



Audi

Workshop Manual Audi A6 2005 ➤

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Air conditioner

Edition 01.2018

List of Workshop Manual Repair Groups

Repair Group

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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87 – Air conditioning system

1 Safety measures for working on vehicles with air conditioning and for handling refrigerant

(ARL005617; Edition 01.2018)

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

1.1.1.2 Tetrafluoroethane (CF₃-CH₂F or CH₂F-CF₃)

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).

- ◆ Safety measures ⇒ [page 1](#)
- ◆ Discharging refrigerant circuit ⇒ [page 2](#)
- ◆ Working on refrigerant circuit ⇒ [page 2](#)
- ◆ Paintwork on vehicles with air conditioner ⇒ [page 3](#)
- ◆ Further information on working on the air conditioner ⇒ [page 3](#)

1.1 Safety measures

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

The refrigerant circuit must be discharged first should repair work require the refrigerant circuit to be opened ⇒ [page 2](#). All contact with liquid refrigerant or refrigerant vapours should be avoided. Should refrigerant escape although all safety precautions are observed, do not inhale the mixture of refrigerant and air which then forms.

Therefore, switch on extraction systems and wear rubber gloves and protect eyes with safety goggles.

Reason:

Intensive exposure to refrigerant would cause frostbite on unprotected parts of the body.



WARNING

Keep an eye-bath to hand.

Should liquid refrigerant come into contact with the 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.

Should refrigerant come into contact with other parts of the body even though all safety precautions have been observed, these areas must also be thoroughly rinsed with cold water immediately for at least 15 minutes.

Although refrigerants do not represent a fire hazard, smoking, welding, soldering and brazing are not permitted in areas exposed to refrigerant.

Reason:

The high temperature of a naked flame or hot objects causes decomposition of refrigerant gas. Inhalation of the toxic decomposition products causes dry coughing and nausea.

1.2 Discharging the 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 service station. The extracted refrigerant must then either be re-processed on site or returned to the manufacturer for proper disposal (different or additional regulations may apply in other countries). For this reason, the vehicle must be taken to a workshop which is equipped with the necessary tools and at which the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a .

Reason:

If refrigerant R134a 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 R134a does not affect the earth's ozone layer (R134a is an HFC with no 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).*

After discharging air conditioner, unplug connector from air conditioner compressor regulating valve - N280- or from refrigerant pressure and temperature sender - G395- .

Reason:

Air conditioner compressor regulating valve - N280- is then no longer actuated and compressor runs at idle. The air conditioner compressor is designed so that, when running at idle, lubrication of the components of the compressor is guaranteed via an internal oil circuit (provided there is enough refrigerant oil in the compressor).

1.3 Working on refrigerant circuit

Always perform work on the refrigerant circuit in well ventilated areas. Make sure that there are no inspection pits, shafts or cellar entrances within a radius of 5 metres. Switch on extraction systems.

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. Use suitable workshop extractors.

Welding, brazing and soldering work must not be performed on components of air conditioner 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:

Discharging the refrigerant circuit ⇒ [page 2](#) .



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. If this happens, the air conditioner cannot be re-charged without having to renew parts of the system.

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1.4 Paintwork repairs on vehicles with air conditioner

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.

1.5 Further information on working on the air conditioner

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 (not provided on all vehicles).

Further information on repair work on vehicles with air conditioners and on handling refrigerants. ⇒ Air conditioner - with refrigerant R134a Audi

2 Notes on general repairs



Caution

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



Note

Disconnect batteries before starting electric welding work on the vehicle ⇒ Electrical system; Rep. gr. 27

The air conditioner refrigerant circuit may only be discharged and opened ⇒ [page 2](#) if this is required by the relevant safety regulations, or if parts of the air conditioner refrigerant circuit have to be renewed ⇒ [page 1](#) .

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

For information on air conditioner servicing work which can be performed without opening the refrigerant circuit, refer to [page 6](#) .

For air conditioner servicing work which requires the refrigerant circuit to be opened, refer to [page 172](#) .



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 service work on the air conditioner which is required so that the refrigerant circuit can be discharged and which therefore cannot be performed in every Audi and VW workshop, refer to [page 172](#) (for discharging of the refrigerant circuit, take the vehicle to a workshop which is equipped with the necessary tools and at which the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a).

- ◆ Contact corrosion ⇒ [page 4](#)
- ◆ Note for vehicles with auxiliary heater (poor heating output) ⇒ [page 5](#)

2.1 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 (see e.g. greenish colour). In addition, components made of rubber and plastic as well as adhesives which are not electrically conductive are used ⇒ Electronic parts catalogue

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These tested, aluminium-compatible components are also available as replacement parts ⇒ Electronic parts catalogue .

Always use genuine parts!

If you have any doubts about whether certain parts can be re-used, always use new components.

Accessories must have been approved by Audi AG.

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

2.2 Note for vehicles with auxiliary heater (poor heating output)

If there are complaints about poor heating output, check the heating output of the air conditioner and, if necessary, the activation of the circulation pump - V55- of the auxiliary heater ⇒ Auxiliary heater; Rep. gr. 82 .

If the heating output is poor or too low at low engine speeds (on vehicles with an auxiliary heater as an optional extra), check activation of heater coolant shut-off valve - N279- and circulation pump - V55- of auxiliary heater by supplementary heater control unit - J364- ⇒ Auxiliary heater; Rep. gr. 82 .

- ◆ Depending e.g. on engine, heater coolant shut-off valve - N279- may also be actuated with ignition switched on. If shut-off valve is not actuated, coolant does not flow directly from engine to heat exchanger (but via auxiliary heater).
 - ◆ Depending e.g. on engine, activation of circulation pump - V55- can increase flow of coolant through heat exchanger of air conditioner at low engine speeds, improving heating output.
 - ◆ Depending e.g. on engine, supplementary heater control unit - J364- may switch on circulation pump - V55- if it receives the following information via convenience data bus system ⇒ Auxiliary heater; Rep. gr. 82 .
- Ignition switched on and engine running
 - Ambient temperature lower than 20 °C
 - Engine speed below 2000 rpm
 - Operating and display unit (Climatronic control unit - J255-) switched on
 - “Heating output” requested for at least one side (driver's or front passenger's side)
- ◆ The circulation pump - V55- is switched on as soon as all cut-in criteria are met. To prevent the circulation pump from having to be switched off and on constantly, it remains activated for at least 30 sec. even if – for example if there are rapid changes in the vehicle speed – a request is only applied for several seconds (e.g. when accelerating after standing at traffic lights).
 - ◆ Incorporation of auxiliary heater (and circulation pump - V55-) into coolant circuit ⇒ Auxiliary heater; Rep. gr. 82

3 Servicing refrigerant circuit

- ◆ Overview of components ➔ [page 6](#)

3.1 Overview of components

- ◆ On the following pages, refrigerant circuit servicing work is split up into two categories.
- All parts or procedures marked ¹⁾ can be serviced, repaired or replaced in any workshop (this work does not involve the refrigerant circuit).
- All parts of the refrigerant circuit not marked ¹⁾ as well as all refrigerant hoses and refrigerant pipes can only be serviced or renewed at workshops equipped with the necessary tools where the work can be performed by appropriately qualified personnel ➔ [page 172](#) and ➔ Air conditioner with refrigerant R134a .

HD = High-pressure side

ND = Low-pressure side

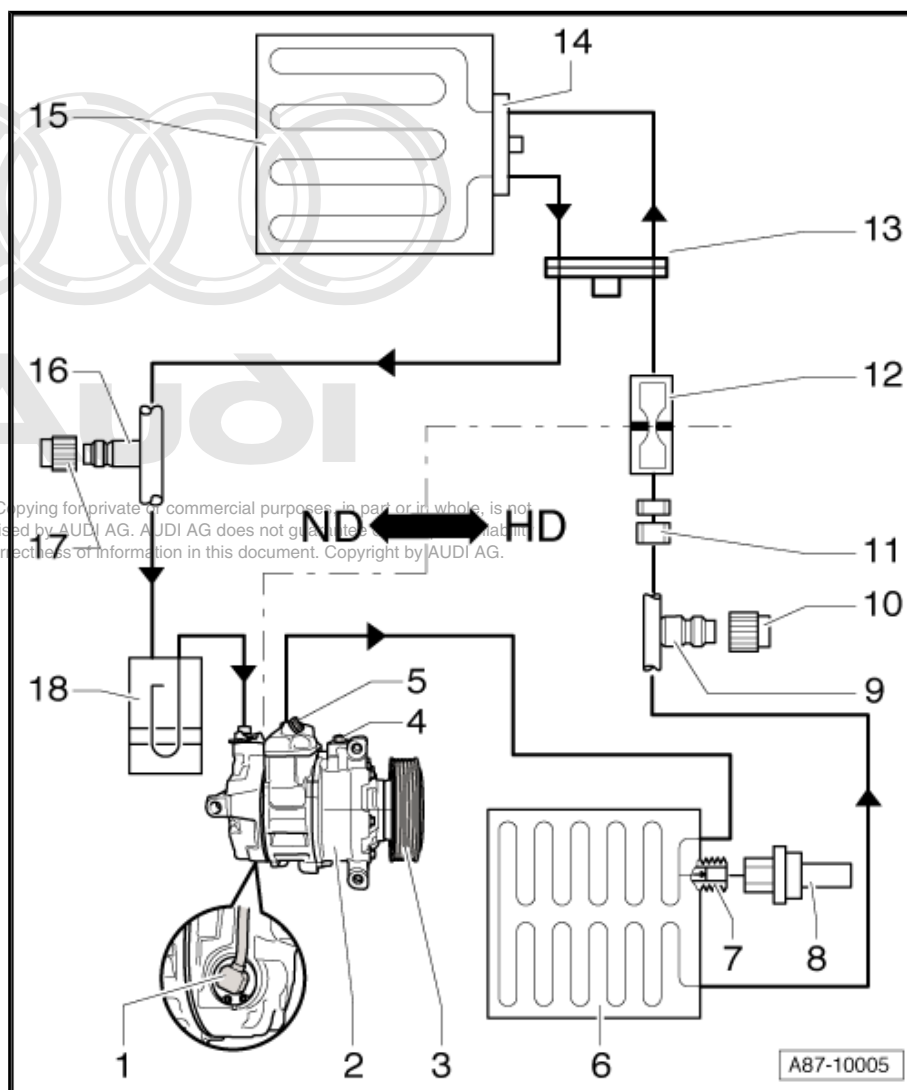
1 - Air conditioner compressor regulating valve - N280-

- ❑ Checking activation and operation ➔ [page 12](#) ¹⁾

2 - Compressor

- ❑ Different versions depending on engine ➔ Electronic parts catalogue
- ❑ Detaching and attaching compressor with pulley at bracket - vehicles with 4 or 6-cyl. engine ➔ [page 11](#) ¹⁾
- ❑ Detaching and attaching compressor with drive unit (shaft) at bracket (vehicles with 8-cyl. engine) ➔ [page 182](#) (vehicles with 10-cyl. engine) ➔ [page 191](#)
- ❑ Detaching and attaching refrigerant line at compressor ➔ [page 177](#)
- ❑ When installing refrigerant lines and corresponding brackets, make sure there is sufficient clearance between belt, bracket and pulley.
- ❑ Removing and installing compressor - vehicles with 4-cyl. or 6-cyl. engine ➔ [page 180](#)

- ❑ Removing and installing compressor - vehicles with 8-cyl. engine ➔ [page 182](#)
- ❑ Removing and installing compressor - vehicles with 10-cyl. engine ➔ [page 191](#)



3 - Pulley/drive unit for compressor

- ☐ Different versions depending on engine ⇒ Electronic parts catalogue
- ☐ Renewing compressor pulley - vehicles with 4-cyl. or 6-cyl. engine ¹⁾ ⇒ [page 16](#)
- ☐ Removing and installing poly V-belt ¹⁾ ⇒ Engine, mechanics; Rep. gr. 19
- ☐ Poly V-belt allocation ⇒ Electronic parts catalogue
- ☐ Renewing compressor drive unit - vehicles with 8-cyl. or 10-cyl. engine ⇒ [page 202](#)



Note

- ◆ *An overload protection device is fitted between pulley and drive shaft of compressor to protect belt should compressor become jammed or stiff.*
- ◆ *An overload protection is fitted between drive unit and drive shaft of compressor to protect chain drive of engine if compressor becomes jammed or stiff.*
- ◆ *If compressor is not operating smoothly, overload protection device interrupts power transmission to compressor.*
- ◆ *Rubber damper elements are fitted between pulley/drive unit and compressor drive shaft to absorb any vibration occurring during compressor operation (damper function in the event of torque fluctuations).*

4 - Oil drain plug

5 - High-pressure safety valve

6 - Condenser

7 - Connection with valve

8 - Refrigerant pressure and temperature sender - G395-

- ☐ Removing and installing ⇒ [page 9](#)
- ☐ Check signal ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding) .



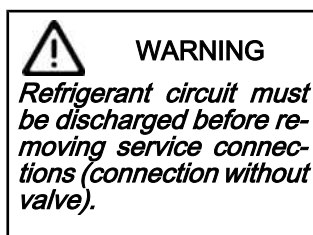
Note

- ◆ *The measured values for the refrigerant pressure and temperature sender - G395- can be read out via the "Reading measured value block" function in two different display groups ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding) .*

- ◆ *The refrigerant pressure and temperature sender - G395- exchanges information via the air conditioner data bus system "Lin bus" with the operating and display unit (Climatronic control unit - J255-). For this reason, the Audi A6 must not be fitted with an high-pressure sender - G65- (only emits square-wave signals) ⇒ Electronic parts catalogue .*
- ◆ *Due to the design 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 in the refrigerant circuit. Currently this is therefore not evaluated and used for the control of the air conditioner.*

9 - 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
- ☐ For measuring, discharging and charging; the vehicle must be taken to a workshop which is equipped with the necessary tools and at which the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a



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10 - Cap

- ☐ With seal
- ☐ Always screw on

11 - Bolt connection in refrigerant line (with restrictor)

- ☐ Only release bolt connection after refrigerant circuit has been discharged; take vehicle to a workshop equipped with the necessary tools where work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a

12 - Restrictor

13 - Bolt connection in refrigerant line (to evaporator)

- ☐ Only release bolt connection after refrigerant circuit has been discharged; take vehicle to a workshop equipped with the necessary tools where work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a

14 - Bolt connection in refrigerant line (at evaporator)

- ☐ Only release bolt connection after refrigerant circuit has been discharged; take vehicle to a workshop equipped with the necessary tools where work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a

15 - Evaporator

16 - 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

17 - Cap

- ☐ With seal
- ☐ Always screw on

18 - Reservoir

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



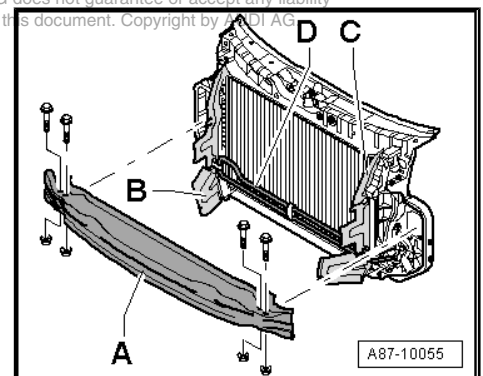
Note

- ◆ *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 compressor.*
- ◆ *Refrigerant circuit remains closed (connection with valve).*
- ◆ *The measured values for the refrigerant pressure and temperature sender - G395- can be read out via the "Reading measured value block" function ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding) .*
- ◆ *The refrigerant pressure and temperature sender - G395- exchanges information via the air conditioner data bus system "Lin bus" with the operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding, Reading measured value block) .*
- ◆ *Due to the design 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.*
- ◆ *The Audi A6 may only be fitted with a refrigerant pressure and temperature sender - G395- ⇒ Electronic parts catalogue .*
- ◆ *The Audi A6 must not be fitted with an high-pressure sender - G65- (only emits square-wave signals) ⇒ Electronic parts catalogue .*

Removing and installing

Remove bumper cover (front) ⇒ General body repairs, exterior;
Rep. gr. 63 .

- Remove air duct -C- and (depending on vehicle version) carrier for bumper cover -A- ⇒ General body repairs, exterior;
Rep. gr. 63 .



- Unplug connector -A- from refrigerant pressure and temperature sender - G395- -B-.
- Remove refrigerant pressure and temperature sender - G395- -B- (tightening torque: 5 Nm).



Note

Note part number on component (risk of interchanging component with high-pressure sender - G65-) ⇒ *Electronic parts catalogue* .

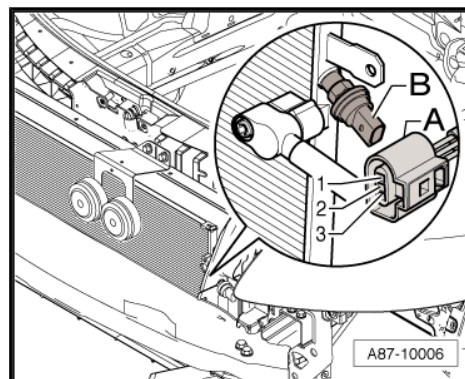
- Renew O-ring -C- ⇒ [page 10](#) (for correct O-ring refer to ⇒ *Electronic parts catalogue*).

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Note

Pin assignment at refrigerant pressure and temperature sender - G395- ⇒ [page 10](#)



3.2.1 Pin assignment at refrigerant pressure and temperature sender - G395-

Contact 1: earth

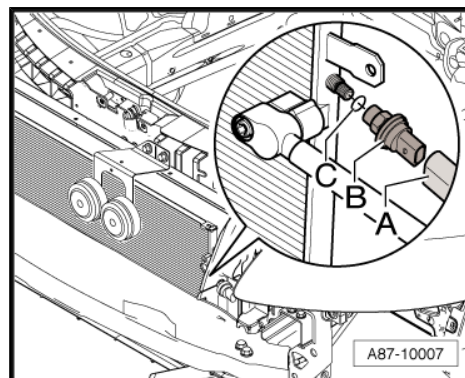
Contact 2: signal output (via air conditioner data bus system "Lin bus" to operating and display unit (Climatronic control unit - J255-))

Contact 3: positive (terminal "75")



Note

- ◆ When connector -A- is unplugged, compressor (air conditioner compressor regulating valve - N280-) is not activated.
- ◆ Refrigerant pressure and temperature sender - G395- -B- is an electronic control unit.



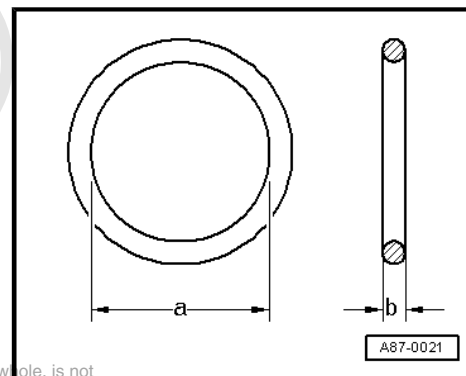
3.3 O-rings for refrigerant circuit

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

Note

- ◆ Only O-rings which are resistant to refrigerant R134a and the corresponding refrigerant oil may be installed. These O-rings are colour-coded to prevent mix-ups (currently "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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3.4 Detaching and attaching compressor (with pulley) at bracket

Note

- ◆ The compressor can be detached from the bracket and re-attached without opening up the refrigerant lines.
- ◆ Do not discharge refrigerant circuit, do not detach refrigerant hoses and pipes from compressor.
- ◆ Do not unfasten the refrigerant lines and corresponding clamps.
- ◆ After detaching compressor, secure it to longitudinal member, e.g. with a wire. Never leave it hanging from refrigerant lines.
- ◆ Before removal, mark direction of rotation of poly V-belt with chalk or felt-tipped pen. Running a used pulley in the opposite direction could damage it irreparably.
- ◆ Depending on the engine and the country-specific version, different compressors may be fitted. ⇒ *Electronic parts catalogue*
- ◆ On vehicles with electric engine mountings, pay attention to correct assignment of connectors at engine mounting and air conditioner compressor regulating valve - N280-; these components have identical connectors. If connectors are interchanged, no fault is stored (components have approx. the same electrical values). Engine mounting is then actuated by operating and display unit (Climatronic control unit - J255-), and air conditioner compressor regulating valve - N280- is actuated by engine control unit.
- ◆ The following illustration shows the compressor on a vehicle with 6-cyl. petrol direct-injection FSI engine. The position of the compressor varies slightly on vehicles with other engines. However, the tightening torques and further procedure for detaching and attaching are virtually the same.

Detaching compressor with pulley from bracket

- Remove engine cover panel (top) ⇒ Engine, mechanics; Rep. gr. 13.
- Remove noise insulation (centre) ⇒ General body repairs, exterior; Rep. gr. 50.
- Mark direction of rotation of poly V-belt.
- Slacken off and detach poly V-belt. ⇒ Engine, mechanics; Rep. gr. 13
- Depending on engine version, remove oil filter and oil cooler (if necessary) and protect sealing surface against damage

(when removing compressor) ⇒ Engine, mechanics; Rep. gr. 17.

- Mark connector -A-.
- Unplug connector -A- from mating plug -E- to air conditioner compressor regulating valve - N280-.
- Remove the three securing bolts -B-.
- Detach compressor and secure it to vehicle with e.g. a piece of wire.

Attaching compressor with pulley to bracket

Install in reverse order of removal; note the following.

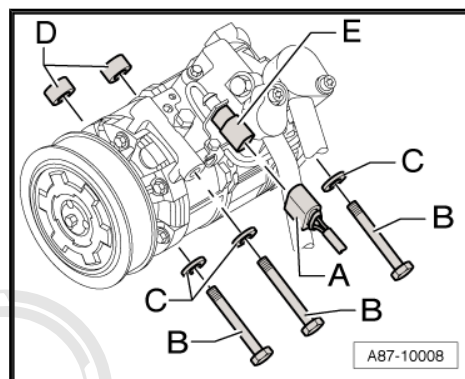
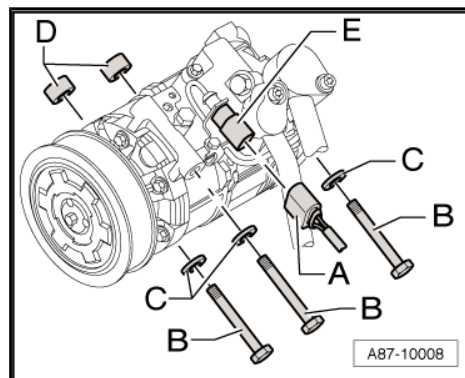
- Before attaching compressor, check position of both bushes -D- in bracket or in compressor.
- Fit one washer -C- at each securing bolt -B- (tightening torque: 25 Nm).
- Before fitting poly V-belt, crank compressor 10 times by hand following installation.



Note

Cranking forces any refrigerant oil which may have collected in compression chamber of removed compressor out of compression chamber.

- After attaching compressor, check routing of refrigerant lines. They must be inserted in the brackets provided (if fitted, depends on engine).
- After securing compressor, also check that refrigerant lines and corresponding brackets have adequate clearance to other components, ensuring sufficient distance between belt, bracket and pulley.



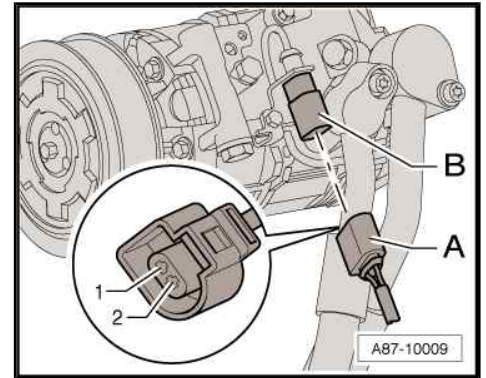
3.5 Checking cut-in signal for air conditioner compressor regulating valve - N280-

- Switch off ignition.
- Remove noise insulation. ⇒ General body repairs, exterior; Rep. gr. 50

- Mark connector -A-.

Note

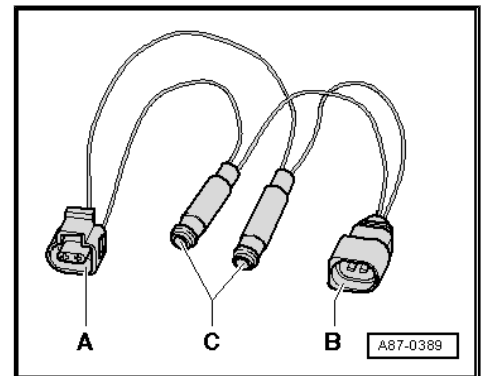
- ◆ *On vehicles with 8-cyl. engine, this connector is not attached to the compressor but to the front of the engine above the compressor.*
- ◆ *On vehicles with electric engine mountings, pay attention to correct assignment of connectors at engine mounting and air conditioner compressor regulating valve - N280- ; these components have identical connectors. If connectors are interchanged, no fault is stored (components have approx. the same electrical values). Engine mounting is then actuated by operating and display unit (Climatronic control unit - J255-), and air conditioner compressor regulating valve - N280- is actuated by engine control unit.*



- Unplug connector -A- from mating plug -B- to air conditioner compressor regulating valve - N280- .
- Use an adapter cable from auxiliary measuring set - V.A.G 1594 C- to re-establish connection between connector -A- and plug -B- to air conditioner compressor regulating valve - N280- .

Note

- ◆ *The actuation of the air conditioner compressor regulating valve - N280- and the current measured by the operating and display unit (Climatronic control unit - J255-) flowing via the air conditioner compressor regulating valve - N280- are displayed in the measured value block of the operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 (Guided Fault Finding) .*
- ◆ *You can also use an improvised adapter cable for this test. For this you will need e.g. one 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 wires (cross-section = 0.5 mm²).*



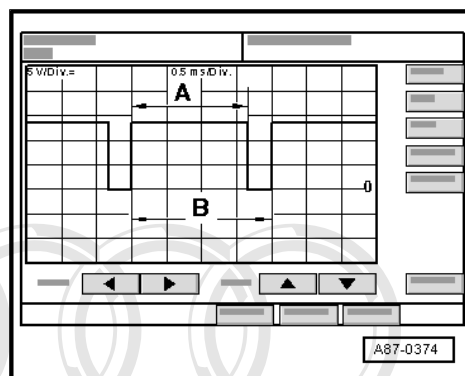
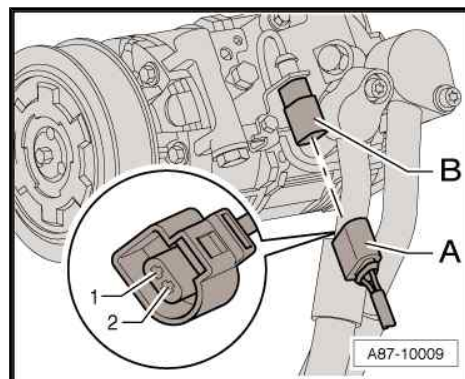
- Connect sensor head - VAS 5051/8- to adapter cables.

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- Test lead (signal wire) to contact -2- of connector -A-
- Test lead (screen, earth) to contact -1- of connector -A-
- On vehicle diagnostic, testing and information system - VAS 5051 A- , set measurement mode: DSO (Digital Storage Oscilloscope) ⇒ Vehicle diagnostic, testing and information system VAS 5051 (“Guided Fault Finding”) .
- Select the following setting on vehicle diagnostic, testing and information system - VAS 5051 A- : 5V/div DC = 0.5ms/div (5V DC and 0.5 milliseconds per unit)
- Start engine.
- Set temperature for driver's and front passenger's side to maximum cooling output (e.g. “Lo” temperature setting or both rotary temperature controls on “cold stop”) on operating and display unit (Climatronic control unit - J255-).
- On operating and display unit (Climatronic control unit - J255-), press e.g. buttons Auto, ECON ON/OFF or A/C/ON/OFF to activate and deactivate actuation of air conditioner compressor regulating valve - N280- .

Depending on the setting of the operating and display unit (Climatronic control unit - J255-), the display of the oscilloscope will show:

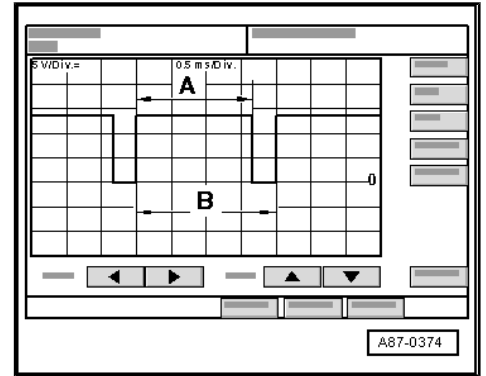
- In “OFF” / “ECON” mode or “A/C off” mode: No square-wave signal (air conditioner compressor regulating valve - N280- is not actuated).
- In “Auto” mode and “Lo” temperature setting: Square-wave signal with pulse width -A- between 75% and 100% (air conditioner compressor regulating valve - N280- is actuated)



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i Note

- ◆ The illustration shows a signal with a duty cycle of approx. 80%.
 - ◆ The pulse width -A- depends on the required cooling output, electrical system voltage etc. (over width of area -A-, current is controlled via the air conditioner compressor regulating valve - N280- by the 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 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 actuated so that the compressor output required to obtain the specified temperatures is achieved).



i Note

- ◆ In "Auto" mode with "Lo" temperature setting, the air conditioner compressor regulating valve - N280- is actuated so that the maximum permissible current of approx. 0.65 A flows via the air conditioner compressor regulating valve - N280- (maximum compressor output).
- ◆ In control mode, the activation time is governed by the required cooling output and the voltage of the vehicle's electrical system, for example; however, it is always long enough to achieve a mean current of 0.3 A.



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4 Renewing compressor pulley

- ◆ Renewing pulley ⇒ [page 16](#)
- ◆ Detaching and attaching pulley at compressor ⇒ [page 17](#)

4.1 Renewing pulley



Note

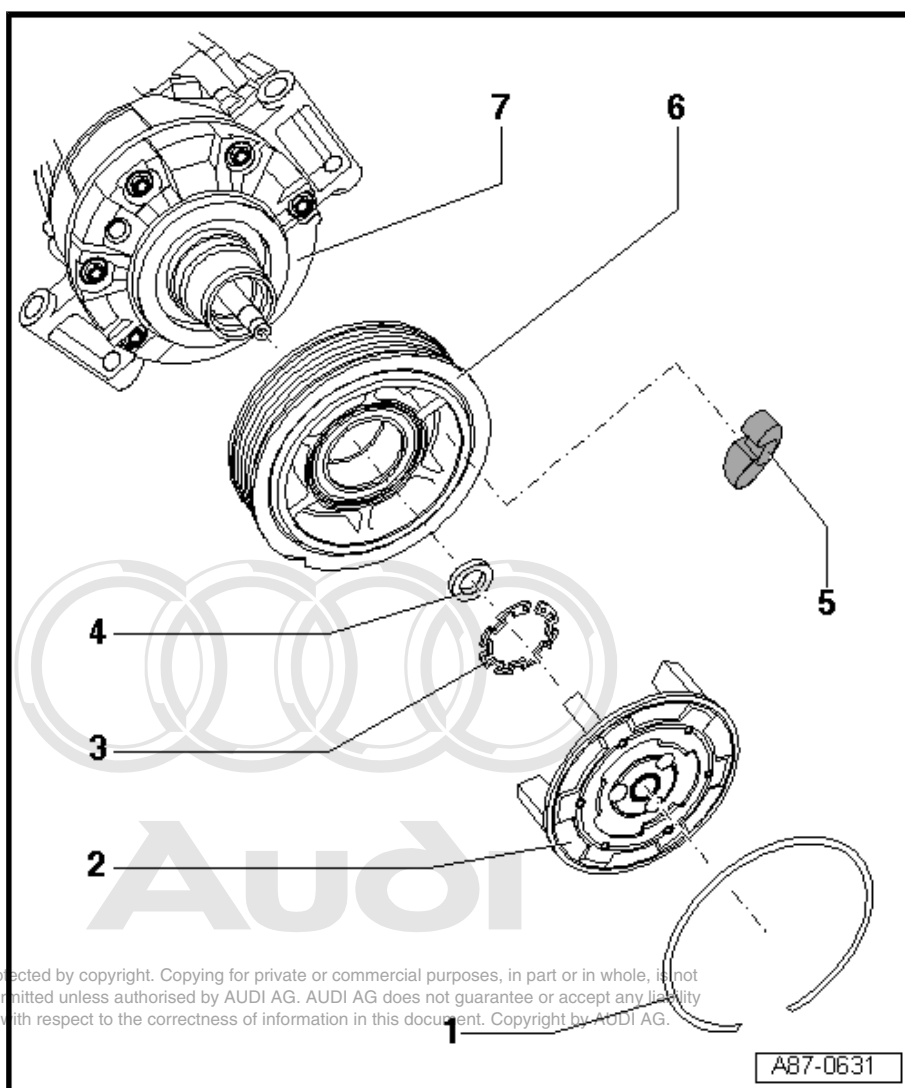
- ◆ Various pulley versions are fitted depending on the type of the compressor and the engine version ⇒ *Electronic parts catalogue*.
- ◆ Detaching and attaching pulley at compressor ⇒ [page 17](#)

1 - Circlip

- ☐ Remove carefully using a small screwdriver or long-nose pliers (paying particular attention to pulley)
- ☐ Detaching and attaching ⇒ [page 17](#)
- ☐ From Model Year 2006 onwards, circlips are being introduced gradually which are provided with a vulcanised rubber disc to replace the plastic disc which was previously bonded on for some versions (not applicable to all compressors) ⇒ [page 17](#)

2 - Drive plate

- ☐ Screwed onto compressor shaft
- ☐ Different versions ⇒ *Electronic parts catalogue*
- ☐ With overload protection, triggered if torque is too great (e.g. if compressor cannot rotate freely) causing pulley to free-wheel without driving compressor
- ☐ Detaching and attaching ⇒ [page 17](#)
- ☐ Tightening torque: 35



Nm

- ☐ A plastic disc may have been bonded on, depending on production period ⇒ [page 17](#).

3 - Circlip

- ☐ Renew
- ☐ Ensure correct installation position (flat side facing compressor)
- ☐ Removing and installing ⇒ [page 17](#)

4 - Spacer

- ☐ Dimensions: 17.5 x 10 x 3 mm

5 - Rubber elements

- ☐ 6x, ensure correct installation ⇒ [page 17](#)
- ☐ Decouples pulley from drive shaft of compressor, damping vibration and noise
- ☐ Before installation, coat rubber elements slightly with lubricant (e.g. tyre fitting paste or soap solution)

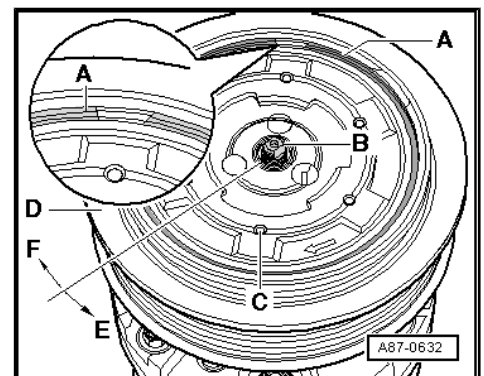
6 - Pulley

- ☐ 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 17](#)

7 - Compressor

- ☐ Different versions may be fitted, depending on engine type and country-specific version of vehicle ⇒ [Electronic parts catalogue](#)
- ☐ Clean compressor flange before attaching pulley.

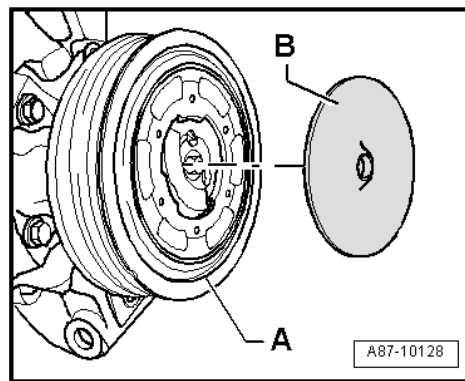
4.2 Detaching and attaching pulley at compressor





Note

- ◆ If pulley overload protection has been triggered, check that compressor can rotate freely before renewing pulley. If the compressor does not rotate freely, renew the complete unit.
- ◆ Depending on the engine version, the compressor might have to be detached from the engine before removing the pulley ⇒ [page 11](#).
- ◆ The compressor can be detached from the bracket and re-attached without opening up the refrigerant lines ⇒ [page 11](#).
- ◆ 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.
- ◆ Depending on the engine and the country-specific version, different compressors may be fitted. ⇒ *Electronic parts catalogue*
- ◆ Pulley is made of plastic, is sensitive to impact and should be treated with special care
- ◆ If overload protection of drive plate -C- has been triggered, remove circlip -A- and then prise drive plate off pulley -D-.
- ◆ For noise optimisation, a plastic disc -B- may be bonded to the drive plate of the pulley -A-, or alternatively a circlip with a vulcanised rubber disc may be fitted ⇒ *Electronic parts catalogue*. This plastic or rubber disc -B- reduces the rattling (castanet-like) noise which can occur at the pulley particularly in the case of vehicles with diesel engine in air conditioner "Econ" mode (or with "A/C off") (in air conditioner full load operation the noise is scarcely audible).

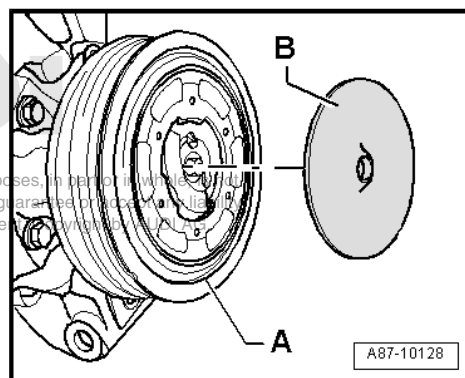


Preparations

- Remove noise insulation. ⇒ General body repairs, exterior; Rep. gr. 50
- Slacken off and detach poly V-belt. ⇒ Engine, mechanics; Rep. gr. 13
- Detach compressor from engine if necessary ⇒ [page 11](#).

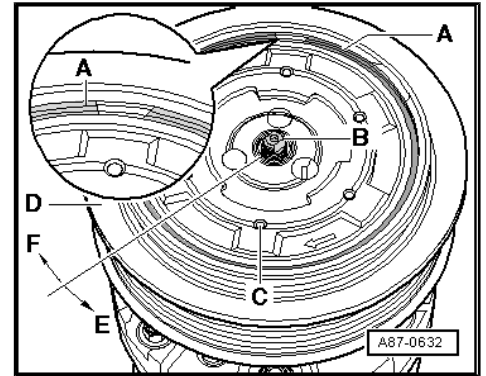
Detaching pulley

- Remove plastic disc -B- from pulley -A- (if fitted).



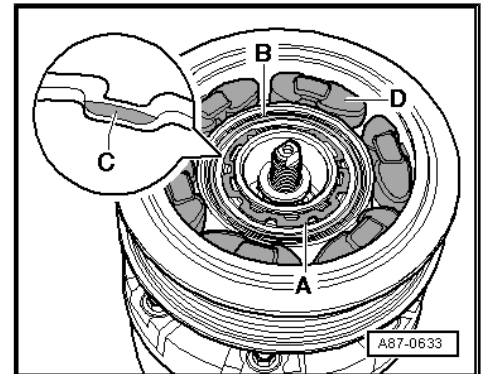
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- Use e.g. a small screwdriver or long-nose pliers to carefully remove circlip -A- (possibly with vulcanised rubber disc), taking particular care not to damage pulley.
- Hold drive shaft -B- of compressor in position with commercially available Allen key or socket wrench from shock absorber set - T10001- (depending on version of compressor) and turn drive plate -C- with pulley -D- in direction of arrow -E- (tightening torque: 35 Nm).
- Detach drive plate -C-.



