 Removing and installing retaining plate (right-side) with control motors -V109- and -V111-

Note

- *The retaining plate with the right footwell flap control motor - V109- and the right centre vent control motor - V111- is only fitted on vehicles with "deluxe" air conditioner.*
- *Dismantling and assembling retaining plate (right-side) with control motors -V109- and -V111- ⇒ page 429*
- *Currently all the control motors on this vehicle are identical. While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

Removing

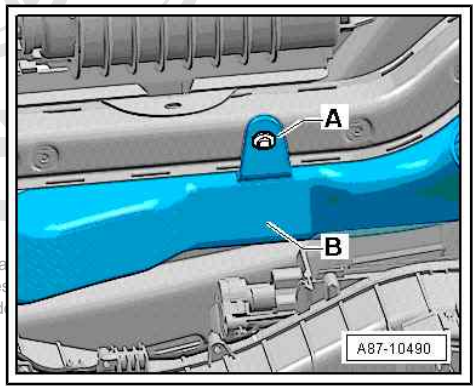
– Set front passenger seat to rearmost position.

– Switch off ignition.

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove bolts -A-.

– Loosen air duct to dash panel vent (right-side) from dash panel cross member (do not remove); different versions ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel .



Note

Air duct from air duct -B- to dash panel vent (right-side) is secured with two bolts; to remove air duct, only unscrew bolt screwed into dash panel cross member from below (only this bolt is accessible).

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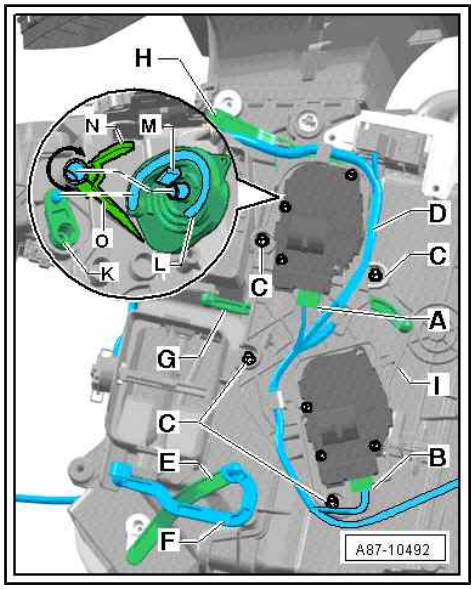
– Remove air duct -B- to right dash panel vent (passenger's side).

– Remove air intake box ⇒ page 512 .

– To prevent interchanging the connectors, mark connector -A- (to right centre vent control motor - V111-) and -B- (to right footwell flap control motor - V109-).
– Unplug connectors -A- and -B-.
– Unplug connector from evaporator output temperature sender - G263- ⇒ page 633 .
– Unfasten wiring -D- from attachment points at retaining plate -J-.
– Carefully unfasten all relevant connecting rods (-E- to -H-) from levers on corresponding flaps.



Note

- *The connecting rods (-E- to -H-) are clipped in at the levers. Unclip them carefully to avoid damaging the lever.*
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*

– Remove bolts -C-.
– Detach retaining plate -J- (with control motors and levers, cam plates and connecting rods) from air conditioning unit.

Installing

Install in reverse order of removal; note the following.

– Lubricate guides of cam plates and pins on flap levers using e.g. small quantity of grease - G 000 150- ⇒ Electronic parts catalogue .
– Check that levers, cam plates and connecting rods on retaining plate -J- are properly assembled ⇒ page 429 .
– When installing retaining plate -J-, observe pins on lever -K- and guide of cam plate -L-.

Note

When fitting, make sure stop of the cam plate -M- is inserted between the two stops on air conditioning unit -N- and -O- (cam plate must be able to move over area marked with arrow).

– Fit bolts -C-.
– Plug in connectors -A- and -B- in accordance with markings.
– Secure wiring harness -D- in attachment points of retaining plate -J-.
– Route wiring harness -D- so that it cannot come into contact with moving components (e.g. lever).
– Re-install all other components removed in reverse order.
– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Switch on ignition.

– Adjust different settings for air outflow direction to different vents on air conditioner operating and display unit (Climatronic control unit - J255-) and check whether the volume of air blown out of the vent changes in accordance with the different settings.

4.17 Removing and installing retaining plate (left-side) with footwell flap control motor - V261-

The footwell flap control motor - V261- is fitted on vehicles with "basic" air conditioner.

Note

- *The retaining plate with footwell flap control motor - V261- is only fitted on vehicles with "basic" air conditioner.*
- *Dismantling and assembling retaining plate with footwell flap control motor - V261- ⇒ page 430*
- *Currently all the control motors on this vehicle are identical. While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ "1.10 Overview - control motors of air conditioner", page 30 .*
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*

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Removing

– Move driver's seat to rearmost position.

– Switch off ignition.

– Remove storage compartment beneath dash panel (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage

compartments/covers/trim panels; Removing and installing dash panel trim (driver side) .

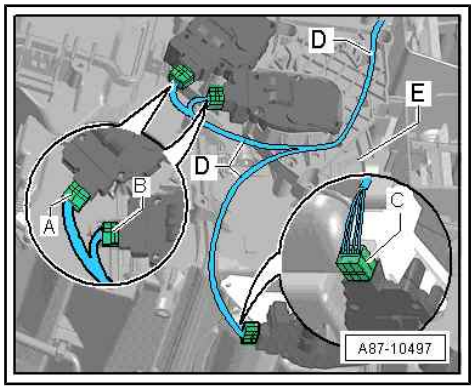
– Remove left footwell vent (driver side) ⇒ page 565 .

– Remove accelerator pedal module ⇒ Rep. gr. 20 ; Accelerator mechanism; Removing and installing accelerator pedal module with accelerator position sender -G79- / -G185- .

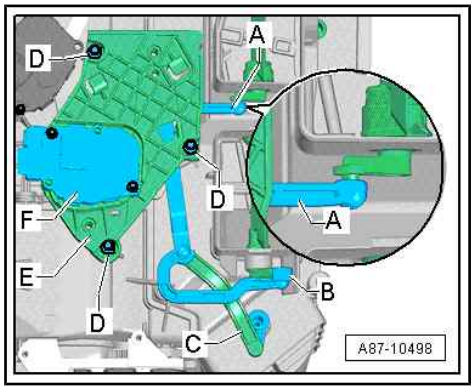
– To prevent interchanging the connectors, mark connectors -A- (to defroster flap control motor - V107-), -B- (to footwell flap control motor - V261-) and -C- (to temperature flap control motor - V68-).

– Unplug connectors -A-, -B- and -C-.

– Unfasten wiring -D- from attachment points at retaining plate -E-.



– Carefully unclip the various connecting rods (-A-, -B- and -C-) from levers on corresponding flaps.



Note

- *The connecting rods (-A- to -C-) are clipped in at the levers. Unclip them carefully to avoid damaging the lever.*
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*

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– Remove bolts -D-.

– Detach retaining plate -E- (with control motor -F- and levers, cam plates and connecting rods) from air conditioning unit.

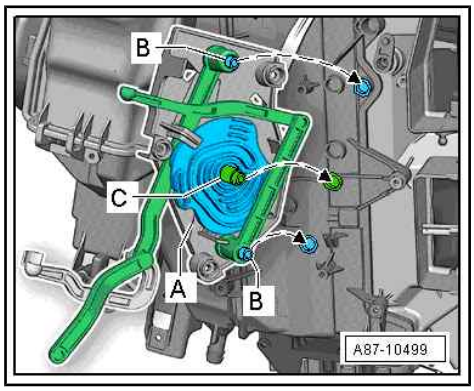
Installing

Install in reverse order of removal; note the following.

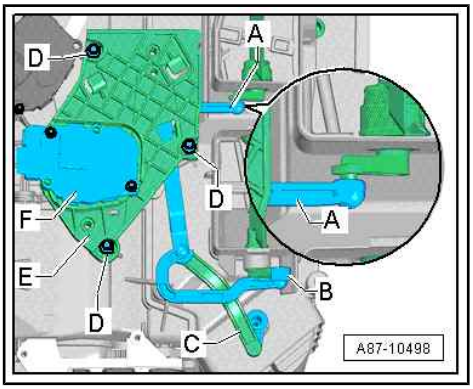
– Lubricate guides of cam plates and pins on flap levers using e.g. small quantity of grease - G 000 150- ⇒ Electronic parts catalogue .

– Check that levers, cam plates and connecting rods on retaining plate -A- are properly assembled ⇒ page 430 .

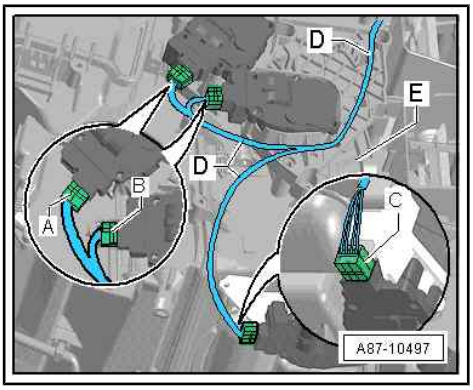
– When installing retaining plate -A-, insert pins of retaining plate -B- and cam plate -C- correctly in mountings of air conditioning unit.



– Fit bolts -D-.
– Clip in the various connecting rods (-A-, -B- and -C-) at levers of corresponding flaps.



– Plug in connectors -A- to -C- in accordance with markings.
– Insert wiring harness -D- in attachment points at retaining plate -E-.
– Check routing of wiring harness -D-; it must not come into contact with moving components (e.g. lever).
– Re-install all other components removed in reverse order.
– Switch on ignition.
– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .



Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

4.18 Dismantling and assembling retaining plate (left-side) with control motors - V108- and -V110-

– Remove retaining plate with left footwell flap control motor - V108- and left centre vent control motor - V110- ⇒ page 419 .

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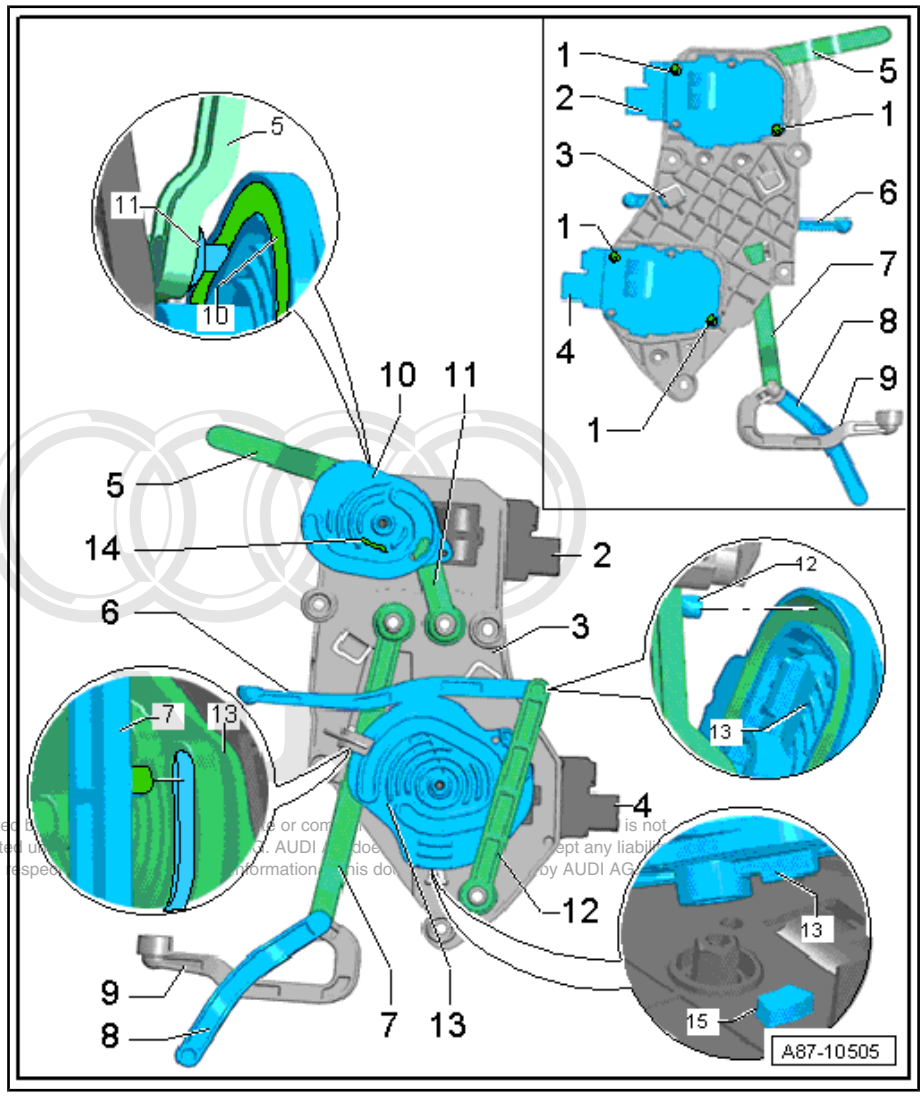
Note

- *The retaining plate with the left footwell flap control motor - V108- and the left centre vent control motor - V110- is only fitted on vehicles with "deluxe" air conditioner.*
- *Currently all the control motors on this vehicle are identical. While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ "1.10 Overview - control motors of air conditioner", page 30 .*
- *The shaft of the control motors has no stop; therefore the shaft of these control motors can be inserted in the cam plates in any position.*
- *On right-hand drive vehicles, the cam plate ⇒ Item 10 (page 428) is not driven directly via the shaft of the control motor. On such vehicles, the cam plate is actuated via two additional gear wheels ⇒ page 400 .*
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*



1 - Bolt

2 - Left centre vent control motor - V110-

3 - Retaining plate

4 - Left footwell flap control motor - V108-

5 - Connecting rod

- ❑ To flap for left centre vent

6 - Connecting rod

- ❑ To flap for left dash panel vent

7 - Actuating arm

8 - Connecting rod

- ❑ To flap for rear left footwell vent

9 - Connecting rod

- ❑ To flap for front left footwell vent

10 - Cam plate

- ❑ At left centre vent control motor - V110-

11 - Actuating arm

12 - Actuating arm

13 - Cam plate

- ❑ At left footwell flap control motor - V108-

14 - Cam plate stop

- ❑ Make sure cam plate is positioned correctly during assembly ⇒ page 421

15 - Stop for cam plate

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4.19 Dismantling and assembling retaining plate (right-side) with control motors -V109- and -V111-

– Removing retaining plate with control motors -V109- and -V111- ⇒ page 423 .

Note

- *The retaining plate with the right footwell flap control motor - V109- and the right centre vent control motor - V111- is only fitted on vehicles with "deluxe" air conditioner.*
- *Currently all the control motors on this vehicle are identical. While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*
- *The shaft of the control motors has no stop; therefore the shaft of these control motors can be inserted in the cam plates in any position.*
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*

1 - Bolt

2 - Right centre vent control motor - V111-

3 - Retaining plate

4 - Right footwell flap control motor - V109-

5 - Connecting rod

❑ To flap for right centre vent

6 - Connecting rod

❑ To flap for right dash panel vent

7 - Actuating arm

8 - Connecting rod

❑ To flap for rear right footwell vent

9 - Connecting rod

❑ To flap for front right footwell vent

10 - Cam plate

❑ At right centre vent control motor - V111-

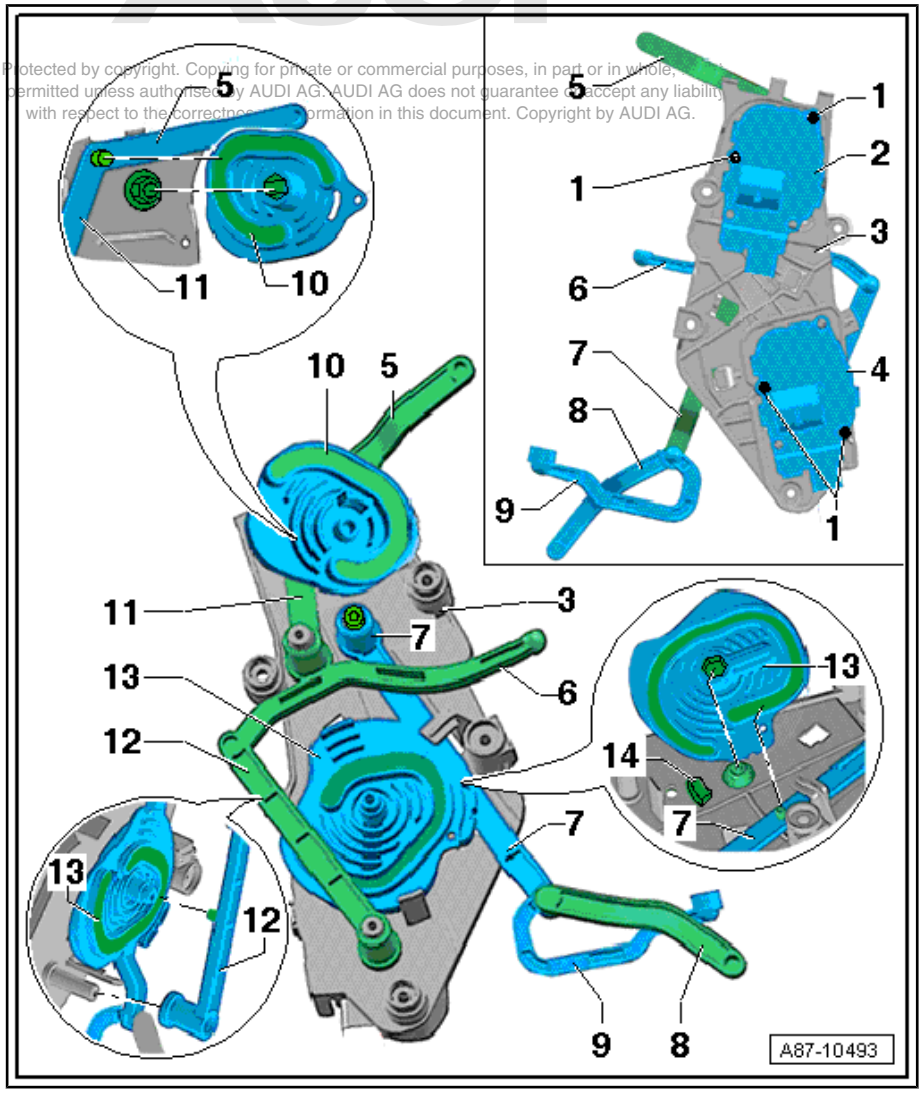
11 - Actuating arm

12 - Actuating arm

13 - Cam plate

❑ At right footwell flap control motor - V109-

14 - Stop for cam plate



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4.20 Dismantling and assembling retaining plate (left-side) with footwell flap control motor - V261-

– Remove retaining plate (left-side) with footwell flap control motor - V261- ⇒ page 425 .

Note

- *The retaining plate with footwell flap control motor - V261- is only fitted on vehicles with “basic” air conditioner.*
- *Currently all the control motors on this vehicle are identical. While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*
- *The shaft of the control motors has no stop; therefore the shaft of these control motors can be inserted in the cam plates in any position.*
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*

1 - Bolt

2 - Footwell flap control motor - V261-

3 - Retaining plate

4 - Connecting rod

- ❑ To flaps for left and right dash panel vents

5 - Actuating arm

6 - Cam plate

- ❑ At footwell flap control motor - V261-

7 - Actuating arm

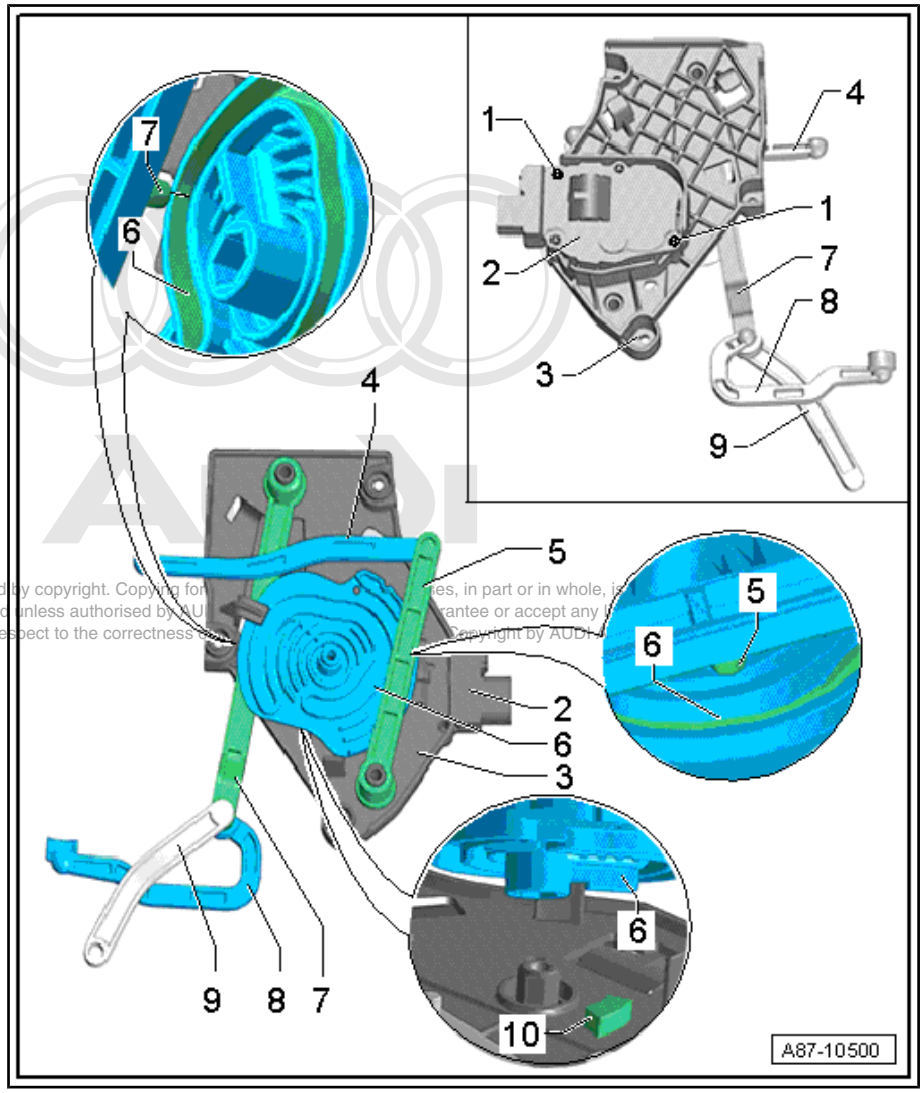
8 - Connecting rod

- ❑ To flaps for rear footwell vents

9 - Connecting rod

- ❑ To flaps for front footwell vents

10 - Stop for cam plate



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5 Front heater and air conditioning unit

⇒ “5.1 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 431

⇒ “5.2 Exploded view - flaps and partitions in air distribution housing”, page 439

⇒ “5.3 Exploded view - air intake box of heater and air conditioning unit”, page 442

⇒ “5.4 Exploded view - evaporator housing”, page 447

⇒ “5.5 Removing and installing evaporator”, page 451

⇒ “5.6 Removing and installing evaporator housing”, page 468

⇒ “5.7 Cleaning evaporator”, page 473

⇒ “5.8 Checking auxiliary air heater element Z35 ”, page 482

⇒ “5.9 Removing and installing auxiliary air heater element Z35 ”, page 487

⇒ “5.10 Checking heating output of actuation of temperature flaps of air conditioner”, page 490

⇒ “5.11 Removing and installing heater and air conditioning unit”, page 496

⇒ “5.12 Removing and installing air intake box of heater and air conditioning unit”, page 512

⇒ “5.13 Removing and installing heater housing (left-side, with temperature flaps) ”, page 516

⇒ “5.14 Removing and installing heater housing (right-side, with temperature flaps)”, page 520

⇒ “5.15 Removing and installing dust and pollen filter”, page 531

⇒ “5.16 Removing and installing fresh air blower V2 ”, page 532

⇒ “5.17 Removing and installing fresh air blower control unit J126 ”, page 535

⇒ “5.18 Preparations for removing heat exchanger”, page 537

⇒ “5.19 Removing and installing heat exchanger”, page 543

⇒ “5.20 Removing and installing condensation drain”, page 551

⇒ “5.21 Checking condensation drain”, page 552

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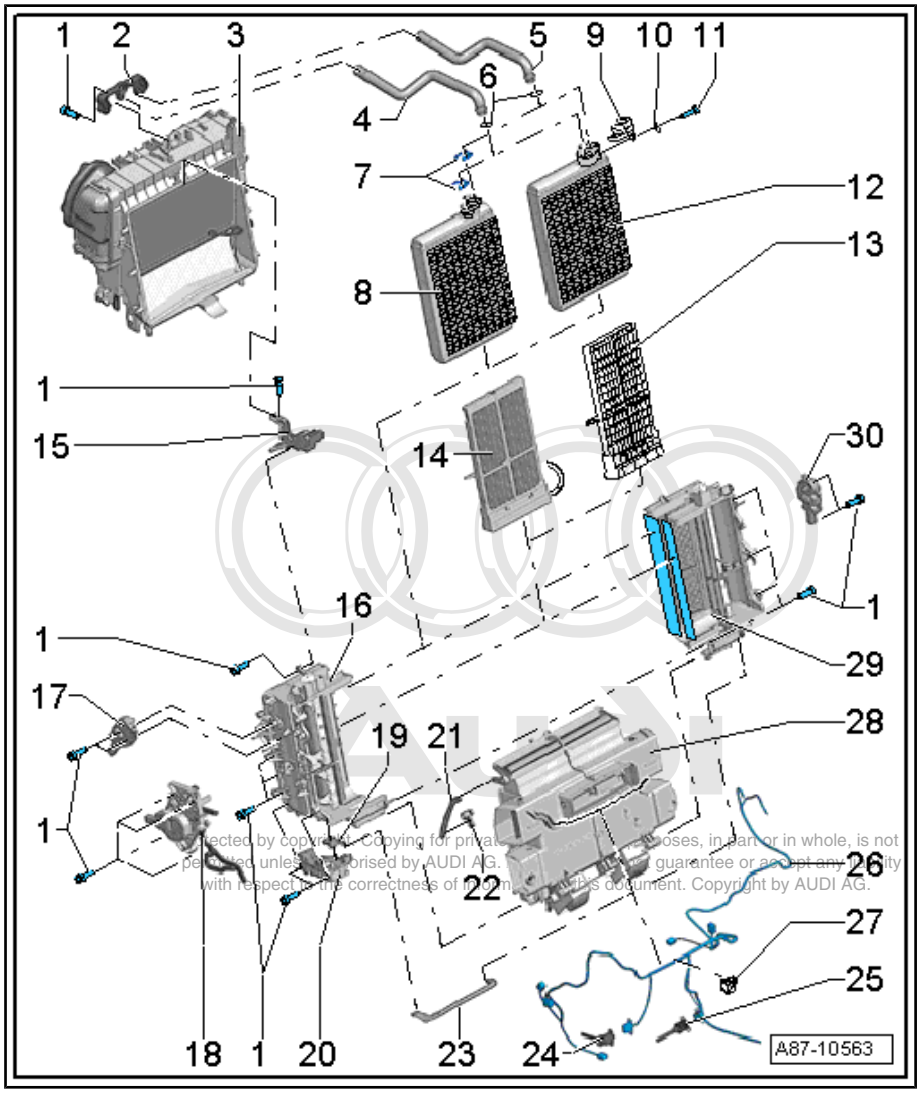
5.1 Exploded view - attachments for heater and air conditioning unit and air intake box

⇒ “5.1.1 Exploded view - attachments for heater and air conditioning unit and air intake box, basic version”, page 431

⇒ “5.1.2 Exploded view - attachments for heater and air conditioning unit and air intake box, deluxe version”, page 435

5.1.1 Exploded view - attachments for heater and air conditioning unit and air intake box, “basic” version

– Removing air conditioning unit ⇒ page 496



1 - Bolt

- ❑ 1Nm

2 - Bracket for coolant pipes

3 - Evaporator housing

- ❑ Dismantling and assembling ⇒ page 447
- ❑ Different versions depending on production period and vehicle version ⇒ page 447 and ⇒ Electronic parts catalogue
- ❑ Detaching and attaching evaporator housing at air conditioning unit ⇒ “5.6 Removing and installing evaporator housing”, page 468

4 - Coolant pipe

- ❑ Detaching and attaching at heat exchanger ⇒ page 543
- ❑ For coolant supply from engine

5 - Coolant pipe

- ❑ Detaching and attaching at heat exchanger ⇒ page 543
- ❑ For coolant return to engine

6 - O-ring

- ❑ Renew
- ❑ Coat lightly with coolant before fitting ⇒ page 543

7 - Clip

- ❑ These clips are fitted at the factory and hold the coolant pipes in position in the factory-fitted heat exchanger ⇒ Item 8 (page 432) .

8 - Heat exchanger for heater

- ❑ This is the factory-fitted version.
- ❑ Removing and installing ⇒ page 543

9 - Bracket for coolant pipes in replacement heat exchanger

- ❑ Supplied with replacement heat exchanger ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ page 543

10 - Washer

- ❑ Supplied with replacement heat exchanger ⇒ Electronic parts catalogue

11 - Bolt

- ❑ Supplied with replacement heat exchanger ⇒ Electronic parts catalogue
- ❑ Tightening torque: 2.5 Nm

12 - Replacement heat exchanger for heater

- ❑ Removing and installing with air conditioning unit installed ⇒ page 543
- ❑ This version is available as a replacement part ⇒ Electronic parts catalogue .

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- ❑ The replacement heat exchanger includes ⇒ Item 6 (page 432) and ⇒ Item 9 (page 432) to ⇒ Item 12 (page 432) ⇒ Electronic parts catalogue
- ❑ Attach foam seals to heat exchanger according to versions of air conditioner and vehicle ⇒ page 543 (Removing and installing heat exchanger).

13 - Honeycomb element

- ❑ Installed on vehicles with petrol engine and vehicles with diesel engine on which auxiliary heater (optional extra) is also activated as supplementary heater (no auxiliary air heater element - Z35- fitted) ⇒ page 482
- ❑ Removing and installing with air conditioning unit installed ⇒ page 487
- ❑ Attach foam seals to honeycomb element in line with air conditioner version ⇒ page 487 (Removing and installing auxiliary air heater element - Z35-).

14 - Auxiliary air heater element - Z35-

- ❑ Installed on vehicles with diesel engine (also for vehicles on which auxiliary heater installed as optional extra is not activated as supplementary heater) and vehicles with certain petrol engines ⇒ page 482
- ❑ Function, checking ⇒ page 482
- ❑ Removing and installing with air conditioning unit installed ⇒ page 487
- ❑ Attach foam seals to auxiliary air heater element - Z35- in line with air conditioner version ⇒ page 487 (Removing and installing auxiliary air heater element - Z35-)

Note

In model year 2009, a modified version of the auxiliary air heater element - Z35- with slightly smaller heating elements is gradually being introduced; observe the correct version and assignment ⇒ Electronic parts catalogue .

15 - Bracket

16 - Heater housing (left-side, with temperature flaps)

- ❑ Activation of temperature flaps and heater housing (left-side) differ on vehicles with “deluxe” or “basic” air conditioner. On the “basic” air conditioner, the two temperature flaps (for left dash panel vent and left footwell vent) are actuated together via the shaft ⇒ page 439 and ⇒ Electronic parts catalogue
- ❑ Different versions (with one or two attachment points at bottom) ⇒ page 516 and ⇒ Electronic parts catalogue
- ❑ Removing and installing with air conditioning unit installed ⇒ page 516
- ❑ Coat guides of cam plate, shaft bearings, toothed segments and pins on flap levers with a small quantity of grease (e.g. grease - G 000 150- ⇒ Electronic parts catalogue).

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17 - Defroster flap control motor - V107-

- ❑ Removing and installing ⇒ page 394

18 - Retaining plate (left-side) with footwell flap control motor - V261-

- ❑ With cam plate, actuating arms and connecting rods
- ❑ Removing and installing footwell flap control motor - V261- ⇒ page 396
- ❑ Removing and installing retaining plate (left-side) with footwell flap control motor - V261- ⇒ page 425
- ❑ Dismantling and assembling retaining plate with footwell flap control motor - V261- ⇒ page 430
- ❑ Activation of air distribution flaps differs on vehicles with “deluxe” or “basic” air conditioner. On a “basic” air conditioner, the flaps (for the left and right dash panel vents and the front left and right footwell vents) are inter-linked via connecting rods in the air distribution housing. The flaps for the rear footwell vents (left and right) are inter-linked via the shaft. These flaps are all activated by the footwell flap control motor - V261- ⇒ page 439 .
- ❑ Coat guides of cam plate, shaft bearings and pins on flap levers with a small quantity of grease (e.g. grease - G 000 150- ⇒ Electronic parts catalogue).

19 - Toothed segment

20 - Retaining plate with temperature flap control motor - V68-

- ❑ Removing and installing retaining plate with temperature flap control motor - V68- , detaching control motor from retaining plate ⇒ page 386
- ❑ Actuation of temperature flaps (left and right) differs on vehicles with “deluxe” or “basic” air conditioner. With the “basic” version of the air conditioner, the shaft of the left temperature flaps is actuated via a toothed segment ⇒ Item 19 (page 434) by the temperature flap control motor - V68- . The temperature flap (right-side) is also actuated via the connecting rod ⇒ Item 23 (page 434) (engaged in this toothed segment) by the temperature flap control motor - V68- ⇒ page 439 .
- ❑ Coat shaft bearings, toothed segments and pins on flap levers with a small quantity of grease (e.g. grease - G 000 150- ⇒ Electronic parts catalogue).

21 - Connecting rod to defroster flap

22 - Actuating arm for defroster flap control motor - V107-

23 - Connecting rod for temperature flaps

Note

Depending on the production period, there are different connecting rods -A- (different version of connecting element to toothed segment and temperature flaps, right-side) ⇒ page 24 and ⇒ Electronic parts catalogue .

24 - Footwell vent temperature sender - G192-

- ❑ Removing and installing ⇒ page 632
- ❑ Footwell vent temperature sender - G192- is installed in footwell vent (left-side).

25 - Centre vent temperature sender - G191-

- ❑ Removing and installing ⇒ page 632
- ❑ Centre vent temperature sender - G191- is installed in air duct to dash panel vent (centre).

26 - Wiring harness for air conditioner (“basic” version)

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Mark assignment before unplugging connectors (identical connectors for different control motors and temperature sensors, danger of interchanging)
- ❑ Secure wiring harness to attachment points on housing (with cable ties ⇒ Item 27 (page 434) or at attachment points) so that harness cannot come into contact with moving components.

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27 - Cable tie

28 - Air distribution housing for air conditioner (“basic” version)

- ❑ Do not dismantle any further
- ❑ Different versions for vehicles with “deluxe” or “basic” air conditioner ⇒ Electronic parts catalogue
- ❑ Coat guides of cam plate, shaft bearings, toothed segments and pins on flap levers with a small quantity of grease (e.g. grease - G 000 150- ⇒ Electronic parts catalogue).

Note

With “basic” air conditioner, the various flaps (e.g. for left and right vents) are connected via connecting rods and actuated by a single control motor ⇒ page 439 .

29 - Heater housing (right-side, with temperature flaps)

- ❑ Activation of temperature flaps and heater housing (right-side) differ on vehicles with “deluxe” or “basic” air conditioner. On the “basic” air conditioner, the two temperature flaps (for the right dash panel vents and right footwell vents) are actuated together via the shaft ⇒ page 439 and ⇒ Electronic parts catalogue

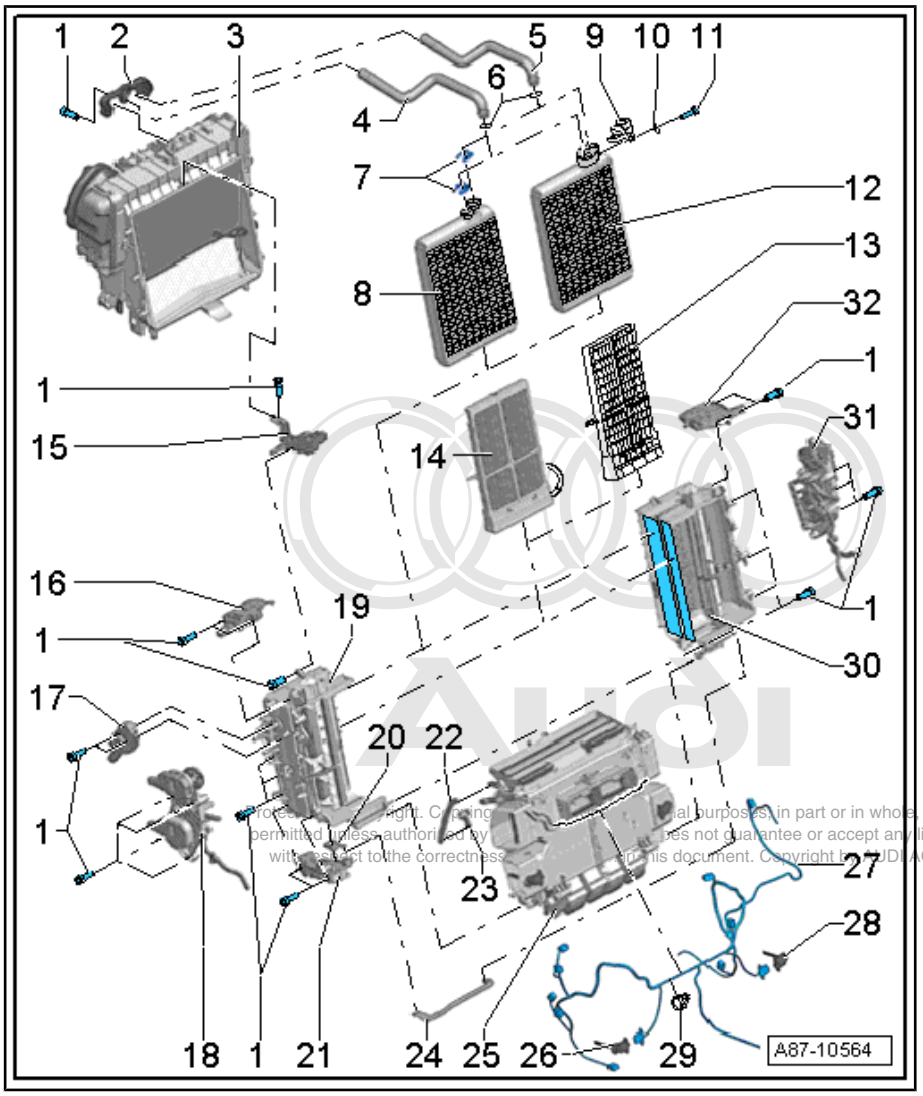
- ❑ Different versions (with one or two attachment points at bottom) ⇒ page 516 and ⇒ Electronic parts catalogue
- ❑ Removing and installing with air conditioning unit installed ⇒ page 520
- ❑ Coat guides of cam plate, shaft bearings, toothed segments and pins on flap levers with a small quantity of grease (e.g. grease - G 000 150- ⇒ Electronic parts catalogue).

30 - Centre vent control motor - V102-

- ❑ Removing and installing ⇒ page 392

5.1.2 Exploded view - attachments for heater and air conditioning unit and air intake box, “deluxe” version

– Removing air conditioning unit ⇒ page 496



1 - Bolt

- ❑ 1Nm

2 - Bracket for coolant pipes

3 - Evaporator housing

- ❑ Dismantling and assembling ⇒ page 447
- ❑ Different versions depending on production period and vehicle version ⇒ page 447 and ⇒ Electronic parts catalogue
- ❑ Detaching and attaching evaporator housing at air conditioning unit ⇒ “5.6 Removing and installing evaporator housing”, page 468

4 - Coolant pipe

- ❑ Detaching and attaching at heat exchanger ⇒ page 543
- ❑ For coolant supply from engine

5 - Coolant pipe

- ❑ Detaching and attaching at heat exchanger ⇒ page 543
- ❑ For coolant return to engine

6 - O-ring

- ❑ Renew
- ❑ Coat lightly with coolant before fitting ⇒ page 543

7 - Clip

- ❑ These clips are fitted at the factory and hold the coolant pipes in position in the factory-fitted heat exchanger ⇒ Item 8 (page 432) .

8 - Heat exchanger for heater

- ❑ This is the factory-fitted version.
- ❑ Removing and installing ⇒ page 543

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9 - Bracket for coolant pipes in replacement heat exchanger

- ❑ Supplied with replacement heat exchanger ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ page 543

10 - Washer

- ❑ Supplied with replacement heat exchanger ⇒ Electronic parts catalogue

11 - Bolt

- ❑ Supplied with replacement heat exchanger ⇒ Electronic parts catalogue
- ❑ Tightening torque: 2.5 Nm

12 - Replacement heat exchanger for heater

- ❑ Removing and installing with air conditioning unit installed ⇒ page 543
- ❑ This version is available as a replacement part ⇒ Electronic parts catalogue .
- ❑ The replacement heat exchanger includes ⇒ Item 6 (page 435) and ⇒ Item 9 (page 436) to ⇒ Item 12 (page 436) ⇒ Electronic parts catalogue
- ❑ Attach foam seals to heat exchanger according to versions of air conditioner and vehicle ⇒ page 543 (Removing and installing heat exchanger).

13 - Honeycomb element

- ❑ Installed on vehicles with petrol engine without auxiliary air heater element - Z35- and vehicles with diesel engine on which auxiliary heater (optional extra) is also activated as supplementary heater (no -Z35- fitted) ⇒ page 482
- ❑ Removing and installing with air conditioning unit installed ⇒ page 487
- ❑ Attach foam seals to honeycomb element in line with air conditioner version ⇒ page 487 (Removing and installing auxiliary air heater element - Z35-)

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14 - Auxiliary air heater element - Z35-

- ❑ Installed on vehicles with diesel engine (also for vehicles on which auxiliary heater installed as optional extra is not activated as supplementary heater) and vehicles with certain petrol engines ⇒ page 482
- ❑ Function, checking ⇒ page 482
- ❑ Removing and installing with air conditioning unit installed ⇒ page 487
- ❑ Attach foam seals to auxiliary air heater element - Z35- in line with air conditioner version ⇒ page 487 (Removing and installing auxiliary air heater element - Z35-).

Note

In model year 2009, a modified version of the auxiliary air heater element - Z35- with slightly smaller heating elements is gradually being introduced; observe the correct version and assignment ⇒ Electronic parts catalogue .

15 - Bracket

16 - Retaining plate with left temperature flap control motor - V158-

- ❑ Removing and installing, dismantling and assembling ⇒ page 407

17 - Defroster flap control motor - V107-

- ❑ Removing and installing ⇒ page 394

18 - Retaining plate (left-side) with left footwell flap control motor - V108- and left centre vent control motor - V110-

- ❑ With cam plates, actuating arms and connecting rods
- ❑ Removing and installing left footwell flap control motor - V108- ⇒ page 396
- ❑ Removing and installing left centre vent control motor - V110- ⇒ page 400
- ❑ Removing and installing retaining plate (left-side) with control motors -V108- and -V110- ⇒ page 419
- ❑ Dismantling and assembling retaining plate with control motors -V108- and -V110- ⇒ page 427

- ❑ Coat guides of cam plate, shaft bearings and pins on flap levers with a small quantity of grease (e.g. grease - G 000 150- ⇒ Electronic parts catalogue).

19 - Heater housing (left-side, with temperature flaps)

- ❑ Activation of temperature flaps and heater housing (left-side) differ on vehicles with “deluxe” or “basic” air conditioner. On the “deluxe” air conditioner, the temperature flaps (for front left and rear) are actuated by different control motors ⇒ page 439 and ⇒ Electronic parts catalogue .
- ❑ Different versions (with one or two attachment points at bottom) ⇒ page 516 and ⇒ Electronic parts catalogue
- ❑ Removing and installing with air conditioning unit installed ⇒ page 516
- ❑ Coat guides of cam plate, shaft bearings, toothed segments and pins on flap levers with a small quantity of grease (e.g. grease - G 000 150- ⇒ Electronic parts catalogue).

20 - Toothed segment

21 - Retaining plate with rear temperature flap control motor - V137-

- ❑ Removing and installing retaining plate with rear temperature flap control motor - V137- , detaching control motor from retaining plate ⇒ page 386
- ❑ Actuation of temperature flaps (left and right) differs on vehicles with “deluxe” or “basic” air conditioner. On a “deluxe” air conditioner, the shaft of the rear left temperature flap is actuated via a toothed segment ⇒ Item 20 (page 437) by the rear temperature flap control motor - V137- . The temperature flap (rear right) is also actuated via the connecting rod ⇒ Item 24 (page 437) (engaged in this toothed segment) by the rear temperature flap control motor - V137- ⇒ page 439 .
- ❑ Coat shaft bearings, toothed segments and pins on flap levers with a small quantity of grease (e.g. grease - G 000 150- ⇒ Electronic parts catalogue).

22 - Connecting rod to defroster flap

23 - Actuating arm for defroster flap control motor - V107-

24 - Connecting rod for rear temperature flaps

25 - Air distribution housing for air conditioner (“deluxe” version)

- ❑ Do not dismantle any further
- ❑ Different versions for vehicles with “deluxe” or “basic” air conditioner ⇒ Electronic parts catalogue
- ❑ Coat guides of cam plate, shaft bearings, toothed segments and pins on flap levers with a small quantity of grease (e.g. grease - G 000 150- ⇒ Electronic parts catalogue).

Note

- ♦ *The version for the “deluxe” air conditioner is fitted with one partition each to separate the left and right, and front and rear sections. There is also one vent each for indirect ventilation (left and right) and for the air duct to the vent in the rear centre console (left and right), each fitted with a flap. The various flaps (e.g. for dash panel vents and footwell vents on left and right) are each activated by a control motor. The flaps for the dash panel vents (centre) and the air duct to the vents (left and right) in the centre console (rear) are each connected by a connecting rod and are actuated by the left centre vent control motor - V110- and the right centre vent control motor - V111- .*

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- *From 08.2007 onwards, air conditioning units with an air distribution housing and optimised routing of air flow are gradually introduced (versions “1” and “2”) ⇒ page 25*

26 - Left footwell vent temperature sender - G261-

- Removing and installing ⇒ page 632
- Left footwell vent temperature sender - G261- is installed in footwell vent (left-side)

27 - Wiring harness for air conditioner (“deluxe” version)

- Different versions ⇒ Electronic parts catalogue
- Mark assignment before unplugging connectors (identical connectors for different control motors and temperature sensors, danger of interchanging)
- Secure wiring harness to attachment points on housing (with cable ties ⇒ Item 29 (page 438) or at attachment points) so that harness cannot come into contact with moving components.

28 - Right footwell vent temperature sender - G262-

- Removing and installing ⇒ page 633
- Right footwell vent temperature sender - G262- is installed in footwell vent (right-side).

29 - Cable tie

30 - Heater housing (right-side, with temperature flaps)

- Activation of temperature flaps and heater housing (right-side) differ on vehicles with “deluxe” or “basic” air conditioner. On the “deluxe” air conditioner, the temperature flaps (for front right and rear right) are actuated by different control motors ⇒ page 439 and ⇒ Electronic parts catalogue
- Different versions (with one or two attachment points at bottom) ⇒ page 516 and ⇒ Electronic parts catalogue
- Removing and installing with air conditioning unit installed ⇒ page 520
- Coat guides of cam plate, shaft bearings, toothed segments and pins on flap levers with a small quantity of grease (e.g. grease - G 000 150- ⇒ Electronic parts catalogue).

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31 - Retaining plate (right-side) with right footwell flap control motor - V109- and right centre vent control motor - V111-

- With cam plates, actuating arms and connecting rods
- Removing and installing right footwell flap control motor - V109- ⇒ page 398
- Removing and installing right centre vent control motor - V111- ⇒ page 403
- Removing and installing retaining plate (right-side) with control motors -V109- and -V111- ⇒ page 423
- Dismantling and assembling retaining plate (right-side) with control motors -V109- and -V111- ⇒ page 429
- Coat guides of cam plate, shaft bearings and pins on flap levers with a small quantity of grease (e.g. grease - G 000 150- ⇒ Electronic parts catalogue).

32 - Retaining plate with right temperature flap control motor - V159-

- Removing and installing, dismantling and assembling ⇒ page 411

5.2 Exploded view - flaps and partitions in air distribution housing

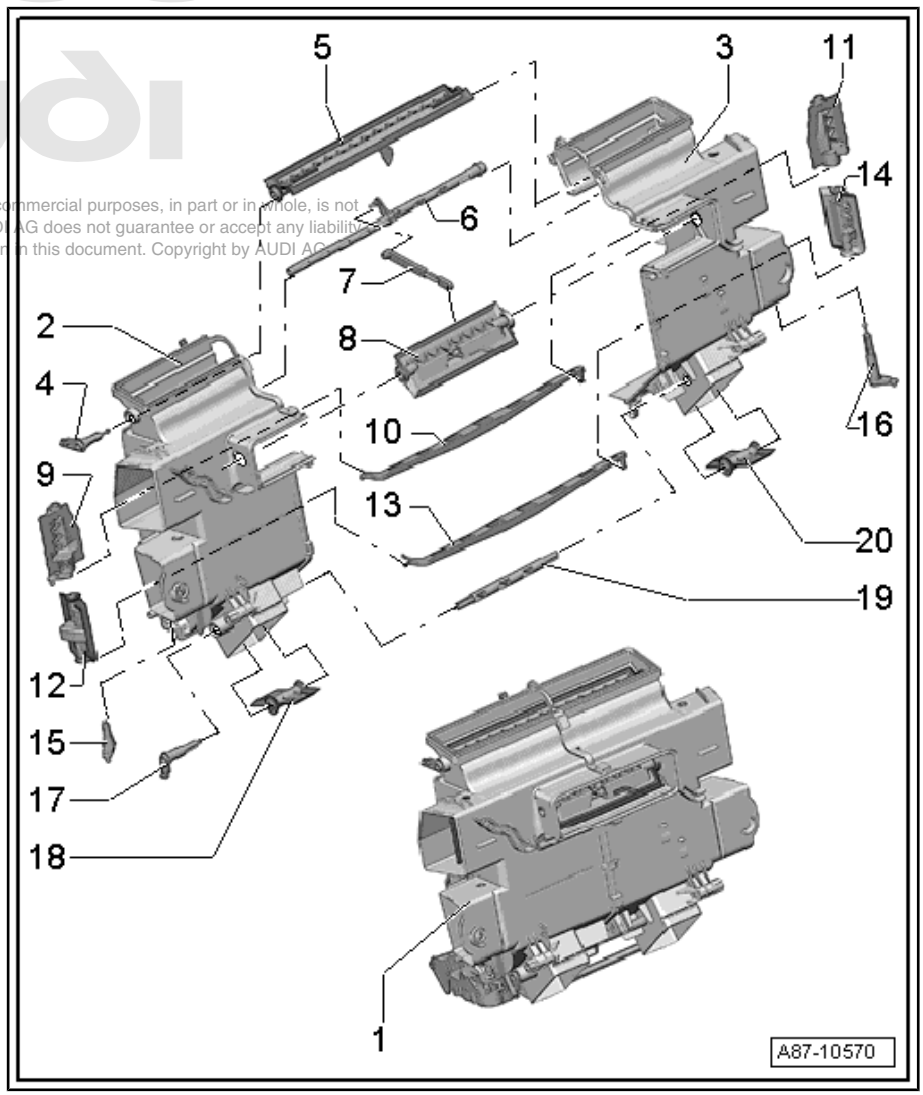
⇒ “5.2.1 Exploded view - flaps and partitions in air distribution housing, basic version”, page 439

⇒ “5.2.2 Exploded view - flaps and partitions in air distribution housing, deluxe version”, page 440

5.2.1 Exploded view - flaps and partitions in air distribution housing, “basic” version

Note

- *Do not dismantle air distribution housing ⇒ Electronic parts catalogue .*
- *Different versions of air distribution housing for vehicles with “deluxe” or “basic” air conditioner ⇒ Electronic parts catalogue*
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*



1 - “Basic” air distribution housing
  - ❑ Complete unit, do not dismantle
2 - Left half of housing
3 - Right half of housing
4 - Lever
5 - Flap in defroster vent
6 - Shaft
7 - Connecting rod
8 - Flap in vent to centre dash panel vents
9 - Flap in vent to left dash panel vent
10 - Connecting rod
11 - Flap in vent to right dash panel vent
12 - Flap in vent to front left footwell vent
13 - Connecting rod
14 - Flap in vent to front right footwell vent
15 - Lever
16 - Lever
17 - Lever
18 - Flap in vent to rear left footwell vent
19 - Shaft
20 - Flap in vent to rear right footwell vent

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5.2.2 Exploded view - flaps and partitions in air distribution housing, “deluxe” version

Note

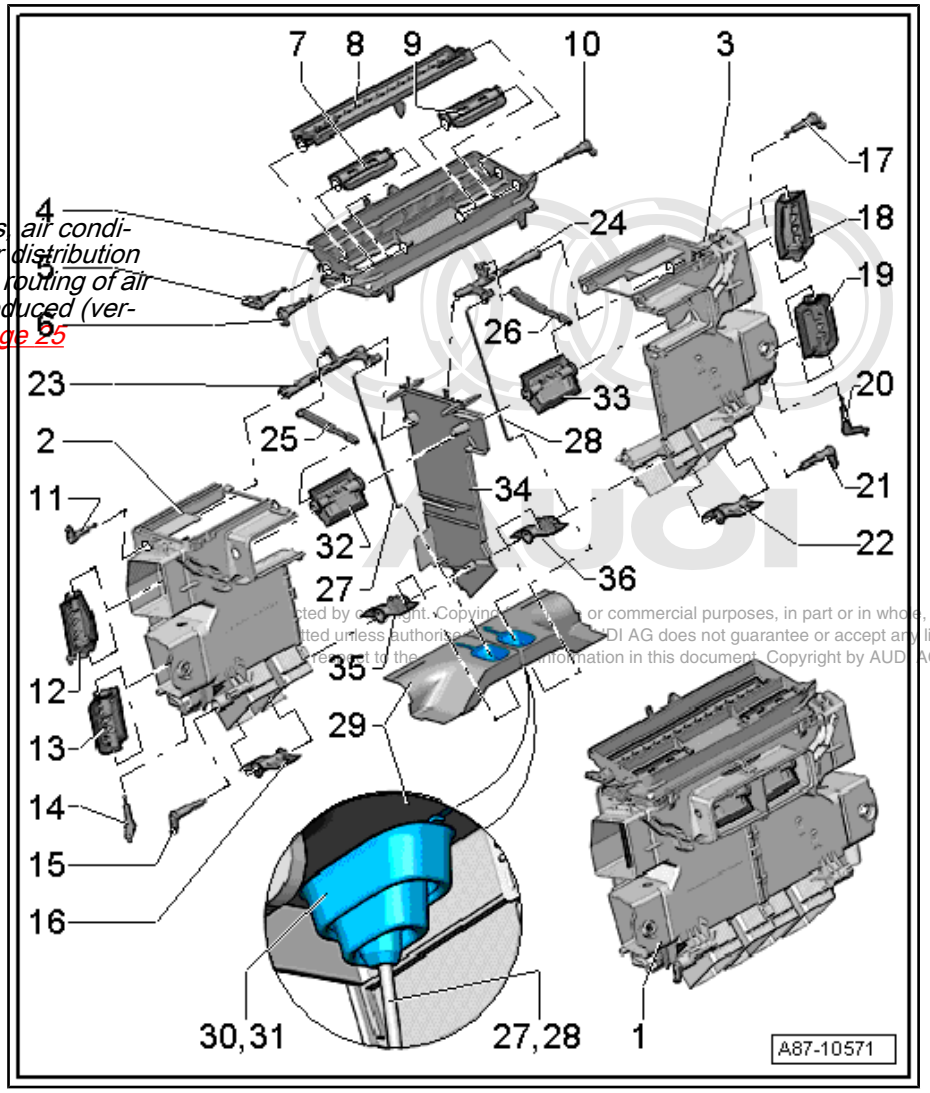
- *Do not dismantle air distribution housing ⇒ Electronic parts catalogue .*
- *Different versions of air distribution housing for vehicles with “deluxe” or “basic” air conditioner ⇒ Electronic parts catalogue*
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*

1 - Air distribution housing (“deluxe” version)

❑ Complete unit, do not dismantle

Note

From 08.2007 onwards, air conditioning units with an air distribution housing and optimised routing of air flow are gradually introduced (versions “1” and “2”) ⇒ page 25



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2 - Left half of housing

3 - Right half of housing

4 - Housing for upper vents

5 - Lever

6 - Lever

7 - Flap in left indirect ventilation vent

8 - Flap in defroster vent

9 - Flap in right indirect ventilation vent

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10 - Lever

11 - Lever

12 - Flap in vent to left dash panel vent

13 - Flap in vent to front left footwell vent

14 - Lever

15 - Lever

16 - Flap in vent to rear left footwell vent

17 - Lever

18 - Flap in vent to right dash panel vent

19 - Flap in vent to front right footwell vent

20 - Lever

21 - Lever

22 - Flap in vent to rear right footwell vent

23 - Shaft

24 - Shaft

25 - Connecting rod

26 - Connecting rod

27 - Connecting rod

28 - Connecting rod

29 - Partition

- ❑ Separates air duct to vents (front and rear) and is necessary to allow different air outflow temperatures (depending on position of corresponding temperature flap)

30 - Grommet

- ❑ Bonded into partition ⇒ Item 29 (page 441)

31 - Grommet

- ❑ Bonded into partition ⇒ Item 29 (page 441)

32 - Flap in vent to centre left dash panel vents

33 - Flap in vent to centre right dash panel vents

34 - Partition

- ❑ Separates air duct to vents (left and right) and is necessary to allow different air outflow temperatures (depending on position of corresponding temperature flap)

35 - Flap in vent to right vent in rear centre console

36 - Flap in vent to right vent in rear centre console

5.3 Exploded view - air intake box of heater and air conditioning unit

Note

- *From 01.2008 onwards, air conditioning units with an additional connection for glove box cooling are being introduced gradually. This connection is sealed with a plug on vehicles without glove box cooling ⇒ page 587 . Therefore it is important to observe the correct assignment of the heater housing (right-side) and the air intake box ⇒ Electronic parts catalogue .*
- *The following illustration shows the top section of the air intake box without connection for glove box cooling.*
- *From model year 2012 onwards and depending on the vehicle version, modified fresh air blower control units - J126- , fresh air blowers - V2- , air conditioner operating and display units (Climatronic control unit - J255-), evaporators, expansion valves, control motors and air conditioning units are introduced gradually ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . Observe notes on these components.*
  ⇒ "4.1.1 Overview of fitting locations - control motors (front), basic version", page 372

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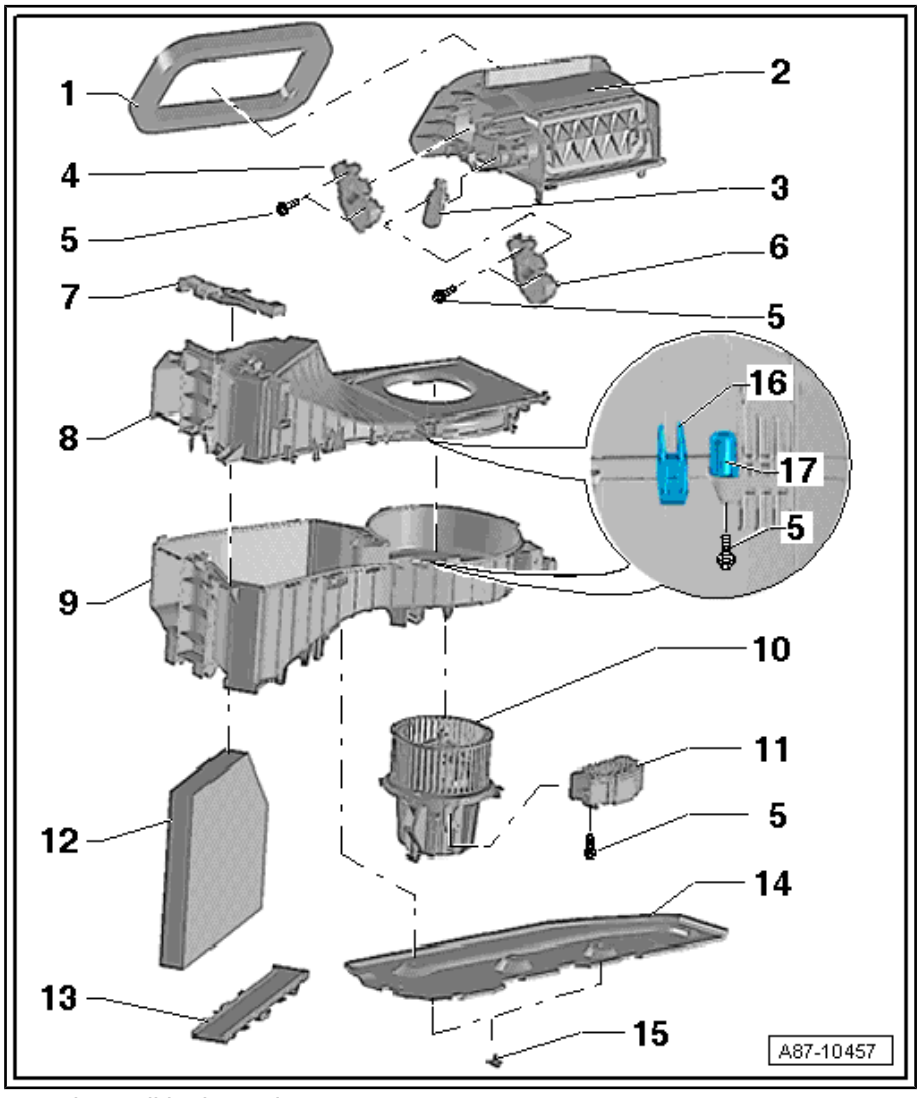
– Remove air intake box ⇒ page 512 .



1 - Foam seal

- ❑ To seal off fresh-air intake duct at vehicle, bonded to intake duct

2 - Air intake duct

- ❑ With air flow, fresh air and air recirculation flap
- ❑ Do not dismantle any further
- ❑ Detaching and attaching at air intake box ⇒ page 576

3 - Cam plate

- ❑ Actuates air flow and fresh air flap via two levers
- ❑ Lubricate guides of cam plate and pins on flap levers with a small quantity of grease (e.g. grease - G 000 150- ⇒ Electronic parts catalogue).

4 - Air flow flap control motor - V71-

- ❑ Removing and installing ⇒ page 390

5 - Bolt

6 - Air recirculation flap control motor - V113-

- ❑ Removing and installing ⇒ page 405

7 - Catch

- ❑ For securing air intake box to air conditioning unit

8 - Air intake box (top section)

- ❑ Do not dismantle

Note

- ♦ *Depending on the version, the top and bottom sections of the genuine part are bolted together at the attachment points, or the top section is welded to the bottom section at various points.*
- ♦ *Currently, the top and bottom sections are supplied as separate replacement parts. Assemble the two parts and then attach them to each other with the bolts ⇒ Item 5 (page 442) at the attachment points ⇒ Item 17 (page 447) ⇒ Electronic parts catalogue .*

- ❑ If any of the retaining tabs ⇒ Item 16 (page 447) break off or any of the welded connections are no longer strong enough, the two housing sections can also be assembled using bolts ⇒ Item 5 (page 442) .
- ❑ Different versions (with or without connection for glove box cooling); this illustration shows the version without a connection for glove box cooling ⇒ Electronic parts catalogue

9 - Air intake box (bottom section)

- ❑ Do not dismantle

Note

- ♦ *Depending on the version, the top and bottom sections of the genuine part are bolted together at the attachment points, or the top section is welded to the bottom section at various points.*
- ♦ *Currently, the top and bottom sections are supplied as separate replacement parts. Assemble the two parts and then attach them to each other with the bolts ⇒ Item 5 (page 442) at the attachment points ⇒ Item 17 (page 447) ⇒ Electronic parts catalogue .*

- ❑ If any of the retaining tabs ⇒ Item 16 (page 447) break off or any of the welded connections are no longer strong enough, the two housing sections can also be assembled using bolts ⇒ Item 5 (page 442) .

From model year 2012 onwards, a modified version is gradually being introduced. Pay attention to the notes on this component ⇒ "4.1.1 Overview of fitting locations - control motors (front), basic version", page 372 .