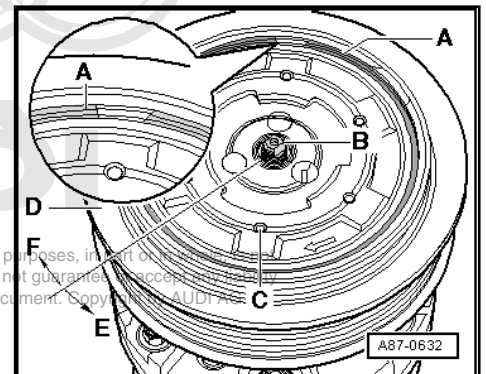
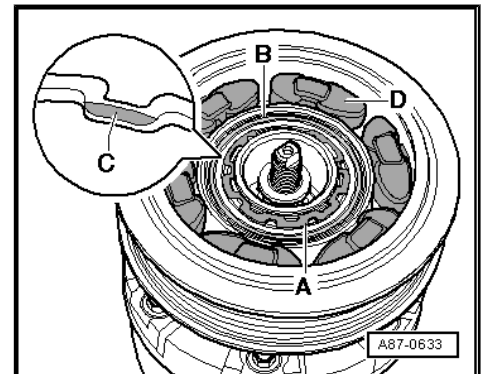
- Remove circlip -A-.
- Detach pulley -B-.

Attaching pulley



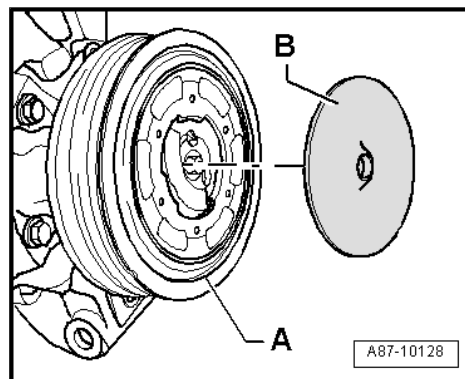
Note

- ◆ *Renew circlip -A-.*
- ◆ *Clean 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 compressor (flat side faces compressor).
- Insert rubber elements -D- into pulley -B- as shown.
- Before installing drive plate, coat rubber elements -D- slightly with lubricant (e.g. tyre fitting paste or soap solution).
- Insert drive plate -C- in rubber elements -D- until it makes contact with shaft of compressor.
- Screw drive plate -C- onto compressor shaft -B- by turning it in direction of arrow -F-.
- By turning it with a commercially available strap wrench (fabric strap) in direction of -arrow F-, tighten drive plate -C- (via pulley -D-) to 35 Nm. Hold compressor shaft -B- in position with commercially available Allen key or socket wrench from shock absorber set - T10001- .
- Fit circlip -A-.



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- Clean drive plate of pulley -A- and bond plastic disc -B- to centre of drive plate (applies only to compressors with no rubber disc attached to circlip).



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5 Control components of air conditioner (not located in passenger compartment)



Note

- ◆ *If there is a fault in the air conditioner, start by reading out the fault memory of the operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- ◆ *If no fault is displayed, read out the measured value block of the operating and display unit (Climatronic control unit - J255-) and activate any potentially faulty component via the "Final control diagnosis" function ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- ◆ *Servicing refrigerant circuit ⇒ [page 6](#)*
- ◆ *For information on air conditioner servicing work which can be performed without opening the refrigerant circuit, refer to [page 6](#) .*
- ◆ *For air conditioner servicing work which requires the refrigerant circuit to be opened, refer to [page 172](#) .*
- ◆ *The electrical checking of the various control motors, potentiometers and senders is described in ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .*
- ◆ *There are different versions of the operating and display unit (Climatronic control unit - J255-). Attention must therefore be paid to the exact assignment on replacement. ⇒ Electronic parts catalogue*
- ◆ *Perform air conditioner self-diagnosis via "Guided Fault Finding" function of vehicle diagnostic, testing and information system - VAS 5051 A- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- ◆ *Currently the operating and display units (Climatronic control unit - J255-) cannot be exchanged in the familiar manner (component protection active) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*
- ◆ *If the operating and display unit (Climatronic control unit - J255-) is to be replaced, interrogate coding of -J255- and adaption of -J255- before removing it via "Replace control unit" function in Guided Fault Finding routine for this operating and display unit ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .*

Perform the following work after completing the repairs:

- 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") .
- Check coding of operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- If applicable, check adaption of 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") .
- ◆ Components not located in passenger compartment
⇒ [page 22](#)
- ◆ Layout of components of air intake unit ⇒ [page 25](#)

5.1 Components not located in passenger compartment

1 - Forced ventilation vent

- ❑ Fitted on left and right 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 33](#)

2 - Heated windscreen control unit - J505-

- ❑ Introduction of "heated windscreen" (optional extra) not yet finalised
- ❑ Installed in luggage compartment (right-side) ⇒ [page 72](#)

If fitted, heated windscreen control unit - J505- exchanges information with operating and display unit (Climatronic control unit - J255-) via air conditioner data bus system ("Lin bus") ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

3 - Sunroof (with solar cells)

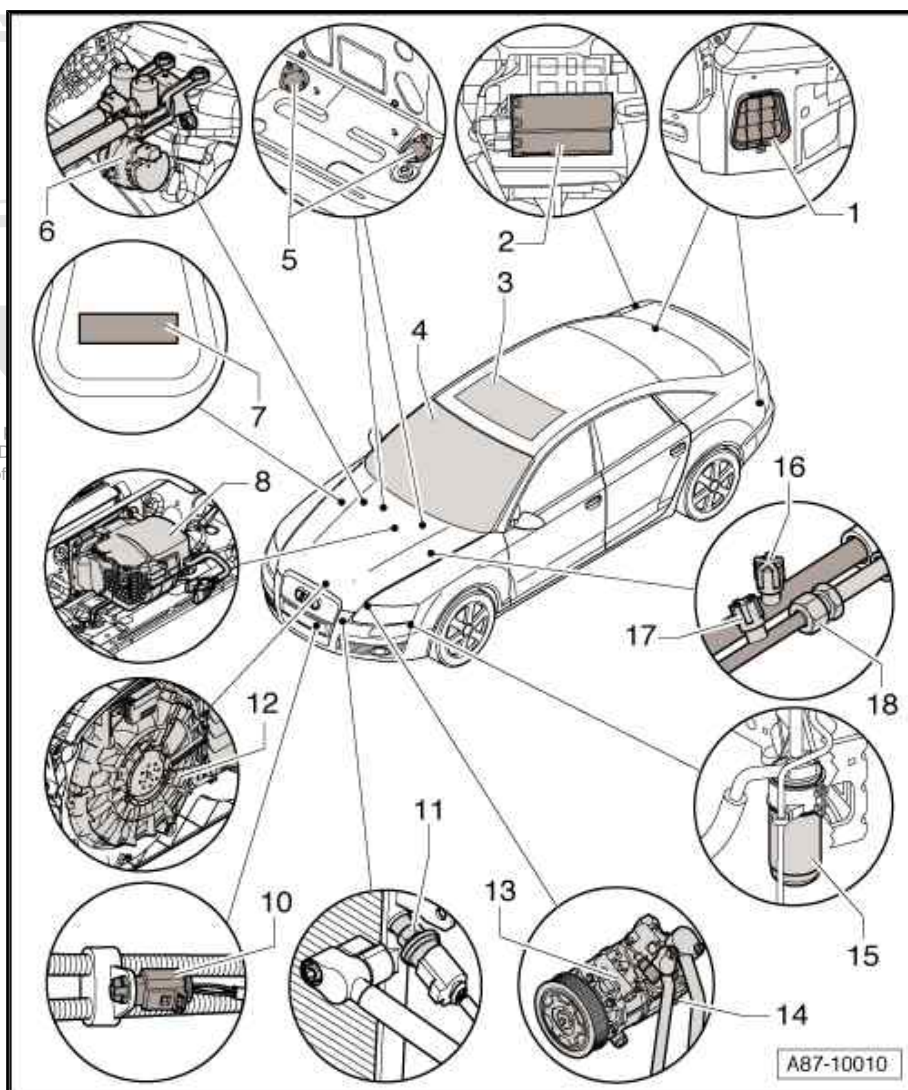
- ❑ Checking operation of solar cells ⇒ [page 54](#)
- ❑ Removing and installing
⇒ General body repairs, exterior; Rep. gr. 60
- ❑ "Solar mode" can be deactivated in MMI (Multi Media Interface) ⇒ "Infotainment/MMI" instructions
- ❑ Depending on adaption of operating and display unit (Climatronic control unit - J255-), "Solar mode" is deactivated at low ambient temperatures (adaption of -J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding", "Reading measured value block") .

4 - Heated windscreen - Z2-

- ❑ Introduction of "heated windscreen" (optional extra) not yet finalised
- ❑ Activated via heated windscreen control unit - J505- ⇒ Electrical system and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

If fitted, heated windscreen control unit - J505- exchanges information with operating and display unit (Climatronic control unit - J255-) via air conditioner data bus system ("Lin bus") ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding", "Reading measured value block") .

- ❑ Operation ⇒ [page 72](#) .



- ☐ Removing and installing windscreen ⇒ General body repairs, exterior; Rep. gr. 64

5 - Plenum chamber water drain

- ☐ Checking, cleaning, removing and installing ⇒ [page 34](#)

6 - Pump valve unit

- ☐ Consists of left heat regulation valve - N175- , right heat regulation valve - N176- and coolant circulation pump - V50-
- ☐ Checking operation ⇒ [page 169](#) and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

Pump valve unit components are activated by operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

- ☐ Removing and installing ⇒ [page 68](#)

7 - Label

- ☐ Indicates type of refrigerant and specified capacity
- ☐ Adhesive label is attached to bonnet (not on all vehicles); for capacity for and notes on refrigerant R134a, refer to ⇒ Air conditioner with refrigerant R134a

8 - Air intake unit

- ☐ Removing and installing ⇒ [page 49](#)
- ☐ Dismantling and assembling ⇒ [page 59](#)
- ☐ Layout of components of air intake unit ⇒ [page 25](#)
- ☐ The following components are installed in/attached to air intake unit
 - Air recirculation flap control motor - V113-
 - Fresh air intake duct temperature sensor - G89-
 - Air flow flap control motor - V71-
 - Air quality sensor - G238- (vehicles with "Convenience" air conditioner only)
 - Fresh air blower - V2-
 - Fresh air blower control unit - J126-
 - Water drain hose of air intake unit



Note

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Depending on the version, a dust 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 .

9 - Condenser

- ☐ Can only be removed after refrigerant circuit has been discharged; take vehicle to a workshop equipped with the necessary tools where work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a
- ☐ Detaching and attaching refrigerant lines ⇒ [page 208](#)
- ☐ Removing and installing condenser ⇒ [page 211](#)

10 - Ambient temperature sensor - G17-

- ☐ Measured value of ambient temperature sensor - G17- is evaluated by control unit in dash panel insert - J285- and transmitted via convenience data bus system to operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")
- ☐ Removing and installing:

- Removing bumper cover ⇒ General body repairs, exterior; Rep. gr. 50
- Unplug connector at temperature sensor.
- Unclip ambient temperature sensor - G17- from mounting.

**Note**

The illustration shows the position of the ambient temperature sensor - G17- on all vehicles except the Audi RS 6 (on the Audi RS 6, -G17- is fitted in the air duct to the left charge air cooler).

11 - Refrigerant pressure and temperature sender - G395-

- ❑ Function, removing and installing ⇒ [page 9](#)
- ❑ Measured value of sender is displayed in "Read measured value block" mode by operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

12 - Radiator fan - V7-

- ❑ Request for fan activation is transmitted by operating and display unit (Climatronic control unit - J255-) to relevant engine control unit via data bus system ("convenience" and "drive system") ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding", "Reading measured value block") .
- ❑ Corresponding engine control unit then actuates radiator fans - V7- or radiator fan control unit - J293- at requested output (infinite regulation) ⇒ Engine, mechanics; Rep. gr. 19 and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding" for corresponding engine control unit).
- ❑ Different versions fitted depending on vehicle equipment ⇒ Electronic parts catalogue and ⇒ Engine, mechanics; Rep. gr. 19
- ❑ Activation by operating and display unit (Climatronic control unit - J255-) displayed in measured value block ⇒ 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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13 - Compressor

- ❑ Different versions depending on engine ⇒ Electronic parts catalogue
- ❑ Detaching and attaching compressor with pulley at bracket - vehicles with 4 or 6-cyl. engine ⇒ [page 11](#)
- ❑ Removing and installing poly V-belt ⇒ Engine, mechanics; Rep. gr. 19
- ❑ For assignment for poly V-belt refer to ⇒ Electronic parts catalogue
- ❑ Detaching and attaching compressor with drive unit (shaft) at bracket - vehicles with 8-cyl. engine ⇒ [page 182](#)
- ❑ Renewing compressor drive unit ⇒ [page 202](#)
- ❑ Detaching and attaching refrigerant line at compressor ⇒ [page 177](#)
- ❑ When installing the refrigerant lines and the corresponding bracket, make sure there is sufficient distance between the belt, bracket and pulley
- ❑ Removing and installing compressor - vehicles with 4-cyl. or 6-cyl. engine ⇒ [page 180](#)
- ❑ Removing and installing compressor - vehicles with 8-cyl. engine ⇒ [page 182](#)
- ❑ Removing and installing compressor - vehicles with 10-cyl. engine ⇒ [page 191](#)

14 - Air conditioner compressor regulating valve - N280-

- ❑ Checking actuation and operation ⇒ [page 12](#) and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

15 - Reservoir

- ❑ Can only be removed after refrigerant circuit has been discharged; take vehicle to a workshop equipped with the necessary tools where work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a .
- ❑ Removing and installing ⇒ [page 221](#)

16 - Service connection

- ☐ Low-pressure side
- ☐ For measuring, discharging and charging; the vehicle must be taken to a workshop which is equipped with the necessary tools and at which the work can be performed by appropriately qualified personnel
⇒ Air conditioner with refrigerant R134a .
- ☐ Cap with seal, always screw on

17 - Service connection

- ☐ High-pressure side
- ☐ For measuring, discharging and charging; the vehicle must be taken to a workshop which is equipped with the necessary tools and at which the work can be performed by appropriately qualified personnel
⇒ Air conditioner with refrigerant R134a .
- ☐ Cap with seal, always screw on

18 - Bolt connection in refrigerant line (with restrictor)

- ☐ Only release bolt connection after refrigerant circuit has been discharged; take vehicle to a workshop equipped with the necessary tools where work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a

5.2 Layout - components of air intake unit



Note

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- ◆ *The air intake unit has various identical connectors which should be marked before unplugging to avoid interchange.*
- ◆ *Different control motors are fitted at the air conditioning unit and in the air intake unit. These motors have different electrical values (different adjustment ranges of integrated potentiometers) and part number indices (⇒ Electronic parts catalogue) and should therefore be marked before they are removed to avoid confusion.*
- ◆ *Depending on the version, a dust 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 .*

1 - Air intake unit (complete)

- ☐ Removing and installing
⇒ [page 49](#)
- ☐ Dismantling and assembling
⇒ [page 59](#)
- Can be dismantled and assembled to a large extent without being removed

2 - Air quality sensor - G238-

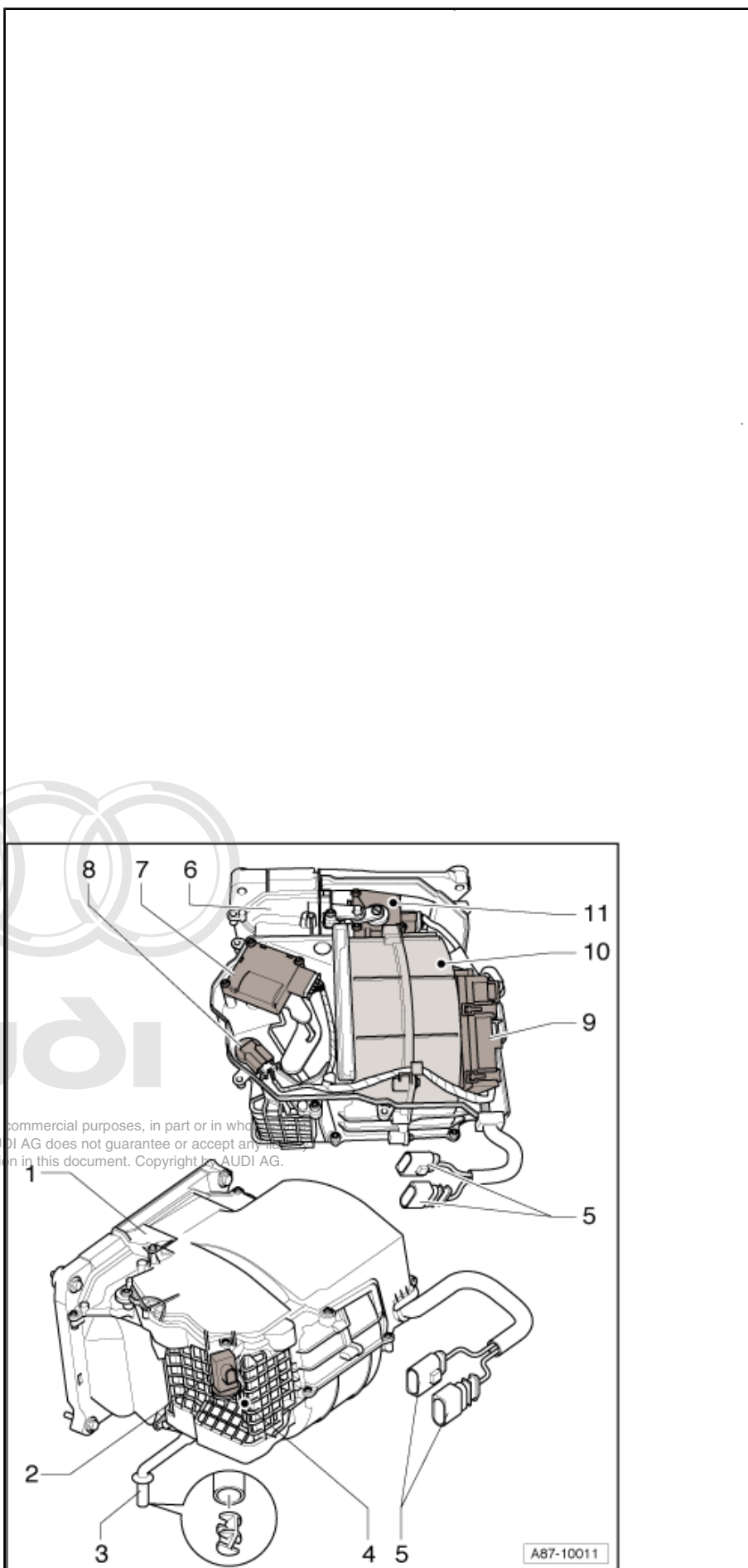
- ☐ Only fitted on vehicles with "Convenience" version of operating and display unit (Climatronic control unit - J255-)
- ☐ Function ⇒ [page 28](#)
- ☐ Checking ⇒ [page 30](#)
- ☐ Removing and installing
⇒ [page 28](#)
- ☐ Depending on setting on Multi Media Interface, sunroof closes as soon as operating and display unit (Climatronic control unit - J255-) is switched to air recirculation mode (automatic air recirculation via air quality sensor or manual air recirculation by pressing air recirculation button). This function is equipment-specific; introduction not yet finalised. ⇒ Operating instructions for "Infotainment/MMI"
- ☐ Measured value of air quality sensor - G238- is evaluated by operating and display unit (Climatronic control unit - J255-) and implemented if there are no shut-off criteria ⇒ Vehicle diagnostic, testing and information system VAS5051 ("Guided Fault Finding", Reading measured value block").

3 - Air intake unit water drain

- ☐ Designed to drain off water entering into air intake unit via fresh-air intake
- ☐ Plastic element for reducing cross-section is inserted in water drain hose

4 - Grille in front of fresh-air intake

- ☐ Removing and installing
⇒ [page 49](#)





Note

Depending on the version, a dust 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 .

5 - Connectors to air intake duct

- ☐ Version and pin assignment ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

6 - Air intake unit without cover (top)

7 - Air flow flap control motor - V71-

- ☐ With potentiometer for air flow flap control motor - G113-
- ☐ Removing and installing ⇒ [page 37](#)

8 - Fresh air intake duct temperature sensor - G89-

- ☐ Removing and installing ⇒ [page 40](#)
- ☐ Checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")
- ☐ Measured value is evaluated by operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

9 - Fresh air blower control unit - J126-

- ☐ Removing and installing ⇒ [page 41](#)
- ☐ Fresh air blower control unit - J126- is activated by operating and display unit (Climatronic control unit - J255-) via air conditioner data bus system ("Lin bus") ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- ☐ Information is exchanged between operating and display unit (Climatronic control unit - J255-) and fresh air blower control unit - J126- via air conditioner data bus system ("Lin bus") ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- ☐ Checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

10 - Fresh air blower - V2-

- ☐ Removing and installing ⇒ [page 42](#)
- ☐ Checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

11 - Air recirculation flap control motor - V113-

- ☐ With potentiometer for air recirculation flap control motor - G143-
- ☐ Removing and installing ⇒ [page 44](#)

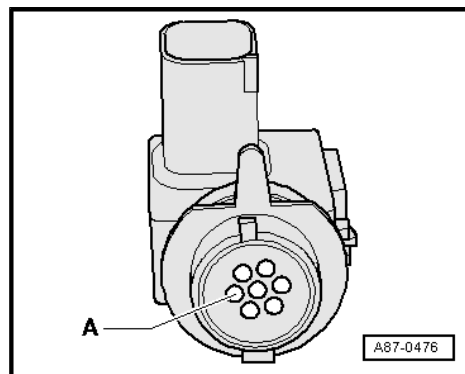
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5.3 Removing and installing air quality sensor - G238-



Note

- ♦ Air quality sensor - G238- is only fitted on vehicles with air conditioner version "Convenience".
- ♦ The air quality sensor - G238- is a highly sensitive electronic component which could be damaged irreparably if it comes into contact with solvents, fuels and certain chemical compounds (contamination e.g. via area -A-).
- ♦ For this reason, never fit an air quality sensor - G238- which has been kept in a tool box or similar.
- ♦ Following removal, do not set down air quality sensor - G238- in areas where it could come into contact with solvents, fuels or certain chemical compounds (liquids or vapours).
- ♦ There are different housings for and versions of the air quality sensor - G238-. Therefore it is important to observe the correct assignment ⇒ Electronic parts catalogue .



5.3.1 Removing and installing

- Remove plenum chamber cover.



WARNING

The two valves of the pump valve unit may be hot even if the engine is cold.

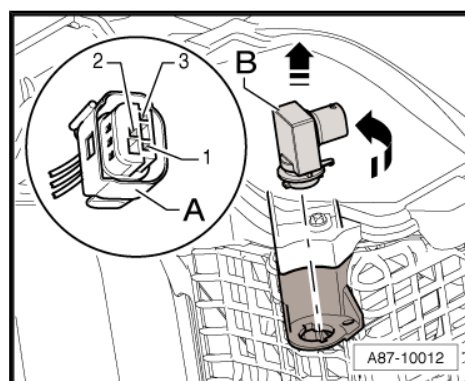
- If necessary, unfasten body brace (not necessary on all vehicles; different versions) ⇒ Running gear; Rep. gr. 40 .
- Turn air quality sensor - G238- -B- by 90° and lift it out of mounting.
- Unplug connector -A- from air quality sensor - G238- .

Contact assignment in connector -A-

1 - Positive (terminal "15")

2 - Negative (terminal "31")

3 - Signal wire to operating and display unit (Climatronic control unit - J255-) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations



Note

The square-wave signal emitted by the air quality sensor - G238- cannot be evaluated using workshop equipment. The measured value is displayed in the measured value block of the operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

5.4 Operation of air quality sensor - G238-

- ♦ Depending on setting in MMI (Multi Media Interface), sunroof closes as soon as operating and display unit (Climatronic

control unit - J255-) switches to air recirculation mode (automatic air recirculation via air quality sensor or manual air recirculation by pressing air recirculation button). This function is equipment-specific; introduction not yet finalised. ⇒ Operating instructions for "Infotainment/MMI"

- ◆ 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.
- At ambient temperatures below approx. –1 °C and in "Econ mode" (or with A/C mode switched off), switch-over only occurs if there is a major increase in pollutant concentration and only for approx. 15 sec. 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" within this period.

If the compressor is switched off (e.g. in "ECON" mode), the maximum duration for "automatic air recirculation mode" is restricted by the operating and display unit (Climatronic control unit - J255-) to approx. 15 sec. 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 compressor will be switched on even at ambient temperatures below + 2 °C when there is a request for "automatic air recirculation". However, at temperatures below approx. –8 °C, compressor operation is no longer possible.
- ◆ If "automatic air recirculation" mode has been set on the MMI (Multi Media Interface), the 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

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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 and air recirculation flaps can close 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, operating and display unit (Climatronic control unit - J255-) does not permit air recirculation mode while "defrost" mode is active.
- ◆ It takes approx. 30 seconds for the air quality sensor - G238- to warm up after the ignition is switched on. During this period no 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.

5.5 Checking air quality sensor - G238-

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

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Test requirements:



Note

- ◆ *The vehicle must be stationary in a clean atmosphere, away from running engines, air extractor outlets etc.*
- ◆ *Engine compartment and plenum chamber 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.*

Checking

- With the ignition switched off, connect the vehicle diagnostic, testing and information system - VAS 5051- to the 16-pin diagnostic socket in the vehicle with the diagnostic cable - VAS 5051/5A- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Start engine.
- 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-) ("Convenience" version) to "Auto" mode.
- Using MMI (Multi Media Interface) on operating and display unit (Climatronic control unit - J255-) or rotary pushbutton of MMI operating unit, select "Automatic air recirculation" mode (different versions) ⇒ Owner's Manual and ⇒ "Infotainment/ MMI" Operating Manual .
- Wait 30 seconds to allow air quality sensor - G238- to warm up.
- Using vehicle diagnostic, testing and information system - VAS 5051- , select "Read measured value block" ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Read out measured values for air quality sensor - G238- and position of air recirculation flap and fresh air flap ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .



Note

The operating status of the air conditioner (position of air recirculation flap and fresh air flap) and the status of the signal from the air quality sensor - G238- are displayed. For explanations of the possible displays, refer to ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

- ◆ Specification: no request for "air recirculation mode", air conditioner in fresh air mode (request for position of air recirculation and fresh air flap) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

Or

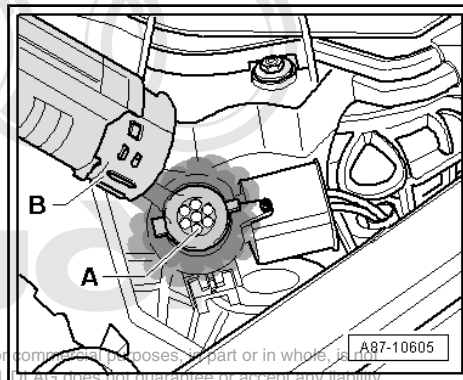
- ◆ Specification: no request for "air recirculation mode", "partial air recirculation mode" (position of air recirculation and fresh air flap open)
- Remove air quality sensor - G238- from mounting
⇒ [page 28](#) .

- 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.
- ◆ There are different housings for and versions of the air quality sensor - G238-. Therefore it is important to observe the correct assignment ⇒ *Electronic parts catalogue*.



- Read out display with measured value for air quality sensor - G238- and position of air recirculation flap and fresh air flap ⇒ Vehicle diagnostic, testing and information system VAS 5051 (“Guided Fault Finding”) .
- ◆ The specification for the position of the air recirculation flap and fresh air flap switches from fresh air or partial air recirculation mode to air recirculation mode (“Automatic air recirculation” requested); the request is fulfilled (air conditioner switches to air recirculation mode).
- Wait briefly (approx. 1 minute, depending on amount of test gas sprayed onto sensor).
- Read out display with measured value for air quality sensor - G238- and position of air recirculation flap and fresh air flap ⇒ Vehicle diagnostic, testing and information system VAS 5051 (“Guided Fault Finding”) .
- ◆ The specification for the position of the air recirculation flap and fresh air flap switches from air recirculation mode to fresh air or partial air recirculation mode (“Automatic air recirculation” no longer requested; air conditioner in fresh air or partial air recirculation mode).



Note

To stop the fresh air and recirculated-air flaps being switched too frequently, an air quality sensor - G238- request for “automatic air recirculation mode” is applied for at least 25 s (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.

- Install air quality sensor - G238- in mounting ⇒ [page 28](#) .
- Actuate the windscreen wash/wipe switch until the washer pump - V5- has conveyed fluid for approx. 2 s.
- Read out display with measured value for air quality sensor - G238- and position of air recirculation flap and fresh air flap ⇒ Vehicle diagnostic, testing and information system VAS 5051 (“Guided Fault Finding”) .
- ◆ Specification: “air recirculation mode” requested due to windscreen washer system (air conditioner switches to air recirculation mode for approx. 10 sec.
- Wait briefly.
- Read out display with measured value for air quality sensor - G238- and position of air recirculation flap and fresh air flap ⇒ Vehicle diagnostic, testing and information system VAS 5051 (“Guided Fault Finding”) .

- ◆ Specification: no request for "air recirculation mode", air conditioner in fresh air or partial air recirculation mode.

Note

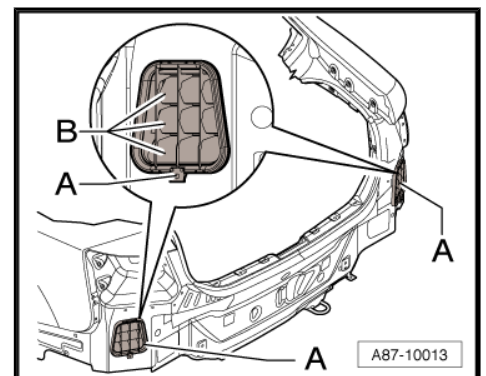
- ◆ Depending on the composition of the windscreen washer fluid, the air quality sensor - G238- may detect air pollution and request "automatic air recirculation".
- ◆ If the air conditioner does not automatically switch to air recirculation mode when the windscreen wipe/wash switch is operated, check its operation (the information "windscreen wash" is transmitted via the convenience data bus system) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").

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 88](#) .
- Connect up the vehicle diagnostic, testing and information system - VAS 5051- and select the "Reading measured value block" function ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.
- A second person is required to read out the values displayed while the other is driving.
- Observe safety precautions ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .
- Select display group with measured value for air quality sensor - G238- and position of air recirculation and fresh air flap ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .
- Start by driving the vehicle into an area with a relatively clean atmosphere (air conditioner in fresh air mode).
- Then drive vehicle into an area where the atmosphere is polluted (e.g. onto an uphill road with lorry traffic).
- Read out the display with the measured value for the air quality sensor - G238- and the position of the air recirculation and fresh air flap. The display in the display zones must change e.g. when you drive through a cloud of diesel emissions (e.g. from fresh air mode to "automatic air recirculation") ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Also refer to ⇒ [page 88](#) and ⇒ [page 28](#) .

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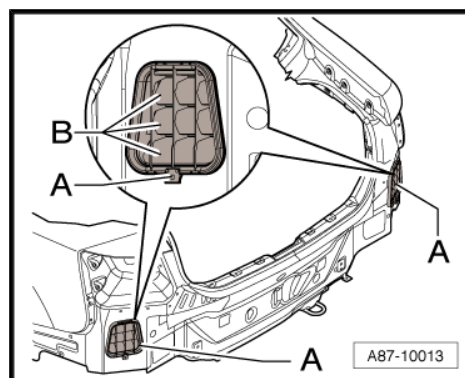
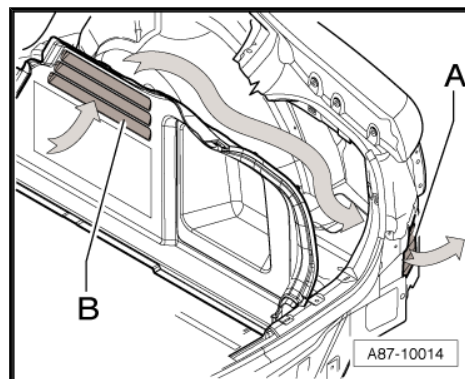
5.6 Checking ventilation frame



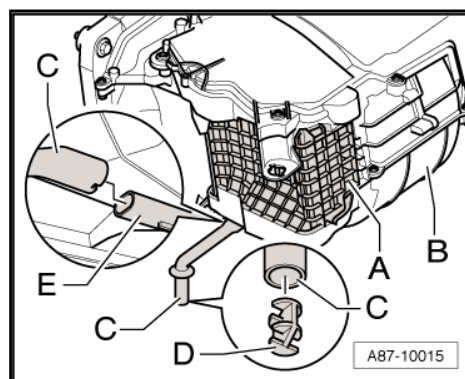


Note

- ◆ Fig. shows vent frames with rear bumper removed.
 - ◆ One ventilation frame -A- (for forced ventilation) is fitted on either side.
 - ◆ Sealing lips -B- only close properly if vent frame -A- has been installed correctly.
 - ◆ To ensure proper functioning of passenger compartment ventilation, vent openings -B- in left and right luggage compartment lining are never to be sealed off.
 - ◆ Space between wing and luggage compartment lining must not be obstructed to avoid impedance of air flow from vent openings -B- to vent frames -A-.
 - ◆ On Saloon models, for example, air from passenger compartment flows via vent slits in rear shelf and through slits incorporated into upper lining into luggage compartment.
 - ◆ If ducts are blocked or sealing lips are stuck together, windows can mist up.
- Check for blockage of air ducts from vent openings -B- on left and right to the two vent frames -A- in luggage compartment.
 - With rear bumper cover removed, check sealing lips -B- in vent frames -A- (must move freely and close automatically).



5.7 Checking, cleaning, removing and installing plenum chamber water drain

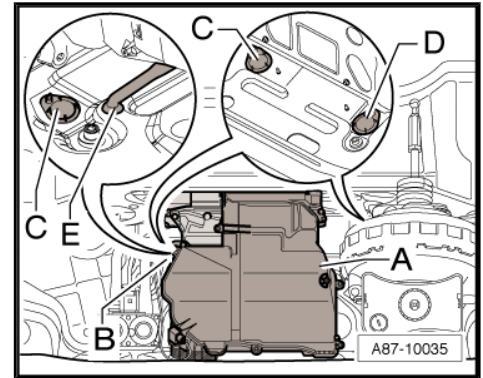


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Note

- ◆ Drainage of water out of plenum chamber may be impaired by deposits such as leaves and pine needles accumulating in the water drains. If the vehicle is then driven through a car wash or in the event of heavy rainfall, the water level in the plenum chamber will rise and water ingress via the fresh-air intake -A- into the air intake unit -B-.
- ◆ The water drain hose -C- is intended to discharge the small amounts of water entering the air intake unit via the fresh-air intake in normal operation.
- ◆ The water drains via the water drain hose -C- out of the plenum chamber (via connection -D-) into the transmission tunnel in the area behind the noise and heat insulation mat (a hole is provided specifically for this in the bottom of the plenum chamber).
- ◆ In water drain hose -C-, a plastic element -D- is inserted for reducing cross-section. If plastic element -D- is not fitted, noise may occur depending on fresh air blower - V2- speed.
- ◆ Water drain socket -C- is accessible after removing alarm horn - H12- of anti-theft alarm -B-. Water drain socket -D- is not accessible with brake servo and air intake unit -A- in position.
- ◆ Depending on vehicle equipment (e.g. in 4-cyl. engine with manual gearbox), water drain sockets -C- and -D- are also accessible from below when rear noise insulation has been removed, and can also be cleaned from below.
- ◆ Use a commercially available illuminated endoscope or similar to check inaccessible water drains. A version with a flexible, waterproof swan neck is most practical.
- ◆ Use a commercially available flexible gripper tool or similar to loosen and remove coarse dirt when cleaning inaccessible water drains. Then rinse out the remaining dirt.
- ◆ If the water drain sockets -C- and -D- are clogged with leaves and pine needles, the drains may freeze up in winter and prevent water drainage. After driving a short distance, the heat emitted by the engine and exhaust system causes the ice in the drains to thaw again. It is possible that the water will have drained off from the plenum chamber again by the time the vehicle arrives at the workshop.
- ◆ Water drain socket -C- can be cleaned e.g. after removing alarm horn - H12- of anti-theft alarm -B- (Removing alarm horn - H12- ➔ Rep. gr. 96 ; Electrical system).
- ◆ Coarse dirt can be removed from the water drain socket -D- using a commercially available flexible gripping tool for example. Fine deposits and sludge can be removed for example using a thin water hose or a pressure-feed spray gun - V.A.G 1538- and a nylon probe - V.A.G 1538/2- .
- ◆ If one of the two water drain sockets -C- or -D- is blocked and there are leaves, for example, in the plenum chamber, remove coarse dirt from the area beneath the air intake unit using a commercially available flexible gripping tool for instance. Fine deposits and sludge can be removed for example using a thin water hose or a pressure-feed spray gun - V.A.G 1538- and a nylon probe - V.A.G 1538/2- .
- ◆ To stop water from the plenum chamber flowing via the water drain hose -E- into the air intake unit, the hose ends in the area behind the noise and heat insulation mat in the transmission tunnel.



5.8 Removing and installing upper cover of air intake unit



Note

There are different versions of the air intake unit housing and the corresponding upper cover (up to 05.04 version "1" and as of 05.04 gradual conversion to version "2", distinguishing features ⇒ [page 63](#)). If the version "1" upper cover or housing has to be replaced on vehicles manufactured up to 05.04, the housing or upper cover of the air extraction unit also has to be replaced (only version "2" components are available as replacements) ⇒ *Electronic parts catalogue* .

Removing

- Switch off ignition.
- Remove plenum chamber cover.



WARNING

The two valves of the pump valve unit may be hot even if the engine is cold.

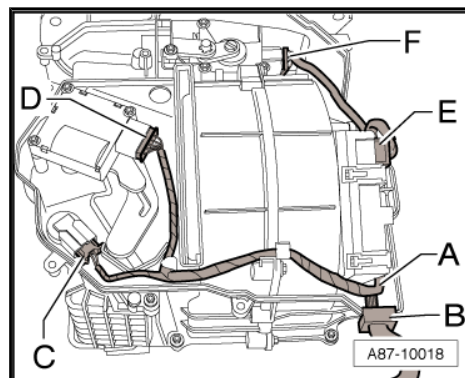
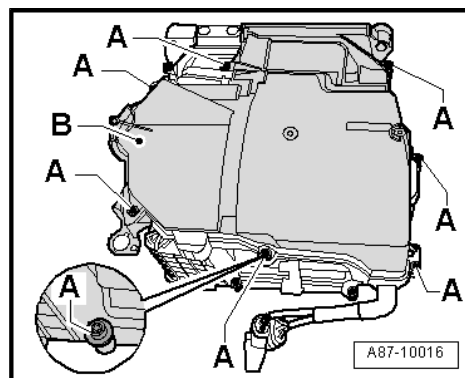
- Remove wiper arms and scuttle panel trim ⇒ Rep. gr. 92 ; Electrical system
- Remove windscreen wiper ⇒ Rep. gr. 92 ; Electrical system .
- Remove strut brace if necessary (not installed in all vehicles). ⇒ Rep. gr. 40 ; Running gear
- Remove air quality sensor - G238- if fitted ⇒ [page 28](#) .
- Unscrew bolts -A-.
- Detach upper cover -B-.

Installing

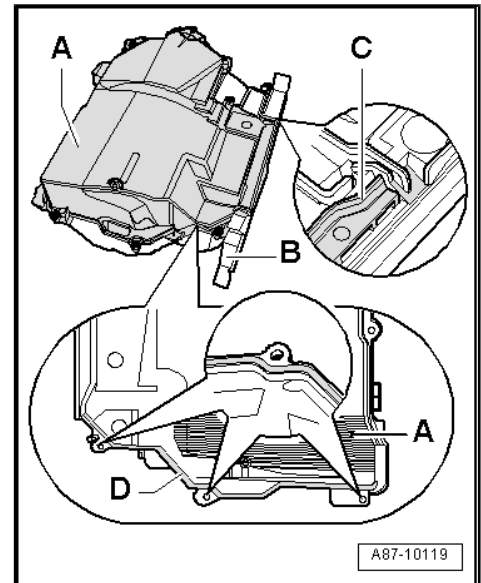


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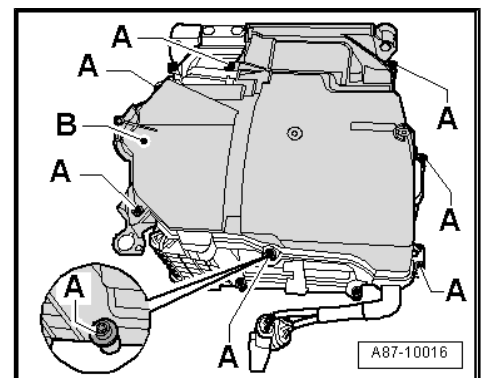
- Before fitting upper cover of air intake unit, check proper attachment of connectors -C- to -F-, routing of wiring -A- and positioning of grommet -B-.



- On vehicles with a version “1” air intake unit (gradual conversion to version “2” as of 05.04, distinguishing features of version “2” ⇒ [page 63](#)), insert a sealing cord (dimensions 2 x 2 mm) in groove -D- of the upper cover -A- or seal the tongue-and-groove joint to the housing -B- e.g. with silicone adhesive sealing material “D 176 001 A3”.
- On vehicles with a version “1” air intake unit, seal the area between the upper cover -A- and the housing -B- (or the inner cover) in area -C- with silicone adhesive sealing material “D 176 001 A3” for example.



- Re-install upper cover -B- of air intake unit.
- Hand-tighten securing bolts -A- (10 Ncm).
- Re-install components in reverse order of removal.
- Interrogate fault 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”).
- If applicable, perform air conditioner basic setting and final control diagnosis ⇒ Vehicle diagnostic, testing and information system VAS 5051 (“Guided Fault Finding”).



5.9 Removing and installing air flow flap control motor - V71- with potentiometer - G113-



Note

- ◆ In the event of fault “Upper or lower limit value exceeded”, check motor/flap connecting element. It must be properly attached to motor and there must not be any clearance between control motor mount and connecting element.
- ◆ The air intake unit has various identical connectors which should be marked before unplugging to avoid interchange.
- ◆ Different control motors are fitted on the air conditioning unit and in the air intake unit. These motors have different electrical values and part number indices ⇒ Electronic parts catalogue and should therefore be marked prior to removal to avoid interchange.
- ◆ This control motor is fitted with a potentiometer with an adjustment range of 120 °; part number index at start of production: “A” ⇒ Electronic parts catalogue.

Removing control motor

- Switch off ignition.
- Remove plenum chamber cover.

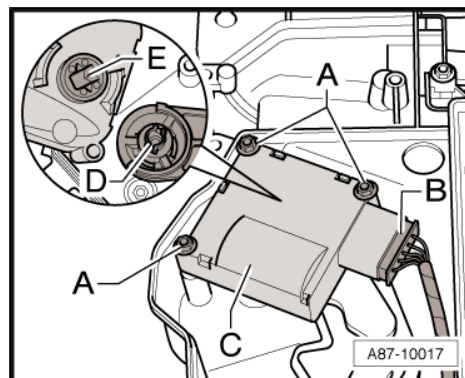


WARNING

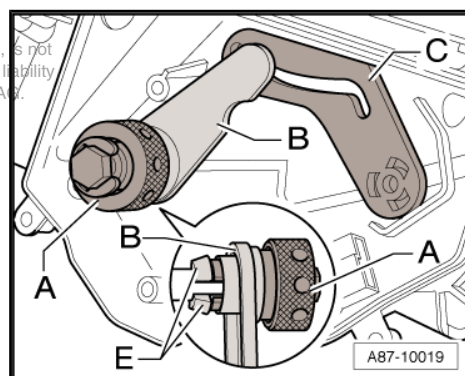
The two valves of the pump valve unit may be hot even if the engine is cold.

- Remove wiper arms and scuttle panel trim ⇒ Rep. gr. 92 ; Electrical system
- Remove strut brace if necessary (not installed in all vehicles). ⇒ Rep. gr. 40 ; Running gear
- Remove the upper cover of the air intake unit ⇒ [page 36](#) .
- Unscrew bolts -A-.
- Unplug connector -B- for control motor.
- Detach control motor -C-.

Removing shaft/control motor connecting element



- Insert release tool - T40072- -A- in connecting element -B-.
- Release fasteners -E- of connecting element -B- by screwing in knurled wheel at release tool - T40072- -A-.
- Carefully prise off connecting element -B- (using screwdriver for example).



Note

Lever -C- is of a different design to connecting element -B- and can therefore not be removed with release tool - T40072- -A- (prise off with screwdriver if necessary).

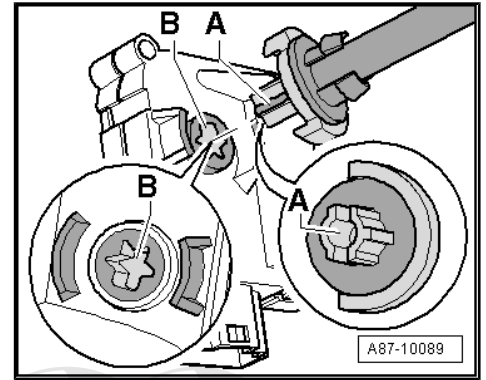
Installing control motor

Install in reverse order of removal; note the following.

- Check position of control motor shaft -B- (must be in position shown).

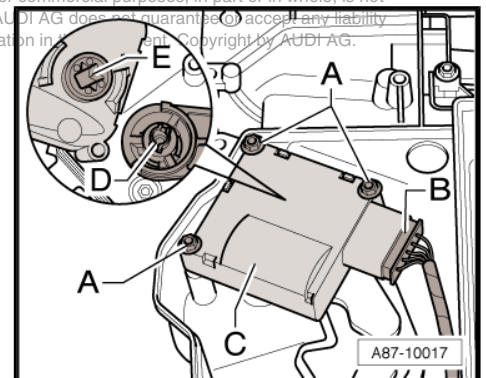
i Note

- ◆ Only attach connecting element -A- in the position that enables it to engage without exertion of force. If the connecting element can only be inserted with force, check the motor shaft -D- (it may be 180° out of position).
- ◆ If motor shaft -B- is not in the position shown (only position in which connecting element can be attached), use adapter cable, for example ⇒ [page 40](#) or test lead from adapter set - V.A.G 1594/C- to connect contacts 5 and 6 of control motor to a 12 V battery via a 5 A fuse. Turn control motor until shaft is in position shown (no force required to attach connecting element). Direction of rotation can be reversed by interchanging positive and negative.
- ◆ Control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. Consequently, voltage should only be applied with control motor detached if connecting element -A- has been attached or to move shaft to correct position if connecting element cannot be attached.
- ◆ Shaft may be incorrectly positioned if pre-tension is required to insert connecting element -A- in control motor.



- Before installing control motor, check air flow flap mount and connecting element -D-.
- Check position of shaft -E- of air flow flap control motor - V71- (must be in position shown).

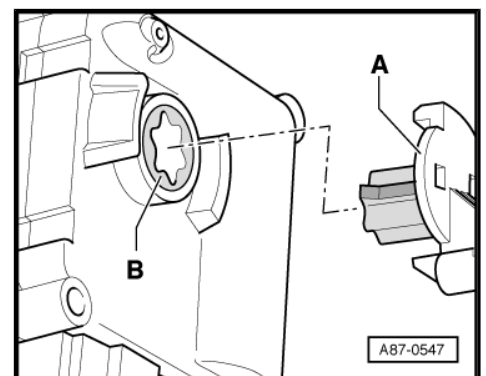
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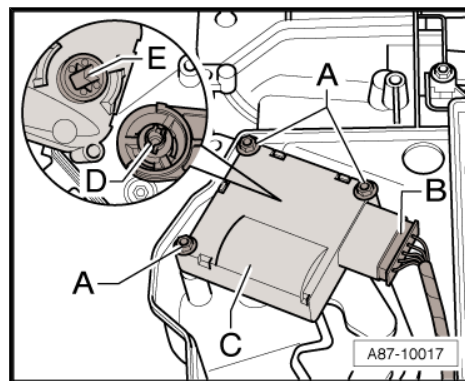
i Note

- ◆ Check positioning of connecting element. There must not be any clearance between mount of control motor -A- and connecting element -B- (remove connecting element if necessary).
- ◆ Only attach connecting element -A- in the position that enables it to engage without exertion of force. If pre-tension is required to insert the connecting element, check the mount of the motor -B- as this may be turned through 180°.

- Attach connecting element -A- to shaft of air flow flap.

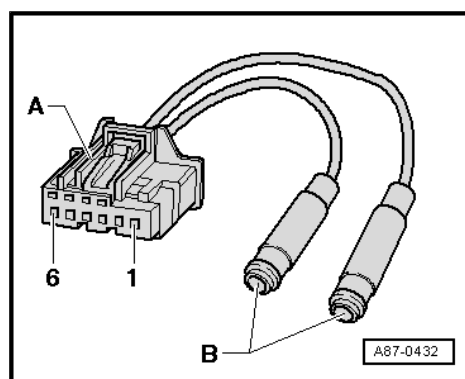


- Install control motor -C-.
- Hand-tighten securing bolts -A- (10 Ncm).
- Plug connector -B- to control motor -C-.
- Before fitting upper cover of air intake unit, check correct attachment of connector -B- and routing of wiring.
- Re-install components in reverse order of removal.
- Interrogate fault 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") .
- Perform basic setting and final control diagnosis for air conditioner ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .



5.10 Preparing adapter cables for activation of control motor

- Make connection to contacts "5" and "6" of connector -A- (part number 6Q0 972 706) using wire with a cross section of 0.25 mm² in each case. ⇒ Electronic parts catalogue
- Connect other end of each wire to a commercially available banana plug -B-.



5.11 Removing and installing fresh air intake duct temperature sensor - G89-

Removing

- Switch off ignition.
- Remove plenum chamber cover.



WARNING

The two valves of the pump valve unit may be hot even if the engine is cold.

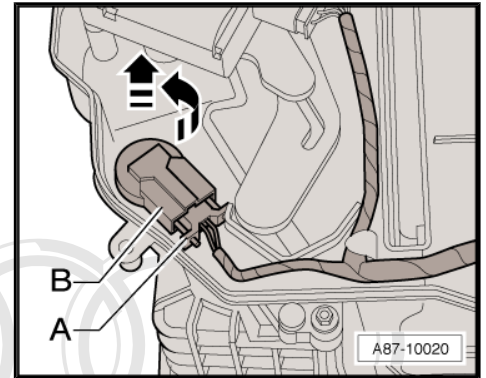
- Remove wiper arms and scuttle panel trim ⇒ Rep. gr. 92 ; Electrical system
- Remove strut brace if necessary (not installed in all vehicles).
⇒ Rep. gr. 40 ; Running gear
- Remove the upper cover of the air intake unit ⇒ [page 36](#).

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- Unplug connector -A- from temperature sensor -B-.
- Give temperature sensor -B- approx. 90° turn in direction of arrow and remove it from intake duct.

Installing

- Fit temperature sensor -B-.
- Plug connector -A- to temperature sensor -B-.
- Before fitting upper cover of air intake unit, check correct attachment of connector -A- and routing of wiring.
- Re-install components in reverse order of removal.
- Interrogate fault memory of operating and display unit, Climatronic control unit - J255- and erase any faulty displayed. ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").



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

Removing

- Switch off ignition.
- Remove plenum chamber cover.

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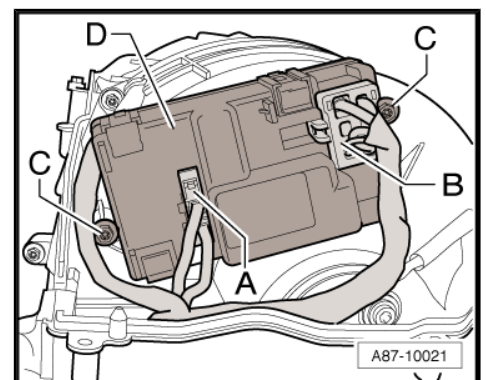
WARNING

The two valves of the pump valve unit may be hot even if the engine is cold.

- Remove wiper arms and scuttle panel trim ⇒ Rep. gr. 92 ; Electrical system .
- Remove strut brace if necessary (not installed in all vehicles). ⇒ Rep. gr. 40 ; Running gear
- Remove the upper cover of the air intake unit ⇒ [page 36](#) .
- Unplug connectors -A- (to fresh air blower - V2-) and -B-.
- Unscrew bolts -C-.
- Remove fresh air blower control unit - J126- -D-.

Installing

- Install fresh air blower control unit - J126- -D-.
- Hand-tighten bolts -C- (10 Ncm).
- Plug in connectors -A- (to fresh air blower - V2-) and -B-.
- Before fitting upper cover of air intake unit, check correct attachment of connectors -A- and -B- as well as routing of wiring.
- Re-install components in reverse order of removal.
- Interrogate fault 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") .
- Perform basic setting and final control diagnosis for air conditioner ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .



5.13 Removing and installing fresh air blower - V2-

Removing

- Switch off ignition.
- Remove plenum chamber cover.



WARNING

The two valves of the pump valve unit may be hot even if the engine is cold.

- Remove wiper arms and scuttle panel trim ⇒ Rep. gr. 92 ; Electrical system .
- Remove strut brace if necessary (not installed in all vehicles).
⇒ Rep. gr. 40 ; Running gear
- Remove windscreen wiper ⇒ Rep. gr. 92 ; Electrical system .
- Remove the upper cover of the air intake unit ⇒ [page 36](#) .
- Remove fresh air blower control unit - J126- ⇒ [page 41](#) .

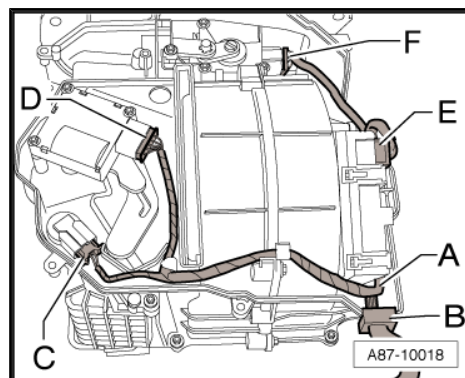


WARNING

The heat sink of the fresh air blower control unit - J126- may be hot.

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- Unplug connectors -C-, -D- and -F- from the various components.
- Unfasten grommet -B- from housing of air intake unit and lay aside wiring harness -A-.



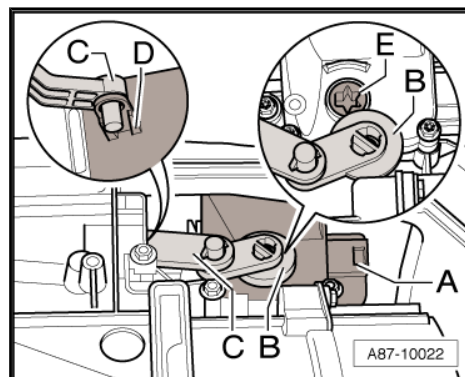
- Carefully (e.g. with a screwdriver) release connecting element -B- from control motor -A-.



Caution

Connecting rod -C- is engaged at lever -D- of recirculated-air flap; lever would break away if bent by way of connecting rod.

- Position connecting rod -C- and connecting element -B- such that they cannot become bent on removing fresh air blower -V2- .



- Completely unscrew bolts -A- (6x).



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.

- Carefully remove fresh air blower - V2- -B-, taking particular care not to bend connecting elements -C-.

Installing

- Check position of shaft -E- of air recirculation flap control motor - V113- (must be in position shown).



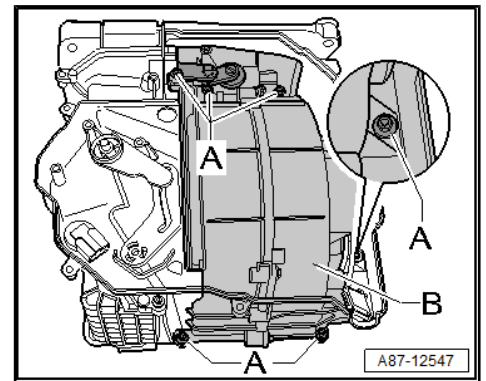
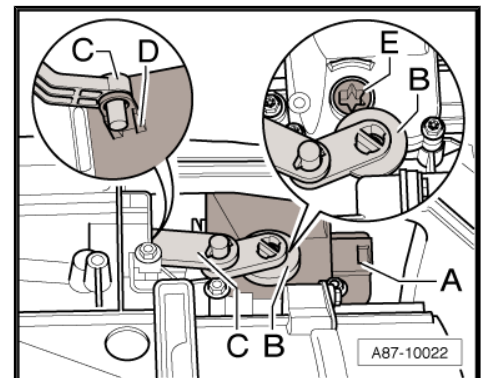
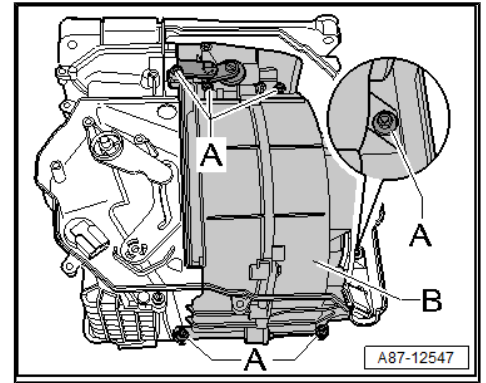
Note

- ◆ *Control motor shaft -E- has no stop. It rotates constantly if voltage is applied to contacts 5 and 6 at connector of control motor -A-. When control motor has been detached, voltage is therefore only to be applied with connecting element -B- attached.*
- ◆ *If control motor shaft -E- has been turned through 180°, pre-tension is required to insert connecting element -D- in control motor.*
- ◆ *If control motor shaft -E- is so awkwardly positioned that connecting element cannot be attached, use adapter cable for example ⇒ [page 40](#) or test lead from adapter set - V.A.G 1594/ C- to connect contacts 5 and 6 of control motor by way of a 5 A fuse to a 12 V battery.*
- ◆ *Turn control motor until shaft -E- is in position shown and no pre-tension is required to attach connecting element. Direction of rotation can be reversed by interchanging positive and negative.*
- ◆ *Check positioning of connecting element. There must not be any clearance between mount of control motor and connecting element (remove connecting element if necessary).*

- Assemble air recirculation flap control motor - V113- and fresh air blower - V2- ⇒ [page 44](#) .

- Carefully insert fresh air blower - V2- -B-, taking particular care not to bend connecting elements -C-.

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- Carefully insert connecting element -B- in shaft -E- of control motor -A-.



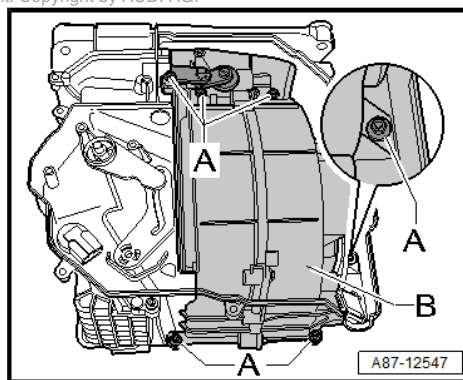
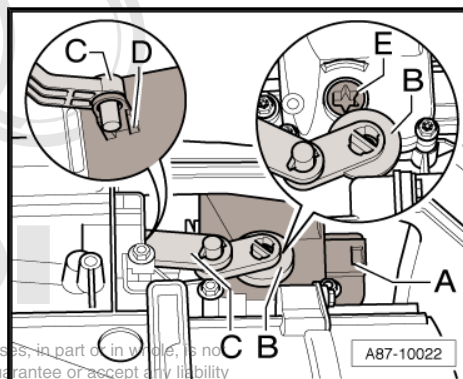
Caution

Connecting rod -C- is engaged at lever -D- of recirculated-air flap; lever would break away if bent by way of connecting rod.

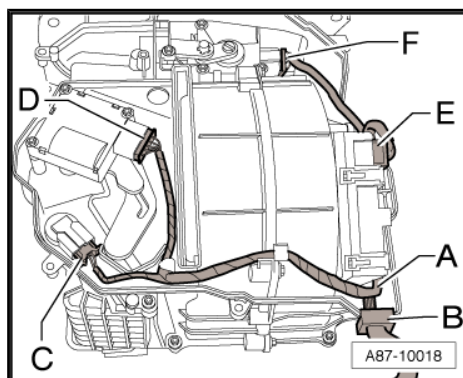
- Check connection between connecting element -B- and shaft of control motor (connecting element must be engaged).

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- Fit bolts -A-.
- Hand-tighten screws -A- (10 Nm).



- Fit grommet -B- and wiring harness -A- as shown.
- Plug in connectors -C-, -D- and -F- of the various components.
- Install fresh air blower control unit - J126- → [page 41](#) .
- Before fitting upper cover of air intake unit, check correct attachment of connectors -A- and -B- as well as routing of wiring.
- Re-install components in reverse order of removal.
- Interrogate fault 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") .
- Perform basic setting and final control diagnosis for air conditioner ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .



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



Note

- ◆ The air intake unit has various identical connectors which should be marked before unplugging to avoid interchange.
- ◆ Different control motors are fitted on the air conditioning unit and in the air intake unit. These motors have different electrical values and part number indices ⇒ Electronic parts catalogue and should therefore be marked prior to removal to avoid interchange.
- ◆ This control motor is fitted with a potentiometer with an adjustment range of 120 °; part number index at start of production: "A" ⇒ Electronic parts catalogue .

Removing

- Switch off ignition.
- Remove plenum chamber cover.



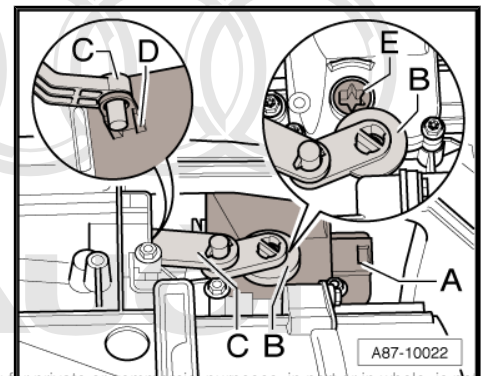
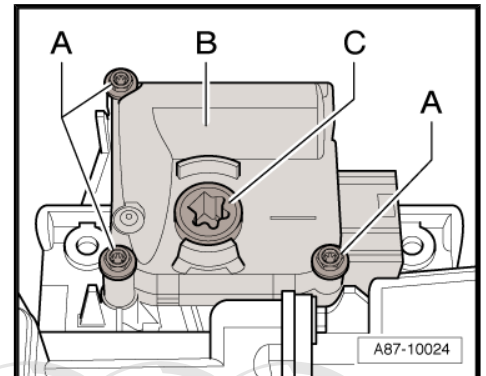
WARNING

The two valves of the pump valve unit may be hot even if the engine is cold.

- Remove fresh air blower - V2- ⇒ [page 42](#) .
- Unscrew bolts -A-.
- Detach control motor -B-.

Installing

- Check position of shaft -E- of air recirculation flap control motor - V113- (must be in position shown).

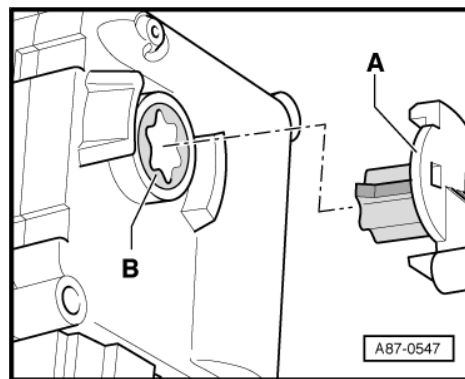


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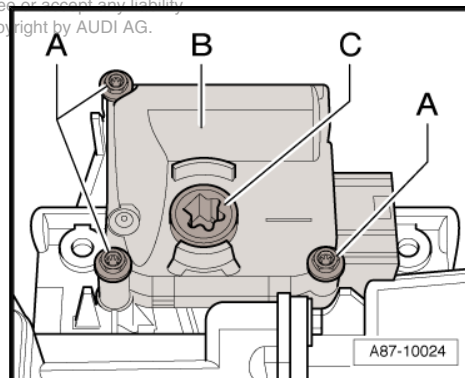


Note

- ◆ *Shaft of control motor -C- has no stop. It rotates continuously if voltage is applied to contacts 5 and 6 of connector -A-. When control motor has been detached, voltage is therefore only to be applied with connecting element (to recirculated-air flap) -B- attached to control motor.*
- ◆ *Control motor shaft may be incorrectly positioned if pre-tension is required to insert connecting element -B- in control motor.*
- ◆ *If shaft is so awkwardly positioned that connecting element cannot be attached, use adapter cable, for example → [page 40](#) or test lead from adapter set - V.A.G 1594/C- to connect contacts 5 and 6 in connector -A- of control motor to a 12 V battery via a 5 A fuse.*
- ◆ *Turn control motor until no pre-tension is required to attach connecting element. Direction of rotation can be reversed by interchanging positive and negative.*
- ◆ *Check positioning of connecting element. There must not be any clearance between mount of control motor -A- and connecting element -B-.*
- ◆ *Check positioning of connecting element -B-. It must engage in shaft of motor -A- and there must not be any clearance between control motor shaft and connecting element.*
- ◆ *Only attach connecting element -B- in the position that enables it to engage without exertion of force. If force is required to insert connecting element, check mount of motor -A- as this may be turned through 180°.*
- ◆ *Motor may be incorrectly positioned if force is required to insert connecting element -A- in control motor.*



- Install control motor -B-.
- Hand-tighten screws -A- (10 Nm).
- Fit fresh air blower - V2- → [page 42](#) .
- Re-install components in reverse order of removal.
- Interrogate fault 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") .
- Perform basic setting and final control diagnosis for air conditioner ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .



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5.15 Removing and installing cover with air intake unit flap

Note

There are different versions of the air intake unit housing and the corresponding upper and inner cover (up to 05.04 version "1" and as of 05.04 gradual conversion to version "2", distinguishing features [⇒ page 63](#)). If the version "1" upper cover or housing has to be replaced on vehicles manufactured up to 05.04, the housing or upper cover of the air extraction unit also has to be replaced (only version "2" components are available as replacements) [⇒ Electronic parts catalogue](#).

Removing

- Switch off ignition.
- Remove plenum chamber cover.



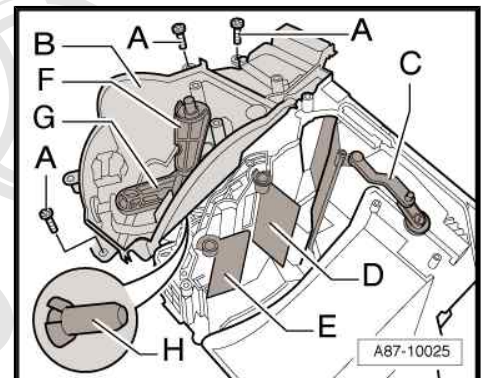
WARNING

The two valves of the pump valve unit may be hot even if the engine is cold.

- Remove fresh air blower - V2- [⇒ page 42](#).
- Remove air flow flap control motor - V71- [⇒ page 37](#).
- Unscrew bolts -A-.
- Detach cover -B-.

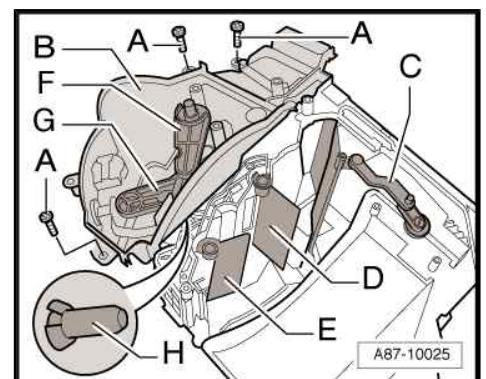
Note

- ◆ Recirculated-air flap -C- (with connecting elements) and the two fresh-air/air flow flaps -D- and -E- are inserted in air intake unit housing.
- ◆ Shaft/control motor connecting element -F- and lever -G- are held in position by way of retainer tabs -H- in cover -B-.
- ◆ Removing shaft/control motor connecting element [⇒ page 37](#)
- ◆ ~~The lever -G- is of a different design to the connecting element -F- and can therefore not be removed with the special tool [⇒ page 37](#) (prise off with a screwdriver if necessary).~~

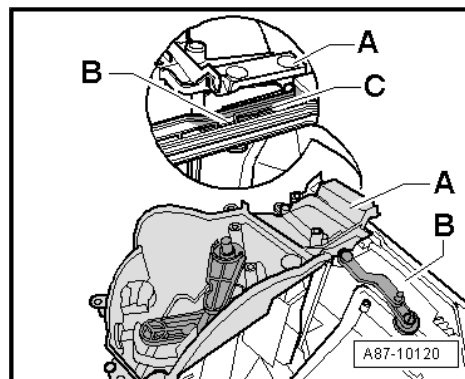


Installing

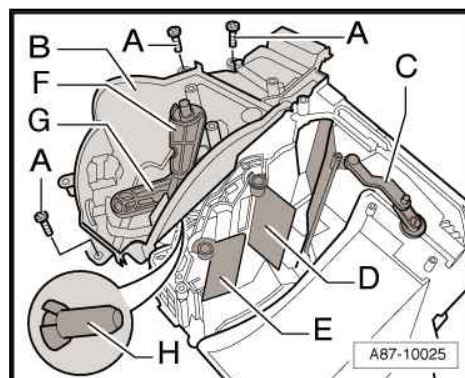
- Insert recirculated-air flap -C- (with connecting elements) and the two fresh-air/air flow flaps -D- and -E- in the corresponding mounts in the air intake unit housing.



- On vehicles with a version “1” air intake unit (gradual conversion to version “2” as of 05.04, distinguishing features of version “2” ⇒ [page 63](#)), seal the area between the inner cover -A- and the housing -B- in area -C- with silicone adhesive sealing material “D 176 001 A3”, for example.



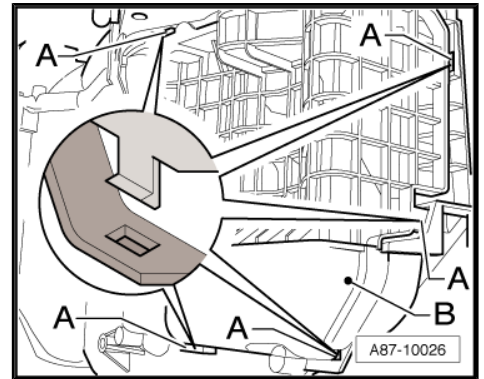
- Fit cover -B-, taking particular care to ensure that the two shafts (of shaft/control motor connecting element -F- and lever -G-) are correctly inserted in the appropriate flap.
- Check position of recirculated-air flap -C- in mounts.
- Hand-tighten securing bolts -A- (10 Ncm).
- Fit fresh air blower - V2- ⇒ [page 42](#) .
- Re-install components in reverse order of removal.
- Interrogate fault 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”) .
- Perform basic setting and final control diagnosis for air conditioner ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .



5.16 Removing and installing grille in front of fresh-air intake

Note

- ◆ 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 for certain countries with a high dust level in the ambient air (e.g. for China) ⇒ Electronic parts catalogue .
- ◆ If a dust filter is installed instead of intake grille -A-, proceed as follows to remove dust filter: Remove plenum chamber cover, air quality sensor - G238- and holder for pump valve unit from the body (secured with 3 hex nuts). Swivel pump valve unit to one side then remove dust filter with holder.



Removing

- Switch off ignition.
- Remove plenum chamber cover.



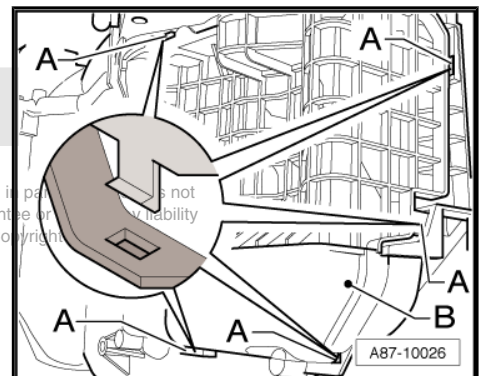
WARNING

The two valves of the pump valve unit may be hot even if the engine is cold.

- Remove wiper arms and scuttle panel trim ⇒ Rep. gr. 92 ; Electrical system
- Remove strut brace if necessary (not installed in all vehicles).
⇒ Rep. gr. 40 ; Running gear
- Remove the upper cover of the air intake unit ⇒ [page 36](#) .
- Release fasteners -A- and detach grille for fresh-air intake -B- from air intake unit.

Installing

- Clean plenum chamber in area beneath air intake unit.
- Attach grille for fresh-air intake -B- to air intake unit.
- Re-install components in reverse order of removal.



5.17 Removing and installing air intake unit

Special tools, testers and other devices required

- ◆ Hose clamps up to Ø 25 mm - 3094- or hose clamps up to Ø 40 mm - 3093-
- ◆ Compressed-air gun, commercially available
- ◆ Hand pump - V.A.G 1274- (and appropriate adapters)

Removing

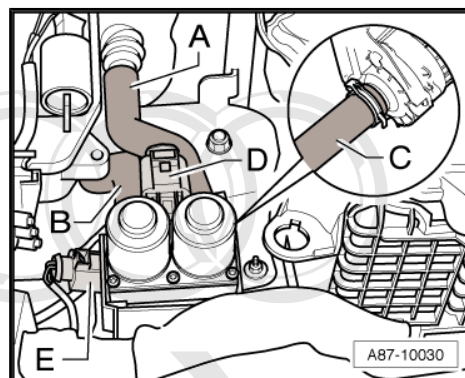
- Switch off ignition.

- Release pressure in coolant circuit by opening cap on coolant expansion tank ⇒ Engine, mechanics; Rep. gr. 19 .
- Remove plenum chamber cover.

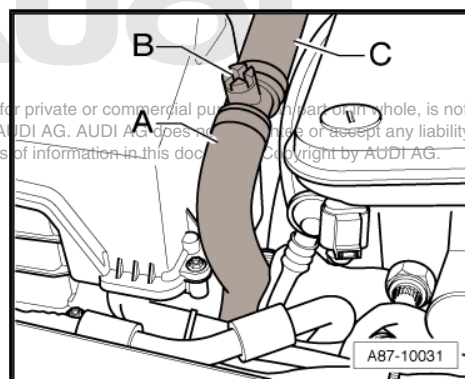

WARNING

The two valves of the pump valve unit may be hot even if the engine is cold.

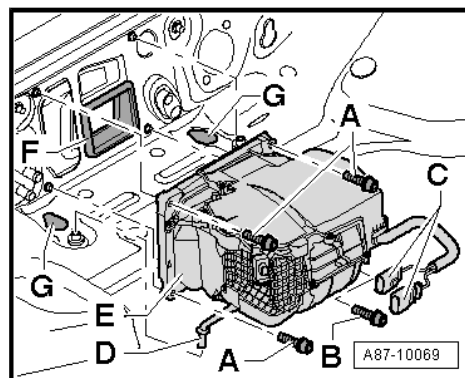
- Remove wiper arms and scuttle panel trim ⇒ Rep. gr. 92 ; Electrical system
- Remove wipers and unclip drip rail from air intake unit ⇒ Rep. gr. 92 ; Electrical system .
- Remove strut brace if necessary (not installed in all vehicles). ⇒ Rep. gr. 40 ; Running gear
- Remove alarm horn - H12- ⇒ Rep. gr. 96 ; Electrical system .
- Remove air quality sensor - G238- if applicable ⇒ [page 28](#) .
- Pinch off coolant hose -C- (supply from engine to coolant circulation pump - V50-), e.g. with hose clamps up to Ø 25 mm - 3094- .



- Pinch off coolant hose -A- (return from heat exchanger to engine), e.g. with hose clamps up to Ø 25 mm - 3094- .
- Detach coolant hose -C- from connection at air conditioning unit and lay aside.



- Unplug connector -C-.
- Screw out bolt -B- (tightening torque 7 Nm).



i Note

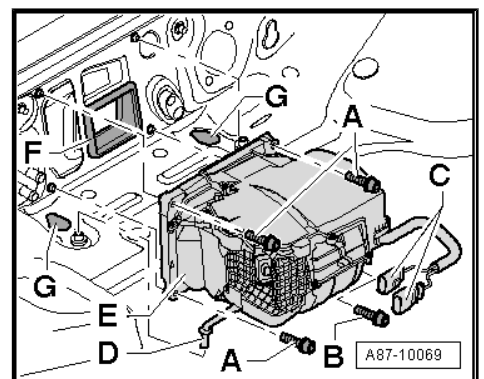
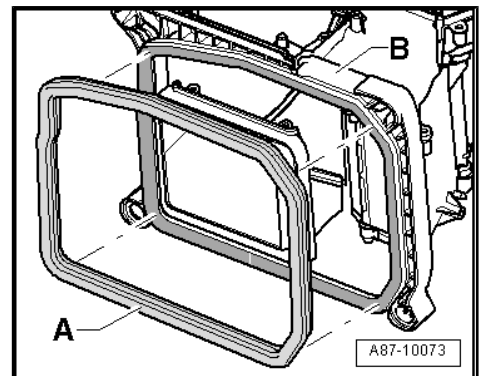
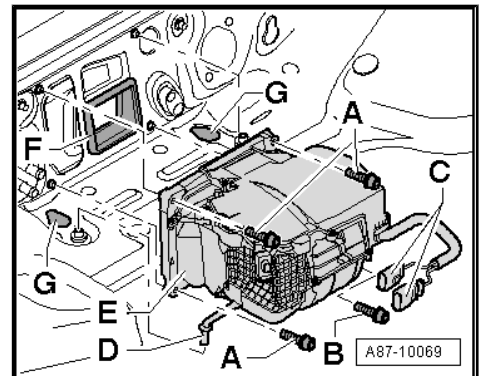
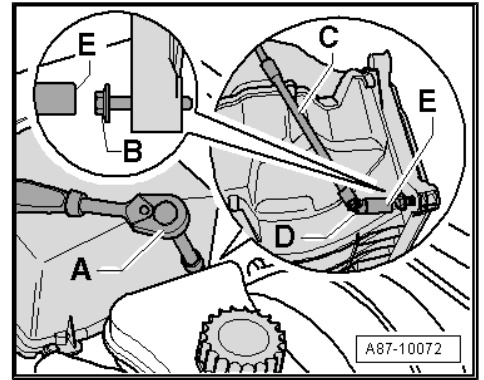
To avoid having to remove brake servo, slacken off and tighten bolt -B- using ratchet -A- from a 1/4 inch socket wrench set with 2 long extensions -C-, universal joint -D- and a socket attachment -E-.