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10 - Fresh air blower - V2-

- ❑ Removing and installing ⇒ page 532
- ❑ Checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

Note

- ♦ *From 08.2007 onwards, fresh air blowers - V2- with an additional foam sheath at the housing (to reduce noise) are gradually being introduced ⇒ page 532 and ⇒ Electronic parts catalogue .*

- *From model year 2009 onwards, fresh air blowers - V2- with a modified housing (with optimised motor and adapted mounting for motor) are gradually introduced. When the modified -V2- is introduced, the additional foam sheath at the housing is discontinued; however, due to the larger motor mounting, a modified insulating mat is installed ⇒ Item 14 (page 446) and ⇒ Electronic parts catalogue .*
- *In model year 2010, petrol engines designed for operation with bioethanol were introduced gradually (Flex Fuel Vehicle). These engines are currently also fitted with an auxiliary air heater element - Z35- ⇒ page 482 .*
- *Vehicles with a high-voltage system (hybrid vehicles) and petrol engine are currently equipped with an auxiliary air heater element - Z35- to provide a supplementary heating function ⇒ page 482 .*
- *On vehicles with a petrol engine, the electric supplementary heater (auxiliary air heater element - Z35-) is activated by a signal from the operating and display unit (Climatronic control unit - J255-) via the local data bus (via the same output by which the fresh air blower control unit - J126- is activated) to the auxiliary air heater control unit - J604- . In the event of problems with the fresh air blower control unit - J126- or the fresh air blower - V2- on these vehicles, also check the auxiliary air heater control unit - J604- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *Checking operation of auxiliary air heater element - Z35- ⇒ page 482*

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- *From model year 2012 onwards and depending on the vehicle version, modified fresh air blower control units - J126- , fresh air blowers - V2- , air conditioner operating and display units (Climatronic control unit - J255-) and air conditioning units are introduced gradually. Make sure that the correct version is used and that the components are combined correctly ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *If the allocation or adaption of -J255- and -J126- (with part number 8K0 820 521 or 8T0 820 521) is not as specified, the fresh air blower - V2- is not controlled by -J126- . Although in this case the activation of -V2- is not OK, an entry is not always made in the event memory. Therefore it is important to pay attention to the correct adaption of -J255- ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *From model year 2012 onwards, a modified version is gradually being introduced. Pay attention to the notes on this component ⇒ "4.1.1 Overview of fitting locations - control motors (front), basic version", page 372 .*

Audi
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11 - Fresh air blower control unit - J126-

- ❑ Removing and installing ⇒ page 535
- ❑ Checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

Note

- *In model year 2010, petrol engines designed for operation with bioethanol were introduced gradually (Flex Fuel Vehicle). These engines are currently also fitted with an auxiliary air heater element - Z35- ⇒ page 482 .*
- *Vehicles with a high-voltage system (hybrid vehicles) and petrol engine are currently equipped with an auxiliary air heater element - Z35- to provide a supplementary heating function ⇒ page 482 .*

- *On vehicles with a petrol engine, the electric supplementary heater (auxiliary air heater element - Z35-) is activated by a signal from the operating and display unit (Climatronic control unit - J255-) via the local data bus (via the same output by which the fresh air blower control unit - J126- is activated) to the auxiliary air heater control unit - J604- . In the event of problems with the fresh air blower control unit - J126- or the fresh air blower - V2- on these vehicles, also check the auxiliary air heater control unit - J604- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *Checking operation of auxiliary air heater element - Z35-* ⇒ page 482
- *From model year 2012 onwards (introduction depending on vehicle version) modified fresh air blower control units - J126- (and fresh air blowers - V2- , air conditioner operating and display units (Climatronic control unit - J255-) and air conditioning units with part number "8T_ 820 005") are introduced gradually. The air intake box has been modified together with -J126- and the air conditioning unit. Pay attention that the correct version is used and that the components are combined correctly ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *From model year 2012 onwards, a modified version is gradually being introduced. Pay attention to the notes on this component* ⇒ "4.1.1 Overview of fitting locations - control motors (front), basic version", page 372 .

12 - Dust and pollen filter

- ❑ Removing and installing ⇒ page 531
- ❑ Observe replacement intervals ⇒ Maintenance tables
- ❑ Different versions (with or without activated charcoal filter insert) ⇒ page 104

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13 - Cover for dust and pollen filter

- ❑ Removing and installing ⇒ page 531

14 - Insulating mat

- ❑ Removing and installing ⇒ page 531
- ❑ Different versions depending on version of fresh air blower - V2- ⇒ Item 10 (page 443) and ⇒ Electronic parts catalogue

15 - Threaded fasteners

16 - Fasteners on air intake box (top section)

17 - Attachment point

5.4 Exploded view - evaporator housing

– Remove air conditioning unit ⇒ page 496 .

– Detach evaporator housing from air conditioning unit ⇒ “5.6 Removing and installing evaporator housing”, page 468 and ⇒ page 431 (Dismantling and assembling air conditioning unit, “basic” version) or ⇒ page 435 (Dismantling and assembling air conditioning unit, “deluxe” version).

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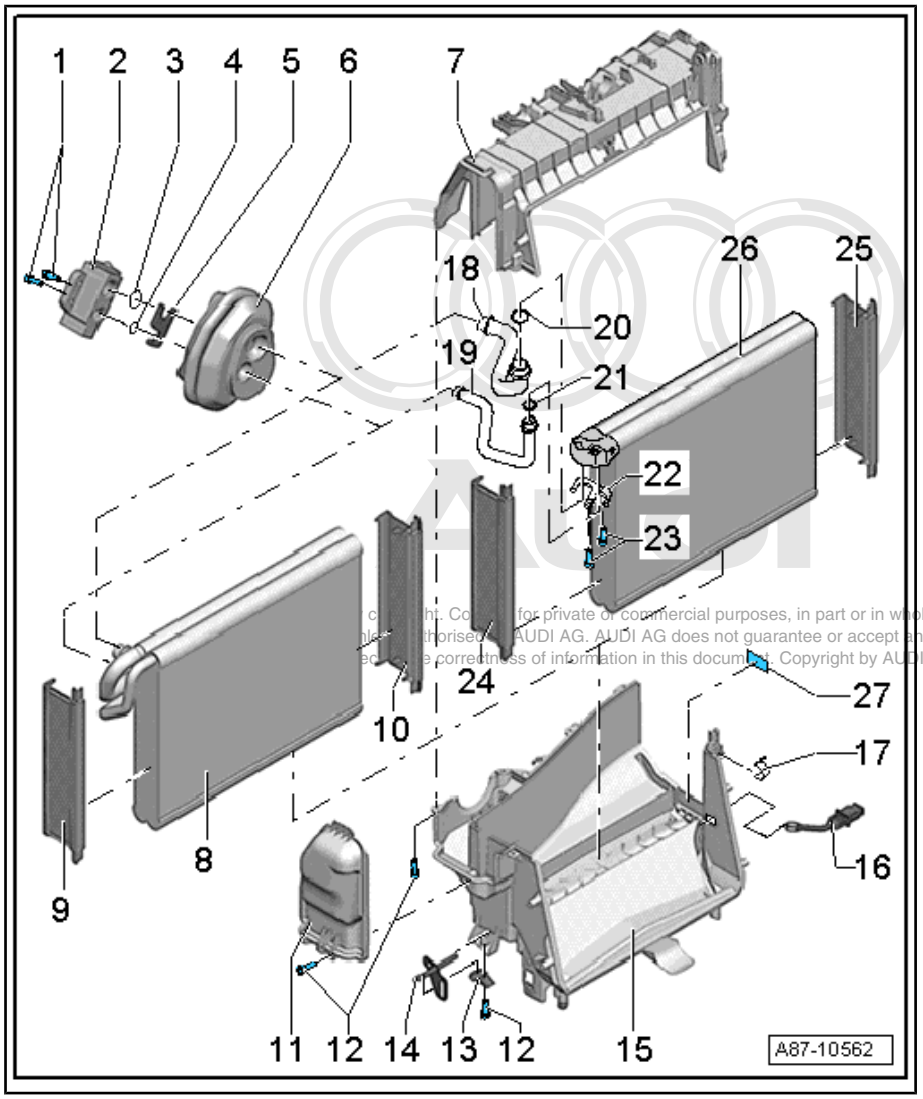
Note

- *From the start of production up to the conversion from model year 2012 onwards, evaporators with a width (block depth) of approx. 40 mm were fitted (air conditioning unit with part number "8K_ 820 005"). From model year 2012 onwards and depending on the vehicle version, evaporators with a width (block depth) of approx. 50 mm are being introduced gradually (air conditioning unit with part number "8T_ 820 005"). Pay attention to the correct assignment of the expansion valve to the evaporator (different versions) ⇒ Electronic parts catalogue .*
- *On vehicles which use refrigerant R1234yf, no separable connections in the refrigerant circuit (e.g. between the refrigerant lines and the evaporator) are permitted in the passenger compartment. On these vehicles, the air conditioning unit (with the evaporator housing) must therefore always be removed, and the evaporator must be renewed (as a complete unit) together with the refrigerant lines ⇒ Electronic parts catalogue and ⇒ page 496 .*



1 - Bolt

2 - Expansion valve

- ❑ Already detached during removal of air conditioning unit ⇒ page 496 (Removing air conditioning unit)
- ❑ Detaching and attaching refrigerant line with internal heat exchanger at expansion valve ⇒ page 217
- ❑ Removing and installing ⇒ page 232
- ❑ Different versions ⇒ page 232 and ⇒ Electronic parts catalogue

3 - O-ring

- ❑ Renewing ⇒ page 106
- ❑ For correct version refer to ⇒ Electronic parts catalogue

4 - O-ring

- ❑ Renewing ⇒ page 106
- ❑ For correct version refer to ⇒ Electronic parts catalogue

5 - Retaining plate

- ❑ Removing and installing ⇒ page 451

6 - Rubber grommet

- ❑ For sealing opening for refrigerant lines through plenum chamber back wall
- ❑ Support ring is already detached during removal of air conditioning unit; pay attention to correct installation position ⇒ page 496 (Removing air conditioning unit)

7 - Evaporator housing (top section)

- ❑ Different versions ⇒ Item 8 (page 448) and ⇒ Electronic parts catalogue

8 - Evaporator

- ❑ This is the factory-fitted version.

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- ❑ Removing with air conditioning unit installed ⇒ page 451
- ❑ Different versions ⇒ page 232 and ⇒ Electronic parts catalogue

Note

- ♦ *From the start of production up to the conversion from model year 2012 onwards, evaporators with a width (block depth) of approx. 40 mm were fitted (air conditioning unit with part number "8K_ 820 005"); these evaporators can be renewed with the air conditioning unit in position ⇒ Electronic parts catalogue .*
- ♦ *From model year 2012 onwards and depending on the vehicle version, evaporators with a width (block depth) of approx. 50 mm are introduced gradually (air conditioning unit with part number "8T_ 820 005"); these evaporators can only be renewed together with the evaporator housing (after removing the air conditioning unit) ⇒ Electronic parts catalogue .*
- ♦ *Pay attention to the correct assignment of the expansion valve to the evaporator (different versions) ⇒ Electronic parts catalogue .*
- ♦ *On vehicles which use refrigerant R1234yf, no separable connections in the refrigerant circuit (e.g. between the refrigerant lines and the evaporator) are permitted in the passenger compartment. On these vehicles, the air conditioning unit (with the evaporator housing) must therefore always be removed, and the evaporator must be renewed (as a complete unit) together with the refrigerant lines ⇒ Electronic parts catalogue and ⇒ page 496 .*

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9 - Evaporator cover

- ❑ Make sure it is correctly attached to evaporator ⇒ page 451 (Removing and installing evaporator with air conditioning unit installed)

10 - Evaporator cover

- ❑ Make sure it is correctly attached to evaporator ⇒ page 451 (Removing and installing evaporator with air conditioning unit installed)

11 - Cover for refrigerant lines

- ❑ Make sure it is correctly attached to evaporator housing ⇒ page 451 (Removing and installing evaporator with air conditioning unit installed)

12 - Bolt

13 - Bracket

14 - Bracket for air conditioning unit at centre tunnel

- ❑ This bracket is used to compensate for positional tolerance between air conditioning unit and centre tunnel

15 - Evaporator housing (bottom section)

- ❑ Different versions ⇒ Item 8 (page 448) and ⇒ Electronic parts catalogue

16 - Evaporator output temperature sender - G263-

- ❑ Removing and installing ⇒ page 633

17 - Clip

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18 - Refrigerant pipe to replacement evaporator

- ❑ Supplied with replacement evaporator ⇒ Electronic parts catalogue
- ❑ Only available for evaporator with width (block depth) of approx. 40 mm ⇒ Item 8 (page 448) and ⇒ Electronic parts catalogue

19 - Refrigerant pipe to replacement evaporator

- ❑ Supplied with replacement evaporator ⇒ Electronic parts catalogue
- ❑ Only available for evaporator with width (block depth) of approx. 40 mm ⇒ Item 8 (page 448) and ⇒ Electronic parts catalogue

20 - O-ring for connection at replacement evaporator

- ❑ Installing ⇒ page 106
- ❑ For correct version refer to ⇒ Electronic parts catalogue
- ❑ Supplied with replacement evaporator ⇒ Electronic parts catalogue

Note

Only available for evaporator with width (block depth) of approx. 40 mm ⇒ Item 8 (page 448) and ⇒ Electronic parts catalogue

21 - O-ring for connection at replacement evaporator

- ❑ Installing ⇒ page 106
- ❑ For correct version refer to ⇒ Electronic parts catalogue
- ❑ Supplied with replacement evaporator ⇒ Electronic parts catalogue

Note

Only available for evaporator with width (block depth) of approx. 40 mm ⇒ Item 8 (page 448) and ⇒ Electronic parts catalogue

22 - Bracket for refrigerant pipes in connection at replacement evaporator

- ❑ Installing ⇒ page 451 (Removing and installing evaporator with air conditioning unit installed)
- ❑ Supplied with replacement evaporator ⇒ Electronic parts catalogue

Note

Only available for evaporator with width (block depth) of approx. 40 mm ⇒ Item 8 (page 448) and ⇒ Electronic parts catalogue

23 - Bolt

- ❑ Installing ⇒ page 451 (Removing and installing evaporator with air conditioning unit installed)

- ❑ Supplied with replacement evaporator ⇒ Electronic parts catalogue
- ❑ Tightening torque: 5 Nm

24 - Cover for replacement evaporator

- ❑ Supplied with replacement evaporator ⇒ Electronic parts catalogue
- ❑ Make sure it is correctly attached to evaporator ⇒ page 451 (Removing and installing evaporator with air conditioning unit installed)
- ❑ Depending on version, cover may have to be reworked in connection area of refrigerant pipes to evaporator before installing ⇒ page 451 .

Note

Only available for evaporator with width (block depth) of approx. 40 mm ⇒ Item 8 (page 448) and ⇒ Electronic parts catalogue

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25 - Cover for replacement evaporator

- ❑ Supplied with replacement evaporator ⇒ Electronic parts catalogue
- ❑ Make sure it is correctly attached to evaporator ⇒ page 451 (Removing and installing evaporator with air conditioning unit installed)

Note

Only available for evaporator with width (block depth) of approx. 40 mm ⇒ Item 8 (page 448) and ⇒ Electronic parts catalogue

26 - Replacement evaporator

- ❑ This version is available as a replacement part ⇒ Electronic parts catalogue .
- ❑ The replacement evaporator is supplied together with the components listed (⇒ Item 18 (page 450) to ⇒ Item 27 (page 451)) ⇒ Electronic parts catalogue
- ❑ Installing with air conditioning unit installed ⇒ page 451

Note

Only available for evaporator with width (block depth) of approx. 40 mm ⇒ Item 8 (page 448) and ⇒ Electronic parts catalogue

27 - Partition

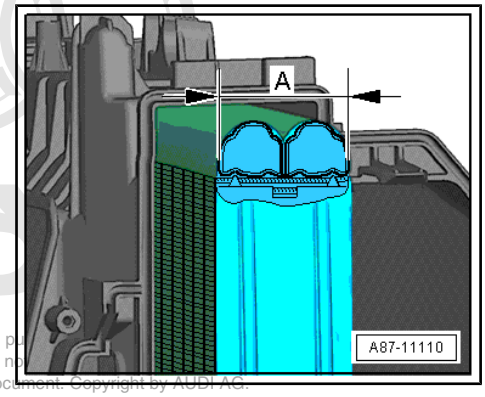
- ❑ Supplied with replacement evaporator ⇒ Electronic parts catalogue
- ❑ This partition is inserted in the bottom section of the evaporator housing and bonded on after installing the replacement evaporator ⇒ page 451 (Removing and installing evaporator with air conditioning unit installed).

Note

Only available for evaporator with width (block depth) of approx. 40 mm ⇒ Item 8 (page 448) and ⇒ Electronic parts catalogue

5.5 Removing and installing evaporator

Only possible on air conditioning units with part no. 8K_ 820 xxx
(see notes below)



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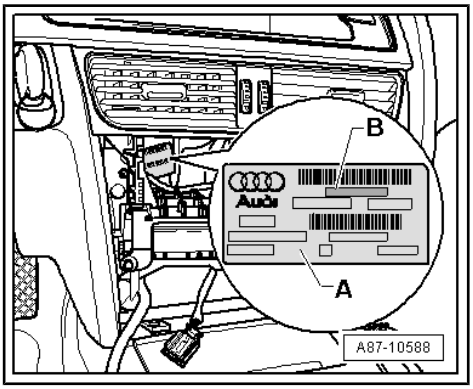

Note

- *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 .*
- *From model year 2012 onwards (introduction depending on vehicle version), modified air conditioning units and evaporators are gradually introduced (air conditioning unit with part number "8T_ 820 005"). On these air conditioning units, the evaporator can no longer be renewed with the air conditioning unit installed. Before starting work, check whether the replacement evaporator is available as an installation kit without the evaporator housing or only together with the evaporator housing ⇒ Electronic parts catalogue . If the evaporator is only available together with the evaporator housing, the air conditioning unit must be removed and the evaporator must be renewed together with the evaporator housing ⇒ page 468 .*
- *On vehicles which use refrigerant R1234yf, no separable connections in the refrigerant circuit (e.g. between the refrigerant lines and the evaporator) are permitted in the passenger compartment. On these vehicles, the air conditioning unit (with the evaporator housing) must therefore always be removed, and the evaporator must be renewed (as a complete unit) together with the refrigerant lines ⇒ Electronic parts catalogue and ⇒ page 496 .*
- *From the start of production up to the conversion from model year 2012 onwards, evaporators with a block depth -A- of approx. 40 mm were fitted (air conditioning unit with part number "8K_ 820 005"); these evaporators can be renewed with the air conditioning unit in position. From model year 2012 onwards and depending on the vehicle version, evaporators with a block depth -A- of approx. 50 mm are introduced gradually (air conditioning unit with part number "8T_ 820 005"); these evaporators can only be renewed together with the evaporator after the air conditioning unit has been removed ⇒ Electronic parts catalogue .*
- *The different versions of the air conditioning unit can be distinguished from the outside by the part number -B- on the label -A- ⇒ Electronic parts catalogue .*
- *The part number -B- on the label -A- can be read e.g. when the CD changer is removed (depending on vehicle equipment) ⇒ Communication; Rep. gr. 91 ; DVD/CD changer; Removing and installing CD changer .*
- *Pay attention to the correct assignment of the expansion valve to the evaporator (different versions) ⇒ Electronic parts catalogue .*

Special tools and workshop equipment required

- Pliers - T40147-
- Strong carpet knife (blade firmly and securely seated in handle)

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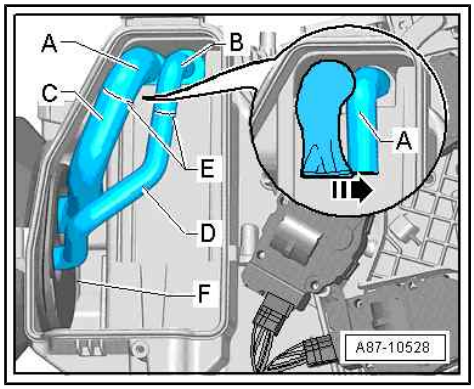

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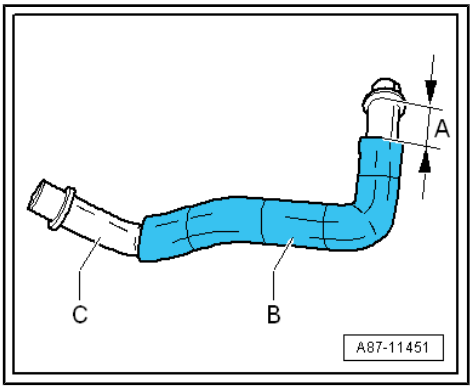

Note

- *On the Audi Q5 hybrid, the refrigerant line -D- is wrapped additionally with insulating tape (butyl or tarred tape) to reduce noise. This insulating tape reduces the noise of the air conditioner compressor operating, which is more noticeable when the engine is stopped.*
- *If the evaporator is renewed on the Audi Q5 hybrid, insulating tape must be wrapped around the refrigerant line -C- for the replacement evaporator. You will need approx. 30 cm of insulating tape (commercially available butyl or tarred tape) -B- with a width of approx. 5 cm and a thickness of approx. 3 mm.*
- *This type of insulating tape -B- is used on air conditioners etc. and is available commercially as butyl or tarred tape e.g. on 10 metre rolls.*

Removing

– Move driver's and front passenger's seat as far to the rear as possible.

– Switch off ignition.

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

Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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As work on the high-voltage system is required for the following sequence of operations, de-energise the high-voltage system ⇒ page 36 , ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system . Pay particular attention to the “General warning instructions for work on the high-voltage system” ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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

De-energising high-voltage system

DANGER!

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

- ***The high-voltage system may only be de-energised by a suitably qualified person (Audi high-voltage technician).***
- ***It must be definitely confirmed that the high-voltage system is de-energised. The system may only be de-energised using the vehicle diagnostic tester via “Guided Fault Finding”.***
- ***The qualified person (Audi high-voltage technician) confirms that the system is de-energised and uses the locking cap - T40262- to ensure that the system cannot be re-energised. As an additional precaution, the ignition key and the maintenance connector for high-voltage system - TW- are then stored in a safe place by the qualified person.***
- ***The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.***

Note

- *De-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - De-energise high-voltage system (Rep. gr. 93)`

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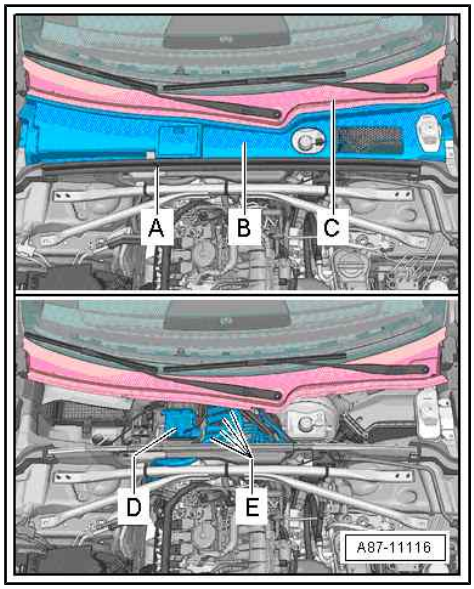
– Disconnect earth connection from battery - A- ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

– Remove rubber seal -A- and plenum chamber cover -B- (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

– After removing plenum chamber cover -B-, visually inspect high-voltage components -D- (in this case power and control electronics for electric drive - JX1-) and high-voltage wires -E- ⇒ page 41 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

– Disconnect earth connection from battery - A- ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .



– Unfasten power distributor -1- and set it down together with wiring towards windscreen ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes

– Detach high-voltage wiring to -JX1- ⇒ Electrical system; Rep. gr. 93 ; High-voltage wires; Overview of fitting locations - high-voltage wires .

– Cover -JX1- and corresponding wiring to prevent damage or contamination ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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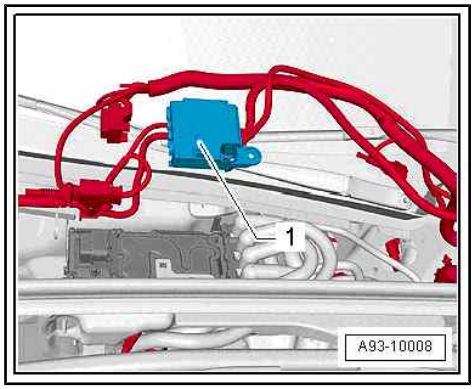
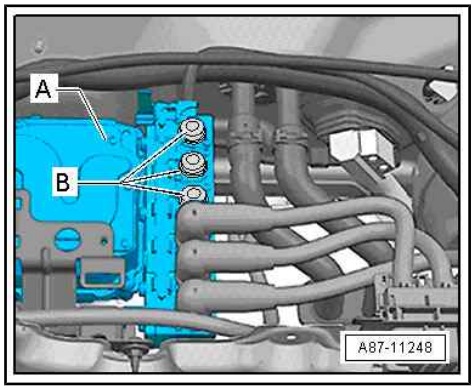
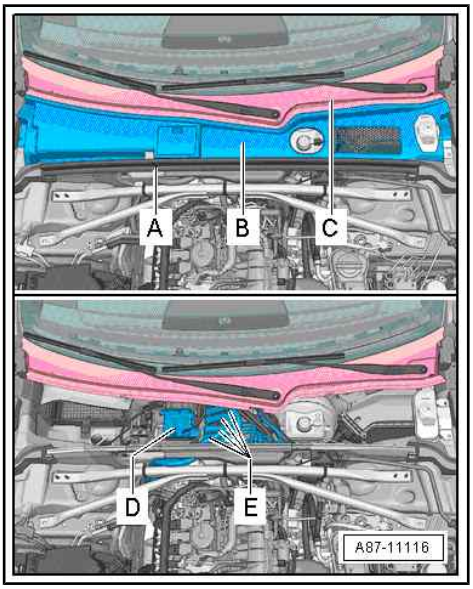


Note

Use e.g. clean sealing plugs -B- (size 20) from engine bung set -JX1- for covering connections at -VAS 6122- -A-



- When working in the vicinity of high-voltage components -D- and high-voltage wires -E-, always take care not to damage these components ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .



Note

Should it be necessary in order to be able to remove and install the expansion valve, remove the cowl panel trim -C- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

Vehicles without high-voltage system

– Switch off ignition.

– Remove plenum chamber cover and/or cowl panel trim (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

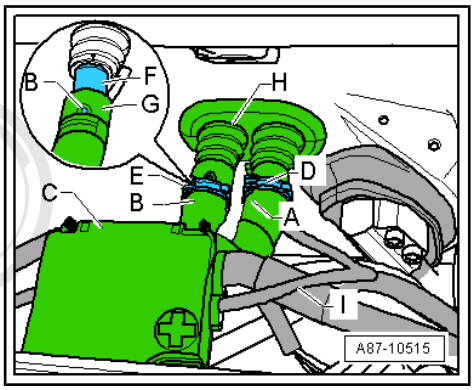
– Disconnect earth connection from battery - A- ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

Note

The earth connection of the battery - A- is detached to prevent short circuits when the slave start socket -C- is removed.

– Remove cover for slave start socket -C-.

All vehicles



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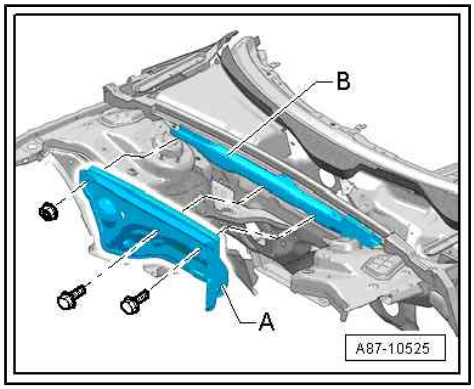
– If fitted and if necessary, remove body brace -B- (e.g. on Audi A5 Coupé, not required e.g. on Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .

– On vehicles with 6-cyl. diesel engine, remove plenum chamber partition panel -A- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .



Note

- *On vehicles with a petrol engine or 4-cyl. TDI engine, the plenum chamber partition panel does not have to be unfastened or removed from the vehicle (there is sufficient space).*
- *On vehicles with a petrol engine or 4-cyl. TDI engine, the two coolant hoses to the heat exchanger are routed through the plenum chamber partition panel -A-. On these vehicles, detach grommet at both coolant hoses and move partition panel to one side (this avoids having to open the coolant circuit).*
- *When unfastening the plenum chamber partition panel, pay attention to the vacuum line to the brake servo to avoid damaging it.*

– On vehicles with 6-cyl. TDI engine, remove plenum chamber partition panel -A- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .

– Remove expansion valve ⇒ page 232 .

Note

Seal open pipe connections.

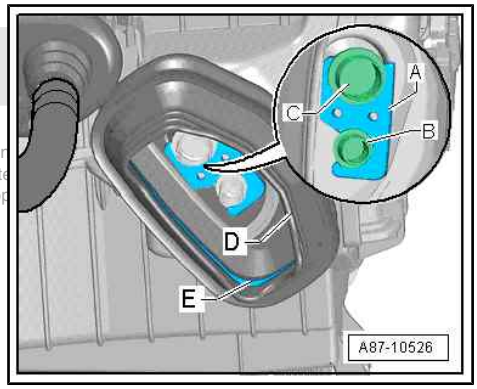
– Detach retaining plate for expansion valve -A- from refrigerant lines -B- and -C-.

– Remove storage compartment beneath dash panel (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel trim (driver side).

– Remove left footwell vent (driver side) ⇒ page 565 .

– Remove steering column ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing steering column .

– Remove pedal cluster and accelerator pedal module ⇒ Brake system; Rep. gr. 46 ; Brake pedal; Removing and installing mounting bracket and ⇒ Rep. gr. 20 ; Accelerator mechanism; Removing and installing accelerator pedal module with accelerator position sender -G79- / -G185- .



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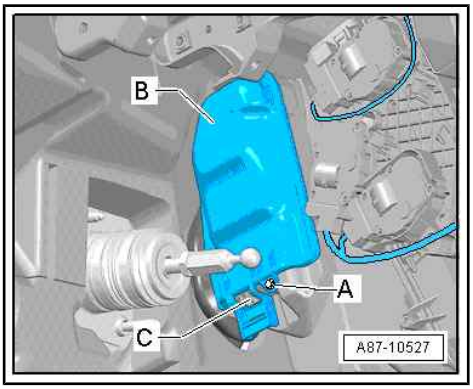
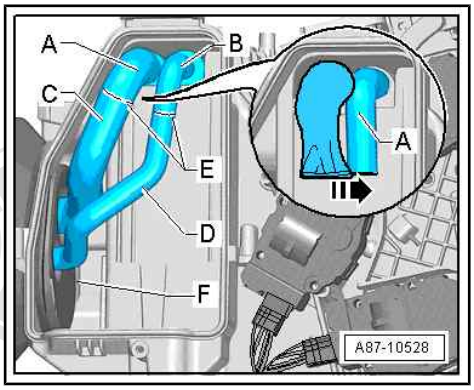
– Remove bolt -A-.

– Release fastener -C- and detach cover for refrigerant lines to evaporator -B-.



– Cut through the two refrigerant lines -A- and -B- to evaporator at locations marked -E- using pliers - T40147- .



Note

- *This illustration shows the refrigerant lines -C- and -D- to the evaporator without wrapping (butyl or tarred tape).*
- *On the Audi Q5 hybrid, the refrigerant line -D- is wrapped additionally with butyl or tarred tape to reduce noise. This butyl or tarred tape reduces the noise of the air conditioner compressor operating, which is more noticeable when the engine is stopped.*

– Release disconnected refrigerant lines -C- and -D- from grommet -F- and remove the two refrigerant lines.

– Bend section of refrigerant line -A- still attached to evaporator to the right (towards evaporator) until it does not impede removal of evaporator.

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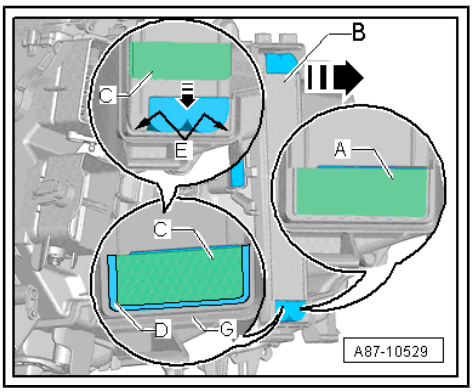
– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove air intake box ⇒ page 512 .

– Using a sharp knife (e.g. strong carpet knife with blade firmly and securely attached in handle), cut wall of housing -A- (on right side of air conditioning unit) out of air conditioning unit at cutting line marked.

– Pull evaporator -B- out of air conditioning unit in direction of -arrow-.

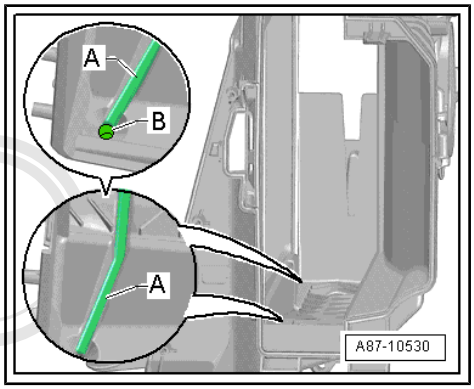


Installing

Before installing 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 .

Install in reverse order of removal; note the following.

– Check air conditioning unit for dirt via installation slot for evaporator and clean air conditioning unit if necessary.

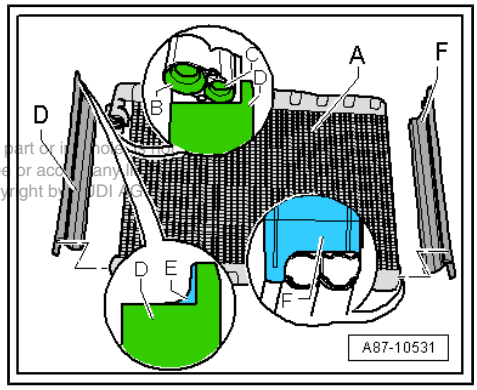


Note

When doing so, pay attention to the two condensation drains -A- and the corresponding condensation drain openings -B-.

– Check the two connections -B- and -C- at replacement evaporator -A- for dirt and damage.

– Fit the two covers -D- and -F- in correct positions on evaporator.



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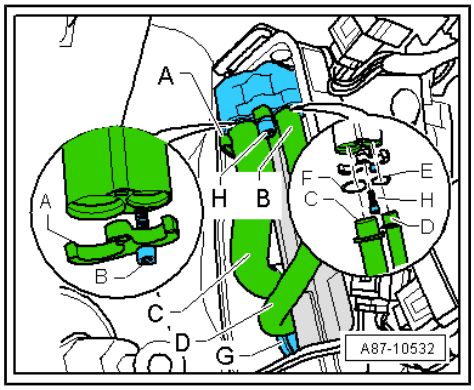
Note

- *The two covers are supplied together with the replacement evaporator ⇒ Electronic parts catalogue .*
- *Depending on the version of the cover -D-, it may be necessary to cut section -E- off the cover (fitted on side with connections).*

– Slide evaporator -A- into slot of air conditioning unit, making sure that covers -D- and -F- do not become detached from evaporator.

– Pre-assemble bracket -A- with bolt -B- at evaporator connection.

– Check refrigerant lines -C- and -D- for damage and dirt.



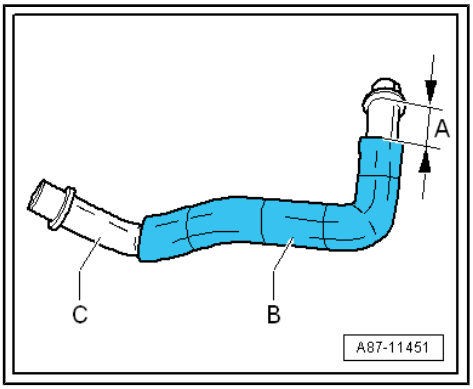
Note

- *Even minor damage (scratches) or slight contamination (a hair) in the connection area may be enough to cause leaks.*
- *The refrigerant lines -C- and -D-, the O-rings -E- and -F-, the bracket -A- and the bolts -B- and -H- are supplied with the replacement evaporator ⇒ Electronic parts catalogue .*

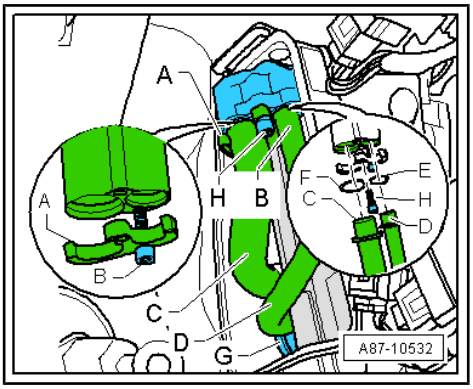
– Insert refrigerant lines -C- and -D- in grommet -G-.

Note

- *If the evaporator is renewed on the Audi Q5 hybrid, insulating tape must be wrapped around the refrigerant line -C- for the replacement evaporator before installation, as shown. You will need approx. 30 cm of insulating tape (butyl or tarred tape) -B- with a width of approx. 5 cm and a thickness of approx. 3 mm.*
- *The ends of the refrigerant line -C- are not wrapped when removed, as shown. Approx. 15 mm must be kept free in section -A- which is installed through the grommet in the air conditioning unit towards the expansion valve. Initially the section that is connected to the evaporator must not be wrapped either.*

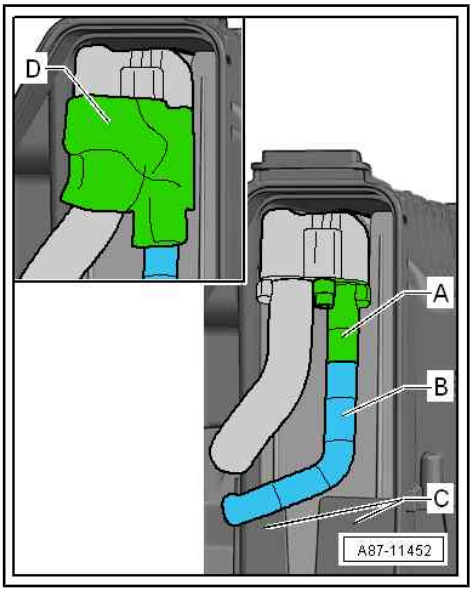


- Lubricate O-rings -E- and -F- lightly with refrigerant oil before fitting ⇒ page 106 .
- Attach O-rings -E- and -F- to refrigerant lines -C- and -D-.
- Insert refrigerant lines -C- and -D- in connections at evaporator.
- Insert bolt -H-.
- Screw in the two bolts -B- and -H- evenly so that the two refrigerant lines -C- and -D- can still be turned without pretension.



Note

- *When screwing in bolts -B- and -H-, make sure you do not strain bracket -A- with the refrigerant lines.*
- *Audi Q5 hybrid: If the tape around the refrigerant line -B- makes contact with the partitions of the evaporator housing -C-, it may be necessary to modify the partitions accordingly.*



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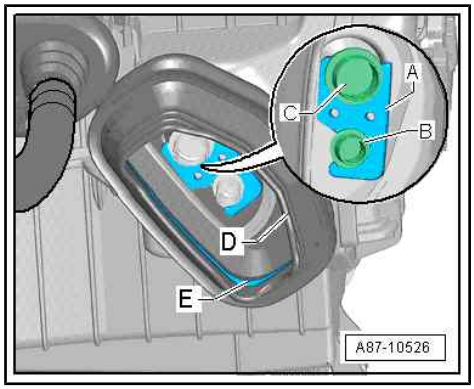
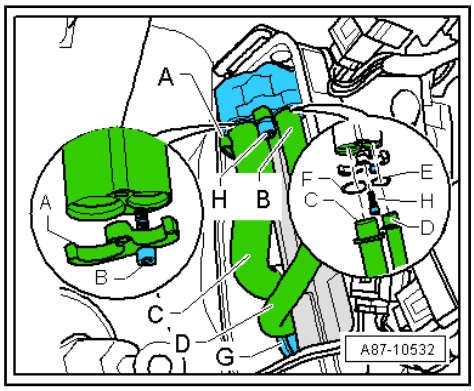
– Attach retaining plate for expansion valve -A- to refrigerant lines -B- and -C-.
– To align the two refrigerant lines, pre-assemble expansion valve ⇒ page 232 and refrigerant line with internal heat exchanger ⇒ page 217 .



Note

The expansion valve and the refrigerant line with the internal heat exchanger are only pre-assembled so that the two refrigerant lines are aligned, and are removed again after tightening the two bolts at the evaporator connection; only then are they finally installed.

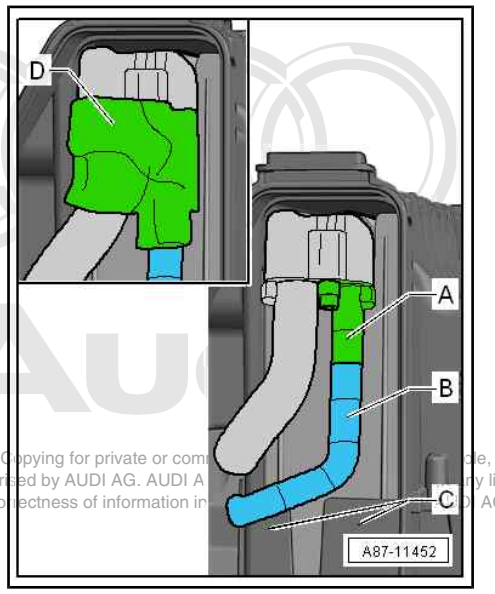
– Tighten bolts -B- and -H- at evaporator connection (tightening torque: 5 Nm).



Note

- *This illustration shows the refrigerant lines -C- and -D- to the evaporator without the wrapping (butyl or tarred tape).*
- *On the Audi Q5 hybrid, the refrigerant line to the evaporator must be wrapped additionally with a piece of butyl or tarred tape at connection -A- (as shown) after tightening the bolt to reduce noise. Subsequently, the entire connection area -D- at the evaporator must be wrapped with another piece of butyl or tarred tape.*

– Detach pre-assembled refrigerant line with internal heat exchanger and expansion valve again.
– Install expansion valve ⇒ page 232 .
– Install refrigerant line with internal heat exchanger ⇒ page 217 .



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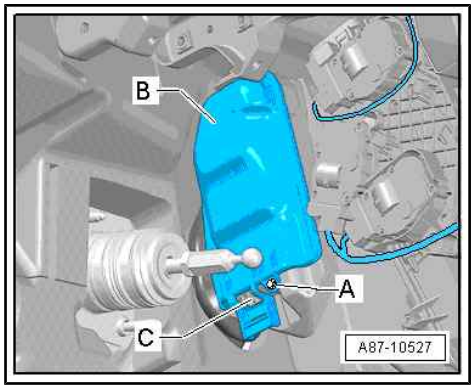
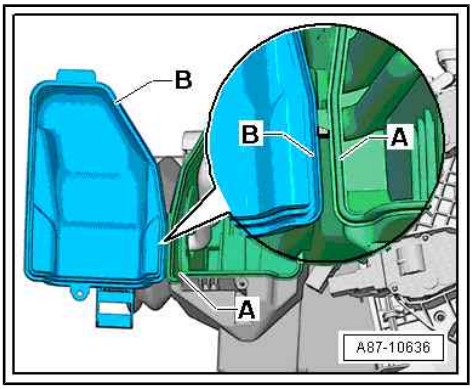
– Install cover for refrigerant lines to evaporator -B- and fit bolt -A-.
– Check that cover -B- is properly seated and is not strained.

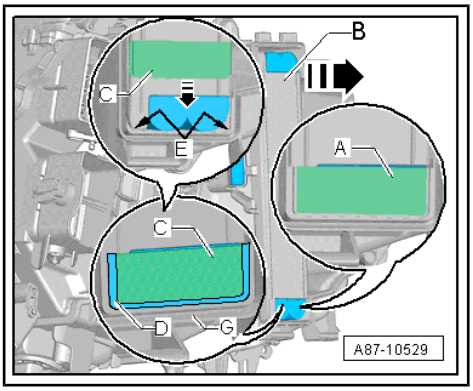


Note

Even very small leaks at the groove/spring connection between the cover -B- and the air conditioning unit -A- can lead to whistling noises caused by emerging air. To completely seal the connection points, coat them lightly e.g. with silicone grease (replacement part number G 000 405 A2) ⇒ Electronic parts catalogue .



– Before inserting partition -C-, clean and dry groove in air conditioning unit -E-.
– Before inserting partition -C-, fill groove in air conditioning unit -E- e.g. with silicone adhesive sealant - D 176 001 A3- ⇒ Electronic parts catalogue .
– Insert partition -C-.



Note

- *The partition -C- is supplied together with the replacement evaporator ⇒ Electronic parts catalogue .*
- *There are different versions of the partition -C- (with or without moulded sealing lip) ⇒ Electronic parts catalogue .*
- *If the connection between the air conditioning unit -E- and the partition -C- in area -D- is not sealed, condensate may run out of the air conditioning unit into the footwell e.g. when cornering.*

– Remove any surplus adhesive sealant (adhesive sealant may only be applied in area -D-). Remove any excess adhesive sealant from groove -G-.
– Install air intake box ⇒ page 512 .

Vehicles with high-voltage system (hybrid vehicles)

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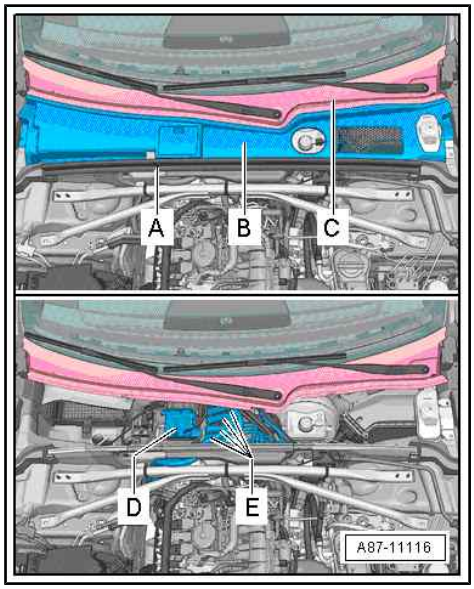
– After completing the work and before installing the plenum chamber cover -B-, visually inspect the high-voltage components -D- and the high-voltage wires -E- ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .
– For electrical connections and routing, refer to ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
– Re-install remaining components removed in reverse order.
– Re-energise power supply of high-voltage system ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system .



Re-energising high-voltage system

DANGER!

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

- ***The high-voltage system may only be re-energised by a suitably qualified person (Audi high-voltage technician).***
- ***The system may only be re-energised using the vehicle diagnostic tester via "Guided Fault Finding".***
- ***The vehicle is then made ready for operation again by the qualified person (Audi high-voltage technician).***
- ***The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.***

Note

- *Re-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - Re-energise high-voltage system (Rep. gr. 93)`

Vehicles without high-voltage system

– Re-connect earth connection of battery - A-, paying attention to notes on connecting the battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
– Re-install remaining components removed in reverse order.

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All vehicles

- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
- Re-install remaining components (removed earlier).
- Switch on ignition.
- Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

- Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

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5.6 Removing and installing evaporator housing

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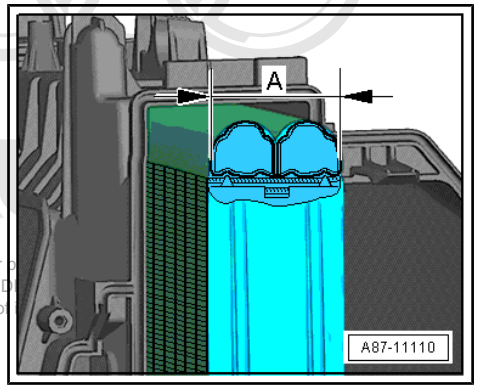
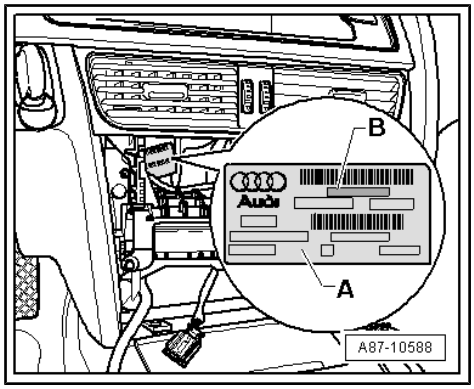




Note

- *From the start of production up to the conversion from model year 2012 onwards, evaporators with a block depth -A- of approx. 40 mm were fitted (air conditioning unit with part number "8K_ 820 005"); these evaporators can be renewed with the air conditioning unit in position ⇒ page 451 . From model year 2012 onwards and depending on the vehicle version, evaporators with a block depth -A- of approx. 50 mm are introduced gradually (air conditioning unit with part number "8T_ 820 005"); these evaporators can only be renewed together with the evaporator after the air conditioning unit has been removed ⇒ Electronic parts catalogue .*
- *Renew the evaporator with the evaporator housing if the evaporator is not available separately or if it is to be renewed together with the evaporator housing for some other reason (the air conditioning unit must be removed to renew the evaporator) ⇒ Electronic parts catalogue*
- *On vehicles which use refrigerant R1234yf, no separable connections in the refrigerant circuit (e.g. between the refrigerant lines and the evaporator) are permitted in the passenger compartment. On these vehicles, the air conditioning unit (with the evaporator housing) must therefore always be removed, and the evaporator must be renewed (as a complete unit) together with the refrigerant lines ⇒ Electronic parts catalogue and ⇒ page 496 .*
- *The different versions of the air conditioning unit can be distinguished from the outside by the part number -B- on the label -A- ⇒ Electronic parts catalogue .*
- *The part number -B- on the label -A- can be read e.g. when the CD changer is removed (depending on vehicle equipment) ⇒ Communication; Rep. gr. 91 ; DVD/CD changer; Removing and installing CD changer .*

Removing

– Remove air conditioning unit ⇒ page 496 .

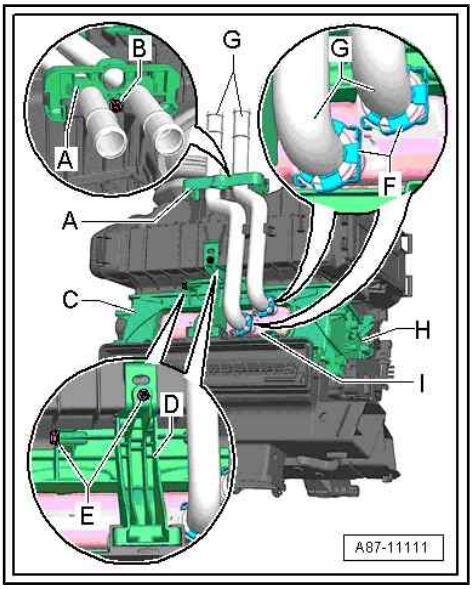
Note

The following illustrations show a "basic" air conditioning unit. The layout of the components may differ on a "deluxe" air conditioning unit (e.g. arrangement and number of control motors).

– Remove bolt -B-, release retaining tabs and detach bracket -A-.

– Remove bolts -E-, release retaining tabs and detach bracket -D-.

– Remove coolant pipe clips -F- and detach coolant pipes -G-.



Note

- *When detaching the coolant pipes -A-, make sure that the seals -B- do not drop into the heat exchanger or the air conditioning unit.*
- *Do not re-use seals -B- and clips -D-; renewing ⇒ Electronic parts catalogue*

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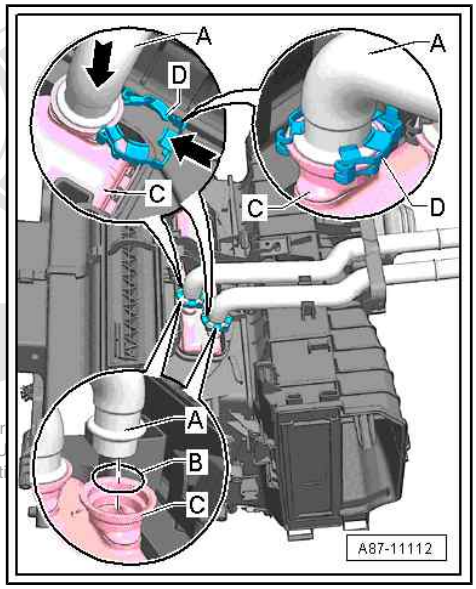
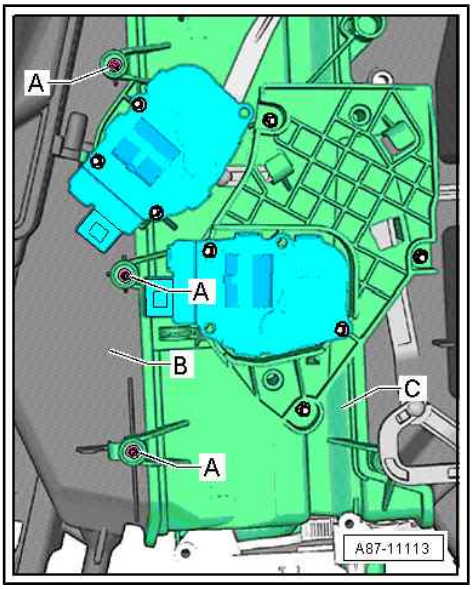


– Remove bolts -A- (securing heater housing, left-side -C-, to evaporator housing -B-).

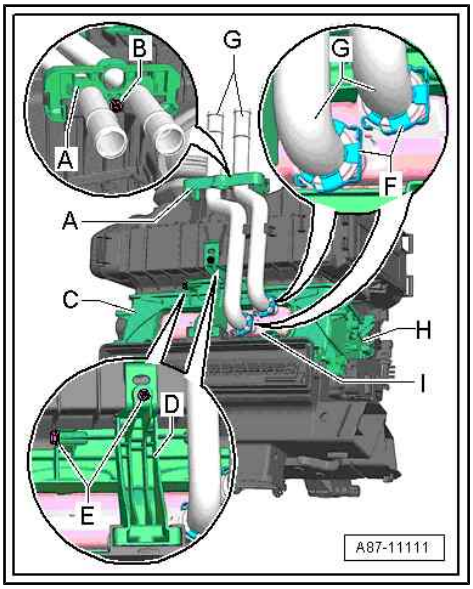
Note

Removing and installing heater housing (left-side) -C-
⇒ page 516



– Remove heater housing (right-side) -H- ⇒ page 520 .

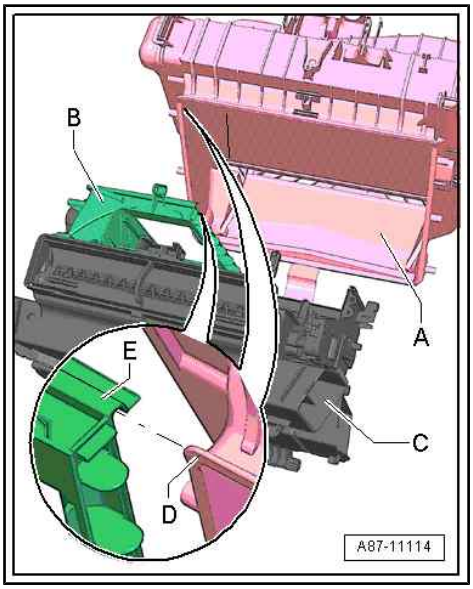
– If applicable, remove heat exchanger -I- and honeycomb element/ auxiliary air heater element - Z35- ⇒ page 543 and ⇒ page 487 .



Note

It is not really necessary to remove the heat exchanger -I- and the honeycomb element (or -Z35-). However, these components can be removed easily as they are now loose in the heater housing (left-side).

– Detach evaporator housing -A- from heater housing (left-side) -B-/air distribution housing -C-.



Note

Currently the evaporator housing should not be dismantled any further; for information on design of evaporator housing, refer to ⇒ page 447 .

Installing

Install in reverse order of removal; note the following:

– Check evaporator housing -A-, heater housing (left-side) -B- and air distribution housing -C- for dirt or damage, and clean or renew if necessary.

– Assemble evaporator housing -A- and heater housing (left-side) -B-/air distribution housing -C-.

Note

Slide guides -D- on top and bottom of evaporator housing -A- into grooves -E- of heater housing (left-side) -B-.

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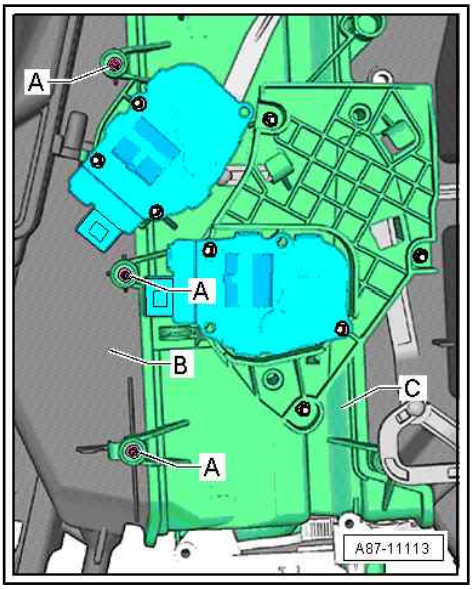
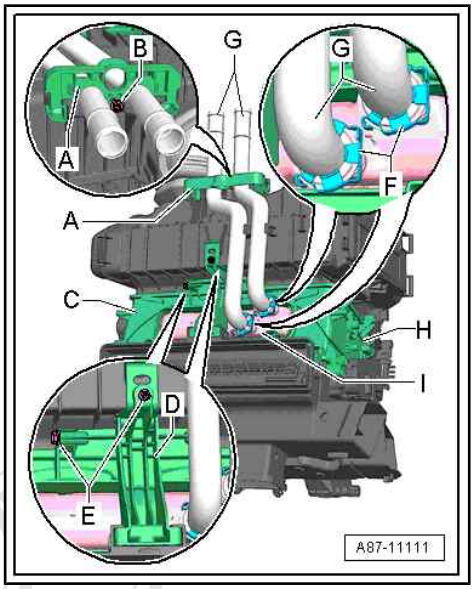
– Fit bolts -A- (securing heater housing, left-side -C-, to evaporator housing -B-).



– Install heat exchanger -I- and honeycomb element/ auxiliary air heater element - Z35- , observing correct installation position ⇒ page 543 and ⇒ page 487 .
– Install heater housing (right-side) -H- ⇒ page 520 .



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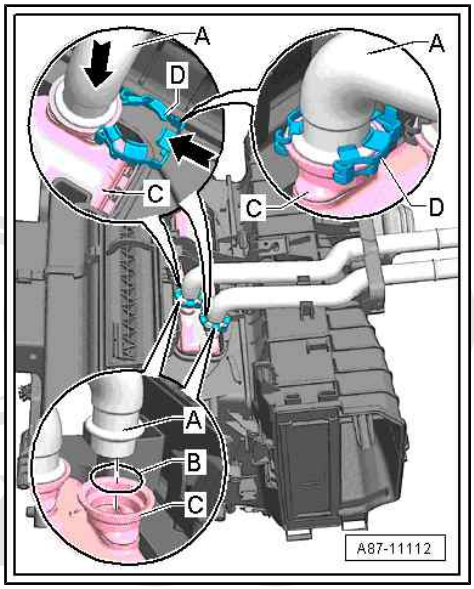
– Check the two connections -C- of heat exchanger and coolant pipes -A- for dirt or damage, and clean or renew if necessary.
– Lubricate coolant pipes -A- and two connections -C- of the heat exchanger lightly with silicone grease.



Note

Silicone grease is available as a replacement part: part number G 000 405 A2 ⇒ Electronic parts catalogue .

– Moisten new seals -B- lightly with coolant (or apply a small quantity of silicone grease) and slip them onto coolant pipes -A-.
– Attach coolant pipes -A- to evaporator housing and press into connections -C- of heat exchanger -arrow-.

Caution

Risk of leaks at heat exchanger.

- ***Crushed O-rings and coolant pipes/clips that are not fitted straight or are not attached fully will lead to leaks.***

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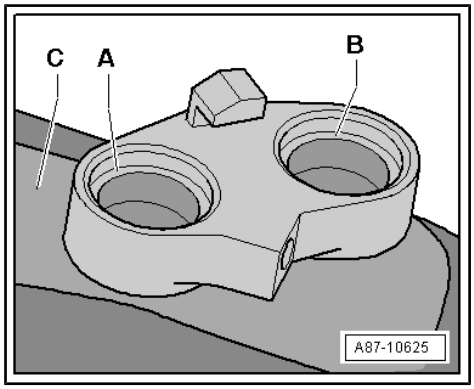
– Fit new coolant pipe clips -F- at connections -C- of heat exchanger, as shown (slide on as far as possible -arrow-).



Note

- *Do not re-use seals -B- and clips -D- after removal; renewing ⇒ Electronic parts catalogue .*
- *If a replacement heat exchanger -C- has been fitted instead of the standard heat exchanger illustrated above, fit the coolant pipes as described for this version of the heat exchanger ⇒ page 543 .*

– Install remaining components at air conditioning unit.
– Install air conditioning unit ⇒ page 496 .

5.7 Cleaning evaporator

⇒ "5.7.1 Cleaning evaporator with an ultrasonic A/C cleaner", page 473

⇒ "5.7.2 Cleaning evaporator using pressure-feed spray gun V.A.G 1538 and spray lance", page 475

5.7.1 Cleaning evaporator with an ultrasonic A/C cleaner

Note

- *There are numerous evaporator cleaning methods with different effects available on the market. For the cleaning method for e.g. the evaporator currently checked and approved by Audi, use an ultrasonic A/C cleaner and a pressure-feed spray gun. Other methods checked and approved by Audi and the corresponding information can be found e.g. in the "Audi ServiceNet" (⇒ "1.2 Notes on odours in vehicles with air conditioner", page 4).*
- *Possible causes of odours from the air conditioner ⇒ "1.2 Notes on odours in vehicles with air conditioner", page 4*
- *Odours originating in the air conditioning unit 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 air conditioning unit is not normally the cause of the problem.*
- *If there are leaks in the heat exchanger, the smell of escaping coolant generally varies with the temperature selected. In the "cold" temperature setting, there is no flow of air through the heat exchanger and the odour is less perceptible.*

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Special tools and workshop equipment required

- Ultrasonic A/C cleaner - VAS 6189A- (for currently available ultrasonic A/C cleaners, refer to ⇒ Electronic parts catalogue)
- Cleaning fluid - VAS 6189/1-
- Vacuum cleaner (commercially available)

Preparations

– Check whether the air conditioning unit is really the source of the odour by switching from fresh air mode to air recirculation mode.

Note

The odour can only be eliminated by cleaning with the ultrasound air conditioner cleaner - VAS 6189A- if it actually occurs in the evaporator.

– Check plenum chamber and water drain valves installed in plenum chamber for dirt; clean if necessary ⇒ page 579 .

– Remove dust and pollen filter and check for odour and dirt ⇒ page 531 .

Note

On this vehicle, the dust and pollen filter is installed between the fresh air blower - V2- and the evaporator and must therefore be removed for cleaning ⇒ page 531 .

– Clean installation slot for dust and pollen filter of air conditioning unit (remove leaves, dust and other dirt) ⇒ page 531 .
– Re-seal opening in air conditioning unit through which dust and pollen filter was removed.
– Open dash panel vents and close windows and sunroof.
– Start engine.

Note

- *On vehicles with high-voltage system it is sufficient to activate the drive system (note "READY" display in control unit in dash panel insert - J285-) ⇒ Owner's Manual .*
- *On vehicles with start/stop system it is sufficient for drive system to be active (READY); the engine does not have to be running ⇒ Owner's Manual .*

– On air conditioner operating and display unit (Climatronic control unit - J255-), set “air recirculation mode” and switch off air conditioner compressor (indicator lamp in AC/A/C button off).
– Open dash panel vents and select lowest possible temperature on air conditioner operating and display unit (Climatronic control unit - J255-) (“cold” temperature setting).
– Close windows and sun roof of vehicle.
– Set lowest fresh air blower speed on air conditioner operating and display unit (Climatronic control unit - J255-) and select “dash panel vents” for the air flow direction.

Cleaning

Note

For information on how to use the ultrasound A/C cleaner, refer to the ⇒ Operating instructions of -VAS 6189A- .

– Shake container of cleaning fluid - VAS 6189/1- and pour contents into ultrasonic A/C cleaner - VAS 6189A- (when doing so, observe operating instructions for ultrasonic A/C cleaner - VAS 6189A-).
– Position ultrasonic A/C cleaner - VAS 6189A- in passenger's footwell.
– Start up ultrasonic 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.

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Note

The cleaning process takes approx.15 to 20 minutes and is completed when no further vapour emerges from the outlet hose of the ultrasonic A/C cleaner - VAS 6189A- .

Final steps

- Switch off ultrasonic A/C cleaner - VAS 6189A- .
- Open doors and vent passenger compartment for at least 10 minutes.
- Remove ultrasonic A/C cleaner - VAS 6189A- from vehicle and clean it in accordance with its operating instructions.
- Switch off ignition.
- Install dust and pollen filter ⇒ page 531 .