- Remove bolts -A- (tightening torque: 7 Nm).
- Unfasten water drain -D- from opening in plenum chamber or from air intake unit.
- If necessary, unfasten wiring harness (fitted in plenum chamber between plenum chamber front wall and air intake unit) from the various holders.
- Remove air intake unit -E-.

Installing

Install in reverse order of removal; note the following.

- Check seal -A- for damage and proper installation in air intake unit -B-.



- Check the two water drain sockets -G- for damage and contamination and clean if necessary.
- Check grommet -F- for damage and correct installation at air conditioning unit as well as in back wall of plenum chamber.
- Clean plenum chamber.
- Check water drain -D- for damage and contamination and clean if necessary.

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Note

- ◆ Drainage of water out of plenum chamber may be impaired by deposits such as leaves and pine needles accumulating in the water drains. If the vehicle is then driven through a car wash or in the event of heavy rainfall, the water level in the plenum chamber will rise and water ingress via the fresh-air intake -A- into the air intake unit -B-.
- ◆ The water drain hose -C- is intended to discharge the small amounts of water entering the air intake unit via the fresh-air intake in normal operation.
- ◆ The water drains via the water drain hose -C- out of the plenum chamber (via connection -E-) into the transmission tunnel in the area behind the noise and heat insulation mat (a hole is provided specifically for this in the bottom of the plenum chamber).
- ◆ In water drain hose -C-, a plastic element -D- is inserted for reducing cross-section. If plastic element -D- is not fitted, noise may occur depending on fresh air blower -V2- speed.

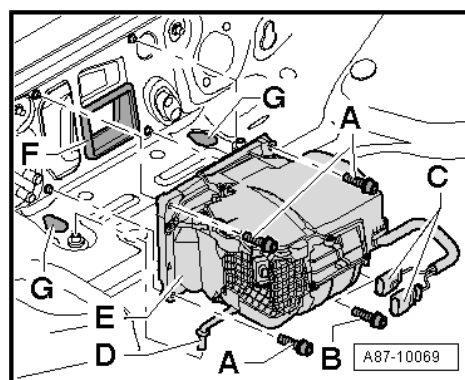
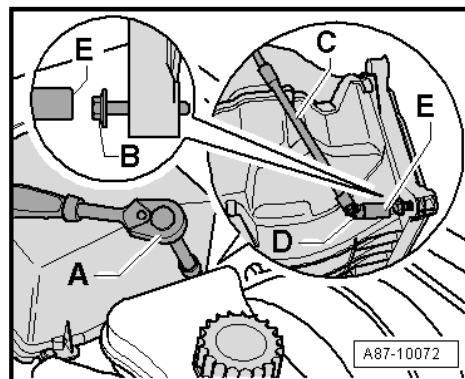
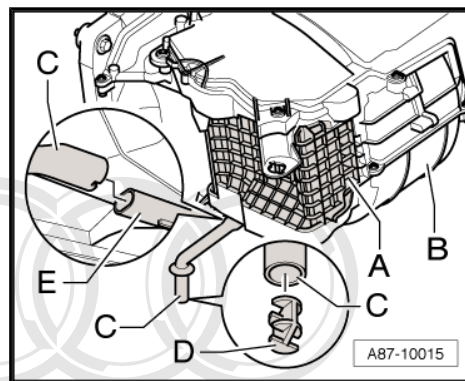
- Insert bolt -B- e.g. with a piece of "butyl cord" in hole of air distributor unit such that it does not fall out on inserting air intake unit.



Note

To avoid having to remove brake servo, slacken off and tighten bolt -B- using ratchet -A- from a 1/4 inch socket wrench set with 2 long extensions -C-, universal joint -D- and a socket attachment -E-.

- Install air intake unit -E- and secure with bolts -A- (tightening torque 7 Nm).
- Tighten bolt -B- (tightening torque 7 Nm).
- Re-install components in reverse order of removal.



- Following installation, check correct positioning of grommet between engine compartment and plenum chamber at coolant hose -C-.
- Filling and bleeding coolant circuit ⇒ Engine, mechanics; Rep. gr. 19
- After bleeding, check the cooling system for leaks ⇒ Engine, mechanics; Rep. gr. 19 .



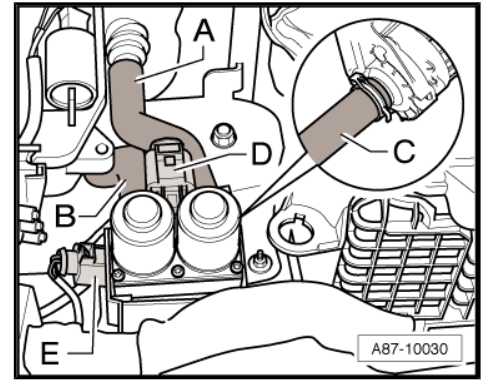
Note

When bleeding the coolant circuit, take particular care to ensure that the heat exchangers are bled completely. If air bubbles remain in heat exchangers, complaints may be received about lack of heat output in winter or differences in temperature of air flowing out of vents with same setting in control mode.

- Interrogate fault 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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- **Perform basic setting and final control diagnosis for air conditioner** ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .

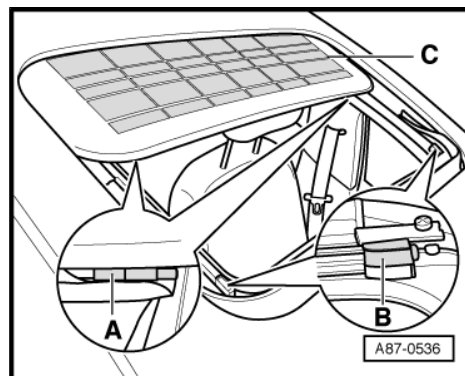


5.18 Operation of solar roof



Note

- ◆ *Solar mode is only possible with sun roof closed or tilted (solar energy converted into electrical energy by solar roof -C- is supplied to vehicle electrical system via contacts -A- (at front edge of sun roof) and -B- (at sun roof frame)).*
- ◆ *Solar mode is not possible with the ignition on and in auxiliary heating/auxiliary ventilation mode (fresh air blower control unit - J126- interrupts connection between solar panel and fresh air blower - V2-) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- ◆ *The measured value block of the operating and display unit, Climatronic control unit - J255- indicates the number of fresh air blower - V2- operating hours in solar mode ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- ◆ *Design of fresh air blower control unit - J126- is such that in solar mode, fresh air blower - V2- is only actuated given generation of sufficient operating energy by solar cells (at present, minimum voltage with fresh air blower - V2- actuated must be greater than 2 V).*
- ◆ *The solar cells on the solar roof must generate a voltage greater than 12.3 V (off-load voltage) for the current generated by the solar cells to be connected through from the fresh air blower control unit - J126- to the fresh air blower - V2- . Once the -J126- detects a voltage greater than 12.3 V, the fresh air blower - V2- is activated until the current generated by the solar cells drops below approx. 2 V (or the ignition, auxiliary ventilation or auxiliary heating is switched on).*
- ◆ *The energy generated by the solar cells - C20- is transferred directly to the fresh air blower - J126- via the fresh air blower control unit - V2- . The fresh air blower - V2- converts the electrical energy generated into blower power.*
- ◆ *On vehicles with no sun roof with solar cells - C20- , all air conditioner control motors come to a halt in their instantaneous position when ignition is switched off. Ventilation of the passenger compartment in solar mode does however require the air flow/fresh-air and recirculated-air flaps to be set to "fresh-air mode". On vehicles with solar roof, the operating and display unit, Climatronic control unit - J255- is therefore informed that solar cells are fitted by way of the encoding. The operating and display unit, Climatronic control unit - J255- then moves the flaps in the air intake unit to the "fresh-air mode" position after switching off ignition.*
- ◆ *The fresh air blower control unit - J126- interrogates the voltage at the input of the solar cells at regular intervals when the ignition is off (no signal detected by operating and display unit, Climatronic control unit - J255-) and converts the voltage generated by the solar cells in such a manner that the fresh air blower runs at the maximum possible speed if sufficient solar energy is being generated.*
- ◆ *If solar operation of the fresh air blower is not required, the function can be deactivated depending on the adaption of the operating and display unit, Climatronic control unit - J255- in the MMI (Multi Media Interface) (different versions) ⇒ Owner's Manual and ⇒ operating instructions for "Infotainment/MMI".*



- ◆ *With sunlight penetration of 500 W/m^2 , the electrical energy supplied by the solar roof is approx. 12 W and is calculated as follows: 500 W/m^2 (sunlight penetration) $\times 0.21 \text{ m}^2$ (solar area of sun roof) $\times 0.13$ (efficiency of solar cells - C20-) $\times 0.9$ (efficiency of fresh air blower control unit - J126-).*



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- ◆ Contacts -A- and -B- (at sun roof and sun roof frame) for transferring the electrical energy generated must be clean and free from normal lubricant.
- ◆ If necessary, contacts -A- and -B- can be coated with a small quantity of contact grease (electrically conductive preservative and lubricant available from electronics dealers).

Checking operation of solar roof

- Move vehicle into the sun.



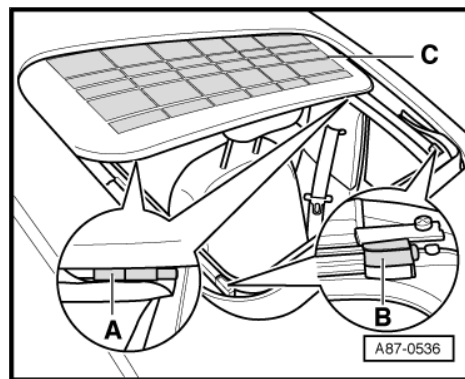
Note

- ◆ *If weather conditions are not suitable, shine two commercially available 1000 W halogen lamps, for example, onto the solar roof, maintaining a distance of at least 500 mm from the roof. To enable the solar cells - C20- to supply sufficient electrical energy to drive the fresh air blower - V2- , it must be ensured that all sun roof solar cells - C20- are evenly and fully illuminated.*
- ◆ *The electrical power generated when shining halogen lamps at the solar roof is only approx. 1.5 W (fresh air blower - V2- rotates but air flow is hardly perceptible).*
- Open “centre” dash panel vents and close all other vents.
- Check the adaption of the operating and display unit, Climatronic control unit - J255- (adaption for the “Sun roof with solar cells” function must have been performed) ⇒ “Guided Fault Finding” function of vehicle diagnostic, testing and information system VAS 5051.
- Check the setting on the MMI (Multi Media Interface). The “solar mode” function must have been set (different versions) ⇒ Owner's Manual and ⇒ operating instructions for “Infotainment/MMI” .
- Close sunroof.
- Switch off ignition (operating and display unit, Climatronic control unit - J255- blank).

A current of air can be felt from the dash panel vents (moisten palm of hand to check if necessary).

If no current of air can be felt:

- Interrogate fault memory of operating and display unit, Climatronic control unit - J255- ⇒ Vehicle diagnostic, testing and information system VAS 5051 (“Guided Fault Finding”) .
- If necessary, check adaption of operating and display unit, Climatronic control unit - J255- . ⇒ Vehicle diagnostic, testing and information system VAS 5051 (“Guided Fault Finding”).



i Note

The current supplied by the sunroof with solar cells - C20- to the fresh air blower - V2- can be read out in the measured value block, depending on the version of the operating and display unit (Climatronic control unit - J255-). Position the vehicle with the sun roof closed in the sun for example (or under two lamps as described above) and then select the corresponding measured value block of the operating and display unit, Climatronic control unit - J255- ⇒ "Guided Fault-Finding" function of vehicle diagnostic, testing and information system VAS 5051 . After switching off the ignition, the display shows the current supplied by the sun roof with solar cells - C20- on switching off the ignition (and for a short time afterwards).

– Switch off ignition.

– Remove plenum chamber cover.

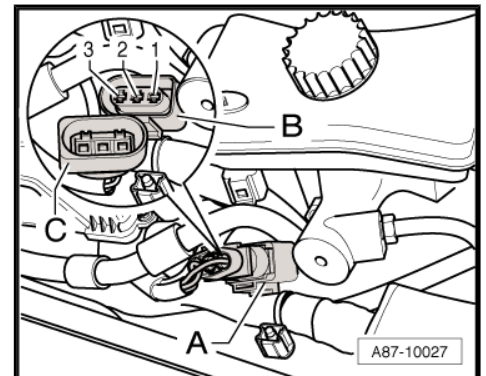
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WARNING

The two valves of the pump valve unit may be hot even if the engine is cold.

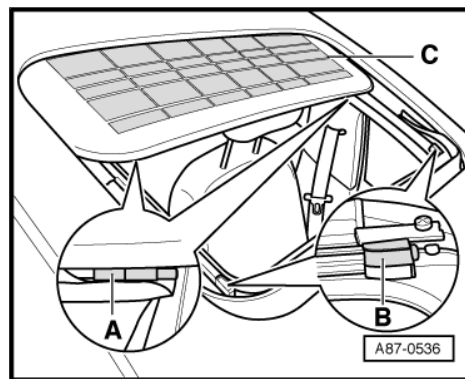
- Open 3-pin connector -A- of vehicle wiring harness to air intake unit (to fresh air blower control unit - J126-).
- Measure voltage at connector -B- between contact -2- (of solar roof) and contact -3- (earth) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ◆ Specification: greater than 12.3 V (depending on intensity of sunlight)
- Connect up test lamp (12 V, max. 5 W) between contacts -2- and -3- at connector -B-.
- Test lamp glows or lights (depending on sunlight intensity).





Note

- ◆ *The solar cells on the solar roof must generate a voltage greater than 12.3 V (off-load voltage) for the current generated by the solar cells to be connected through from the fresh air blower control unit - J126- to the fresh air blower - V2- . Once the -J126- detects a voltage greater than 12.3 V, the fresh air blower - V2- is activated until the current generated by the solar cells drops below approx. 2 V (or the ignition, auxiliary ventilation or auxiliary heating is switched on).*
- ◆ *Solar roof function is OK if test lamp glows or lights. If fresh air blower - V2- does not run, check freedom of movement of fresh air blower - V2- and actuation of fresh air blower control unit - J126- by operating and display unit, Climatronic control unit - J255- . Replace fresh air blower control unit - J126- if no fault is found.*
- ◆ *If test lamp does not glow or light, check wiring to the two contacts -B- at the sun roof opening. Check solar panel if no fault is found. ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ General body repairs, exterior; Rep. gr. 60*
- ◆ *The electrical power generated when shining halogen lamps at the solar roof is only approx. 1.5 W (fresh air blower - V2- rotates but air flow is hardly perceptible).*



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6 Dismantling and assembling air intake unit



Note

- ◆ *With the exception of the housing, all air intake unit components can be removed/installed without taking out the entire unit.*
- ◆ *The air intake unit has various identical connectors which should be marked before unplugging to avoid interchange.*
- ◆ *Different control motors are fitted on the air conditioning unit and in the air intake unit. These motors have different electrical values and part number indices ⇒ Electronic parts catalogue and should therefore be marked prior to removal to avoid interchange.*
- ◆ *There are different versions of the air intake unit housing and the corresponding upper cover (up to 05.04 version "1" and as of 05.04 gradual conversion to version "2", distinguishing features ⇒ [page 63](#)). If the version "1" upper cover or housing has to be replaced on vehicles manufactured up to 05.04, the housing or upper cover of the air extraction unit also has to be replaced (only version "2" components are available as replacements) ⇒ Electronic parts catalogue .*
- ◆ Components fitted in air intake unit ⇒ [page 59](#)
- ◆ Removing and installing air flaps of air intake unit ⇒ [page 61](#)
- ◆ Distinguishing features of air intake unit versions "1" and "2" ⇒ [page 63](#)

6.1 Components fitted in air intake unit



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.

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1 - Gasket

- ☐ Between plenum chamber wall and air intake unit

2 - Housing of air intake unit with air flaps

- ☐ Removing and installing ⇒ [page 49](#)
- Fitted components can for the most part be removed/installed with housing in position
- ☐ Removing and installing air flaps of air intake unit ⇒ [page 61](#)

3 - Plastic element for reducing cross-section in water drain

4 - Air intake unit water drain

- ☐ Designed to drain off water entering into air intake unit via fresh-air intake
- ☐ Plastic element for reducing cross-section is inserted in water drain hose

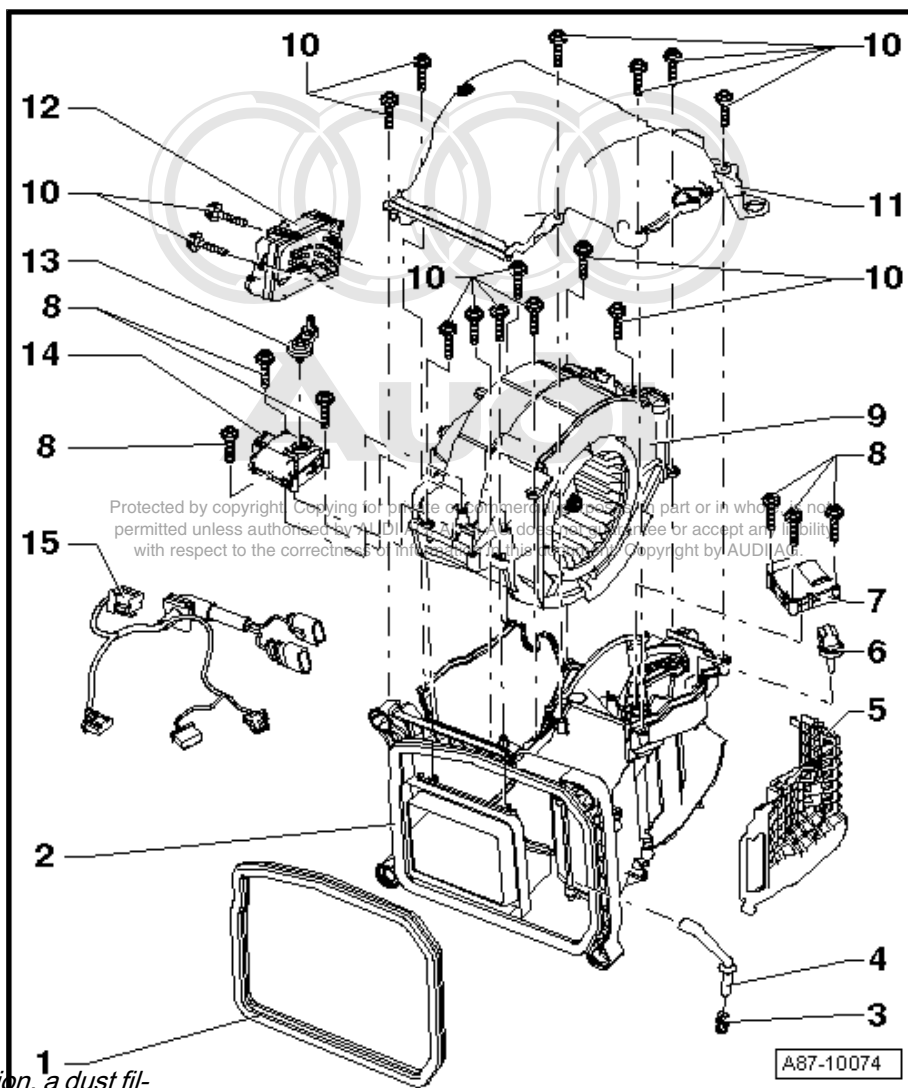
5 - Grille in front of fresh-air intake

- ☐ Removing and installing ⇒ [page 49](#)



Note

Depending on the version, a dust 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*.



6 - Fresh air intake duct temperature sensor - G89-

- ☐ Removing and installing ⇒ [page 40](#)
- ☐ Checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

7 - Air flow flap control motor - V71-

- ☐ With potentiometer for air flow flap control motor - G113-
- ☐ Removing and installing ⇒ [page 37](#)

8 - Bolt

- ☐ Tightening torque 10 Ncm

9 - Fresh air blower - V2-

- ☐ Removing and installing ⇒ [page 42](#)
- ☐ Checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

10 - Bolt

- ☐ Tightening torque 10 Ncm

11 - Upper cover of air intake unit

- ❑ Sealing tongue-and-groove joint between upper cover and housing of air intake unit version "1"
⇒ [page 47](#)

12 - Fresh air blower control unit - J126-

- ❑ Removing and installing ⇒ [page 41](#)
- ❑ Checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

13 - Lever

14 - Air recirculation flap control motor - V113-

- ❑ With potentiometer for air recirculation flap control motor - G143-
- ❑ Removing and installing ⇒ [page 44](#)

15 - Air intake unit wiring harness

- ❑ Version and pin assignment ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Pay attention to correct routing

6.2 Removing and installing air flaps of air intake unit



Note

- ◆ *Removing and installing air flaps of air intake unit with air intake unit in position ⇒ [page 47](#)*
- ◆ *There are different versions of the air intake unit housing and the corresponding upper cover (up to 05.04 version "1" and as of 05.04 gradual conversion to version "2", distinguishing features ⇒ [page 63](#)). If the version "1" upper cover or housing has to be replaced on vehicles manufactured up to 05.04, the housing or upper cover of the air extraction unit also has to be replaced (only version "2" components are available as replacements) ⇒ Electronic parts catalogue .*

1 - Housing

- ❑ Sealing joint between inner cover and housing of air intake unit version "1" ⇒ [page 47](#)

2 - Fresh-air/air flow flap "1"

3 - Fresh-air/air flow flap "2"

4 - Air recirculation flap

5 - Inner cover

- ❑ Sealing joint between inner cover and housing of air intake unit version "1" ⇒ [page 47](#)

6 - Bolt

7 - Lever

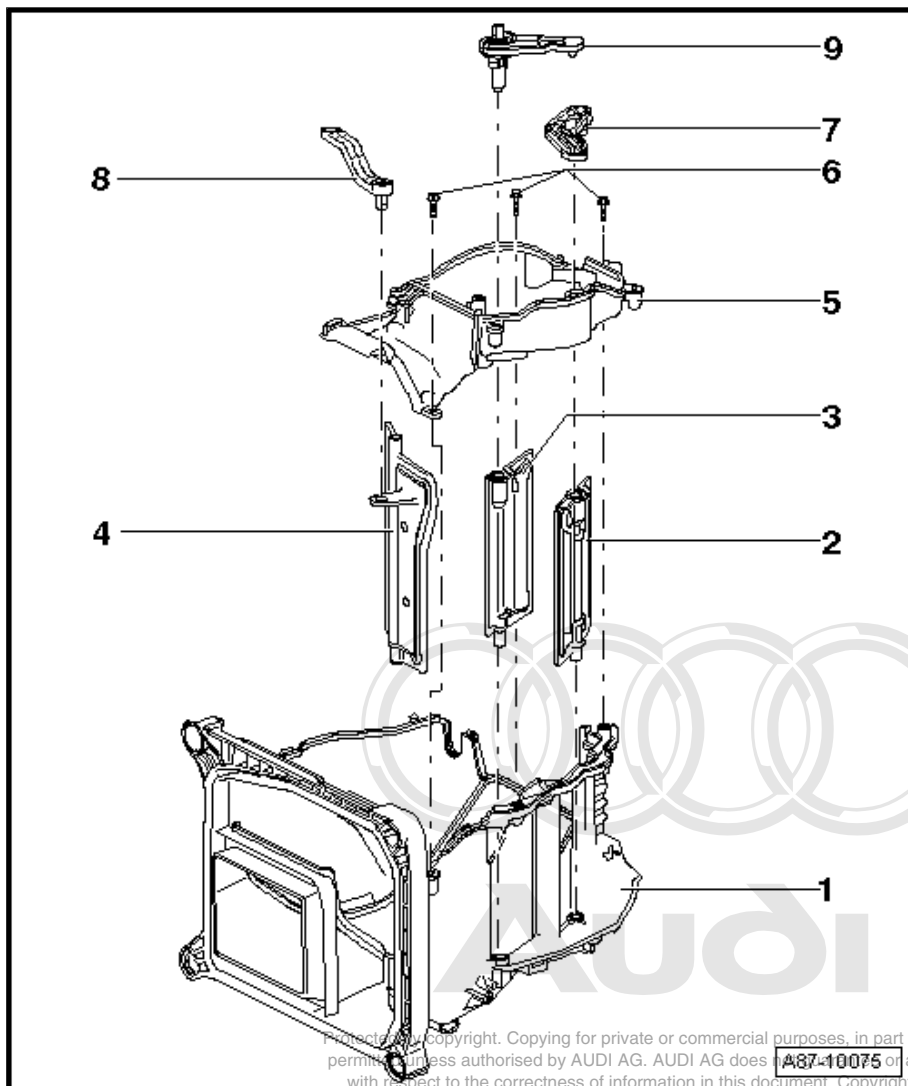
- ❑ Removing and installing ⇒ [page 47](#)

8 - Lever

- ❑ Removing and installing ⇒ [page 47](#)

9 - Lever

- ❑ Removing and installing ⇒ [page 47](#)



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6.3 Distinguishing features of air intake unit versions "1" and "2"



Note

- ◆ *There are different versions of the air intake unit housing and the corresponding upper cover (up to 05.04 version "1" and as of 05.04 gradual conversion to version "2"). If the version "1" upper cover or housing has to be replaced on vehicles manufactured up to 05.04, the housing or upper cover of the air extraction unit also has to be replaced (only version "2" components are available as replacements) ⇒ Electronic parts catalogue .*
- ◆ *The details marked -A- in the following illustration show the version "1" status, whereas the details marked -B- show the version "2" status.*
- ◆ *The modifications for version "2" are designed to prevent the ingress of water into the air intake duct by way of the various joints.*
- ◆ *To stop water penetrating the air intake duct by way of the various joints for version "1" components, a sealing cord is inserted at the factory in the groove of the tongue-and-groove joint between the upper cover and the housing ⇒ [page 47](#) and the joint between the inner cover and the housing is sealed with a piece of butyl sealing cord ⇒ [page 47](#) .*

1 - Upper cover of air intake unit

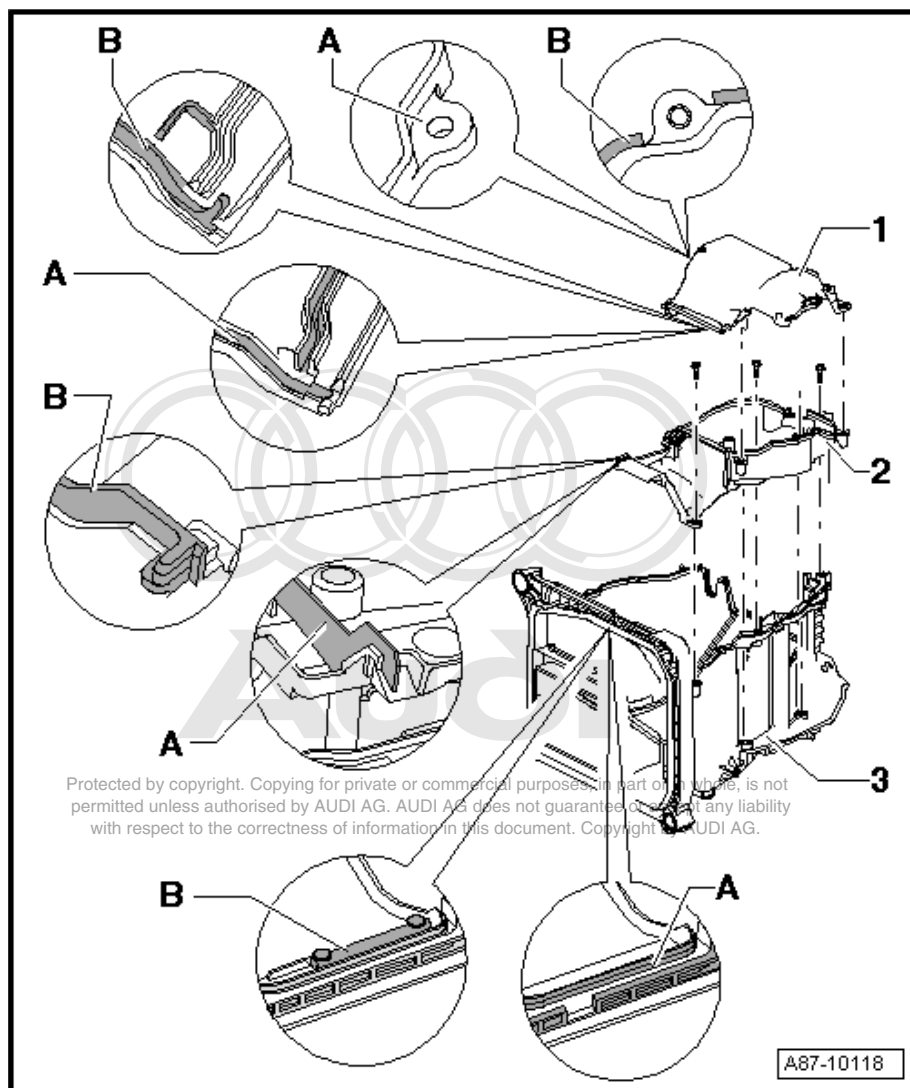
- ❑ Sealing tongue-and-groove joint between upper cover and housing of air intake unit version "1" ⇒ [page 47](#)

2 - Inner cover

- ❑ Sealing joint between inner cover and housing of air intake unit version "1" ⇒ [page 47](#)

3 - Housing

- ❑ Sealing joint between inner cover and housing of air intake unit version "1" ⇒ [page 47](#)



7 Incorporation of air conditioning unit into engine coolant circuit



WARNING

The two valves of the pump valve unit may be hot even if the engine is cold.



Note

- ◆ *With ignition on, valves of pump valve unit (left heat regulation valve - N175- and right heat regulation valve - N176-) are constantly actuated as a function of temperature setting on operating and display unit, Climatronic control unit - J255- . Valves may therefore be warm or even hot despite engine being cold.*
- ◆ *The two valves of the pump valve unit (left heat regulation valve - N175- and right heat regulation valve - N176-) are interchanged on left and right-hand drive vehicles (different connection assignment ⇒ Current flow diagrams, Electrical fault finding and Fitting locations).*
- ◆ *If the coolant circulation pump - V50- is noisy, check for complete bleeding of the cooling system before removing the pump valve unit (the noise may be caused by air in the coolant circuit) ⇒ Engine, mechanics; Rep. gr. 19 .*
- ◆ *In the event of complaints about blubbering noise from the heat exchanger of the air conditioning unit or poor air conditioner heat output under certain ambient conditions (a coolant circulation pump - V50- fault may also have been stored), check the incorporation of the pump valve unit into the coolant circuit. If air bubbles are visible in the upper connection of the coolant expansion tank with the engine running, additionally check for the correct version of the coolant expansion tank ⇒ Engine, mechanics; Rep. gr. 19 and ⇒ Electronic parts catalogue .*
- ◆ *Valves of pump valve unit are open when de-energised. If power supply or valve connection to operating and display unit, Climatronic control unit - J255- is interrupted, air conditioner heat output cannot be regulated (air conditioner provides constant heating) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- ◆ *Incorporation of air conditioning unit in coolant circuit in left-hand drive vehicles ⇒ [page 65](#)*
- ◆ *Incorporation of air conditioning unit in coolant circuit in right-hand drive vehicles ⇒ [page 67](#)*

7.1 Incorporation of air conditioning unit in coolant circuit on left-hand drive vehicles

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1 - Coolant hose

- ☐ Coolant supply from engine to pump valve unit
- ☐ Connection of the coolant hose to the relevant engine ⇒ Engine, mechanics; Rep. gr. 19

2 - Grommet

- ☐ For coolant hose passage from engine compartment to plenum chamber

3 - Right heat regulation valve - N176- (front passenger's side)

- ☐ Part of pump valve unit

4 - Left heat regulation valve - N175- (driver's side)

- ☐ Part of pump valve unit

5 - Coolant circulation pump - V50-

- ☐ Part of pump valve unit

6 - Coolant hose to heat exchanger (front passenger's side)

7 - Coolant hose to heat exchanger (driver's side)

8 - "Supply" coolant pipe to heat exchanger (front passenger's side)

- ☐ The coolant pipe can be replaced with the air conditioning unit fitted

⇒ [page 145](#)

9 - "Supply" coolant pipe to heat exchanger (driver's side)

- ☐ The coolant pipe can only be replaced with the air conditioning unit removed ⇒ [page 145](#)

10 - Heater (air conditioning unit) heat exchanger

- ☐ Heat exchanger splits up in centre (driver's and front passenger's side)
- ☐ Removing and installing ⇒ [page 145](#)

11 - "Return" coolant pipe from heat exchanger

- ☐ The coolant pipe can be replaced with the air conditioning unit fitted ⇒ [page 145](#)

12 - T-piece with bleeder valve

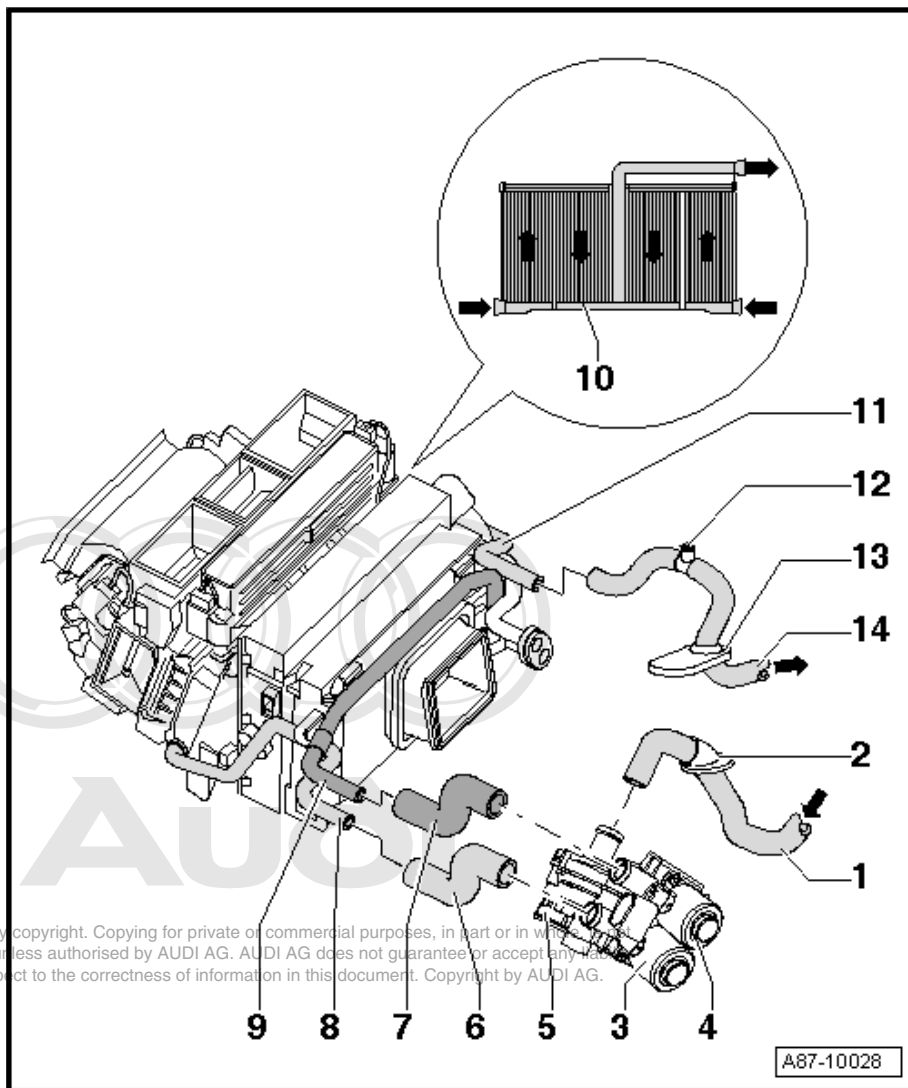
- ☐ As of 07.2005, T-pieces with restrictor are gradually being introduced (the constriction eliminates the noise caused by pressure pulsation which can occur under certain operating conditions on switching of the pump valve unit valves).
- ☐ On vehicles with an auxiliary heater with control unit - J364- up to software version "059", the restrictor in the T-piece may, under certain usage conditions, cause premature switching of the auxiliary heater to part load mode or the control interval. In the event of problems, remove the constriction in the T-piece or, if applicable, fit a T-piece with no restrictor.

13 - Grommet

- ☐ For coolant hose passage from plenum chamber to engine compartment

14 - Coolant hose

- ☐ Coolant return from air conditioning unit heat exchanger to engine



- ☐ Connection of the coolant hose to the relevant engine ⇒ Engine, mechanics; Rep. gr. 19

7.2 Incorporation of air conditioning unit in coolant circuit in right-hand drive vehicles

1 - Coolant hose

- ☐ Coolant supply from engine to pump valve unit
- ☐ Connection of the coolant hose to the relevant engine ⇒ Engine, mechanics; Rep. gr. 19

2 - Grommet

- ☐ For coolant hose passage from engine compartment to plenum chamber

3 - Coolant circulation pump - V50-

- ☐ Part of pump valve unit

4 - Right heat regulation valve - N176- (driver's side)

- ☐ Part of pump valve unit

5 - Left heat regulation valve - N175- (front passenger's side)

- ☐ Part of pump valve unit

6 - Coolant hose to heat exchanger (driver's side)

7 - Coolant hose to heat exchanger (front passenger's side)

8 - "Supply" coolant pipe to heat exchanger (driver's side)

- ☐ The coolant pipe can only be replaced with the air conditioning unit remove ⇒ [page 145](#)

9 - "Supply" coolant pipe to heat exchanger (front passenger's side)

- ☐ The coolant pipe can be replaced with the air conditioning unit fitted ⇒ [page 145](#)

10 - Heater (air conditioning unit) heat exchanger

- ☐ Heat exchanger splits up in centre (driver's and front passenger's side)
- ☐ Removing and installing ⇒ [page 145](#)

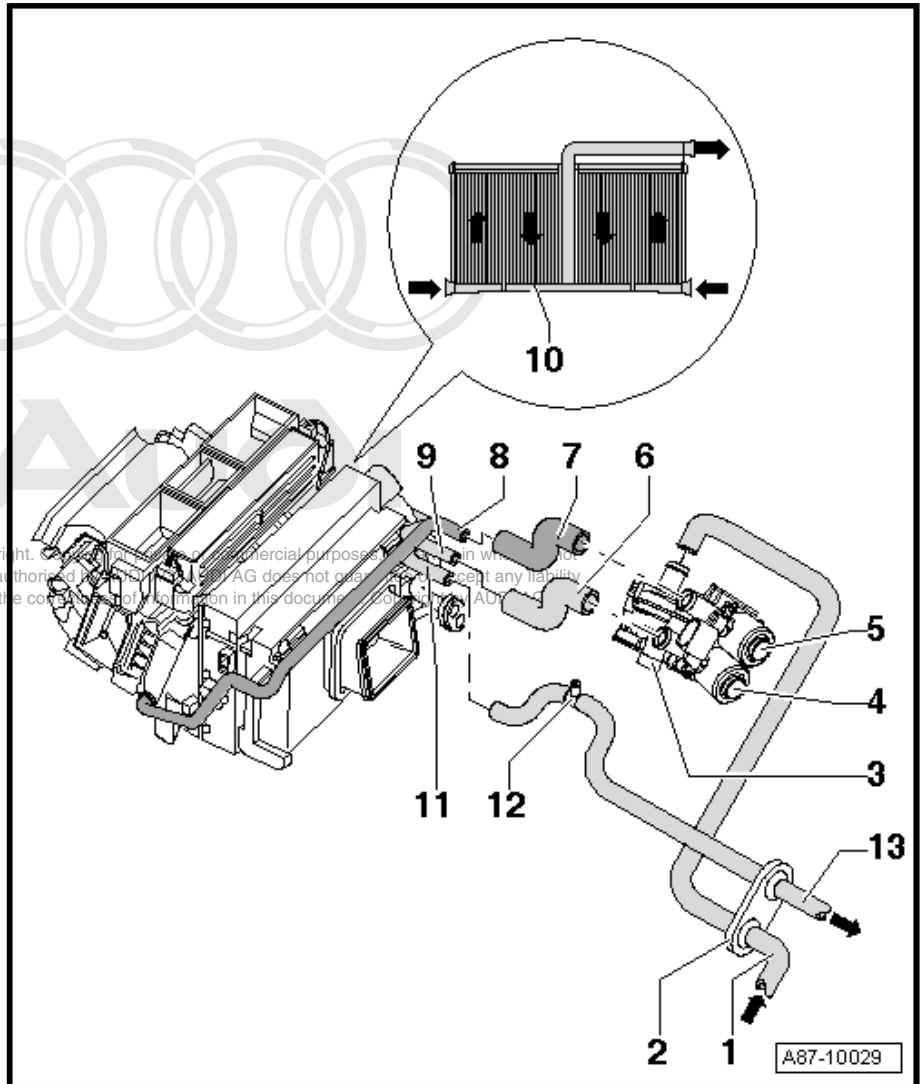
11 - "Return" coolant pipe from heat exchanger

- ☐ The coolant pipe can be replaced with the air conditioning unit fitted ⇒ [page 145](#)

12 - Bleeder valve

13 - Coolant hose

- ☐ Coolant return from air conditioning unit heat exchanger to engine
- ☐ Connection of the coolant hose to the relevant engine ⇒ Engine, mechanics; Rep. gr. 19



7.3 Removing and installing pump valve unit



WARNING

The two valves of the pump valve unit may be hot even if the engine is cold.