5.7.2 Cleaning evaporator using pressure-feed spray gun - V.A.G 1538- and spray lance

Note

- *There are numerous evaporator cleaning methods with different effects available on the market. For the cleaning method for e.g. the evaporator currently checked and approved by Audi, use an ultrasonic A/C cleaner and a pressure-feed spray gun. Other methods checked and approved by Audi and the corresponding information can be found e.g. in the "Audi ServiceNet" (⇒ "1.2 Notes on odours in vehicles with air conditioner", page 4).*
- *Possible causes of odours from the air conditioner ⇒ "1.2 Notes on odours in vehicles with air conditioner", page 4*
- *Odours originating in the air conditioning unit 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 air conditioning unit is not normally the cause of the problem.*
- *If there are leaks in the heat exchanger, the smell of escaping coolant generally varies with the temperature selected. In the "cold" temperature setting, there is no flow of air through the heat exchanger and the odour is less perceptible.*

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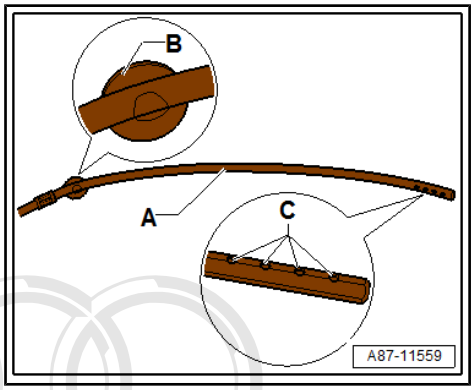
Special tools and workshop equipment required

- Pressure-feed spray gun - V.A.G 1538- (for currently available pressure-feed spray guns, refer to ⇒ Electronic parts catalogue)

- Probe for evaporator cleaning, straight - V.A.G 1538/5- -A- (short version: approx. 500 mm, curved or probe - VAS1538/9- as specified for this vehicle); for currently available probes, refer to ⇒ Electronic parts catalogue



- Cleaning solution for evaporator in air conditioner “D 600 100 A2” (for currently available cleaning fluids, refer to ⇒ Electronic parts catalogue)
- Vacuum cleaner (commercially available)

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.***

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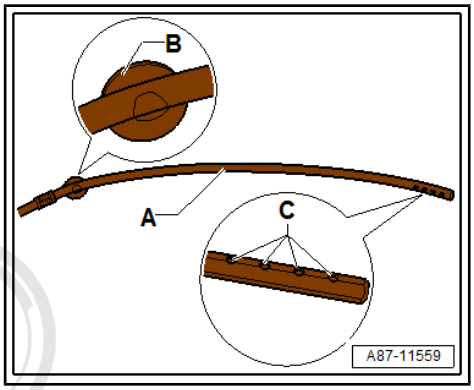
Note

- *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 A1 from 2011 onwards, Audi A3 from MY 2013 onwards, Audi A6 from 2011 onwards, Audi A7 from 2011 onwards and Audi A8 from 2010 onwards.*

Preparations

– Switch on ignition.

– Open all dash panel vents.

– Switch on air conditioner.

– Check whether the air conditioning unit evaporator is really the source of the odour by switching from fresh air to air recirculation mode.

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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 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove and check dust and pollen filter; renew if necessary after cleaning evaporator ⇒ page 531 .

Note

We recommend renewing the used dust and pollen filter every time the evaporator is cleaned.

– Check the area between the installation slot for the dust and pollen filter and the fresh air blower - V2- in the evaporator housing for contamination and clean it if necessary ⇒ page 531 .

– Check plenum chamber and water drain of plenum chamber and clean if necessary ⇒ page 579 .

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 openings, refer to ⇒ page 551).
– 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 477 .

– Connect spray lance to pressure-feed spray gun and fill with 1 litre of cleaning solution for air conditioner evaporators.

– Set compressed-air supply for pressure-feed spray gun to a pressure of approx. 7.5 bar (minimum pressure 5 bar / maximum pressure 10 bar).

Note

Setting this pressure on the compressed-air supply means that the spray lance has an operating pressure between 3.5 and 4 bar.

– Connect pressure-feed spray gun VAS 1538 to compressed-air supply.

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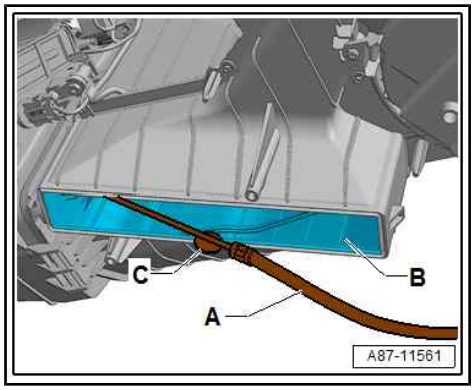
– Insert spray lance -A- through opening for removed dust and pollen filter -B- and into evaporator housing with spray direction towards evaporator.



Note

The spray direction is fixed by the guide washer -C- on the spray lance -A-.

Caution

Ensure that no cleaning fluid escapes from the evaporator housing of the air conditioning unit into the passenger compartment during cleaning.

- ***Cover the area under the spray lance in the evaporator housing with absorbent paper.***
- ***After spraying about 0.1 to 0.2 litres of cleaning fluid, check that it actually drains through the condensation drains and into the drip tray under the vehicle. If the fluid only drips out, the condensation drain must be cleaned before the cleaning process can continue*** ***⇒ page 551*** ***.***

– Clean and rinse evaporator and surrounding area of housing with cleaning solution by operating metering lever on pressure-feed spray gun and moving spray lance -A- back and forth.

Note

- *The dirty cleaning agent runs out through the condensation drain.*
- *During the cleaning process, always check that the cleaning fluid is flowing out through the condensation drain.*

– Use entire contents of pressure-feed spray gun to clean evaporator.

– Remove drip tray and dispose of collected cleaning agent.

Note

Used cleaning agent can be disposed of e.g. via the wastewater disposal system (observe official local regulations) ⇒ Audi ServiceNet, HSO Environmental Protection (or ⇒ Volkswagen ServiceNet, Handbooks, Service Handbook; Environmental Protection, Emission Control).

Allow 30 minutes for cleaning solution to take effect.

Note

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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.

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5.8 Checking auxiliary air heater element - Z35-

Note

- *Vehicles with a diesel engine and vehicles with certain petrol engines (e.g. petrol engines designed for operation with bio-ethanol installed in "Flex Fuel Vehicles" from model year 2010 onwards and vehicles with a high-voltage system) are currently fitted with an electric supplementary heater as an auxiliary air heater ⇒ Audi sales literature . Heat energy is supplied to the air after it has left the heat exchanger of the air conditioning unit if there is a request from the air conditioner operating and display unit (Climatronic control unit - J255-).*
- *Heat energy is added to the air via the auxiliary air heater element - Z35- after the air emerges from the heat exchanger of the air conditioning unit. At a later date (introduction not yet finalised), it will also be possible to activate an auxiliary heater (installed as optional equipment) as a "supplementary heater" ⇒ page 487 and ⇒ Auxiliary/supplementary heater; Rep. gr. 82 ; Overview of fitting locations - auxiliary/supplementary heater; Overview of fitting locations - components not located in passenger compartment .*
- *Vehicles without an auxiliary air heater element - Z35- are fitted with a honeycomb element in the air conditioning unit (instead of -Z35-) ⇒ page 487 .*
- *On vehicles with diesel engine, the electric supplementary heater (auxiliary air heater element - Z35-) is activated via the relevant engine control unit (control units exchange relevant information via data bus) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *On vehicles with a petrol engine, the electric supplementary heater (auxiliary air heater element - Z35-) is activated by a signal from the operating and display unit (Climatronic control unit - J255-) via the local data bus (via the same output by which the fresh air blower control unit - J126- is activated) to the auxiliary air heater control unit - J604- . -J604- then activates the low heat output relay - J359- and the high heat output relay - J360- (and these supply power to -Z35-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *The measured value block of the air conditioner operating and display unit (Climatronic control unit - J255-) shows that the request for activation of the electric supplementary heater is being transmitted to the relevant engine control unit / to the auxiliary air heater control unit - J604- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . On vehicles with a diesel engine, the measured value block of the engine control unit then indicates the implementation of the request or the reason why it is not activated despite the request ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *Currently the auxiliary air heater control unit - J604- fitted on vehicles with certain petrol engines has no diagnosis capability ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

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- *Vehicles with a high-voltage system (hybrid vehicles) and petrol engine are currently equipped with an auxiliary air heater element - Z35- to provide a supplementary heating function* *⇒ page 482* *.*
- *Checking the activation of the auxiliary air heater element - Z35- depends on the engine version. For vehicles with a diesel engine this can be found in the Guided Fault Finding for the engine fitted in the particular vehicle. For vehicles with a petrol engine, this can be found in the Guided Fault Finding for the air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *In model year 2009, a modified version of the auxiliary air heater element - Z35- with slightly smaller heating elements is gradually being introduced; observe the correct version and assignment ⇒ Electronic parts catalogue .*
- *From model year 2010 onwards, a start/stop system (optional equipment) is offered for this vehicle in combination with certain engines. On vehicles with a start/stop system, the activation of the auxiliary air heater element - Z35- is switched off while the stop function is active (to protect the battery - A-). After the engine has been switched on again via the start function, the auxiliary air heater element - Z35- is activated again ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *For information on how to check the resistance value of the auxiliary air heater element - Z35- , refer to ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

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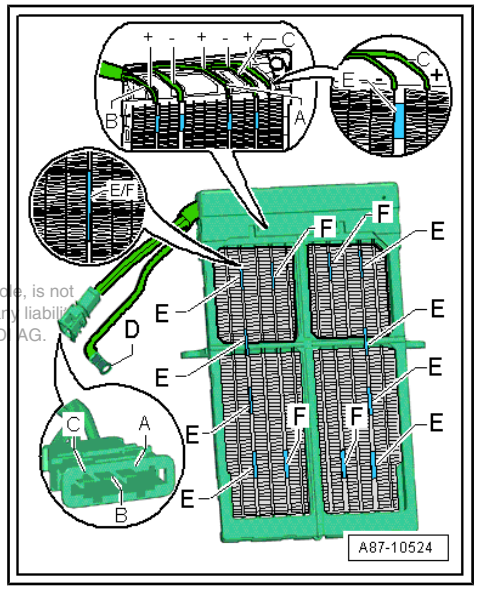
Design and operation of auxiliary air heater element - Z35-



- The auxiliary air heater element - Z35- is made up of several layers of resistor elements -E- and -F-. Given simultaneous activation via all 3 inputs -A- to -C-, these can attain a combined heating output of approx. 1000 W. These resistor elements have a positive temperature coefficient (the resistance increases with temperature so that the current draw and thus the heating output decrease).
- The heater resistor elements (-E- and -F-) are activated via wires -A- to -C-. The current is discharged via earth connection -D-.
- The auxiliary air heater element - Z35- is designed so that, when it is activated, it is not possible for a current above 35 A to flow via any of the contacts -A- to -C-. The resistance of the heater resistor elements -E- and -F- increases immediately following activation, and the current decreases.
- To reach the maximum heating output of approx. 1000 W (3 x 333 W), the temperature of the heater resistor elements must be low and sufficient current must be supplied by the alternator - C- .
- Voltage is switched via the low heat output relay - J359- via wire -A- to the heater resistor elements -F- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Voltage is switched via high heat output relay - J360- via wires -B- and -C- to heater resistor elements -E- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- The resistance of the heater elements is governed by temperature and is between approx. 0.2 and 5 Ω (measured between connections -A-, -B- and -C- (in connector) and earth connection -D-).

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Note

- *For measuring resistance values and checking activation of auxiliary air heater element - Z35- , unplug connector at air conditioning unit*
  ⇒ "5.9 Removing and installing auxiliary air heater element Z35 ", page 487 .
- *As resistance values of below 10 Ω cannot be measured with sufficient accuracy using workshop equipment, it is not possible to detect a short circuit in the auxiliary heater element - Z35- .*
- *To check the operation, activate the low heat output relay - J359- and the high heat output relay - J360- e.g. via the "final control diagnosis" function of the corresponding engine control unit and, while doing so, measure the voltage between the contacts in the mating plug to the connector at the auxiliary air heater element - Z35- and earth ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

- The engine control unit/ auxiliary air heater control unit - J604- activates the auxiliary air heater element - Z35- in 3 stages. Voltage is applied to the contacts -A-, -B- and -C- as follows. For the corresponding wiring, please refer to the relevant current flow diagram ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

– For stage "1", voltage is switched by the low heat output relay - J359- to contact -A-.
– For stage "2", stage "1" is deactivated and voltage is switched via high heat output relay - J360- to contacts -B- and -C-.

– For stage “3”, stage “1” is activated in addition to stage “2”. ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding)

Note

The corresponding engine control unit constantly monitors the load of the alternator - C- ; if it remains below a certain limit, the next stage is switched on. If a specified limit is exceeded, it switches back a stage.

Cut-in criteria for activation of electric supplementary heater

Note

These cut-in criteria in the air conditioner operating and display unit (Climatronic control unit - J255-) must be satisfied for a request to be transmitted to the corresponding engine control unit.

– The following conditions must be met for the air conditioner operating and display unit (Climatronic control unit - J255-) to transmit a request for the activation of the supplementary heating system to the engine control unit:

- Engine running for at least 8 seconds and engine speed above 500 rpm
- Engine temperature below 75 °C
- Calculated ambient temperature below 8 °C
- Electrical system voltage above 12.2 V and onboard supply control unit - J519- not transmitting any request preventing activation
- No faults stored in air conditioner operating and display unit (Climatronic control unit - J255-)
- No faults stored in engine control unit and load of alternator - C- less than 30 ... 77 % (depending on engine speed)
- Due to the setting and the temperatures measured, the air conditioner operating and display unit (Climatronic control unit - J255-) has calculated that additional heating output is required to reach the temperature specified for the passenger compartment.
- The air conditioner operating and display unit (Climatronic control unit - J255-) has calculated that more than 90 % of the air is being routed through the heat exchanger of the air conditioning unit.

Note

The engine control unit/ auxiliary air heater control unit - J604- activates the 3-stage auxiliary air heater element - J359- via the two supplementary heater relays (low heat output relay - J360- and high heat output relay - Z35-) so that the load of the alternator - C- does not exceed 95 % ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (for engine control unit on vehicles with a diesel engine / for air conditioner control unit on vehicles with a petrol engine) and current flow diagram ⇒ 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 electric supplementary heater

Note

The activation is shut off as soon as one of the cut-in criteria is no longer met in the air conditioner operating and display unit (Climatronic control unit - J255-) or in the corresponding engine control unit, or if one of the shut-off criteria is detected.

– The air conditioner operating and display unit (Climatronic control unit - J255-) cancels the request for activation of the electric supplementary heating system if:

- One of the cut-in criteria no longer met
- Calculated ambient temperature above 11 °C
- Load of alternator - C- above 95%
- The air conditioner operating and display unit (Climatronic control unit - J255-) has calculated that less than 60 % of the air is being routed through the heat exchanger of the air conditioning unit (position of temperature flaps).

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5.9 Removing and installing auxiliary air heater element - Z35-

Note

- *Vehicles with a diesel engine and vehicles with certain petrol engines (e.g. petrol engines designed for operation with bio-ethanol installed in "Flex Fuel Vehicles" from model year 2010 onwards and vehicles with a high-voltage system) are currently fitted with an electric supplementary heater as an auxiliary air heater ⇒ Audi sales literature . Heat energy is supplied to the air after it has left the heat exchanger of the air conditioning unit if there is a request from the air conditioner operating and display unit (Climatronic control unit - J255-).*
- *On vehicles with diesel engine, the electric supplementary heater (auxiliary air heater element - Z35-) is activated via the relevant engine control unit (control units exchange relevant information via data bus) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *On vehicles with a petrol engine, the electric supplementary heater (auxiliary air heater element - Z35-) is activated by a signal from the operating and display unit (Climatronic control unit - J255-) via the local data bus (via the same output by which the fresh air blower control unit - J126- is activated) to the auxiliary air heater control unit - J604- . -J604- then activates the low heat output relay - J359- and the high heat output relay - J360- (and these supply power to -Z35-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *Checking operation of auxiliary air heater element - Z35- ⇒ page 482*
- *On vehicles not fitted with an auxiliary air heater element - Z35- , a honeycomb element is installed as a spacer element in the air conditioning unit ⇒ page 558 (air intake, air outlet and routing of air flow in air conditioning unit) and ⇒ Electronic parts catalogue .*
- *In model year 2009, a modified version of the auxiliary air heater element - Z35- with slightly smaller heating elements is gradually being introduced; observe the correct version and assignment ⇒ Electronic parts catalogue .*

Removing

– Switch on ignition.

– Set air outflow direction on air conditioner operating and display unit (Climatronic control unit - J255-) to "DEF" (to windscreen).

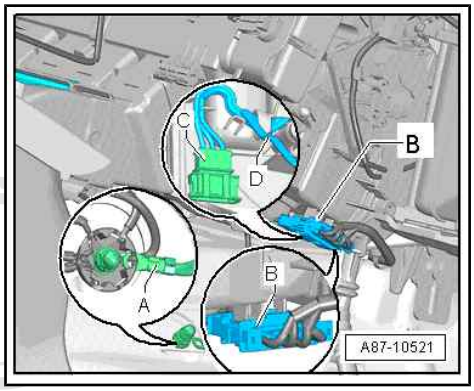
– Set front passenger seat to rearmost position.

– Switch off ignition.

– Remove air intake box
⇒ "5.12 Removing and installing air intake box of heater and air conditioning unit", page 512 .

– Unplug connector from evaporator output temperature sender - G263-
⇒ "9.9 Removing and installing evaporator output temperature sender G263 ", page 633 .

– Unplug connector -B- and unplug connector -C- from heater housing (right-side).



> **Caution**
>
> *When folding back the floor covering, pay attention to the centre console to avoid damage.*

– Carefully fold back floor covering in area of centre console and detach earth connection to auxiliary air heater element - Z35- -A- from earth point at centre tunnel (right-side) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

– Unfasten wiring to auxiliary air heater element - Z35- -D- from mountings at heater housing (right-side).

– Remove heater housing (right-side) ⇒ “5.14 Removing and installing heater housing (right-side, with temperature flaps)”, page 520 .

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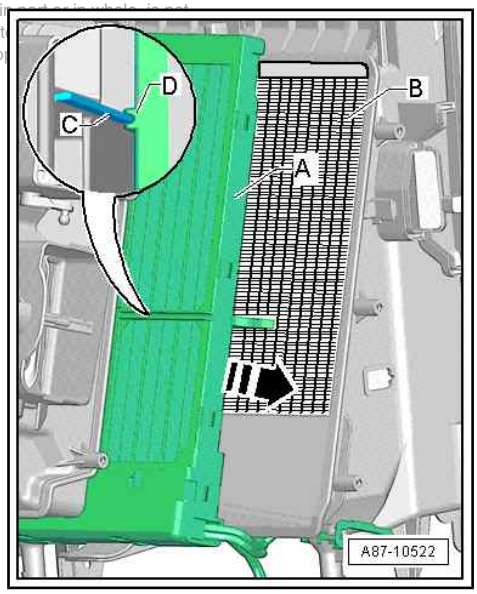
– Pull auxiliary air heater element - Z35- -A- out of air conditioning unit.



Installing

Install in reverse order of removal; note the following.

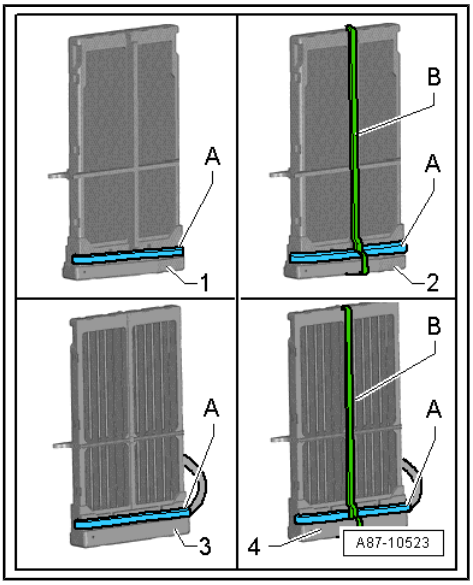
– The auxiliary air heater element - Z35- (honeycomb element) installed must be fitted with foam seals -A- and -B- supplied depending on air conditioner version.

1 - Honeycomb element for vehicles with “basic” air conditioner

2 - Honeycomb element for vehicles with “deluxe” air conditioner

3 - Auxiliary air heater element - Z35- for vehicles with “basic” air conditioner

4 - Auxiliary air heater element - Z35- for vehicles with “deluxe” air conditioner



Note

- *On vehicles with a “deluxe” air conditioner, different temperature settings are possible for the left and right side and the rear part of the passenger compartment. The seal -B- separates the air ducts in the air conditioning unit for the left and right side ⇒ “6.2 Air intake and air outlet openings”, page 558 .*
- *Seal -B- must be bonded on in the centre of the honeycomb element of auxiliary air heater element - Z35- .*
- *The seal may curl up when it is inserted if it has not been bonded on properly.*
- *If the seal is damaged or has not been fitted properly, cold air can flow past the auxiliary air heater element - Z35- (honeycomb element). On vehicles with a “deluxe” air conditioner, a proper separation of the left and right side may not be possible.*

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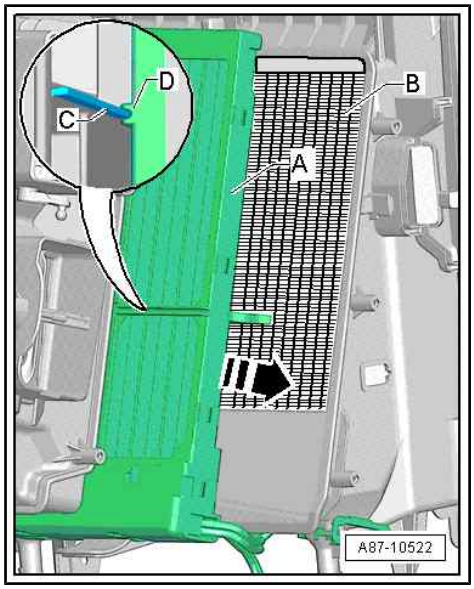
– Check air conditioning unit, heat exchanger and evaporator -B- for dirt with auxiliary air heater element - Z35- (honeycomb element) removed; remove any dirt.
– Slide auxiliary air heater element - Z35- (honeycomb element) -A- into air conditioning unit.



Note

On vehicles with a “deluxe” air conditioner, pay attention to the groove/spring joint -C- and -D- while inserting.

– Re-install all components removed in reverse order.
– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly*
  ⇒ “1.10 Overview - control motors of air conditioner”, page 30 .

– Switch on ignition.
– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
– Following installation, check activation and operation of auxiliary air heater element - Z35- if applicable
  ⇒ “5.8 Checking auxiliary air heater element Z35 ”, page 482 .

Tightening torques

Designation	Tightening torque
Bolted connection - earth point to centre tunnel	9 Nm

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5.10 Checking heating output of actuation of temperature flaps of air conditioner

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage

⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

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Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

Working with ignition switched on or high-voltage system active

DANGER!

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

Before switching on the ignition, perform the following steps:

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

– To minimise the number of automatic engine starts when the vehicle's drive system is active (READY) during test and measurement work, charge the vehicle batteries e.g. with the

battery charger 60A - VAS 5904- in battery standby mode ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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

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Note

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

Special tools and workshop equipment required

- Battery charger, 60A - VAS 5904-

DANGER!

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

Before switching on the ignition, perform the following steps:

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

Note

- *If the ignition is on and the drive system is active (READY), the engine will only start or run if warmer coolant is required to attain the set temperature in the passenger compartment or, for instance, if the drive battery - A2- (hybrid battery) is not sufficiently charged.*
- *With the ignition on and the drive system active/READY (engine not running), the flow of coolant through the heat exchanger of the air conditioning unit is maintained via the coolant circulation pump - V50- ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly . Depending on the vehicle version, - V50- is activated directly by the air conditioner operating and display unit (Climatronic control unit - J255-) or by the relevant engine control unit when requested by -J255- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

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– Activate drive system (observe display in control unit in dash panel insert - J285-) ⇒ Owner's Manual .

All vehicles

Special tools and workshop equipment required

- Vehicle diagnostic, testing and information system - VAS 5051/- (or vehicle diagnostic and service information system - VAS 5052-)
- 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 of the air conditioning unit, reducing the heat output of the air conditioner. In addition, there may be problems with noises or with differences in the temperature of the air from the vents on the driver's and passenger's sides although the same setting is selected for both sides.

Remedy:

– Perform a road test (at least 10 minutes) at high engine speeds (above 2500 rpm) with “maximum air conditioner heat output” selected. When doing so, select a low gear to prevent excessive vehicle speed.

– If there is a customer complaint about poor heating output at certain engine speeds, check incorporation of heat exchanger in air conditioning unit into coolant circuit. If the two coolant hoses (supply and return) from the engine have been interchanged, coolant will flow through the heat exchanger in the wrong direction ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .

If there are differences in the temperature of the air flowing out of the vents (air conditioner in control mode), there are several possible causes:

- One or more temperature flap(s) in heater housing do not close completely or do not reach end position.
- There is air in heat exchanger (flow through heat exchanger fluctuates, causing uneven heat distribution).
- A foam seal has become detached during installation of heat exchanger, allowing air to flow past heat exchanger ⇒ page 543

- A foam seal has become detached during installation of auxiliary air heater element - Z35- /honeycomb element, allowing air to flow past the incorporated partitions ⇒ page 487
- Air conditioner refrigerant circuit not filled with the correct amount of refrigerant (perform cooling output test) ⇒ page 71 .

Note

- *From model year 2010 onwards, a start/stop system (optional equipment) is offered for this vehicle in combination with certain engines. Depending on the setting on the operating and display unit (Climatronic control unit - J255-), the stop function can be prevented. 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. The same also applies if the difference between the selected required temperature and the calculated actual temperature exceeds a certain value in heating or cooling mode ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *Depending on the vehicle equipment and version, vehicles with a start/stop system may be fitted with an additional coolant circulation pump - V50- (coolant pump - V36-) for the start/stop system ⇒ page 126 , ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *Depending on the vehicle model, -V50- (-V36-) is not only activated when the “stop function” is active, but also when the engine is running, e.g. when the temperature is preset to “warm” on the air conditioner operating and display unit (Climatronic control unit - J255-) (“HI” displayed on air conditioner operating and display unit and Multi Media Interface). -V50- (-V36-) is then activated to support the engine's coolant pump ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The version of the coolant circulation pump - V50- (coolant pump - V36-) and the activation of the pump(s) differ depending on the vehicle version and production period. From model year 2012 onwards and depending on the engine, the pumps fitted from the start of production onwards and activated via a 500 hertz signal (500 pulses per second) are gradually being replaced by pumps activated via a variable signal (100 ... 500 hertz). The pumps activated via a variable signal are equipped additionally with a diagnostic function and are generally activated via the corresponding engine control unit. Therefore it is important to observe the correct assignment (only the assigned pump can be activated) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Electronic parts catalogue .*

Activation of temperature flaps differs between different versions of air conditioner (“basic” or “deluxe”) ⇒ page 563 .

– On a “deluxe” air conditioner, the temperature flap for the front right vent is actuated by the right temperature flap control motor - V159- and the temperature flap for the front left vent is actuated by the left temperature flap control motor - V158- . The two temperature flaps for the rear footwell vents (left and right) and the vent in the rear centre console are connected via a connecting rod and actuated by the rear temperature flap control motor - V137- .
– On “basic” version of air conditioner, the top and bottom temperature flaps (for front right and right footwell vent) and the

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top and bottom temperature flaps (for front left and left footwell vent) are connected via the shafts. The shafts of the right and left temperature flaps are connected via a connecting rod and are jointly actuated by the temperature flap control motor - V68- .

Notes for vehicles with auxiliary heater

If there are problems with poor or insufficient heating output on vehicles with an “auxiliary heater” (optional extra), check activation and operation of the heater coolant shut-off valve - N279- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (for auxiliary heater).

- On the Audi Q5, the heater coolant shut-off valve - N279- may only be activated up to an engine speed of approx. 1200 rpm. If -N279- is activated at a higher engine speed, it may not open when activation is switched off as the coolant flow rate is then higher (and no heated coolant flows into the heat exchanger of the air conditioning unit).

If there are complaints about poor or too little heating output at low engine speeds on vehicles with an auxiliary heater (optional extra), check the activation and operation of the circulation pump - V55- of the auxiliary heater (request from air conditioner operating and display (Climatronic control unit - J255-), activation by auxiliary heater control unit - J364-) ⇒ Auxiliary/supplementary heater; Rep. gr. 82 ; Overview of fitting locations - auxiliary/supplementary heater; Overview of fitting locations - components not located in passenger compartment and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (for auxiliary heater).

- Depending on the production period and on the versions of the vehicle, engine and auxiliary heater, -V55- is activated to assist the engine coolant pump at certain engine speeds when requested by -J255- . To make a request for activation of -V55- by -J364- possible, this function must be adapted correctly in -J364- ⇒ Auxiliary/supplementary heater; Rep. gr. 82 ; Overview of fitting locations - auxiliary/supplementary heater; Overview of fitting locations - components not located in passenger compartment and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") (for auxiliary heater).

All vehicles

⇒ “3.7.1 Requirements for checking heating output and actuation of temperature flaps of air conditioner”, page 52

⇒ “3.7.2 Checking heating output and actuation of temperature flaps of air conditioner”, page 58

5.11 Removing and installing heater and air conditioning unit

Special tools and workshop equipment required

- Hose clamps up to 25 mm - 3094- and hose clamps up to 40 mm - 3093-
- Commercially available compressed-air gun with rubber mouthpiece
- Cooling system tester - V.A.G 1274- (and appropriate adapters)

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Note

- *When removing, note down bolt lengths and assignment for re-installation.*
- *All cable ties and other wiring harness fasteners detached or cut open during the removal of the air conditioning unit must be re-attached in the same positions during installation.*
- *On vehicles which use refrigerant R1234yf, no separable connections in the refrigerant circuit (e.g. between the refrigerant lines and the evaporator) are permitted in the passenger compartment. On these vehicles, the air conditioning unit (with the evaporator housing) must therefore always be removed, and the evaporator must be renewed (as a complete unit) together with the refrigerant lines ⇒ Electronic parts catalogue .*

Removing

– Move driver's and front passenger's seat as far to the rear as possible.

– Switch off ignition.

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

Note

Depending on the position of the service connection at the refrigerant line and the vehicle version, it may be necessary to remove the additional reinforcement for the body brace (left-side) to make it possible to connect the service coupling of the air conditioner service station (e.g. on the Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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As work on the high-voltage system is required for the following sequence of operations, de-energise the high-voltage system ⇒ page 36 , ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system . Pay particular attention to the “General warning instructions for work on the high-voltage system” ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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

De-energising high-voltage system

DANGER!

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

- ***The high-voltage system may only be de-energised by a suitably qualified person (Audi high-voltage technician).***
- ***It must be definitely confirmed that the high-voltage system is de-energised. The system may only be de-energised using the vehicle diagnostic tester via “Guided Fault Finding”.***
- ***The qualified person (Audi high-voltage technician) confirms that the system is de-energised and uses the locking cap - T40262- to ensure that the system cannot be re-energised. As an additional precaution, the ignition key and the maintenance connector for high-voltage system - TW- are then stored in a safe place by the qualified person.***
- ***The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.***

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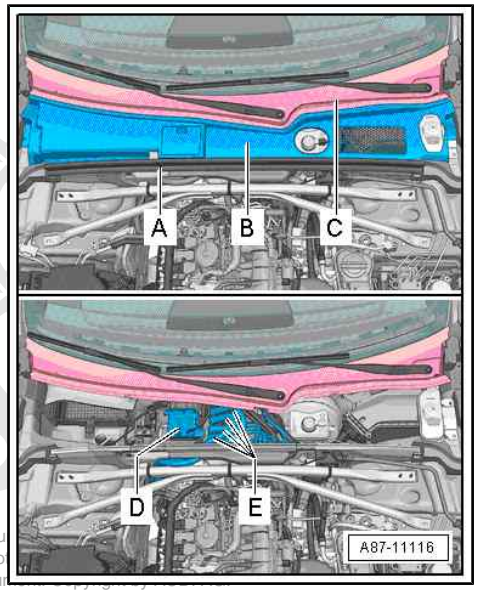
Note

- *De-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - De-energise high-voltage system (Rep. gr. 93)`

– Remove rubber seal -A- and plenum chamber cover -B- (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

– After removing plenum chamber cover -B-, visually inspect high-voltage components -D- (in this case power and control electronics for electric drive - JX1-) and high-voltage wires -E- ⇒ page 41 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

– Disconnect earth connection from battery - A- ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .



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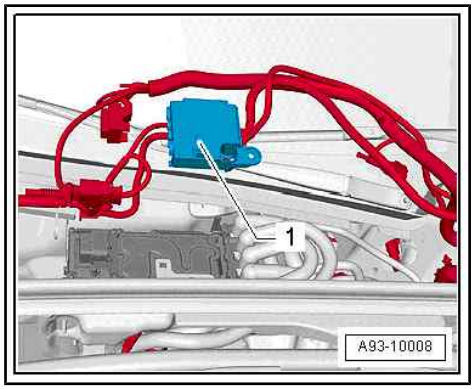
– Unfasten power distributor -1- and set it down together with wiring towards windscreen ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes

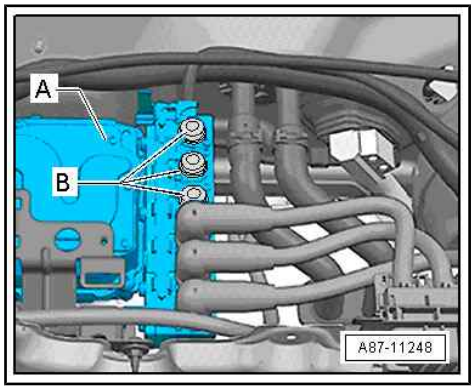
– Detach high-voltage wiring to -JX1- ⇒ Electrical system; Rep. gr. 93 ; High-voltage wires; Overview of fitting locations - high-voltage wires .

– Cover -JX1- and corresponding wiring to prevent damage or contamination ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

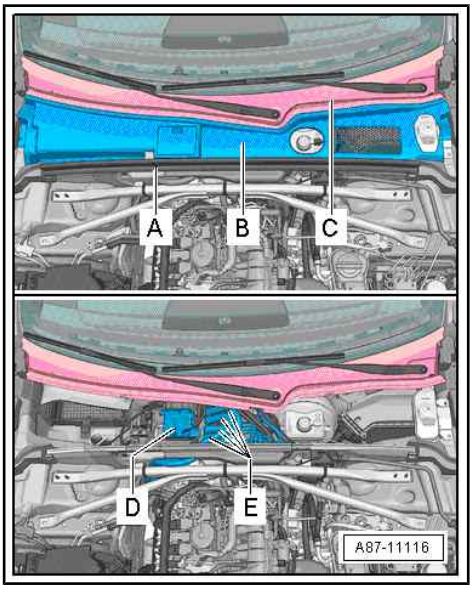


Note

Use e.g. clean sealing plugs -B- (size 20) from engine bung set -JX1- for covering connections at -VAS 6122- -A-



- When working in the vicinity of high-voltage components -D- and high-voltage wires -E-, always take care not to damage these components ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .



Note

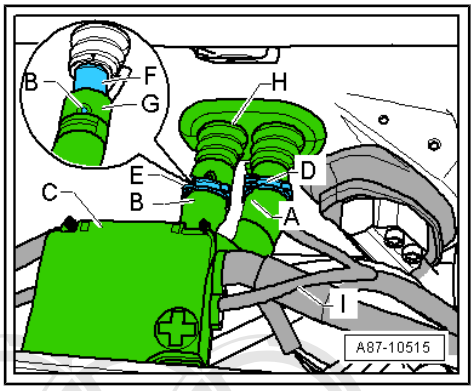
Should it be necessary in order to be able to remove and install the expansion valve, remove the cowl panel trim -C- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

Vehicles without high-voltage system

– Disconnect earth connection from battery - A- ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
– Remove plenum chamber cover and/or cowl panel trim (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
– Disconnect earth connection from battery - A- ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

Note

The earth connection of the battery - A- is detached to prevent short circuits when the slave start socket -C- is detached and when the cable for the positive supply to the two relays for the auxiliary air heater element - Z35- -J- is detached.



– Remove cover for slave start socket -C-.

All vehicles

– On vehicles with auxiliary air heater element - Z35- , detach cable for positive supply to the two relays for -Z35- -J- from slave start socket -C- ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes .

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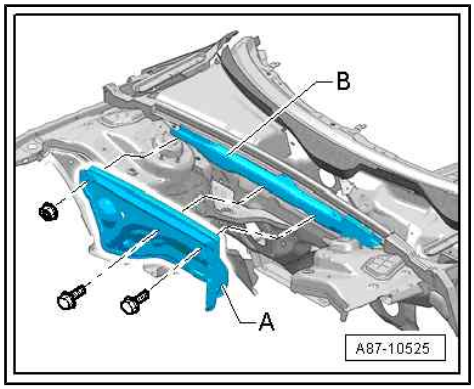
– If fitted and if necessary, remove body brace -B- (e.g. on Audi A5 Coupé, not required e.g. on Audi Q5) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .

– On vehicles with 6-cyl. TDI engine, remove plenum chamber partition panel -A- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .



Note

- *On vehicles with a petrol engine or 4-cyl. TDI engine, the plenum chamber partition panel does not have to be unfastened or removed from the vehicle (there is sufficient space).*
- *On vehicles with a petrol engine or 4-cyl. TDI engine, the two coolant hoses to the heat exchanger are routed through the plenum chamber partition panel -A-. On these vehicles, detach grommet at both coolant hoses and move partition panel to one side (this avoids having to open the coolant circuit).*
- *When unfastening the plenum chamber partition panel, pay attention to the vacuum line to the brake servo to avoid damaging it.*

– Remove expansion valve ⇒ page 232 .

Note

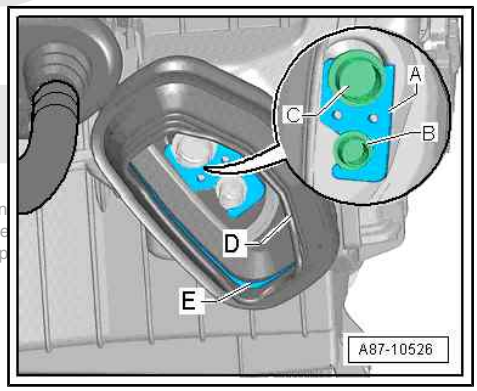
- *The air conditioning unit can also be removed and re-installed with the expansion valve attached. Here the removal and installation procedures are described with the expansion valve removed (more space and accessibility).*
- *Seal open pipe connections.*
- *To seal the open connections at the evaporator, use e.g. the caps of a replacement expansion valve.*

– Detach retaining plate for expansion valve -A- from refrigerant lines -B- and -C- (to avoid losing it during removal).

– Coat inside of grommet -D- with lubricant and remove support ring -E-.

– Detach grommet -D- towards passenger compartment from plenum chamber back wall (removed and installed together with air conditioning unit).

– Release pressure in the coolant circuit by opening cap on coolant expansion tank ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .



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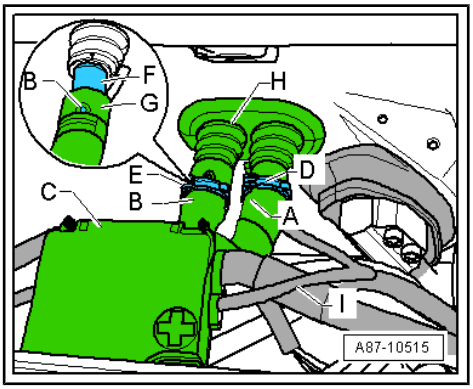
– Mark arrangement of coolant hoses -A- (supply from cylinder head) and -B- (return to coolant pump).



Note

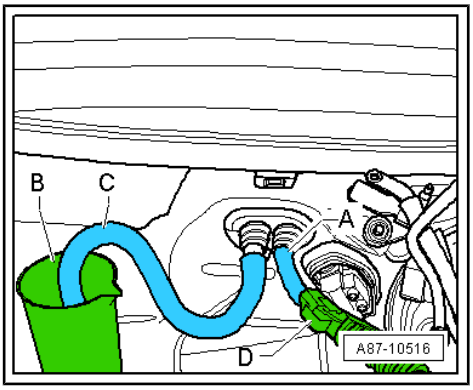
- *The heat exchanger is designed for a certain coolant flow direction. Therefore it is important to connect the coolant hoses correctly.*
- *Bleed coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .*

– Use hose clamps to pinch off the coolant hoses -A- and -B-.

– Cover area beneath connections for coolant hoses -A- and -B- e.g. with absorbent paper.

– Detach coolant hoses -A- and -B- from connections to heat exchanger of air conditioning unit ⇒ Rep. gr. 19 ; Cooling system/coolant .

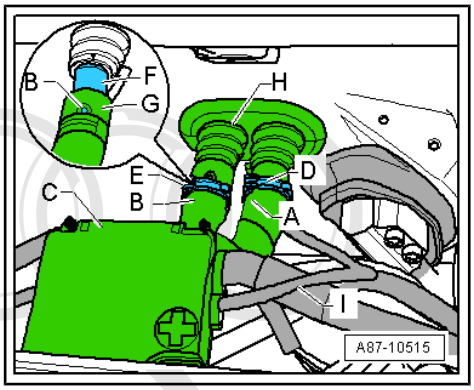
– Attach a section of tubing (-A- and -C-) to each of the two connections at the heat exchanger.



– Place a container -B- underneath other end of hose -C-.

– Use a compressed-air gun -D- to carefully blow coolant out of heat exchanger (into container -B-) via hose -A-.

– Unfasten grommet -H- from plenum chamber back wall and detach from coolant pipes leading to heat exchanger.



– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove centre console (⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console) and dash panel (⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel).

Note

In order not to damage the dash panel fascia, only place the dash panel on a clean workbench, covered e.g. with clean cardboard.

– Remove air intake box ⇒ page 512 .

– Remove air ducts to dash panel vents (left and right).

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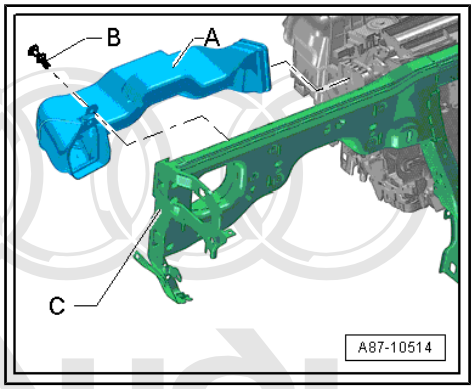
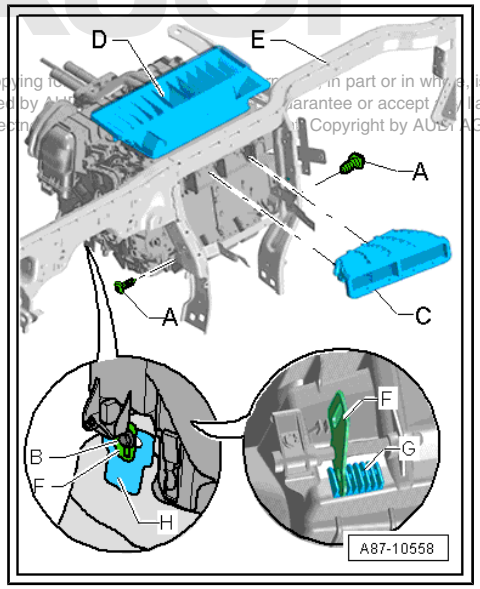
Note

The air duct to the left dash panel vent -A- is attached with a fastener or a bolt -B- to the dash panel cross member -C-. This fastener or bolt can only be removed after taking out the dash panel fascia.



- Remove air ducts to centre dash panel vent -C- and defroster vent -D-.
- Remove bolts -A- and -B-.
- Remove steering column ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing steering column .
- Unplug connector from brake light switch - F- ⇒ Brake system; Rep. gr. 45 ; Sensors; Removing and installing brake light sensor .
- Unfasten dash panel cross member (central tube) -E- from vehicle and air conditioning unit ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Removing and installing central tube for dash panel .



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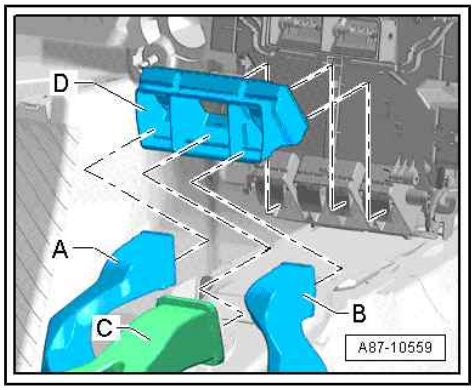
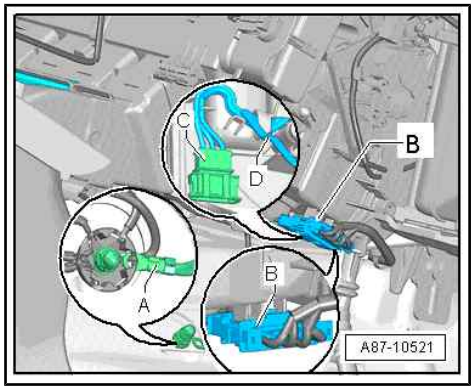
Note

With the exception of the fuse box (left-side), it is not necessary to unfasten any other relay and control unit brackets (left-side) from the dash panel cross member.

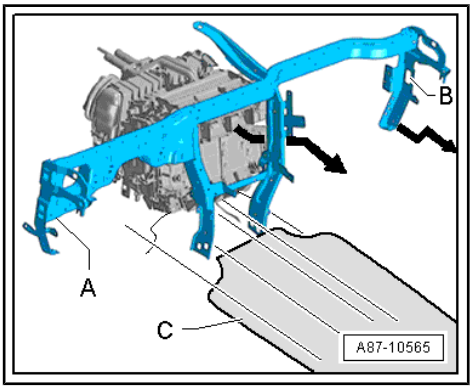
- Remove air duct to vent in centre console (rear) -C- (only fitted on vehicles with “deluxe” air conditioner).
- Unfasten air ducts to rear footwell vents -A- and -B- from intermediate piece -D- and remove intermediate piece -D-.



- On vehicles with an auxiliary air heater element - Z35- , unfasten earth connection -A- and unplug connector -B- ⇒ page 487 .
- Detach the two condensation drain hoses from air conditioning unit ⇒ page 551 .



– Unfasten fuse holder (driver's side) on left side of dash panel cross member (central tube) -A- from dash panel cross member ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes .



Note

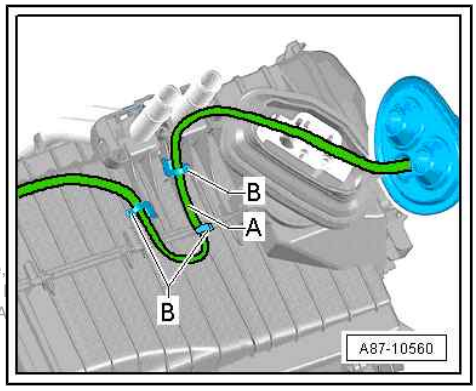
As the dash panel cross member is only unfastened from the vehicle but not removed completely, the other relay/fuse carriers and connector points do not have to be detached from the dash panel cross member.

– Detach all electrical connections between dash panel cross member and vehicle on passenger's side -B-.
– Protect floor covering in area of centre tunnel with a sturdy mat -C- (and place loose covers on both seats if this has not already been done).

Note

It is not necessary to remove the dash panel cross member completely to remove the air conditioning unit; it is sufficient to unfasten it from the vehicle and the air conditioning unit, to swivel it to the rear on the right and then to set it down at the centre tunnel.

– Carefully unfasten dash panel cross member from vehicle and, making sure that no components are damaged by any connections which have not yet been unfastened, swivel it towards rear -arrow- on passenger's side -B- so that air conditioning unit can be removed towards right -arrow-.
– Detach vehicle wiring harness from air conditioning unit in area of dash panel cross member.
– Carefully detach air conditioning unit slightly from vehicle, making sure that no components are damaged by any connections which have not yet been unfastened.
– On vehicles with an auxiliary air heater element - Z35- , mark the position of the attachment points -B- (with cable ties at air conditioning unit) at the cable for the positive supply to the two relays for -Z35- -A- (e.g. with a suitable pen at cable).
– Detach cable -A- from air conditioning unit.
– Detach remaining fasteners of vehicle wiring harness (e.g. with cable ties) from air conditioning unit.



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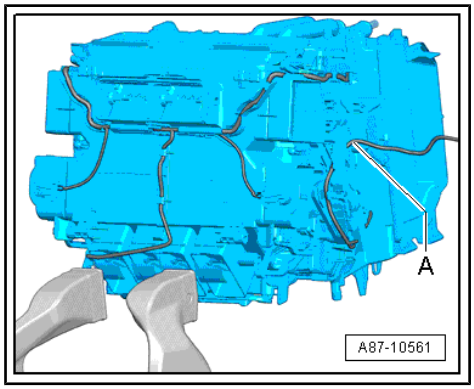
– Remove air conditioning unit -A- towards passenger's side.



Note

Wiring harness for air conditioner is removed together with air conditioning unit.

Installing

Install in reverse order of removal; note the following.

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Note

Check all seals and grommets at the air conditioning unit for damage prior to installation and renew any damaged components.

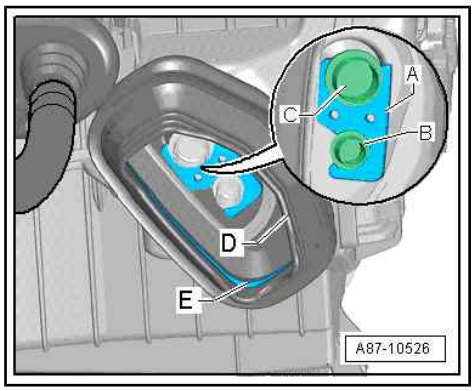
– Insert air conditioning unit -A- with components removed together with air conditioning unit (“air conditioner” wiring harness, grommet at refrigerant lines to evaporator etc.) in vehicle.

– Coat grommet -D- with lubricant and insert it in plenum chamber back wall.

– Insert support ring -E- in grommet -D-.

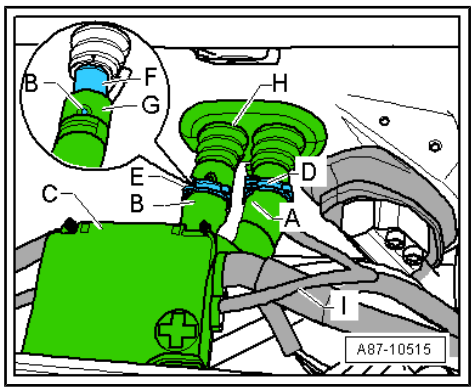
– Install dash panel cross member (central tube) ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Removing and installing central tube for dash panel .

– Install retaining plate for expansion valve -A- at refrigerant lines -B- and -C-.

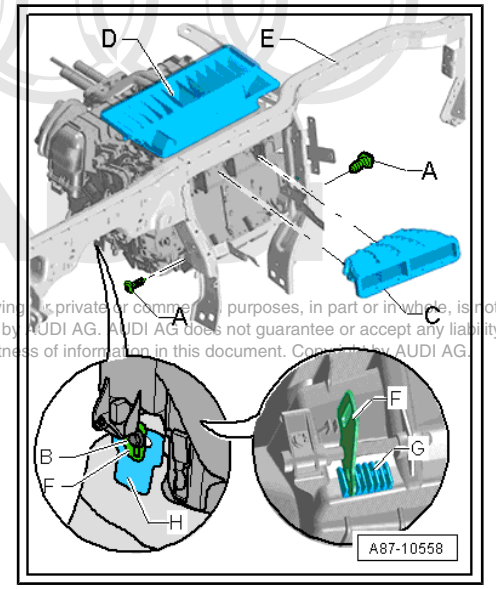


– Fit grommet -H- in plenum chamber back wall.

– Check position of coolant and refrigerant lines in the two grommets and, if necessary, align air conditioning unit so that lines in grommets are not strained.



– Fit bolts -A-.
– Slide lug -F- as far as it will go towards bracket -H- and then turn it downwards (this secures air conditioning unit in position at lug via mounting -G-).
– Fit bolts -B-.
– Attach the two condensation drain hoses to air conditioning unit ⇒ page 551 .



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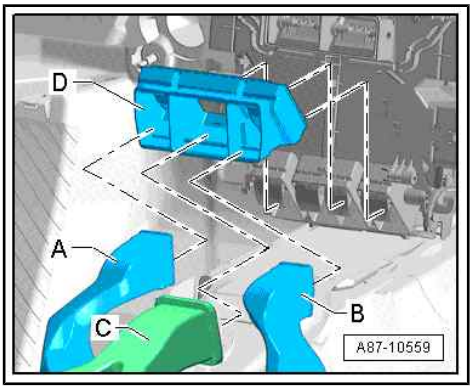
Note

- *When installing the intermediate piece -D-, the air ducts to the rear footwell vents -A- and -B- and the air duct to the vent in the rear centre console -C-, make sure that the components are correctly positioned and that there are no leaks at the connections. If there are leaks at the connections, hot or cold air may escape and influence the control of the air conditioner (this air is drawn in by the temperature sensor blower - V42- , and the measured value of the dash panel temperature sensor - G56- differs from the actual temperature in the passenger compartment).*
- *The intermediate piece -D- is engaged in the air outlet opening of the air conditioning unit. For this purpose, there are slots in the intermediate piece -D-. If the flaps are positioned inconveniently, in particular on vehicles with a "deluxe" air conditioner, whistling noises might be caused at these slots in certain settings. For this reason, the top slots are covered with adhesive tape during production (gradual introduction of adhesive tape from February 2009 onwards) ⇒ page 588 .*



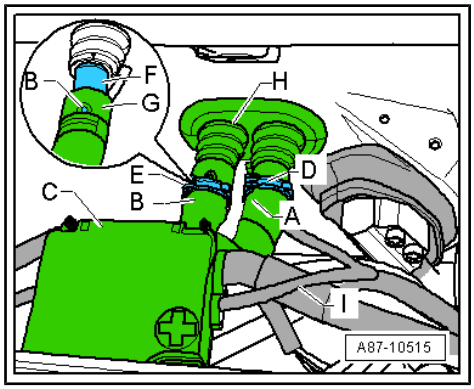
– Install air intake box ⇒ page 512 .
– Install expansion valve ⇒ page 232 .
– Install refrigerant line with internal heat exchanger ⇒ page 217 .

– Check that grommet -H- is correctly positioned in back wall of plenum chamber.
– Properly connect coolant hoses to heat exchanger, paying attention to markings.

A - Supply from cylinder head

B - Return to coolant pump

– Attach coolant hose -A- to coolant pipe going to heat exchanger (observe marking) and secure it with clip -D-.
– Slip coolant hose to heat exchanger -B- over coolant pipe -F- only so far that bleeder hole -G- is not sealed off.
– Detach hose clamp from coolant hose -A-.
– Fill coolant into coolant expansion tank ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
– Using e.g. hand pump of cooling system tester - V.A.G 1274/- , carefully press coolant out of coolant expansion tank into heat exchanger.
– As soon as coolant emerges from bleeder hole -G-, attach coolant hose -B- to coolant pipe -F- according to mark made.
– Secure coolant hose -B- with clip -E- at marked location.
– Detach hose clamp from coolant hose -B-.
– If necessary, fill more coolant into coolant expansion tank ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .



Note

This procedure completely bleeds the cooling system. If there is still air in the cooling system for other reasons, it may be necessary to bleed the cooling system after installing all the components removed earlier ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

Check connections at heat exchanger for leaks as follows:

– Use e.g. hand pump of cooling system tester - V.A.G 1274/- to carefully increase pressure in coolant circuit.

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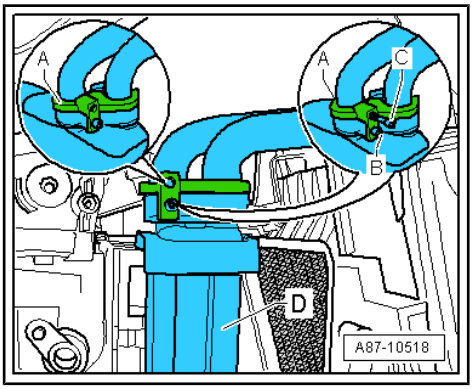
– Check coolant circuit for leaks, paying particular attention to connection between coolant pipes and heat exchanger.



Note

- *This illustration shows the coolant pipes on a replacement heat exchanger. On a factory-fitted heat exchanger, the coolant pipes are secured to the heat exchanger with clips ⇒ page 543 .*
- *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 ⇒ page 490 .*
- *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.*

– Re-attach wiring harness at appropriate locations and re-install various air ducts in reverse order.

– Re-install dash panel (⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel), centre console (⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console), glove box (⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box) etc.

Note

When installing the dash panel, make sure that the intermediate piece for “defrost” is properly seated on the air conditioning unit when it is inserted and that the defroster vent does not squeeze the intermediate piece when it is installed ⇒ page 554 .

Vehicles with high-voltage system (hybrid vehicles)

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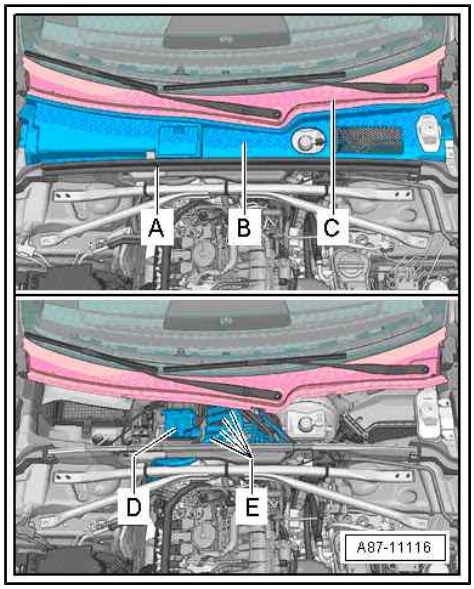
– After completing the work and before installing the plenum chamber cover -B-, visually inspect the high-voltage components -D- and the high-voltage wires -E- ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .
– For electrical connections and routing, refer to ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
– Re-install remaining components removed in reverse order.
– Re-energise power supply of high-voltage system ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system .



Re-energising high-voltage system

DANGER!

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

- ***The high-voltage system may only be re-energised by a suitably qualified person (Audi high-voltage technician).***
- ***The system may only be re-energised using the vehicle diagnostic tester via "Guided Fault Finding".***
- ***The vehicle is then made ready for operation again by the qualified person (Audi high-voltage technician).***
- ***The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.***

Note

- *Re-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - Re-energise high-voltage system (Rep. gr. 93)`

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Vehicles without high-voltage system

– Re-connect earth connection of battery - A- , paying attention to notes on connecting the battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
– Re-install remaining components removed in reverse order.

All vehicles

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

– Switch on ignition.

– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

♦ *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

♦ *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

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– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).

5.12 Removing and installing air intake box of heater and air conditioning unit

Note

- *From 01.2008 onwards, air conditioning units with an additional connection for glove box cooling are being introduced gradually. This connection is sealed with a plug on vehicles without glove box cooling ⇒ page 587 . Therefore it is important to observe the correct assignment of the heater housing (right-side) and the air intake box ⇒ Electronic parts catalogue .*
- *From model year 2012 onwards, a modified version is gradually being introduced. Pay attention to the notes on this component ⇒ "4.1.1 Overview of fitting locations - control motors (front), basic version", page 372 .*

Removing

– Switch on ignition.

– Set air outflow direction on air conditioner operating and display unit (Climatronic control unit - J255-) to "DEF" (to windscreen).

– Set front passenger seat to rearmost position.

– Switch off ignition.

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove right footwell vent (front passenger side) ⇒ "6.4 Removing and installing footwell vent (front passenger side)", page 566 .

– Remove threaded fasteners -A- and detach insulating mat -B-.

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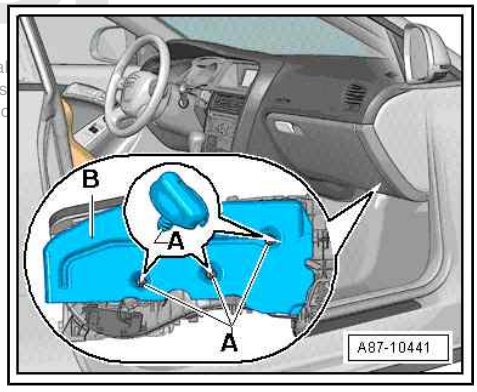
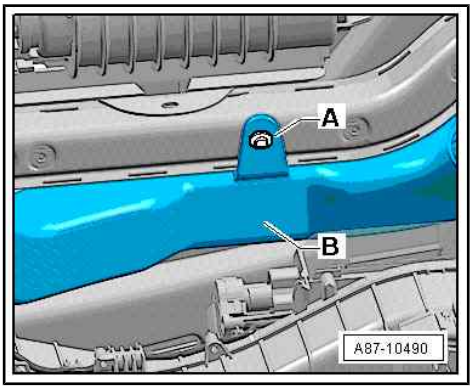


– Remove bolts -A-.

– Loosen air duct to dash panel vent (right-side) from dash panel cross member (do not remove); different versions ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel .



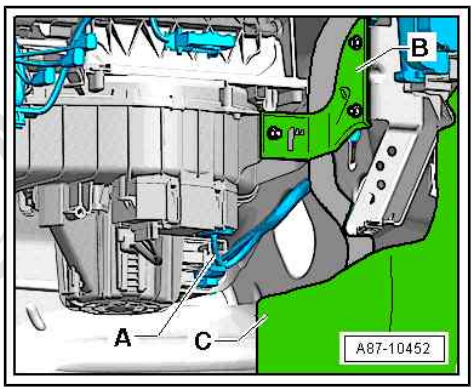
Note

Air duct from air duct -B- to dash panel vent (right-side) is secured with two bolts; to remove air duct, only unscrew bolt screwed into dash panel cross member from below (only this bolt is accessible).

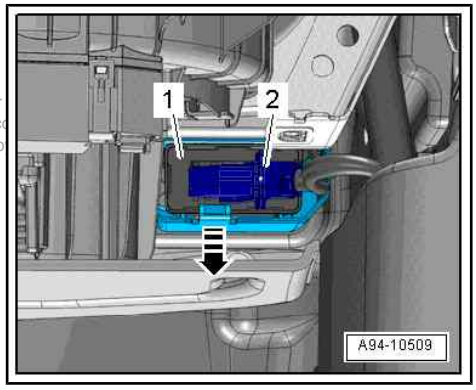
– Remove air duct -B- to right dash panel vent (passenger's side).

– Unfasten bracket -B- and move it to side/remove it.

– Unplug connector -A- from fresh air blower control unit - J126- .



– If fitted, remove control unit for headlight range control - J431- -1- (or control unit for cornering light and headlight range control - J745-) and corresponding retaining frame ⇒ Electrical system; Rep. gr. 94 ; Automatic headlight range control; Removing and installing headlight range control unit .

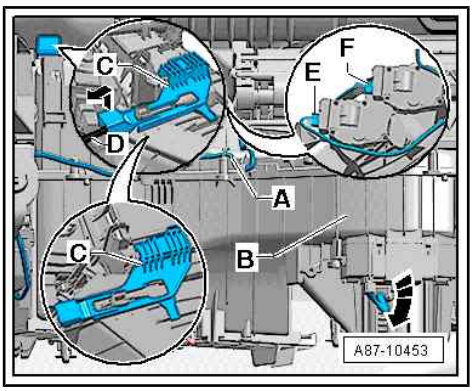


– Unfasten wiring -A- from attachment points at air intake box.

– Use e.g. a screwdriver -D- (lift slightly and pull in direction of arrow) to release fastener -C- (between air conditioning unit and air intake box -B-).

– Pull air intake box -B- downwards on right side (in direction of -arrow-).

– To avoid interchanging them with other identical connectors, mark connector to air flow flap control motor - V71- -E- and connector -F- to air recirculation flap control motor - V113- and unplug them from control motors.



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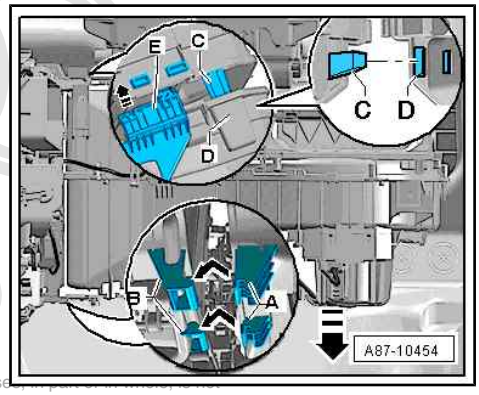
– Unfasten upper lug of air conditioning unit -E- from mounting of air intake box -D-.
– Unfasten the two lower mounting points between air conditioning unit -B- and air intake box -A-.
– Remove air intake box.



Installing

Install in reverse order of removal; note the following.

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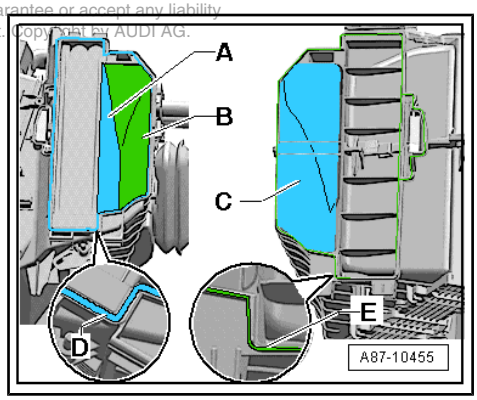
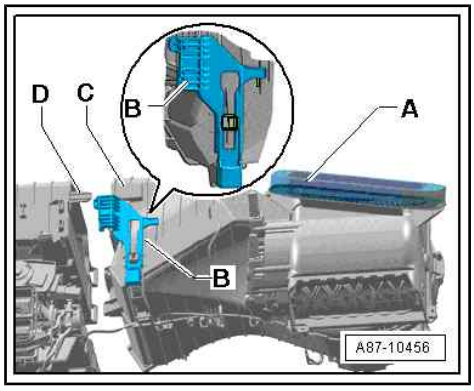
– Check evaporator -A- and air duct in air conditioning unit to evaporator -B- for dirt and clean if necessary.
– Check dust and pollen filter and air duct in air intake box to air conditioning unit -C- for dirt and clean if necessary.
– Check all-round groove at air conditioning unit -D- and all-round chamfer at air intake box -E- for damage.

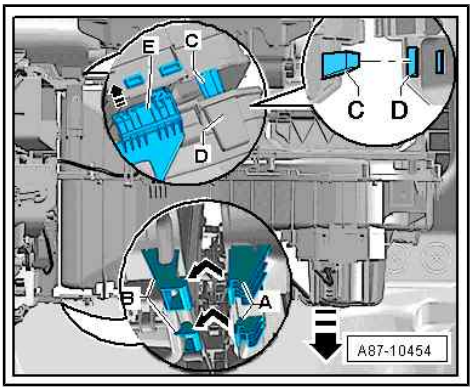


Note

If the groove or chamfer is damaged, fill the damaged area with e.g. silicone adhesive sealant D176 001 A3 ⇒ Electronic parts catalogue ; otherwise air could emerge at this point when the air conditioner is being operated, leading to noise.

– Before inserting air intake box -C-, check seal at fresh-air intake duct -A- for damage. Renew seal if damaged.
– Check position of fastener. Air intake box -C- and air conditioning unit -D- can only be assembled if catch -B- is in position shown.





– Plug in connectors to air flow flap control motor - V71- -E- and air recirculation flap control motor - V113- -F- according to marks made previously.
– Insert the two lower lugs of air intake box -A- in mounting points of air conditioning unit -B-.
– Lift air intake box on right side until upper lug of air conditioning unit -C- is positioned in mounting of air intake box -D- and then press the two components together.

Caution

- ***When assembling the air intake box and the air conditioning unit, proceed carefully and do not exert much pressure.***
- ***If you apply pressure while connecting the air intake box with the air conditioning unit, the bottom tabs on the air intake box -A- might be deformed.***
- ***Deformed tabs on the air intake box -A- can lead to whistling noises during the operation of the air conditioner due to small leaks at the connection points.***

Note

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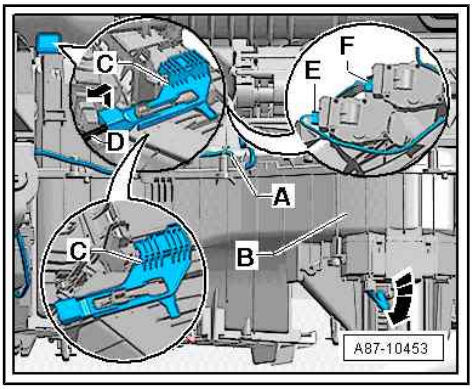
- *If the catch -E- has slipped forwards during installation, the two components cannot be assembled.*
- *During assembly, make sure that no other components are trapped and that the chamfer at the air intake box is inserted all round in the groove of the air conditioning unit.*

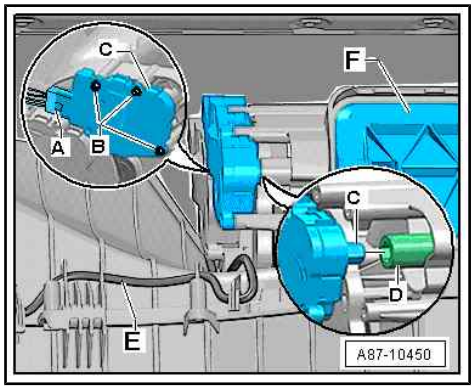


– Slide catch -C- in direction opposite to arrow (this engages air conditioning unit with air intake box -B-).
– Insert wiring -A- into attachment points at air intake box.

Note

When routing the wiring, make sure it is routed at the control motors so that it cannot come into contact with moving parts of the control motors.

– Re-install all parts removed in reverse order.
– Switch on ignition.
– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .



Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*
- *In cases of doubt as to whether the two control motors (air flow flap control motor - V71- and air recirculation flap control motor - V113-) have been connected properly to the wiring, you can check the activation via the "air conditioner final control diagnosis" function. The air recirculation flap -F- is visible when the glove box is removed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed. ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding)

Tightening torques

- ⇒ General body repairs, interior; Rep. gr. 70 ; Central tube for dash panel; Exploded view - central tube for dash panel

Designation	Tightening torque
Bolted connection - bracket for central tube for dash panel and air intake box	3.6 Nm
Bolted connection - air duct for dash panel vent (right-side) and central tube for dash panel	3 Nm

5.13 Removing and installing heater housing (left-side, with temperature flaps)

Note

- *Activation of temperature flaps (and heater housing with temperature flaps, left-side) differs on vehicles with "deluxe" or "basic" air conditioner ⇒ page 439 and ⇒ Electronic parts catalogue .*
- *To maintain the stability of the air conditioning unit, only remove one heater housing at a time (left or right side) when the air conditioning unit is fitted.*
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*

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Caution

Do not remove the left and right heater housings at the same time.

- *As both heater housings are supporting elements of the air conditioning unit, they can not be removed at the same time, because the air conditioning unit will lose its stability.*
- *If necessary, remove and install the left and right heater housings one after the other.*

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Removing

– Switch on ignition.

– Move driver's seat to rearmost position.

– Switch off ignition.

– Remove storage compartment beneath dash panel (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel trim (driver side) .

– Remove left footwell vent (driver side) ⇒ page 565 .

– Remove steering column ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing steering column .

– Remove pedal cluster and accelerator pedal module ⇒ Brake system; Rep. gr. 46 ; Brake pedal; Removing and installing mounting bracket and ⇒ Rep. gr. 20 ; Accelerator mechanism; Removing and installing accelerator pedal module with accelerator position sender -G79- / -G185- .

– On vehicles with “deluxe” air conditioner, remove retaining plate with left footwell flap control motor - V108- and left centre vent control motor - V110- as well as left temperature flap control motor - V158- ⇒ page 419 and ⇒ page 407 .

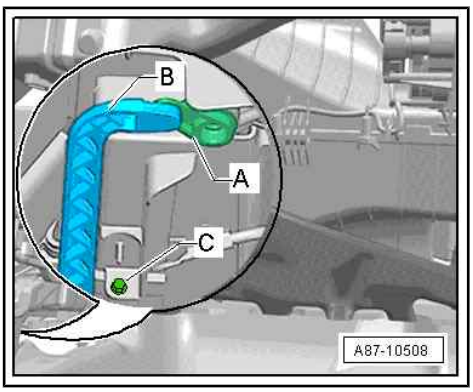
– On vehicles with “basic” air conditioner, remove retaining plate with footwell flap control motor - V261- ⇒ page 425 .

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

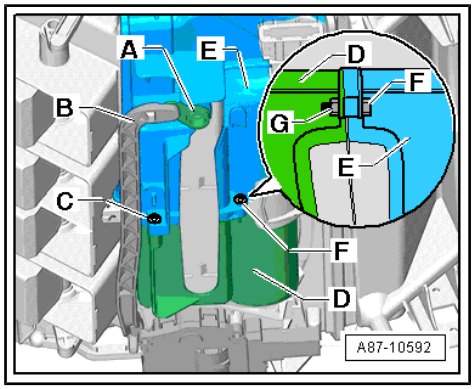
– Remove right footwell vent (front passenger side) ⇒ page 566 .

– To prevent damage to lever, carefully unclip connecting rod -B- from lever at right temperature flap -A-.

– Loosen bolt -C-.



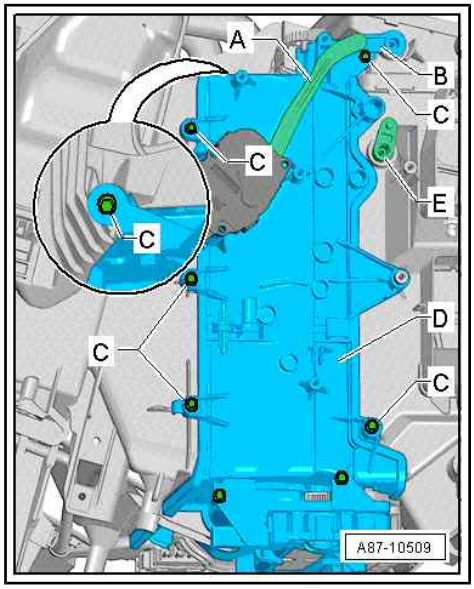
– Loosen or remove bolt -F- (fitted from 07.2007 onwards, different versions).



Note

- *At the start of production, air conditioning units were installed in which the left and right sides of the heater housing -D- and -E- were bolted together on the underside only with bolt -C-. From 07.2007 onwards, air conditioning units are gradually introduced in which both heater housings -D- and -E- are bolted together additionally with bolt -F-.*
- *From 07.2007 to 09.2007, bolt -F- was fitted with hexagon nut -G- at heater housing (left-side) -D-. In heater housing (left-side) -D- there is only a hole instead of a threaded attachment point. For removing and fitting bolt -F- and hexagon nut -G- on vehicles with this version, control motor -V68- or -V137- must be removed* ⇒ page 386 .
- *A locking device can be attached at the holes in the heater housing (right-side) -E- to prevent bolt -C- (and bolt -F-) from dropping out of the hole after being loosened.*

– To avoid damaging lever, carefully unclip connecting rod -A- from lever on defroster flap -B-.



– Remove bolt -C-.

– Pull heater housing (left-side) -D- (with control motors -V107- and -V68- or -V137-) out of air conditioning unit, paying attention to lever on defroster flap -B- (and lever on centre left dash panel vent flap -E- on vehicles with “deluxe” air conditioner).

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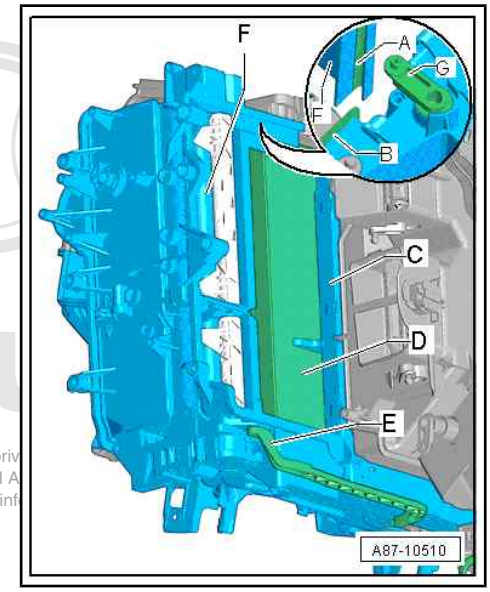
Installing

Install in reverse order of removal; note the following.

– Check groove -A- on heater housing (left-side) -F- and tongue at air conditioning unit -B- for damage.



Note

If the groove -A- on the heater housing (left-side) -F- or the tongue on the air conditioning unit -B- is damaged, seal this area with e.g. silicone adhesive sealant D176 001 A3 ⇒ Electronic parts catalogue .

– Check heat exchanger -C- and evaporator -D- for dirt and clean these components if necessary.
– Check foam seals at heat exchanger -C- and at auxiliary air heater element - Z35- (or at honeycomb element on vehicles without -Z35-) for damage.
– Insert grooves -A- at heater housing (left-side) -F- in tongues at air conditioning unit -B- and slide heater housing (left-side) -F- into air conditioning unit.

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Note

When inserting, pay attention to connecting rod to right temperature flap -E- and lever on defroster flap -G- (and to lever on centre left dash panel vent flap on vehicles with “deluxe” air conditioner).

– Re-install all other components removed in reverse order.
– Switch on ignition.
– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Tightening torques

- ⇒ “5.1 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 431

5.14 Removing and installing heater housing (right-side, with temperature flaps)

⇒ “5.14.1 Removing and installing heater housing (right-side) - vehicles with air conditioner (basic version) or with retaining plate for control motors detached”, page 520

⇒ “5.14.2 Removing and installing heater housing (right-side) together with retaining plate for control motors - vehicles with air conditioner (deluxe version) only”, page 525

5.14.1 Removing and installing heater housing (right-side) - vehicles with air conditioner (basic version) or with retaining plate for control motors detached

Note

- *From 01.2008 onwards, air conditioning units with an additional connection for glove box cooling are being introduced gradually ⇒ page 587 . It is important to observe the correct assignment of the heater housing (right-side) and the air intake box (different versions) ⇒ Electronic parts catalogue .*
- *Activation of temperature flaps and heater housing (right-side) differ on vehicles with “deluxe” or “basic” air conditioner ⇒ “4 Control motors”, page 372 and ⇒ Electronic parts catalogue .*
- *To maintain the stability of the air conditioning unit, only remove one heater housing at a time (left or right side) when the air conditioning unit is fitted.*
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*
- *On vehicles with a “deluxe” air conditioner, the heater housing (right-side) can be removed and installed with the retaining plate for the control motors attached or detached. This retaining plate is not installed on vehicles with a “basic” air conditioner.*

Caution

Do not remove the left and right heater housings at the same time.

- ***As both heater housings are supporting elements of the air conditioning unit, they can not be removed at the same time, because the air conditioning unit will lose its stability.***
- ***If necessary, remove and install the left and right heater housings one after the other.***

- Removing and installing heater housing (right-side) together with retaining plate (right-side) and control motors (only on vehicles with a “deluxe” air conditioner)
  ⇒ “5.14.2 Removing and installing heater housing (right-side) together with retaining plate for control motors - vehicles with air conditioner (deluxe version) only”, page 525
- On vehicles with a “basic” air conditioner (retaining plate for control motors not installed)

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- On vehicles with a “deluxe” air conditioner on which the retaining plate (right-side) with the control motors and the heater housing (right-side) are to be removed and installed one after the other

Removing

– Switch on ignition.

– Set air outflow direction on air conditioner operating and display unit (Climatronic control unit - J255-) to “DEF” (to windscreen).

– Set front passenger seat to rearmost position.

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– Switch off ignition.

– Remove air intake box
⇒ “5.12 Removing and installing air intake box of heater and air conditioning unit”, page 512 .

Vehicles with “deluxe” air conditioner:

– Remove retaining plate (right-side) with control motors -V109- and -V111-
⇒ “4.16 Removing and installing retaining plate (right-side) with control motors V109 and V111 ”, page 423 .

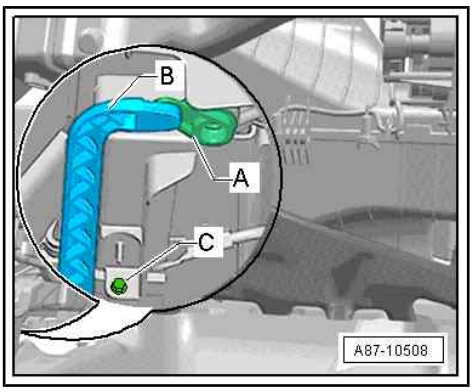
Vehicles with “basic” air conditioner:

– Remove centre vent control motor - V102-
⇒ “4.4 Removing and installing centre vent control motor V102 ”, page 392 .

All vehicles

– Unplug connector from evaporator output temperature sender - G263-
⇒ “9.9 Removing and installing evaporator output temperature sender G263 ”, page 633 .

– Carefully unclip connecting rod -B- from lever on right temperature flap -A- so that lever is not damaged.

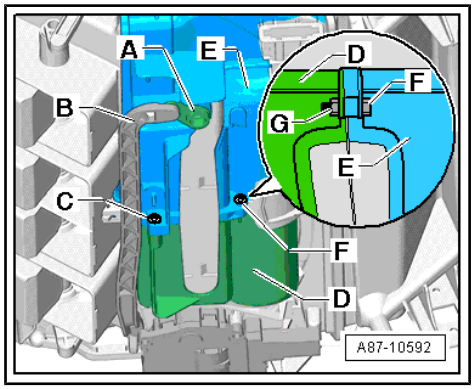


Note

Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .

– Loosen bolt -C- until bolt head makes contact with securing piece.

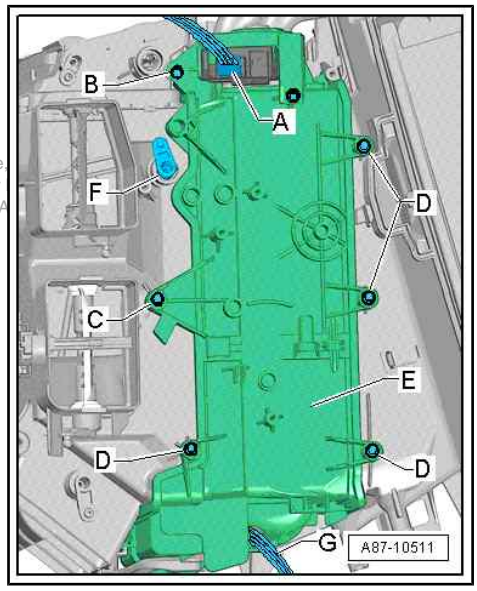
– Loosen bolt -F- until bolt head makes contact with securing piece (installed on vehicles from 07.2007 onwards, different versions).



Note

- *At the start of production, air conditioning units were installed in which the left and right sides of the heater housing -D- and -E- were bolted together on the underside only with bolt -C-. From 07.2007 onwards, air conditioning units are gradually introduced in which both heater housings -D- and -E- are bolted together additionally with bolt -F-.*
- *From 07.2007 to 09.2007, bolt -F- was fitted with hexagon nut -G- at heater housing (left-side) -D-. In heater housing (left-side) -D- there is only a hole instead of a threaded attachment point. For removing and fitting bolt -F- and hexagon nut -G- on vehicles with this version, control motor -V68- or -V137- must be removed*
  ⇒ “4.2 Removing and installing temperature flap control motor V68 / rear temperature flap control motor V137 ”, page 386 .
- *A locking device is attached at the holes in the heater housing (right-side) -E- to prevent bolt -C- (and bolt -F-) from dropping out of the hole after being loosened.*

– On vehicles with “deluxe” air conditioner, mark connector -A- to prevent interchange and unplug connector from right temperature flap control motor - V159- .



Note

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The right temperature flap control motor - V159- is only fitted on vehicles with “deluxe” air conditioner.

– Remove bolt -B-.
– Remove bolt -C-.

Note

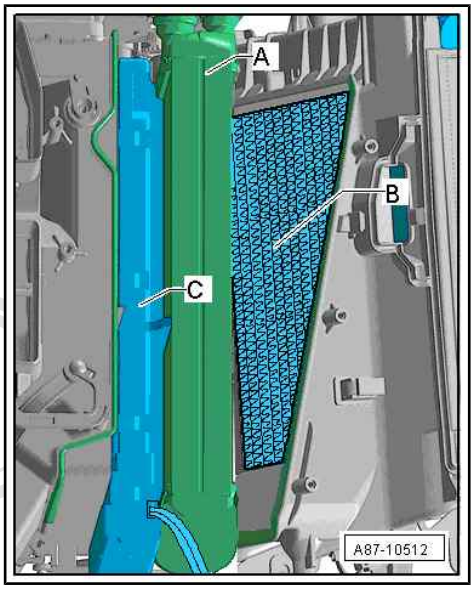
On vehicles with “deluxe” air conditioner, bolt -C- is already removed during removal of retaining plate with control motors - V109- and -V111- .

– Remove bolts -D-.
– On vehicles with auxiliary air heater element - Z35- , unfasten wiring -G- from heater housing (right-side) -E-
  ⇒ “5.9 Removing and installing auxiliary air heater element Z35 ”, page 487 .
– Pull heater housing (right-side) -E- (with right temperature flap control motor - V159-) out of air conditioning unit; pay attention to lever on dash panel vent flap -F-.

Installing

Install in reverse order of removal; note the following.

– Check heat exchanger -A- and evaporator -B- for dirt and clean these components if necessary.
– Check foam seals at heat exchanger -A- and at auxiliary air heater element - Z35- -C- (or at honeycomb element on vehicles without -Z35-) for damage.



– Check tongues of air conditioning unit -B- and grooves -A- on heater housing (right-side) -C- for damage.

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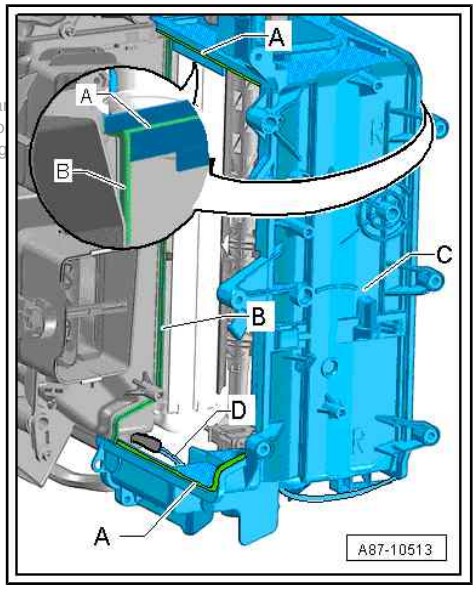
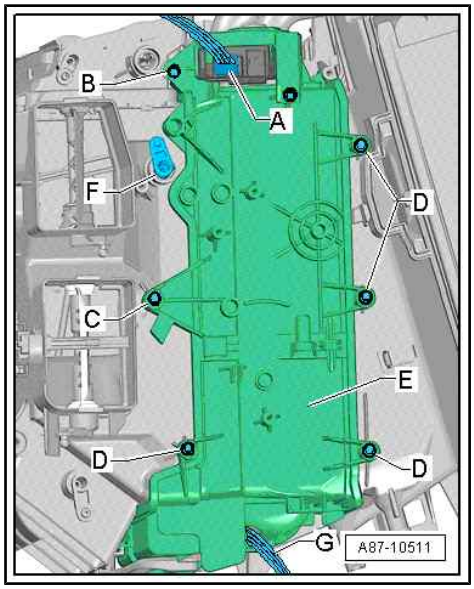
Note

If the groove -A- on the heater housing (right-side) -C- or the tongue on the air conditioning unit -B- is damaged, seal this area, e.g. with silicone adhesive sealant D176 001 A3 ⇒ Electronic parts catalogue .

– Insert grooves -A- on heater housing (right-side) in tongues on air conditioning unit -B- and slide heater housing (right-side) -C- into air conditioning unit.





Note

- *On vehicles with auxiliary air heater element - Z35- , pay attention to wiring -D- when inserting housing -C-.*
- *Pay attention to lever on dash panel vent flap -F- when inserting.*

– Fit bolts -B- and -C- and install.

– Re-install all other components removed in reverse order.

– Switch on ignition.

– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Tightening torques

- ⇒ “5.1 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 431

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5.14.2 Removing and installing heater housing (right-side) together with retaining plate for control motors - vehicles with air conditioner (“deluxe” version) only

Note

- *From 01.2008 onwards, air conditioning units with an additional connection for glove box cooling are being introduced gradually ⇒ page 587 . It is important to observe the correct assignment of the heater housing (right-side) and the air intake box (different versions) ⇒ Electronic parts catalogue .*
- *Activation of temperature flaps and heater housing (right-side) differ on vehicles with “deluxe” or “basic” air conditioner ⇒ page 372 and ⇒ Electronic parts catalogue .*
- *To maintain the stability of the air conditioning unit, only remove one heater housing at a time (left or right side) when the air conditioning unit is fitted.*
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*
- *On vehicles with a “deluxe” air conditioner, the heater housing (right-side) can be removed and installed with the retaining plate for the control motors attached or detached. This retaining plate is not installed on vehicles with a “basic” air conditioner.*

Caution

Do not remove the left and right heater housings at the same time.

- ***As both heater housings are supporting elements of the air conditioning unit, they can not be removed at the same time, because the air conditioning unit will lose its stability.***
- ***If necessary, remove and install the left and right heater housings one after the other.***

- Removing and installing heater housing, right-side (on vehicles with a “basic” air conditioner, and on vehicles with a “deluxe” air conditioner, on which the retaining plate (right-side) with the control motors and the heater housing (right-side) are to be removed and installed one after the other) ⇒ “5.14.1 Removing and installing heater housing (right-side) - vehicles with air conditioner (basic version) or with retaining plate for control motors detached”, page 520
- The retaining plate for control motors (right-side) is only installed on vehicles with a “deluxe” air conditioner.

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Removing

– Switch on ignition.

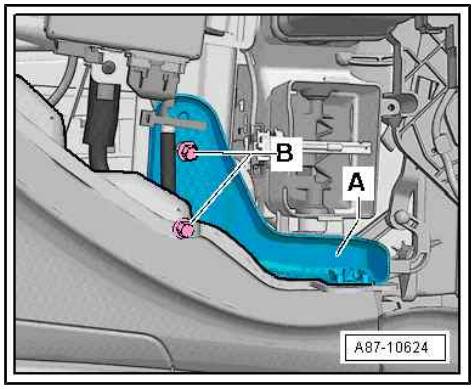
– Set air outflow direction on air conditioner operating and display unit (Climatronic control unit - J255-) to “DEF” (to windscreen).

– Set front passenger seat to rearmost position.

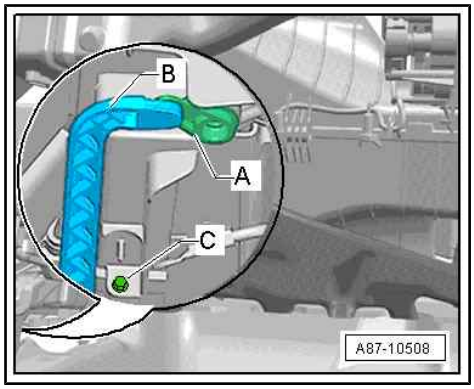
– Switch off ignition.

– Remove air intake box
⇒ “5.12 Removing and installing air intake box of heater and air conditioning unit”, page 512 .

– Unscrew 2 bolts -B- and detach bracket -A-.



– Carefully unclip connecting rod -B- from lever on right temperature flap -A- so that lever is not damaged.

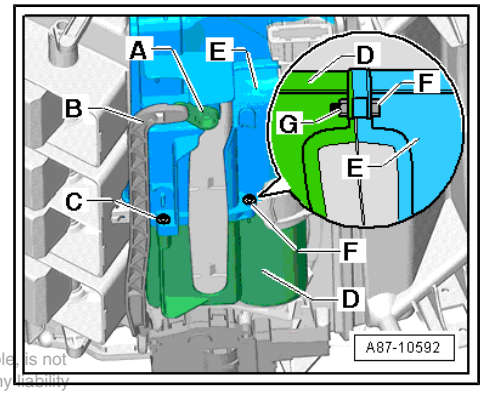


Note

Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .

– Loosen bolt -C- until bolt head makes contact with securing piece.

– Loosen bolt -F- until bolt head makes contact with securing piece (installed on vehicles from 07.2007 onwards, different versions).



Note

- *At the start of production, air conditioning units were installed in which the left and right sides of the heater housing -D- and -E- were bolted together on the underside only with bolt -C-. From 07.2007 onwards, air conditioning units are gradually introduced in which both heater housings -D- and -E- are bolted together additionally with bolt -F-.*
- *From 07.2007 to 09.2007, bolt -F- was fitted with hexagon nut -G- at heater housing (left-side) -D-. In heater housing (left-side) -D- there is only a hole instead of a threaded attachment point. For removing and fitting bolt -F- and hexagon nut -G- on vehicles with this version, control motor -V68- or -V137- must be removed ⇒ page 386 .*
- *A locking device is attached at the holes in the heater housing (right-side) -E- to prevent bolt -C- (and bolt -F-) from dropping out of the hole after being loosened.*

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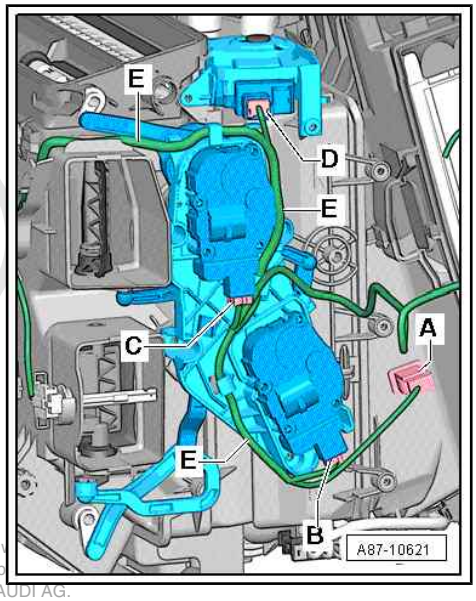
– Unplug connector -A- from evaporator output temperature sender - G263- ⇒ page 633 .
– To prevent interchange, mark connectors -B- (to right footwell flap control motor - V109-), -C- (to right centre vent control motor - V111-) and -D- (to right temperature flap control motor - V159-).
– Unplug connectors -B-, -C- and -D- from control motor.
– Unfasten wiring -E- from attachment points at retaining plate.



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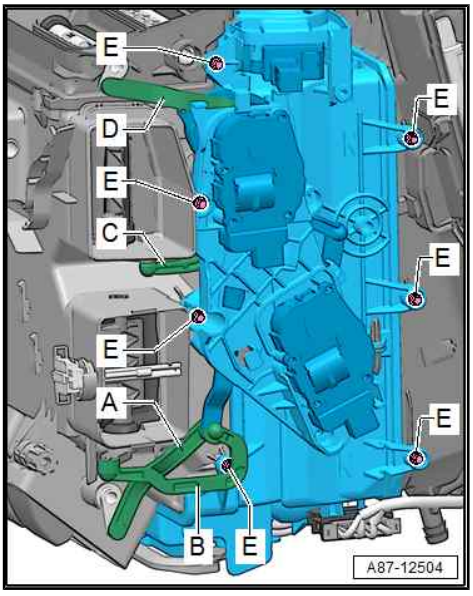
– Carefully unfasten all relevant connecting rods (-A- to -D-) from levers on corresponding flaps.

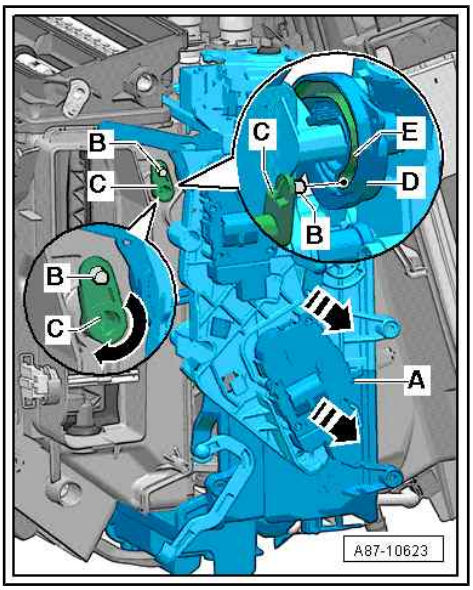


Note

- *The connecting rods (-A- to -D-) are clipped in at the levers. Unclip them carefully to avoid damaging the lever.*
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*

– Remove bolts -E-.
– On vehicles with auxiliary air heater element - Z35- , unfasten wiring to -Z35- from heater housing (right-side) ⇒ page 487 .

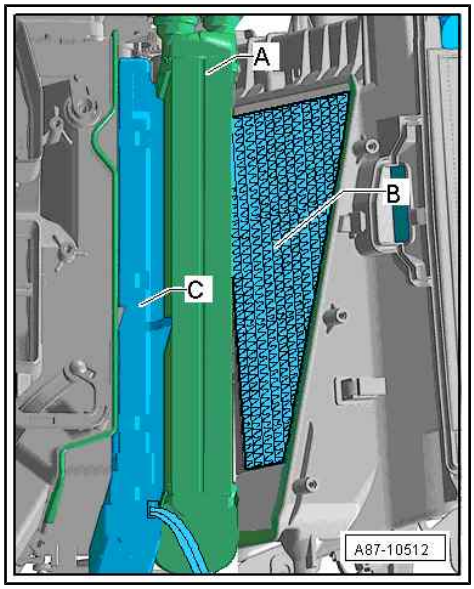
– Pull heater housing (right-side) -A- (with retaining plate, control motors and levers, cam plates and connecting rods) out of air conditioning unit in direction of -arrows-.



Installing

Install in reverse order of removal; note the following.

– Check heat exchanger -A- and evaporator -B- for dirt and clean these components if necessary.
– Check foam seals at heat exchanger -A- and at auxiliary air heater element - Z35- -C- (or at honeycomb element on vehicles without -Z35-) for damage.

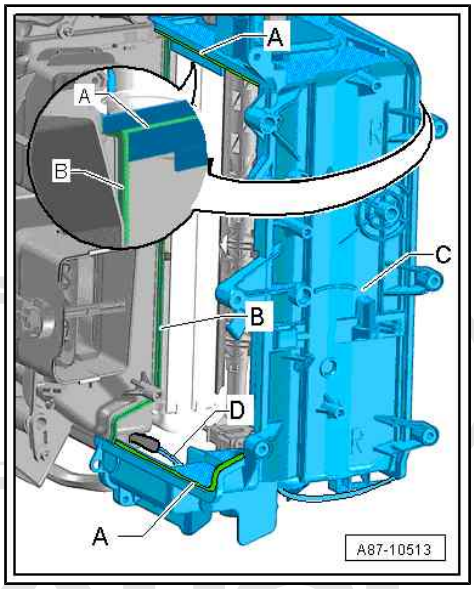


– Check tongues of air conditioning unit -B- and grooves -A- on heater housing (right-side) -C- for damage.

Note

If the groove -A- on the heater housing (right-side) -C- or the tongue on the air conditioning unit -B- is damaged, seal this area, e.g. with silicone adhesive sealant D176 001 A3 ⇒ Electronic parts catalogue .

– Insert grooves -A- on heater housing (right-side) in tongues on air conditioning unit -B- and slide heater housing (right-side) -C- slightly into air conditioning unit.



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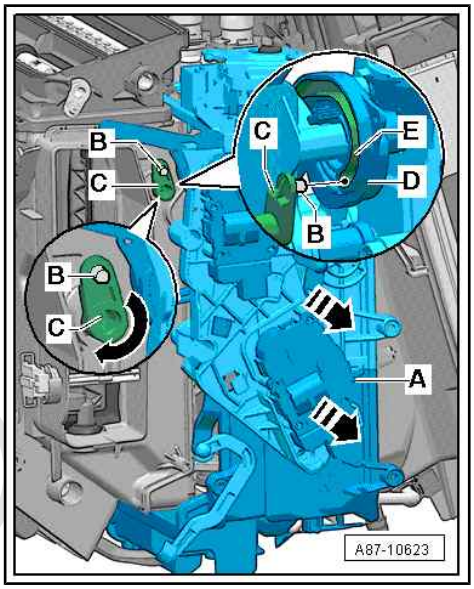
Note

- *On vehicles with auxiliary air heater element - Z35- , pay attention to wiring to -Z35- when inserting housing -C-.*
- *When inserting, pay attention to lever on flap for dash panel vent (centre right) -C- and to various connecting rods to flaps on air distribution housing.*

– Slide lever on flap for dash panel vent -C- as far as possible upwards (in direction of arrow).



Note

As the air outflow direction was set to "DEF" (to the windscreen) on the air conditioner operating and display unit (Climatronic control unit - J255-) before the heater housing was removed, the cam plate -D- is now positioned so that the pin -B- moves into the groove on the cam plate -E- when the heater housing is fitted.

– Position connecting rods to flaps so that they do not jam and are in the correct position when the heater housing is fully inserted.
– Carefully slide heater housing -A- as far as possible into air conditioning unit.
– Check position of pin -B- in groove of cam plate -E- with an illuminated angled mirror or an endoscope.

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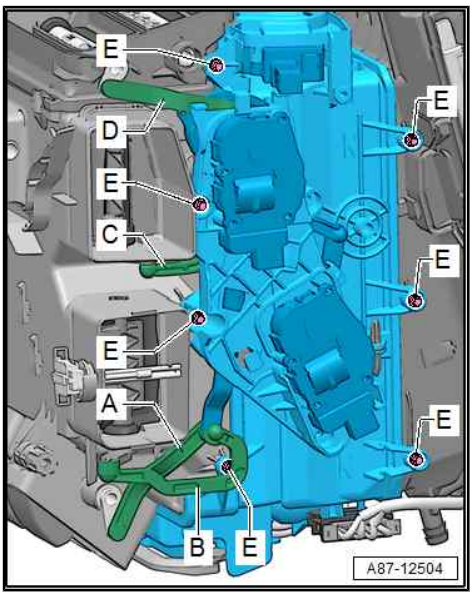
– Fit bolts -E-.
– Carefully clip in various connecting rods (-A- to -D-) at levers of corresponding flaps.

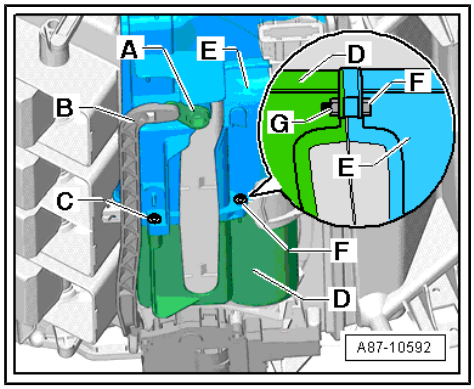


Note

- *The connecting rods (-A- to -D-) are clipped in at the levers. Clip them in carefully to avoid damaging the lever.*
- *Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .*

– Fit bolt -C- (and bolt -F-).

– Carefully clip in connecting rod -B- at lever of right temperature flap -A- so that lever is not damaged.



Note

Depending on the production period, there are different versions of the levers and connecting elements at the air conditioning unit ⇒ page 24 and ⇒ Electronic parts catalogue .

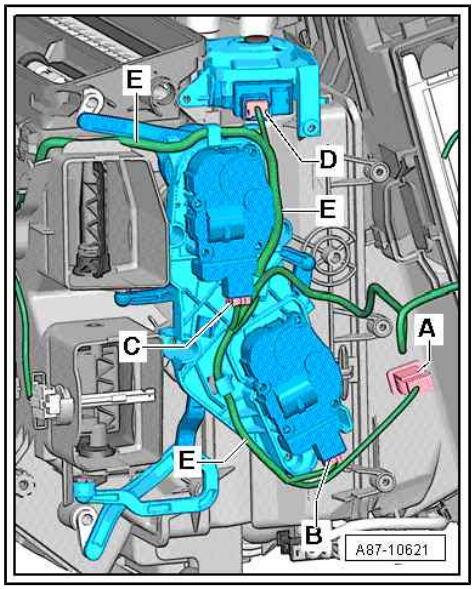
– Route wiring -E- in attachment points of retaining plate as shown in illustration so that they cannot make contact with moving components.

– Plug in connectors -B-, -C- and -D- in accordance with marks on control motors.

– Re-install all other components removed in reverse order.

– Switch on ignition.

– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .



Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

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– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Adjust different settings for air outflow direction to different vents on air conditioner operating and display unit (Climatronic control unit - J255-) and check whether the volume of air blown out of the vent changes in accordance with the different settings.

Tightening torques

- ⇒ “5.1 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 431

5.15 Removing and installing dust and pollen filter

Note

- *Replacement interval for dust and pollen filter ⇒ Maintenance tables*
- *The dust and pollen filter is available in different versions (with and without active charcoal filter insert). Vehicles with a "de-luxe" air conditioner are currently fitted with a dust and pollen filter with an activated charcoal filter insert, whereas vehicles with a "basic" air conditioner currently have a dust and pollen filter without activated charcoal filter insert ⇒ Electronic parts catalogue .*
- *Clean the area around the dust and pollen filter in the aperture of the air conditioning unit before fitting a new filter.*
- *On vehicles with special equipment for driving schools you may have to remove the additional pedals (some driving school pedals have detachable connections); refer to ⇒ Fitting instructions for equipment for driving schools .*
- *In model year 2012, a modified dust and pollen filter with ACF insert is gradually being introduced on vehicles with a "deluxe" air conditioner. This filter with an improved fine particulate filtration rate has approximately the same air resistance values as the filter fitted prior to the conversion and can therefore also be installed on vehicles manufactured prior to the conversion ⇒ Electronic parts catalogue .*
- *If requested by the customer, vehicles with a "basic" air conditioner fitted with a dust and pollen filter with no activated charcoal filter insert at the factory can also be fitted with a dust and pollen filter with activated charcoal filter insert ⇒ Electronic parts catalogue .*
- *Depending on the version, an additional dust filter may be fitted instead of the intake grille at the fresh-air intake in vehicles for certain countries with a high dust level in the ambient air (e.g. for China); check the dust filter and renew if necessary ⇒ "6.8 Removing and installing fresh air intake", page 572 .*

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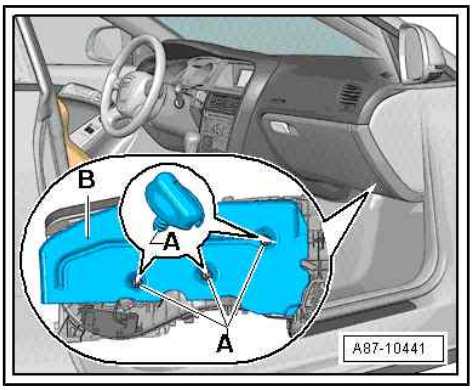
Removing

– Set front passenger seat to rearmost position.

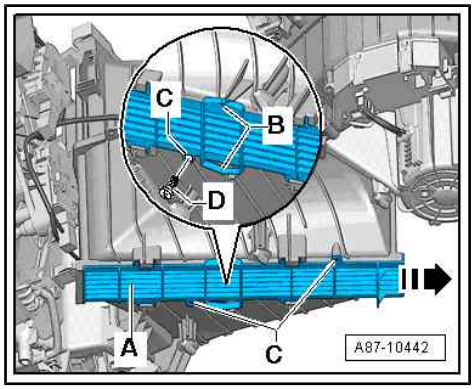
– Switch off ignition.

– Remove threaded fasteners -A- and detach insulating mat -B-.

– Cover floor covering beneath dust and pollen filter with paper.



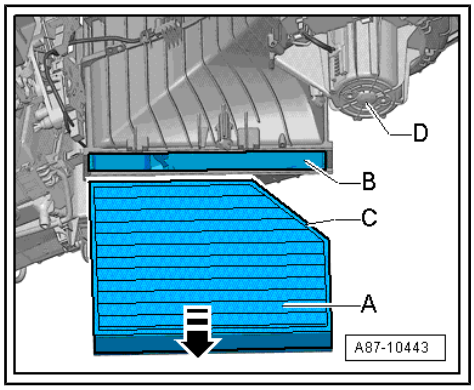
– Release tabs -B-, push cover -A- in direction of -arrow- and then remove cover.



Note

If the tabs -B- no longer hold properly, the cover -A- can be secured at the attachment points -C- with bolts -D-.

– Pull dust and pollen filter -A- out of aperture in air conditioning unit -B-.



Installing

Install in reverse order of removal; note the following.

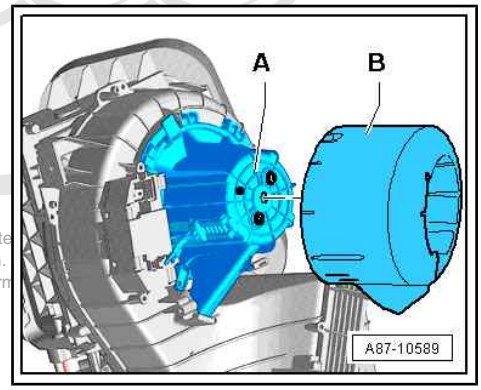
– Clean air conditioning unit via aperture -B- (e.g. with a vacuum cleaner) after removing dust and pollen filter -A-.

– Install dust and pollen filter -A- correctly (with diagonally cut side -C- facing fresh air blower -D-).

Note

- *The direction of air flow is not specified for the dust and pollen filter -A- for this vehicle (left-hand and right-hand drive vehicles are fitted with the same filter).*
- *There are different versions of the dust and pollen filter (without or with activated charcoal filter insert); observe correct version ⇒ Electronic parts catalogue .*

5.16 Removing and installing fresh air blower - V2-



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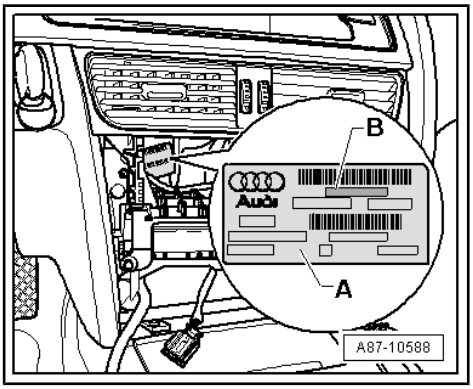

Note

- *Different versions of the fresh air blower - V2- are available as replacement parts. For correct version, refer to ⇒ Electronic parts catalogue .*
- *From 08.2007 onwards, fresh air blowers - V2- -A- fitted with an additional foam sheath -B- (to reduce noise) are gradually introduced ⇒ Electronic parts catalogue .*
- *From model year 2009 onwards, fresh air blower - V2- -A- with a modified housing (with optimised motor and adapted mounting for motor) is gradually introduced. When the modified -V2- is introduced, the additional foam sheath at the housing -B- is discontinued; however, due to the larger motor mounting, a modified insulating mat (see item -B- in following illustration) is installed ⇒ Electronic parts catalogue .*
- *From model year 2012 onwards and depending on the vehicle version, modified fresh air blower control units - J126- , fresh air blowers - V2- , air conditioner operating and display units (Climatronic control unit - J255-) and air conditioning units are introduced gradually. Make sure that the correct version is used and that the components are combined correctly ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The different versions of the air conditioning unit can be distinguished from the outside by the part number -B- on the label -A- ⇒ Electronic parts catalogue .*
- *The part number -B- on the label -A- can be read e.g. when the CD changer is removed (depending on vehicle equipment) ⇒ Communication; Rep. gr. 91 ; DVD/CD changer; Removing and installing CD changer .*
- *In model year 2010, petrol engines designed for operation with bioethanol were introduced gradually (Flex Fuel Vehicle). These engines are currently also fitted with an auxiliary air heater element - Z35- ⇒ page 482 .*
- *Vehicles with a high-voltage system (hybrid vehicles) and petrol engine are currently equipped with an auxiliary air heater element - Z35- to provide a supplementary heating function ⇒ page 482 .*
- *On vehicles with a petrol engine, the electric supplementary heater (auxiliary air heater element - Z35-) is activated by a signal from the operating and display unit (Climatronic control unit - J255-) via the local data bus (via the same output by which the fresh air blower control unit - J126- is activated) to the auxiliary air heater control unit - J604- . In the event of problems with the fresh air blower control unit - J126- or the fresh air blower - V2- on these vehicles, also check the auxiliary air heater control unit - J604- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *From model year 2012 onwards (introduction depending on vehicle version) modified fresh air blower control units - J126- (and fresh air blowers - V2- , air conditioner operating and display units (Climatronic control unit - J255-) and air conditioning units with part number “8T_ 820 005”) are introduced gradually. The air intake box has been modified together with -J126- and the air conditioning unit. Pay attention that the correct version is used and that the components are combined correctly ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

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- *If the allocation or adaption of -J255- and -J126- (with part number 8K0 820 521 or 8T0 820 521) is not as specified, the fresh air blower - V2- is not controlled by -J126- . Although in this case the activation of -V2- is not OK, an entry is not always made in the event memory. Therefore it is important to pay attention to the correct adaption of -J255- ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *Checking operation of auxiliary air heater element - Z35-* *⇒ page 482*

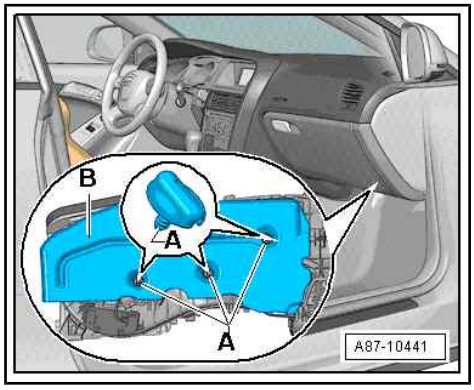
Removing

– Set front passenger seat to rearmost position.

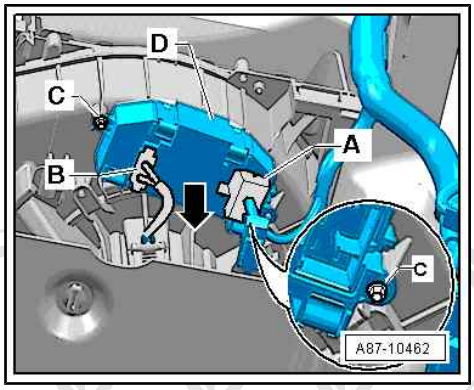
– Switch off ignition.

– Remove threaded fasteners -A- and detach insulating mat -B-.

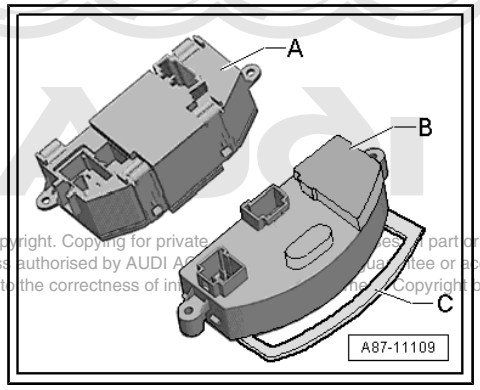
– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .



– Unplug connector -B- from fresh air blower control unit - J126- .



– Remove fresh air blower control unit - J126- (version -A-) ⇒ page 535 .



Note

From model year 2012 onwards (and depending on the vehicle version) modified fresh air blower control units - J126- -B- and fresh air blowers - V2- are introduced gradually. On modified version -B-, it is not always necessary to take out -J126- to remove -V2- .

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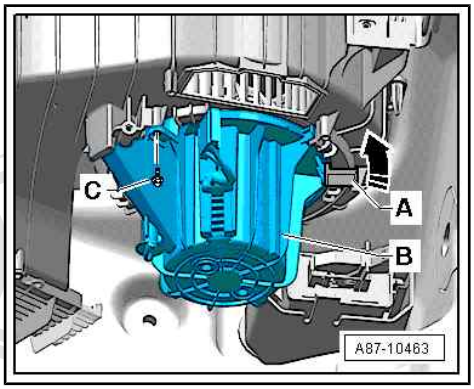
– Release fastener -A- and turn housing of fresh air blower - V2- -B- in direction of arrow.



Caution

Do not take hold of fan of fresh air blower - V2- . Applying force to fan or moving balancing weights attached to fan could cause imbalance and lead to operating problems.

Installing

Install in reverse order of removal; note the following.

– If fastener -A- breaks off or can no longer hold fresh air blower - V2- -B- in position, it can also be secured in air intake box with bolt -C-.

– When installing, make sure fresh air blower - V2- -B- is correctly positioned in air intake box.

– Switch on ignition.

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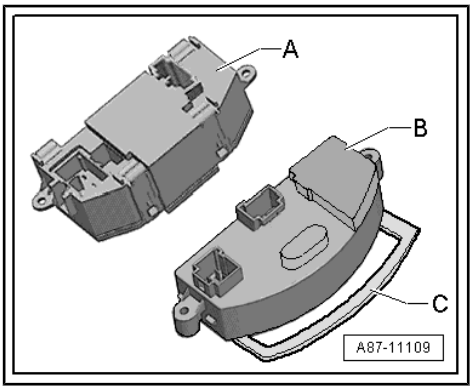
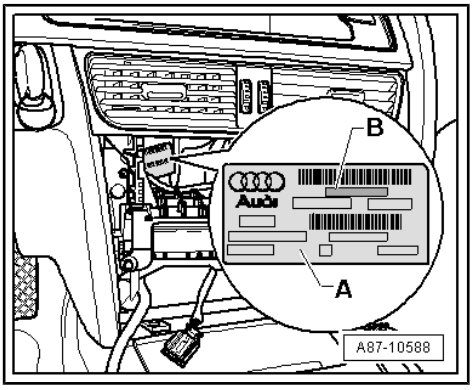
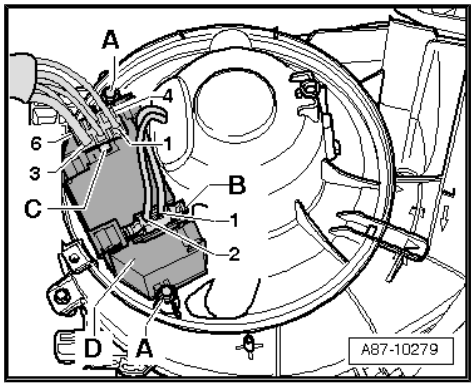
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– To check operation, perform final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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







Note

- *Different versions of the fresh air blower control unit - J126- are available as replacement parts (e.g. versions -A- and -B-); observe correct assignment ⇒ Electronic parts catalogue .*
- *Version -A- was fitted from the start of production until model year 2012. From model year 2012 onwards, version -A- is gradually being replaced by version -B- (conversion date depends on vehicle version). Version -B- is additionally fitted with a seal -C- ⇒ Electronic parts catalogue .*
- *From model year 2012 onwards (introduction depending on vehicle version) modified fresh air blower control units - J126- -B- (and fresh air blowers - V2- , air conditioner operating and display units (Climatronic control unit - J255-) and air conditioning units with part number "8T_ 820 005") are introduced gradually. The air intake box has been modified together with -J126- and the air conditioning unit. Pay attention that the correct version is used and that the components are combined correctly ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *If the allocation or adaption of -J255- and -J126- (with part number 8K0 820 521 or 8T0 820 521) is not as specified, the fresh air blower - V2- is not controlled by -J126- . Even if the activation of -V2- is not OK, an entry is not always made in the event memory. Therefore it is important to pay attention to the correct adaption of -J255- ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The different versions of the air conditioning unit can be distinguished from the outside by the part number -B- on the label -A- ⇒ Electronic parts catalogue .*
- *The part number -B- on the label -A- can be read e.g. when the CD changer is removed (depending on vehicle equipment) ⇒ Communication; Rep. gr. 91 ; DVD/CD changer; Removing and installing CD changer .*
- *The fresh air blower control unit - J126- (e.g. version -A-) relays the "positive" signal through from contact "4" of connector -C- to contact "1" of connector -B- when the ignition is switched on and the fresh air blower - V2- is activated. The speed of the fresh air blower - V2- is regulated by the fresh air blower control unit - J126- via the earth connection between contact "2" of connector -B- and contact "3" of connector -C- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *In model year 2010, petrol engines designed for operation with bioethanol were introduced gradually (Flex Fuel Vehicle). These engines are currently also fitted with an auxiliary air heater element - Z35- ⇒ page 482 .*
- *Vehicles with a high-voltage system (hybrid vehicles) and petrol engine are currently equipped with an auxiliary air heater element - Z35- to provide a supplementary heating function ⇒ page 482 .*

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- *On vehicles with a petrol engine, the electric supplementary heater (auxiliary air heater element - Z35-) is activated by a signal from the operating and display unit (Climatronic control unit - J255-) via the local data bus (via the same output by which the fresh air blower control unit - J126- is activated) to the auxiliary air heater control unit - J604- . In the event of problems with the fresh air blower control unit - J126- or the fresh air blower - V2- on these vehicles, also check the auxiliary air heater control unit - J604- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *Checking operation of auxiliary air heater element - Z35- ⇒ page 482*

Removing

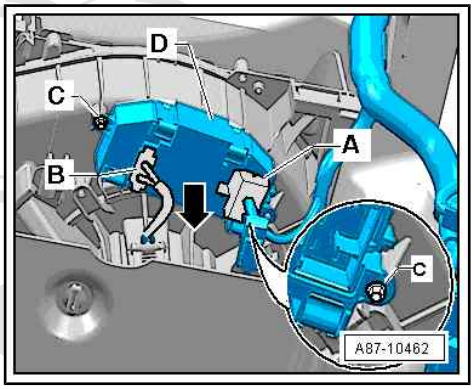
– Set front passenger seat to rearmost position.

– Switch off ignition.

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Unplug connectors -A- and -B-.

– Remove bolts -C-.



WARNING

The heat sink at the fresh air blower control unit - J126- may be hot.

– Remove fresh air blower control unit - J126- -D- from air intake box.

Installing

Install in reverse order of removal; note the following.

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– Switch on ignition.

– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– To check operation, perform final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

5.18 Preparations for removing heat exchanger

– Switch on ignition.

– Set air outflow direction on air conditioner operating and display unit (Climatronic control unit - J255-) to “DEF” (to windscreen).

– Set front passenger seat to rearmost position.

– Switch off ignition.

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles

⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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As work on the high-voltage system is required for the following sequence of operations, de-energise the high-voltage system ⇒ page 36 , ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system . Pay particular attention to the “General warning instructions for work on the high-voltage system” ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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

De-energising high-voltage system

DANGER!

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

- ***The high-voltage system may only be de-energised by a suitably qualified person (Audi high-voltage technician).***
- ***It must be definitely confirmed that the high-voltage system is de-energised. The system may only be de-energised using the vehicle diagnostic tester via "Guided Fault Finding".***
- ***The qualified person (Audi high-voltage technician) confirms that the system is de-energised and uses the locking cap - T40262- to ensure that the system cannot be re-energised. As an additional precaution, the ignition key and the maintenance connector for high-voltage system - TW- are then stored in a safe place by the qualified person.***
- ***The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.***

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Note

- *De-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - De-energise high-voltage system (Rep. gr. 93)`

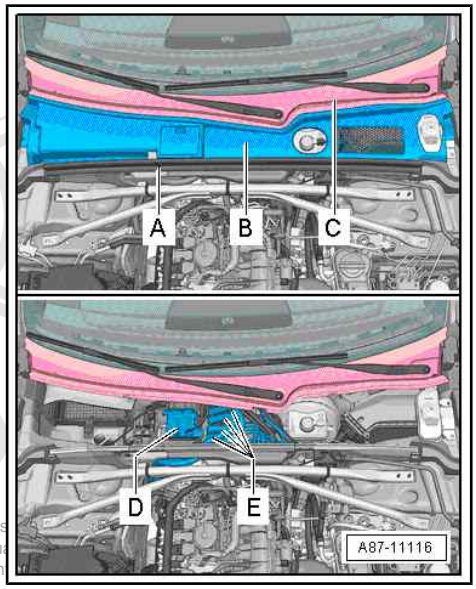
– Disconnect earth connection from battery - A- ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

– Remove rubber seal -A- and plenum chamber cover -B- (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

♦ After removing plenum chamber cover -B-, visually inspect high-voltage components -D- (in this case power and control electronics for electric drive - JX1-) and high-voltage wires -E- ⇒ page 41 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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

– Disconnect earth connection from battery - A- ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .



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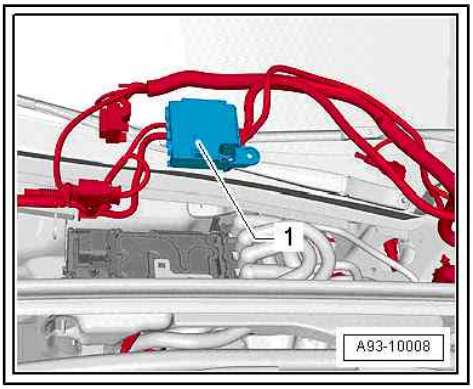
– Unfasten power distributor -1- and set it down together with wiring towards windscreen ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes .

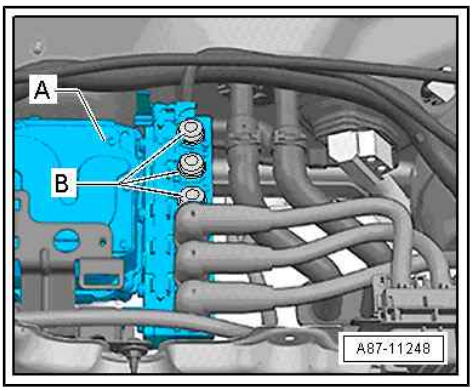
– Detach high-voltage wires to electrical air conditioner compressor - V470- and from drive battery - A2- from power and control electronics for electric drive - JX1- ⇒ Electrical system; Rep. gr. 93 ; High-voltage wires; Overview of fitting locations - high-voltage wires .

– Cover -JX1- and corresponding wiring to prevent damage or contamination ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .



Note

Use e.g. clean sealing plugs -B- (size 20) from engine bung set -JX1- for covering connections at -VAS 6122- -A-

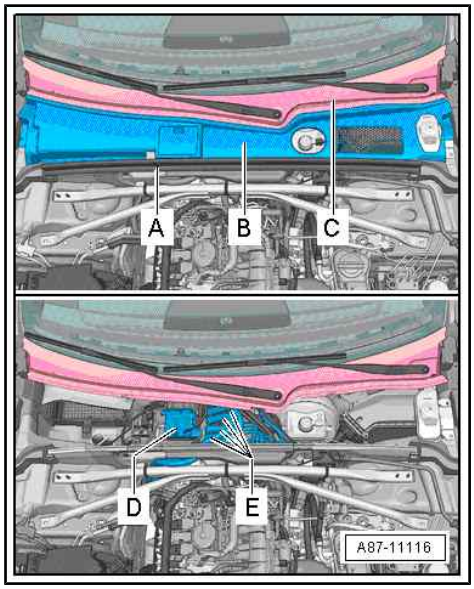


- When working in the vicinity of high-voltage components -D- and high-voltage wires -E-, always take care not to damage these components ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .
- After completing the work and before installing the plenum chamber cover -B-, visually inspect the high-voltage components -D- and the high-voltage wires -E- ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

Vehicles without high-voltage system

– Remove plenum chamber cover (not always necessary; different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

– Disconnect earth connection from battery - A- ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

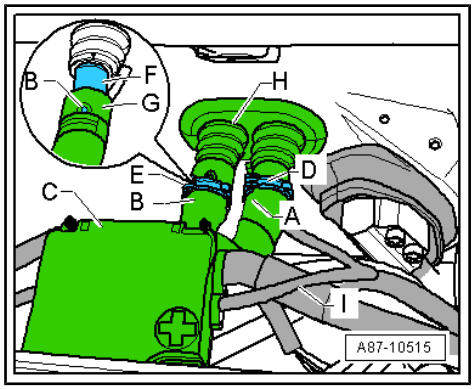


Note

The earth connection of the battery - A- is detached to prevent short circuits when the slave start socket -C- is removed.

– Remove cover for slave start socket -C-.

– Detach slave start socket -C- from dome brace and move to side ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes .



All vehicles

– Remove air intake box ⇒ page 512 .

– Unplug connector from evaporator output temperature sender - G263- ⇒ page 633 .

– Remove heater housing (right-side) ⇒ page 520 .

- Remove heat exchanger ⇒ page 543 .

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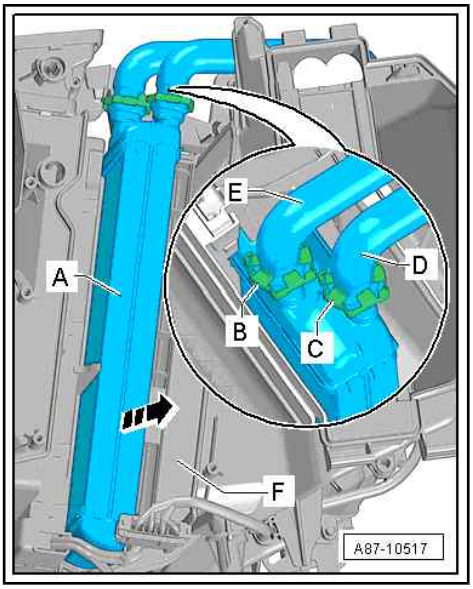
5.19 Removing and installing heat exchanger

Note

A heat exchanger installed at the factory cannot be removed and re-installed safely with the dash panel (and the air conditioning unit) installed due to clips -B- and -C- (not enough room for removal and installation). If the original factory-fitted heat exchanger is to be re-installed, the dash panel and the air duct to the "defrost" vent must be removed. Then attach the O-rings (moistened with a small quantity of coolant; as described for installation procedure for replacement heat exchanger) to the coolant pipes -D- and -E- and press the coolant pipes -D- and -E- (with the O-rings) from above into the connections at the heat exchanger -A-. Hold coolant pipes -D- and -E- in heat exchanger and fit clips -B- and -C-. Perform the remaining installation as described for the replacement heat exchanger.