Note

- ◆ *With ignition on, valves of pump valve unit (left heat regulation valve - N175- and right heat regulation valve - N176-) are constantly actuated as a function of temperature setting on operating and display unit, Climatronic control unit - J255- . Valves may therefore be warm or even hot despite engine being cold.*
- ◆ *If coolant circulation pump - V50- is noisy, check for complete bleeding of cooling system before removing pump valve unit (noise may be caused by air in coolant circuit) ⇒ Engine, mechanics; Rep. gr. 19 .*
- ◆ *Valves of pump valve unit are open when de-energised. If power supply or valve connection to operating and display unit, Climatronic control unit - J255- is interrupted, air conditioner heat output cannot be regulated (air conditioner provides constant heating) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- ◆ *The two valves of the pump valve unit (left heat regulation valve - N175- and right heat regulation valve - N176-) are interchanged on left and right-hand drive vehicles (different connection assignment ⇒ Current flow diagrams, Electrical fault finding and Fitting locations).*
- ◆ *In the event of complaints about blubbering noise from the heat exchanger of the air conditioning unit or poor air conditioner heat output under certain ambient conditions (a coolant circulation pump - V50- fault may also have been stored), check the incorporation of the pump valve unit into the coolant circuit. If air bubbles are visible in the upper connection of the coolant expansion tank with the engine running, additionally check for the correct version of the coolant expansion tank ⇒ Engine, mechanics; Rep. gr. 19 and ⇒ Electronic parts catalogue .*
- ◆ *In the event of a problem with "poor heat output", check the following before removing pump valve unit:*
 - Connection of pump valve unit and air conditioning unit heat exchanger return to engine coolant circuit (proper assignment of supply and return connection to engine); interchanging the two connections would cause engine coolant pump to work in opposition to coolant circulation pump - V50-
 - Possible interchange of wiring to coolant circulation pump - V50- ("+" and "-"); interchanging the connections would cause pump to run in wrong direction (and work in opposition to engine coolant pump) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
 - Check the bleeding of the coolant circuit and bleed again if necessary ⇒ Engine, mechanics; Rep. gr. 19 .
 - Heat output of air conditioner ⇒ [page 169](#)

Tools required for removal/installation of pump valve unit

Special tools and workshop equipment required

- ◆ Hose clamps up to Ø 25 mm - 3094- or hose clamps up to Ø 40 mm - 3093-
- ◆ Hand pump - V.A.G 1274- (and appropriate adapters)

Removing

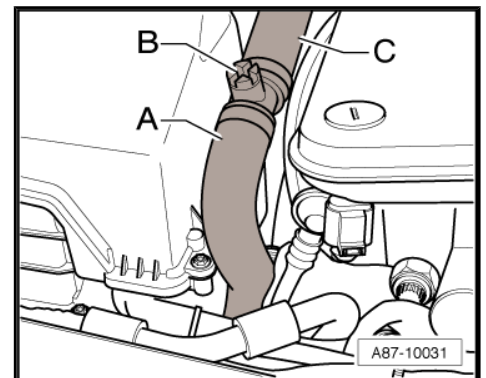
- Switch off ignition.
- Remove plenum chamber cover.



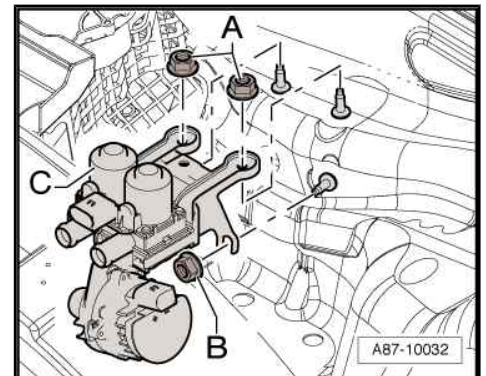
WARNING

The two valves of the pump valve unit may be hot even if the engine is cold.

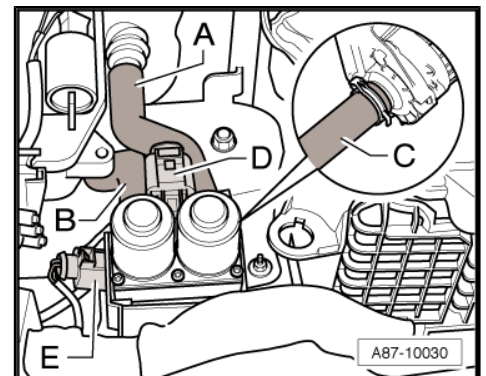
- Remove dome brace if necessary (not fitted on all vehicles) ⇒ Rep. gr. 40 ; Running gear .
- Release pressure in coolant circuit by opening cap on coolant expansion tank ⇒ Engine, mechanics; Rep. gr. 19 .
- Pinch off coolant hose -A- (return from air conditioning unit heat exchanger to engine).e.g. with hose clamps up to Ø 25 mm - 3094- .



- Remove nuts -A- and -B- (tightening torque 4 Nm).



- Mark arrangement of coolant hoses -A- (supply to left heat exchanger) and -B- (supply to right heat exchanger).
- Unplug connector -D- to left heat regulation valve - N175- and right heat regulation valve - N176- .
- Unplug connector -E- to coolant circulation pump - V50- .
- Pinch off coolant hose -C- (supply from engine to coolant circulation pump - V50-), e.g. with hose clamps up to Ø 25 mm - 3094- .
- Detach coolant hoses -A-, -B- and -C- from connections of pump valve unit.



- Remove pump valve unit -C-.



Note

Detaching and attaching holder of pump valve unit ⇒ [page 70](#)

Installing



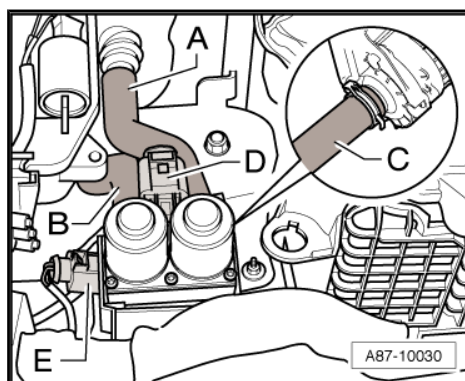
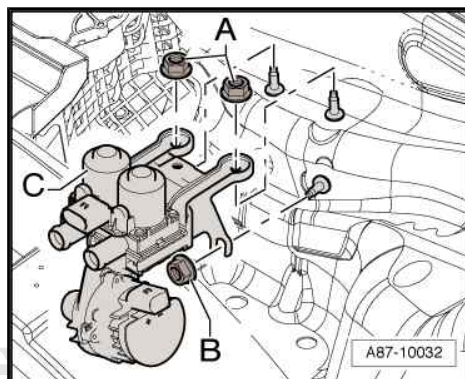
Note

- ♦ Coolant circulation pump - V50- for circulating pump valve unit coolant must not be started up until coolant circuit has been bled (dry running would destroy coolant circulation pump - V50-).
- ♦ For bleeding coolant circuit, the two valves of the pump valve unit (left heat regulation valve - N175- and right heat regulation valve - N176-) must be open (this is the case when not actuated).
- ♦ Switching on ignition with pump valve unit connectors unplugged causes the faults coolant circulation pump - V50- , left heat regulation valve - N175- and right heat regulation valve - N176- to be detected by operating and display unit, Climatronic control unit - J255- and stored.
- ♦ Detaching and attaching holder of pump valve unit ⇒ [page 70](#)

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Install in reverse order of removal; note the following.

- Re-install components removed in reverse order (with the exception of plenum chamber cover).
- Following installation, check correct positioning of grommet between engine compartment and plenum chamber at coolant hose -C-.
- Check pump valve unit; it must not make contact with other components (noise).
- Bleed coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 .
- Plug in connectors -D- to left heat regulation valve - N175- and right heat regulation valve - N176- and -E- to coolant circulation pump - V50- after bleeding coolant circuit.
- Remove residual coolant from plenum chamber.
- Install the remaining removed components in reverse sequence.
- Interrogate fault 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”) .



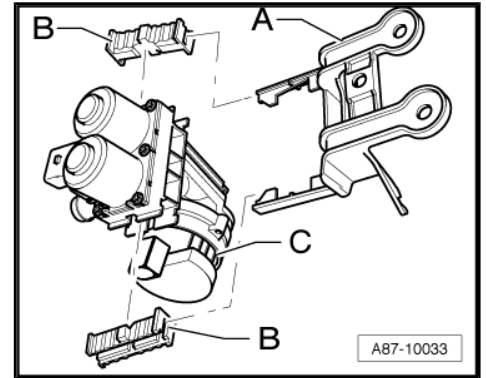
7.3.1 Detaching and attaching holder of pump valve unit

- Remove pump valve unit ⇒ [page 68](#) .



Note

- ◆ *Left and right-hand drive vehicles have a different holder -A-.*
- ◆ *Rubber elements -B- are fitted between pump valve unit -C- and holder -A- to prevent operating noise of pump valve unit -C- being transmitted to body.*



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8 Heated windscreen



Note

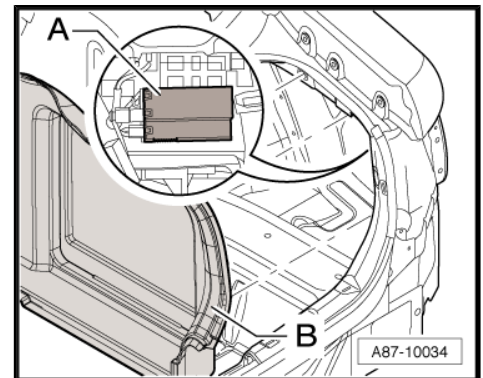
Introduction of "heated windscreen" (optional extra) not yet finalised

- ◆ Operation of heated windscreen ⇒ [page 73](#)

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8.1 Operation of heated windscreen

- ◆ Heated windscreen control unit - J505- -A- is installed in luggage compartment on right behind lining -B-.
- ◆ If fitted, the heated windscreen control unit - J505- -A- is actuated by the operating and display unit, Climatronic control unit - J255- by way of the air conditioner data bus system "Lin bus" (reading measured value block) ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.
- After starting cold engine if ambient temperature is less than + 5° C and operating and display unit, Climatronic control unit - J255- is set to "Auto" mode; temperature setting on operating and display unit, Climatronic control unit - J255- must be such that air conditioner is in heating mode and temperature measured by senders (left vent temperature sender - G150- , right vent temperature sender - G151- , centre vent temperature sender - G191-) must not be in excess of + 35° C; The heating period is governed by ambient temperature (max. 6 minutes at -40°).
- On selecting "Defrost" mode on the operating and display unit, Climatronic control unit - J255- if the ambient temperature is less than + 5° C. Depending on the ambient temperature, the heating period is between 2 and 6 minutes. lamp in Defrost button flashes as long as heated windscreen is switched on; Activation only takes place when the engine is running.
- ◆ Heated windscreen control unit - J505- -A- switches on heated windscreen - Z2- if the following conditions are fulfilled:
 - Operating and display unit, Climatronic control unit - J255- actuating heated windscreen control unit - J505-
 - Voltage at heated windscreen control unit - J505- greater than 12.70 V
 - Heated windscreen control unit - J505- not overheated
- ◆ The heated windscreen control unit - J505- is actuated by the operating and display unit, Climatronic control unit - J255- by way of the air conditioner data bus system "Lin bus". If a condition exists in the heated windscreen control unit - J505- which does not permit activation of the heated windscreen, the operating and display unit, Climatronic control unit - J255- is informed by way of this data line that the heated windscreen is not to be activated ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.
- ◆ Resistance of metal foil in heated windscreen - Z2- is approx. 1.9 ohms. A voltage greater than the voltage of the electrical system is required to achieve the maximum possible heating output of approx. 1000 W (watts) at the windscreen. Heated windscreen control unit - J505- converts electrical system voltage for heated windscreen - Z2- into a variable voltage of between 25 and 48 V depending on electrical system voltage. If the latter is 13.1 V at heated windscreen control unit - J505- , control unit supplies 41 V to heated windscreen - Z2- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
- ◆ To prevent electrical system overload, heated windscreen control unit - J505- regulates heat output for heated windscreen - Z2- . With an electrical system voltage of 12.70 V this is approx. 200 W and is infinitely regulated to 1000 W at 13.10 V. Heated windscreen control unit - J505- permits an increase in power output of max. 200 W per second to guard against voltage dips in the electrical system on switching on heated windscreen.





- ◆ To prevent actuation of heated windscreen - Z2- in the event of short circuit or open circuit in wiring, heated windscreen control unit - J505- interrogates resistance of heated windscreen - Z2- . If the resistance measured is less than approx. 1.5 ohms (short circuit) or greater than approx. 2.5 ohms (open circuit or contact resistance), the heated windscreen control unit - J505- does not switch on the windscreen heating or switches it off ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.



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9 Control components of air conditioner (in passenger compartment)

Note

- ◆ If there is a fault in the air conditioner, start by reading out the fault memory of the operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- ◆ If no fault is displayed, read out the measured value block of the operating and display unit (Climatronic control unit - J255-) and activate any potentially faulty component via the "Final control diagnosis" function ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- ◆ Servicing refrigerant circuit ⇒ [page 6](#)
- ◆ For information on air conditioner servicing work which can be performed without opening the refrigerant circuit, refer to ⇒ [page 6](#) .
- ◆ For air conditioner servicing work which requires the refrigerant circuit to be opened, refer to ⇒ [page 172](#) .
- ◆ The electrical checking of the various control motors, potentiometers and senders is described in ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .
- ◆ There are different versions of the operating and display unit (Climatronic control unit - J255-). Attention must therefore be paid to the exact assignment on replacement. ⇒ Electronic parts catalogue
- ◆ Perform air conditioner self-diagnosis via "Guided Fault Finding" function of vehicle diagnostic, testing and information system - VAS 5051 A- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- ◆ Currently the operating and display units (Climatronic control unit - J255-) cannot be exchanged in the familiar manner (component protection active) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- ◆ If the operating and display unit (Climatronic control unit - J255-) is to be replaced, interrogate coding of -J255- and adaption of -J255- before removing it via "Replace control unit" function in Guided Fault Finding routine for this operating and display unit ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .

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Perform the following work after completing the repairs:

- 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") .
- Check coding of operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- If applicable, check adaption of 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") .

- ◆ Air conditioner components located in passenger compartment (viewed from left side) ⇒ [page 76](#)
- ◆ Air conditioner components located in passenger compartment (viewed from right side) ⇒ [page 80](#)
- ◆ Components of air conditioning unit ⇒ [page 83](#)

9.1 Air conditioner components located in passenger compartment (viewed from left side)



Note

Fig. shows left side of passenger compartment for vehicle with left-hand drive.

1 - Accelerator mechanism

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

2 - diagnostic socket

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

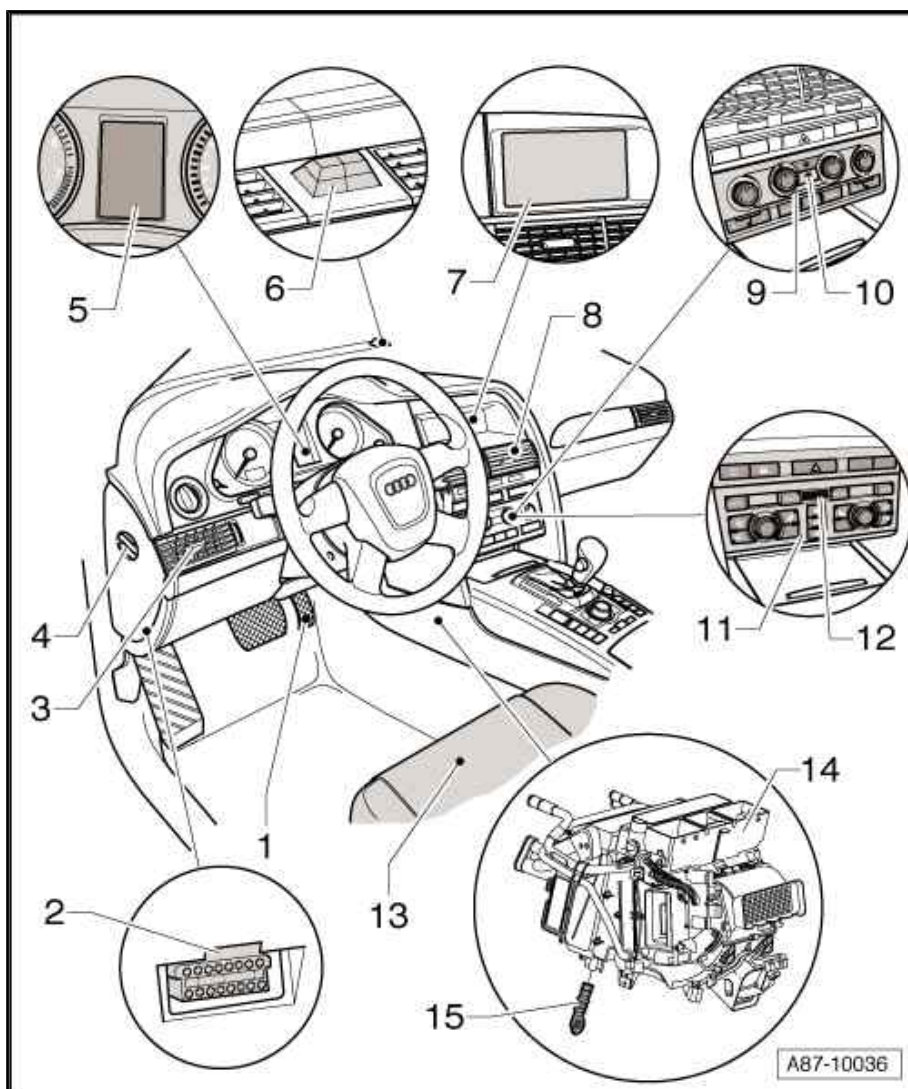
3 - Dash panel vent (left-side)

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

4 - Vent to front left door (driver door)

5 - Driver information system (DIS) in dash panel insert

- ❑ With ambient temperature indicator - G106-
- ❑ The ambient temperature output by the operating and display unit, Climatronic control unit - J255- is displayed in the measured value block ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .



- ❑ If the temperature display is faulty, check the measured values of the temperature sensors ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
- ❑ Measured value of ambient temperature sensor - G17- is evaluated by control unit in dash panel insert - J285- and transmitted via convenience data bus system to operating and display unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

6 - Sunlight penetration photosensor - G107-

- ❑ Removing and installing ⇒ [page 96](#)
- ❑ The sunlight penetration measured by the sunlight penetration photosensor - G107- and calculated by the operating and display unit, Climatronic control unit - J255- is indicated in the measured value block ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").

7 - Multi Media Interface (MMI) display

- ❑ Different versions and operation depending on the type of MMI ("Infotainment" or "Basic") and vehicle equipment ⇒ operating instructions for "Infotainment/MMI"
- ❑ The MMI display indicates the functions selected on the operating and display unit, Climatronic control unit - J255- (and various additional air conditioner functions) (different versions) ⇒ Owner's Manual and ⇒ operating instructions for "Infotainment/MMI"
- ❑ The Setup button on the operating and display unit (Climatronic control unit - J255-) or the rotary pushbutton on the MMI control console can be used to call up and change the settings of various additional functions of the air conditioner (various versions) ⇒ Owner's Manual and ⇒ "Infotainment/MMI" Operating Manual .
- ❑ On vehicles with "Convenience" air conditioner as of Model year 2007 and depending on the encoding and adaption of the front operating and display unit, Climatronic control unit - J255- , the corresponding setting may not always appear on the Multi Media Interface (MMI) display on turning the rotary temperature controls (with USA encoding, the display only appears for example if the rotary temperature control has been pressed beforehand)
- ❑ As of Model Year 2009, modified operating and display units, Climatronic control unit - J255- are being gradually introduced ⇒ [Item 11 \(page 78\)](#) and ⇒ Electronic parts catalogue . On vehicles with such operating and display units, the screen display for example of the "MMI" (Multi Media Interface) is no longer switched to "Air conditioning" on pressing the buttons and actuating the controls of the operating and display unit. The selected air conditioner functions are incorporated into the current display (different versions) ⇒ Owner's Manual and ⇒ "Infotainment/MMI" Operating Manual .



Note

- ◆ *On vehicles with an operating and display unit (Climatronic control unit - J255- , "Convenience" version) without a Setup button, the additional functions are selected and activated using rotary pushbutton on the MMI operating unit (different versions) ⇒ Owner's Manual and ⇒ "Infotainment/MMI" Operating Manual .*
- ◆ *Pay attention to correct assignment of the operating and display unit (Climatronic control unit - J255- , "Convenience" version) to the control unit for front display and information control panel - J523- / control unit 1 for information electronics - J794- (different versions) ⇒ Electronic parts catalogue . If the assignment is incorrect, the various functions of the air conditioner cannot be displayed and selected on the MMI.*

8 - Dash panel vent (centre)

- ❑ With centre left vent sensor - G347- and centre right vent sensor - G348-

- The two sensors enable the operating and display unit, Climatronic control unit - J255- to detect position of flap in corresponding vent (open or closed)
- ❑ Removing and installing dash panel vent ⇒ General body repairs, interior; Rep. gr. 70
- ❑ On vehicles with an operating and display unit, Climatronic control unit - J255- of the "Basic" type, the temperature of the air emerging cannot be altered by way of the Multi Media Interface (MMI) ⇒ Owner's Manual
- ❑ On vehicles with an operating and display unit, Climatronic control unit - J255- of the "Convenience" type, the temperature of the air emerging can be altered by way of the Multi Media Interface (MMI) (different versions) ⇒ Owner's Manual and ⇒ operating instructions for "Infotainment/MMI".

9 - Operating and display unit (Climatronic control unit - J255-), "basic" version

- ❑ Different versions (for vehicles without/with seat heating, with left or right-hand drive, temperature scales in °C or °F); for assignment, refer to ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ [page 96](#)
- ❑ Perform self-diagnosis of operating and display unit, Climatronic control unit - J255- as described in Guided Fault Finding⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
- ❑ Buttons and display zones are illuminated by LEDs, which cannot be replaced

10 - Infrared temperature and sunlight penetration sensor

- ❑ Sensor determines temperature and sunlight penetration on operating and display unit, Climatronic control unit - J255-
- ❑ Sensor is part of operating and display unit, Climatronic control unit - J255- of "Basic" type and cannot be replaced separately
- ❑ Check measured value ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

11 - Operating and display unit (Climatronic control unit - J255-), "Convenience" version

- ❑ Different versions (for vehicles without/with seat heating, with left or right-hand drive, with [A/C](#), [Econ ON/OFF](#) button or just with [ON/OFF](#) button; for assignment, refer to ⇒ Electronic parts catalogue



Note

Depending on the operating and display unit, Climatronic control unit - J255- , the target temperature for actuating the seat heating differs in the "Convenience" air conditioner version. In a -J255- with part number 4F1 820 043 up to index "AI" (for vehicles with left-hand drive) or 4F2 820 043 up to index "S" (for vehicles with right-hand drive), the target temperature for stage 6 was 60 °C, for example. In a -J255- with part number 4F1 820 043 from index "AK" (for vehicles with left-hand drive) or 4F2 820 043 from index "T" or "AA" (for vehicles with right-hand drive), the target temperature for stage 6 is set to 39 °C, for example ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").

- ❑ Removing and installing ⇒ [page 96](#)
- ❑ The temperature sensor - G56- is integrated into the operating and display unit (Climatronic control unit - J255-) and cannot be renewed separately.
- ❑ "Humidity sender" is installed in area of temperature sensor - G56- in operating and display unit, Climatronic control unit - J255- and cannot be replaced separately.
- ❑ Temperature sensor blower - V42- is installed in operating and display unit, Climatronic control unit - J255- , but can be replaced separately ⇒ [page 96](#) .
- ❑ Also heed additional notes on operating and display unit ⇒ [page 96](#)

- ❑ Perform self-diagnosis of operating and display unit, Climatronic control unit - J255- as described in Guided Fault Finding⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
- ❑ Buttons and display zones are illuminated by LEDs, which cannot be replaced
- ❑ As of Model Year 2009, operating and display units, Climatronic control unit - J255- of "Convenience" type with part no. 4F1 820 043 as of index "AK" (for left-hand drive vehicles) or 4F2 820 043 as of index "T" (for right-hand drive vehicles) are being gradually introduced ⇒ Electronic parts catalogue . On vehicles with such operating and display units, the screen display for example of the "MMI" (Multi Media Interface) is no longer switched to "Air conditioning" on pressing the buttons and actuating the controls of the operating and display unit. The air conditioning functions selected are incorporated into the current display. In addition, operating and display units of this type feature an A/C button instead of the Setup button and an ON/OFF button instead of the ECON ON /OFF button ⇒ Owner's Manual .⇒



Note

- ◆ *On vehicles with an operating and display unit, Climatronic control unit - J255- of "Convenience" type with no Setup button, the additional air conditioner functions are selected by way of the rotary knob/pushbutton of the MMI operating unit (different versions) ⇒ Owner's Manual and ⇒ operating instructions for "Infotainment/MMI" .*
- ◆ *Pay attention to correct assignment of the operating and display unit, Climatronic control unit - J255- of "Convenience" type to the front information control unit - J523- / information electronics control unit 1 - J794- (operating and display units, -J255- of "Convenience" type with Setup button are fitted on vehicles with a front information control unit - J523- ; operating and display units, -J255- of "Convenience" type with no Setup button are fitted on vehicles with an information electronics control unit 1 - J794-) ⇒ Electronic parts catalogue and ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051. In the event of incorrect assignment, the various air conditioner functions cannot be indicated in the MMI display and thus selected.*

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12 - Temperature sensor blower - V42- and temperature sensor - G56-

- ❑ Installed in operating and display unit, Climatronic control unit - J255- , checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
- ❑ Removing and installing temperature sensor blower - V42- ⇒ [page 96](#) .
- ❑ Temperature sensor - G56- cannot be renewed separately.

13 - Front left seat temperature sender - G344- and heated seat cushion for front left seat - Z45-

- ❑ Not all vehicles feature seat heating (and seat ventilation); optional extra (introduction of seat ventilation not yet finalised)
- ❑ Seat heating actuation is indicated in measured value block of operating and display unit, Climatronic control unit - J255- , checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")

**Note**

*Depending on the operating and display unit, Climatronic control unit - J255-, the target temperature for actuating the seat heating differs in the "Convenience" air conditioner version. In a -J255- with part number 4F1 820 043 up to index "AI" (for vehicles with left-hand drive) or 4F2 820 043 up to index "S" (for vehicles with right-hand drive), the target temperature for stage 6 was 60 °C, for example. In a -J255- with part number 4F1 820 043 from index "AK" (for vehicles with left-hand drive) or 4F2 820 043 from index "T" or "AA" (for vehicles with right-hand drive), the target temperature for stage 6 is set to 39 °C, for example
⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").*

- ☐ Servicing seat heating and seat ventilation ⇒ General body repairs, interior; Rep. gr. 74

14 - Air conditioning unit (viewed from left)

- ☐ Different versions (for operating and display unit, Climatronic control unit - J255- of "Basic" or "Convenience" type, left or right-hand drive vehicles, vehicles without/with supplementary heater element - Z35-)
⇒ Electronic parts catalogue
- ☐ Components of air conditioning unit ⇒ [page 83](#)
- ☐ Routing of air flow in air conditioning unit and vehicle ⇒ [page 153](#)
- ☐ Removing and installing air conditioning unit ⇒ [page 236](#)

15 - Condensation drain hose

- ☐ Left (driver's side)
- ☐ Checking, removing and installing ⇒ [page 105](#)
- ☐ 1 condensation drain hose each for driver's and front passenger's side

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9.2 Air conditioner components located in passenger compartment (viewed from right side)

**Note**

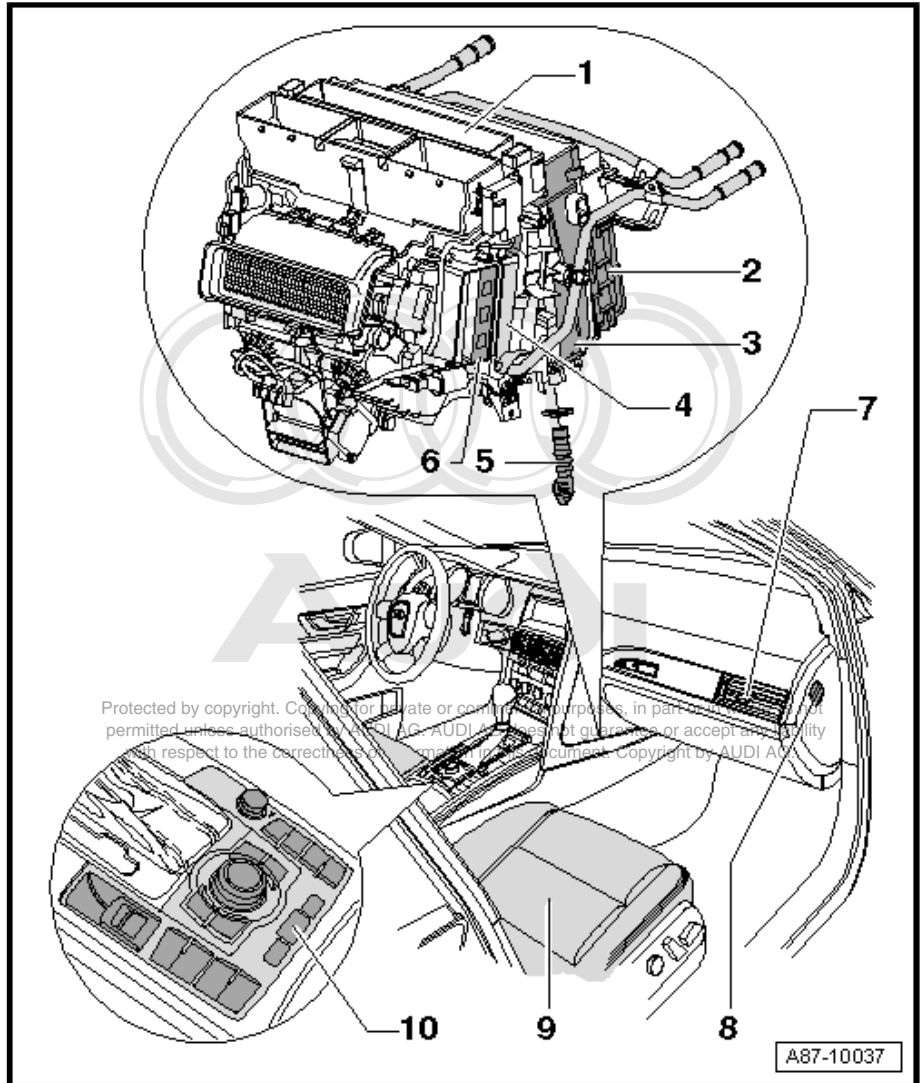
Fig. shows right side of passenger compartment for vehicle with left-hand drive.

1 - Air conditioning unit (viewed from right)

- ❑ Different versions (for operating and display unit, Climatronic control unit - J255- of "Basic" or "Convenience" type, left or right-hand drive vehicles, vehicles without/ with supplementary heater element - Z35-)
⇒ Electronic parts catalogue
- ❑ Components of air conditioning unit
⇒ [page 83](#)
- ❑ Routing of air flow in air conditioning unit and vehicle ⇒ [page 153](#)
- ❑ Removing and installing air conditioning unit
⇒ [page 236](#)

2 - Dust and pollen filter (with or without ACF element)

- ❑ Observe replacement intervals ⇒ Maintenance tables
- ❑ Different versions depending on vehicle equipment and production period ⇒ Electronic parts catalogue
- No ACF element on vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type



- With ACF element on vehicles with operating and display unit, Climatronic control unit - J255- of "Convenience" type; These vehicles are also fitted with an air quality sensor - G238- .
- ❑ In Model Year 2008, a modified dust and pollen filter with ACF insert is gradually being introduced on vehicles with a "Convenience" 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 .
- ❑ Removing and installing ⇒ [page 88](#)



Note

*Depending on the version, a dust filter designed to stop the fresh air blower drawing in dust and sand may be fitted at the air intake unit instead of the intake grille for certain countries with a high dust level in the ambient air (e.g. for China). If applicable, this is to be replaced together with the dust and pollen filter
⇒ [page 49](#) and ⇒ Electronic parts catalogue .*

3 - Evaporator

- ☐ Can only be removed after refrigerant circuit has been discharged; take vehicle to a workshop equipped with the necessary tools where work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a
- ☐ Removing and installing ⇒ [page 225](#)
- ☐ Cleaning air conditioner evaporator with ultrasound A/C cleaner - VAS 6189- ⇒ [page 92](#)

4 - Heat exchanger for heater

- ☐ Removing and installing ⇒ [page 145](#)

5 - Supplementary air heater element - Z35-

- ☐ Only fitted on diesel models.
 - Certain models only with diesel engine and auxiliary heater
- ☐ Removing and installing ⇒ [page 142](#)

6 - Condensation drain hose

- ☐ Right (front passenger's side)
- ☐ Checking, removing and installing ⇒ [page 105](#)
- ☐ 1 condensation drain hose each for driver's and front passenger's side

7 - Dash panel vent (right-side)

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

8 - Vent to front left door (driver door)

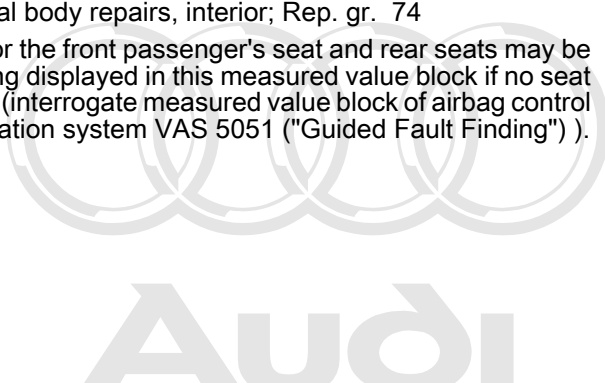
9 - Front right seat temperature sender - G345- and heated seat cushion for front right seat - Z46-

- ☐ Not all vehicles feature seat heating (and seat ventilation); optional extra (introduction of seat ventilation not yet finalised)
- ☐ Seat heating actuation is indicated in measured value block of operating and display unit, Climatronic control unit - J255- , checking ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")
- ☐ Servicing seat heating and seat ventilation ⇒ General body repairs, interior; Rep. gr. 74
- ☐ On vehicles with seat occupied sensor, the heating for the front passenger's seat and rear seats may be deactivated after approx. 10 minutes without this being displayed in this measured value block if no seat occupied is detected by the airbag control unit - J234- (interrogate measured value block of airbag control unit - J234- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding")).



Note

Depending on the operating and display unit, Climatronic control unit - J255- , the target temperature for actuating the seat heating differs in the "Convenience" air conditioner version. In a -J255- with part number 4F1 820 043 up to index "AI" (for vehicles with left-hand drive) or 4F2 820 043 up to index "S" (for vehicles with right-hand drive), the target temperature for stage 6 was 60 °C, for example. In a -J255- with part number 4F1 820 043 from index "AK" (for vehicles with left-hand drive) or 4F2 820 043 from index "T" or "AA" (for vehicles with right-hand drive), the target temperature for stage 6 is set to 39 °C, for example ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").


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10 - Multi Media Interface (MMI) control console

- ❑ Different versions and operation depending on the type of MMI ("Infotainment" or "Basic") and vehicle equipment ⇒ Owner's Manual and ⇒ operating instructions for "Infotainment/MMI"
- ❑ The **[Setup]** button on the operating and display unit, Climatronic control unit - J255- or on MMI terminal can open various additional air conditioner functions and change its settings (various versions) ⇒ Owner's Manual and ⇒ operating instructions for "Infotainment/MMI"
- ❑ The MMI display shows the functions selected on the operating and display unit (Climatronic control unit - J255-) (and several additional functions of the air conditioner) ⇒ Owner's Manual and ⇒ operating instructions for "Infotainment/MMI" .
- ❑ The air conditioner functions selected can only be indicated on the MMI display if the correct versions of the operating and display unit, Climatronic control unit - J255- and the MMI control unit have been fitted ⇒ [Item 11 \(page 78\)](#) .

9.3 Components of air conditioning unit



Note

- ◆ *Different versions depending on vehicle model and equipment (vehicle with operating and display unit, Climatronic control unit - J255- of "Basic" or "Convenience" type, left or right-hand drive, without/with supplementary heater element - Z35-) ⇒ Electronic parts catalogue*
- ◆ *Routing of air flow in air conditioning unit and vehicle*
⇒ [page 153](#)
- ◆ *Removing and installing air conditioning unit* ⇒ [page 236](#)
- ◆ *The air conditioning unit wiring harness has various identical connectors which should be marked before unplugging to avoid interchange.*
- ◆ *Different control motors are fitted on the air conditioning unit and in the air intake unit. These motors have different electrical values and part number indices ⇒ Electronic parts catalogue and should therefore be marked prior to removal to avoid interchange.*



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1 - Front right chest vent control motor - V238- ("Convenience" version) or front left chest vent control motor - V237- ("Basic" version)



Note

The designation of this component in the Guided Fault Finding and the current flow diagram depends on the version of the operating and display unit, control unit - J255- ("Convenience" or "Basic" version).