Special tools and workshop equipment required

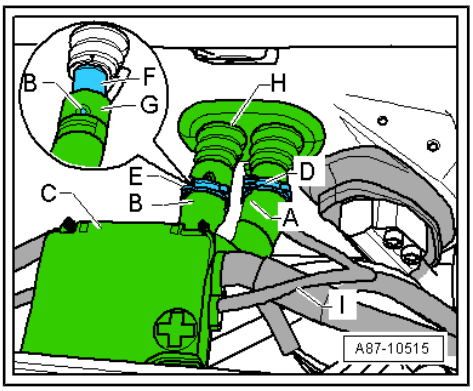
- Hose clamps up to Ø 25 mm - 3094- or hose clamps up to Ø 40 mm - 3093-
- Commercially available compressed-air gun with rubber mouthpiece
- Cooling system tester - V.A.G 1274- (and appropriate adapters)

Removing

– Perform preparations for removing heat exchanger ⇒ page 537 .

– Release pressure in the coolant circuit by opening the cap on the coolant expansion tank ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

– Mark arrangement of coolant hoses -A- (supply from cylinder head) and -B- (return to coolant pump).



Note

- *The heat exchanger is designed for a certain coolant flow direction. Therefore it is important to connect the coolant hoses correctly.*
- *Bleed coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .*

– Use hose clamps to pinch off coolant hoses -A- and -B-.

– Cover area beneath connections for coolant hoses -A- and -B- in plenum chamber e.g. with absorbent paper.

– Detach coolant hoses -A- and -B- from connections to heat exchanger of air conditioning unit ⇒ Rep. gr. 19 ; Cooling system/coolant .

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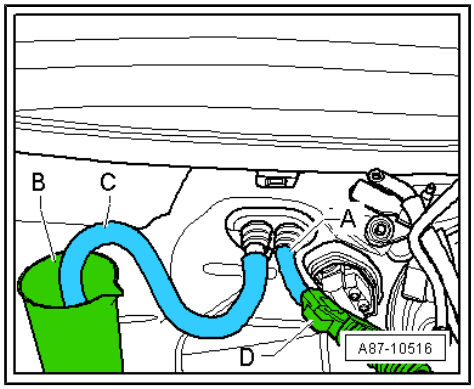
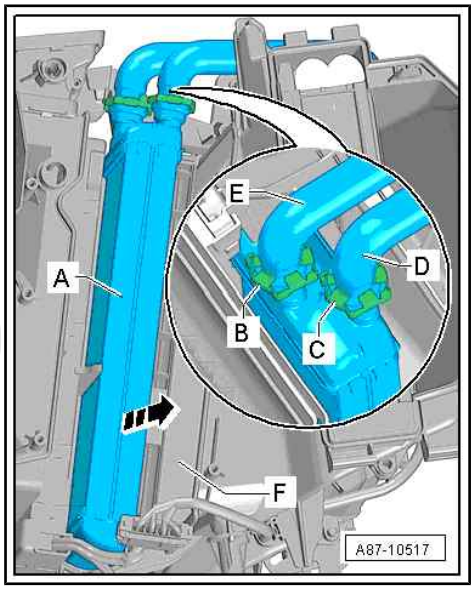
– Attach a section of tubing (-A- and -C-) to each of the two connections at the heat exchanger.
– Place a container -B- underneath other end of hose -C-.
– Use a compressed-air gun -D- to carefully blow coolant out of heat exchanger (into container -B-) via hose -A-.



– Detach clips -B- and -C- from connections at heat exchanger -A-.
– Unfasten two coolant pipes -D- and -E- from connections of heat exchanger -A-.
– Remove heat exchanger -A- in direction of -arrow-.



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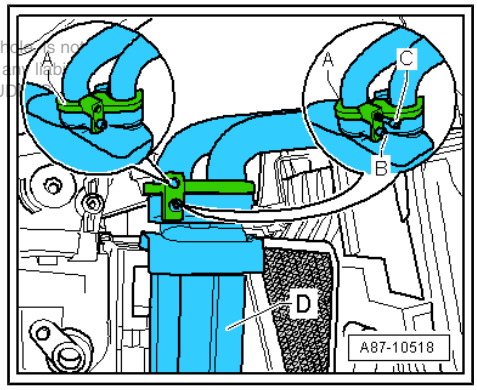
Note

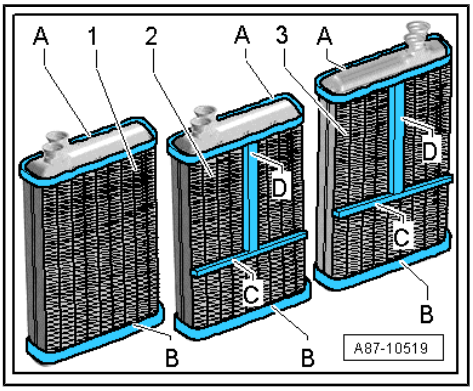
The top illustration shows a heat exchanger with connections as fitted at the factory. If the heat exchanger has already been renewed, the two coolant pipes in the replacement heat exchanger are held in position in the heat exchanger by a bracket -A-. Unscrew bolt -B- on this heat exchanger. Then screw in a longer bolt -C- (with M5 thread) as far as stop (as shown in illustration) and use this bolt to unfasten bracket -A- from connection.



Installing

Install in reverse order of removal; note the following.

– The heat exchanger to be installed must be fitted with foam seals -A- to -D- supplied depending on the vehicle and air conditioner version.



1 - Heat exchanger for left-hand-drive or right-hand-drive vehicles with “basic” air conditioner

2 - Heat exchanger for left-hand-drive vehicles with “deluxe” air conditioner

3 - Heat exchanger for right-hand-drive vehicles with “deluxe” air conditioner

– Check seals attached to heat exchanger. Only fit a heat exchanger if seals are undamaged and firmly attached.

Note

- *On vehicles with a “deluxe” air conditioner, different temperature settings are possible for the left and right side and the rear part of the passenger compartment. The seals -C- and -D- separate the air ducts in the air conditioning unit for these areas ⇒ “6.2 Air intake and air outlet openings”, page 558 .*
- *There is a coloured mark on the heat exchanger; seal -C- must be bonded onto this mark. Bond seal -D- onto centre of heat exchanger as shown in illustration.*
- *Seal -C- is available in different lengths (short version as shown, or long version which reaches all around heat exchanger). If a long sealing strip -C- is supplied together with the heat exchanger, bond it on all around the heat exchanger.*
- *The seal may curl up when it is inserted if it has not been bonded on properly.*
- *If the seal is damaged or has not been fitted properly, cold air can flow past the heat exchanger. On vehicles with a “deluxe” air conditioner, a proper separation of the different areas may then not be possible.*

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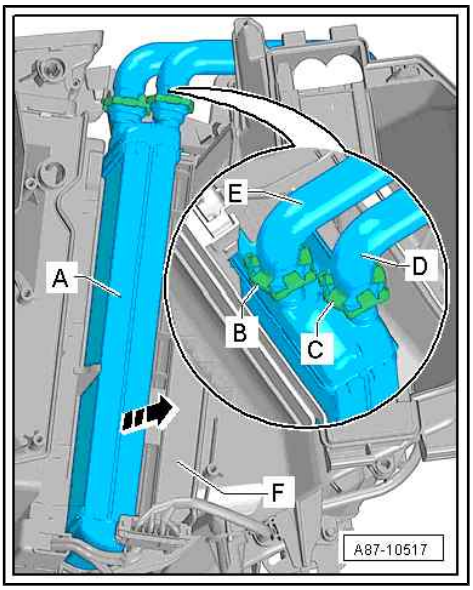
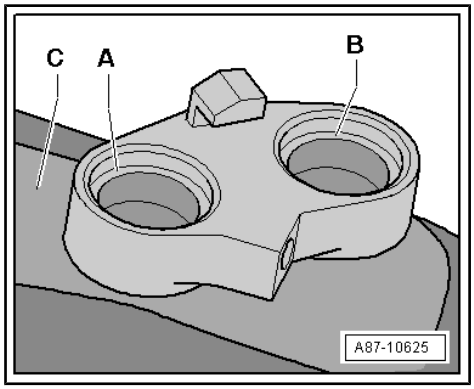
– With heat exchanger -A- removed, check air conditioning unit and evaporator -F- for dirt (through slot for heat exchanger).

– Remove any dirt or remnants of escaped coolant from the air conditioning unit (e.g. after removing a leaking heat exchanger).

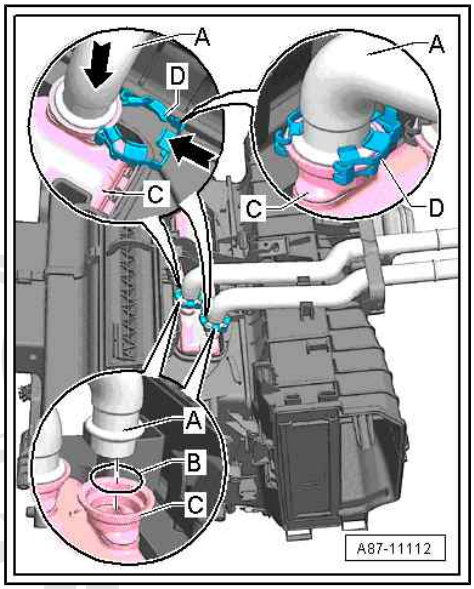


– Check the two connections -A- and -B- of the heat exchanger -C- for dirt or damage.
– Lubricate the two connections -A- and -B- of the heat exchanger -C- lightly with silicone grease.



Note

- *Silicone grease is available as a replacement part: part number G 000 405 A2 ⇒ Electronic parts catalogue .*
- *This illustration shows the connection area of an installed replacement heat exchanger.*
- *If the heat exchanger installed at the factory is to be re-used (e.g. after renewing the evaporator together with the evaporator housing with the air conditioning unit removed), the two O-rings -B- and the two clips for the coolant pipes -F- must be renewed. Install coolant pipes -A- with O-rings -B- and clips for coolant pipes -F- in heat exchanger ⇒ page 468 (Removing and installing evaporator housing).*



– Moisten new seals -D- supplied with heat exchanger lightly with coolant (or coat lightly with silicone grease).

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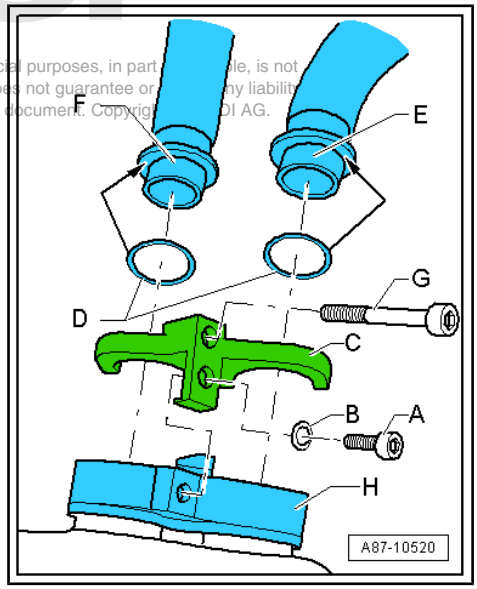
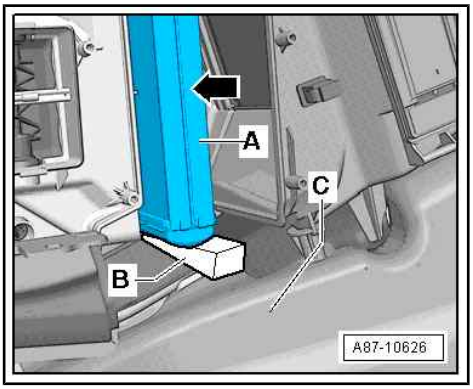
Note

This and the following illustrations show the connection area and the installation procedure for the coolant pipes on an installed replacement heat exchanger.

– Attach new seals -D- to the two coolant pipes -E- and -F- to heat exchanger.



– Slide heat exchanger -A- into air conditioning unit.
– Support heat exchanger -A- at centre tunnel -C-, e.g. with a plastic wedge -B-, so that it cannot slip down when the coolant pipes are pressed in.

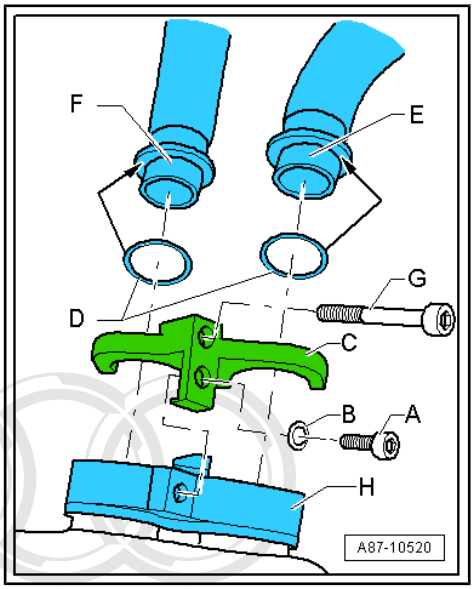


– Screw a longer bolt -G- (with M5 thread) as far as stop into bracket -C-, as shown in illustration.
– Insert the two coolant pipes -E- and -F- with corresponding seal -D- in heat exchanger connections at connecting flange -H- and press them in as far as stop.

Caution

Risk of leaks at heat exchanger.

- *Crushed O-rings and coolant pipes/clips that are not fitted straight or are not attached fully will lead to leaks.*



Note

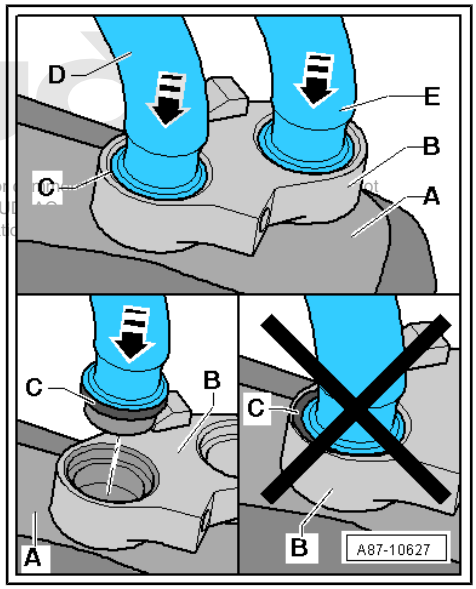
Do not tilt coolant pipes -D- and -E- when pressing them into the heat exchanger connections.

– Check position of seals -C- between coolant pipes -D- and -E- and connections at connecting flange -B- of heat exchanger -A-.

Caution

Seals -C- that are not fitted correctly or are crushed can cause leaks.

- *The seals -C- must be inserted completely in the connections in the connecting flange -B- with the coolant pipes -D- and -E-*



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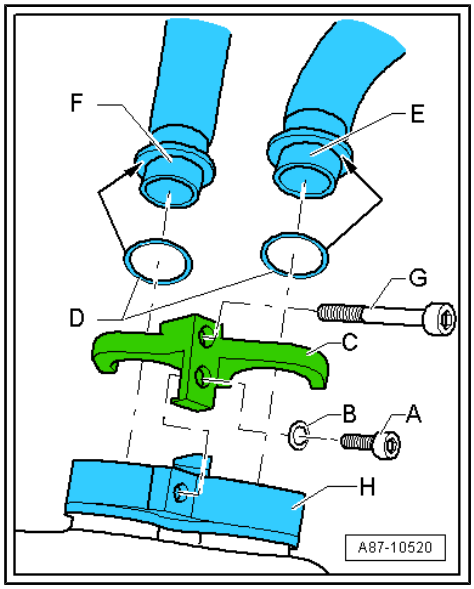
– Attach the two coolant pipes -E- and -F- with bracket -C- to connecting flange of heat exchanger -H-.



Note

The bolt -G- is an assembly aid and must be removed after installing the bracket.

– Insert bolt -A- with washer -B- and tighten bolt -A-.

Tightening torque of bolt -A-: 2.5 Nm

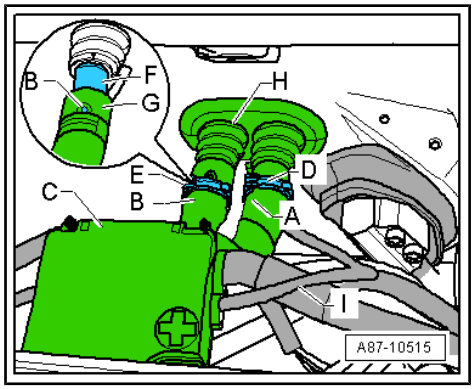
– Remove bolt -G-.

– Check that grommet -H- is correctly positioned in back wall of plenum chamber.

– Properly connect coolant hoses to heat exchanger, paying attention to markings.

A - Supply from cylinder head

B - Return to coolant pump



– Attach coolant hose -A- to coolant pipe going to heat exchanger (observe marking) and secure it with clip -D-.

– Slip coolant hose to heat exchanger -B- over coolant pipe -F- only so far that bleeder hole -G- is not sealed off.

– Detach hose clip from coolant hose -A-.

– Fill coolant into coolant expansion tank ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

– Using e.g. hand pump of cooling system tester - V.A.G 1274/- , carefully press coolant out of coolant expansion tank into heat exchanger.

– As soon as coolant emerges from bleeder hole -G-, attach coolant hose -B- to coolant pipe -F- according to mark made.

– Secure coolant hose -B- with clip -E- at marked location.

– Detach hose clamp from coolant hose -B-.

– If necessary, fill more coolant into coolant expansion tank ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

Note

This procedure completely bleeds the cooling system. If there is still air in the cooling system for other reasons, it may be necessary to bleed the cooling system again after installing all the components removed earlier ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

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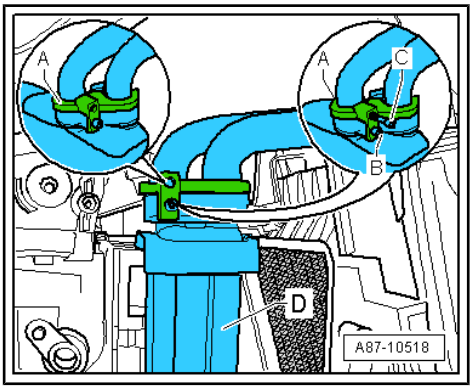
Check connections at heat exchanger for leaks as follows:

– Use e.g. hand pump of cooling system tester - V.A.G 1274/- to carefully increase pressure in coolant circuit.

– Check coolant circuit for leaks, paying particular attention to connection between coolant pipes and heat exchanger ⇒ Rep. gr. 19 ; Cooling system/coolant; Checking cooling system for leaks .



Note

- *When bleeding the coolant circuit, take particular care to ensure that the heat exchanger is bled completely. If there are still air bubbles in the heat exchanger, there may be complaints about a lack of heating output in winter or about differences in the temperature of the air flowing out of the vents with the same setting in control mode ⇒ page 490 .*
- *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.*

– Re-install all components removed in reverse order ⇒ page 537 (preparations for removing heat exchanger).

Vehicles with high-voltage system (hybrid vehicles)

– Attach high-voltage wires to electrical air conditioner compressor - V470- and from drive battery - A2- to power and control electronics for electric drive - JX1- ⇒ Electrical system; Rep. gr. 93 ; High-voltage wires; Overview of fitting locations - high-voltage wires .

– Install cowl panel trim -C- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

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– Check that power and control electronics for electric drive - JX1- -D- and corresponding wiring -D- are fitted correctly ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

– Re-energise power supply of high-voltage system ⇒ Electrical system; Rep. gr. 93 ; De-energising high-voltage system .

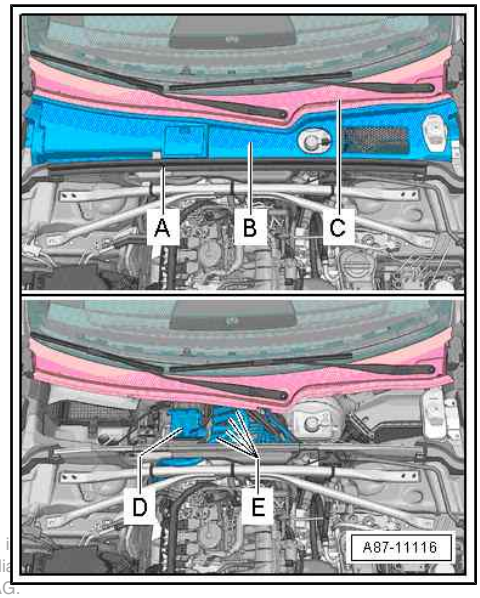
Re-energising high-voltage system

DANGER!

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock.

- ***The high-voltage system may only be re-energised by a suitably qualified person (Audi high-voltage technician).***
- ***The system may only be re-energised using the vehicle diagnostic tester via "Guided Fault Finding".***
- ***The vehicle is then made ready for operation again by the qualified person (Audi high-voltage technician).***
- ***The qualified person (Audi high-voltage technician) marks the vehicle by attaching the appropriate warning signs.***



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Note

- *Re-energising high-voltage system:*
- *Connect vehicle diagnostic tester*
- *Select* `Guided Fault Finding` *mode*
- *Using the* `Go to` *key, select the following menu items in succession*
- `Function/component selection`
- `Body`
- `Electrical system`
- `Self-diagnosis compatible systems`
- `8C - Hybrid battery management -J840`
- `8C - Hybrid battery management, functions`
- `51 - Re-energise high-voltage system (Rep. gr. 93)`

Vehicles without high-voltage system

– Re-connect earth connection of battery - A- , paying attention to notes on connecting the battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

All vehicles

– Switch on ignition.

– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

- *The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the air conditioning unit during basic setting; only then can it be activated by the air conditioner operating and display unit (Climatronic control unit - J255-); currently all control motors are identical ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *While you are performing the basic setting, the control motors are assigned and adapted in accordance with the series connection of the wiring. If the sequence is not as specified, the control motors will not be adapted properly and the flaps will not be controlled correctly ⇒ page 30 (overview of air conditioner control motors).*

– Switch on ignition.

– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Adjust different settings for air outflow direction to different vents on air conditioner operating and display unit (Climatronic control unit - J255-) and check whether the volume of air blown out of the vent changes in accordance with the different settings.

5.20 Removing and installing condensation drain

Removing

– Switch off ignition.

– Remove glove box (to remove condensation drain on right side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove storage compartment beneath dash panel on driver side (to remove condensation drain on left side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel trim (driver side) .

– Carefully fold back floor covering in area of condensation drain hose (left or right) until condensation drain is visible ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .

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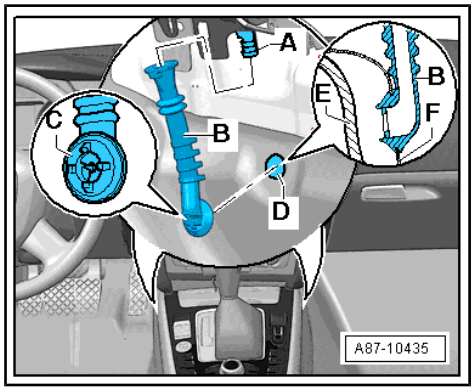


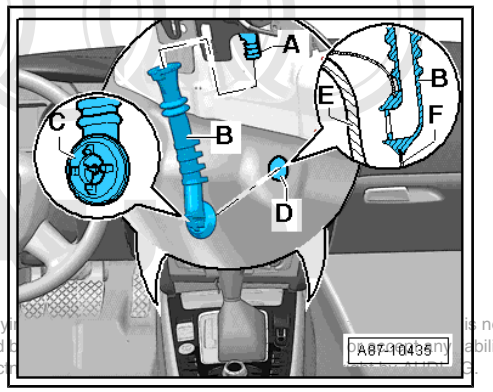
- Check that both condensation drain hoses -B- are routed correctly and not dirty. For example, eliminate any cross-sectional constrictions.
- Cover area beneath the two openings -D- (for drain holes of condensation drain -C-) with absorbent paper to prevent any water from running beneath floor covering.
- Remove the two condensation drain hoses -B-.
- Use e.g. a piece of wire to check for dirt in the two condensation drains of the air conditioning unit -A-.
- Check distance between insulating mat -E- in centre tunnel and end of condensation drain hose -C- via openings -D- in floor panel -F-. There must be enough of a gap for condensate to drain out of condensation drain hose -B-.

Installing

Install in reverse order of removal; note the following.

- Install the two condensation drain hoses -B- so that they are not twisted or crushed (different versions for left and right sides) ⇒ Parts catalogue .
- When fitting floor covering, take particular care to ensure that it does not squash condensation drain hose -B-.
- If a condensation drain hose -B- is not fitted securely enough to the condensation drain of the air conditioning unit -A-, secure it e.g. with a clip if necessary to prevent it from slipping off.

5.21 Checking condensation drain



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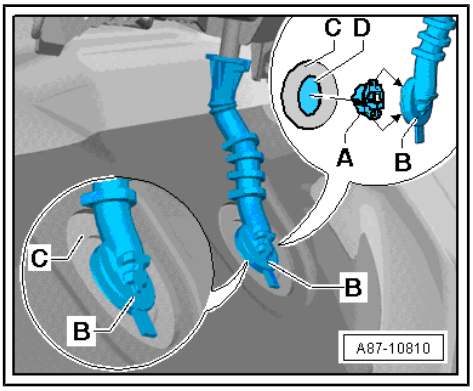

Note

- *This vehicle is fitted with two condensation drains (on right and left of air conditioning unit/centre tunnel).*
- *There is no valve and no flap at the outlet opening -C- of the condensation drain hose -B-; the condensation drains off via the rubber lips.*
- *There are different versions of the condensation drain hoses -B-. On version 1 (see illustration above), the condensation drain -B- is inserted directly in the opening -D-. On version 2, retainer -A- is inserted in condensation drain -B-. The retainer -A- is held in position in the opening -D- in the floor panel -C- via the retaining tabs on the retainer -A-. To prevent condensation from escaping from the condensation drain -B- into the passenger compartment, the condensation drain -B- must be pressed firmly against the floor panel -C- after fitting the bracket -A-. If not sufficiently tensioned, seal the joint between the two components with silicone adhesive sealant D176 001 A3 or similar ⇒ Electronic parts catalogue .*

If there are problems with moisture in the passenger compartment, check the following in addition to the condensation drain:

– Water drains for plenum chamber ⇒ page 579

– Cowl panel trim and cover for fresh-air intake duct for correct installation and damage ⇒ page 572

– Dust and pollen filter for dirt and correct installation ⇒ page 531

– Forced ventilation vents in luggage compartment ⇒ page 568

– Activation and operation of air flow/fresh air flaps ⇒ page 390 and air recirculation flap ⇒ page 405 is performed e.g. via “Final control diagnosis” function of Guided Fault Finding ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

- If there are problems with moisture in the passenger compartment which only occur when the air conditioner compressor is switched on and under certain ambient conditions, also check the temperature of the air flowing out of the evaporator as follows:

– In “Read measured value block” function of "Guided Fault Finding", select measured value block with measured value for evaporator output temperature sender - G263- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Check the temperature of the air flowing out of the evaporator under the usage conditions described by the customer or with the following settings on the air conditioner operating and display unit (Climatronic control unit - J255-): “Auto” mode, air conditioner compressor switched on (indicator lamp in AC/A/C button on), “cold” temperature setting, medium fresh air blower speed with a voltage of approx. 7 V at the fresh air blower - V2- , fresh air mode (indicator lamp in “air recirculation” button off) and dash panel vents open.

– If the measured value for the sender is too low (at ambient temperatures above 0 °C, colder than 0 °C for lengthy period) or too high (above e.g. 10 °C although air conditioner is functioning properly), eliminate cause of deviation; observe notes on checking cooling output ⇒ page 71 .

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6 Air duct system

⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 554

⇒ “6.2 Air intake and air outlet openings”, page 558

⇒ “6.3 Removing and installing footwell vent (driver side)”, page 565

⇒ “6.4 Removing and installing footwell vent (front passenger side)”, page 566

⇒ “6.5 Installing plugs in air duct to centre vent”, page 566

⇒ “6.6 Removing and installing forced ventilation vents in passenger compartment”, page 567

⇒ “6.7 Checking forced ventilation vents in passenger compartment”, page 568

⇒ “6.8 Removing and installing fresh air intake”, page 572

⇒ “6.9 Removing and installing intake duct”, page 576

⇒ “6.10 Removing and installing plenum chamber water drain”, page 577

⇒ “6.11 Checking plenum chamber water drain”, page 579

⇒ “6.12 Cleaning plenum chamber water drain”, page 583

⇒ “6.13 Removing and installing dash panel vents and rear vent”, page 587

⇒ “6.14 Connection for glove box cooling at air intake box”, page 587

⇒ “6.15 Masking slots of air duct to vents (rear)”, page 588

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

Note

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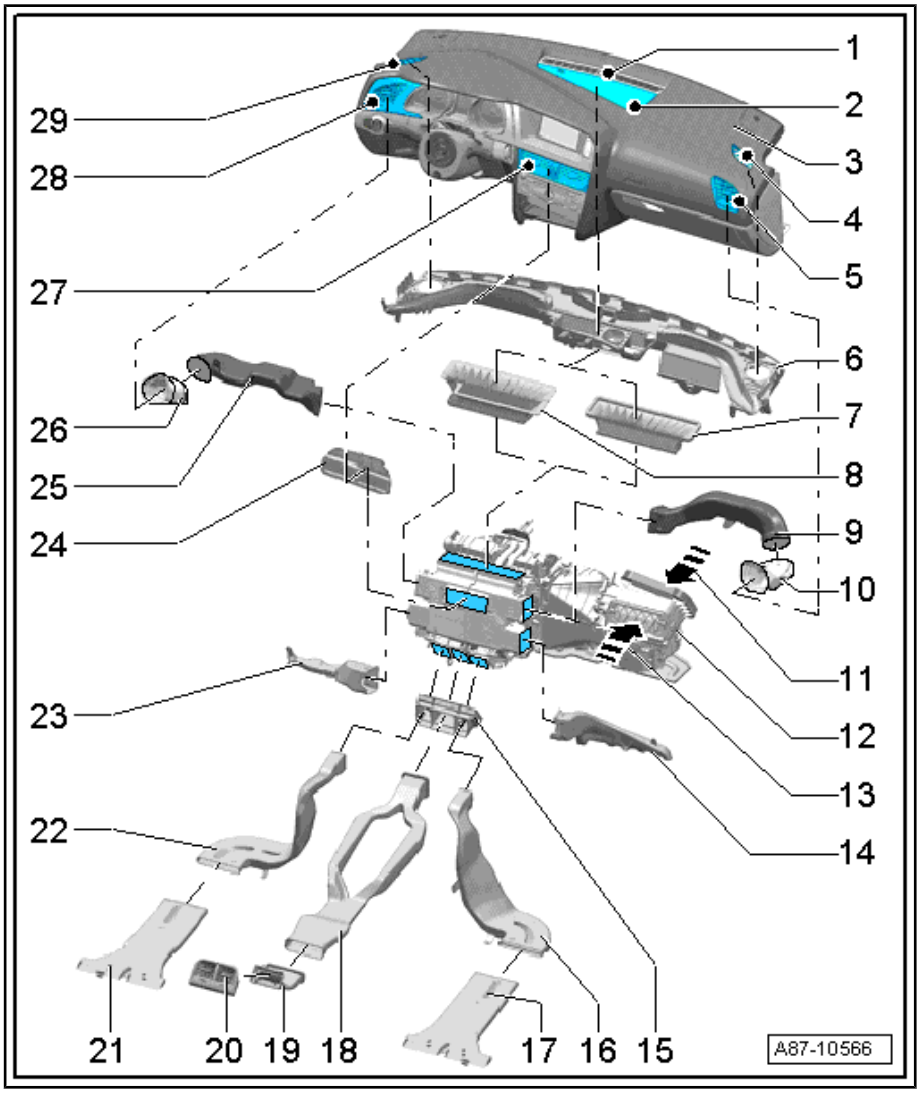
- *⇒ “6.2 Air intake and air outlet openings”, page 558*
- *Fitting locations of individual components ⇒ “1.2 Overview of fitting locations - components in passenger compartment (front)”, page 130 and ⇒ “4 Control motors”, page 372*
- *The passenger compartment is ventilated via two ventilation frames (on left and right of luggage compartment in area of bumper) ⇒ page 568 (forced ventilation of passenger compartment).*
- *The routing of air flow and the air distribution in the passenger compartment is different on vehicles with a “deluxe” or “basic” air conditioner.*
- *From 01.2008 onwards, air conditioning units with an additional connection for glove box cooling are being introduced gradually. This connection is sealed with a plug on vehicles without glove box cooling ⇒ page 587 .*
- *The following illustrations show the layout of the components on an Audi A5 Coupé. The layout may differ slightly on the Audi A5 Sportback, Audi A4, Audi Q5, etc. However, the components must be removed and installed in the same manner as described for the Audi A5 Coupé (unless indicated otherwise).*



1 - Defroster vent/windscreen

- ❑ Air duct to windscreen
- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing defroster vent (front centre)
- ❑ If the air duct/defroster intermediate piece (⇒ Item 8 (page 556) and ⇒ Item 7 (page 556)) is crushed or squashed during the installation of the dash panel, this will result in uneven or inadequate routing of air flow to the windscreen ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel

2 - Indirect ventilation vent

- ❑ Only installed on vehicles with “deluxe” air conditioner
- ❑ On vehicles with a “deluxe” air conditioner, air emerges via this vent. On vehicles with a “basic” air conditioner, the opening in the air conditioning unit is sealed off (different versions of air conditioning unit).

3 - Dash panel

- ❑ With air ducts to defroster vents and various dash panel vents
- ❑ Different versions depending on version of air conditioner (“deluxe” and “basic”) ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel

4 - Defroster vent/side window (right-side)

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

5 - Dash panel vent (right-side)

- ❑ Removing and installing dash panel vents ⇒ page 587 and ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel vents

6 - Air duct/dash panel

- ❑ With air ducts to defroster vents and various dash panel vents
- ❑ Different versions depending on version of air conditioner (“deluxe” and “basic”) ⇒ Electronic parts catalogue
- ❑ The air duct is part of the dash panel ⇒ Item 3 (page 555) and cannot be renewed separately ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel .
- ❑ Removing and installing dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel

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7 - Air duct/defroster intermediate piece (“basic” version)

- ❑ Different versions depending on version of air conditioner (“deluxe” and “basic”) ⇒ Electronic parts catalogue
- ❑ Remove dash panel before removing and installing this component ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
- ❑ If the air duct/defroster intermediate piece is crushed or squashed during the installation of the dash panel, this will result in uneven or inadequate routing of air flow to the windscreen ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

8 - Air duct/defroster intermediate piece (“deluxe” version)

- ❑ Different versions depending on version of air conditioner (“deluxe” and “basic”) ⇒ Electronic parts catalogue
- ❑ Remove dash panel before removing and installing this component ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
- ❑ If the air duct/defroster intermediate piece is crushed or squashed during the installation of the dash panel, this will result in uneven or inadequate routing of air flow to the windscreen ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

9 - Air duct to dash panel vent (right-side)

- ❑ Removing and installing ⇒ page 512 (Removing and installing air intake box of air conditioning unit)

10 - Air duct to dash panel vent (right-side)

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

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11 - Fresh air intake

- ❑ Air is drawn in from plenum chamber ⇒ page 572 .

12 - Air conditioning unit with air intake box

- ❑ Different versions depending on version of air conditioner (“deluxe” and “basic”) ⇒ page 431 and ⇒ Electronic parts catalogue
- ❑ Removing and installing air conditioning unit ⇒ page 496
- ❑ Removing and installing air intake box ⇒ page 512
- ❑ Air intake, air outlet and routing of air flow in air conditioning unit ⇒ page 558

13 - Air intake from passenger compartment (air recirculation mode)

- ❑ The air is drawn in underneath the glove box from the passenger's footwell.

14 - Front right footwell vent

- ❑ Removing and installing ⇒ page 566

15 - Air duct to vents (rear)

- ❑ Different versions depending on version of air conditioner (“deluxe” and “basic”) ⇒ Electronic parts catalogue
- ❑ On vehicles with a “basic” air conditioner, there is no air duct and no vent in the centre console (rear).

Note

This air duct is engaged in the air outlet opening of the air conditioning unit. For this purpose, there are slots in the air duct. If the flaps are positioned inconveniently, in particular on vehicles with a “deluxe” air conditioner, whistling noises might be caused at these slots in certain settings. For this reason, the top slots are covered with adhesive tape during production (gradual introduction of adhesive tape from February 2009 onwards) ⇒ page 588 .

16 - Air duct to rear right footwell vent

- ❑ Removing and installing, removing floor covering ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering

17 - Footwell vent (rear right)

- ❑ Air emerges beneath front passenger's seat.
- ❑ Removing and installing, removing floor covering ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering

Note

The rear right footwell vent can be removed towards the rear without having to take out the carpet (connecting web on carpet must be cut through). Re-secure the connecting web using a suitable adhesive after installing the footwell vent.

18 - Air duct to vent in rear centre console

- ❑ Removing and installing, removing centre console (rear) ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .
- ❑ Only fitted on vehicles with air conditioner version “deluxe”

19 - Air duct to vent in rear centre console

- ❑ Removing and installing, removing centre console (rear) ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .
- ❑ Only fitted on vehicles with air conditioner version “deluxe”

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20 - Vent in rear centre console

- ❑ Removing and installing ⇒ page 587 and ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Exploded view - centre console
- ❑ Only fitted on vehicles with “deluxe” air conditioner (opening in centre console is sealed off on vehicles with “basic” air conditioner)
- ❑ With potentiometer for rear temperature selection - G538-
- ❑ The potentiometer for rear temperature selection - G538- is part of the vent and cannot be renewed separately ⇒ Electronic parts catalogue .

21 - Footwell vent (rear left)

- ❑ Air emerges beneath driver's seat.
- ❑ Removing and installing, removing floor covering ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering

Note

The rear left footwell vent can be removed towards the rear without having to take out the carpet (connecting web on carpet must be cut through). Re-secure the connecting web using a suitable adhesive after installing the footwell vent.

22 - Air duct to rear left footwell vent

- ❑ Removing and installing, removing floor covering ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering

23 - Front left footwell vent

- ❑ Removing and installing ⇒ page 565

24 - Air duct to centre dash panel vent

- ❑ On vehicles with “basic” air conditioner, centre vent temperature sender - G191- is fitted in this air duct ⇒ page 632 .

- ❑ On vehicles with a “deluxe” air conditioner, the opening for the centre vent temperature sender - G191- in the air duct is sealed with a plug (-G191- is not fitted in this case)⇒ Electronic parts catalogue .

Note

There is an opening in this air duct. At this opening whistling noises might occur in certain settings. For this reason, this opening is sealed with a plug during production (gradual introduction from February 2009 onwards) ⇒ page 566 .

25 - Air duct to dash panel vent (left-side)

- ❑ Remove dash panel before removing and installing this component ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

26 - Air duct to dash panel vent (left-side)

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

27 - Dash panel vent (centre)

- ❑ Removing and installing dash panel vents ⇒ page 587 and ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel vents

28 - Dash panel vent (left-side)

- ❑ Removing and installing dash panel vents ⇒ page 587 and ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel vents

29 - Defroster vent/side window (left-side)

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

6.2 Air intake and air outlet openings

Note

- ♦ *Routing of air flow and air distribution in passenger compartment ⇒ page 554*
- ♦ *For fitting locations of individual components, refer to ⇒ page 130 (Components of air conditioner components in passenger compartment) and ⇒ page 372 (Components of air conditioning unit and air intake box).*
- ♦ *The routing of air flow and the air distribution in the passenger compartment is different on vehicles with a “deluxe” or “basic” air conditioner.*

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Air intake and air outlet openings and air conditioning unit
⇒ page 559

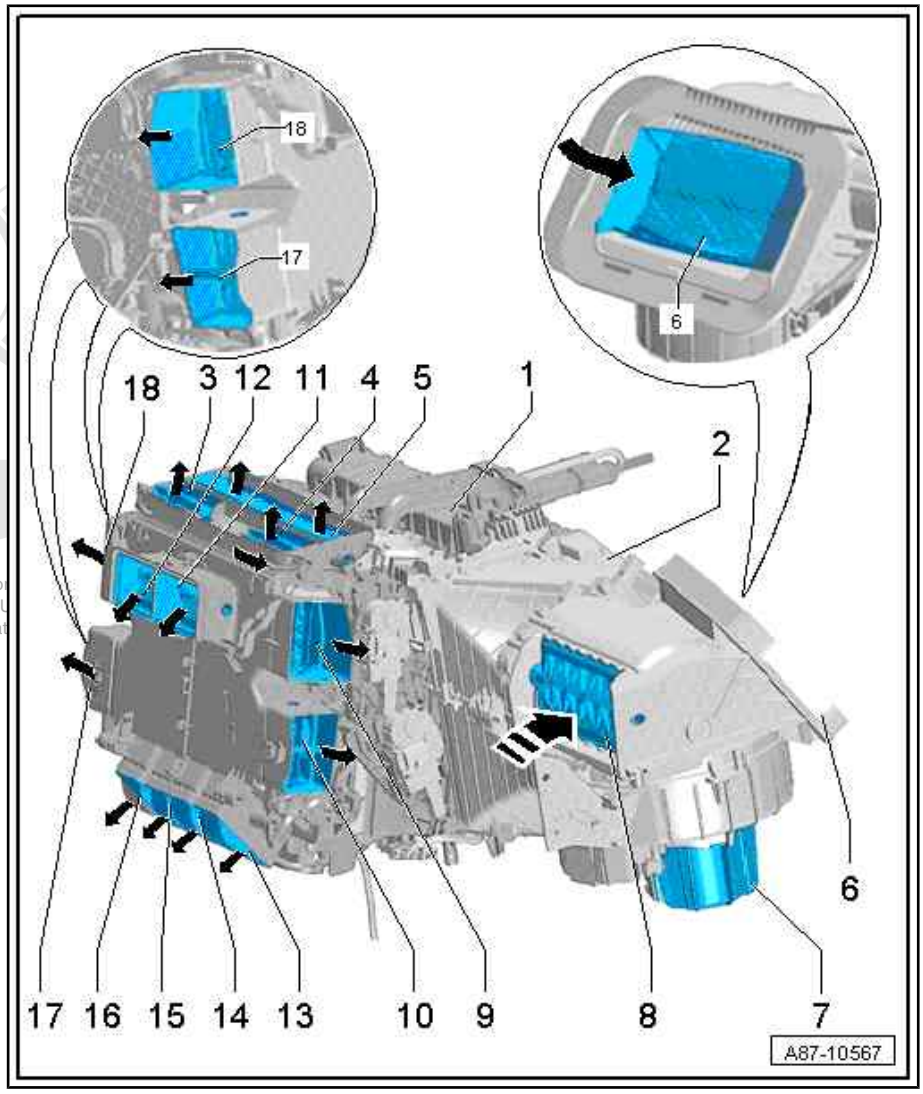
Routing of air flow in air intake box and air conditioning unit
⇒ page 561

Temperature flaps in heater housing (left and right)
⇒ page 563

Air intake and air outlet openings and air conditioning unit

Note

- *This illustration shows the “deluxe” version of the air conditioning unit; some of the illustrated ventilation openings do not exist on the “basic” version.*
- *Actuation of the various flaps in the vents and the temperature flaps differs with “basic” or “deluxe” version.*
- *From 01.2008 onwards, air conditioning units with an additional connection for glove box cooling are being introduced gradually. This connection is sealed with a plug on vehicles without glove box cooling ⇒ page 587 .*



1 - Air conditioning unit

- ❑ Different versions depending on version of air conditioner (“deluxe” or “basic”) ⇒ page 431 (dismantling and assembling air conditioning unit) and ⇒ Electronic parts catalogue
- ❑ Removing and installing air conditioning unit ⇒ page 496

2 - Air intake box

- ❑ Removing and installing ⇒ page 512
- ❑ Dismantling and assembling ⇒ page 442

3 - Air outlet to indirect ventilation vent (left-side)

- ❑ Only fitted on vehicles with “deluxe” air conditioner (not fitted on “basic” version)
- ❑ Different air temperatures are possible for the left and right sides depending on the setting ⇒ page 439 .

4 - Air outlet to indirect ventilation vent (right-side)

- ❑ Only fitted on vehicles with “deluxe” air conditioner (not fitted on “basic” version)
- ❑ Different air temperatures are possible for the left and right sides depending on the setting ⇒ page 439 .

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5 - Air outlet to dash panel defroster vent

- Different air temperatures are possible for the left and right sides depending on the setting ⇒ page 439 .

6 - Fresh air intake

- Air is drawn in from plenum chamber ⇒ page 572 .

7 - Fresh air blower - V2-

8 - Air intake from passenger compartment (air recirculation mode)

- The air is drawn in underneath the glove box from the passenger's footwell.

9 - Air outlet to dash panel vent (right-side)

- On the “basic” version of the air conditioner, the flaps in the vents to the left and right dash panel vents are connected via a connecting rod ⇒ page 439 .

10 - Air outlet to footwell vent (front right)

- On the “basic” version of the air conditioner, the flaps in the vents to the front left and right footwell are connected via a connecting rod ⇒ page 439 .

11 - Air outlet to dash panel vent (centre right)

- On the “deluxe” version, different air temperatures are possible for the left and right side depending on the setting ⇒ page 439 .
- On the “basic” version of the air conditioner, a joint vent is provided for the left and right side, and there is only one flap installed ⇒ page 439 .

12 - Air outlet to dash panel vent (centre left)

- On the “deluxe” version, different air temperatures are possible for the left and right side depending on the setting ⇒ page 439 .
- On the “basic” version of the air conditioner, a joint vent is provided for the left and right side, and there is only one flap installed ⇒ page 439 .

13 - Air outlet to footwell vent (rear right)

- On the “basic” version of the air conditioner, the flaps in the vents to the rear left and right footwell are connected via the shaft ⇒ page 439 .
- On the “deluxe” version, different air temperatures are possible for the front and rear depending on the setting ⇒ page 439 .

14 - Air outlet to vent in centre console (rear right)

- Only fitted on vehicles with “deluxe” air conditioner (not fitted on “basic” version)
- Different air temperatures are possible for the front and rear depending on the setting ⇒ page 439 .

15 - Air outlet to vent in centre console (rear left)

- Only fitted on vehicles with “deluxe” air conditioner (not fitted on “basic” version)
- Different air temperatures are possible for the front and rear depending on the setting ⇒ page 439 .

16 - Air outlet to footwell vent (rear left)

- On the “basic” version of the air conditioner, the flaps in the vents to the rear left and right footwell are connected via the shaft ⇒ page 439 .
- On the “deluxe” version, different air temperatures are possible for the front and rear depending on the setting ⇒ page 439 .

17 - Air outlet to footwell vent (front left)

- On the “basic” version of the air conditioner, the flaps in the vents to the front left and right footwell are connected via a connecting rod ⇒ page 439 .

18 - Air outlet to dash panel vent (left-side)

- On the “basic” version of the air conditioner, the flaps in the vents to the left and right dash panel vents are connected via a connecting rod ⇒ page 439 .

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Routing of air flow in air intake box and air conditioning unit

Note

- *This illustration shows the “deluxe” version of the air conditioning unit; various components are not fitted on the “basic” version.*
- *Actuation of the various flaps in the vents and the temperature flaps differs with “basic” or “deluxe” version.*
- *To illustrate the routing of air flow in the air intake box and air conditioning unit, the two components are shown in the form of sectional views “A - A” and “B - B”.*
- *From 01.2008 onwards, air conditioning units with an additional connection for glove box cooling are being introduced gradually. This connection is sealed with a plug on vehicles without glove box cooling* ⇒ page 587 .
- *This illustration shows an air conditioning unit without connection for glove box cooling. On vehicles with glove box cooling, the cooled air routed into the glove box is tapped directly downstream of the evaporator* ⇒ Item 8 (page 561) .

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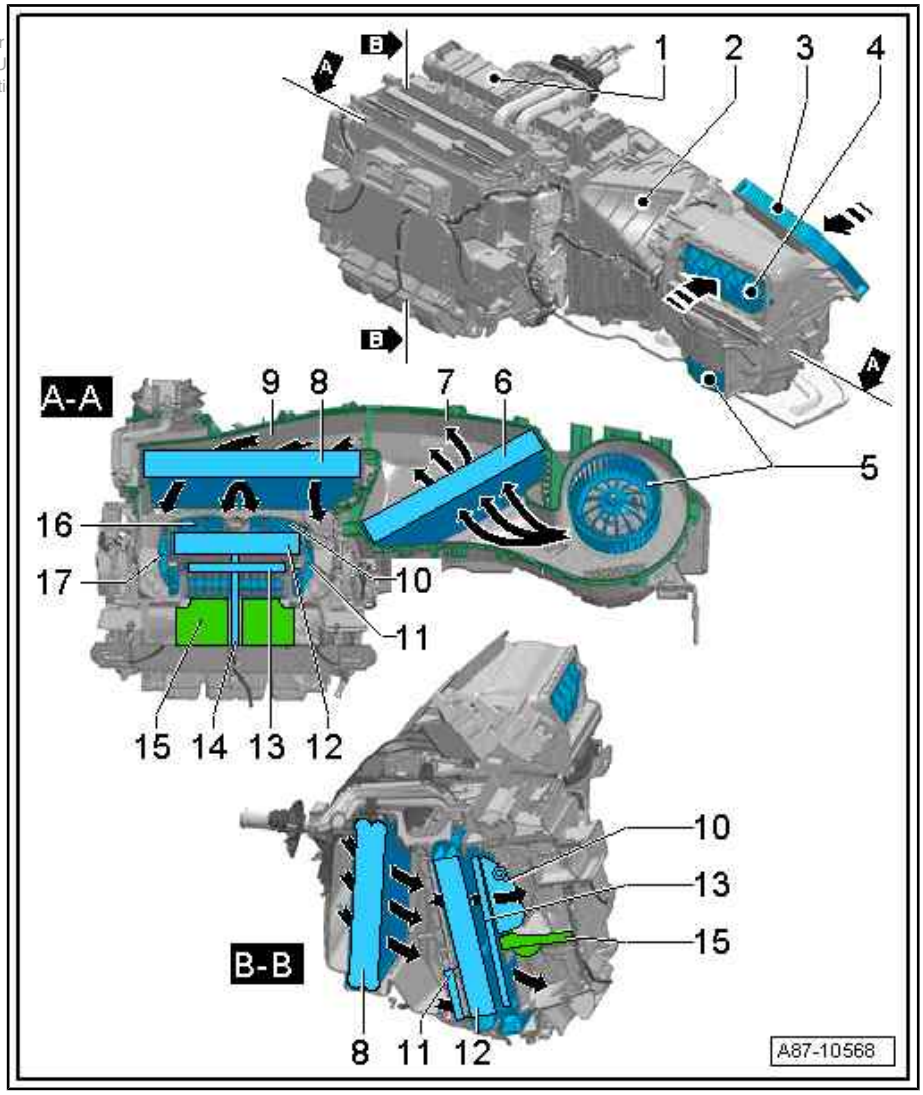

1 - Air conditioning unit

- ❑ Different versions depending on version of air conditioner (“deluxe” and “basic”) ⇒ page 431 and ⇒ Electronic parts catalogue

2 - Air intake box

3 - Fresh air intake

- ❑ Air is drawn in from plenum chamber ⇒ page 572 .

4 - Air intake from passenger compartment (air recirculation mode)

- ❑ When air recirculation flap is open, air is drawn in beneath glove box from passenger's footwell
- ❑ Illustration shows the air recirculation flap in “closed” position.

5 - Fresh air blower - V2-

6 - Dust and pollen filter

- ❑ There are different versions of the dust and pollen filter (with or without activated charcoal filter insert) ⇒ page 104 and ⇒ Electronic parts catalogue .

7 - Air intake box, bottom section (with fitted components)

- ❑ This illustration shows an “A - A” sectional view of the air intake box.

8 - Evaporator

9 - Air conditioning unit, bottom section (with fitted components)

- ❑ This illustration shows an “A - A” sectional view of the air conditioning unit.

10 - Temperature flap for front right vents

- ❑ This illustration shows temperature flap in “heating” position.
- ❑ On the “deluxe” version of the air conditioner, the front right and left temperature flaps are actuated by one control motor each. The two temperature flaps for the rear vents are connected via a connecting rod and activated by another control motor ⇒ page 431 .
- ❑ On vehicles with a “basic” version of the air conditioner, the front temperature flaps and the temperature flap for the rear footwell vents are connected via the shaft. The shafts of the right and left temperature flaps are connected via a connecting rod and actuated by one control motor ⇒ page 431 .
- ❑ Temperature flaps in heater housing (left and right) ⇒ page 563

11 - Temperature flap for rear right vents

- ❑ This illustration shows temperature flap in “cooling” position.
- ❑ Notes on activation of temperature flaps ⇒ Item 10 (page 562)

12 - Heat exchanger for heater

- ❑ Removing and installing heat exchanger with air conditioning unit installed ⇒ page 543
- ❑ Different foam seals depending on air conditioner version (“deluxe” or “basic”) ⇒ page 543

13 - Auxiliary air heater element - Z35- /honeycomb element

The auxiliary air heater element - Z35- is installed on vehicles with a diesel engine and vehicles with certain petrol engines ⇒ page 482 .

Vehicles with petrol engine (without auxiliary air heater element - Z35-) are fitted with a honeycomb element as spacer element in the unused space (this ensures identical flow conditions in air conditioning unit with and without auxiliary air heater element - Z35-).

- ❑ If, on vehicles with diesel engine, an auxiliary heater fitted as optional extra is activated as a supplementary heater, there is no auxiliary air heater element - Z35- but only a honeycomb element (introduction not yet finalised) ⇒ page 482 .
- ❑ Different foam seals depending on air conditioner version (“deluxe” or “basic”) ⇒ page 487

Note

- ♦ *In model year 2009, a modified version of the auxiliary air heater element - Z35- with slightly smaller heating elements is gradually being introduced; observe the correct version and assignment ⇒ Electronic parts catalogue .*
- ♦ *From model year 2010 onwards, petrol engines designed for operation with bioethanol have been introduced gradually (Flex Fuel Vehicle). These engines are currently also fitted with an auxiliary air heater element - Z35- ⇒ page 482 .*
- ♦ *Vehicles with a high-voltage system (hybrid vehicles) and petrol engine are currently equipped with an auxiliary air heater element - Z35- to provide a supplementary heating function ⇒ page 482 .*

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14 - Partition

- ❑ Only fitted on vehicles with “deluxe” air conditioner (not fitted on “basic” version; in this case only one temperature setting is possible for all vents).
- ❑ On the “deluxe” version, this partition separates the air duct to the left and right vents and is necessary to permit different air outflow temperatures. The temperature of the air emerging depends on the position of the corresponding temperature flaps ⇒ Item 10 (page 562) .

15 - Partition

- ❑ Only fitted on vehicles with “deluxe” air conditioner (not fitted on “basic” version; in this case only one temperature setting is possible for all vents).
- ❑ On the “deluxe” version, this partition separates the air duct to the front and rear vents and is necessary to permit different air outflow temperatures at the front and rear (depending on the position of the corresponding temperature flap ⇒ Item 10 (page 562)).

16 - Temperature flap for vents (rear left)

- ❑ This illustration shows temperature flap in “heating” position.
- ❑ Notes on actuation of temperature flaps ⇒ Item 10 (page 562)

17 - Temperature flap for vents (front left)

- ❑ This illustration shows temperature flap in “cooling” position.
- ❑ Notes on actuation of temperature flaps ⇒ Item 10 (page 562)

Temperature flaps in heater housing (left and right)

Note

- ◆ *On the “deluxe” version of the air conditioner, the front right (⇒ Item 1 (page 564)) and front left (⇒ Item 2 (page 564)) temperature flaps are actuated by one control motor each (right temperature flap control motor - V159- and left temperature flap control motor - V158-). The two temperature flaps for the rear right vents ⇒ Item 3 (page 564) and rear left vents ⇒ Item 4 (page 564) are connected via a connecting rod and actuated by the rear temperature flap control motor - V137- ⇒ page 431 .*
- ◆ *On the “basic” version of the air conditioner, the temperature flap for the right dash panel vents ⇒ Item 1 (page 564) and the right footwell vents (front and rear) ⇒ Item 3 (page 564) as well as the temperature flap for the left dash panel vents ⇒ Item 2 (page 564) and the left footwell vents (front and rear) ⇒ Item 4 (page 564) are connected via the shafts (⇒ Item 13 (page 565) and ⇒ Item 12 (page 565)). The shafts of the right (⇒ Item 3 (page 564)) and left (⇒ Item 4 (page 564)) temperature flaps are connected via a connecting rod and are jointly actuated by the temperature flap control motor - V68- ⇒ page 431 .*

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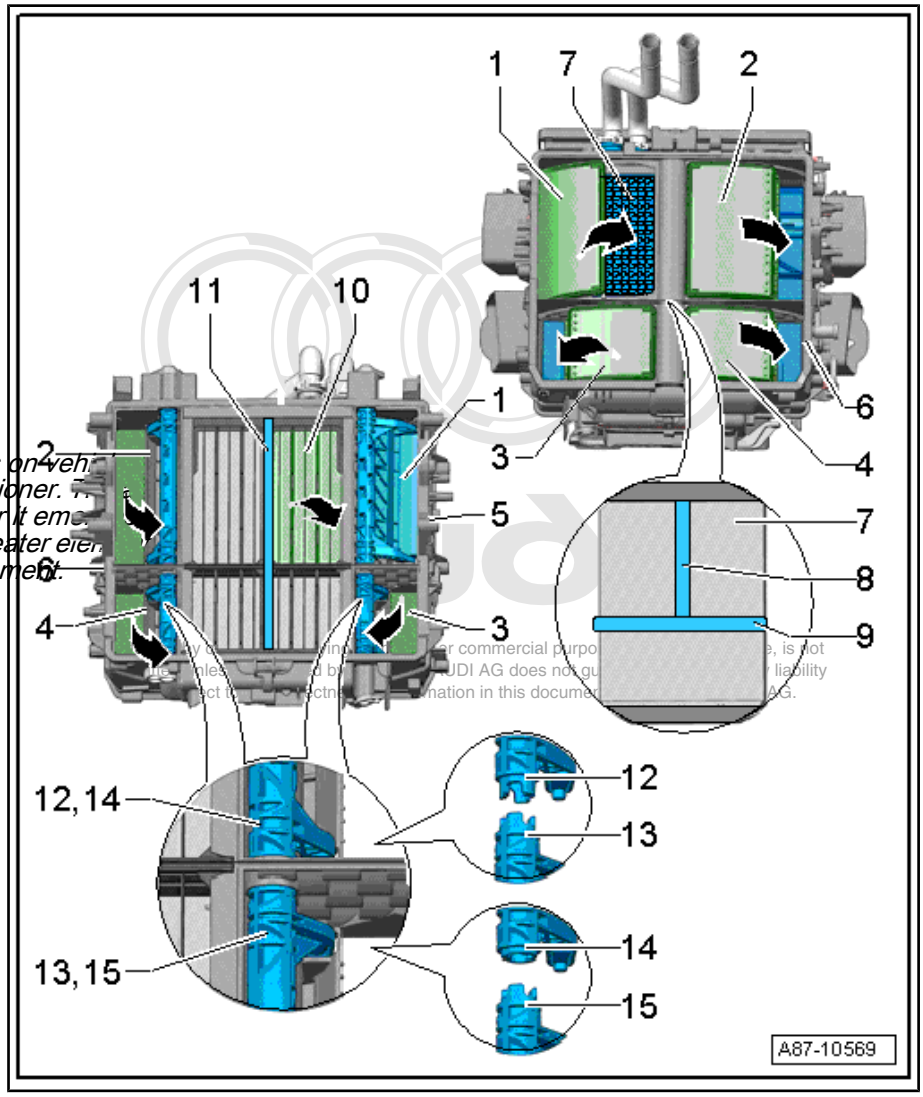


1 - Temperature flap (top right)

- For dash panel vents (right and centre right) and footwell vents (front right) on “deluxe” air conditioner
- For dash panel vents (right and centre) on “basic” air conditioner
- This illustration shows temperature flap in “heating” position.

Note

There are no partitions on veh... with a “basic” air conditioner. ... is therefore mixed after it em... from the auxiliary air heater ele... - Z35- /honeycomb element.

2 - Temperature flap (top left)

- For dash panel vents (left and centre left) and footwell vents (front left) on “deluxe” air conditioner
- For dash panel vents (left and centre) ⇒ Item 1 (page 564) on “basic” air conditioner
- This illustration shows temperature flap in “cooling” position.

3 - Temperature flap (bottom right)

- For footwell vents (rear right) on “deluxe” air conditioner
- For front and rear footwell vents (right-side) ⇒ Item 1 (page 564) on “basic” air conditioner
- This illustration shows temperature flap in “cooling” position.

4 - Temperature flap (bottom left)

- For footwell vents (rear left) on “deluxe” air conditioner
- For front and rear footwell vents (left-side) ⇒ Item 1 (page 564) on “basic” air conditioner
- This illustration shows temperature flap in “heating” position.

5 - Heater housing (right-side)

- Different versions depending on version of air conditioner (“deluxe” or “basic”)

6 - Heater housing (left-side)

- Different versions depending on version of air conditioner (“deluxe” or “basic”)

7 - Heat exchanger for heater

- Different foam seals depending on air conditioner version (“deluxe” or “basic”) ⇒ page 543

8 - Foam seal

- Only on vehicles with “deluxe” air conditioner (to separate left and right side of air duct)

9 - Foam seal

- Only on vehicles with “deluxe” air conditioner (to separate front and rear section of air duct)

10 - Auxiliary air heater element - Z35- /honeycomb element

- Different foam seals depending on air conditioner version (“deluxe” or “basic”) ⇒ page 487

Note

In model year 2009, a modified version of the auxiliary air heater element - Z35- with slightly smaller heating elements is gradually being introduced; observe the correct version and assignment ⇒ Electronic parts catalogue .

11 - Foam seal

- ❑ Only on vehicles with “deluxe” air conditioner (to separate left and right side of air duct)

12 - Upper temperature flap shaft

- ❑ On “basic” version, connected to shaft ⇒ Item 13 (page 565) (flaps move simultaneously)

13 - Lower temperature flap shaft

- ❑ On “basic” version, connected to shaft ⇒ Item 12 (page 565) (flaps move simultaneously)

14 - Upper temperature flap shaft

- ❑ On “deluxe” version, mounted in shaft ⇒ Item 15 (page 565) (independent movement of flaps)

15 - Lower temperature flap shaft

- ❑ On “deluxe” version, mounted in shaft ⇒ Item 14 (page 565) (independent movement of flaps)

6.3 Removing and installing footwell vent (driver side)

Removing

– Move driver's seat to rearmost position.

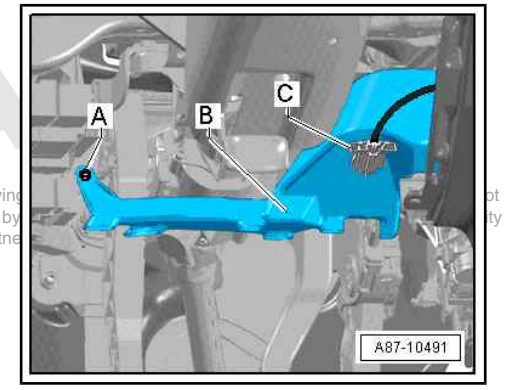
– Switch off ignition.

– Remove storage compartment beneath dash panel (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel trim (driver side)

– Unplug connector -C- from footwell vent temperature sender -G192- /left footwell vent temperature sender -G261- .

– Remove bolts -A-.

– Remove footwell vent (left-side) -B-.



Installing

Install in reverse order of removal; note the following.

– Switch on ignition.

– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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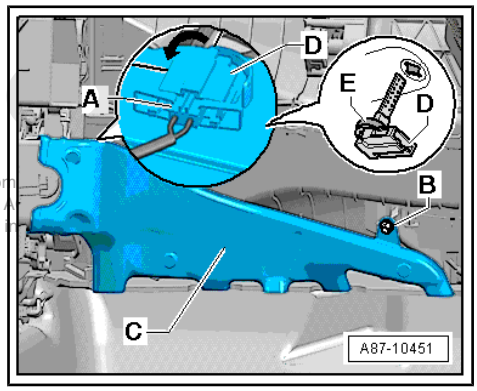
6.4 Removing and installing footwell vent (front passenger side)

Note

From 01.2008 onwards, air conditioning units with an additional connection for glove box cooling are being introduced gradually ⇒ page 587 . It is important to observe the correct assignment of the heater housing (right-side) and the air intake box ⇒ Electronic parts catalogue .

Removing

- Set front passenger seat to rearmost position.
- Switch off ignition.
- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .
- Unplug connector -A- from temperature sensor (only fitted on vehicles with “deluxe” air conditioner).
- Remove bolts -B-.
- Remove footwell vent (right-side) -C-.



Installing

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warranty for the correctness of information in

Install in reverse order of removal; note the following.

- Switch on ignition.
- Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed (only on vehicles with “deluxe” air conditioner) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .⇒

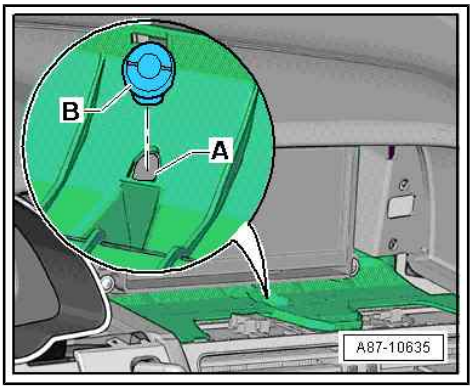
6.5 Installing plugs in air duct to centre vent

Note

There is an opening in this air duct. At this opening whistling noises might occur in certain settings. For this reason, this opening is sealed with a plug during production (gradual introduction from February 2009 onwards).

- Protect centre console against damage by covering it.
- Remove display unit for front information display and operating unit control unit - J685- ⇒ Communication; Rep. gr. 91 ; Infotainment system; Removing and installing infotainment system display .

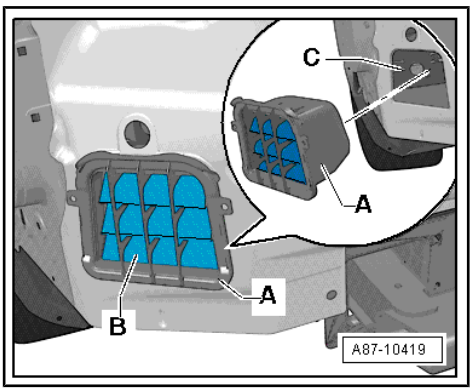
– Reach into opening in dash panel and insert plug -B- in opening in air duct -A-.
– Make sure plug -B- is seated securely in opening in air duct -A-.



Note

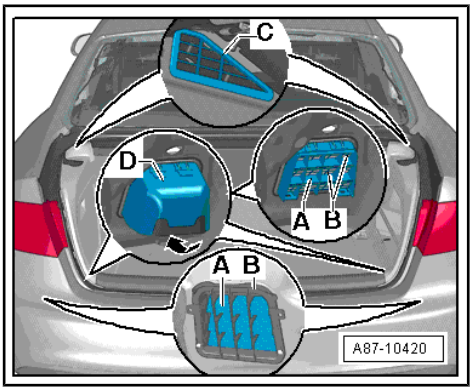
- *This illustration shows the opening -A- on an Audi A4. On an Audi Q5, it is concealed by a strut which makes it difficult to access.*
- *The plug -B- is available as a replacement part (replacement part no. 8K9 805 673) ⇒ Electronic parts catalogue .*

6.6 Removing and installing forced ventilation vents in passenger compartment



Note

- *One ventilation frame -A- each is fitted on the left and right in the body ventilation opening -C- for forced ventilation.*
- *The ventilation frames of the forced ventilation -A- are removed and installed from the outside (with the bumper cover removed).*
- *There are different versions of the forced ventilation frame -A- (for vehicles with or without noise insulation cover -D-). The installation procedure for the noise insulation cover -D- depends on the version of the vehicle ⇒ Electronic parts catalogue .*



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

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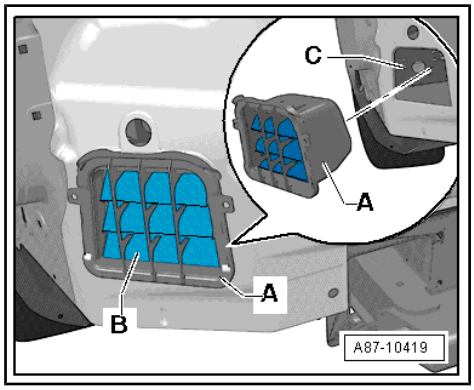
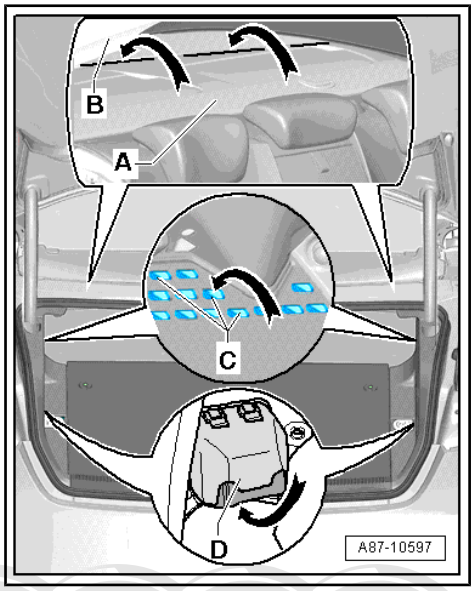
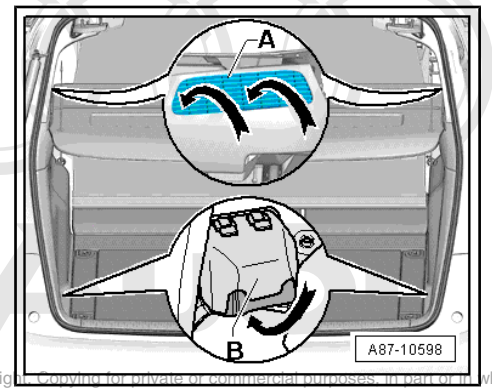
Note

- *The sealing lips -B- only close properly if the ventilation frame -A- has been installed in the correct position.*
- *This illustration shows the ventilation frame -A- with the bumper cover (rear) removed.*
- *When installing, press ventilation frame -A- into opening at rear cross panel until all retaining tabs are properly engaged.*



6.7 Checking forced ventilation vents in passenger compartment





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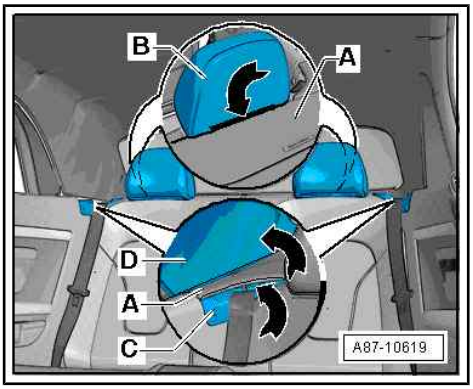

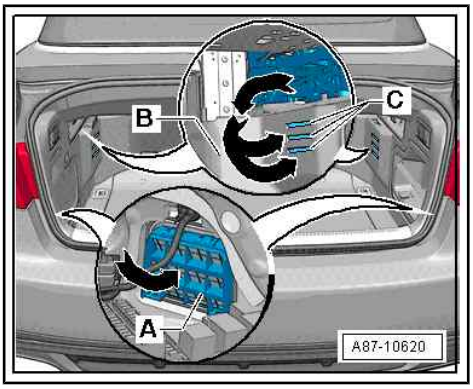

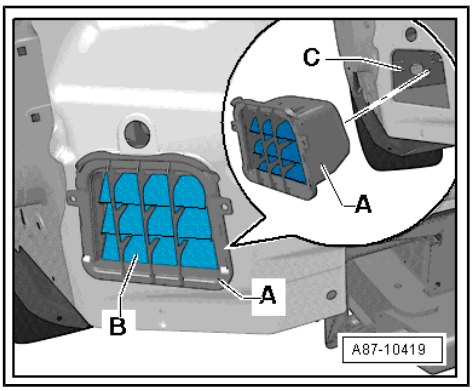

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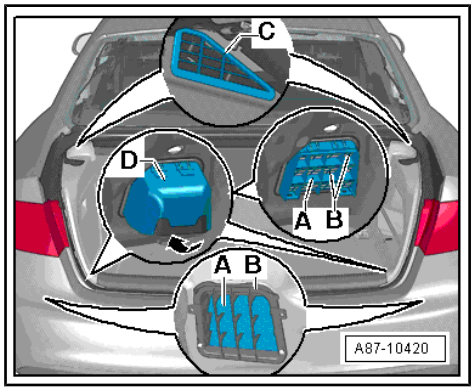

Note

- *The following describes how to check the forced ventilation vents in the passenger compartment of an Audi A5 Coupé. The layout of the components may differ on other vehicles (e.g. on the Audi A5 Sportback, the Audi A4, the Audi Q5 etc.). However, the functional checks and removal and installation procedures should be performed in the same manner.*
- *On the Audi A4 Saloon, the air extracted from the passenger compartment is routed e.g. via the openings between the rear window -B- and the rear shelf -A- (on body) into the luggage compartment. From the luggage compartment, the air is routed through ventilation openings -C- and the area between the body and the luggage compartment lining to the ventilation frames -D-.*
- *On the Audi A4 Avant and the Audi Q5, the air is routed via the ventilation grilles -A- in the side trim (left and right) into the area behind the luggage compartment side trim. From there the air flows to the ventilation frame -B-.*
- *On the Audi A5 Cabriolet, the air is routed e.g. via openings in the area of the rear shelf -A- (behind the head restraints -B-), the guides for the seat belts -C- and through the convertible roof trim -D- when the convertible roof is closed.*
- *On the Audi A5 Cabriolet, the passenger compartment is ventilated the same way as on other vehicles when the convertible roof is closed. For this, there are ventilation openings -C- in the luggage compartment lining -B-; the air is routed through these openings to the forced ventilation frame -A-.*
- *One ventilation frame -A- each is fitted on the left and right in the body ventilation opening -C- for forced ventilation.*
- *The ventilation frames of the forced ventilation -A- are removed and installed from the outside (with the bumper cover removed).*
- *There are different versions of the forced ventilation frame -A- (for vehicles with or without noise insulation cover -D-). The installation procedure for the noise insulation cover -D- depends on the version of the vehicle ⇒ Electronic parts catalogue .*
- *On vehicles with a high-voltage system (hybrid vehicles) it may be necessary to remove the second battery -A1- to gain access to the noise insulation cover (left-side) -D- ⇒ Electrical system; Rep. gr. 27 ; Battery, Disconnecting and connecting battery .*

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Checking ventilation openings in luggage compartment lining

– Check whether air duct through ventilation frames in luggage compartment lining (left and right) -C- and behind luggage compartment lining to the two ventilation frames -A- in luggage compartment (left and right) is blocked.

Note

- *To ensure that the passenger compartment is ventilated properly, the ventilation frames -C- in the luggage compartment linings (left and right) should never be blocked.*
- *The windows may mist up if the ventilation frames in the luggage compartment linings -C- are blocked off or the air ducts to the ventilation frames -A- are obstructed.*
- *This illustration shows the luggage compartment on an Audi A5 Coupé. The layout of the components may differ on an Audi A5 Sportback, Audi A4, Audi Q5, etc.*

Checking forced ventilation frame from inside:

– Remove covers for luggage compartment side trim (left and right) ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Exploded view - luggage compartment side trim .

– Check that ventilation frame -A- (left and right) is not blocked.

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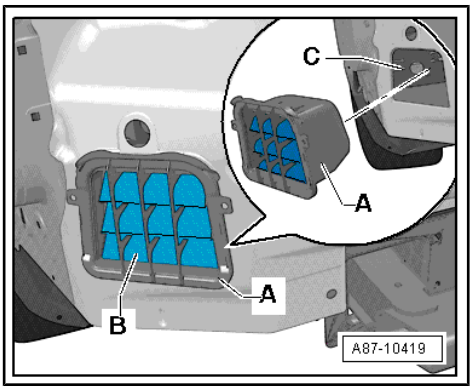
Note

- *The sealing lips -B- in the ventilation frame -A- must move freely and close automatically; if the sealing lips -B- are stuck together, the windows can mist up.*
- *On vehicles with a noise insulation cover -D-, make sure that the air duct beneath the noise insulation cover -arrow- to the ventilation frames -A- is not obstructed.*
- *If the air ducts to the ventilation frames -A- are blocked or obstructed, the windows may mist up.*
- *The sealing lips -B- only close properly if the ventilation frame -A- has been installed correctly.*

Checking forced ventilation frame from outside:

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

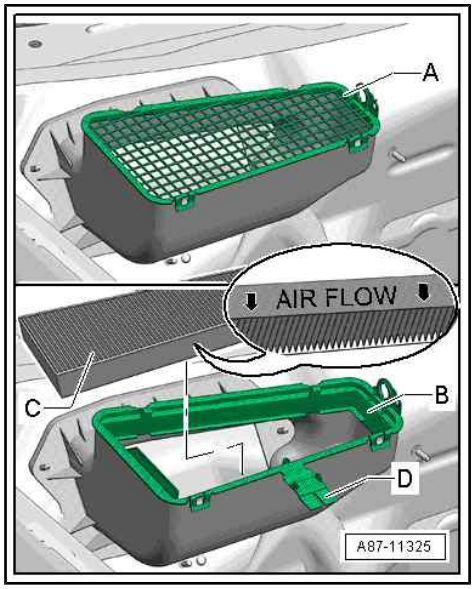
– Check that ventilation frame (left and right) -A- is not blocked and that sealing lips -B- operate properly.



Note

- *If the sealing lips -B- are stuck together, the windows can mist up.*
- *The sealing lips -B- only close properly if the ventilation frame -A- has been installed in the correct position.*
- *This illustration shows the ventilation frame -A- with the bumper cover (rear) removed.*

6.8 Removing and installing fresh air intake



Note

- *Depending on the version, a dust filter -C- may be fitted in the filter mounting -B- instead of the intake grille -A- in vehicles for certain countries with a high dust level in the ambient air (e.g. for China). The dust filter -C- is designed to stop the fresh air blower - V2- from drawing in dust and sand ⇒ Electronic parts catalogue .*
- *Make sure that no dirt falls into the intake duct of the air conditioning unit when removing the dust filter -C-.*
- *The dust filter -C- is held in position in the filter mounting -B- by tab -D-.*
- *Observe replacement interval for dust filter -C- ⇒ Maintenance tables .*
- *Clean the intake duct and the area surrounding the dust filter -C- in the plenum chamber before installing a new filter.*
- *When installing the dust filter -C-, observe the direction of air flow -arrows-.*

Preparations

– Switch off ignition.

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

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WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

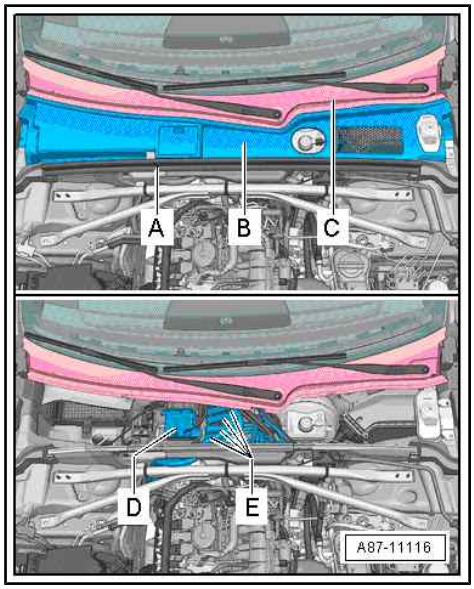
Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

– Remove rubber seal -A- and plenum chamber cover -B- (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .



- After removing plenum chamber cover -B-, visually inspect high-voltage components -D- (in this case power and control electronics for electric drive - JX1-) and high-voltage wires -E- ⇒ page 41 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .
- When working in the vicinity of high-voltage components -D- and high-voltage wires -E-, always take care not to damage these components ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .
- After completing the work and before installing the plenum chamber cover -B-, visually inspect the high-voltage components -D- and the high-voltage wires -E- ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

Note

Should it be necessary in order to be able to clean the water drains, remove the cowl panel trim -C- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

Vehicles without high-voltage system

– Remove plenum chamber cover and/or cowl panel trim (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

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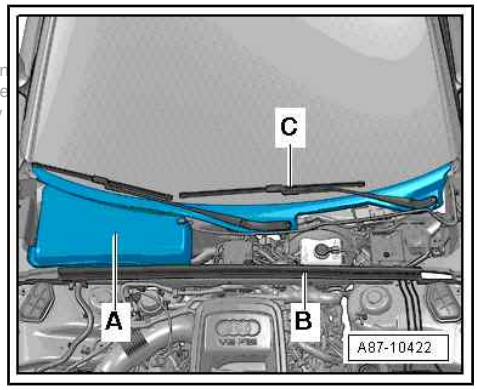
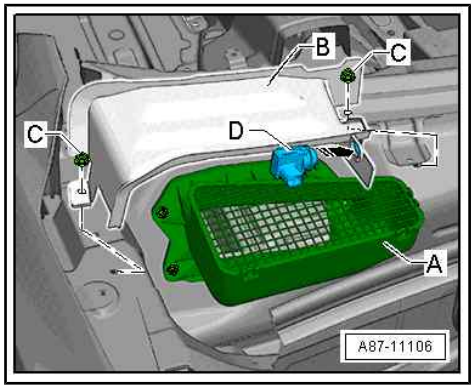


Note

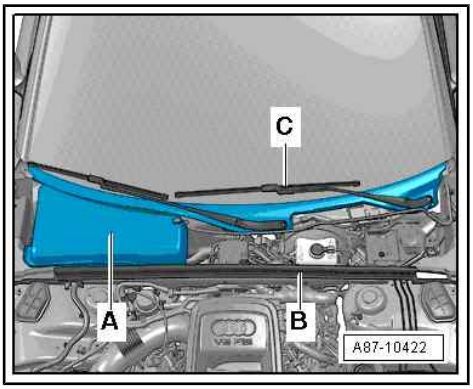
- *The following illustration shows the layout of the components on an Audi A5 Coupé. The layout may differ slightly on the Audi A5 Sportback, Audi A4, Audi Q5, etc. However, the components must be removed, installed and checked in the same manner as described for the Audi A5 Coupé (unless indicated otherwise).*
- *An additional cover with drip rail -B- may be fitted at the fresh air intake duct -A- depending on the vehicle version and the type of plenum chamber cover fitted ⇒ Electronic parts catalogue .*



– Remove the two wiper arms (only on vehicles on which cowl panel trim and cover for fresh air intake at cowl panel trim -A- form one component) ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system; Removing and installing wiper arms .

– Detach rubber seal (left-side) -B- as far as necessary ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

– Remove cover for fresh-air intake at cowl panel trim -A-, or remove cowl panel trim (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .



Note

If necessary, carefully detach cowl panel trim from fastener at cross member of windscreen -C- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

All vehicles

Checking

– Check that cowl panel trim -A- is properly installed and not damaged ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

– Check seals between cover for fresh-air intake -A-, cowl panel trim and cross member of windscreen -C- for damage and proper attachment. These seals prevent water from running between windscreen cross member and cowl panel trim into intake duct of air conditioning unit ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

Removing and installing

Note

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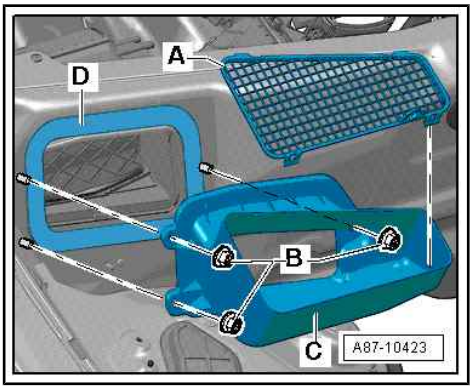
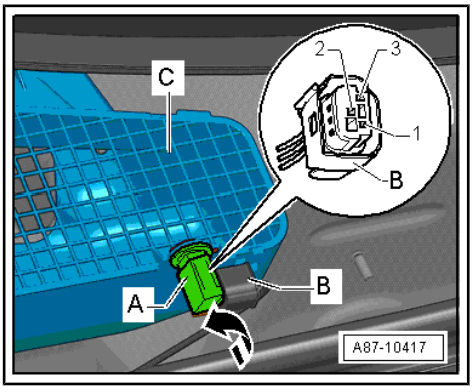
Depending on the version, a dust filter -A- designed to stop the fresh air blower from drawing in dust and sand may be fitted instead of the intake grille in vehicles for certain countries with a high dust level in the ambient air (e.g. for China) ⇒ Electronic parts catalogue .



– Perform preparations ⇒ page 572 .

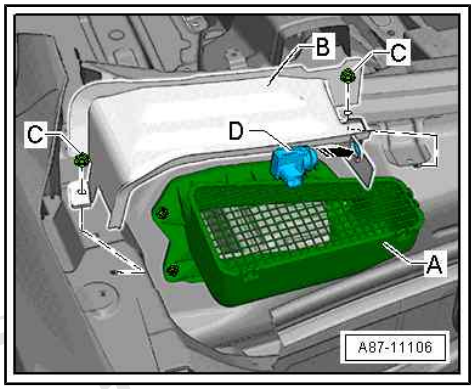
– If fitted, unplug connector -B- from -G238- / -G657- (different layouts).



Note

There are different versions of the fresh air intake duct -C- (with and without mounting for -G238- -A-, mounting at front or on side). Pay attention to the correct version ⇒ Electronic parts catalogue.

– If fitted, remove bolts -C- (tightening torque: 3 Nm) and detach cover with drip rail -B-.



– Remove bolts -B-.

– Detach fresh-air intake -C-.

Install in reverse order of removal; note the following:

- When installing, pay attention to tightening sequence of nuts -B-.

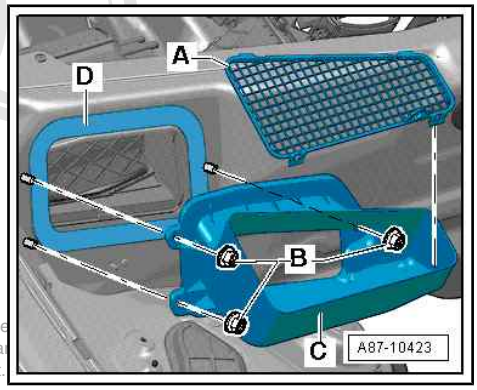
– Hand-tighten nuts -B- loosely in the following sequence:

♦ Initially tighten inside nut -B- (on right side in illustration).

♦ Initially tighten outside nut -B- (top left in illustration).

♦ Initially tighten outside nut -B- (bottom left in illustration).

– Tighten nuts -B- to final torque (3.5 Nm) in the same sequence.



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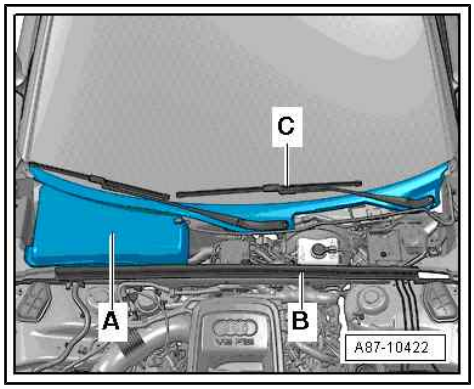
Note

♦ *Before installing fresh air intake -C-, check fresh air intake and bonded seal for damage. Renew seal or fresh air intake -C- if damaged ⇒ Electronic parts catalogue .*

♦ *When installing, make sure that the fresh air intake -C- and the corresponding seal are correctly positioned. If the fresh air intake -C- is not installed properly, water could run via the sealing surface -D- into the intake duct of the air conditioning unit.*

♦ *Before fitting cowl panel trim cover -A-, check cowl panel trim and corresponding seals to cover -A- (different versions) and windscreen cross member -C- for damage. If cover, cowl panel trim or seals have not been installed properly or are damaged, water may run into fresh-air intake and into intake duct of air conditioning unit.*



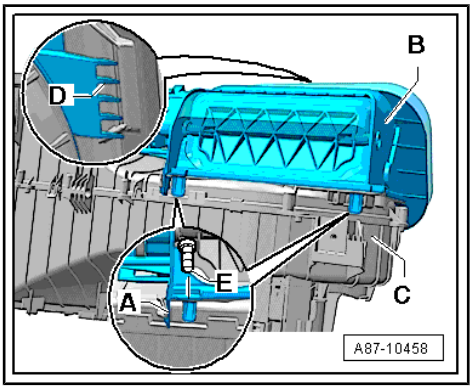
6.9 Removing and installing intake duct

Removing

– Switch off ignition.

– Remove air intake box ⇒ page 512 .

– Release fasteners -A- and detach intake duct -B- from air intake box -C-.



Installing

Install in reverse order of removal; note the following.

– Insert intake duct -B- in mountings -C- at air intake box -C- and assemble the two components.

Note

If any of the retaining tabs -A- break off or are no longer strong enough, the two housing sections can also be assembled using bolts -D-.

– Re-install all parts removed in reverse order.

– Perform basic setting and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

6.10 Removing and installing plenum chamber water drain

Removing

Vehicles with high-voltage system (hybrid vehicles)

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For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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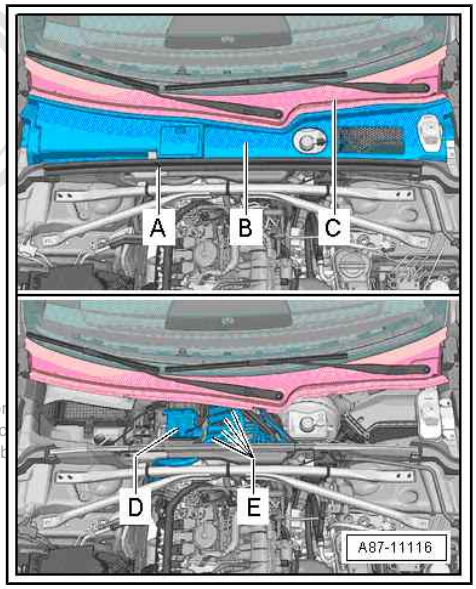
– Switch off ignition.

– Remove rubber seal -A- and plenum chamber cover -B- (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

♦ After removing plenum chamber cover -B-, visually inspect high-voltage components -D- (in this case power and control electronics for electric drive - JX1-) and high-voltage wires -E- ⇒ page 41 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

♦ When working in the vicinity of high-voltage components -D- and high-voltage wires -E-, always take care not to damage these components ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

♦ After completing the work and before installing the plenum chamber cover -B-, visually inspect the high-voltage components -D- and the high-voltage wires -E- ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .



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Vehicles without high-voltage system

– Switch off ignition.

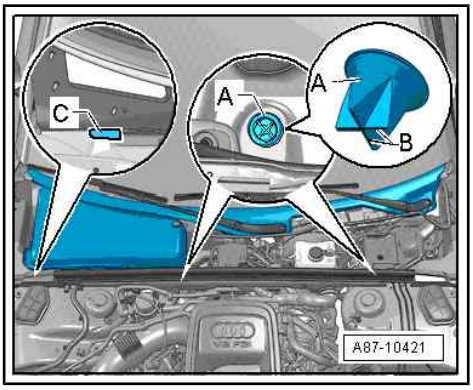
– Remove plenum chamber cover and/or cowl panel trim (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

All vehicles

Note

♦ *The following illustration shows the layout of the components on an Audi A5 Coupé. The layout may differ slightly on the Audi A5 Sportback, Audi A4, Audi Q5, etc. However, the components must be removed, installed and checked in the same manner as described for the Audi A5 Coupé (unless indicated otherwise).*

♦ *The grommets -A- of the water drains are clipped into the openings in the bottom of the plenum chamber from above.*



– Unfasten grommets -B- from above from openings for water drains -A- in bottom of plenum chamber.

Installing

– Clip grommets -A- from above into openings for water drains in bottom of plenum chamber.

– Following installation, check that grommets -A- operate correctly (valves -B- must not be gummed up and must close).

– Re-install all removed components in reverse order.

6.11 Checking plenum chamber water drain

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage

⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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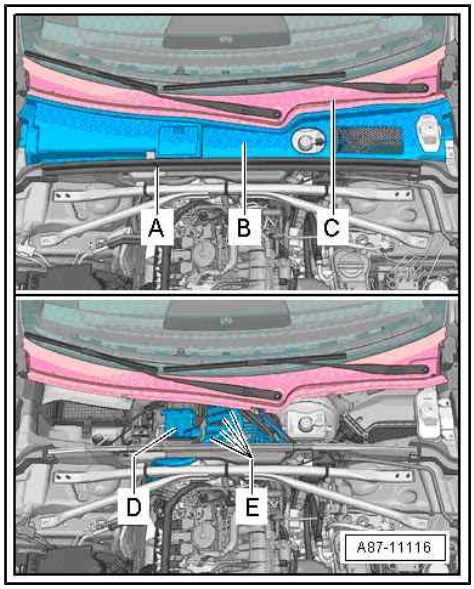
– Switch off ignition.

– Remove rubber seal -A- and plenum chamber cover -B- (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

♦ After removing plenum chamber cover -B-, visually inspect high-voltage components -D- (in this case power and control electronics for electric drive - JX1-) and high-voltage wires -E- ⇒ page 41 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

♦ When working in the vicinity of high-voltage components -D- and high-voltage wires -E-, always take care not to damage these components ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

♦ After completing the work and before installing the plenum chamber cover -B-, visually inspect the high-voltage components -D- and the high-voltage wires -E- ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .



Vehicles without high-voltage system

– Switch off ignition.

– Remove plenum chamber cover and/or cowl panel trim (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

All vehicles

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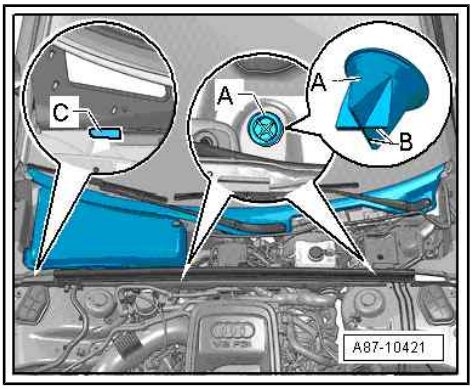

Note

- *The following illustration shows the layout of the components on an Audi A5 Coupé. The layout may differ slightly on the Audi A5 Sportback, Audi A4, Audi Q5, etc. However, the components must be removed, installed and checked in the same manner as described for the Audi A5 Coupé (unless indicated otherwise).*
- *Water may not drain properly from the plenum chamber if leaves, pine needles or other debris accumulate in the water drains -A-. 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 via the intake duct and is blown onto the evaporator by the fresh air blower - V2- together with the air delivered.*
- *If the two water drain grommets -A- (on left and right in plenum chamber) are clogged with leaves or pine needles, the drains may freeze up in winter and prevent water drainage. After a short journey, the heat emitted by engine and exhaust system melts the ice in the drains again. By the time the vehicle arrives at the workshop, the water may have already drained out of the plenum chamber.*
- *The grommets -A- of the water drains are clipped into the openings in the bottom of the plenum chamber from above.*
- *In addition to the two grommets on the water drains -A-, there is an opening -C- in the body (right-side) through which the water can drain off into the area behind the wheel housing liners should the two grommets on the water drains -A- be obstructed. Also check these openings for dirt.*

– Check that grommets -A- function correctly (valves -B- must not be blocked or obstructed with dirt).

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.

6.12 Cleaning plenum chamber water drain

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

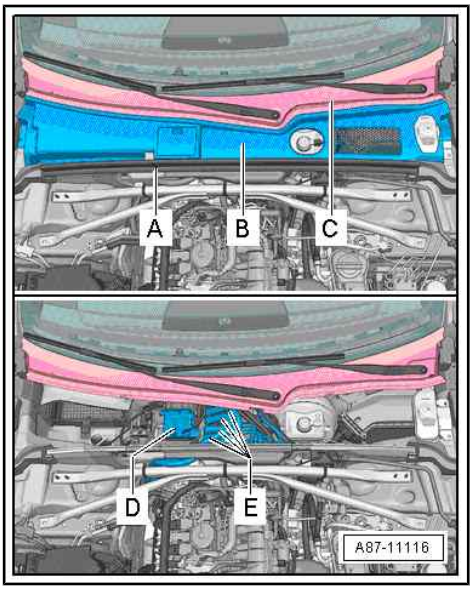
– Switch off ignition.

– Remove rubber seal -A- and plenum chamber cover -B- (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

♦ After removing plenum chamber cover -B-, visually inspect high-voltage components -D- (in this case power and control electronics for electric drive - JX1-) and high-voltage wires -E- ⇒ page 41 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

♦ When working in the vicinity of high-voltage components -D- and high-voltage wires -E-, always take care not to damage these components ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

♦ After completing the work and before installing the plenum chamber cover -B-, visually inspect the high-voltage components -D- and the high-voltage wires -E- ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .



Note

Should it be necessary in order to be able to clean the water drains, remove the cowl panel trim -C- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

Vehicles without high-voltage system

– Switch off ignition.

– Remove plenum chamber cover and/or cowl panel trim (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

All vehicles

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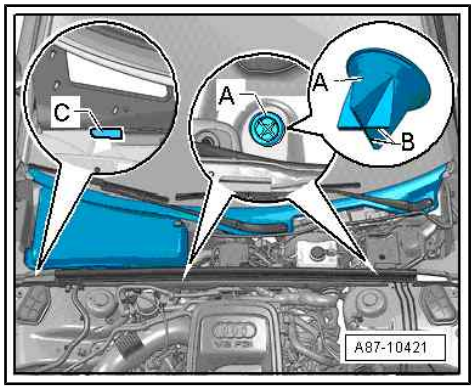

Note

- *The following illustration shows the layout of the components on an Audi A5 Coupé. The layout may differ slightly on the Audi A5 Sportback, Audi A4, Audi Q5, etc. However, the components must be removed, installed and checked in the same manner as described for the Audi A5 Coupé (unless indicated otherwise).*
- *The grommets -A- of the water drains are clipped into the openings in the bottom of the plenum chamber from above.*
- *In addition to the two grommets on the water drains -A-, there is an opening -C- in the body (right-side) through which the water can drain off into the area behind the wheel housing liners should the two grommets on the water drains -A- be obstructed. Also check these openings for dirt.*

– Clean water drains (left and right) -A-.

– Remove leaves, pine needles and other dirt from plenum chamber.

Note

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.

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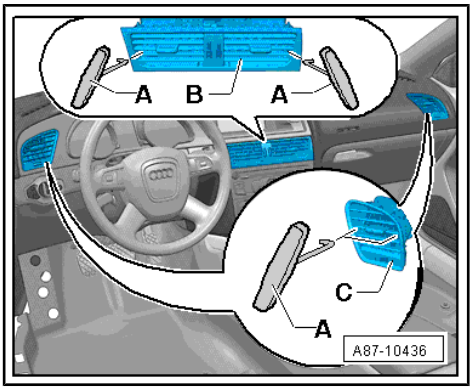
6.13 Removing and installing dash panel vents and rear vent



Note

- *The following illustration shows the layout of the components on an Audi A5 Coupé. The layout may differ slightly on the Audi A5 Sportback, Audi A4, Audi Q5, etc. The components are however to be removed and installed in the same manner as described for the Audi A5 Coupé.*
- *Removing and installing dash panel vents -B- and -C- ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel vents*
- *The vent in the centre console (rear) must be removed in the same manner as the dash panel vents ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Exploded view - centre console .*

Caution

- ***To avoid damaging the dash panel vent during removal, do not engage the hook - 3438- -A- at the slats of the vents -B- and -C-.***

– Switch off ignition.
– Open relevant vent.
– Insert hook - 3438- -A- in vent as shown.
– Swivel hook - 3438- -A- by approx. 90° towards vent housing and insert hook in disassembly holes in vent housing.
– Carefully pull relevant dash panel vent -B- or -C- out of dash panel.

6.14 Connection for glove box cooling at air intake box

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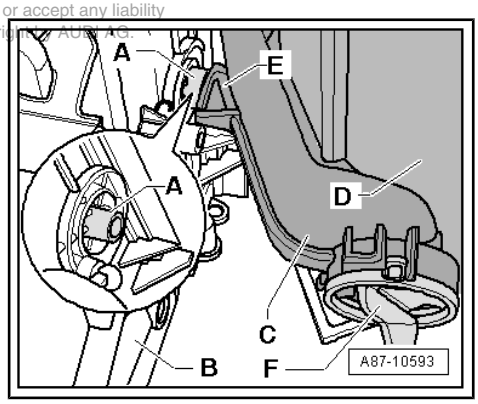

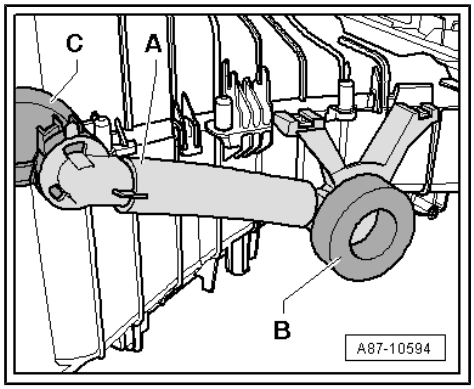

Note

- *From 01.2008 onwards, air conditioning units with an additional connection for glove box cooling are being introduced gradually. This connection is sealed with a plug on vehicles without glove box cooling.*
- *On an air intake box -D- with a connection for glove box cooling -C-, the tab -E- is approx. 3 mm longer than on the version with no connection for glove box cooling -C-. Therefore it is important to observe the correct assignment ⇒ Electronic parts catalogue .*
- *If an air intake box -D- with a connection for glove box cooling -C- is to be installed in a vehicle which previously was not equipped with an air intake box -D- with a connection for glove box cooling -C-, the pin -A- at the heater housing (right-side) -B- must be shortened by approx. 3 mm (different versions).*
- *On vehicles with an air intake box -D- with a connection for glove box cooling -C-, but without the glove box cooling feature (optional equipment), the connection for glove box cooling -C- is sealed with a plug -F-.*
- *On vehicles with glove box cooling (optional equipment), the plug -F- must be removed from the connection for glove box cooling -C-.*
- *On vehicles with glove box cooling (optional equipment), the cooled air from the air conditioning unit is routed into the glove box via the connection for glove box cooling -C- and the air duct -A- attached to the air intake box. The air duct to the glove box is sealed by the foam seal -B-.*
- *Pay attention to the version of the glove box on vehicles with glove box cooling ⇒ Electronic parts catalogue and ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Exploded view - glove box .*

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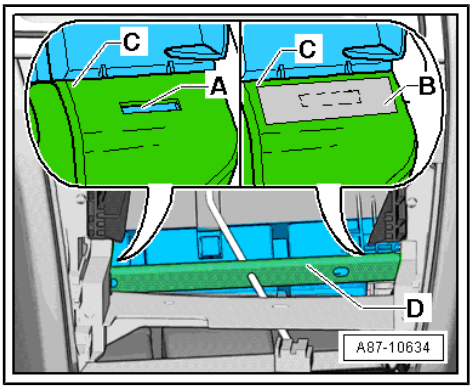
6.15 Masking slots of air duct to vents (rear)

Note

This air duct is engaged in the air outlet opening of the air conditioning unit. For this purpose, there are slots in the air duct. If the flaps are positioned inconveniently, in particular on vehicles with a "deluxe" air conditioner, whistling noises might be caused at these slots in certain settings. For this reason, the top slots are covered with adhesive tape during production (gradual introduction of adhesive tape from February 2009 onwards).

– Protect centre console against damage by covering it.
– Remove radio - R- (⇒ Communication; Rep. gr. 91 ; Radio; Removing and installing radio) / multimedia system operating unit - E380- (⇒ Communication; Rep. gr. 91 ; Infotainment system; Removing and installing multimedia system operating unit - E380-).
– Remove air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ page 608 .
– If fitted, remove control unit for front display and information control panel - J523- ⇒ Communication; Rep. gr. 91 ; Infotainment system; Removing and installing control unit for front display and information control panel .

– Reach into opening in centre console and mask the two top slots -A- in air duct -C- (left and right) with a piece of adhesive tape -B- (approx. 2 cm x 4 cm, air-tight material).



Note

- *The slots -A- are concealed by the strut -D-.*
- *You can cut two pieces of adhesive tape -B- e.g. from the damping washer (replacement part no. 8E0 260 329) ⇒ Electronic parts catalogue .*

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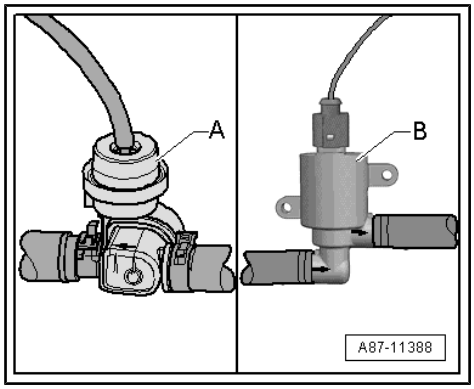
7 Coolant circuit

⇒ "7.1 Layout, activation and operation of coolant shut-off valve N82 / N422 ", page 590

⇒ "7.2 Layout, activation and operation of coolant circulation pump V50 (coolant pump V36)", page 594

7.1 Layout, activation and operation of coolant shut-off valve -N82- / -N422-

Climatronic coolant shut-off valve - N422- / coolant shut-off valve - N82-



Note

- *Certain vehicles without an auxiliary heater (optional equipment) were fitted with vacuum-actuated coolant shut-off valves -A- from the start of production onwards (depending on engine). At a later date, shut-off valves -B- with direct electric activation were gradually introduced. Depending on the engine version and the production period, these valves may be designated Climatronic coolant shut-off valve - N422- or coolant shut-off valve - N82- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *When installing, observe specified direction of coolant flow -arrow-.*
- *Depending on the engine version and the production period, this valve may be designated Climatronic coolant shut-off valve - N422- or coolant shut-off valve - N82- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *Depending on the vehicle model and the production period, the activation of -N422- / -N82- varies; it is activated either by the air conditioner operating and display unit (Climatronic control unit - J255-) or by the relevant engine control unit ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *-N489- / -N422- is currently not fitted in vehicles with an engine with regulated coolant circuit (e.g. vehicles with a regulated coolant pump and a coolant valve for cylinder head - N82-). On engines with a regulated coolant pump, the engine control unit activates the coolant pump to regulate coolant circulation ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly .*

Notes on vacuum-actuated coolant shut-off valves

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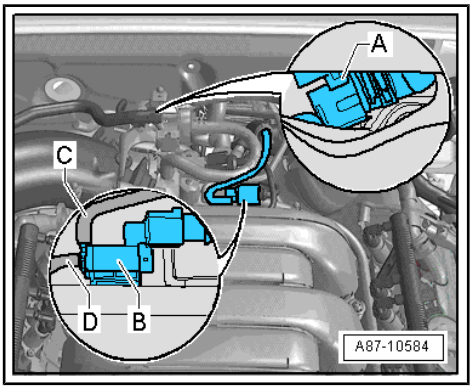
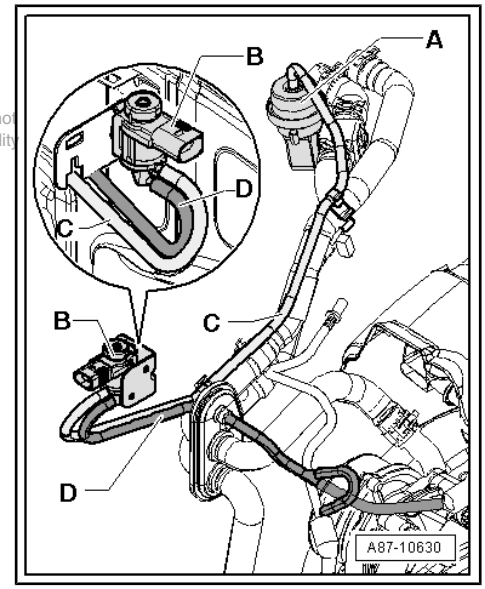
The fitting location and the version of the Climatronic coolant shut-off valve - N422- -B- and the coolant shut-off valve -A- depends on the engine, the vehicle version and the production period.





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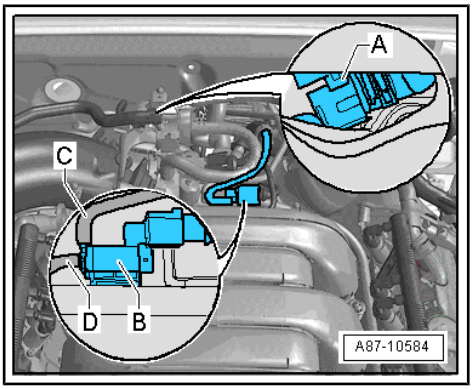
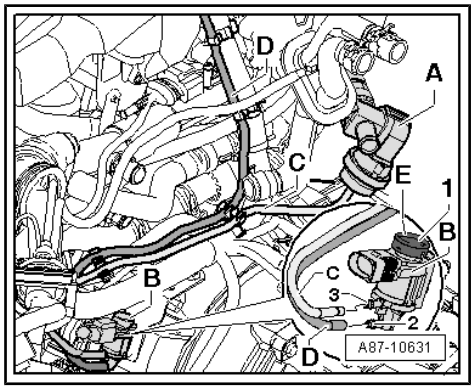
- This illustration shows the layout and version of the -N422- -B- on vehicles with a 6-cyl. FSI engine (as installed at the start of production). Here, the -N422- -B- (version 1) is fitted in the area of the cylinder head.
- On certain vehicles (e.g. on the Audi Q5 with a 6-cyl. diesel engine), -N422- -B- is installed in the plenum chamber. This illustration shows version 2 of -N422- .
- For example, at the start of production the Climatronic coolant shut-off valve - N422- was fitted only on vehicles with a 6-cyl. FSI engine. The valve was gradually introduced for other engines in model year 2008. The introduction also depended on the vehicle equipment and production period ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly .
- If a vehicle is equipped with e.g. an auxiliary heater (optional extra), no -N422- -B- and no shut-off valve -A- is installed. This function is assumed by the heater coolant shut-off valve - N279- fitted on vehicles with an auxiliary heater ⇒ Auxiliary/ supplementary heater; Rep. gr. 82 ; Overview of fitting locations - auxiliary/supplementary heater; Overview of fitting locations - components not located in passenger compartment .



When installing -N422- -B-, make sure vacuum hoses are connected properly.



- On version 1, vacuum hose to shut-off valve -A- is attached at connection 3 -C-. Vacuum supply from engine is connected via connection “2” -D-.
- On version 2, vacuum hose -C- to shut-off valve -A- is attached at connection 3. Vacuum supply from engine is connected via connection “2” -D-.
- This illustration shows e.g. the layout on a 4-cyl. diesel engine (model year 2009).
- After the activation, the vacuum unit of the shut-off valve -A- is vented e.g. via connection “1” beneath cap -E- on version 2 of -N422- -B-.
- Depending on the version, the vacuum hose -C- (to shut-off valve -A-) may be marked white in the area of the connection.

Caution

- *Observe correct layout of vacuum hoses at -N422- -B-.*
- *If vacuum hoses are interchanged, this can cause the heating in the passenger compartment to fail.*

- To check the function of -N422- -B-, it is activated briefly e.g. by the air conditioner operating and display unit (Climatronic control unit - J255-) at certain intervals (e.g. after 20 engine starts), even if the function is not required. If the vacuum hoses at -N422- -B- are connected incorrectly (interchanged), the coolant shut-off valve -A- is also activated briefly. However, if the vacuum hoses are interchanged, the vacuum remains trapped in the vacuum unit of the shut-off valve -A- for an uncertain time and the shut-off valve -A- will not open. If the shut-off valve -A- is closed, no coolant can flow to the heat exchanger and the air conditioner will not heat.
- If the vacuum hoses are not connected correctly, the engine continuously draws in a small amount of fresh air via connection “1” of the -N422- ; this can lead to problems in the idling speed regulation of the engine and to an entry in the memory of the engine control unit.

Notes on all valves

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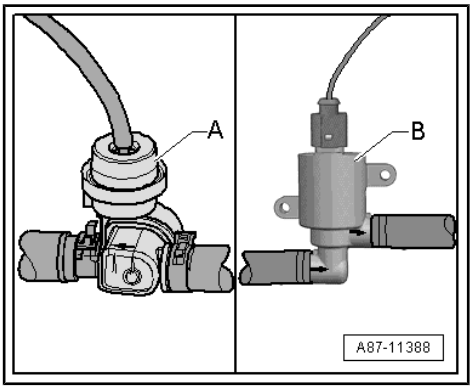

- Shut-off valve -B- (activated electrically) or coolant shut-off valve -A- (vacuum-actuated) is installed in the plenum chamber or the engine compartment depending on the engine and the vehicle version.
- -N422- / -N82- , for example, is only activated via the control of the air conditioner (directly or via the corresponding engine control unit) if the air conditioner is set to “OFF”. In this case, the engine speed must be smaller than 5000 rpm, and the coolant temperature must be below 90 °C (Centigrade). If the coolant circuit to the heat exchanger of the air conditioning unit is shut off, the engine will heat up more quickly when the coolant is cold.
- If a vehicle is equipped with e.g. an auxiliary heater (optional equipment), no -N422- / -N82- -B- and no shut-off valve -A- is installed. This function is assumed by the heater coolant shut-off valve - N279- fitted on vehicles with an auxiliary heater ⇒ Auxiliary/supplementary heater; Rep. gr. 82 ; Overview of fitting locations - auxiliary/supplementary heater; Overview of fitting locations - components not located in passenger compartment .
- The activation of the Climatronic coolant shut-off valve - N422- can be deactivated via the “Adaption” function of the air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Vehicles with 6-cyl. FSI engine (currently not planned for 6-cyl. TFSI engine) or with other engines in combination with certain optional extras (e.g. vehicles with a start/stop system) but without an auxiliary heater (optional extra) are fitted additionally with a coolant circulation pump - V50- (coolant pump - V36-) ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly . For an illustration of the pump and further information, refer to ⇒ page 596 .
- Depending on the version of the air conditioner operating and display unit (Climatronic control unit - J255-), the coolant circulation pump - V50- may also be referred to as coolant pump - V36- in the Guided Fault Finding routine ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Depending on the production period, -V50- (-V36-) is activated via the circulation pump relay - J160- (via the same output as the Climatronic coolant shut-off valve - N422-) or - with gradual introduction from model year 2009 onwards - directly by the air conditioner operating and display unit (Climatronic control unit - J255-). On certain vehicles (e.g Audi Q5 hybrid), activation occurs after a request from -J255- via the corresponding engine control unit. Observe correct version of air conditioner operating and display unit (Climatronic control unit - J255-) as well as correct encoding and adaption ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- On vehicles with a circulation pump relay - J160- (e.g. vehicles from model year 2008), -V50- (-V36-) is always activated when the ignition is switched on and the Climatronic coolant shut-off valve - N422- / coolant shut-off valve - N82- is not being activated (e.g. in the “warm” temperature setting on the air conditioner operating and display unit, Climatronic control unit - J255-) ⇒ page 596 and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

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- On vehicles without a circulation pump relay - J160- (gradual introduction from model year 2009 onwards), -V50- (-V36-) is activated directly by the air conditioner operating and display unit (Climatronic control unit - J255-) when the ignition is switched on (depending on the coolant temperature and the setting on the operating and display unit). On certain vehicles (e.g. Audi Q5 hybrid) activation occurs after a request from - J255- via the corresponding engine control unit ⇒ page 596 and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Activation of -V50- (-V36-) and -N422- depends on vehicle equipment and production period ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- On vehicles on which -V50- (-V36-) and -N422- / -N82- are activated directly by the air conditioner operating and display unit (Climatronic control unit - J255-), faults in these components are stored in the air conditioner operating and display unit (Climatronic control unit - J255-). Therefore it is important to observe the correct version, encoding and adaption of - J255- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- The version of the coolant circulation pump - V50- (coolant pump - V36-) and the activation of the pump(s) differ depending on the vehicle version and production period. From model year 2012 onwards and depending on the engine, the pumps fitted from the start of production onwards and activated via a 500 hertz signal (500 pulses per second) are gradually being replaced by pumps activated via a variable signal (100 ... 500 hertz). The pumps activated via a variable signal are equipped additionally with a diagnostic function and are generally activated via the corresponding engine control unit. Therefore it is important to observe the correct assignment (only the assigned pump can be activated) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Electronic parts catalogue .

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7.2 Layout, activation and operation of coolant circulation pump - V50- (coolant pump - V36-)

⇒ "7.2.1 Layout, activation and operation of coolant circulation pump V50 (coolant pump V36) - vehicles with 4-cyl. or 6-cyl. engine", page 594

⇒ "7.2.2 Layout, activation and operation of coolant circulation pump V50 (coolant pump V36) - vehicles with 6-cyl. petrol engine", page 596

7.2.1 Layout, activation and operation of coolant circulation pump - V50- (coolant pump - V36-) - vehicles with 4-cyl. or 6-cyl. engine

Layout on vehicles with a 4-cyl. engine and on certain vehicles with a 6-cyl. engine

Note

- *-V50- can be fitted in different locations. On most vehicles with a 4-cyl. engine and certain vehicles with a 6-cyl. engine, it is located between the plenum chamber partition panel and the engine. Different fitting location in vehicles with a 6-cyl. engine* *⇒ page 596*
- *Depending on the version of the air conditioner operating and display unit (Climatronic control unit - J255-), the coolant circulation pump - V50- may also be referred to as coolant pump - V36- in the Guided Fault Finding routine ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The version of the coolant circulation pump - V50- (coolant pump - V36-) and the activation of the pump(s) differ depending on the vehicle version and production period. From model year 2012 onwards and depending on the engine, the pumps fitted from the start of production onwards and activated via a 500 hertz signal (500 pulses per second) are gradually being replaced by pumps activated via a variable signal (100 ... 500 hertz). The pumps activated via a variable signal are equipped additionally with a diagnostic function and are generally activated via the corresponding engine control unit. Therefore it is important to observe the correct assignment (only the assigned pump can be activated) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Electronic parts catalogue .*
- *-V50- can be fitted in different locations. On vehicles with a high-voltage system (hybrid vehicles) it is located between the plenum chamber partition panel and the engine.*
- *The activation of -V50- differs. On vehicles with a high-voltage system (hybrid vehicles), activation occurs after a request from -J255- via the corresponding engine control unit ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

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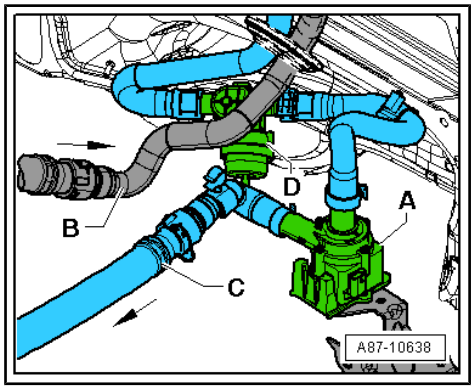

- Vehicles with a 4-cyl. engine and with the start/stop system (optional extra), but without an auxiliary heater (optional extra), are fitted with -V50- (-V36-) ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly . Activation of -V50- (-V36-) depends on vehicle equipment and production period ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Vehicles with a 4-cyl. engine and with the start/stop system (optional extra), but without an auxiliary heater (optional extra), are fitted with a coolant circulation pump - V50- (-V36-) -A- e.g. in the area between the engine and the plenum chamber partition panel ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly .
- This illustration shows the layout on an Audi A4 with a 4-cyl. TFSI engine (model year 2010). Depending on the engine, vehicle model and production period, the coolant circulation pump - V50- (coolant pump - V36-) -A- may also be installed at a different location (e.g. in the plenum chamber) ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly .
- When -V50- (-V36-) is running, coolant is drawn in through coolant hose -B- (from the engine through the heat exchanger of the air conditioning unit and the coolant shut-off valve -D-) and conveyed through coolant hose -C- back to the engine (note direction of flow -arrows-).
- Depending on the coolant temperature and the setting on the air conditioner operating and display unit (Climatronic control unit - V50-), -V36- (-J255-) is activated directly by the operating and display unit when the ignition is on ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

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- Depending on the vehicle model, -V50- (-V36-) is not only activated when the “stop function” is active, but also when the engine is running, e.g. when the temperature is preset to “warm” on the air conditioner operating and display unit (Climatronic control unit - J255-) (“HI” displayed on air conditioner operating and display unit and Multi Media Interface). The coolant circulation pump - V50- is then activated to support the engine's coolant pump ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- On vehicles with a start/stop system, -V50- (-V36-) and the Climatronic coolant shut-off valve - N422- / coolant shut-off valve - N82- are activated directly by the air conditioner operating and display unit (Climatronic control unit - J255-) or by the corresponding engine control unit. If faults are detected at these components in the air conditioner operating and display unit (Climatronic control unit - J255-), you must therefore observe the correct version, coding and adaption of the -J255- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Vehicles with auxiliary heater (optional equipment) are not fitted with -N422- / -N82- or -V50- (-V36-). On these vehicles the components of the auxiliary heater (heater coolant shut-off valve - N279- and circulation pump - V55-) assume this function ⇒ Auxiliary/supplementary heater; Rep. gr. 82 ; Overview of fitting locations - auxiliary/supplementary heater; Overview of fitting locations - components not located in passenger compartment .

7.2.2 Layout, activation and operation of coolant circulation pump - V50- (coolant

pump - V36-) - vehicles with 6-cyl. petrol engine

Layout on certain vehicles with a 6-cyl. engine

Note

- *-V50- can be fitted in different locations; on most vehicles with a 6-cyl. engine, it can be located on the longitudinal member (or between the plenum chamber partition panel and the engine ⇒ page 594).*
- *Depending on the version of the air conditioner operating and display unit (Climatronic control unit - J255-), the coolant circulation pump - V50- may also be referred to as coolant pump - V36- in the Guided Fault Finding routine ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The version of the coolant circulation pump - V50- (coolant pump - V36-) and the activation of the pump(s) differ depending on the vehicle version and production period. From model year 2012 onwards and depending on the engine, the pumps fitted from the start of production onwards and activated via a 500 hertz signal (500 pulses per second) are gradually being replaced by pumps activated via a variable signal (100 ... 500 hertz). The pumps activated via a variable signal are equipped additionally with a diagnostic function and are generally activated via the corresponding engine control unit. Therefore it is important to observe the correct assignment (only the assigned pump can be activated) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Electronic parts catalogue .*

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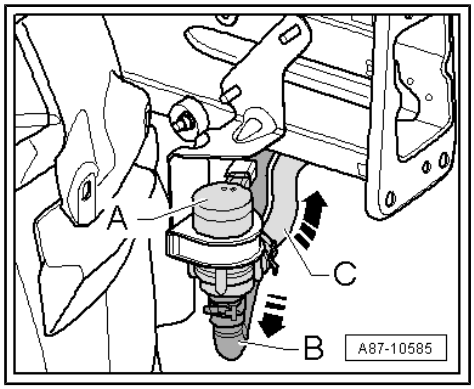
- Vehicles with a 6-cyl. FSI engine (currently not planned for 6-cyl. TFSI engine) or with other engines in combination with certain optional extras (e.g. vehicles with a start/stop system) but without an auxiliary heater (optional extra) are fitted with -V50- (-V36-) ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly . Activation of -V50- (-V36-) depends on vehicle equipment and production period ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- On vehicles with 6-cyl. FSI engine without an auxiliary heater (optional extra), -V50- (-V36-) -A- is fitted e.g. in the area between the engine and the right longitudinal member beneath the right headlight. This illustration shows the layout on an Audi A5 Coupé with a 6-cyl. FSI engine; on the Audi A5 Sportback, Audi A4, Audi Q5 etc. or on vehicles with a different engine the layout of the components may differ ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly .



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- When -V50- (-V36-) is running, coolant is drawn in through coolant hose -B- (from engine) and conveyed through coolant hose -C- to heat exchanger in air conditioning unit (note direction of flow -arrows-).
- Depending on production period, -V50- (-V36-) is activated via circulation pump relay - J160- (via same output as Climatronic coolant shut-off valve - N422-) or - with gradual introduction from 2009 onwards - directly by air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- On vehicles with a circulation pump relay - J160- (e.g. vehicles from model year 2008), -V50- (-V36-) is always activated when the ignition is switched on and the Climatronic coolant shut-off valve - N422- is not being activated (e.g. in the “warm” temperature setting on the air conditioner operating and display unit, Climatronic control unit - J255-) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ page 596 .
- On vehicles without a circulation pump relay - J160- (gradual introduction from model year 2009 onwards), -V50- (-V36-) is activated directly by the air conditioner operating and display unit (Climatronic control unit - J255-) when the ignition is switched on (depending on the coolant temperature and the setting on the operating and display unit) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Depending on the vehicle version, -V50- (-V36-) is not only activated when the “stop function” is active (gradual introduction as optional equipment from model year 2010 onwards), but also when the engine is running, e.g. when the temperature is preset to “warm” on the air conditioner operating and display unit (Climatronic control unit - J255-) (“HI” displayed on air conditioner operating and display unit and Multi Media Interface). The coolant circulation pump - V50- is then activated to support the engine's coolant pump ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

- On vehicles on which -V50- (-V36-) and -N422- / -N82- are activated directly by the air conditioner operating and display unit (Climatronic control unit - J255-), faults in these components are stored in the air conditioner operating and display unit (Climatronic control unit - J255-). Therefore it is important to observe the correct version, encoding and adaption of - J255- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Vehicles with auxiliary heater (optional equipment) are not fitted with -N422- / -N82- or -V50- (-V36-). On these vehicles the components of the auxiliary heater (heater coolant shut-off valve - N279- and circulation pump - V55-) assume this function ⇒ Auxiliary/supplementary heater; Rep. gr. 82 ; Overview of fitting locations - auxiliary/supplementary heater; Overview of fitting locations - components not located in passenger compartment .

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8 Operating and display unit

⇒ “8.1 Assignment of operating and display unit”, page 600

⇒ “8.2 Removing and installing operating and display unit”, page 608

⇒ “8.3 Removing and installing temperature sensor blower ”, page 611

8.1 Assignment of operating and display unit

Climatronic control unit - J255-

- From 08.2007 onwards, “deluxe” air conditioning units with air distribution housing with optimised routing of air flow are gradually introduced (for differences between versions “1” and “2”, see ⇒ page 25 and ⇒ Electronic parts catalogue).
- The activation of the coolant circulation pump - V50- (coolant pump - V36-) differs depending on the production period.

Note

The version of the coolant circulation pump - V50- (coolant pump - V36-) and the activation of the pump(s) differ depending on the vehicle version and production period. From model year 2012 onwards and depending on the engine, the pumps fitted from the start of production onwards and activated via a 500 hertz signal (500 pulses per second) are gradually being replaced by pumps activated via a variable signal (100 ... 500 hertz). The pumps activated via a variable signal are equipped additionally with a diagnostic function and are generally activated via the corresponding engine control unit. Therefore it is important to observe the correct assignment (only the assigned pump can be activated) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Electronic parts catalogue .

– On vehicles with version 2 of the air conditioning unit, only the “deluxe” version of the air conditioner operating and display unit (Climatronic control unit - J255-) with part number “8T1 820 043” from index “Q” onwards (for vehicles with left-hand drive) or with part number “8T2 820 043” from index “M” onwards (for vehicles with right-hand drive) may be installed.
– If a “deluxe” version of the air conditioner operating and display unit (Climatronic control unit - J255-) with part number “8T1 820 043” from index “Q” onwards (for left-hand drive vehicles) or with part number “8T2 820 043” from index “M” onwards (for right-hand drive vehicles) is installed on vehicles with version 1 of the air conditioning unit, the adaption must be changed accordingly ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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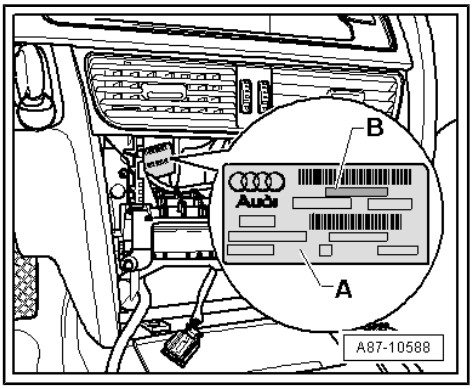

Note

- *The different versions of the air conditioning unit can be distinguished from the outside by the part number -B- on the label -A- ⇒ Electronic parts catalogue .*
- *The part number -B- on the label -A- can be read e.g. when the CD changer is removed (depending on vehicle equipment) ⇒ Communication; Rep. gr. 91 ; DVD/CD changer; Removing and installing CD changer .*

– The “deluxe” version of the air conditioner operating and display unit (Climatronic control unit - J255-) with part number “8T1 820 043” up to index “L” (for left-hand drive vehicles) or part number “8T2 820 043” up to index “H” (for right-hand drive vehicles) should not be fitted on vehicles with air conditioning unit version 2.