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- ☐ Front right chest vent control motor - V238- has an integrated front right chest vent potentiometer - G388-.
- ☐ Front left chest vent control motor - V237- has an integrated front left chest vent potentiometer - G387-.
- ☐
- On vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type, flaps for front left and right chest vents are actuated by front left chest vent control motor - V237- (the two flaps are interconnected by a shaft).

- ☐ Removing and installing ⇒ [page 135](#).

2 - Defroster flap control motor - V107-

- ☐ With potentiometer for defroster flap control motor - G135-
- ☐ Removing and installing ⇒ [page 118](#)

3 - Right vent temperature sender - G151-

- ☐ Removing and installing ⇒ [page 139](#)

4 - Coolant pipe

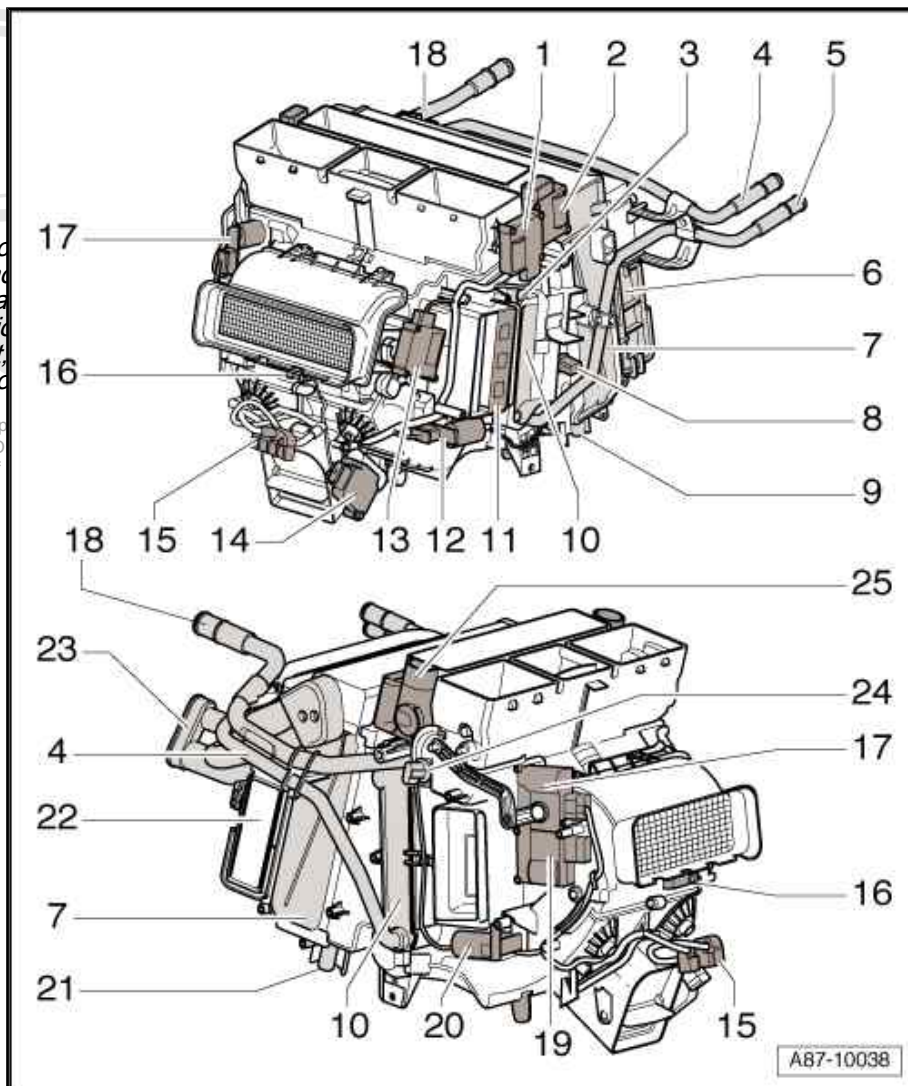
- ☐ Supply from pump valve unit to left side of heat exchanger
- ☐ Different versions for left-hand drive and right-hand drive vehicles ⇒ Electronic parts catalogue
- ☐ There are different versions of the heat exchanger and the corresponding coolant pipes. In Model Year 2006, the seal between the connections at the heat exchanger and the coolant pipes was gradually switched from an axial/radial seal to a radial seal. Pay attention to correct assignment ⇒ [page 145](#).

5 - Coolant pipe

- ☐ Supply from pump valve unit to right side of heat exchanger
- ☐ Different versions for left-hand drive and right-hand drive vehicles ⇒ Electronic parts catalogue
- ☐ There are different versions of the heat exchanger and the corresponding coolant pipes. In Model Year 2006, the seal between the connections at the heat exchanger and the coolant pipes was gradually switched from an axial/radial seal to a radial seal. Pay attention to correct assignment ⇒ [page 145](#).

6 - Dust and pollen filter (with or without ACF element)

- ☐ Observe replacement intervals ⇒ Maintenance tables



- ❑ Different versions depending on vehicle equipment and production period ⇒ Electronic parts catalogue
- No ACF (activated charcoal filter) element on vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type
- With ACF filter element on vehicles with operating and display unit, Climatronic control unit - J255- of "Convenience" type; These vehicles are also fitted with an air quality sensor - G238- .
- ❑ In Model Year 2008, a modified dust and pollen filter with ACF insert is gradually being introduced on vehicles with a "Convenience" 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 .
- ❑ Removing and installing ⇒ [page 88](#)



Note

Depending on the version, a dust filter designed to stop the fresh air blower drawing in dust and sand may be fitted at the air intake unit instead of the intake grille for certain countries with a high dust level in the ambient air (e.g. for China). If applicable, this is to be replaced together with the dust and pollen filter ⇒ [page 49](#) and ⇒ Electronic parts catalogue .

7 - Evaporator

- ❑ Can only be removed after refrigerant circuit has been discharged; take vehicle to a workshop equipped with the necessary tools where work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a
- ❑ Removing and installing ⇒ [page 225](#)
- ❑ Cleaning air conditioner evaporator with ultrasound A/C cleaner - VAS 6189- ⇒ [page 92](#)

8 - Evaporator output temperature sender - G263-

- ❑ Removing and installing ⇒ [page 141](#)

9 - Connection for condensation drain (right-side)

- ❑ Checking, removing and installing condensation drain hose ⇒ [page 105](#)
- ❑ 1 condensation drain hose each for driver's and front passenger's side

10 - Heater (air conditioning unit) heat exchanger

- ❑ Removing and installing ⇒ [page 145](#)
- ❑ There are different versions of the heat exchanger and the corresponding coolant pipes. In Model Year 2006, the seal between the connections at the heat exchanger and the coolant pipes was gradually switched from an axial/radial seal to a radial seal. Pay attention to correct assignment ⇒ [page 145](#) .

11 - Supplementary air heater element - Z35-

- ❑ Only fitted on diesel models.
- Certain models only with diesel engine and auxiliary heater
- ❑ Removing and installing ⇒ [page 142](#)
- ❑ Checking function ⇒ [page 112](#) .

12 - Right footwell flap control motor - V109- ("Convenience" version) or left footwell flap control motor - V108- ("Basic" version)**Note**

The designation of this control motor in the Guided Fault Finding routine and the current flow diagram varies depending on the version of the operating and display unit, Climatronic control unit - J255- ("Convenience" or "Basic" version).

- ☐ Right footwell flap control motor - V109- has an integrated potentiometer for right footwell flap control motor - G140- .
- ☐ Left footwell flap control motor - V108- has an integrated potentiometer for left footwell flap control motor - G139- .
- On vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type, flaps for left and right footwell vents are actuated by left footwell flap control motor - V108- (control motor is installed on right, the two flaps are linked by a connecting rod).
- ☐ Removing and installing ⇒ [page 123](#)
- ☐ Right footwell flap control motor - V109- is only fitted on vehicles with operating and display unit, Climatronic control unit - J255- of "Convenience" type.
- On vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type, both flaps are actuated by left footwell flap control motor - V108- .

13 - Front cold air flap control motor - V197-

- ☐ With front cold air flap control motor potentiometer - G315-
- ☐ Removing and installing ⇒ [page 127](#)

14 - Rear footwell vent control motor - V112-

- ☐ With rear footwell vent control motor potentiometer - G141-
- ☐ Removing and installing ⇒ [page 125](#)

15 - Connector to operating and display unit, Climatronic control unit - J255-**16 - Centre vent temperature sender - G191-**

- ☐ Removing and installing ⇒ [page 140](#)
- ☐ The centre vent temperature sender - G191- is being gradually discontinued as of Model Year 2006. Attention is therefore to be paid to correct assignment of the operating and display unit, Climatronic control unit - J255- (different versions) ⇒ Electronic parts catalogue .

17 - Indirect ventilation flap control motor - V213-

- ☐ With indirect ventilation flap control motor potentiometer - G330-
- Indirect ventilation flap control motor - V213- is only fitted on vehicles with operating and display unit, Climatronic control unit - J255- of "Convenience" type. This control motor is not fitted on vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type (opening in air conditioning unit is sealed off and flap not fitted).
- ☐ Removing and installing ⇒ [page 130](#)

18 - Coolant pipe

- ☐ Return from heat exchanger to engine
- ☐ There are different versions of the heat exchanger and the corresponding coolant pipes. In Model Year 2006, the seal between the connections at the heat exchanger and the coolant pipes was gradually switched from an axial/radial seal to a radial seal. Pay attention to correct assignment ⇒ [page 145](#) .

19 - Centre vent control motor - V102-

- ☐ With central vent control motor potentiometer - G138-
- ☐ Removing and installing ⇒ [page 116](#)

20 - Left footwell flap control motor - V108-

- ☐ With left footwell flap control motor potentiometer - G139-



Note

No control motor is fitted at this location on vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type. On such vehicles, left footwell flap control motor - V108- is attached to right of air conditioning unit (the two flaps are linked by a connecting rod).

- ☐ Left footwell flap control motor - V108- is fitted on left on vehicles with operating and display unit, Climatronic control unit - J255- of "Convenience" type and on right of air conditioning unit on vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type.
- On vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type, both footwell flaps are actuated by left footwell flap control motor - V108- (attached to right of air conditioning unit)
- ☐ Removing and installing with "Convenience" version ⇒ [page 120](#)
- ☐ Removing and installing with "Basic version" ⇒ [page 123](#)

21 - Connection for condensation drain (left-side)

- ☐ Checking, removing and installing condensation drain hose ⇒ [page 105](#)
- ☐ 1 condensation drain hose each for driver's and front passenger's side

22 - Sealing cap

- ☐ For opening to dust and pollen filter on right-hand drive vehicles (dust and pollen filter is removed to left on such vehicles)
- ☐ Removing and installing dust and pollen filter ⇒ [page 88](#)

23 - Refrigerant pipes to evaporator

- ☐ Detaching refrigerant pipes from evaporator/attaching, removing and installing evaporator ⇒ [page 225](#)
- ☐ Detaching refrigerant line to air conditioning unit/attaching ⇒ [page 223](#)

24 - Left vent temperature sender - G150-

- ☐ Removing and installing ⇒ [page 138](#) .

25 - Front left chest vent control motor - V237-

- ☐ With front left chest vent potentiometer - G387-



Note

No control motor is fitted at this location on vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type. On such vehicles, front left chest vent control motor - V237- is attached to right of air conditioning unit (the two flaps are inter-connected by a shaft).

- ☐ Front left chest vent control motor - V237- is fitted on left on vehicles with operating and display unit, Climatronic control unit - J255- of "Convenience" type and on right of air conditioning unit on vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type.
- On vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type, the two flaps for the front left and right chest vents are actuated by the front left chest vent control motor - V237- (attached to right of air conditioning unit).
- ☐ Removing and installing with "Convenience" version ⇒ [page 132](#)
- ☐ Removing and installing with "Basic version" ⇒ [page 135](#)

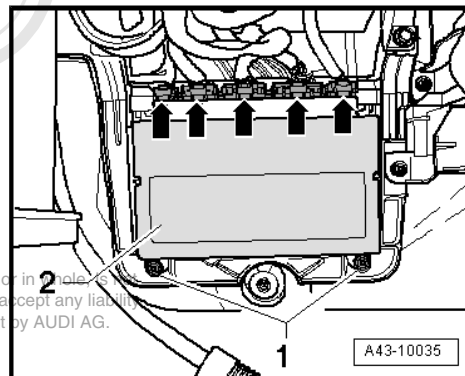
9.4 Removing and installing dust and pollen filter



Note

- ◆ Replacement interval for dust and pollen filter ⇒ Maintenance tables
- ◆ The dust and pollen filter consists of 2 identical filter elements. When installing, ensure correct installation position (flow direction of filter is marked by arrows.)
- ◆ If necessary, clean the plenum chamber after renewing the dust and pollen filter; pay particular attention to the area beneath the air intake unit.
- ◆ Before installing a new filter clean opening in air conditioner in which dust and pollen filter will be inserted.
- ◆ Depending on the version, a dust filter designed to stop the fresh air blower drawing in dust and sand may be fitted at the air intake unit instead of the intake grille for certain countries with a high dust level in the ambient air (e.g. for China). If applicable, this is to be replaced together with the dust and pollen filter ⇒ [page 49](#) and ⇒ Electronic parts catalogue .
- ◆ There are different dust and pollen filter versions. The two filters (with and without ACF element) have a different air resistance value. Attention is therefore to be paid to the correct version. The control characteristic for actuation of the fresh air blower - V2- is adapted accordingly in the operating and display unit, Climatronic control unit - J255- (of "Basic" and "Convenience" type).
- ◆ In Model Year 2008, a modified dust and pollen filter with ACF insert is gradually being introduced on vehicles with a "Convenience" 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 filter with no activated charcoal element is fitted on vehicles with an operating and display unit, Climatronic control unit - J255- of "Basic" type ⇒ Electronic parts catalogue . These vehicles are not equipped with an air quality sensor - G238- .
- The filter with activated charcoal element (ACF element as integrated odour filter) is fitted on vehicles with an operating and display unit, Climatronic control unit - J255- of "Convenience" type ⇒ Electronic parts catalogue . These vehicles are equipped with an air quality sensor - G238- .

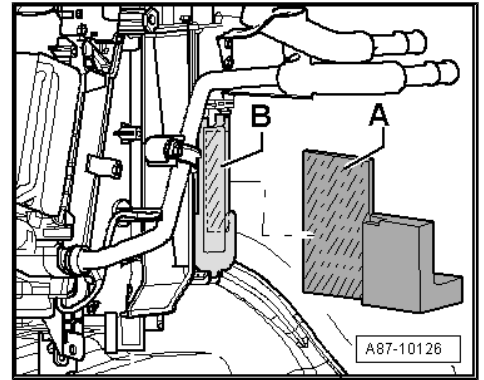
Removing



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 Note

- ◆ Depending on the vehicle equipment, in certain versions (e.g. in the Audi RS6 or in vehicles with pneumatic suspension) or with certain optional extras (e.g. police vehicles or taxis with "satellite tracking") it may additionally be necessary to remove certain control units that are installed in this area (e.g. the electronically controlled damping control unit - J250- -2- in the Audi RS6, the adaptive suspension control unit - J197- in vehicles with pneumatic suspension ⇒ front and all-wheel drive running gear; Rep. gr. 43 or the special vehicle control unit - J608- in vehicles with "satellite tracking". Depending on the type and version of these control units, you may even need to remove the glove compartment in order to remove and install these control units and then the dust and pollen filter.
- ◆ It may be necessary to remove the driving instructor's pedals on driving school vehicles (depending on version, the driving instructor's pedals may be provided with service disconnection points) ⇒ Heed fitting instructions for driving school equipment.
- ◆ Depending on vehicle equipment, certain models may be fitted in the area of cover -B- with (bonded-on) foam insulation -A-, which is to be removed if necessary.
- ◆ On right-hand drive vehicles, the dust and pollen filter must be taken out of the air conditioner towards the left side (not towards the right as on left-hand drive vehicles). The remaining procedure is essentially the same.

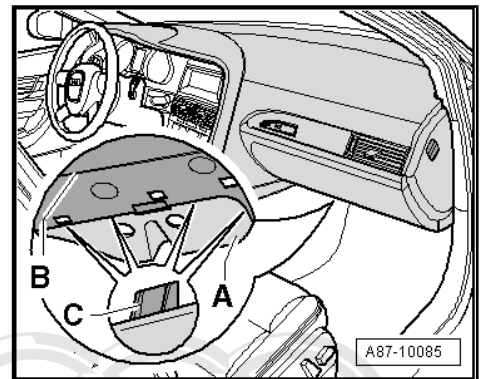


- Remove cover -A- from bottom cover of glove compartment-B-.

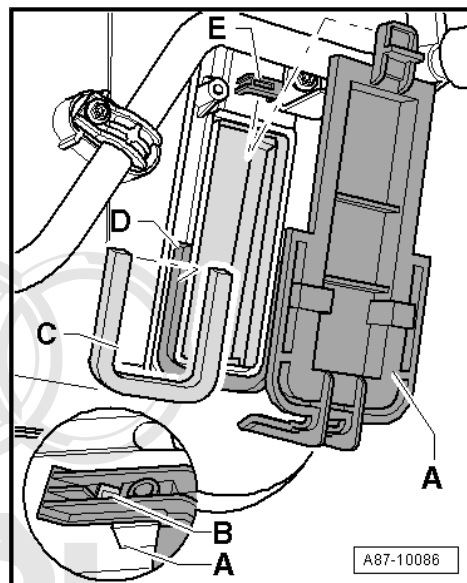
 Note

Cover -A- is secured to bottom cover of glove compartment -B- with 4 fasteners. It may be difficult to release these fasteners, so please take care not to damage bottom cover of glove compartment -B- during removal.

- Cover floor covering in front passenger footwell with paper under opening in air conditioner for fitting dust and pollen filter.



- In vehicles in which additionally installed control units hamper removal and installation of cover -A- and dust and pollen filter, remove these control units.
- Release fastener -B- and remove cover -A- for dust and pollen filter from air conditioning unit.



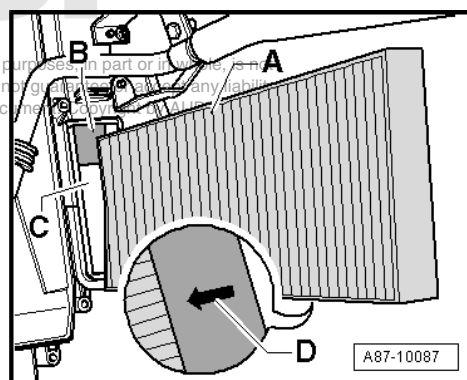
- Remove first part of dust and pollen filter -A- from air conditioning unit.



Note

Two identical filter elements are installed one above the other in the air conditioning unit.

- Reach into the slot of the air conditioning unit -C- and pull the second section of the dust and pollen filter -B- downwards (at the tab) and then out of the air conditioning unit slot.



Installing

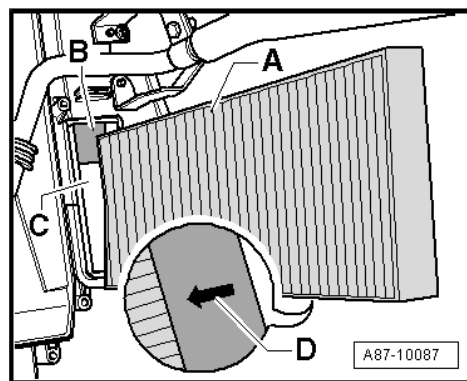
- Remove leaves, dust and other contamination from mounting slot for dust and pollen filter of air conditioning unit -C- using commercially available vacuum cleaner, suction nozzle -VAS 6288- (and corresponding hose).



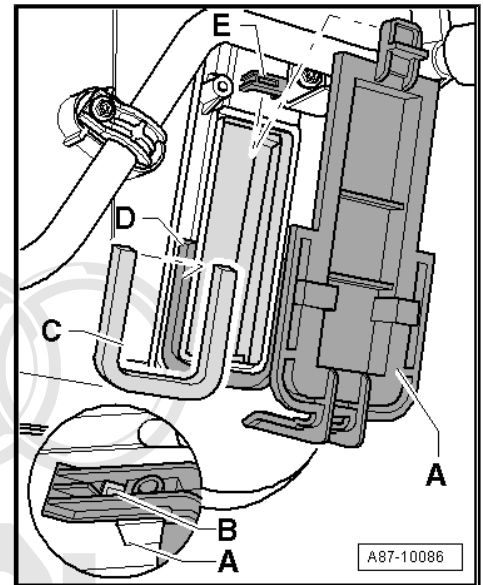
Note

The nozzle -VAS 6288- has a brush attached to remove any dust or dirt which is stuck to the air conditioning unit.

- Insert first part -B- of dust and pollen filter into opening in air conditioning unit -C- and push it into the top installation position. Make sure the flow direction is correct (arrows on filter -D- point towards evaporator).
- If necessary, use a steel rule for example to hold the section of the dust and pollen filter installed first -B- in the upper installation position.
- Slide second part of dust and pollen filter -A- into opening in air conditioning unit (under the first part -B-). Make sure the flow direction is correct (arrows on filter -D- point towards evaporator).



- Check position of seal -C- in groove -D-.
- Install cover -A-, ensuring it is correctly fitted in mounting bracket -E- and fastener -B-.
- Install the remaining removed components in reverse sequence.



9.5 Dust and pollen filter with activated charcoal filter insert

- ◆ Dust and pollen filter with **additional activated charcoal filter element** is fitted in vehicles with operating and display unit, Climatronic control unit - J255- of "Convenience" type. These vehicles are additionally equipped with an air quality sensor - G238- ⇒ [page 28](#) .
- ◆ The filter with ACF layer continues to function as a dust and pollen filter, but it is also designed to filter out gaseous pollutants such as ozone, benzene and nitrogen dioxide from the air through-flow.
- ◆ The purpose of the activated charcoal is to absorb the gaseous pollutants in the air flow until the air flow/fresh-air flaps are closed and the air conditioner is operating in recirculated-air mode. Switching from fresh-air to recirculated-air mode is implemented by operating and display unit, Climatronic control unit - J255- of "Convenience" type as soon as air quality sensor - G238- detects gaseous pollutants in the ambient atmosphere ("automatic air recirculation" function must have been selected).
- ◆ In Model Year 2008, a modified dust and pollen filter with ACF insert is gradually being introduced on vehicles with a "Convenience" 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 activated charcoal layer in the dust and pollen filter acts differently on the various pollutants in the air:
 - Certain pollutants are firmly bound in the activated charcoal layer.
 - Other pollutants are converted into harmless compounds, as in a catalytic converter.
 - For the rest of the pollutants the activated charcoal functions like a capacitor. When pollution increases, the activated charcoal initially absorbs pollutants until a certain level of saturation has been reached. If the pollutant level drops, the activated charcoal layer continuously emits the absorbed particles again.

- ◆ As the activated charcoal layer permanently binds some of the particles in the air, we recommend renewing the dust and pollen filter earlier than specified under the following operating conditions:
 - If the vehicle is driven in areas with a high level of air pollution.
 - Vehicle operation with “Automatic air recirculation” function mainly disabled
- ◆ In vehicles fitted with an air quality sensor - G238- , the air conditioner should preferably always be operated with the function “Automatic air recirculation” enabled. However, if it is necessary or desirable to disable this function, attention must be paid to 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 activated 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, it is important to observe the following:
 - If the vehicle is driven in an area with relatively clean ambient air, i.e. with a low level of gaseous pollutants in the air, the air conditioner will automatically switch from fresh air ventilation mode to air recirculation mode at a different time than in an area with a generally high level of pollution, e.g. in an industrial area.
 - The air conditioner automatically switches from fresh air ventilation mode to 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 running on diesel.

9.6 Cleaning air conditioner evaporator



Note

- ◆ *Air conditioner odours may have different causes. Only some of these odours occur in the evaporator of the air conditioning unit and can therefore be eliminated by cleaning the evaporator with the ultrasonic A/C cleaner - VAS 6189A- for example.*
- ◆ *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 the ultrasound A/C cleaner - VAS 6189A- . Other methods checked and approved by Audi and the corresponding information can be found e.g. in the “Audi ServiceNet” (⇒ table).*
- ◆ *The following procedures are examples of how to access the “Audi ServiceNet”. For precise details of how to find the instructions on “Air conditioner cleaning”, follow the directions given in the “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

- ◆ Possible cause of build-up of odours ⇒ [page 93](#)
- ◆ Cleaning evaporator ⇒ [page 94](#)

9.6.1 Possible cause of build-up of odours

- ◆ Smell of burnt oil
 - Generally occurs in the engine compartment due to leakage at the engine or gearbox
- ◆ Sulphur-like smell of exhaust gas
 - Caused by leakage at the exhaust system
 - Caused by exhaust gas entering the passenger compartment (e.g. when reversing through cloud of exhaust fumes)
- ◆ Fishy smell of coolant
 - Caused by leaks in engine cooling system or air conditioner heat exchangers



Note

If the fishy odour occurs in both fresh air and air recirculation mode, check the heat exchangers of the air conditioning unit for leaks.

- ◆ Scorched clutch smell
- ◆ Odour given off by floor coverings, retrofitted loose seat covers, etc.
- ◆ Mouldy smell from plenum chamber
 - Caused by accumulation and deposits of foreign matter such as leaves, pine needles etc.
 - Caused by water not able to drain out of plenum chamber or air intake duct



Note

Check water drains of plenum chamber and air intake duct ⇒ [page 34](#).

- ◆ Odour from air conditioning unit

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**Note**

- ◆ *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 a heat exchanger is leaking, the odour of the escaping coolant will be perceptible in both fresh air and air recirculation mode (constant flow of air through the heat exchanger).*
- Caused by too much water condensation in the air conditioning unit

**Note**

Check both water condensation drains ⇒ [page 105](#).

- Caused by old or severely contaminated dust and pollen filters

**Note**

Check dust and pollen filters ⇒ [page 88](#).

- Caused by deposits on evaporator fins.

**Note**

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*Clean evaporator with ultrasound A/C cleaner - VAS 6189A-
⇒ [page 94](#).*

9.6.2 Cleaning evaporator with ultrasonic A/C cleaner - VAS 6189A-

Special tools and workshop equipment required

- ◆ Ultrasound A/C cleaner - VAS 6189A-
- ◆ Cleaning fluid - VAS 6189/1-
- ◆ Commercially available vacuum cleaner and suction nozzle - VAS 6288-

Preparations

- By switching from fresh air to air recirculation mode, check whether the air conditioning unit evaporator is really the source of the odour.

**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 fitted in it and clean these if necessary ⇒ [page 34](#).
- Remove dust and pollen filter and check it for odour and dirt ⇒ [page 88](#).



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.

- Remove leaves, dust and other contamination from the mounting slot for the dust and pollen filter of the air conditioning unit using a commercially available vacuum cleaner, the suction nozzle - VAS 6288- (and the corresponding hose)
⇒ [page 88](#) .
- Re-seal the opening at the air conditioning unit through which the dust and pollen filter was removed.
- Start engine.
- On the operating and display unit, Climatronic control unit - J255- , set "recirculated-air mode" and switch off the compressor "Econ mode".
- Open dash panel vents and, on operating and display unit (Climatronic control unit - J255-), set lowest possible temperature for driver's and front passenger's side (e.g. "Lo" temperature setting).
- Close windows and sunroof of vehicle.
- Select the lowest fresh air blower speed on the operating and display unit (Climatronic control unit - J255-) and set the air distribution to the "dash panel vents".

Cleaning

- Shake the bottle of cleaning fluid - VAS 6189/1- and pour the fluid into the ultrasound air conditioner cleaner - VAS 6189A- , according to the operating instructions for the ultrasound air conditioner cleaner - VAS 6189A- .
- Place the ultrasound air conditioner cleaner - VAS 6189A- in the passenger's footwell.
- Start up the ultrasound air conditioner cleaner - VAS 6189A- (in accordance with the appropriate operating instructions) and position the outlet hose in such a way that the emerging vapour is drawn in by the fresh air blower - V2- via the air recirculation opening of the air conditioning unit (beneath the dash panel).
- Close doors of vehicle.



Note

The cleaning process takes roughly 15 to 20 minutes and is completed when no further vapour emerges from the outlet hose.

Final steps

- Switch off ultrasound air conditioner cleaner - VAS 6189A- .
- Open doors and vent vehicle for at least 10 minutes.
- Remove ultrasound air conditioner cleaner - VAS 6189A- from vehicle and clean it in line with the appropriate operating instructions.
- Switch off ignition.
- Install dust and pollen filter ⇒ [page 88](#) .

9.7 Removing and installing sunlight penetration photosensor - G107-

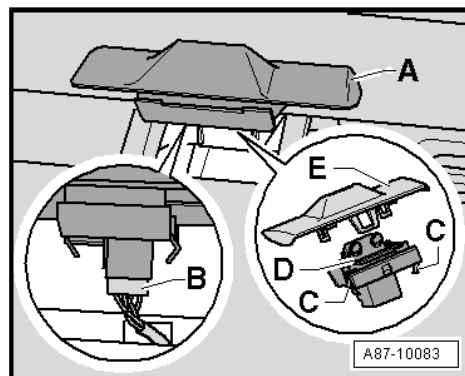
- Switch off ignition.
- Carefully prise cover panel with sunlight penetration photosensor - G107- -A- out of dash panel vent to windscreen.



Note

- ♦ Cover panel with sunlight penetration photosensor - G107- -A- is held in position in dash panel by means of clips -C-.
- ♦ Different versions of the sunlight penetration photosensor - G107- are available. Attention is therefore to be paid to correct assignment ➔ *Electronic parts catalogue*.

- Unplug connector -B-.
- Detach sunlight penetration photosensor - G107- -D- from cover panel -E-.



9.8 Removing and installing temperature sensor blower - V42-



Note

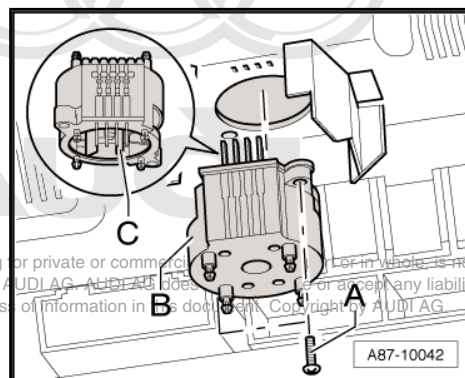
The temperature sensor blower - V42- is fitted in the operating and display unit, Climatronic control unit - J255- , "Convenience" version) on vehicles fitted with this unit.

- Remove operating and display unit, Climatronic control unit - J255- ➔ [page 96](#).
- Remove bolts -A-.
- Pull temperature sensor blower - V42- -B- out of operating and display unit (Climatronic control unit - J255-).



Note

When installing the temperature sensor blower - V42- , do not press down on the motor -D-, but hold the blower at its housing.



9.9 Removing and installing operating and display unit (Climatronic control unit - J255-)

- ♦ General notes on operating and display unit, Climatronic control unit - J255- ➔ [page 98](#)
- ♦ Notes on operating and display unit, Climatronic control unit - J255- of "Convenience" type ➔ [page 100](#)
- ♦ Notes on operating and display unit, Climatronic control unit - J255- of "Basic" type ➔ [page 101](#)
- ♦ Removing operating and display unit, Climatronic control unit - J255- ➔ [page 101](#)

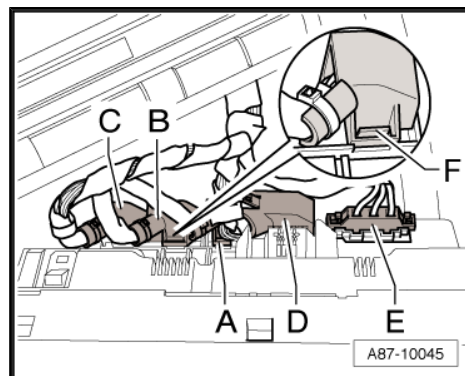
- ◆ Installing operating and display unit, Climatronic control unit - J255- ➔ [page 104](#)



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9.9.1 General notes on operating and display unit, Climatronic control unit - J255-

- ◆ There are different models of operating and display unit, Climatronic control unit - J255- ("Convenience" and "Basic", different trim colours (pearl grey metallic, Nero)) and also different versions of these models. Therefore, when replacing an operating and display unit, Climatronic control unit - J255-, ensure correct allocation ⇒ Electronic parts catalogue
- ◆ As of Model Year 2006, the centre vent temperature sender - G191- is being gradually discontinued. Vehicles with no such temperature sender are only to be fitted with operating and display units, Climatronic control unit - J255- with part number 4F1 820 043 as of index "M" (for left-hand drive vehicles) or 4F2 820 043 as of index "F" (for right-hand drive vehicles) ⇒ Electronic parts catalogue .
- ◆ If vehicles with no centre vent temperature sender - G191- are fitted with an operating and display unit, Climatronic control unit - J255- with part no. 4F1 820 043 up to and including index "L" (for left-hand drive vehicles) or 4F2 820 043 up to and including index "E" (for right-hand drive vehicles), the absence of the sender is displayed as a fault.
- ◆ Operating and display units, Climatronic control unit - J255- with part no. 4F1 820 043 as of index "M" (for left-hand drive vehicles) or 4F2 820 043 as of index "F" (for right-hand drive vehicles) have gradually also been introduced since 05 2005 for vehicles with vent temperature sender, centre - G191- (with these operating and display units, the sender measured value is no longer required for control purposes and is therefore not evaluated).
- ◆ Operating and display units can no longer be interchanged in the usual way. Component protection is activated as soon as an operating and display unit, Climatronic control unit - J255-, has been matched to a vehicle ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- ◆ If an operating and display unit, Climatronic control unit - J255- with active component protection (anti-theft system) is installed in a different vehicle, the functions required for vehicle security can still be selected, but not the convenience functions ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
- ◆ Component protection can only be cancelled by entering certain vehicle data ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
- ◆ The functions selected are indicated by the illumination of the LEDs in the various buttons of the operating and display unit (Climatronic control unit - J255-).
- ◆ The operating and display unit, Climatronic control unit - J255- , uses LEDs for the illumination of display zones and controls (LEDs cannot be replaced).
- ◆ Operating and display unit, Climatronic control unit - J255- is not always connected to terminal "15". Following interruption of power supply (via connector -D-), it is therefore necessary to wait at least 30 s before unplugging remaining connections so as to protect electronics⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ◆ If a new operating and display unit, Climatronic control unit - J255- , has been installed and basic setting not performed, air conditioner control action is restricted and this is displayed as a fault in the fault memory. ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").

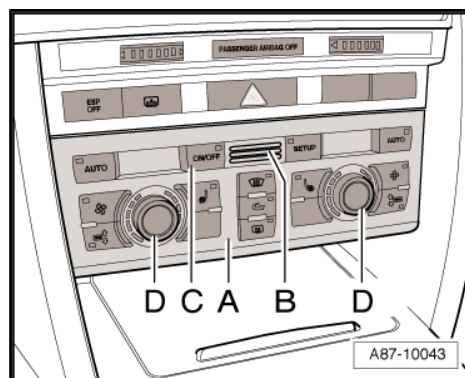


- ◆ Following service installation of an auxiliary heater in a vehicle, connector "D" contact "11" is used instead of terminal "15" for connection of the activation signal from the auxiliary heater for actuation of the operating and display unit, Climatronic control unit - J255- . On account of the modified contact assignment, attention is therefore also to be paid to correct adaption of - J255- ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.
- ◆ Always perform the following operations after replacing operating and display unit, Climatronic control unit - J255- , ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
 - Check encoding.
 - Implement basic setting.
 - Check adaption.
 - Interrogate fault memory.

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9.9.2 Notes on operating and display unit, Climatronic control unit - J255- of "Convenience" type

- ◆ The unit (°C or °F) for the temperature display of the operating and display unit, Climatronic control unit - J255- is transmitted by the MMI (Multi Media Interface) via the convenience data bus system and is determined by the setting entered.
- ◆ The operating and display unit, Climatronic control unit - J255- of "Convenience" type -A-, is available in the following versions (without/with seat heating button, for vehicles with left or right-hand drive, with a button -C- with **ECON ON/OFF** function or just with an **ON/OFF** button).
- ◆ On the operating and display unit "Convenience" Climatronic control unit - J255- -A-, the two rotary controls -D- can be pulled off and renewed separately ⇒ Electronic parts catalogue .
- ◆ In the event of incorrect measurement by dash panel temperature sensor - G56- (only with operating and display unit, Climatronic control unit - J255- of "Convenience" type -A- type), check intake grille -B- of operating and display unit trim panel, Climatronic control unit - J255- , (must not be sealed) and check operation of temperature sensor blower - V42- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
- ◆ The operating and display unit, Climatronic control unit - J255- of "Convenience" type can be started up for a certain length of time (up to approx. 30 minutes) after switching off the ignition by pressing the **ECON ON/OFF** or **ON/OFF** button (the operating time is governed by the battery charge; maximum time approx. 10 minutes). ⇒ Owner's Manual and ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.
- ◆ "Humidity sender" is installed in area of temperature sensor - G56- in operating and display unit, Climatronic control unit - J255- and cannot be replaced separately.
- ◆ As of Model Year 2009, operating and display units, Climatronic control unit - J255- of "Convenience" type with part no. 4F1 820 043 as of index "AK" (for left-hand drive vehicles) or 4F2 820 043 as of index "T" (for right-hand drive vehicles) are being gradually introduced ⇒ Electronic parts catalogue . On vehicles with such operating and display units, the screen display for example of the "MMI" (Multi Media Interface) is no longer switched to "Air conditioning" on pressing the buttons and actuating the controls of the operating and display unit. The selected air conditioner functions are incorporated in the current display (different versions) ⇒ Owner's Manual and operating instructions for ⇒ "Infotainment/MMI" . In addition, operating and display units of this type feature an **A/C** button instead of the **Setup** button and an **ON/OFF** button instead of the **ECON ON/OFF** button ⇒ Owner's Manual .⇒
- ◆ Depending on the operating and display unit, Climatronic control unit - J255- , the target temperature for actuating the seat heating differs in the "Convenience" air conditioner version. In a -J255- with part number 4F1 820 043 up to index "AI" (for vehicles with left-hand drive) or 4F2 820 043 up to index "S" (for vehicles with right-hand drive), the target temperature for stage 6 was 60 °C, for example. In a -J255- with part number 4F1 820 043 from index "AK" (for vehicles with left-hand drive) or 4F2 820 043 from index "T" or "AA" (for vehicles with right-hand drive), the target temperature for stage 6 is set to 39 °C, for example ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").

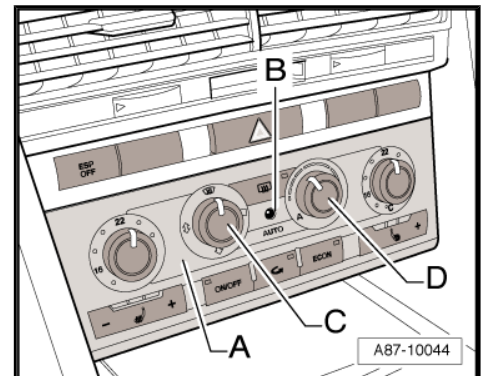


Note

- ◆ On vehicles with an operating and display unit, Climatronic control unit - J255- of "Convenience" type with no Setup button, the additional air conditioner functions are selected and activated by way of the rotary knob/pushbutton of the MMI operating unit ⇒ Owner's Manual and ⇒ operating instructions for "Infotainment/MMI".
- ◆ Pay attention to correct assignment of the operating and display unit, Climatronic control unit - J255- of "Convenience" type to the front information control unit - J523- / information electronics control unit 1 - J794- (operating and display units, -J255- of "Convenience" type with Setup button are fitted on vehicles with a front information control unit - J523- ; operating and display units, -J255- of "Convenience" type with no Set-up button are fitted on vehicles with an information electronics control unit 1 - J794-) ⇒ Electronic parts catalogue and ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051. In the event of incorrect assignment, the various air conditioner functions cannot be indicated in the MMI display and thus selected.