Note

No modifications have been made to the air conditioning unit and the air distribution housing of the “basic” air conditioner.

- From model year 2009 onwards, Audi A5 Coupé and Audi A4 vehicles are gradually being fitted with operating and display units (Climatronic control unit - J255-) with part no. 8T1 820 043 from index “T” onwards (for left-hand-drive vehicles) or 8T2 820 043 from index “Q” onwards (for right-hand-drive vehicles). These were fitted right from the start of production on the Audi Q5 ⇒ Electronic parts catalogue .

– On vehicles with such operating and display units and depending on the encoding and adaption, e.g. the screen display of the “MMI” (Multi Media Interface) is no longer switched to “Air conditioning” when the buttons and controls of the operating and display unit. The air conditioner functions selected are then indicated on the current display ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") , ⇒ Operating Manual for “Infotainment/MMI” and ⇒ Owner's Manual .⇒

– Observe correct assignment, coding and adaption of operating and display unit (Climatronic control unit - J255-) for control unit for front display and information control panel - J523- / control unit 1 for information electronics - J794- ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . If the assignment, encoding or adaption are incorrect, the various functions of the air conditioning system cannot be displayed and selected on the MMI.

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Note

- *Operating and display units (-J255-) with part number 8T1 820 043 up to index "S" (for left-hand drive vehicles) or 8T2 820 043 up to index "Q" (for right-hand drive vehicles) are fitted on vehicles with control unit for front display and information control panel - J523- .*
- *Operating and display units (-J255-) with part number 8T1 820 043 from index "T" onwards (for left-hand-drive vehicles) or 8T2 820 043 from index "Q" onwards (for right-hand-drive vehicles) may be fitted on vehicles with control unit 1 for information electronics - J794- . The various functions can only be displayed and selected if the encoding and adaption have been performed correctly for the vehicle equipment.*

- From model year 2010 onwards, a start/stop system (optional equipment) is offered for this vehicle in combination with certain engines.
- In model year 2010, petrol engines designed for operation with bioethanol were introduced gradually (Flex Fuel Vehicle).

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Note

- *On vehicles with a start/stop system, the stop function is prevented depending on the setting on the operating and display 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. The same also applies if the difference between the selected required temperature and the calculated actual temperature exceeds a certain value in heating or cooling mode ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *On vehicles with a start/stop system, only operating and display units (Climatronic control unit - J255-) with part number 8T1 820 043 from index “AG” onwards (for vehicles with left-hand drive) or 8T2 820 043 from index “AD” onwards (for vehicles with right-hand drive) or with part number 8K_ 820 043 may be installed ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *Whether the coolant circulation pump - V50- (coolant pump - V36-), if fitted, is activated depends on the production period and the vehicle version. Therefore make sure the correct version of -J255- is installed. On vehicles with -J255- with part number 8T1 820 043 from index “AG” onwards (for vehicles with left-hand drive) or 8T2 820 043 from index “AD” onwards (for vehicles with right-hand drive), also observe the adaption for the activation of -V50- (-V36-) ⇒ page 596 and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The version of the coolant circulation pump - V50- (coolant pump - V36-) and the activation of the pump(s) differ depending on the vehicle version and production period. From model year 2012 onwards and depending on the engine, the pumps fitted from the start of production onwards and activated via a 500 hertz signal (500 pulses per second) are gradually being replaced by pumps activated via a variable signal (100 ... 500 hertz). The pumps activated via a variable signal are equipped additionally with a diagnostic function and are generally activated via the corresponding engine control unit. Therefore it is important to observe the correct assignment (only the assigned pump can be activated) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Electronic parts catalogue .*
- *In model year 2010, petrol engines designed for operation with bioethanol were introduced gradually (Flex Fuel Vehicle). These engines are currently also fitted with an auxiliary air heater element - Z35- ⇒ page 482 . On vehicles with a petrol engine, the electric supplementary heater (auxiliary air heater element - Z35-) is activated by a signal from the operating and display unit (Climatronic control unit - J255-) via the local data bus (via the same output by which the fresh air blower control unit - J126- is activated) to the auxiliary air heater control unit - J604- . ⇒ Current flow diagrams, Electrical fault finding and Fitting locations*

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- *On vehicles with a petrol engine designed for operation with bioethanol, only operating and display units (Climatronic control unit - J255-) with part number 8T1 820 043 from index "AG" onwards (for vehicles with left-hand drive) or 8T2 820 043 from index "AD" onwards (for vehicles with right-hand drive) or with part number 8K_ 820 043 may be installed ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

- Vehicles with high-voltage system (hybrid vehicles)

Note

- *Vehicles with a high-voltage system (up to conversion of vehicle design, applicable only to vehicles with left-hand drive) must only be fitted with an operating and display unit (Climatronic control unit - J255-) with part number 8R1 820 043 (up to conversion, from model year 2012 onwards, see below)⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

- *An operating and display unit (Climatronic control unit - J255-) with part number 8R1 820 043 may only be fitted on vehicles with a high-voltage system up to the conversion of the vehicle design (from model year 2012 onwards, see below). After the conversion of the vehicle design, vehicles with a high-voltage system will be fitted with operating and display units (Climatronic control unit - J255-) with part number 8K_ 820 043 (pay attention to index of part number and encoding) ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

- *To permit implementation of the various functions of the operating and display unit (Climatronic control unit - J255-) required for vehicles with a high-voltage system following the conversion of the design, such vehicles must always be fitted with -J255- provided with the relevant functions. The functions required for vehicles with a high-voltage system are not available e.g. with -J255- with part number 8K_ 820 043 and from index "K or AA" up to index "P or AE". These functions are integrated into -J255- with part number 8K_ 820 043 from index "Q or AF" onwards. Instead of -J255- with part number 8Kx 820 043 and index "Q", e.g. the version with index "AF" can be fitted (activation function for -N25- is not used) ⇒ Electronic parts catalogue . In this case, the functions required for the corresponding vehicle are deactivated or activated via the encoding of -J255- ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .*

- From model year 2012 onwards, modified -J255- control units are being gradually introduced (introduction depending on model and version); note correct assignment ⇒ Electronic parts catalogue .

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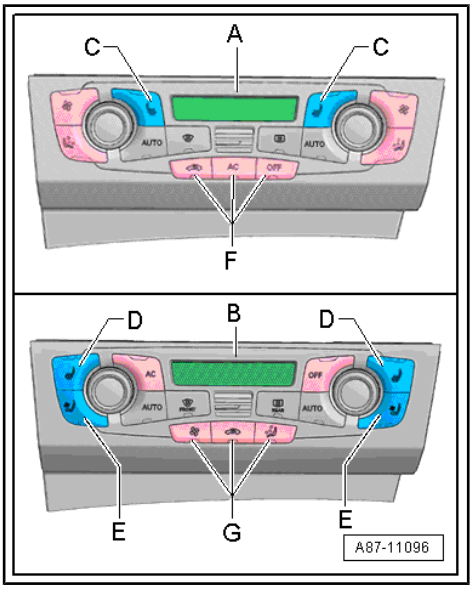

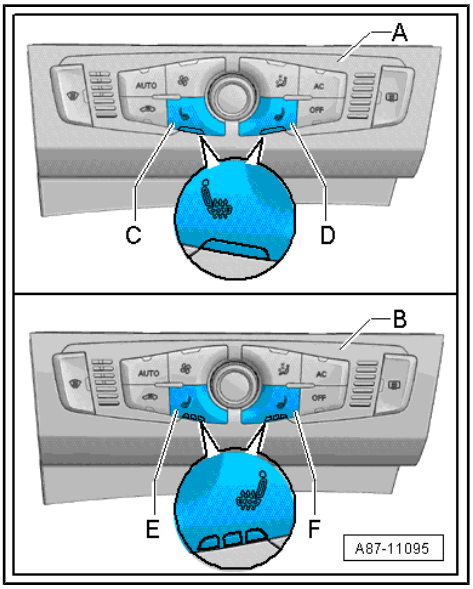

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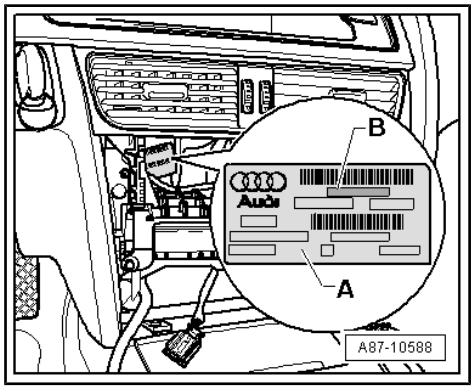

Note

- *From model year 2012 onwards, the design of the vehicles is modified gradually, starting with the Audi A4 and Audi A5. Vehicles manufactured prior to this conversion may only be fitted with operating and display units (Climatronic control unit - J255-) with part number 8T__ 820 043 (vehicles with a high-voltage system: versions with part number 8R1 820 043 only). Vehicles manufactured following the conversion may only be fitted with operating and display units (Climatronic control unit - J255-) with part number 8K_ 820 043 ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *On the “deluxe” version of the air conditioner, -J255- with part number 8T_ 820 043 / 8R1 820 043 -A- and with part number 8K_ 820 043 -B- can be distinguished (when fitted) as follows: On -J255- -A- (part number 8T_ 820 043 / 8R1 820 043) installed at the start of production, the seat heating and seat ventilation is selected via the buttons -C- and the rotary push-button. On -J255- -B- (part number 8K_ 820 043) fitted from the conversion of the vehicle design onwards (gradual introduction from model year 2012 onwards), the seat heating and seat ventilation are activated via two separate buttons -D- and -E-. Furthermore, the arrangement of certain buttons -F- and -G- is different on the two versions.*
- *Since the introduction of version -B- of -J255- , the seat heating and seat ventilation can be set separately in 3 stages using the corresponding buttons ⇒ Owner's Manual .*
- *On the “basic” version of the air conditioner, -J255- with part number 8T_ 820 043 (with part number 8R1 820 043) -A- and with part number 8K_ 820 043 -B- can be distinguished (when fitted) as follows: When fitted, the only features which distinguish versions -A- and -B- are the rotary pushbutton (version -B- with a chrome ring) and the seat heating buttons. On -J255- -A- fitted from the start of production onwards, the seat symbols in the buttons -C- and -D- face in different directions. On -J255- -B- fitted from the conversion of the vehicle design onwards (gradual introduction from model year 2012 onwards), the seat symbols in the buttons -C- and -D- face in the same direction.*
- *Since the introduction of version -B- of -J255- , the seat heating can be set in 3 stages using the corresponding buttons ⇒ Owner's Manual .*
- *From model year 2012 onwards and depending on the vehicle version, modified fresh air blower control units - J126- , fresh air blowers - V2- , air conditioner operating and display units (Climatronic control unit - J255-), onboard supply control units - J519- , convenience system central control units - J393- , air quality sensors - G238- and air conditioning units are introduced gradually. Pay attention to the correct version and assignment of these components ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *If the allocation or adaption of -J255- and -J126- (with part number 8K0 820 521 or 8T0 820 521) is not as specified, the fresh air blower - V2- is not controlled by -J126- . Although in this case the activation of -V2- is not OK, an entry is not always made in the event memory. Therefore it is important to pay attention to the correct adaption of -J255- ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

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- *At the start of production, the humidity sender - G355- was only fitted on vehicles with “deluxe” air conditioners. Since the introduction of the start/stop system (from model year 2010 onwards), -G355- is also fitted on vehicles with “basic” air conditioners (vehicles with start/stop system as optional extra).*
- *On vehicles manufactured prior to the conversion (excl. Audi Q5 hybrid), the measured value for -G355- is evaluated by the convenience system central control unit - J393- or the data bus diagnostic interface - J533- . On vehicles manufactured after the product conversion (and on Audi Q5 hybrid), the measured value for -G355- is evaluated by the onboard supply control unit - J519- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations, ⇒ Electrical system and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *Depending on the production period (gradual introduction from model year 2012 onwards) and the vehicle version, the humidity sender - G355- may no longer be addressed as a component in the event memory. If there is a discrepancy for -G355- on such vehicles, the rain and light sensor - G397- is indicated as the location of the fault.*
- *The different versions of the air conditioning unit can be distinguished from the outside by the part number -B- on the label -A- ⇒ Electronic parts catalogue .*
- *The part number -B- on the label -A- can be read e.g. when the CD changer is removed (depending on vehicle equipment) ⇒ Communication; Rep. gr. 91 ; DVD/CD changer; Removing and installing CD changer .*
- *From model year 2012 onwards and depending on the vehicle version, engine and production period, different versions of the coolant circulation pump - V50- (coolant pump - V36-) are introduced gradually; the activation of these pumps also differs. From model year 2012 onwards, the pumps fitted from the start of production onwards and activated via a 500 hertz signal (500 pulses per second) are replaced by pumps activated via a variable signal (100 ... 500 hertz). The pumps activated via a variable signal are equipped additionally with a diagnostic function and are generally activated via the corresponding engine control unit. Therefore it is important to observe the correct assignment (only the assigned pump can be activated) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Electronic parts catalogue .*
- From model year 2012 onwards, air conditioner compressors with an additional air conditioning system magnetic clutch - N25- fitted are gradually being introduced for certain vehicles with 4-cyl. engines.

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Note

- *In certain air conditioner operating modes (e.g. “Econ” mode), the air conditioner compressor drive system is deactivated completely via this magnetic clutch. For -N25- to be activated by the operating and display unit (Climatronic control unit - J255-), the correct version of -J255- must be fitted and correctly encoded ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .*
- *To make it possible for the air conditioning system magnetic clutch - N25- to be activated by the operating and display unit (Climatronic control unit - J255-), these vehicles may only be fitted with -J255- provided with the functions required for the activation of -N25- (e.g. -J255- with part number 8K_ 820 043 and index “K” is not designed for activation of -N25- . E.g. -J255- with part number 8K_ 820 043 and index “AA” is designed for activation of -N25-). Instead of -J255- with part number 8K_ 820 043 and index “K”, a version with index “AA” (activation function for -N25- is not used) or a version with index “AF” (activation functions for -N25- or for vehicles with a high-voltage system are not used) can also be fitted ⇒ Electronic parts catalogue . In this case, the functions required for the corresponding vehicle are deactivated or activated via the encoding of -J255- ⇒ Vehicle diagnostic, testing and information system - VAS 5051/- ("Guided Fault Finding") .*

- In model year 2014/from model year 2015 onwards, modified operating and display units (Climatronic control unit - J255-) are gradually being introduced (introduction depending on model and version); note correct assignment ⇒ Electronic parts catalogue .

Note

The exact date of introduction has not yet been finalised. -J255- can be distinguished e.g. by the AC button (part number 8K_ 820 043 up to index “AL”) and the A/C button (part number 8K_ 820 043 from index “AM” / “BA” onwards) ⇒ Electronic parts catalogue .

8.2 Removing and installing operating and display unit

Climatronic control unit - J255-

Note

The removal and installation procedures are identical for both versions (“basic” and “deluxe”) of the air conditioner operating and display unit (Climatronic control unit - J255-).

Removing

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– Interrogate adaption and encoding of operating and display unit (Climatronic control unit - J255-) via “Replace control unit” function in Guided Fault Finding mode (if front operating and display unit, Climatronic control unit - J255- , is supposed to be renewed) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

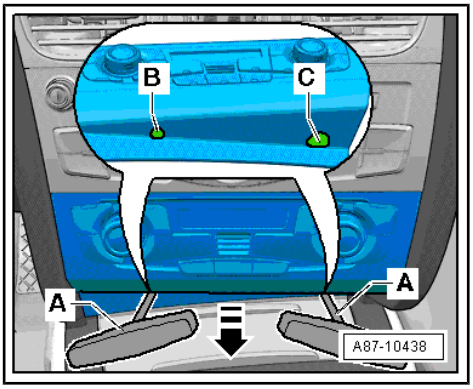
Caution

- *Take care not to pull too firmly to avoid damaging the air conditioner operating and display unit (Climatronic control unit - J255-) and the centre console during removal.*
- *Take care not to damage the surface of the centre console during removal (cover it if necessary).*

– Switch off ignition.

– Position hook - 3438- -A- as shown in one of the openings -B- or -C- of air conditioner operating and display unit (Climatronic control unit - J255-).

– Carefully pull air conditioner operating and display unit (Climatronic control unit - J255-) out of centre console in direction of -arrow-.



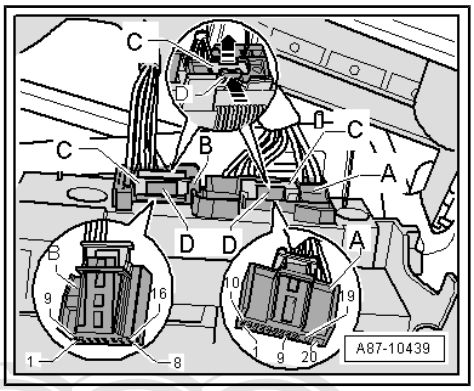
Note

The air conditioner operating and display unit (Climatronic control unit - J255-) is held in position by the clips (left and right) in the centre console support brackets.

Unplugging connectors from air conditioner operating and display unit (Climatronic control unit - J255-)

– Release locking element -C- of connectors -A- and -B- by pulling in direction of -arrow-.

– Press locking element -D- towards connector -arrow- and unplug connectors -A- and -B-.



Installing

Install in reverse order of removal; note the following.

- When renewing air conditioner operating and display unit (Climatronic control unit - J255-), it is important to observe the exact assignment ⇒ page 600 and ⇒ Electronic parts catalogue .

Attaching trim panel to operating and display unit on Audi Q5

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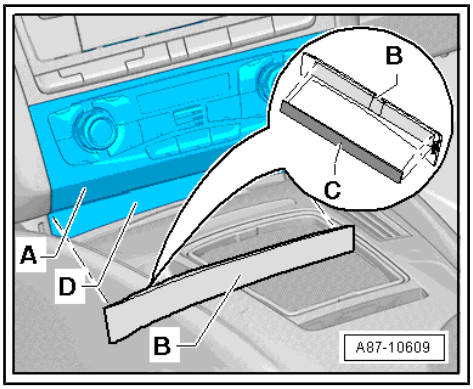
– Clean bonding surface -D- on operating and display unit -A- e.g. using cleaning solution D 009 401 04 ⇒ Electronic parts catalogue .

– Install operating and display unit -A-.



Note

- *Replacement trim panels -B- are supplied with double-sided adhesive tape -C- already affixed ⇒ Electronic parts catalogue .*
- *If you want to re-use trim panel -B- when renewing the operating and display unit (Climatronic control unit - J255-) -A-, remove adhesive tape -C- from trim panel -B-. Clean bonding surface on trim panel -B- as described in usage and handling instructions for adhesive tape. Then stick a strip of double-sided adhesive tape -C- (dimensions: 204 mm x 10 mm, thickness approx. 1.2 mm; e.g. adhesive tape D 438 515 A1 ⇒ Electronic parts catalogue) onto the trim panel -B-.*

– Position trim panel -B- with adhesive tape -C- on bonding surface -D- of operating and display unit -A- and align trim panel -B-.

– Press trim panel -B- onto bonding surface -D-.

- Always perform the following work steps after renewing/installing the air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Re-code (or check coding of) air conditioner operating and display unit (Climatronic control unit - J255-).

– Perform basic setting of air conditioner operating and display unit (Climatronic control unit - J255-).

– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-), eliminate cause of any faults displayed, and erase event memory.

– Check and, if necessary, correct adaption of air conditioner operating and display unit (Climatronic control unit - J255-).

– Perform final control diagnosis for air conditioner operating and display unit (Climatronic control unit - J255-), depending on the problem encountered.

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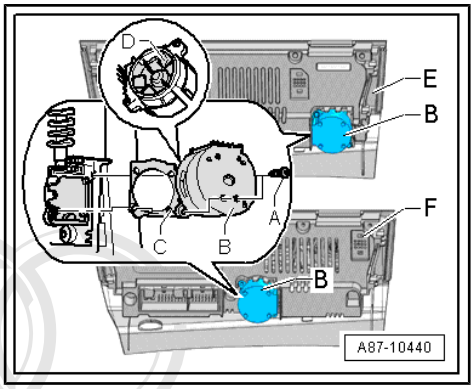
8.3 Removing and installing temperature sensor blower



Note

- *Both versions of the air conditioner operating and display unit (Climatronic control unit - J255-) (“basic” -E- and “deluxe” -F-) are currently fitted with the same temperature sensor blowers - V42- -B-. However, due to the different fitting locations in the operating and display unit, the blowers operate at different speeds (approx. 2500 to 3200 rpm on “basic” version and approx. 2800 to 3500 rpm on “deluxe” version) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *Depending on the version, the air conditioner operating and display unit (Climatronic control unit - J255-) may be fitted with a moulded seal -C-; re-install the seal if applicable.*

Removing

– Remove air conditioner operating and display unit (Climatronic control unit - J255-) ⇒ page 608 .

– Remove bolts -A-.

– Pull temperature sensor blower - V42- -B- out of air conditioner operating and display unit (Climatronic control unit - J255-).

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Installing

Install in reverse order of removal; note the following.

– When installing temperature sensor blower - V42- , do not press on fan -D- but hold blower at housing.

– Switch on ignition.

– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

9 Further control components

⇒ “9.1 Removing and installing sunlight penetration photosensor G107 ”, page 612

⇒ “9.2 Operation of air quality sensor G238 ”, page 614

⇒ “9.3 Checking air quality sensor G238 ”, page 617

⇒ “9.4 Removing and installing air quality sensor G238 / humidity sender in fresh air intake duct G657 ”, page 627

⇒ “9.5 Removing and installing ambient temperature sensor G17 ”, page 631

⇒ “9.6 Removing and installing centre vent temperature sender G191 ”, page 632

⇒ “9.7 Removing and installing footwell vent temperature sender G192 / left footwell vent temperature sender G261 ”, page 632

⇒ “9.8 Removing and installing right footwell vent temperature sender G262 ”, page 633

⇒ “9.9 Removing and installing evaporator output temperature sender G263 ”, page 633

⇒ “9.10 Removing and installing humidity sender G355 ”, page 634

⇒ “9.11 Removing and installing rain and light sensor G397 ”, page 637

⇒ “9.12 Removing and installing front left chest vent temperature sensor G385 ”, page 638

⇒ “9.13 Removing and installing front right chest vent temperature sensor G386 ”, page 639

⇒ “9.14 Operation of humidity sender in fresh air intake duct G657 ”, page 640

⇒ “9.15 Checking humidity sender in fresh air intake duct G657 ”, page 641

9.1 Removing and installing sunlight penetration photosensor - G107-

Note

- *There are different versions of the sunlight penetration photosensor - G107- ; therefore it is important to observe the correct assignment ⇒ Electronic parts catalogue . If the wrong version of the sunlight penetration photosensor - G107- for the vehicle is fitted (signal emitted is not the one specified in the air conditioner operating and display unit), the air conditioner operating and display unit (Climatronic control unit - J255-) cannot evaluate the signal from the sunlight penetration photosensor - G107- and there will be problems with air conditioner control.*
- *The following illustration shows the layout of the components on an Audi A5 Coupé. The layout may differ slightly on the Audi A5 Sportback, Audi A4, Audi Q5, etc. The components are however to be removed and installed in the same manner as described for the Audi A5 Coupé.*

Audi
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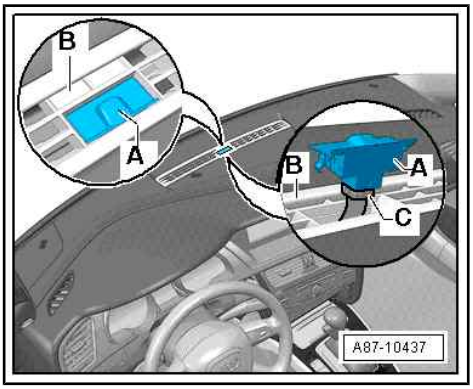
Removing

– Switch off ignition.

– Using e.g. a small screwdriver, carefully prise sunlight penetration photosensor - G107- -A- out of defroster vent -B- (for windscreen). ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel



Note

When doing so, take care not to damage the surface of the cover for the sunlight penetration photosensor - G107- -A- and the defroster vent -B-.

– Unplug connector -C-.

Installing

Install in reverse order of removal; note the following.

– Switch on ignition.

– Following installation, interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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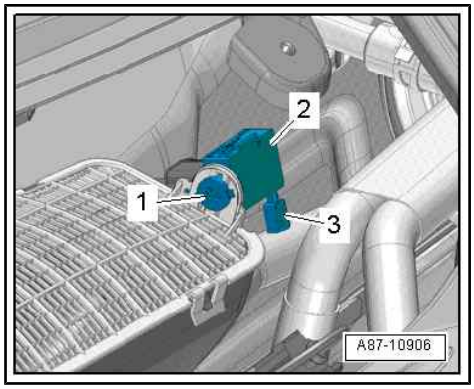
9.2 Operation of air quality sensor - G238-



Note

- *Different versions are fitted depending on the production period of the vehicles and the version of the air conditioner ("basic" or "deluxe"). Until the gradual conversion of the vehicle version from model year 2012 onwards, "basic" air conditioners were not fitted with -G657- / -G238- . From this conversion onwards, -G657- without -G238- (black housing) is fitted. Until the gradual conversion of the vehicle version from model year 2012 onwards, "deluxe" air conditioners were fitted with -G238- without -G657- . From the conversion onwards, -G657- with -G238- (brown housing) is fitted.*
- *The air quality sensor - G238- without -G657- is only fitted on vehicles with a "deluxe" air conditioner (from start of production up to conversion) ⇒ Electronic parts catalogue .*
- *From model year 2012 onwards, the version of the vehicles is gradually being converted, starting with the Audi A4 and Audi A5 ⇒ page 600 . On vehicles manufactured prior to the conversion, "deluxe" air conditioners are fitted with -G238- (not fitted on "basic" version). On vehicles manufactured after this conversion (and on the Audi Q5 hybrid), the "basic" version is fitted with -G657- and the "deluxe" version is fitted with -G657- with -G238- .*
- *The distinguishing features of the different versions are as follows: On the version with -G657- and -G238- , the housing is brown (gradual introduction from model year 2012 onwards). On the version with -G657- without -G238- , the housing is black (gradual introduction from model year 2012 onwards). On the version with -G238- without -G657- , the housing is black and there is no -G657- -3- (gradual discontinuation from model year 2012 onwards).*

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- There are different versions of the air quality sensor - G238- -2-; this vehicle is fitted with an air quality sensor - G238- which is equipped with one sensor each for determining the NOx (nitrogen oxide) and CO (carbon monoxide) content of the air flowing past. In addition, the air quality sensor - G238- installed in this vehicle exchanges information with the onboard supply control unit - J519- via a local data bus. Therefore it is important to observe the precise allocation of -G238- ⇒ Electronic parts catalogue .
- The measured value of the air quality sensor - G238- -1- is evaluated by the onboard supply control unit - J519- and transmitted via data bus to the operating and display unit (Climatronic control unit - J255-). When it detects a request, the operating and display unit (Climatronic control unit - J255-) switches on air recirculation mode if there is no shut-off criterion ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- After switching on the ignition, the air quality sensor - G238- takes approx. 2 minutes to reach its operating temperature; the function of the -G238- is restricted during the warm-up phase.

- Under certain ambient conditions, a fault message may be displayed for the air quality sensor - G238- during the warm-up phase. Only renew -G238- if the entry indicates that it is permanently defective. If the fault display for -G238- switches from “static” to “sporadic” after switching the ignition off and on again (wait at least 2 minutes in each case), -G238- is OK and the entry in the event memory can be ignored (erase event memory) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- The air quality sensor - G238- detects pollutants in the ambient atmosphere (generally petrol and/or diesel emissions) and causes the operating and display unit (Climatronic control unit - J255-) to switch the air conditioner to air recirculation mode.
- The operating and display unit (Climatronic control unit - J255-) detects the nature and level of air pollution from the sensor signal. Depending on the ambient temperature and the degree of air pollution, the operating and display unit (Climatronic control unit - J255-) effects the following (⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")):

– At ambient temperatures above approx. + 2 °C, even a slight increase in the pollutant concentration causes the system to switch to air recirculation mode if there is a request from the air quality sensor - G238-.

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– At ambient temperatures below approx. -1 °C and with “Econ mode” selected (air conditioner compressor switched off, lamp in AC/A/C button off), switch-over only occurs if there is a major increase in pollutant concentration for only approx. 15 seconds. If the pollutant concentration increases again within approx. 2 minutes, the operating and display unit (Climatronic control unit - J255-) does not switch to “Automatic air recirculation mode” during this period.

If the air conditioner compressor is switched off (e.g. in “ECON” mode, indicator lamp in AC/A/C button off), the maximum duration for “Automatic air recirculation mode” is restricted by the operating and display unit (Climatronic control unit - J255-) to approx. 15 seconds to prevent the windows from misting up.

– A decrease in concentration results in the air conditioner being switched back to fresh air mode.
– The duration of the “automatic air recirculation mode” depends on the version of the operating and display unit (Climatronic control unit - J255-). At ambient temperatures below approx. +10 °C, the system remains e.g. in “automatic air recirculation mode” for approx. 30 sec. After this period, the system switches to fresh air mode. If there is a renewed increase in the pollutant concentration within approx. 2 minutes, the operating and display unit (Climatronic control unit - J255-) does not switch to “automatic air recirculation mode” within this period.

- The “automatic air recirculation” function can be deactivated at any time. If the function is active, the air conditioner compressor will be switched on even at ambient temperatures below + 2 °C when there is a request for “automatic air recirculation”. However, at temperatures below approx. - 5 °C, compressor operation is no longer possible.
- If “automatic air recirculation” mode has been set on the MMI (Multi Media Interface), the air conditioner compressor may be switched on down to temperatures of approx. - 5 °C even if air recirculation mode has been activated manually (via the “air recirculation” button).

- To prevent the air conditioner from constantly operating in air recirculation mode in areas with a persistently high level of pollutant emissions, the air quality sensor - G238- is adaptive (sensitivity is matched to environmental impact).
- If the pollutant level in the ambient air remains relatively high for a lengthy period, the air quality sensor - G238- starts to adapt to the change in ambient conditions via an adaption program, with the result that a request for air recirculation is generally applied for less than 12 minutes if the ambient air pollution remains the same. If there are several consecutive peak pollutant levels, the air conditioner may also operate in air recirculation mode for a longer period.
- It takes the air conditioner compressor a certain length of time to re-position the flaps. To prevent gaseous pollutants from entering the passenger compartment together with the fresh air drawn in before the air flow/fresh air flaps can close (and the air recirculation flaps can open) when there is a sudden increase in pollutant levels (e.g. when driving through a cloud of diesel emissions), vehicles with an air quality sensor - G238- are fitted with a dust and pollen filter with an activated charcoal layer. Once a filter is saturated with pollutants, it can no longer perform this function and must be renewed.
- To stop the air flow/fresh air and air recirculation flaps from being switched too frequently, switching does not take place immediately if there is a slight increase in the pollutant level in the ambient atmosphere (air quality sensor - G238- does not transmit request to operating and display unit, Climatronic control unit - J255-). In such cases, the filter effect of the activated charcoal layer in the dust and pollen filter is enough.
- To prevent the air flow/fresh air and air recirculation flaps from being switched too frequently, a request from the air quality sensor - G238- for “automatic air recirculation mode” is applied for at least 25 seconds (minimum dwell time) even if the pollutant concentration in the air has decreased to such an extent that air recirculation mode would no longer be necessary.
- To clear misted windows as quickly as possible, the operating and display unit (Climatronic control unit - J255-) does not permit the air recirculation mode while the “defrost” mode is active (a request from the air quality sensor - G238- is not implemented).
- It takes approx. 30 seconds for the air quality sensor - G238- to warm up after the ignition is switched on. During this period no request is sent for “automatic air recirculation” by the air quality sensor - G238- to the operating and display unit (Climatronic control unit - J255-).
- The air quality sensor - G238- is a highly sensitive electronic component which could be damaged irreparably by direct exposure to solvents, fuels and certain chemical compounds. Sensors that have come into contact with such substances must not be installed in the vehicle.
- When the ignition is switched on, certain ambient influences (e.g. high pollutant content in the air) during the warm-up phase of the air quality sensor - G238- may result in a fault being stored for the -G238- in the onboard supply control unit - J519- although the sensor is OK. In this case, proceed as follows:

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– Switch off ignition for at least two minutes.
– Switch on ignition and wait at least two minutes.

– Read out event memory of onboard supply control unit - J519- . If a static fault is still displayed for the air quality sensor - G238- , perform Guided Fault Finding ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . If a fault is no longer displayed for the air quality sensor - G238- or if the fault is now sporadic, the air quality sensor - G238- is OK (and can be ignored). Erase the event memory.

9.3 Checking air quality sensor - G238-

Note

- *Different versions are fitted depending on the production period of the vehicle and the version of the air conditioner (“basic” or “deluxe”) ⇒ page 614 .*
- *-G238- is only fitted on vehicles with “deluxe” air conditioner.*
- *After switching on the ignition, -G238- and -G657- take approx. 2 minutes to reach their operating temperature; the function of -G238- and -G657- is restricted during the warm-up phase.*
- *Under certain ambient conditions, a fault message may be displayed for the air quality sensor - G238- during the warm-up phase. Only renew the air quality sensor - G238- if the entry indicates that it is permanently defective. If the fault display for the air quality sensor - G238- switches from “static” to “sporadic” after the ignition is switched off and on again (wait at least 2 minutes in each case), the air quality sensor - G238- is OK and the entry in the event memory can be ignored (erase event memory) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

Special tools, testers and other devices required

- Vehicle diagnostic, testing and information system - VAS 5051- with diagnostic cable - VAS 5051/5A-
- Commercially available gas lighter (for checking -G238-)

Test requirements:

- The vehicle must be stationary in a clean atmosphere, away from running engines, air extractor outlets etc.
- The engine compartment and plenum chamber must be clean (not contaminated with oil or fuel).
- The engine compartment and plenum chamber must not have been sprayed with solvent-based cleaning agents or anti-corrosion material.
- “Automatic air recirculation” must be switched on.

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Note

The “automatic air recirculation” function can be activated and deactivated via the “AC” function in the “CAR” menu of the MMI (Multi Media Interface) ⇒ Infotainment/MMI Operating Manual .

Checking operation of -G238-

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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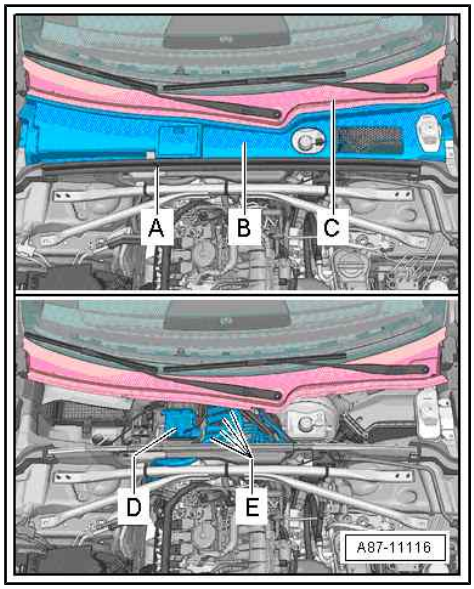
– Switch off ignition.

– Remove rubber seal -A- and plenum chamber cover -B- (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

♦ After removing plenum chamber cover -B-, visually inspect high-voltage components -D- (in this case power and control electronics for electric drive - JX1-) and high-voltage wires -E- ⇒ page 41 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

♦ When working in the vicinity of high-voltage components -D- and high-voltage wires -E-, always take care not to damage these components ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

♦ After completing the work and before installing the plenum chamber cover -B-, visually inspect the high-voltage components -D- and the high-voltage wires -E- ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .



Working with ignition switched on or high-voltage system active

DANGER!

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

Before switching on the ignition, perform the following steps:

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

– To minimise the number of automatic engine starts when the vehicle's drive system is active (READY) during test and measurement work, charge the vehicle batteries e.g. with the battery charger 60A - VAS 5904- in battery standby mode ⇒ Electrical system; Rep. gr. 27 ; Battery; Charging battery and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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

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Note

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

Vehicles without high-voltage system

– Switch off ignition.

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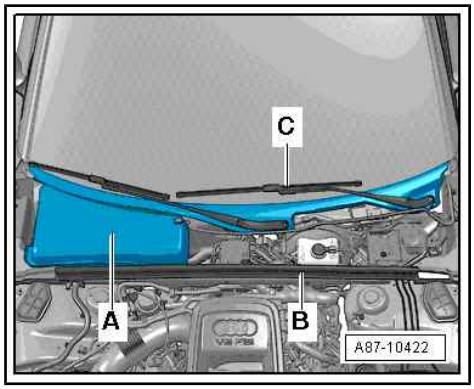
– Detach rubber seal (left-side) -B- as far as necessary ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
– Remove cover for fresh-air intake at cowl panel trim -A-, or remove cowl panel trim (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .



Note

If necessary, carefully detach cowl panel trim from fastener at cross member of windscreen -C- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

All vehicles

– With ignition switched off, connect vehicle diagnostic, testing and information system - VAS 5051/- to diagnostic connection in vehicle with diagnostic cable - VAS 5051/5A- and start Guided Fault Finding ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
– Switch on ignition (vehicles with high-voltage system).
– Start engine (vehicles without high-voltage system).

Note

On vehicles with a start/stop system, the engine may be shut off automatically by the vehicle electronics.

– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
– Set operating and display unit (Climatronic control unit - J255-) (“deluxe” version) to “Auto” mode.
– Use operating and display unit (Climatronic control unit - J255-) of MMI (Multi Media Interface) to set “automatic air recirculation mode” ⇒ Infotainment/MMI Operating Manual .
– Wait 2 minutes to allow air quality sensor - G238- to warm up.
– Use vehicle diagnostic, testing and information system - VAS 5051- to select “Read measured value block” function and read out measured values for air quality sensor - G238- ⇒ Vehicle diagnostic, testing and information system VAS 5051 (“Guided Fault Finding”) .

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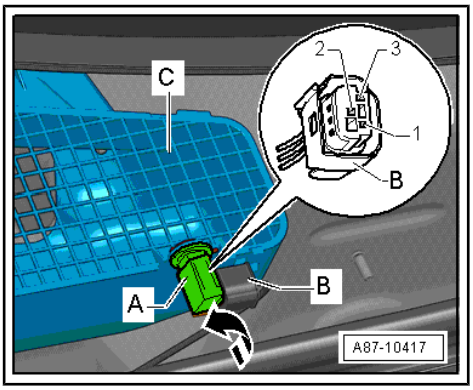
Note

- *The measured value block displays the air pollution level measured by the air quality sensor - G238- and the measured values for the NOx (nitrogen oxide) and CO (carbon monoxide) content of the air. For explanatory notes on the possible displays, refer to ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The value measured by -G238- is not displayed directly on all versions of the operating and display unit (Climatronic control unit - J255-). Some versions of -J255- may only display the measured value as a status indicating whether the heater and air conditioning unit is in fresh air mode or recirculated air mode ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051 .*

– Turn air quality sensor - G238- -A- approx. 90° in anti-clockwise direction and remove it from fresh-air intake -C-.



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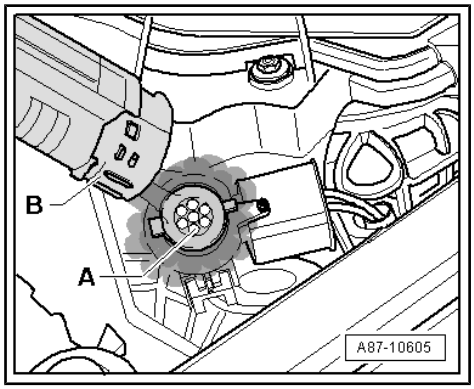
– Allow a small quantity of gas from cigarette lighter -B- to flow past section -A- of air quality sensor - G238- (from above).



Note

The air quality sensor - G238- reacts when exposed to cigarette smoke or cigarette lighter gas. As cigarette lighter gas is heavier than air, remove the air quality sensor - G238- and let the gas flow past it from above.

– Select and read out measured value block with measured values for air quality sensor - G238- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Specifications:

- The measured values in the display zones should increase in comparison to the initial value, indicating that both sensors in the air quality sensor - G238- are functioning properly and that the electronics in the -G238- are evaluating the measured values correctly.

– Wait briefly (approx. 1 minute, depending on amount of gas applied to sensor).

– Read out display in display zones with measured values for air quality sensor - G238- .

Specifications:

- The measured values in the display zones should return to the initial levels, indicating that both sensors are functioning properly and the sensor electronics are evaluating the measured values correctly.

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Note

Due to changes in pollutant levels, the values currently displayed may differ from those measured initially.

– Read out the display with the measured values for the air conditioner operating status (air recirculation/fresh air mode).

Specifications:

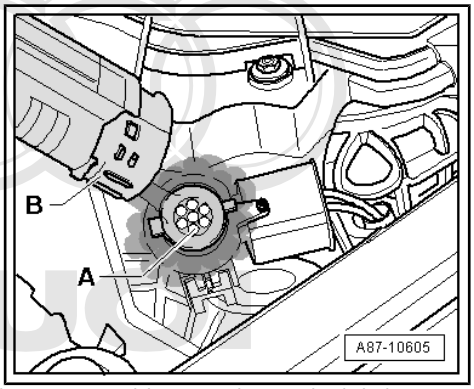
- The display zone should indicate that the air conditioner is operating in fresh air mode.

Note

- *If a value deviating from “fresh air mode” is displayed in the measured value block, air recirculation mode has already been requested (e.g. because of request for “maximum cooling output” or “air recirculation mode”); in this case select a mode which does not require air recirculation.*
- *If the measured value block indicates that the air quality sensor - G238- is already requesting automatic air recirculation mode, clean the plenum chamber (if necessary) or move the vehicle to an area with a cleaner ambient atmosphere ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

– Allow a small quantity of gas from cigarette lighter -B- to flow past section -A- of air quality sensor - G238- (from above).

– Read out display for air recirculation/fresh air mode.



Specifications:

♦ The measured value block should indicate that there is a request for air recirculation mode and the air conditioner is operating in air recirculation mode.

Note

♦ *Should the measured value block indicate that the air quality sensor - G238- is requesting automatic air recirculation mode, but that this request is not being implemented by the operating and display unit (Climatronic control unit - J255-) due to a shut-off criterion, eliminate the cause of the shut-off criterion (if applicable) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

♦ *To prevent the air flow/fresh air and air recirculation flaps from being switched too frequently, a request from the air quality sensor - G238- for "automatic air recirculation mode" is applied for at least 25 seconds (minimum dwell time) even if the pollutant concentration in the air has decreased again to such an extent that air recirculation mode would no longer be necessary.*

– Wait briefly (approx. 1 minute, depending on amount of gas applied to sensor).

♦ The measured value block indicates that there is no request for air recirculation mode and that the air conditioner is operating in fresh air mode again.

Proceed as follows if the air quality sensor - G238- functions properly in this test but a customer complaint has been received:

– Check dust and pollen filter for dirt ⇒ page 531 .

– With ignition switched off, connect vehicle diagnostic, testing and information system - VAS 5051/- to diagnostic connection in vehicle with diagnostic cable - VAS 5051/5A- and start Guided Fault Finding ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Use vehicle diagnostic, testing and information system - VAS 5051- to select "Read measured value block" function ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Note

A second person is required to read out the values displayed while the other is driving.

Observe safety precautions ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

– Alternately read out displays in measured value block for measured values of air quality sensor - G238- and request for air recirculation/fresh air mode.

– Start by driving vehicle into an area with a relatively clean atmosphere (system in fresh air mode).

– Then drive vehicle into an area where the atmosphere is polluted (e.g. onto an uphill road with heavy commercial traffic).

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– Read out displays in the various display zones. The displays in the various zones must change, e.g. when driving through a cloud of diesel emissions.

Note

Also refer to ⇒ page 531 (Removing and installing dust and pollen filter) and
⇒ "9.2 Operation of air quality sensor G238 ", page 614 .

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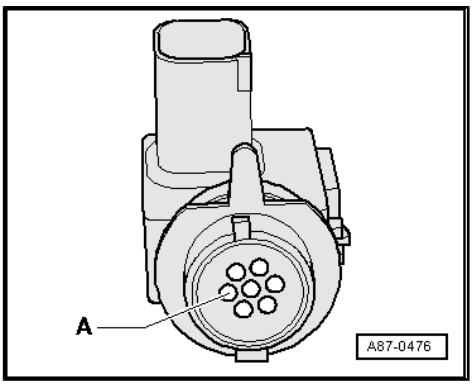
9.4 Removing and installing air quality sensor - G238- / humidity sender in fresh air intake duct - G657-



Note

- *Different versions are fitted depending on the production period of the vehicle and the version of the air conditioner ("basic" or "deluxe")* *⇒ page 614* *.*
- *-G238- is only fitted on vehicles with "deluxe" air conditioner.*
- *-G657- is only installed on vehicles from model year 2012 onwards (gradual introduction)* *⇒ page 614* *.*
- *-G238- / -G657- is a highly sensitive electronic component which could be damaged irreparably by direct exposure to solvents, fuels and certain chemical compounds (contamination can enter e.g. via area -A-). For this reason, never fit -G238- / -G657- if it has been kept in a tool box or similar.*
- *Following removal, do not set down -G238- / -G657- in areas where it could come into contact with solvents, fuels or certain chemical compounds (liquids or vapours).*
- *There are different versions of -G238- / -G657- with different modes of operation. Therefore it is important to observe the version ⇒ Electronic parts catalogue .*

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

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WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

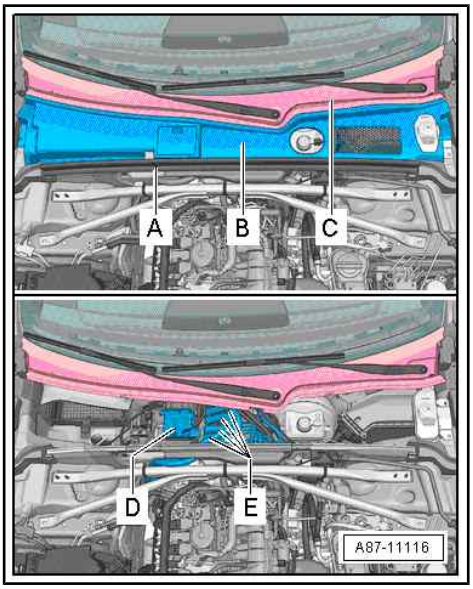
– Switch off ignition.

– Remove rubber seal -A- and plenum chamber cover -B- (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

♦ After removing plenum chamber cover -B-, visually inspect high-voltage components -D- (in this case power and control electronics for electric drive - JX1-) and high-voltage wires -E- ⇒ page 41 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

♦ When working in the vicinity of high-voltage components -D- and high-voltage wires -E-, always take care not to damage these components ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

♦ After completing the work and before installing the plenum chamber cover -B-, visually inspect the high-voltage components -D- and the high-voltage wires -E- ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

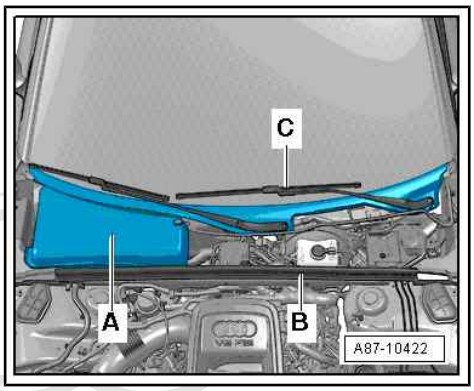


Vehicles without high-voltage system

– Switch off ignition.

– Detach rubber seal (left-side) -B- as far as necessary ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

– Remove cover for fresh-air intake at cowl panel trim -A-, or remove cowl panel trim (different versions) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .



Note

If necessary, carefully detach cowl panel trim from fastener at cross member of windscreen -C- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

All vehicles

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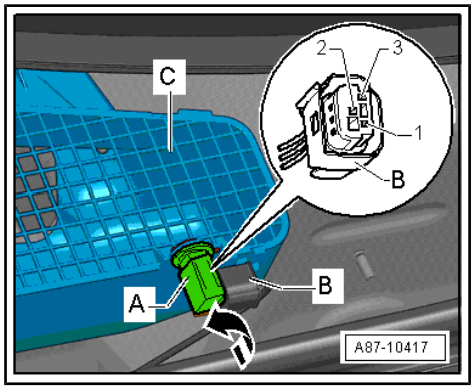
– Turn -G238- / -G657- -A- approx. 90° in anti-clockwise direction and remove it from fresh-air intake -C-.

– Unplug electrical connector -B- from -G238- / -G657- .



Contact assignment in connector -B-

1 - Positive (terminal “15”)

2 - Negative (terminal “31”)

3 - Signal wire to onboard supply control unit - J519- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

Note

- *The signal emitted by -G238- / -G657- cannot be evaluated using workshop equipment.*
- *The data of -G238- / -G657- are evaluated by the onboard supply control unit - J519- and transmitted via the data bus to the operating and display unit (Climatronic control unit - J255-).*
- *There are different versions of the fresh air intake duct -C- (with and without mounting for -G238- / -G657- -A- , mounting at front or on side). Pay attention to the correct version ⇒ Electronic parts catalogue .*
- *The measured values of -G238- / -G657- are displayed in the measured value block of the operating and display unit (Climatronic control unit - J255-) and in the measured value block of the onboard supply control unit - J519- . For explanatory notes on displays, refer to ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

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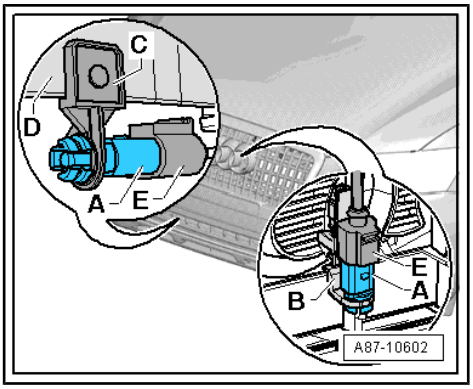
9.5 Removing and installing ambient temperature sensor - G17-



Note

- *The measured value of the ambient temperature sensor - G17- is evaluated by the onboard supply control unit - J519- and transmitted via the data bus to the air conditioner operating and display unit (Climatronic control unit - J255-) and the control unit in dash panel insert - J285- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

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- *This illustration shows the position of the ambient temperature sensor - G17- -A- on an Audi A5 Coupe. The layout may be different on an Audi A5 Sportback, Audi A4, Audi Q5, etc.*
- *On vehicles on which -G17- -A- is fitted with bracket -B- at the air intake grille above the impact bar, an excessively high temperature may be measured under certain usage conditions due to the fitting location of -G17- (because of heat radiating from radiator and condenser, e.g. on model year 2008 vehicles). The fitting location of -G17- -A- is therefore gradually altered in model year 2009. -G17- is fitted with a modified bracket -C- slightly further to the front (closer to the radiator grille) and beneath the impact bar -D- ⇒ Electronic parts catalogue .*
- *If there are problems with an excessively high measured value on vehicles on which -G17- -A- is secured to the air intake grille above the impact bar with bracket -B-, install -G17- -A- with a modified bracket -C- slightly further towards the front (closer to the radiator grille) and beneath the impact bar -D-. Depending on the version, it may also be necessary to lengthen the wiring ⇒ Electronic parts catalogue . Bracket -C- is clipped in at impact bar -D- (if not already provided, a hole with a diameter of 7 mm must be drilled into the bottom of the impact bar -D-).*

.

Removing and installing:

– Switch off ignition.

– Remove cover (top) for lock carrier ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .

– Unplug connector -E- at temperature sensor -A- and unclip temperature sensor from bracket (-B- or -D-).

Note

Depending on the vehicle equipment, it may be necessary to detach the bumper in order to remove -G17- -A- from bracket -C- installed beneath impact bar -D- (if -G17- is not accessible from above e.g. on vehicles with additional radiators).

– Following installation, interrogate event memory of operating and display unit (Climatronic control unit - J255-) and control unit in dash panel insert - J285- and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

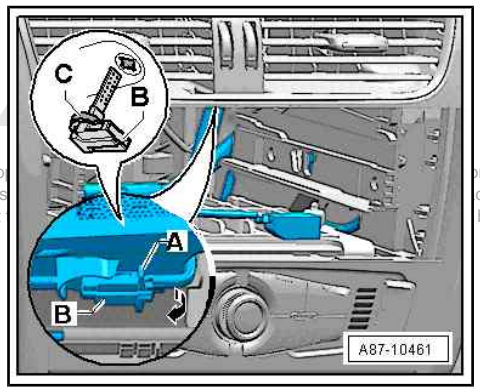
9.6 Removing and installing centre vent temperature sender - G191-

Note

The centre vent temperature sender - G191- is only fitted on vehicles with “basic” air conditioner.

Removing

- Switch off ignition.
- Remove radio - R- or CD changer (depending on vehicle equipment) ⇒ Communication; Rep. gr. 91 ; Radio; Removing and installing radio , or ⇒ Communication; Rep. gr. 91 ; DVD/CD changer; Removing and installing CD changer .
- Reach through installation slot for radio and unplug connector -A-.
- Turn sender -B- 90° and pull it out of air duct to centre dash panel vents.



Installing

Install in reverse order of removal; note the following.

- Check that seal -C- is not damaged and is seated correctly.
- Re-install all parts removed in reverse order.
- Switch on ignition.
- Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

9.7 Removing and installing footwell vent temperature sender - G192- / left footwell vent temperature sender - G261-

The footwell vent temperature sender - G192- is fitted on vehicles with “basic” air conditioner.

The left footwell vent temperature sender - G261- is fitted on vehicles with “deluxe” air conditioner.

Note

There are different designations for the currently identical sender depending on the version of the air conditioner ⇒ page 372 (Components of air conditioning unit).

Removing

- Move driver's seat to rearmost position.
- Switch off ignition.
- Remove storage compartment beneath dash panel (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel trim (driver side) .

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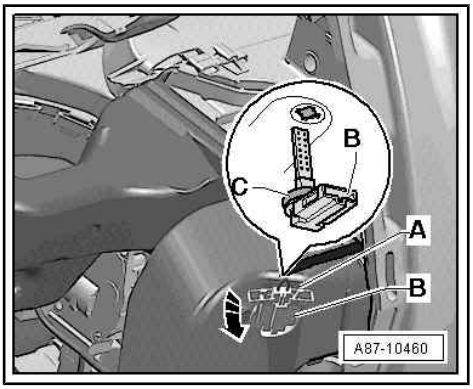
– Unplug connector -A-.
– Turn sender -B- 90° and pull it out of left footwell vent (driver's side).



Installing

Install in reverse order of removal; note the following.

– Check that seal -C- is not damaged and is seated correctly.
– Re-install all parts removed in reverse order.
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

9.8 Removing and installing right footwell vent temperature sender - G262-

Note

The front footwell vent temperature sender - G262- is only fitted on vehicles with a "deluxe" air conditioner.

Removing

– Set front passenger seat to rearmost position.
– Switch off ignition.
– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .
– Remove right footwell vent (front passenger's side) -C- ⇒ page 566 .
– Unplug connector -A-.
– Turn sender -D- 90° and pull it out of footwell vent (right-side) -C-.

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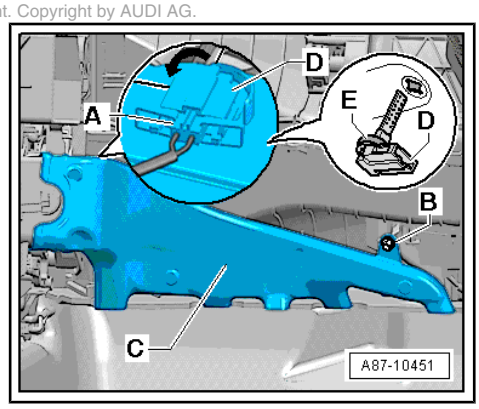


Installing

Install in reverse order of removal; note the following.

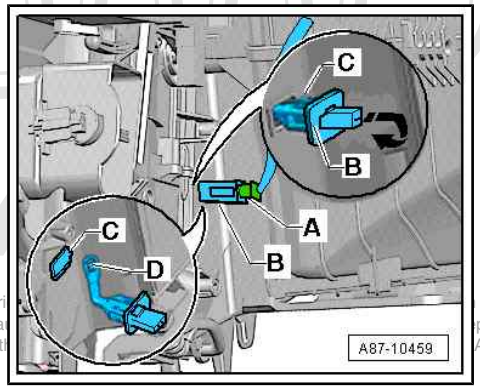
– Check that seal -E- is not damaged and is seated correctly.
– Re-install all parts removed in reverse order.
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

9.9 Removing and installing evaporator output temperature sender - G263-

Removing

– Set front passenger seat to rearmost position.
– Switch off ignition.
– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove right footwell vent (front passenger side) ⇒ page 566 .
– Unplug connector -A-.
– Release evaporator output temperature sender - G263- -B- from mounting -C- of air conditioning unit.
– Turn evaporator output temperature sender - G263- -B- 180° and pull it out of air conditioning unit.



Note

Evaporator output temperature sender - G263- -B- is installed with temperature sensor -D- facing evaporator. To make it possible to remove and install it with the air intake box in position, it must be turned in its mounting by 180° from its installation position after detaching / before attaching.

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Installing

Install in reverse order of removal; note the following.

– Insert evaporator output temperature sender - G263- -B- in mounting -C- of air conditioning unit.
– Turn evaporator output temperature sender - G263- -B- 180° and then secure it in mounting.
– Re-install all parts removed in reverse order.
– Switch on ignition.
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

9.10 Removing and installing humidity sender - G355-

⇒ “9.10.1 Removing and installing humidity sender G355 - vehicles without main beam assist”, page 634

⇒ “9.10.2 Removing and installing humidity sender G355 - vehicles with main beam assist”, page 636

9.10.1 Removing and installing humidity sender - G355- - vehicles without main beam assist

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

Note

- *Depending on the production period (gradual introduction from model year 2012 onwards) and the vehicle version, the humidity sender - G355- may no longer be addressed as a component in the event memory. If there is a discrepancy for -G355- on such vehicles, the rain and light sensor - G397- is indicated as the location of the fault ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *At the start of production, the humidity sender - G355- was only fitted on vehicles with "deluxe" air conditioners. Since the introduction of the start/stop system (from model year 2010 onwards), -G355- is also fitted on vehicles with "basic" air conditioners (vehicles with start/stop system as optional extra).*
- *From model year 2010 onwards, a different version of the humidity sender - G355- is fitted (gradual introduction) ⇒ Electronic parts catalogue . The removal and installation procedures for -G355- differ depending on the version. The removal and installation procedures for version 1 (fitted up to model year 2009, gradual discontinuation) are described below. For the removal and installation procedures for version 2 (fitted from model year 2010 onwards, gradual introduction) refer to ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system; Removing and installing rain and light sensor .*

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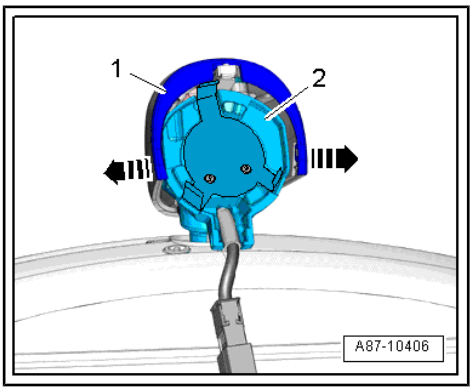
Removing (version 1)

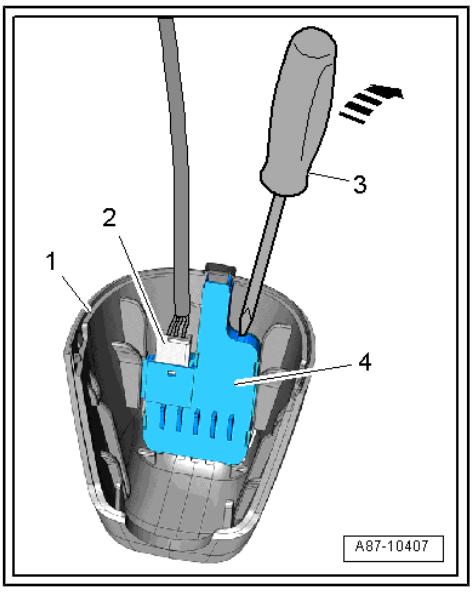
– Remove interior mirror ⇒ General body repairs, interior; Rep. gr. 68 ; Interior mirror; Removing and installing interior mirror .

– Press apart cover -1- slightly on both sides -arrows- and detach cover from interior mirror base -2-.



– Unplug electrical connector -2-.

– Using a small screwdriver -3-, carefully press humidity sender - G355- -item 4- off cover -1- -arrow- and at the same time pull it off upwards.



Installing (version 1)

Install in reverse order of removal; note the following:

– Carefully insert humidity sender - G355- in guides at sides.

Note

The cover cannot be fitted if the humidity sender - G355- has not been inserted properly.

– Install interior mirror ⇒ General body repairs, interior; Rep. gr. 68 ; Interior mirror; Removing and installing interior mirror .

9.10.2 Removing and installing humidity sender - G355- - vehicles with main beam assist

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

Note

- *Depending on the production period (gradual introduction from model year 2012 onwards) and the vehicle version, the humidity sender - G355- may no longer be addressed as a component in the event memory. If there is a discrepancy for -G355- on such vehicles, the rain and light sensor - G397- is indicated as the location of the fault ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *At the start of production, the humidity sender - G355- was only fitted on vehicles with "deluxe" air conditioners. Since the introduction of the start/stop system (from model year 2010 onwards), -G355- is also fitted on vehicles with "basic" air conditioners (vehicles with start/stop system as optional extra).*
- *From model year 2010 onwards, a different version of the humidity sender - G355- is fitted (gradual introduction) ⇒ Electronic parts catalogue . The removal and installation procedures for -G355- differ depending on the version. The removal and installation procedures for version 1 (fitted up to model year 2009, gradual discontinuation) are described below. For the removal and installation procedures for version 2 (fitted from model year 2010 onwards, gradual introduction) refer to ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system; Removing and installing rain and light sensor .*

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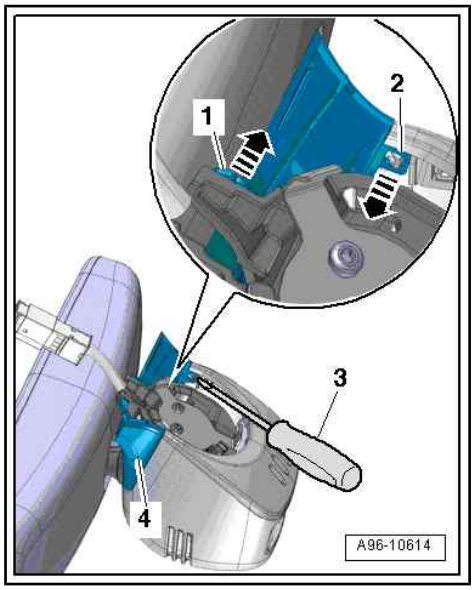
Removing (version 1)

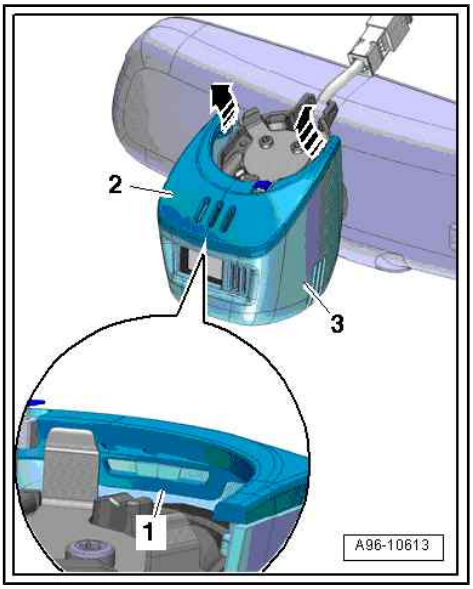
– Remove interior mirror ⇒ General body repairs, interior; Rep. gr. 68 ; Interior mirror; Removing and installing interior mirror .

– Release retaining tabs -1- and -2- with a screwdriver -3-.

– Disengage cover -4- at rear.



– Release retaining tabs -arrows- and carefully fold cover -2- upwards slightly at top.
– Disengage retaining tab -1- on cover -3- at front.
– Detach cover at top.



– Disengage retaining hooks in direction of -arrows- and pull cover -2- downwards at front out of guide elements at interior mirror base -1-.