9.9.3 Notes on operating and display unit, Climatronic control unit - J255- of "Basic" type

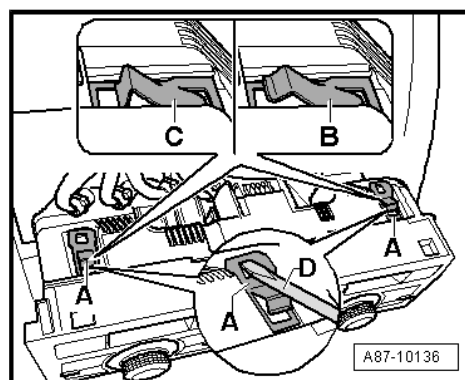
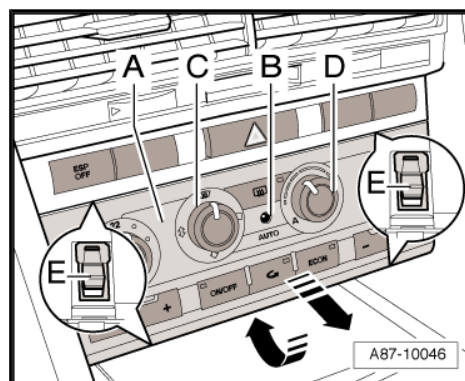
- ◆ The operating and display unit, Climatronic control unit - J255- of "Basic" type -A- is available in the following versions (with-out/with seat heating button, for left or right-hand drive vehicles, with temperature scale in °C or °F).
- ◆ On operating and display unit, Climatronic control unit - J255- of "Basic" type -A-, the controls can not be detached and therefore not replaced separately.
- ◆ In the event of incorrect measurement by infrared temperature and sunlight penetration sensor -B- (only fitted with operating and display unit, Climatronic control unit - J255- of "Basic type" -A-), check trim panel of operating and display unit, Climatronic control unit - J255- , and make sure infrared temperature and sunlight penetration sensor -B- is clean.
- ◆ With operating and display unit, Climatronic control unit - J255- of "Basic" type, "air distribution" is regulated automatically by way of a control characteristic if rotary control -C- is in position "A". Fresh air blower speed is regulated automatically if rotary control -D- is in position "A".



9.9.4 Removing operating and display unit, Climatronic control unit - J255-

- Interrogate the encoding and adaption of the operating and display unit, Climatronic control unit - J255- by way of the "Replace control unit" function in the Guided Fault Finding routine (if the operating and display unit, Climatronic control unit - J255- is to be replaced) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
- Switch off ignition.

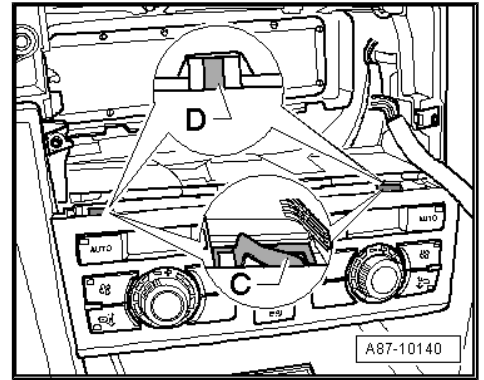
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 Note

- ◆ The procedure for removing the operating and display unit, Climatronic control unit - J255-, is the same for both the "Convenience" and "Basic" versions.
- ◆ Operating and display unit, Climatronic control unit - J255-A- is held in position in centre console by way of 4 clips -E-.
- ◆ As of the start of 2006, operating and display units, Climatronic control unit - J255- with modified clips -A- at the top are to be gradually introduced (the clips at the bottom remain the same, version -B-). At the same time, use is to be made of dash panel centre sections with modified support bracket for upper clips of version -C-. In the case of operating and display units, Climatronic control unit - J255- fitted with clip -B- (friction-locked clip with an angle of approx. 120°, installed with the version fitted up to the start of 2006, trim colour pearl grey metallic), the operating and display unit can be removed without taking out the centre dash panel vent.
- ◆ For operating and display units, Climatronic control unit - J255-, that are fitted with clip -C- (positive-locking clip with an angle of approx. 65°, installed with version fitted from the start of 2006, trim colour Nero), the operating and display unit can only be removed after removal of centre dash panel vent ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel . To enable the clips -C- to be unfastened, a slot -D- has been provided in the dash panel centre section in the area of the upper support brackets for each of the clips.



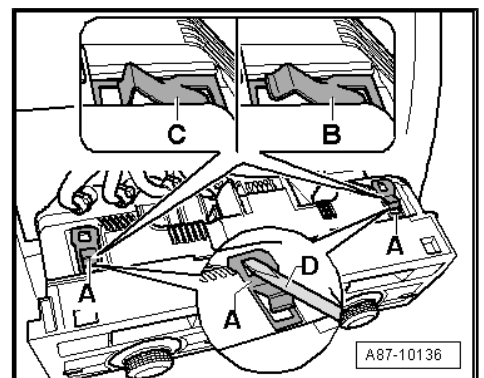
Caution

- ◆ The introduction of the positive-locking clips -C- (with an angle of approx. 65°) on the top of the operating and display unit is accompanied by the use of modified dash panel centre sections (can be recognised from a vertical slot -D- in area of upper support brackets). If an operating and display unit with clips -C- is fitted in a dash panel centre section without these slots -D-, removal may only be possible after taking out the dash panel centre section (the positive-locking connection can only be released from the front by way of this slot)

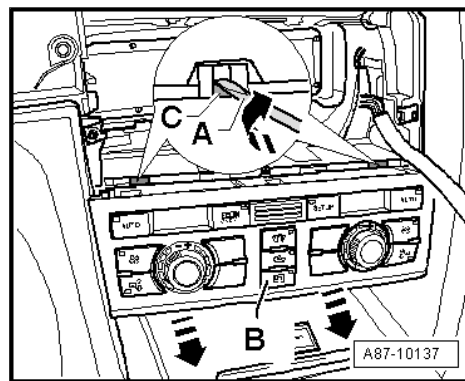
 Note

Operating and display units, Climatronic control unit - J255-, installed at the start of 2006 with "pearl grey metallic" trim are fitted at the top with friction-locked clips -B-. In a transitional period, however, positive-locking clips -C- are used on some components. With the introduction of operating and display units with "Nero" coloured trim, exclusive use will be made of positive-locking clips -C-.

Removal on vehicle with date of manufacture as of the start of 2006



- Reach beneath operating and display unit, Climatronic control unit - J255- -B- and carefully pull operating and display unit, Climatronic control unit - J255- out of centre console (operating and display unit with “pearl grey metallic” trim). If it cannot be removed from the dash panel centre section, dash panel centre vent must be taken out ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel .
- Remove dash panel centre vent (operating and display unit with “Nero” coloured trim) ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel .
- Use two small screwdrivers -A- to release fasteners of the two upper clips -C- (by way of slots in dash panel centre section). Then reach beneath operating and display unit, Climatronic control unit - J255- -B-, and pull it carefully out of centre console.

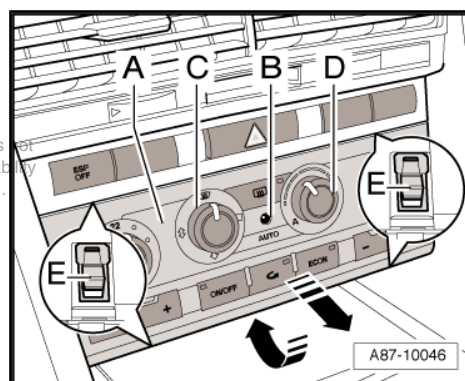


Removal on vehicle with date of manufacture up to the start of 2006

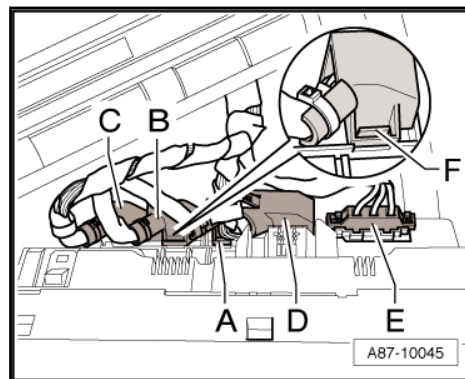
- Reach beneath operating and display unit, Climatronic control unit - J255- -A- and pull it carefully out of centre console (operating and display unit with “pearl grey metallic” trim).

Continued procedure

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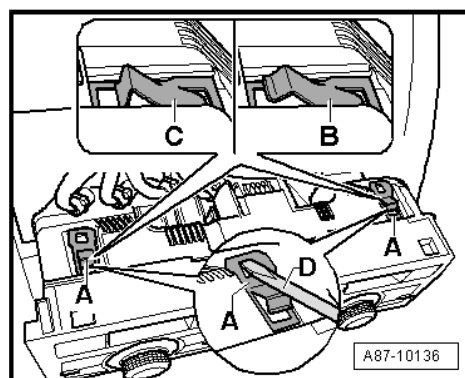


- Release fasteners of connector -D- by pressing retaining tabs -F- and unplug connector.
- Wait 30 sec. (to protect electronics in operating and display unit, Climatronic control unit - J255-).
- Release and unplug connector -E-.
- Release fasteners of connectors -A- to -C- by pressing retainer tabs -F- and unplug connectors.



9.9.5 Installing operating and display unit, Climatronic control unit - J255-

- Check the clips on the top of the operating and display unit, Climatronic control unit - J255- . If the new operating and display unit to be fitted has different clips -A- than the operating and display unit removed (e.g. clips -B- instead of -C-), detach these clips using a small screwdriver -D- and replace them with the correct version.

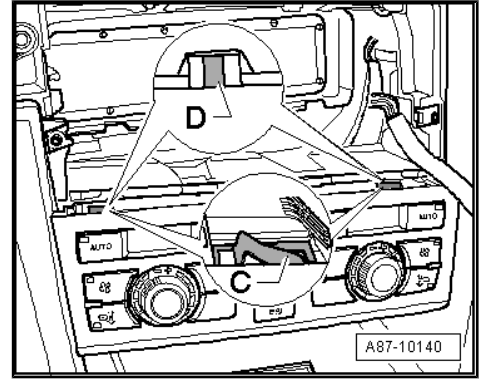


i Note

Operating and display units, Climatronic control unit - J255- fitted with clips -C- (positive-locking clips with an angle of approx. 65°) are only to be installed if there are slots -D- in the dash panel centre section (without such slots, the dash panel centre section has to be taken out to permit removal of the operating and display unit again; the clips cannot be unfastened in the case of a dash panel centre section with no slots).

Install operating and display unit, Climatronic control unit - J255- in reverse order of removal.

- Interrogate fault 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").
- Perform basic setting, encoding, adaption and final control diagnosis for air conditioner ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").

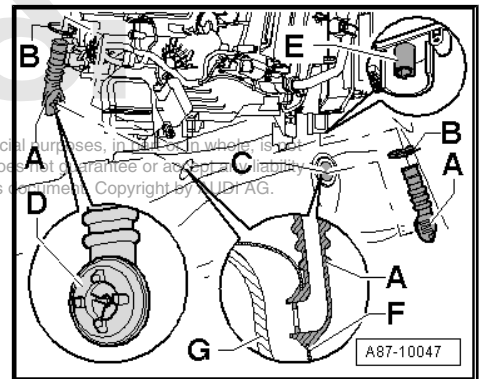


9.10 Checking, removing and installing condensation drain hose

i Note

- ◆ *This vehicle is fitted with two condensation drains (on right and left of air conditioning unit/centre tunnel).*
- ◆ *There is no flap at outlet opening of condensation drain hose -A-; condensation drains off by way of rubber lips -D-.*

- ◆ Checking condensation drain ⇒ [page 105](#)
- ◆ Removing condensation drain hose ⇒ [page 106](#)
- ◆ Installing condensation drain hose ⇒ [page 107](#)

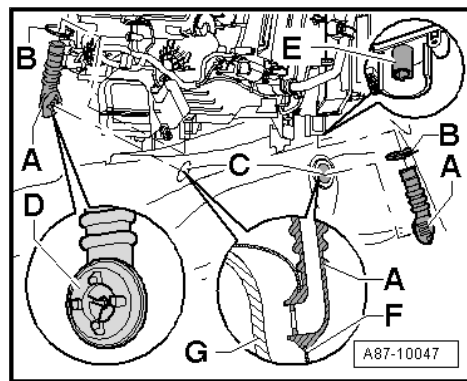


9.10.1 Checking condensation drain

i Note

Always check both condensation drains.

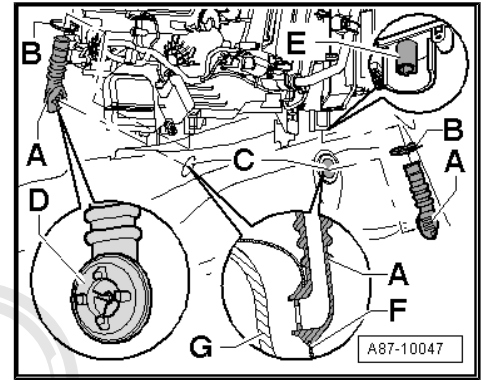
- ◆ Remove both condensation drain hoses -A- ⇒ [page 106](#) and check the following:
 - Gap between floor panel -F- and insulation mat -G- in transmission tunnel; there must be sufficient space for condensate to be able to drain out of condensation drain opening -D-
 - Contamination of condensation drain of air conditioning unit -E- with a piece of wire, for example; clean if necessary
 - Check installation position of floor covering; cross-section of condensation drain hose -A- must not be constricted.
- ◆ If there are problems due to moisture in the passenger compartment, check the following components in addition to the condensation drains:
 - Water drain openings in plenum chamber ⇒ [page 34](#) .
 - Water drain from air intake unit ⇒ [page 34](#) .
 - Plenum chamber cover and scuttle panel trim for damage and correct installation ⇒ General body repairs, exterior; Rep. gr. 50 .
 - Dust and pollen filter (and, if fitted, dust filter attached to air intake unit) for contamination and correct installation ⇒ [page 88](#) .
 - Forced ventilation vents in luggage compartment ⇒ [page 33](#) .
 - Actuation and operation of fresh-air/air flow flaps and recirculated-air flap (e.g. by way of "Final control diagnosis") ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
 - The signal for detection of wiper operation is displayed on the operating and display unit, Climatronic control unit - J255- ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051
- ◆ Check temperature of air flowing out of evaporator by way of measured values from evaporator outflow temperature sender - G263- under usage conditions described by customer and with following settings on operating and display unit, Climatronic control unit - J255- : ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
 - "Lo" temperature setting for driver's and front passenger's side ("Convenience" version) or temperature switch on "Cold" stop ("Basic" version)
 - Medium fresh air blower speed (approx. 7V) ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051
 - "Fresh-air" mode
 - Check measured value of evaporator outflow temperature sender - G263- (read measured value block) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding"). If measured value is too low (colder than 0 °C for a lengthy period at an ambient temperature above 0 °C) or too high (greater than e.g. 10 °C although air conditioner is functioning properly), see notes on checking the cooling output ⇒ [page 158](#) .



9.10.2 Removing condensation drain hose

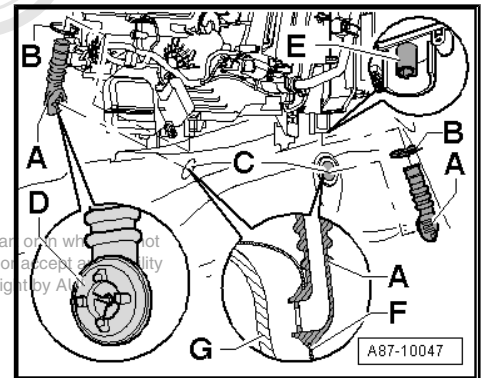
- Remove centre console cover on left and/or right ⇒ General body repairs, interior; Rep. gr. 68 .

- If necessary, carefully fold back floor covering until condensation drain hose -A- is visible.
- Unfasten clamp -B-.
- Protect area of floor covering beneath condensation drain hose -A- with absorbent paper (to stop any water running onto or beneath floor covering).
- Remove condensation drain hose -A-.



9.10.3 Installing condensation drain hose

- ◆ Check the following before installing condensation drain hose -A-:
 - Gap between floor panel -F- and insulation mat -G- in transmission tunnel; there must be sufficient space for condensate to be able to drain out of condensation drain opening -D-
 - Contamination of condensation drain of air conditioning unit -E- with a piece of wire, for example; clean if necessary
 - Insert condensation drain in opening in lower floor panel -C-
 - Attach condensation drain hose -A- to condensation drain of air conditioning unit -E- and secure connection with clip -B-.
 - Check installation position of floor covering; cross-section of condensation drain hose -A- must not be constricted.
 - Fit centre console covers on left and/or right, taking care to avoid contact with condensation drain hose -A- and thus constriction of its cross-section.



10 Checking electrical components activated by air conditioner

- ◆ Checking heated rear window - Z1- ⇒ [page 109](#)
- ◆ Checking heated seats ⇒ [page 111](#)
- ◆ Checking supplementary air heater element - Z35- (vehicles with diesel engine) ⇒ [page 112](#)
- ◆ Checking actuation of heated windscreen - Z2- ⇒ [page 113](#)
- ◆ Checking "Solar mode" function on vehicles with sun roof with solar cells ⇒ [page 114](#)



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10.1 Checking heated rear window - Z1-



Note

- ◆ *Situations preventing activation of the heated rear window (short circuit in connection to rear window, open circuit in power supply to operating and display unit, Climatronic control unit - J255-) are not stored as faults in the operating and display unit, Climatronic control unit - J255- ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- ◆ *If voltage measured at energy management control unit - J644- at terminal "30" drops below value stored in energy management control unit - J644- , heated rear window is deactivated e.g. by onboard supply control unit - J519- (or power is reduced) to relieve load on alternator ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").*
- ◆ *The heated rear window is only actuated by the onboard supply control unit - J519- when the engine is running. With the engine stopped, there is no feedback from the onboard supply control unit - J519- and the LED in the button of the operating and display unit, Climatronic control unit - J255- goes out again shortly after actuation.*
- ◆ *If heated rear window has to be deactivated on account of undervoltage, indicator lamp in button for heated rear window in operating and display units (Climatronic control unit - J255-) remains on. However if deactivation lasts longer than approx. 150 s, operating and display units (Climatronic control unit - J255-) switch off indicator lamp.*
- ◆ *The measured value block of the operating and display unit, Climatronic control unit - J255- shows that the heated rear window - Z1- is being heated or indicates why there is no actuation in spite of a corresponding request ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051. As however the heated rear window - Z1- is actuated by the convenience system central control unit - J393- , faults in the operation, power supply and actuation of the rear window heating cannot be detected and displayed by the operating and display unit, Climatronic control unit - J255- ⇒ 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").*
- ◆ *At ambient temperatures above 0 °C, the rear window heating is switched off automatically by the operating and display unit, Climatronic control unit - J255- , after the operating period (approx. 10 minutes) stored in the operating and display unit, Climatronic control unit - J255- .*
- ◆ *Depending on the version of operating and display unit, Climatronic control unit - J255- , the "heated rear window On" function may not be disabled automatically at an outside temperature above 0 °C. If the heated rear window button is pressed longer than 2 sec. when switching on ⇒ Owner's Manual .*



- ◆ *At ambient temperatures below 0 °C, the rear window heating remains switched on until the ignition is switched off (it can be switched off and on again manually any time). If the temperature rises above 0 °C while you are driving, the heated rear window - Z1- is disabled after the operating period (approx. 10 minutes) stored in the operating and display unit, Climatronic control unit - J255- .*
- ◆ *Depending on the version of the operating and display unit, Climatronic control unit - J255- , the function "heated rear window on" is stored when the ignition is switched off and the heated rear window is re-activated after starting the engine ⇒ Owner's Manual .*



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10.2 Checking heated seats



Note

- ◆ *Situations preventing activation of the driver's or front passenger's seat heating (short circuit in connection to seat heating element, open circuit in power supply to operating and display unit, Climatronic control unit - J255-) are stored as faults in the operating and display unit, Climatronic control unit - J255- ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- ◆ *Checking actuation of heated seat operation is described in the Guided Fault Finding for the air conditioner. ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").*
- ◆ *If the voltage measured at the energy management control unit - J644- at terminal "30" drops below a value stored in the energy management control unit - J644- , the seat heating is deactivated (or the power is reduced) to relieve the load on the alternator (the electronics system of the operating and display unit, Climatronic control unit - J255- reduces the actuation duty cycle from 100% to 90....0%) ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051. (the control units exchange the appropriate information by way of the convenience data bus system).*
- ◆ *The measured value block of the operating and display unit, Climatronic control unit - J255- shows that the front seat heating is being actuated or indicates why there is no actuation in spite of a corresponding request ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- ◆ *On vehicles with seat occupied sensor, the heating for the front passenger's seat and rear seats may be deactivated after approx. 10 minutes if no seat occupied is detected by the airbag control unit - J234- (e.g. interrogate measured value block of airbag control unit - J234- ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051).*
- ◆ *Depending on the operating and display unit, Climatronic control unit - J255- , the target temperature for actuating the seat heating differs in the "Convenience" air conditioner version. In a -J255- with part number 4F1 820 043 up to index "AI" (for vehicles with left-hand drive) or 4F2 820 043 up to index "S" (for vehicles with right-hand drive), the target temperature for stage 6 was 60 °C, for example. In a -J255- with part number 4F1 820 043 from index "AK" (for vehicles with left-hand drive) or 4F2 820 043 from index "T" or "AA" (for vehicles with right-hand drive), the target temperature for stage 6 is set to 39 °C, for example ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").*

10.3 Checking supplementary air heater element - Z35- (vehicles with diesel engine)

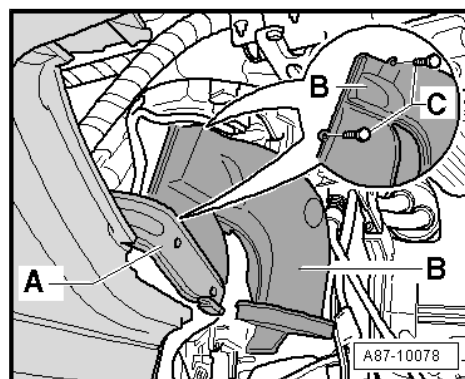


Note

- ◆ Vehicles with diesel engine are currently fitted with an electric supplementary heater as supplementary air heater (if requested by operating and display unit, Climatronic control unit - J255- , heat energy is added to air on exiting from heat exchanger of air conditioning unit) ⇒ Audi sales range .
- ◆ On vehicles with diesel engine and "auxiliary heater" as optional extra not fitted with a supplementary heater element - Z35- (equipment-specific), the auxiliary heater assumes the function of the supplementary heater, and operates as a fuel-driven supplementary heater (the auxiliary heater adds heat energy to the coolant) ⇒ Audi sales range and ⇒ Auxiliary heater; Rep. gr. 82 .
- ◆ The electric supplementary heater (supplementary air heater element - Z35-) is actuated via the appropriate engine control unit (the control units exchange information for this purpose via the data bus system). ⇒ 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 operating and display unit, Climatronic control unit - J255- shows actuation of the supplementary heater (electric supplementary heater or "Supplementary heating" function of auxiliary heater) or indicates why there is no actuation in spite of a low ambient temperature ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.
- ◆ Vehicles with petrol engine are currently not fitted with an additional heater/auxiliary heater is not actuated as additional heater. ⇒ Auxiliary heater; Rep. gr. 82
- ◆ For checking actuation of supplementary air heater element - Z35- , refer to ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding"). (for engine fitted in this vehicle).

Checking

- Switch off ignition.
- Remove the glove compartment. ⇒ General body repairs, interior; Rep. gr. 70
- Remove lower right trim of centre console ⇒ General body repairs, interior; Rep. gr. 68
- On right side, remove holder for dash panel -A- and bolts -C- ⇒ General body repairs, interior; Rep. gr. 68 .
- Remove air duct to footwell vent -B- for front passenger's side.

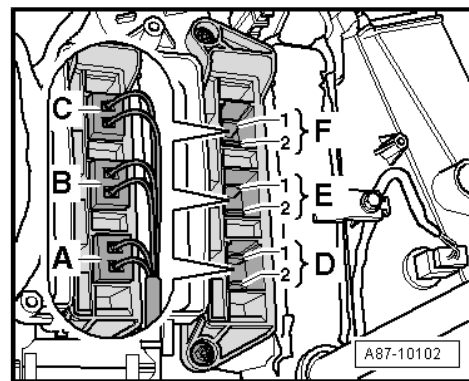


- Unplug connectors -A-, -B- and -C- from supplementary air heater element - Z35- -D-.
- Measure resistance between individual contacts “1” and “2” of connectors -D- to -E- e.g. using Vehicle diagnostic, testing and information system - VAS 5051 A-

Specification: Greater than 0.2 ohms and less than 5 ohms

Note

- ◆ *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 air heater element - Z35- unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.*
- ◆ *The resistor elements are actuated by way of the relevant engine control unit in 3 stages (stage 1 approx. 330 W via one connector, stage 2 approx. 660 W via the other two connectors and stage 3 approx. 1000 W via all 3 connectors). The resistor elements are actuated separately by way of the 3 connectors. As they are however interconnected in the heater element, the current is discharged via the earth connection offering the least resistance.*
- ◆ *The supplementary air heater element - Z35- consists of several layers of resistance elements, which together can achieve a heating output of approx. 1000 W (if 3 heater elements are actuated simultaneously). These resistor elements have a positive temperature coefficient (resistance increases with temperature and current input decreases) with the result that rated power is only attained at a low component temperature.*
- ◆ *The supplementary air heater element - Z35- is designed such that, on actuation, it is not possible for a current in excess of 35 A to flow via any of the contacts (resistance increases immediately following activation and current decreases).*
- ◆ *To reach the maximum heating output on the supplementary air heater element - Z35- , the heater element must be cold and the alternator - C- must not be overloaded or must still have sufficient power reserves. If the alternator - C- is overloaded, the corresponding engine control unit partially or completely disables the supplementary air heater element - Z35- ➔ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding"). (for engine fitted in this vehicle).*



10.4 Checking actuation of heated windscreen - Z2-

Note

- ◆ *On vehicles with "heated windscreen" as optional extra (introduction not yet finalised), the heated windscreen control unit - J505- is actuated by the operating and display unit, Climatronic control unit - J255- by way of the air conditioner data bus system "Lin bus". Actuation is displayed in the measured value block ➔ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- ◆ *Checking actuation of heated windscreen ➔ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").*

10.5 Checking "Solar mode" function on vehicles with sun roof with solar cells



Note

- ◆ On vehicles with "sun roof with solar cells" as optional extra (introduction not yet finalised), fresh air blower - V2- is started up by way of fresh air blower control unit - J126- with ignition off ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
- ◆ Depending on the adaption of the operating and display unit, Climatronic control unit - J255- , the "Solar mode" function can be deactivated via the MMI (Multi Media Interface) (the control units exchange the appropriate information via the convenience data bus system) ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
- ◆ Depending on the adaption of the operating and display unit, Climatronic control unit - J255- , the "Solar mode" function is deactivated by the fresh air blower control unit - J126- at low ambient temperatures. (The control units exchange the relevant information via the air conditioner data bus system "Lin bus") ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
- ◆ The measured value block of the operating and display unit, Climatronic control unit - J255- indicates, for example, the number of fresh air blower control unit - J126- operating hours in solar mode ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.
- ◆ Checking sun roof with solar cells ⇒ [page 54](#) and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").

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11 Removing and installing electrical components of air conditioning unit (with air conditioning unit in position)

Note

- ◆ *The air conditioning unit wiring harness has various identical connectors which should be marked before unplugging to avoid interchange.*
- ◆ *Different control motors are fitted to the air conditioning unit and in the air intake unit. These motors have different electrical values (different adjustment ranges of integrated potentiometers) and part number indices (⇒ Electronic parts catalogue) and should therefore be marked before they are removed to avoid confusion.*
- ◆ Removing and installing centre vent control motor - V102-
⇒ [page 116](#)
- ◆ Removing and installing defroster flap control motor - V107-
⇒ [page 118](#)
- ◆ Removing and installing left footwell flap control motor - V108-
⇒ [page 120](#)
- ◆ Removing and installing right footwell flap control motor - V109- (or left footwell flap control motor - V108-)
⇒ [page 123](#)
- ◆ Removing and installing rear footwell vent control motor - V112- ⇒ [page 125](#)
- ◆ Removing and installing front cold air flap control motor - V197- ⇒ [page 127](#)
- ◆ Removing and installing indirect ventilation flap control motor - V213- ⇒ [page 130](#)
- ◆ Removing and installing front left chest vent control motor - V237- (air conditioner of "Convenience" type) ⇒ [page 132](#)
- ◆ Removing and installing front right chest vent control motor - V238- (or front left chest vent control motor - V237-)
⇒ [page 135](#)
- ◆ Removing and installing left vent temperature sender - G150-
⇒ [page 138](#)
- ◆ Removing and installing right vent temperature sender - G151-
⇒ [page 139](#)
- ◆ Removing and installing centre vent temperature sender - G191- ⇒ [page 140](#)
- ◆ Removing and installing evaporator output temperature sender - G263- ⇒ [page 141](#)
- ◆ Removing and installing supplementary air heater element - Z35- ⇒ [page 142](#)

11.1 Removing and installing centre vent control motor - V102-



Note

- ◆ *This control motor is fitted with a potentiometer with an adjustment range of 120 °; part number index at start of production: "A" ⇒ Electronic parts catalogue .*
- ◆ *If necessary, mark motor/flap connecting element on removal to avoid interchange with connecting elements of other control motors.*
- ◆ *Mark the control motor prior to removal. Pay attention to correct assignment on installation, as well as the correct part number/index on replacement (the various control motors have different electrical values and part number indices) ⇒ Electronic parts catalogue .*
- ◆ *In the event of fault "Upper or lower limit value exceeded", check motor/flap connecting element. It must be properly attached to motor and there must not be any clearance between control motor mount and connecting element.*

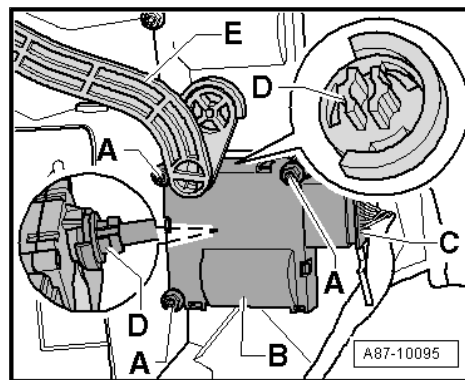
Removing

- Switch off ignition.
- Remove driver's storage compartment. ⇒ General body repairs, interior; Rep. gr. 70
- Mark connector -C- to control motor (to prevent interchange with other identical connectors).
- Unplug connector -C- from central vents control motor - V102- .
- Remove bolts -A- (tightening torque 10 Ncm).
- Use a screwdriver to carefully prise connecting element -D- off control motor -B- and remove control motor.



Note

- ◆ *If, on vehicles with air conditioner of "Convenience" type, indirect ventilation flap control motor - V213- is so awkwardly positioned that connecting elements -E- impede control motor removal, then these must be removed ⇒ [page 130](#) .*
- ◆ *Leave connecting element -D- to flap shaft in position on air conditioning unit.*
- ◆ *Remove connecting element to shaft of flap -D- ⇒ [page 252](#)*



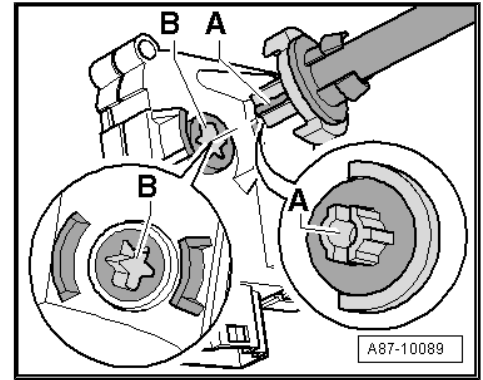
Installing

Install in reverse order of removal; note the following.

- Check position of control motor shaft -B- (must be in position shown).

i Note

- ◆ Only attach connecting element -A- in the position that enables it to engage without exertion of force. If the connecting element can only be inserted with force, check the motor shaft -D- (it may be 180° out of position).
- ◆ If motor shaft -B- is not in the position shown (only position in which the connecting element can be attached), use an adapter cable, for example, ⇒ [page 40](#) or a test lead from the adapter set - V.A.G 1594/C- to connect contacts "5" and "6" of the control motor by way of a 5 A fuse to a 12 V battery. Turn control motor until shaft is in position shown (no force required to attach connecting element). Direction of rotation can be reversed by interchanging positive and negative.
- ◆ Control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. Consequently, voltage should only be applied with control motor detached if connecting element -A- has been attached or to move shaft to correct position if connecting element cannot be attached.
- ◆ Shaft may be incorrectly positioned if pre-tension is required to insert connecting element -A- in control motor.

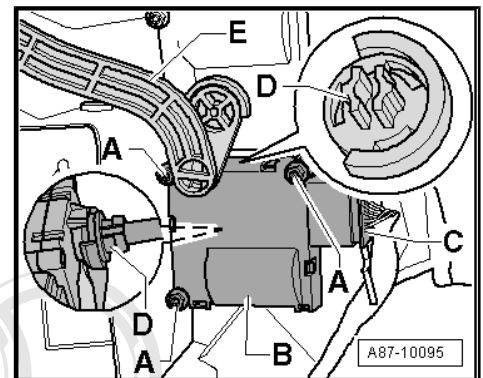


- Attach control motor -B- to connecting element -D- of shaft to flap for centre vent.

i Note

Check positioning of connecting element. It must engage in shaft of motor and there must not be any clearance between control motor shaft and connecting element.

- Re-install components in reverse order of removal.
- Interrogate fault 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") .
- Perform basic setting and final control diagnosis for air conditioner ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .



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11.2 Removing and installing defroster flap control motor - V107-



Note

- ◆ This control motor is fitted with a potentiometer with an adjustment range of 120 °; part number index at start of production: "A" ⇒ *Electronic parts catalogue* .
- ◆ If necessary, mark motor/flap connecting element on removal to avoid interchange with connecting elements of other control motors.
- ◆ Mark the control motor prior to removal. Pay attention to correct assignment on installation, as well as the correct part number/index on replacement (the various control motors have different electrical values and part number indices) ⇒ *Electronic parts catalogue* .
- ◆ In the event of fault "Upper or lower limit value exceeded", check motor/flap connecting element. It must be properly attached to motor and there must not be any clearance between control motor mount and connecting element.

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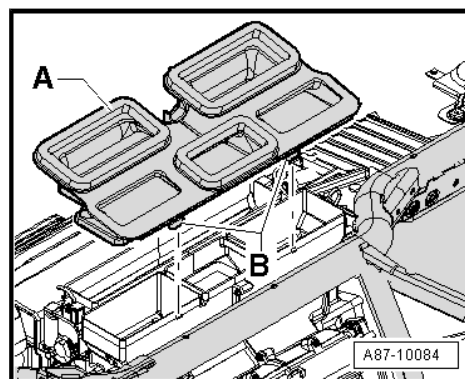
Removing

- Switch off ignition.
- Remove entire dash panel fascia ⇒ General body repairs, interior; Rep. gr. 70



Note

- ◆ On right-hand drive vehicles, central tube of dash panel must additionally be detached from vehicle or removed ⇒ General body repairs, interior; Rep. gr. 70 .
 - ◆ If applicable, obtain radio anti-theft code before disconnecting battery.
- Release fasteners -B- and remove air duct -A-.



- If necessary, mark connector -C- to defroster flap control motor - V107- to prevent interchange with other identical connectors.
- Unplug connector -C- from defroster flap control motor - V107-.
- Remove bolts -A- (e.g. using ratchet ring spanner - T40083- or ring spanner bent to appropriate shape) (tightening torque 10 Ncm).
- Use a screwdriver to carefully prise connecting element -D- off control motor -B- and remove control motor.



Note

- ◆ Leave connecting element -D- in position at air conditioning unit.
- ◆ Removing connecting element to shaft of flap in air conditioning unit ⇒ [page 252](#)

Installing

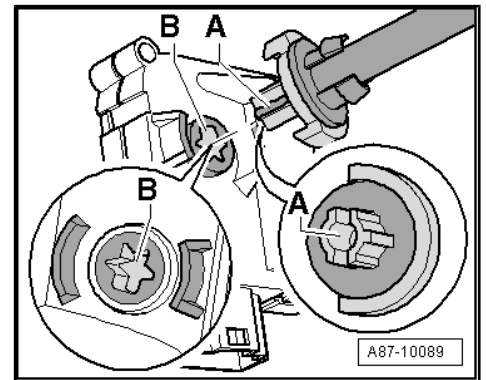
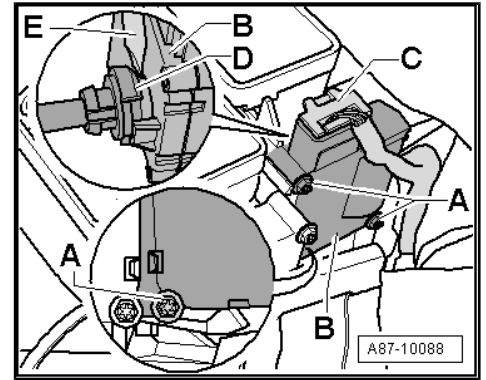
Install in reverse order of removal; note the following.

- Check position of control motor shaft -B- (must be in position shown).



Note

- ◆ Only attach connecting element -A- in the position that enables it to engage without exertion of force. If the connecting element can only be inserted with force, check the motor shaft -D- (it may be 180° out of position).
- ◆ If motor shaft -B- is not in the position shown (only position in which the connecting element can be attached), use an adapter cable, for example, ⇒ [page 40](#) or a test lead from the adapter set - V.A.G 1594/C- to connect contacts "5" and "6" of the control motor by way of a 5 A fuse to a 12 V battery. Turn control motor until shaft is in position shown (no force required to attach connecting element). Direction of rotation can be reversed by interchanging positive and negative.
- ◆ Control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. Consequently, voltage should only be applied with control motor detached if connecting element -A- has been attached or to move shaft to correct position if connecting element cannot be attached.
- ◆ Shaft may be incorrectly positioned if pre-tension is required to insert connecting element -A- in control motor.

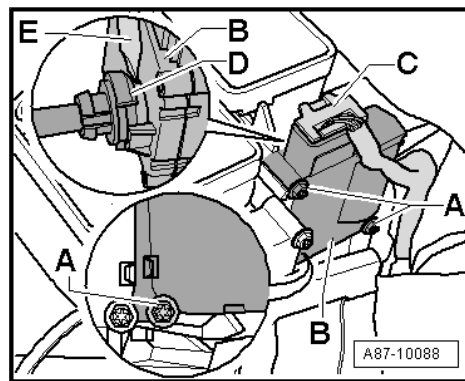


- Attach control motor -B- to connecting element -D- of shaft to defrost flap.