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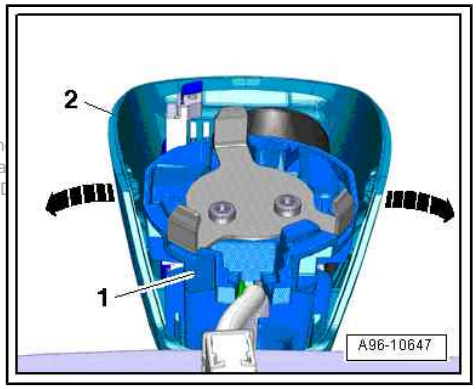
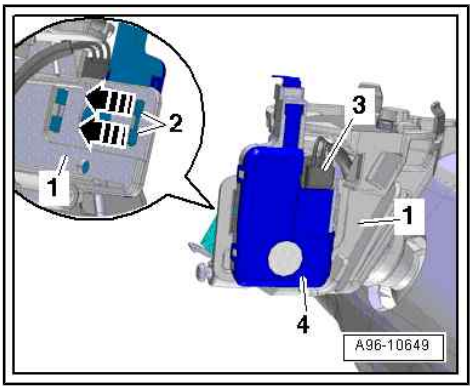


– Release retaining clips -2- -arrows- and detach humidity sender - G355- -item 4- from interior mirror base -1-.
– Unplug electrical connector -3-.

Installing (version 1)

Install in reverse order of removal; note the following:

– Install interior mirror ⇒ General body repairs, interior; Rep. gr. 68 ; Interior mirror; Removing and installing interior mirror .



9.11 Removing and installing rain and light sensor - G397-

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

Note

- *Depending on the production period (gradual introduction from model year 2012 onwards) and the vehicle version, the humidity sender - G355- may no longer be addressed as a component in the event memory. If there is a discrepancy for -G355- on such vehicles, the rain and light sensor - G397- is indicated as the location of the fault ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *From model year 2010 onwards, a different version of the humidity sender - G355- (with or without rain and light sensor - G397-) is fitted (gradual introduction) ⇒ Electronic parts catalogue . The removal and installation procedures for the two versions differ. Depending on the date of production and the vehicle model, version 1 (up to model year 2009, gradual discontinuation) or version 2 (from model year 2010 onwards, gradual introduction) may be fitted.*

Removing and installing (version 1)

– Removing and installing interior mirror ⇒ General body repairs, interior; Rep. gr. 68 ; Interior mirror; Removing and installing interior mirror

– Removing and installing humidity sender - G355- / rain and light sensor - G397- ⇒ page 634

Removing and installing (version 2)

– Removing and installing humidity sender - G355- / rain and light sensor - G397- ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system; Removing and installing rain and light sensor

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

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Note

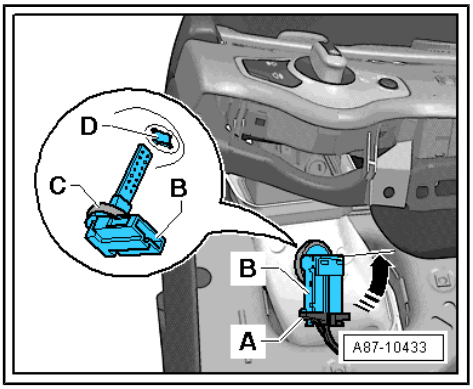
The front left chest vent temperature sensor - G385- is only fitted on vehicles with a “deluxe” air conditioner.

Removing

– Switch off ignition.

– Remove storage compartment beneath dash panel (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel trim (driver side)

– Unplug connector -A- from temperature sensor.
– Turn front left chest vent temperature sensor - G385- -B- 90° and pull it out of mounting in air duct -D-.



Installing

Install in reverse order of removal; note the following.

– Check that seal -C- is not damaged and is seated correctly.
– Switch on ignition.
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

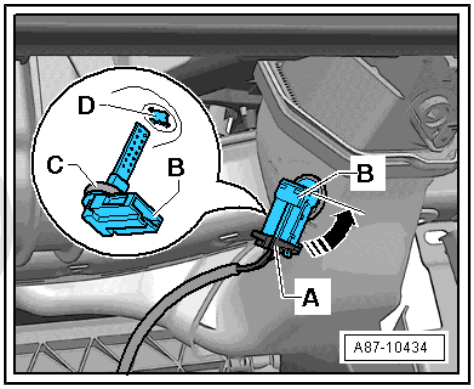
9.13 Removing and installing front right chest vent temperature sensor - G386-

Note

The front right chest vent temperature sensor - G386- is only fitted on vehicles with a “deluxe” air conditioner.

Removing

– Switch off ignition.
– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .
– Unplug connector -A- from temperature sensor.
– Turn front right chest vent temperature sensor - G386- -B- approx. 90° and pull it out of mounting in air duct -D-.



Installing

Install in reverse order of removal; note the following.

– Check that seal -C- is not damaged and is seated correctly.
– Switch on ignition.
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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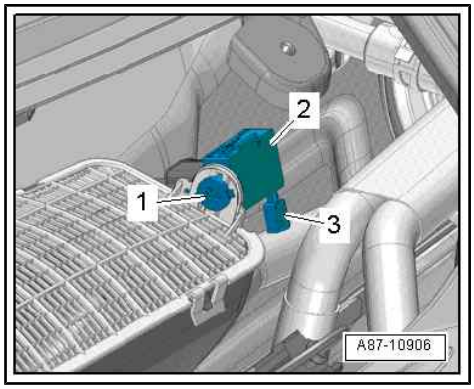
9.14 Operation of humidity sender in fresh air intake duct - G657-



Note

- *Different versions are fitted depending on the production period of the vehicles and the version of the air conditioner ("basic" or "deluxe"). Until the gradual conversion of the vehicle version from model year 2012 onwards, "basic" air conditioners were not fitted with -G657- / -G238- . From this conversion onwards, -G657- without -G238- (black housing) is fitted. Until the gradual conversion of the vehicle version from model year 2012 onwards, "deluxe" air conditioners were fitted with -G238- without -G657- . From the conversion onwards, -G657- with -G238- (brown housing) is fitted.*
- *The air quality sensor - G238- without -G657- is only fitted on vehicles with a "deluxe" air conditioner (from start of production up to conversion) ⇒ Electronic parts catalogue .*
- *From model year 2012 onwards, the version of the vehicles is gradually being converted, starting with the Audi A4 and Audi A5 ⇒ page 600 . On vehicles manufactured prior to the conversion, "deluxe" air conditioners are fitted with -G238- (not fitted on "basic" version). On vehicles manufactured after this conversion (and on the Audi Q5 hybrid), the "basic" version is fitted with -G657- and the "deluxe" version is fitted with -G657- with -G238- .*
- *The distinguishing features of the different versions are as follows: On the version with -G657- and -G238- , the housing is brown (gradual introduction from model year 2012 onwards). On the version with -G657- without -G238- , the housing is black (gradual introduction from model year 2012 onwards). On the version with -G238- without -G657- , the housing is black and there is no -G657- -3- (gradual discontinuation from model year 2012 onwards).*

- Version for vehicles with "deluxe" air conditioner: -G657- -item 3- is fitted together with -G238- -item 1- in a joint housing -2- (brown housing).
- Version for vehicles with "basic" air conditioner: only -G657- -item 3- is fitted; there is no -G238- -item 1- in housing -2- (black housing).
- -G657- is a highly sensitive electronic component which could be damaged irreparably by direct exposure to liquids, solvents, fuels and certain chemical compounds.
- Direct contact with water can impair the function of -G657- to such an extent that the values for humidity levels can no longer be measured correctly (either temporarily or permanently, depending on the composition of the fluid). Sensors that have come into contact with such substances must not be installed in the vehicle.
- -G657- determines the temperature and the moisture content of the air flowing past and exchanges information with the onboard supply control unit - J519- via the data bus.
- The measured value of -G657- is evaluated by -J519- and transmitted to the operating unit (Climatronic control unit - J255-) via the data bus.

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- -J255- uses the measured values to calculate the current relative humidity of the fresh air drawn in. The calculated humidity value then indicates whether there is a risk of the windscreen, rear window and door windows misting up from the inside. If this is the case, -J255- takes corrective action by altering various characteristic curves. This may involve reducing the evaporator temperature (by activating air conditioner compressor), increasing the response thresholds for the request for “automatic air recirculation mode” or preventing engine shut-off via the start/stop function etc.
- After the ignition is switched on, it takes -G657- approx. 2 minutes to reach its operating temperature; the function of -G657- is restricted during the warm-up phase.

9.15 Checking humidity sender in fresh air intake duct - G657-

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Note

- *Different versions are fitted depending on the production period of the vehicle and the version of the air conditioner (“basic” or “deluxe”)* *⇒ page 614* *.*
- *-G657- is only installed on vehicles from model year 2012 onwards (gradual introduction)* *⇒ page 614* *.*
- *After switching on the ignition, -G238- and -G657- take approx. 2 minutes to reach their operating temperature; the function of -G238- and -G657- is restricted during the warm-up phase.*
- *The operation of -G657- can only be checked using the “Guided Fault Finding” routine; the measured values of -G657- are evaluated using the “Read measured values” function and compared to the temperature and humidity measured at the fitting location of -G657- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) .*

Checking operation of -G657- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)

10 Battery cooling module

⇒ “10.1 Overview of fitting locations - components not located in passenger compartment”, page 642

⇒ “10.2 Overview of fitting locations - components in passenger compartment (rear)”, page 646

⇒ “10.3 Exploded view - battery cooling module”, page 648

⇒ “10.4 Air intake, air outlet and routing of air flow at battery cooling module”, page 651

⇒ “10.5 Exploded view - air ducts”, page 653

⇒ “10.6 Removing and installing refrigerant shut-off valve 1 for hybrid battery N516 ”, page 656

⇒ “10.7 Removing and installing air outlet duct (rear) for drive battery A2 ”, page 659

⇒ “10.8 Removing and installing air outlet duct (front) for drive battery A2 ”, page 661

⇒ “10.9 Removing and installing air inlet duct for drive battery A2 ”, page 663

⇒ “10.10 Removing and installing air ducts (left and right) at drive battery A2 ”, page 665

⇒ “10.11 Moving battery cooling module to service position”, page 667

⇒ “10.12 Removing and installing battery cooling module”, page 669

⇒ “10.13 Removing and installing battery fan 1 V457 ”, page 672

⇒ “10.14 Removing and installing temperature sensor before evaporator for hybrid battery G756 ”, page 674

⇒ “10.15 Removing and installing temperature sensor after evaporator for hybrid battery G757 ”, page 676

⇒ “10.16 Removing and installing condensation drain”, page 678

⇒ “10.17 Checking condensation drain”, page 680

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

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

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WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

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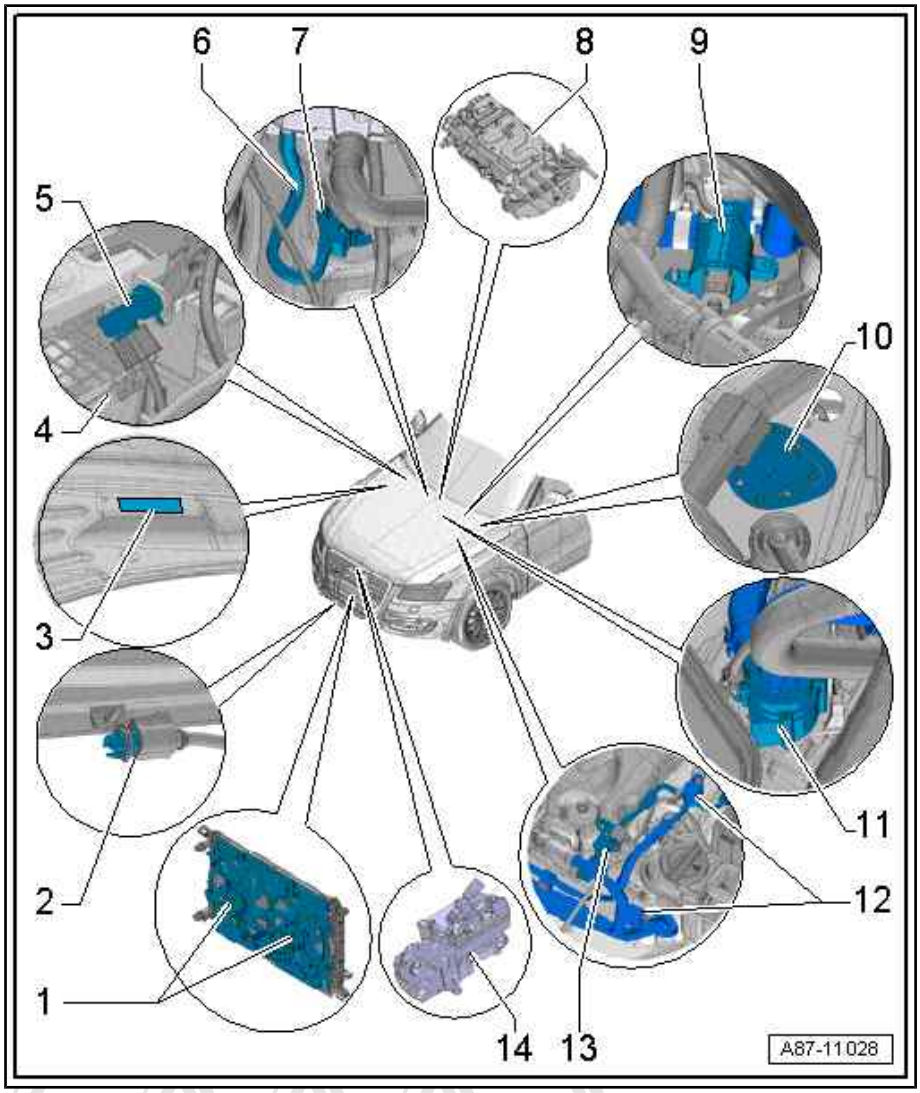
- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

Note

- *Components not located in passenger compartment on vehicles without and with a high-voltage system* *⇒ page 116*
- *The vehicles in this series with high-voltage systems are all fitted with refrigerant circuits charged with refrigerant R134a.*



1 - Radiator fan - V7- and radiator fan 2 - V177-

- For notes, refer to ⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 116

2 - Ambient temperature sensor - G17-

- For notes, refer to ⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 116

3 - Label

- With information on the type of refrigerant and the specified capacity ⇒ “4 Technical data”, page 107 and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils .

4 - Fresh-air intake with intake grille

- For notes, refer to ⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 116

5 - Air quality sensor - G238- / humidity sender in fresh air intake duct - G657-

- For notes, refer to ⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 116

6 - Condensation drain

- For notes, refer to ⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 116

7 - Plenum chamber water drain

- For notes, refer to ⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 116

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

- For all work on the power and control electronics for electric drive - JX1- and on vehicles with a high-voltage system, pay attention to the additional warning instructions for such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

9 - Coolant changeover valve / coolant shut-off valve -N422- / -N82-

Certain vehicles without an auxiliary heater (optional equipment) were fitted with vacuum-actuated coolant shut-off valves from the start of production onwards (depending on engine). At a later date, shut-off valves that are activated directly were gradually introduced. Depending on the engine version and the production period, this valve may be designated Climatronic coolant shut-off valve - N422- or coolant shut-off valve - N82- ⇒ page 590 .

- For notes, refer to ⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 116

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Note

-N489- / -N422- is currently not fitted in vehicles with an engine with regulated coolant circuit (e.g. vehicles with a regulated coolant pump and a coolant valve for cylinder head - N82-). On engines with a regulated coolant pump, the engine control unit activates the coolant pump to regulate coolant circulation ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly .

10 - Plenum chamber water drain

- For notes, refer to
⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 116

11 - Coolant circulation pump - V50-

- For notes, refer to
⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 116

12 - Connections of refrigerant lines to evaporator in battery cooling module

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WARNING

The refrigerant circuit must be discharged before slackening off the bolts at the connection point.

13 - Refrigerant shut-off valve 1 for hybrid battery - N516-

- Installed in area of left suspension turret in engine compartment
- Checking ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode

Note

-N516- is activated, for example, if the battery needs to be cooled but the air conditioner is not set to cooling mode for the passenger compartment (valve open when not activated).

- Removing and installing ⇒ page 656

14 - Electrically driven air conditioner compressor

- With control unit for air conditioning compressor - J842- and electrical air conditioner compressor - V470-
- Detaching and attaching air conditioner compressor at bracket (vehicles with 4-cyl. engine)
⇒ page 292 1)

Note

- *The type of compressor may differ depending on the production period and engine. ⇒ Electronic parts catalogue*

- *These air conditioner compressors are available as replacement parts with different oil capacities, so it is important to pay attention to the oil quantity in the air conditioner compressor and to check the exact part number ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils .*
- *There may be different refrigerant oil capacities for the refrigerant circuit depending on the type of air conditioner compressor. The reason for the different oil quantities in the air conditioner compressor for an otherwise identical refrigerant circuit is the design of the actual compressor; please note the different oil quantities. Too much oil in the refrigerant circuit results in higher pressures and a reduction in the cooling output of the air conditioner. Insufficient oil can cause lubrication problems ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Air conditioner with refrigerant R134a; Capacities for refrigerant R134a/ refrigerant oil and approved refrigerant oils .*
- *When fitting refrigerant lines and the corresponding retainers, make sure there is adequate clearance from other components (such as belts and engine pulleys).*

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

Vehicles with high-voltage system (hybrid vehicles)

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For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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Note

- ⇒ *"10.4 Air intake, air outlet and routing of air flow at battery cooling module", page 651*
- ⇒ *"10.3 Exploded view - battery cooling module", page 648*
- *The vehicles in this series with high-voltage systems are all fitted with refrigerant circuits charged with refrigerant R134a.*

WARNING

- *The refrigerant circuit must be discharged before slackening off the bolts at the connection point.*

1 - Air recirculation flap 1 control motor for hybrid battery - V479-

- ❑ Removing and installing ⇒ page 413

2 - Expansion valve with refrigerant shut-off valve 2 for hybrid battery - N517-

- ❑ Removing and installing ⇒ page 238

3 - Opening for refrigerant lines

- ❑ Removing and installing ⇒ page 201

4 - Battery fan 1 - V457-

- ❑ Removing and installing ⇒ page 672

5 - Air recirculation flap 2 control motor for hybrid battery - V480-

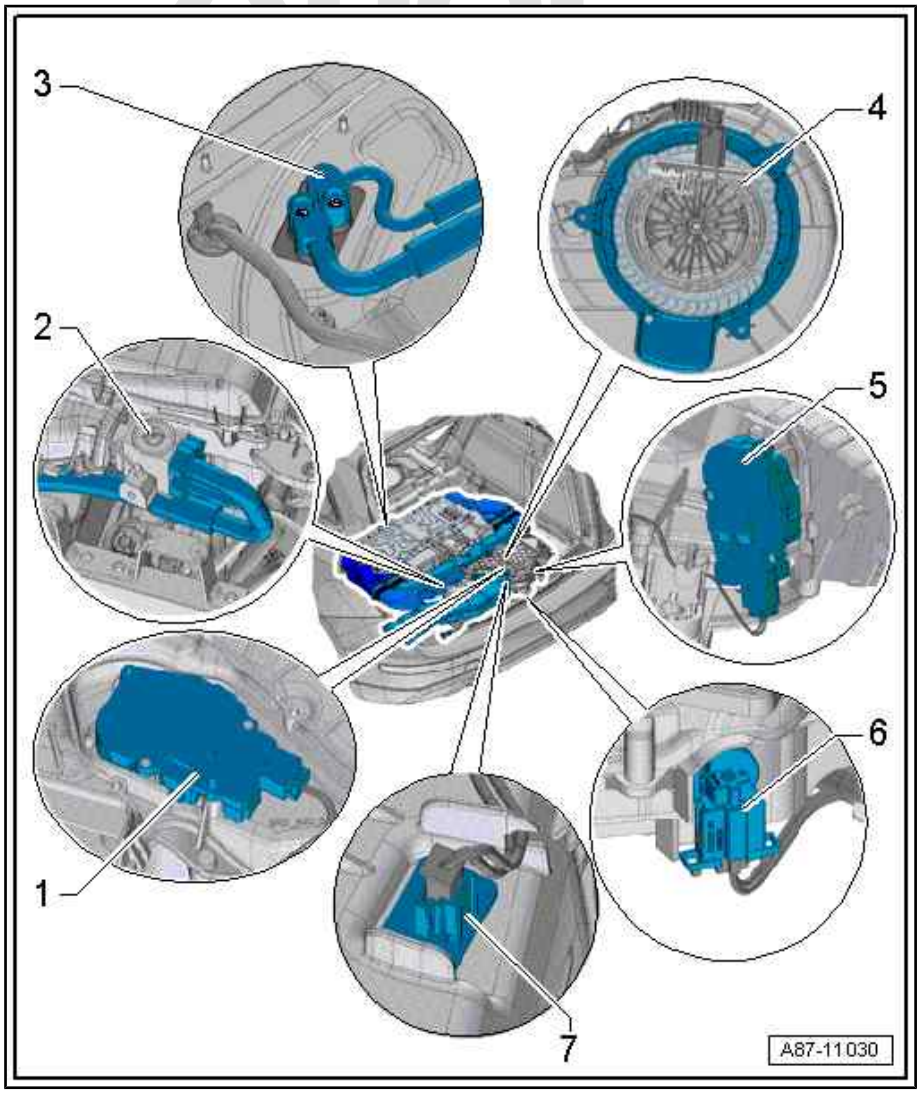
- ❑ Removing and installing ⇒ page 416

6 - Temperature sensor before evaporator for hybrid battery - G756-

- ❑ Removing and installing ⇒ page 674

7 - Temperature sensor after evaporator for hybrid battery - G757-

- ❑ Removing and installing ⇒ page 676



10.3 Exploded view - battery cooling module

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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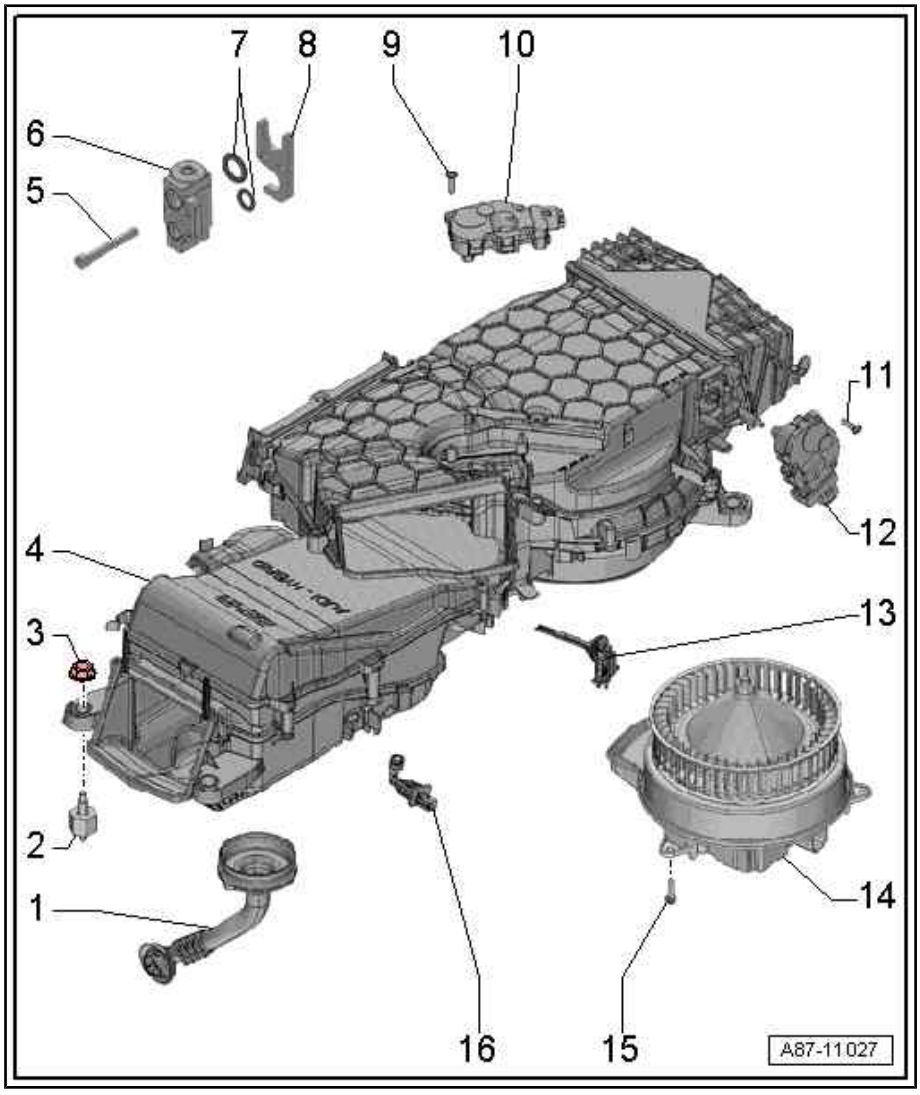
Note

- *The attachments are activated by the battery regulation control unit - J840- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- *The vehicles in this series with high-voltage systems are all fitted with refrigerant circuits charged with refrigerant R134a.*

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .



1 - Condensation drain

- ❑ Checking ⇒ page 680
- ❑ Removing and installing ⇒ page 678

2 - Bonded rubber mounting

3 - Nut

- ❑ 9 Nm

4 - Battery cooling module

- ❑ Moving to service position ⇒ page 667
- ❑ Removing and installing ⇒ page 669

5 - Bolt

- ❑ Tightening torque: 10 Nm ⇒ “2.16 Removing and installing expansion valve (rear) with refrigerant shut-off valve 2 for hybrid battery N517 ”, page 238

6 - Expansion valve with refrigerant shut-off valve 2 for hybrid battery - N517-

- ❑ Removing and installing ⇒ page 238

7 - O-rings

- ❑ Renew

8 - Retaining clip

9 - Bolt

- ❑ 1.5 Nm

10 - Air recirculation flap 1 control motor for hybrid battery - V479-

- ❑ Removing and installing ⇒ page 413

11 - Bolt

- ❑ 1.5 Nm

12 - Air recirculation flap 2 control motor for hybrid battery - V480-

- ❑ Removing and installing ⇒ page 416

13 - Temperature sensor before evaporator for hybrid battery - G756-

- ❑ Removing and installing ⇒ page 674

14 - Battery fan 1 - V457-

- ❑ Removing and installing ⇒ page 672

15 - Bolt

- ❑ 1.5 Nm

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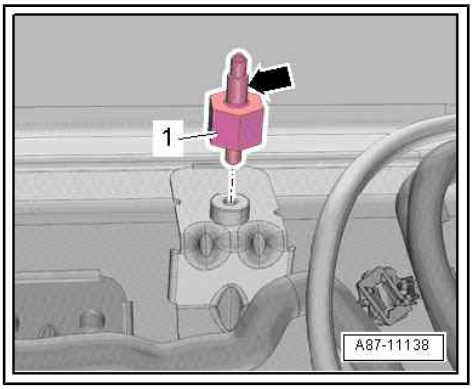
16 - Temperature sensor after evaporator for hybrid battery - G757-

- ❑ Removing and installing ⇒ page 676

Bonded rubber mounting - installation position

- The collar -arrow- on the bonded rubber mounting -1- faces upwards.



10.4 Air intake, air outlet and routing of air flow at battery cooling module

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

Note

Removing and installing air ducts ⇒ *"10.5 Exploded view - air ducts", page 653*

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1 - Air duct to battery cooling module

- ❑ Air inlet from area below luggage compartment floor panel

2 - Air duct (left-side) to drive battery - A2-

3 - Air duct (right-side) to drive battery - A2-

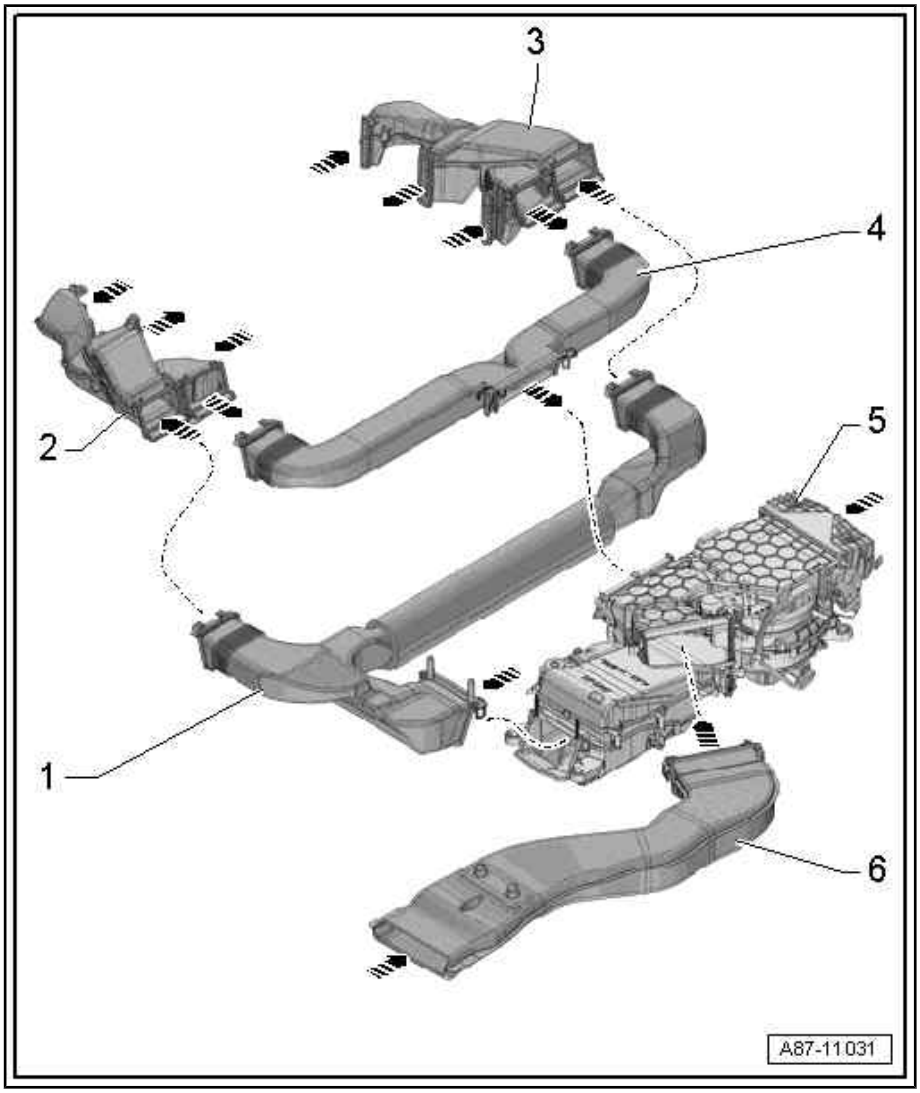
4 - Air outlet duct (front) for drive battery - A2-

- ❑ To battery cooling module

5 - Battery cooling module

6 - Air outlet duct (rear) from battery cooling module

- ❑ To forced ventilation vents of vehicle



10.5 Exploded view - air ducts

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

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WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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Additional work

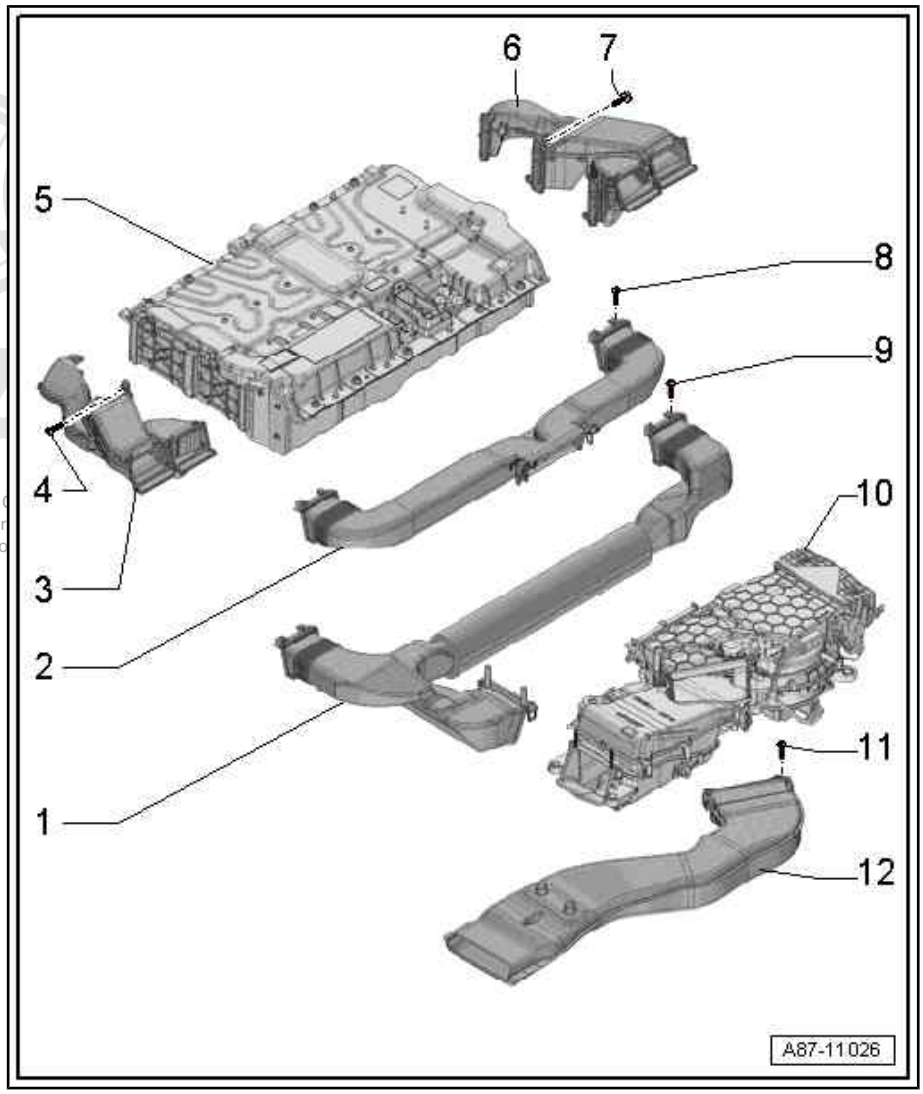
– Switch off ignition.

– Remove luggage compartment floor (different versions) ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Exploded view - luggage compartment floor .

- After removing the luggage compartment floor, visually inspect the high-voltage components and cables and observe the “General warning instructions for work on the high-voltage

system” ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

- When working in the vicinity of high-voltage components and cables, always take care not to damage these components.
- On completion of work and before fitting the luggage compartment floor, visually inspect the high-voltage components and cables.



1 - Air inlet duct for drive battery

- ❑ Removing and installing ⇒ page 663
- ❑ If the fasteners no longer hold or one of the retaining tabs breaks off, the air duct can also be secured with a bolt at the battery cooling module and with bolts at the air ducts.

2 - Air outlet duct (front) for drive battery

- ❑ Removing and installing ⇒ page 661
- ❑ If the fasteners no longer hold or if one of the retaining tabs breaks off, the air duct can also be secured with bolts at the battery cooling module.

3 - Air duct (left-side)

- ❑ Removing and installing ⇒ page 665
- ❑ If the fasteners no longer hold, the air duct must be secured with an additional bolt. To do so, remove drive battery ⇒ Electrical system; Rep. gr. 93 ; High-voltage battery unit; Removing and installing high-voltage battery .

4 - Bolt

- ❑ If the air duct fasteners no longer hold, the air duct must be secured with an additional bolt. To do so, remove drive battery ⇒ Electrical system; Rep. gr. 93 ; High-voltage battery unit; Removing and installing high-voltage battery .

5 - Drive battery - A2-

- ❑ For work on -A2- , such as removal and installation, de-energisation of the system etc., refer to ⇒ Electrical system; Rep. gr. 93 ; High-voltage battery unit; Removing and installing high-voltage battery .

6 - Battery cooling module

7 - Air duct (right-side)

- ❑ Removing and installing ⇒ page 665
- ❑ If the fasteners no longer hold, the air duct must be secured with an additional bolt. To do so, remove drive battery ⇒ Electrical system; Rep. gr. 93 ; High-voltage battery unit; Removing and installing high-voltage battery .

8 - Bolt

- ❑ If the air duct fasteners no longer hold, the air duct must be secured with an additional bolt.

9 - Bolt

- ❑ If the air duct fasteners no longer hold, the air duct must be secured with an additional bolt.

10 - Battery cooling module

11 - Bolt

- ❑ If the air duct fasteners no longer hold, the air duct must be secured with an additional bolt.

12 - Air outlet duct (rear) for drive battery

- ❑ Removing and installing ⇒ page 659
- ❑ If any of the retaining tabs break off, the air duct can also be secured with bolts at the battery cooling module.

10.6 Removing and installing refrigerant shut-off valve 1 for hybrid battery - N516-

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

Note

The vehicles in this series with high-voltage systems are all fitted with refrigerant circuits charged with refrigerant R134a.

Removing

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

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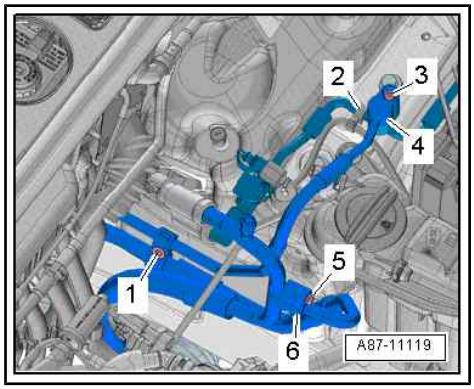
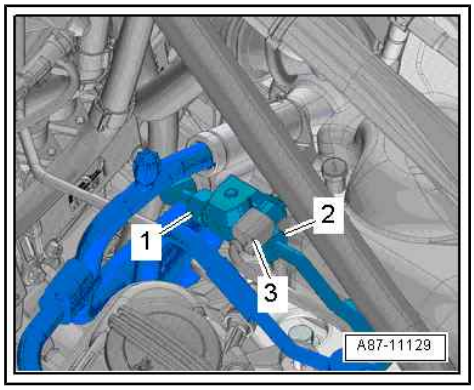
– Move retaining clip -2- for wiring harness clear at refrigerant line.
– Remove bolt -3- and disconnect refrigerant line -4-.



Note

Disregard -items 1, 5, 6-.

– Take electrical connector -3- out of bracket and unplug.
– Counterhold at connection, unscrew union nuts -1, 2- and remove refrigerant shut-off valve 1 for hybrid battery - N516- .



Installing

Install in reverse order of removal; note the following.

Note

- *Observe fitting instructions for O-rings ⇒ page 106 .*
- *After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.*

– Renew O-rings; for correct version, refer to ⇒ Electronic parts catalogue .
– Screw on union nuts -1 and 2- by hand until they make contact, then tighten fully.
- Tightening torque for union nuts -1 and 2-: 16.5 Nm

Note

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

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).
– Switch on ignition.
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and control unit for air conditioning compressor - J842- and erase any faults displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .
– Start up air conditioner after charging refrigerant circuit ⇒ page 271 .

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Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems . Before using air conditioner after system has been re-charged.

10.7 Removing and installing air outlet duct (rear) for drive battery - A2-

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- ***It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.***
- ***Before starting work, visually inspect the high-voltage components in the areas involved.***
- ***Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.***
- ***Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.***
- ***Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .***
- ***Visually inspect all potential equalisation lines.***

Check the following when making the visual inspection:

- ***There must be no external damage on any component.***
- ***The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.***
- ***There must be no unusual deformation of the high-voltage wiring.***
- ***All high-voltage components must be identified by a red warning sticker.***

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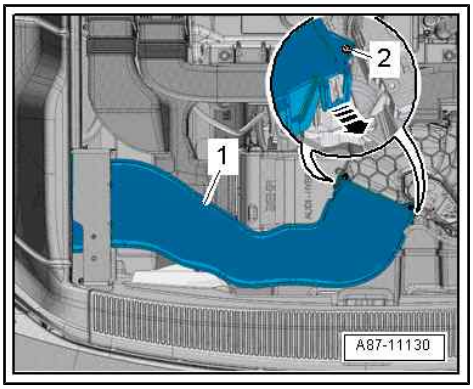
Removing

– Switch off ignition.

– Remove luggage compartment floor ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Exploded view - luggage compartment floor .

– If fitted, remove bolts -2- (left and right).

– Release retaining tabs (left and right) -arrow- and detach air outlet duct (rear) to the right.



Installing

Install in reverse order of removal; note the following.

Note

If any of the retaining tabs -4- break off, the air duct can also be secured with bolts -3- at the battery cooling module -1-.

– Press air duct -2- onto battery cooling module -1- (retaining tabs (left and right) -4- should engage audibly).

– Re-install all parts removed in reverse order.

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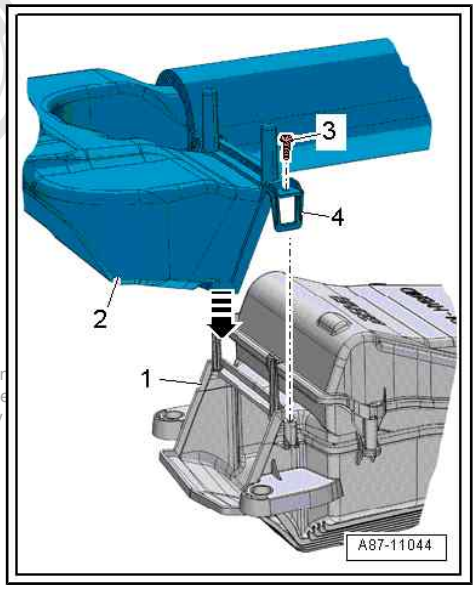

10.8 Removing and installing air outlet duct (front) for drive battery - A2-

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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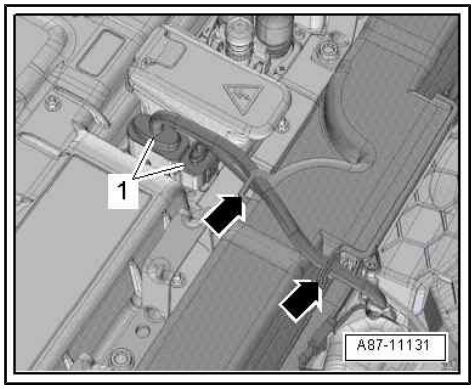
Removing

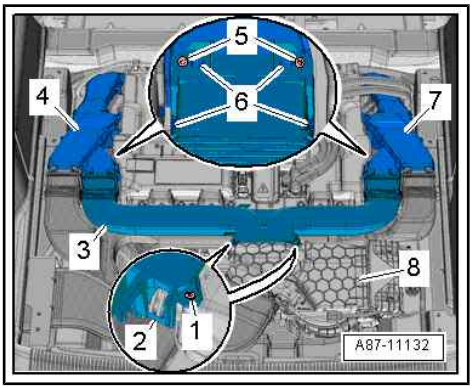
– Switch off ignition.

– Remove luggage compartment floor ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Exploded view - luggage compartment floor .

– Unplug electrical connectors -1- and move wiring harness clear -arrows-.



– If fitted, unscrew bolts -1 and 5- (left and right).
– Release retaining tabs (left and right) -2- and detach air outlet duct (front) -3- from battery cooling module -8-.
– Carefully unclip air outlet duct (front) from fasteners -6- of air ducts -4- and -7- and detach.

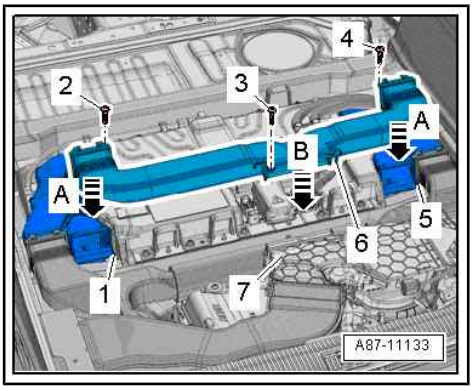


Installing

Install in reverse order of removal; note the following.

Note

If fasteners -6- no longer hold or if one of the retaining tabs -1, 5- breaks off, the air duct can also be secured with bolts -2, 3, 4- at the battery cooling module -7-.



– First clip in air outlet duct (front) in battery cooling module -7- -arrow B-; then clip it into air ducts (left -1- and right -5-) -arrows A-.
– For electrical connections and routing, refer to ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
– Re-install all remaining components (removed earlier).
– Switch on ignition.
– Interrogate event memory of air conditioner operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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10.9 Removing and installing air inlet duct for drive battery - A2-

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

Removing

– Switch off ignition.

– Remove air outlet duct (rear) for drive battery ⇒ page 659.

– Remove air outlet duct (front) for drive battery ⇒ page 661.

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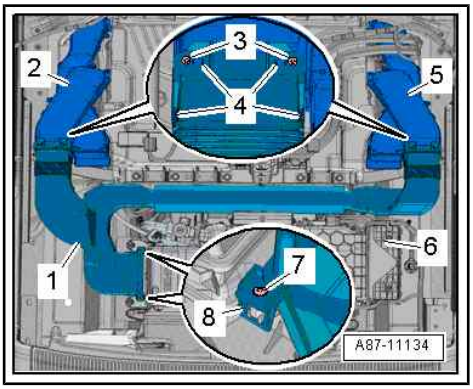
– If fitted, unscrew bolts -3 and 7- (left and right).
– Release retaining tabs -8- (front and rear) and detach air inlet duct -1- from battery cooling module -6-.
– Carefully unclip air inlet duct from fasteners -4- of air ducts (left -2- and right -5-) and detach.



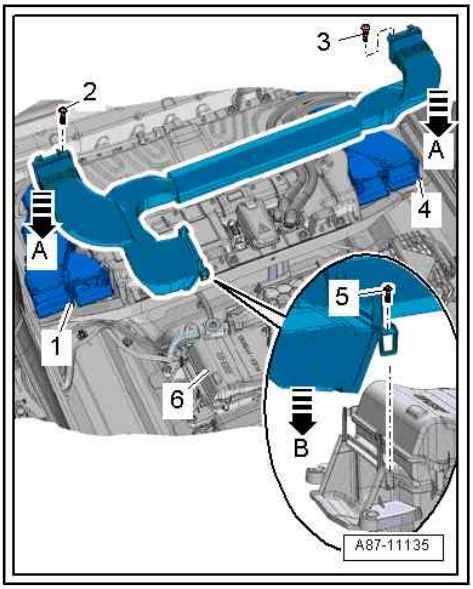
Installing

Install in reverse order of removal; note the following.

Note

If the fasteners no longer hold or if one of the retaining tabs breaks off, the air duct can also be secured with a bolt -5- at the battery cooling module -6- and with bolts -2, 3- at the air ducts (left -1- and right -4-).

– First clip in air inlet duct at battery cooling module -6- -arrow B-; then clip into air ducts (left -1- and right -4-) -arrows A-.
– Re-install all other components removed in reverse order.



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10.10 Removing and installing air ducts (left and right) at drive battery - A2-

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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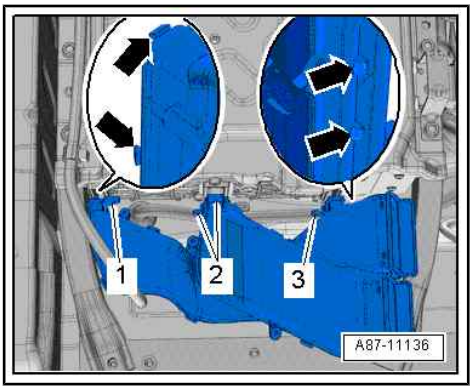
Removing

– Switch off ignition.



Note

Removal of the air ducts involves taking out the drive battery on vehicles with the additional threaded fasteners -1- and -3-.

Vehicles with additional threaded fasteners for air ducts:

– Remove drive battery ⇒ Electrical system; Rep. gr. 93 ; High-voltage battery unit; Removing and installing high-voltage battery .

– Remove bolts -1, 2 and 3- and detach air ducts.

Vehicles without additional threaded fasteners for air ducts:

– Remove corresponding retainer (front) for luggage compartment floor ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Exploded view - luggage compartment floor .

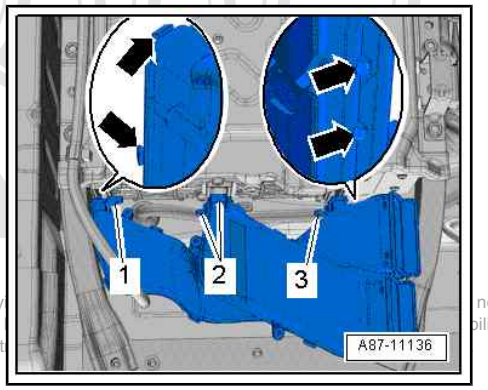
– Remove bolts -2- and carefully unclip air ducts from fasteners.

Installing

Install in reverse order of removal; note the following.

Caution

If the air duct fasteners no longer hold, the air ducts must be secured with additional bolts -1, 3-. To do so, remove drive battery ⇒ Electrical system; Rep. gr. 93 ; High-voltage battery unit; Removing and installing high-voltage battery .



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10.11 Moving battery cooling module to service position

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

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Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

Moving battery cooling module to service position

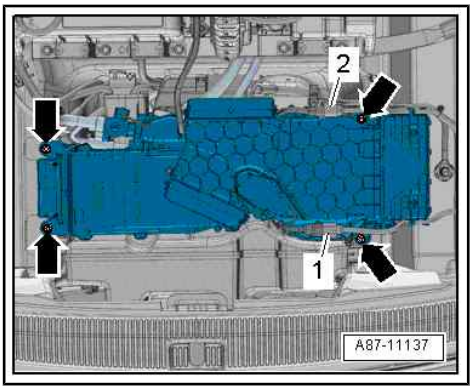
– Switch off ignition.

– Remove luggage compartment floor ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Exploded view - luggage compartment floor .

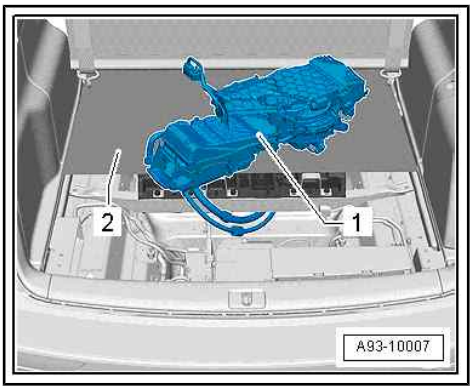
– Remove air outlet duct (rear) for drive battery ⇒ page 659 .

– Remove air outlet duct (front) for drive battery ⇒ page 661 .

– Remove air ducts to battery cooling module ⇒ page 663 .
– Unplug and move clear connectors -1, 2-.
– Remove nuts -arrows-.



– Cover drive battery - A2- using Audi wing protector - V.A.G 1917A- -2- or similar.
– Detach battery cooling module -1- and set down as shown on covered battery module.



Caution

Risk of damage to refrigerant lines and hoses.

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

Installing

Install in reverse order of removal; note the following.

– Re-install removed components.
– Switch on ignition.
– After installation, interrogate event memory of operating and display unit (Climatronic control unit - J255-) and battery regulation control unit - J840- and erase any faults displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .

10.12 Removing and installing battery cooling module

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

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WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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Note

The vehicles in this series with high-voltage systems are all fitted with refrigerant circuits charged with refrigerant R134a.

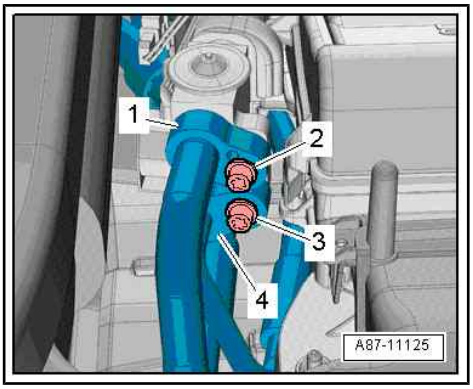
Removing

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

– Remove air inlet duct for drive battery ⇒ page 663 .

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

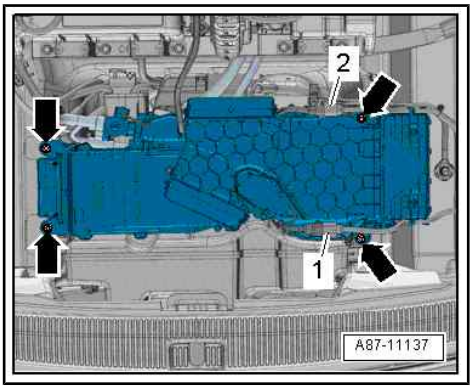


Note

Seal open lines and connections at refrigerant line with suitable caps (to prevent dirt and moisture from entering).

– Unplug and move clear connectors -1, 2-.

– Unscrew nuts -arrows- and detach battery cooling module.



Installing

Install in reverse order of removal; note the following.

Note

- *Observe fitting instructions for O-rings ⇒ page 106 .*
- *After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.*

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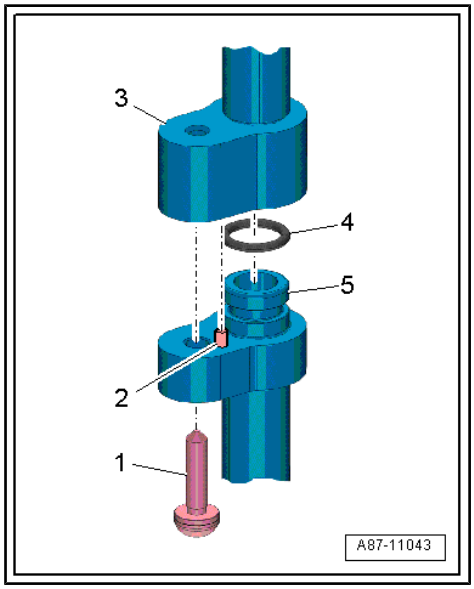
- Renew O-rings -4-; for correct version refer to ⇒ Electronic parts catalogue .
- Clean refrigerant line connections -3 and 5- and check for damage.
- Make sure that O-rings -4- are correctly seated in grooves of corresponding mounting.
- Check that dowel pin -2- (not fitted on all connections) is not damaged and is seated correctly.
- Tighten bolts -1-.
- Install refrigerant lines to battery cooling module in luggage compartment ⇒ page 206 .
- Re-install remaining components (removed earlier).
- For electrical connections and routing, refer to ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).
- Switch on ignition.
- Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .
- Start up air conditioner after charging refrigerant circuit ⇒ page 271 .



Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems . Before using air conditioner after system has been re-charged.

10.13 Removing and installing battery fan 1 - V457-

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

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WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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Note

- *Supplied with power via fan enabling relay - J937- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations*
- *Activated by the battery regulation control unit - J840- ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .*

Removing

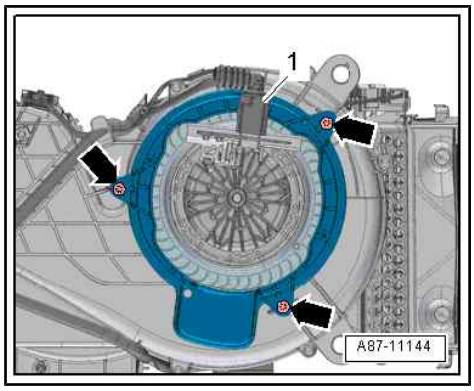
– Switch off ignition.

– Remove luggage compartment floor ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Exploded view - luggage compartment floor .

– Move battery cooling module to service position ⇒ page 667 .

– Fold back sleeve -1- at electrical connector and unplug connector.

– Remove bolts -arrows- and detach battery fan 1 - V457- .



Installing

Install in reverse order of removal; note the following.

– Re-install remaining components (removed earlier).

– Switch on ignition.

– After installation, interrogate event memory of operating and display unit (Climatronic control unit - J255-) and battery regulation control unit - J840- and erase any faults displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .

10.14 Removing and installing temperature sensor before evaporator for hybrid battery - G756-

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

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WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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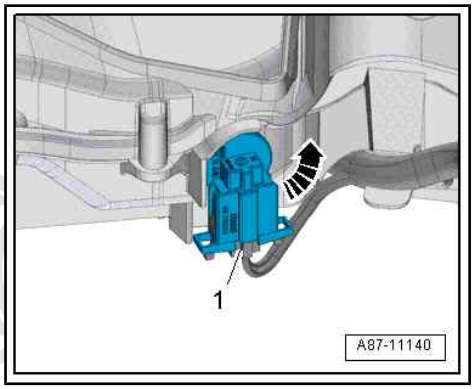
– Switch off ignition.

– Remove luggage compartment floor ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Exploded view - luggage compartment floor .

– Move battery cooling module to service position ⇒ page 667 .

– Unplug electrical connector -1-.
– Turn temperature sensor anti-clockwise -arrow- and detach.



Installing

Install in reverse order of removal; note the following.

– Re-install remaining components (removed earlier).
– Check any seals for damage and proper attachment.
– Switch on ignition.
– After installation, interrogate event memory of operating and display unit (Climatronic control unit - J255-) and battery regulation control unit - J840- and erase any faults displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .

10.15 Removing and installing temperature sensor after evaporator for hybrid battery - G757-

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Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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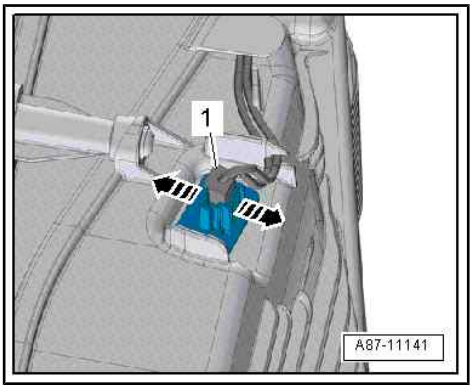
– Switch off ignition.
– Remove luggage compartment floor ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Exploded view - luggage compartment floor .
– Move battery cooling module to service position ⇒ page 667 .
– Unplug electrical connector -1-.
– Release temperature sensor after evaporator for hybrid battery - G757- from fastener by moving it back and forth -arrows- and detach.



Installing

Install in reverse order of removal; note the following.

– Re-install remaining components (removed earlier).
– Check any seals for damage and proper attachment.
– Switch on ignition.
– After installation, interrogate event memory of operating and display unit (Climatronic control unit - J255-) and battery regulation control unit - J840- and erase any faults displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .

10.16 Removing and installing condensation drain

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

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Removing

– Switch off ignition.

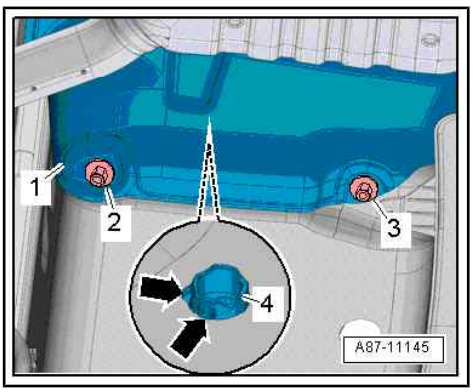
– Remove luggage compartment floor ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Exploded view - luggage compartment floor .

– Move battery cooling module to service position ⇒ page 667 .

– Unscrew nuts -2- and -3- and press heat shield slightly to the left.

– Carefully release fasteners -arrows- of plastic ring and press condensation drain into battery recess.

– Detach condensation drain from retaining bracket.



Installing

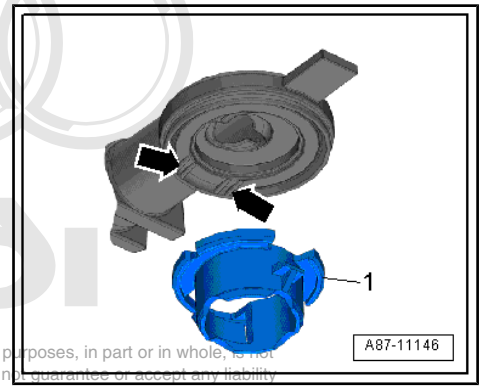
Install in reverse order of removal; note the following.

Note

- *Renew the condensation drain if the plastic ring is damaged.*
- *Seal the plastic ring with silicone compound if slightly out of shape.*

– Pay attention to installation position when fitting plastic ring:

• The lug -1- on the plastic ring must be positioned between the two marks on the condensation drain -arrows-.



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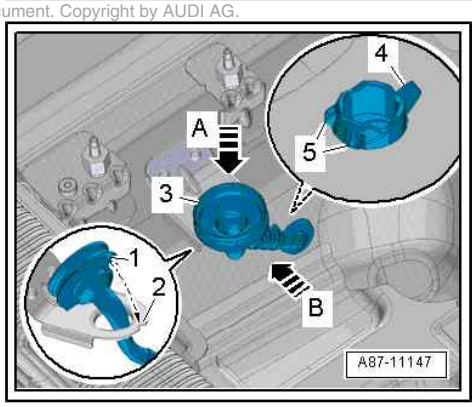
– Fit condensation drain -arrow A- so that lug -1- engages in recess -2- in retaining bracket.

– Fit grommet in opening in battery recess. When doing so, insert lug -4- upwards and engage at bottom.



Note

♦ *If the grommet does not completely seal off the battery recess, apply silicone adhesive sealant - D 176 001 A3- or similar at this location ⇒ Electronic parts catalogue .*

♦ *The bonding surface must be clean and free from grease when applying the silicone adhesive sealant.*

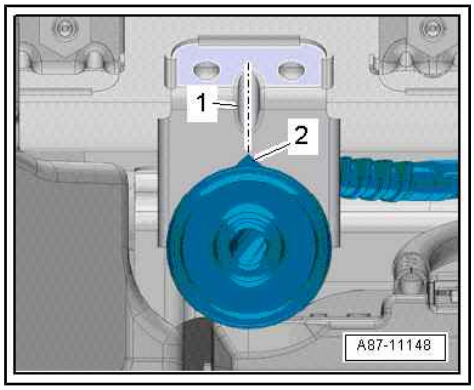
– Check that condensation drain is correctly positioned.

• Lug -2- must face bead -1- in retaining bracket.

– Re-install remaining components (removed earlier).

– Switch on ignition.

– After installation, interrogate event memory of operating and display unit (Climatronic control unit - J255-) and battery regulation control unit - J840- and erase any faults displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding") .



10.17 Checking condensation drain

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with a high-voltage system, note the additional warning instructions for working on such vehicles ⇒ page 36 and ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ page 41 and note ⇒ Electrical system; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .

WARNING

Safety hazard: the engine can start unexpectedly.

Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.

WARNING

Working on vehicles with high-voltage wiring:

- *Do not support yourself or tools on high-voltage wiring or associated components --> this can damage the insulation.*
- *High-voltage wiring must not be excessively bent or kinked --> this can damage the insulation.*
- *The round high-voltage connectors are colour-coded with an external coloured ring and are provided with mechanical coding or guide lugs. It is important to observe this coding when joining up the round high-voltage connectors; otherwise the connectors can be damaged.*

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DANGER!

Risk of fatal injury if high-voltage components are damaged.

Observe the following when working in the vicinity of high-voltage components or wiring:

- *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- *Before starting work, visually inspect the high-voltage components in the areas involved.*
- *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1- , electric drive motor - V141- , air conditioner compressor - V470- and high-voltage wiring.*
- *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- *Visually inspect all potential equalisation lines.*

Check the following when making the visual inspection:

- *There must be no external damage on any component.*
- *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- *There must be no unusual deformation of the high-voltage wiring.*
- *All high-voltage components must be identified by a red warning sticker.*

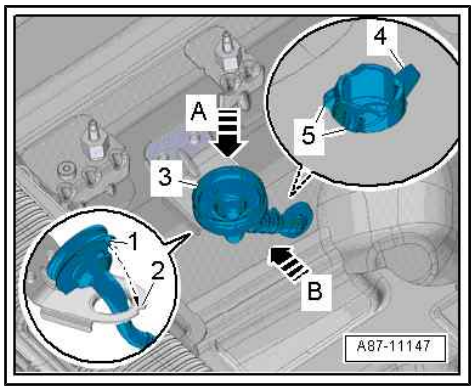
Checking

– Switch off ignition.

– Remove luggage compartment floor ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Exploded view - luggage compartment floor .

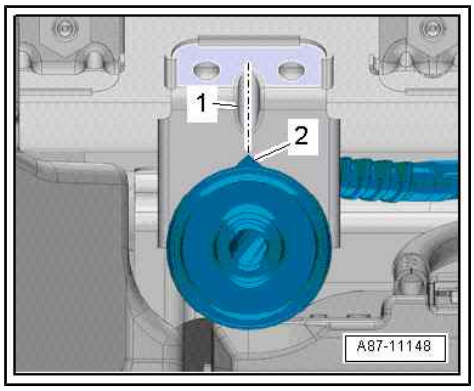
– Move battery cooling module to service position ⇒ page 667 .

– Check that condensation drain -3- is clean and installed properly.



– Check that condensation drain is correctly positioned.

• Lug -2- must face bead -1- in retaining bracket.



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