Note

- ◆ If necessary, reach into the vent and move the flap into the position in which the control motor can be attached.
- ◆ Check positioning of connecting element. It must engage in shaft of motor and there must not be any clearance between control motor shaft and connecting element.
- Re-install components in reverse order of removal.
- Interrogate fault 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") .
- Perform basic setting and final control diagnosis for air conditioner ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .



11.3 Removing and installing left footwell flap control motor - V108-



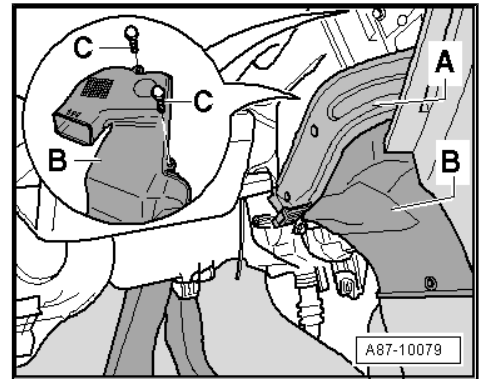
Note

- ◆ This control motor is fitted with a potentiometer with an adjustment range of 120 °; part number index at start of production: "A" ⇒ Electronic parts catalogue .
- ◆ This control motor is only fitted at this location on vehicles with air conditioner of "Convenience" type. In vehicles with an air conditioner of "Basic" type, this control motor is installed on the right side of the air conditioning unit ⇒ [page 123](#) .
- ◆ There is no control motor at this location on vehicles with air conditioner of "Basic" type.
- ◆ On vehicles with air conditioner of "Basic" type, flaps for front left and right footwell vents are actuated by left footwell flap control motor - V108- (the two flaps are linked by a connecting rod ⇒ [page 254](#) , control motor is attached to right of air conditioning unit) ⇒ [page 123](#) .
- ◆ When removing, mark motor/flap connecting element to avoid interchanging with connecting elements of other control motors.
- ◆ Mark the control motor prior to removal. Pay attention to correct assignment on installation, as well as the correct part number/index on replacement (the various control motors have different electrical values and part number indices) ⇒ Electronic parts catalogue .
- ◆ In the event of fault "Upper or lower limit value exceeded", check motor/flap connecting element. It must be properly attached to motor and there must not be any clearance between control motor mount and connecting element.

Removing

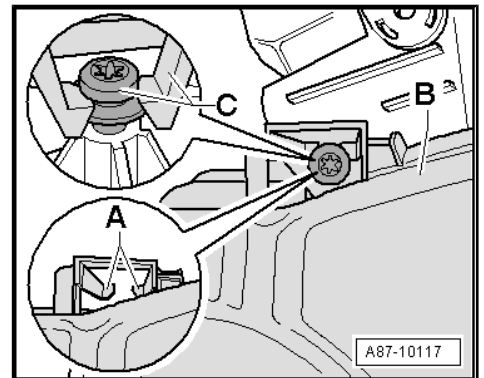
- Switch off ignition.
- Remove driver's storage compartment. ⇒ General body repairs, interior; Rep. gr. 70

- Remove lower left trim of centre console ⇒ General body repairs, interior; Rep. gr. 68
- On left side, remove holder for dash panel -A- and bolts -C- ⇒ General body repairs, interior; Rep. gr. 68 .
- Remove air duct to footwell vent -B- for driver's side.



Note

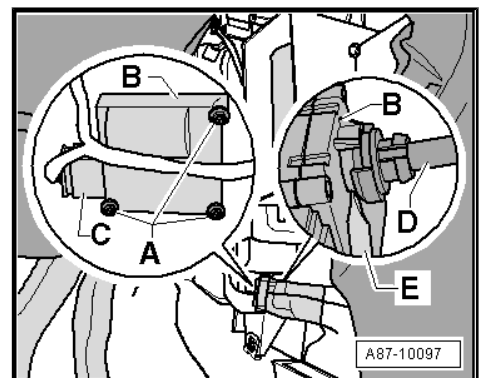
- ◆ Depending on the vehicle equipment and the positional tolerance between the air conditioning unit and the bracket for the pedal cluster, removal of the footwell vent -B- for the driver's side may involve detaching the pedal cluster from the vehicle and sliding it slightly to the left ⇒ Brake system; Rep. gr. 46 .
- ◆ In Model Year 2005, the air duct fastening to the footwell vent -B- has been modified (gradual introduction). Bolt -C- must then no longer be removed, and the air duct is clipped in via retainer tab -A-.



- Mark connector -C- to control motor (to prevent interchange with other identical connectors).
- Unplug connector -C- from left footwell flap control motor - V108- .
- Remove bolts -A- (tightening torque 10 Ncm).
- Use a screwdriver to carefully prise connecting element -D- off control motor -B- and remove control motor.

Note

- ◆ Leave the connecting element -D- in position at the air conditioning unit.
- ◆ Removing connecting element -D- to shaft of flap in air conditioning unit ⇒ [page 252](#)



Installing

Install in reverse order of removal; note the following.



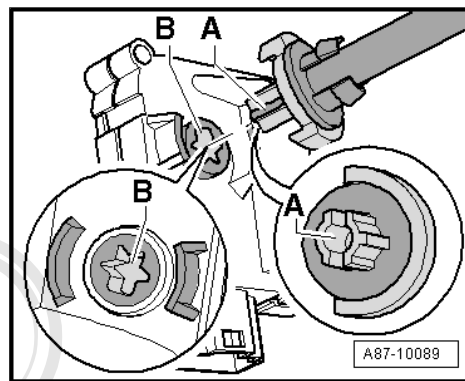
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- Check position of control motor shaft -B- (must be in position shown).



Note

- ◆ Only attach connecting element -A- in the position that enables it to engage without exertion of force. If the connecting element can only be inserted with force, check the motor shaft -D- (it may be 180° out of position).
- ◆ If motor shaft -B- is not in the position shown (only position in which the connecting element can be attached), use an adapter cable, for example, ⇒ [page 40](#) or a test lead from the adapter set - V.A.G 1594/C- to connect contacts "5" and "6" of the control motor by way of a 5 A fuse to a 12 V battery. Turn control motor until shaft is in position shown (no force required to attach connecting element). Direction of rotation can be reversed by interchanging positive and negative.
- ◆ Control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. Consequently, voltage should only be applied with control motor detached if connecting element -A- has been attached or to move shaft to correct position if connecting element cannot be attached.
- ◆ Shaft may be incorrectly positioned if pre-tension is required to insert connecting element -A- in control motor.

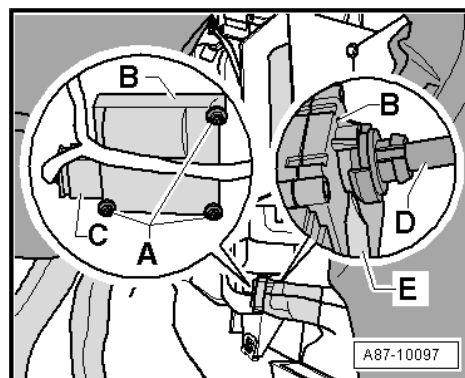


- Attach control motor -B- to connecting element -D- of shaft to footwell flap.



Note

- ◆ If necessary, reach into vent and move flap -E- into position in which control motor can be attached.
- ◆ Check positioning of connecting element. It must engage in shaft of motor and there must not be any clearance between control motor shaft and connecting element.



- Re-install components in reverse order of removal.
- Interrogate fault 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") .
- Perform basic setting and final control diagnosis for air conditioner ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .

11.4 Removing and installing right footwell flap control motor - V109- (or left footwell flap control motor - V108-)

Different designations, right footwell flap control motor - V109- ("Convenience" version) and left footwell flap control motor - V108- (fitted on right on "Basic" version)



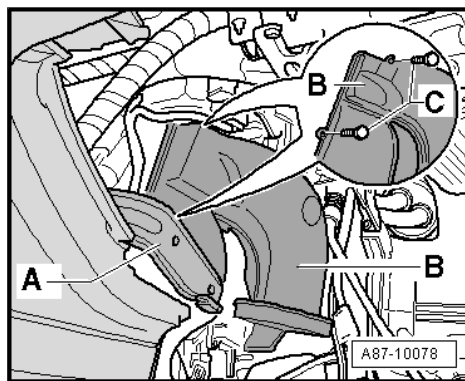
Note

- ◆ *This control motor is fitted with a potentiometer with an adjustment range of 120 °; part number index at start of production: "A" ⇒ Electronic parts catalogue .*
- ◆ *Control motor designation is different for air conditioners of "Convenience" and "Basic" types.*
- ◆ *Designation right footwell flap control motor - V109- only applies to air conditioners of "Convenience" type. On vehicles with air conditioner of "Basic" type, the designation for this motor is left footwell flap control motor - V108- .*
- ◆ *The designation for this control motor is governed by the type of air conditioner (operating and display unit, Climatronic control unit - J255-). The designation in the Guided Fault Finding routine and the current flow diagram differs for the "Convenience" and "Basic" versions.*
- ◆ *On vehicles with air conditioner of "Basic" type, flaps for front left and right footwell vents are actuated by left footwell flap control motor - V108- (the two flaps are linked by a connecting rod ⇒ [page 254](#)).*
- ◆ *When removing, mark motor/flap connecting element to avoid interchanging with connecting elements of other control motors.*
- ◆ *Mark the control motor prior to removal. Pay attention to correct assignment on installation, as well as the correct part number/index on replacement (the various control motors have different electrical values and part number indices) ⇒ Electronic parts catalogue .*
- ◆ *In the event of fault "Upper or lower limit value exceeded", check motor/flap connecting element. It must be properly attached to motor and there must not be any clearance between control motor mount and connecting element.*

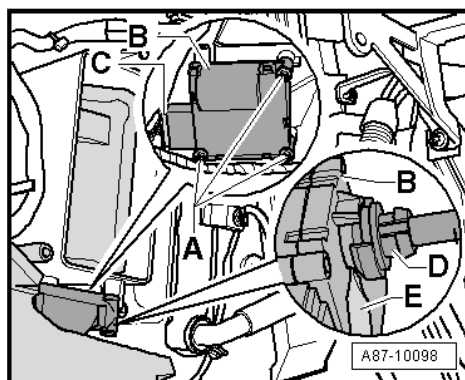
Removing

- Switch off ignition.
- Remove the glove compartment. ⇒ General body repairs, interior; Rep. gr. 70
- Remove lower right trim of centre console ⇒ General body repairs, interior; Rep. gr. 68

- On right side, remove holder for dash panel -A- and bolts -C-
⇒ General body repairs, interior; Rep. gr. 68 .
- Remove air duct to footwell vent -B- for front passenger's side.



- Mark connector -C- to control motor (to prevent interchange with other identical connectors).
- Unplug connector -C- from control motor.
- Remove bolts -A- (tightening torque 10 Ncm).
- Use a screwdriver to carefully prise connecting element -D- off control motor -B- and remove control motor.



Note

- ◆ Leave the connecting element -D- in position at the air conditioning unit.
- ◆ Remove connecting element -D- to shaft of flap in air conditioning unit ⇒ [page 252](#)

Installing

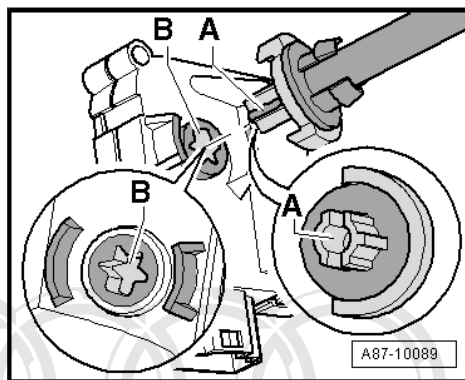
Install in reverse order of removal; note the following.

- Check position of control motor shaft -B- (must be in position shown).



Note

- ◆ Only attach connecting element -A- in the position that enables it to engage without exertion of force. If the connecting element can only be inserted with force, check the motor shaft -D- (it may be 180° out of position).
- ◆ If motor shaft -B- is not in the position shown (only position in which the connecting element can be attached), use an adapter cable, for example, ⇒ [page 40](#) or a test lead from the adapter set - V.A.G 1594/C- to connect contacts "5" and "6" of the control motor by way of a 5 A fuse to a 12 V battery. Turn control motor until shaft is in position shown (no force required to attach connecting element). Direction of rotation can be reversed by interchanging positive and negative.
- ◆ Control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. Consequently, voltage should only be applied with control motor detached if connecting element -A- has been attached or to move shaft to correct position if connecting element cannot be attached.
- ◆ Shaft may be incorrectly positioned if pre-tensioning is required to insert connecting element -A- in control motor.

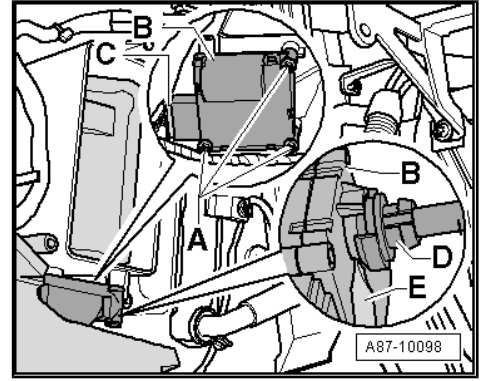


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- Attach control motor -B- to connecting element -D- of shaft to footwell flap.

i Note

- ◆ *If necessary, reach into vent and move flap -E- into position in which control motor can be attached.*
- ◆ *Check positioning of connecting element. It must engage in shaft of motor and there must not be any clearance between control motor shaft and connecting element.*
- Re-install components in reverse order of removal.
- Interrogate fault 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") .
- Perform basic setting and final control diagnosis for air conditioner ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .



11.5 Removing and installing rear footwell vent control motor - V112-

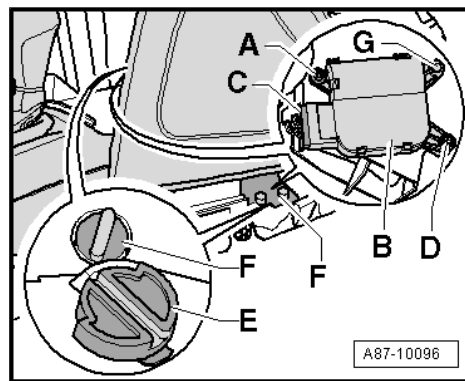
i Note

- ◆ *With the exception of the rear footwell vent control motor - V112- , the housings of the air conditioning unit control motors are currently identical. This control motor is fitted with a potentiometer with an adjustment range of 120 °; at the start of production the part number of this control motor has no index ⇒ Electronic parts catalogue .*
- ◆ *When removing, mark motor/flap connecting element to avoid interchanging with connecting elements of other control motors.*
- ◆ *Mark the control motor prior to removal. Pay attention to correct assignment on installation, as well as to the correct part number/index on replacement (the various control motors have different electrical values and part number indices with identical housing) ⇒ Electronic parts catalogue .*
- ◆ *In the event of fault "Upper or lower limit value exceeded", check motor/flap connecting element. It must be properly attached to motor and there must not be any clearance between control motor mount and connecting element.*

Removing

- Switch off ignition.
- Remove operating and display unit, Climatronic control unit - J255- ⇒ [page 96](#) .
- Remove lower right trim of centre console ⇒ General body repairs, interior; Rep. gr. 68

- If necessary, remove lower right holder -H- between central tube of dash panel and transmission tunnel (to provide better access) ⇒ General body repairs, interior; Rep. gr. 68 .
- If necessary, mark connector -C- to control motor (to prevent interchange with other identical connectors).
- Reach through mounting slot for operating and display unit, Climatronic control unit - J255- , and unplug connector -C- from rear footwell vent control motor - V112- .
- Reach through mounting slot for operating and display unit, Climatronic control unit - J255- , and remove bolt -A- (tightening torque 10 Ncm).
- Remove bolt -D- (from underneath by way of gap between dash panel fascia and transmission tunnel) (tightening torque 10 Ncm).
- Detach control motor -B-.
- Use screwdriver for example to carefully prise connecting element -E- off control motor -B-.



Installing

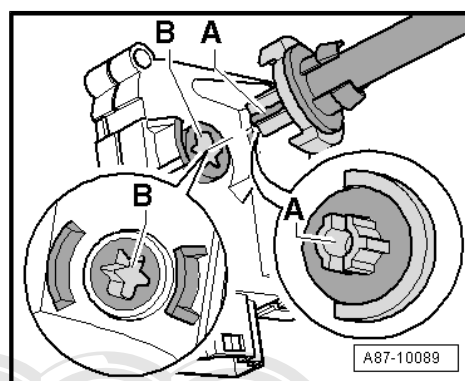
Install in reverse order of removal; note the following.

- Check position of control motor shaft -B- (must be in position shown).



Note

- ◆ Only attach connecting element -A- in the position that enables it to engage without exertion of force. If the connecting element can only be inserted with force, check the motor shaft -D- (it may be 180° out of position).
- ◆ If motor shaft -B- is not in the position shown (only position in which the connecting element can be attached), use an adapter cable, for example, ⇒ [page 40](#) or a test lead from the adapter set - V.A.G 1594/C- to connect contacts "5" and "6" of the control motor by way of a 5 A fuse to a 12 V battery. Turn control motor until shaft is in position shown (no force required to attach connecting element). Direction of rotation can be reversed by interchanging positive and negative.
- ◆ Control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. Consequently, voltage should only be applied with control motor detached if connecting element -A- has been attached or to move shaft to correct position if connecting element cannot be attached.
- ◆ Shaft may be incorrectly positioned if pre-tension is required to insert connecting element -A- in control motor.



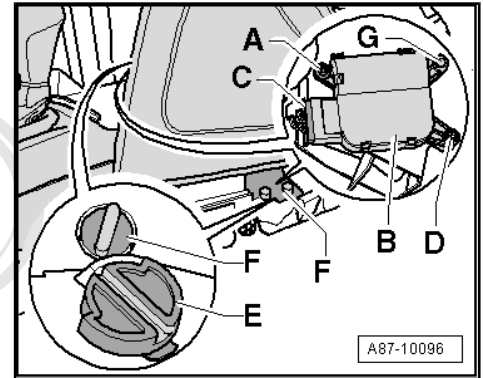
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- Move connecting element of rear footwell flap -F- into position so that it is aligned with groove in connecting element of control motor -E-.
- Insert control motor in mount -G- and join the two connecting elements -E- and -F-.

i Note

Check positioning of both connecting elements.

- Re-install components in reverse order of removal.
- Interrogate fault 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") .
- Perform basic setting and final control diagnosis for air conditioner ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .



11.6 Removing and installing front cold air flap control motor - V197-

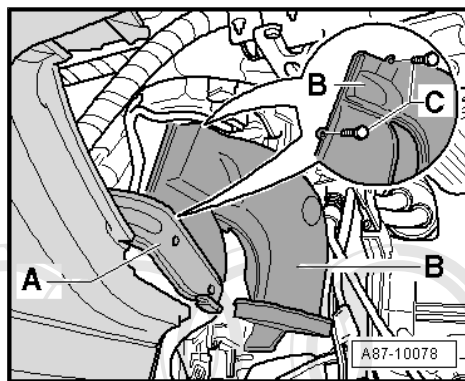
i Note

- ◆ *This control motor is fitted with a potentiometer with an adjustment range of 150 °; part number index at start of production: "B" ⇒ Electronic parts catalogue .*
- ◆ *When removing, mark motor/flap connecting element to avoid interchanging with connecting elements of other control motors.*
- ◆ *In the event of fault "Upper or lower limit value exceeded", check motor/flap connecting element. It must be properly attached to motor and there must not be any clearance between control motor mount and connecting element.*
- ◆ *Mark the control motor prior to removal. Pay attention to correct assignment on installation, as well as the correct part number/index on replacement (the various control motors have different electrical values and part number indices) ⇒ Electronic parts catalogue .*
- ◆ *This control motor actuates cold air flap (installed in air duct bypassing heat exchanger).*

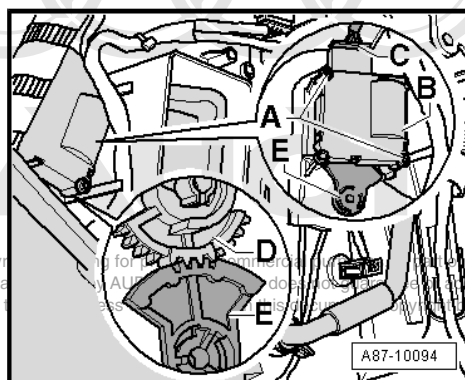
Removing

- Switch off ignition.
- Remove the glove compartment. ⇒ General body repairs, interior; Rep. gr. 70
- Remove lower right trim of centre console ⇒ General body repairs, interior; Rep. gr. 68

- On right side, remove holder for dash panel -A- and bolts -C-
⇒ General body repairs, interior; Rep. gr. 68 .
- Remove air duct to footwell vent -B- for front passenger's side.



- Mark connector -C- to control motor (to prevent interchange with other identical connectors).
- Unplug connector -C- from front cold air flap control motor - V197- .
- Remove bolts -A- (tightening torque 10 Ncm).
- Detach control motor -B-.
- Use a screwdriver to carefully prise the connecting element -D- off the control motor -B-.



Note

- ◆ Leave connecting element -E- to flap shaft in position in air conditioning unit.
- ◆ Remove connecting element to shaft of flap -E- ⇒ [page 252](#)

Installing

Install in reverse order of removal; note the following.

- Check position of control motor shaft -B- (must be in position shown).
- Attach connecting element -A- to control motor shaft -B-.

i Note

- ◆ Only attach connecting element -A- in the position that enables it to engage without exertion of force. If the connecting element can only be inserted with force, check the motor shaft -D- (it may be 180° out of position).
- ◆ Check positioning of connecting element. It must engage in shaft of motor and there must not be any clearance between control motor shaft and connecting element.
- ◆ If motor shaft -B- is not in the position shown (only position in which the connecting element can be attached), use an adapter cable, for example, ⇒ [page 40](#) or a test lead from the adapter set - V.A.G 1594/C- to connect contacts "5" and "6" of the control motor by way of a 5 A fuse to a 12 V battery. Turn control motor until shaft is in position shown (no force required to attach connecting element). Direction of rotation can be reversed by interchanging positive and negative.
- ◆ Control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. Consequently, voltage should only be applied with control motor detached if connecting element -A- has been attached or to move shaft to correct position if connecting element cannot be attached.
- ◆ Shaft may be incorrectly positioned if pre-tension is required to insert connecting element -A- in control motor.

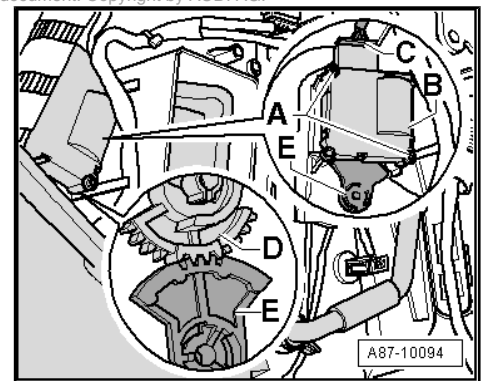
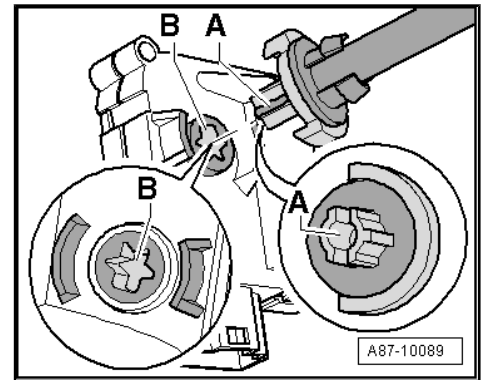
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- Install control motor -B-, paying attention to correct mutual positioning of the two connecting elements -D- and -E-.

i Note

In case of doubt regarding the correct mutual positioning of the two connecting elements -D- and -E-, use an adapter cable, for example, ⇒ [page 40](#) or a test lead from the adapter set - V.A.G 1594/C- to connect contacts "5" and "6" of the control motor by way of a 5 A fuse to a 12 V battery. Turn the control motor until an end position is reached (direction of rotation can be reversed by interchanging positive and negative) and in doing so observe the two connecting elements.

- Re-install components in reverse order of removal.
- Interrogate fault 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") .
- Perform basic setting and final control diagnosis for air conditioner ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .



11.7 Removing and installing indirect ventilation flap control motor - V213-



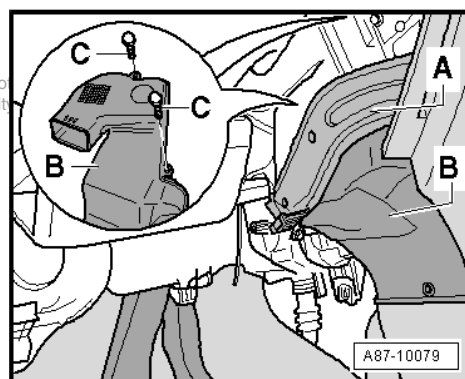
Note

- ◆ This control motor is fitted with a potentiometer with an adjustment range of 150 °; part number index at start of production: "B" ⇒ *Electronic parts catalogue* .
- ◆ This control motor is only installed in vehicles with a "Convenience" type air conditioner. This control motor is not fitted on vehicles with a "Basic" type air conditioner (opening in air conditioning unit is sealed off and flap is not fitted).
- ◆ When removing, mark motor/flap connecting element to avoid interchanging with connecting elements of other control motors.
- ◆ Mark the control motor prior to removal. Pay attention to correct assignment on installation, as well as the correct part number/index on replacement (the various control motors have different electrical values and part number indices) ⇒ *Electronic parts catalogue* .
- ◆ In the event of fault "Upper or lower limit value exceeded", check motor/flap connecting element. It must be properly attached to motor and there must not be any clearance between control motor mount and connecting element.

Removing

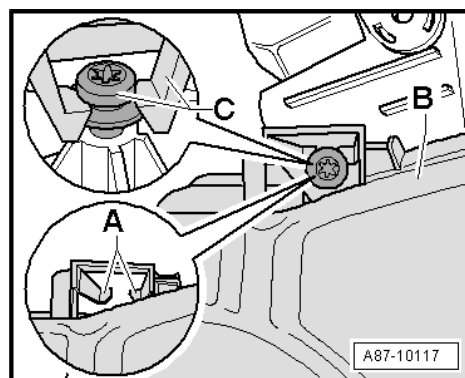
- Switch off ignition.
- Remove driver's storage compartment. ⇒ General body repairs, interior; Rep. gr. 70
- Remove lower left trim of centre console ⇒ General body repairs, interior; Rep. gr. 68
- On left side, remove holder for dash panel -A- and bolts -C- ⇒ General body repairs, interior; Rep. gr. 68 .
- Remove air duct to footwell vent -B- for driver's side.

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Note

- ◆ Depending on the vehicle equipment and the positional tolerance between the air conditioning unit and the bracket for the pedal cluster, removal of the footwell vent -B- for the driver's side may involve detaching the pedal cluster from the vehicle and sliding it slightly to the left ⇒ *Brake system; Rep. gr. 46* .
- ◆ In Model Year 2005, the air duct fastening to the footwell vent -B- has been modified (gradual introduction). Bolt -C- must then no longer be removed, and the air duct is clipped in via retainer tab -A-.



- Mark connector -C- to control motor (to prevent interchange with other identical connectors).
- Unplug connector -C- from indirect ventilation flap control motor - V213- .
- Carefully prise connecting element -D- off control motor.
- Release fastener -F- from connecting element -E- (on shaft to flap) and detach connecting elements to connecting rod -G-.
- Remove bolts -A- (tightening torque 10 Ncm).
- Detach control motor -B-.

Installing

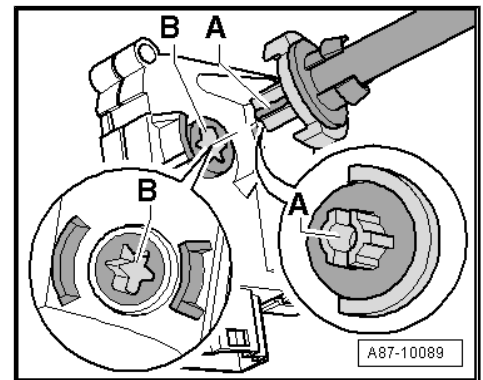
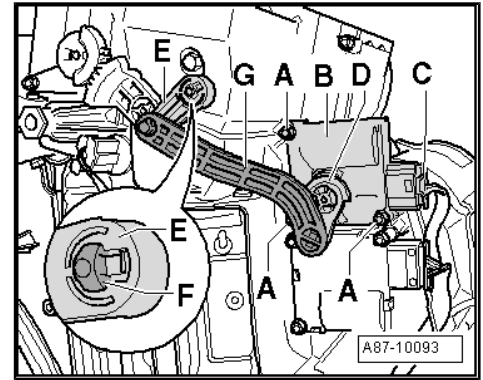
Install in reverse order of removal; note the following.

- Check position of control motor shaft -B- (must be in position shown).



Note

- ◆ Only attach connecting element -A- in the position that enables it to engage without exertion of force. If the connecting element can only be inserted with force, check the motor shaft -D- (it may be 180° out of position).
- ◆ If motor shaft -B- is not in the position shown (only position in which the connecting element can be attached), use an adapter cable, for example, [⇒ page 40](#) or a test lead from the adapter set - V.A.G 1594/C- to connect contacts "5" and "6" of the control motor by way of a 5 A fuse to a 12 V battery. Turn control motor until shaft is in position shown (no force required to attach connecting element). Direction of rotation can be reversed by interchanging positive and negative.
- ◆ Control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. Consequently, voltage should only be applied with control motor detached if connecting element -A- has been attached or to move shaft to correct position if connecting element cannot be attached.
- ◆ Shaft may be incorrectly positioned if pre-tension is required to insert connecting element -A- in control motor.



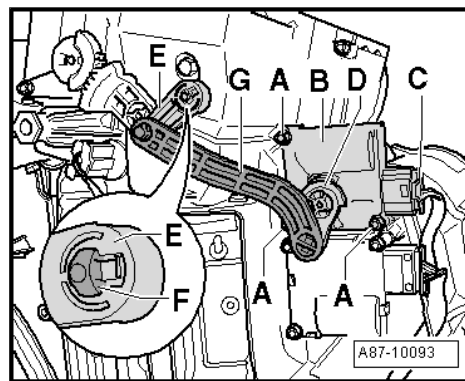
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- Install control motor -B-.
- Attach connecting element -E- on shaft to flap, taking care to ensure a firm connection to fastener -F-.
- Attach connecting element -D- at control motor shaft, taking care to ensure correct positioning and engagement in control motor shaft.



Note

Check positioning of connecting element. It must engage in shaft of motor and there must not be any clearance between control motor shaft and connecting element.



- Re-install components in reverse order of removal.
- Interrogate fault 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") .
- Perform basic setting and final control diagnosis for air conditioner ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .

11.8 Removing and installing front left chest vent control motor - V237- (air conditioner of "Convenience" type)



Note

- ◆ *This control motor is fitted with a potentiometer with an adjustment range of 120 °; part number index at start of production: "A" ⇒ Electronic parts catalogue .*
- ◆ *This control motor is only fitted at this location on vehicles with air conditioner of "Convenience" type. In vehicles with an air conditioner of "Basic" type, this control motor is installed on the right side of the air conditioning unit ⇒ [page 135](#) .*
- ◆ *There is no control motor at this location on vehicles with air conditioner of "Basic" type.*
- ◆ *On vehicles with "Basic" type air conditioner, flaps for front left and right chest vents are actuated by front left chest vent control motor - V237- (the two flaps are interconnected by a shaft ⇒ [page 254](#) , control motor is attached to right of air conditioning unit) ⇒ [page 135](#) .*
- ◆ *When removing, mark motor/flap connecting element to avoid interchanging with connecting elements of other control motors.*
- ◆ *Mark the control motor prior to removal. Pay attention to correct assignment on installation, as well as the correct part number/index on replacement (the various control motors have different electrical values and part number indices) ⇒ Electronic parts catalogue .*
- ◆ *In the event of fault "Upper or lower limit value exceeded", check motor/flap connecting element. It must be properly attached to motor and there must not be any clearance between control motor mount and connecting element.*

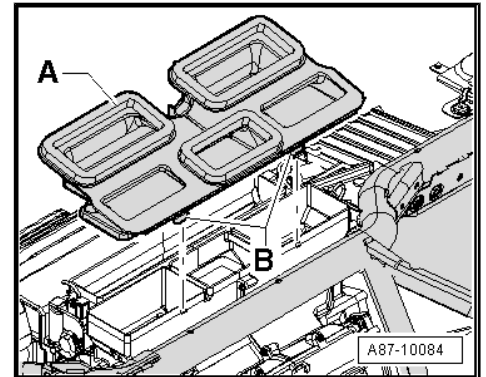
Removing

- Switch off ignition.
- Remove entire dash panel fascia ⇒ General body repairs, interior; Rep. gr. 70

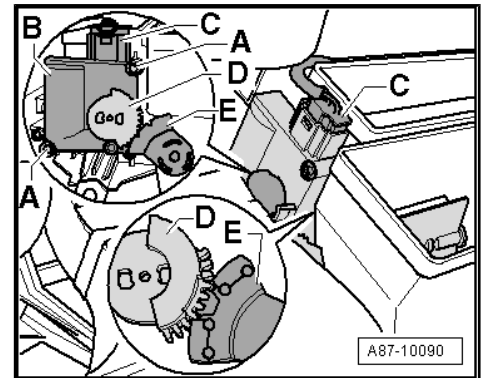
Note

If applicable, obtain radio anti-theft code before disconnecting battery.

- Release fasteners -B- and remove air duct -A-.



- If necessary, mark connector -C- to front left chest vent control motor - V237- to prevent interchange with other identical connectors.
- Unplug connector -C- from front left chest vent control motor - V237-.
- Remove bolts -A- (e.g. using ratchet ring spanner - T40083- or ring spanner bent to appropriate shape) (tightening torque 10 Ncm).
- Use a screwdriver to carefully prise connecting element -D- off control motor -B- and remove control motor.



Note

- ◆ Leave connecting element -E- to shaft of flap -F- in position on air conditioning unit.
- ◆ Removing connecting element to shaft of flap -E- ⇒ [page 252](#)

Installing

Install in reverse order of removal; note the following.



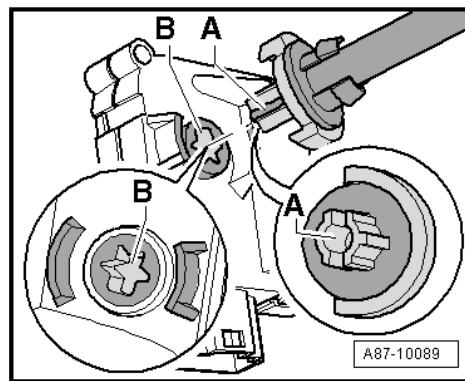
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- Check position of control motor shaft -B- (must be in position shown).



Note

- ◆ Only attach connecting element -A- in the position that enables it to engage without exertion of force. If the connecting element can only be inserted with force, check the motor shaft -D- (it may be 180° out of position).
- ◆ If motor shaft -B- is not in the position shown (only position in which the connecting element can be attached), use an adapter cable, for example, ⇒ [page 40](#) or a test lead from the adapter set - V.A.G 1594/C- to connect contacts "5" and "6" of the control motor by way of a 5 A fuse to a 12 V battery. Turn control motor until shaft is in position shown (no force required to attach connecting element). Direction of rotation can be reversed by interchanging positive and negative.
- ◆ The shaft of the control motor -B- has no stop. It rotates constantly if voltage is applied between contacts "5" and "6". Consequently, voltage should only be applied with control motor detached if connecting element -A- has been attached or to move shaft to correct position if connecting element cannot be attached.
- ◆ Shaft may be incorrectly positioned if pre-tension is required to insert connecting element -A- in control motor.

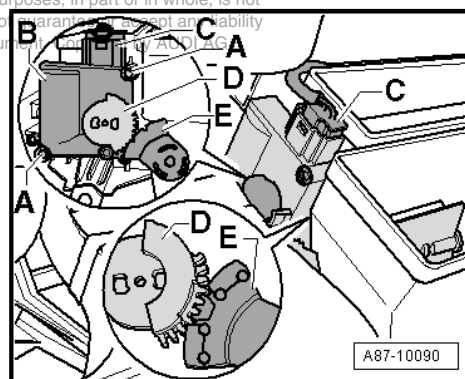


- Install control motor -B-.
- Attach connecting element -D- of control motor shaft, paying attention to correct mutual positioning of the two connecting elements -D- and -E-.



Note

- ◆ If necessary, reach into vent and move flap -F- into correct position.
 - ◆ Check positioning of connecting element. It must engage in shaft of motor and there must not be any clearance between control motor shaft and connecting element.
 - ◆ In case of doubt regarding the correct mutual positioning of the two connecting elements -D- and -E-, use an adapter cable, for example, ⇒ [page 40](#) or a test lead from the adapter set - V.A.G 1594/C- to connect contacts "5" and "6" of the control motor by way of a 5 A fuse to a 12 V battery. Turn the control motor until an end position is reached (direction of rotation can be reversed by interchanging positive and negative) and in doing so observe the two connecting elements.
- Re-install components in reverse order of removal.
 - Interrogate fault 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") .
 - Perform basic setting and final control diagnosis for air conditioner ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .



11.9 Removing and installing front right chest vent control motor - V238- (or front left chest vent control motor - V237-)

Different designations, front right chest vent control motor - V238- ("Convenience" version) and front left chest vent control motor - V237- (fitted on right on "Basic" version)



Note

- ◆ This control motor is fitted with a potentiometer with an adjustment range of 120 °; part number index at start of production: "A" ⇒ Electronic parts catalogue .
- ◆ Control motor designation is different for air conditioners of "Convenience" and "Basic" types.
- ◆ Designation front right chest vent control motor - V238- only applies to air conditioners of "Convenience" type. On vehicles with air conditioner of "Basic" type, the designation for this motor is front left chest vent control motor - V237- .
- ◆ The designation for this control motor is governed by the type of air conditioner (operating and display unit, Climatronic control unit - J255-). The designation in the Guided Fault Finding routine and the current flow diagram differs for the "Convenience" and "Basic" versions.
- ◆ On vehicles with "Basic" type air conditioner, flaps for front left and right chest vents are actuated by front left chest vent control motor - V237- (control motor is attached to right of air conditioning unit, the two flaps are interconnected by a shaft ⇒ [page 254](#)).
- ◆ When removing, mark motor/flap connecting element to avoid interchanging with connecting elements of other control motors.
- ◆ Mark the control motor prior to removal. Pay attention to correct assignment on installation, as well as the correct part number/index on replacement (the various control motors have different electrical values and part number indices) ⇒ Electronic parts catalogue .
- ◆ In the event of fault "Upper or lower limit value exceeded", check motor/flap connecting element. It must be properly attached to motor and there must not be any clearance between control motor mount and connecting element.

Removing

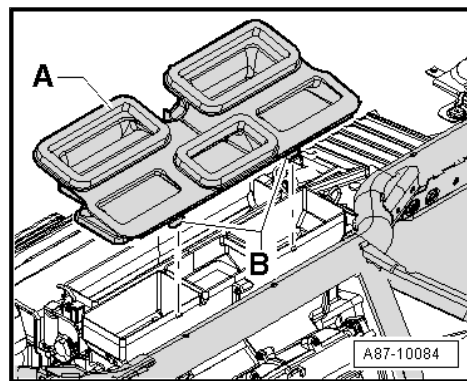
- Switch off ignition.
- Remove entire dash panel fascia ⇒ General body repairs, interior; Rep. gr. 70



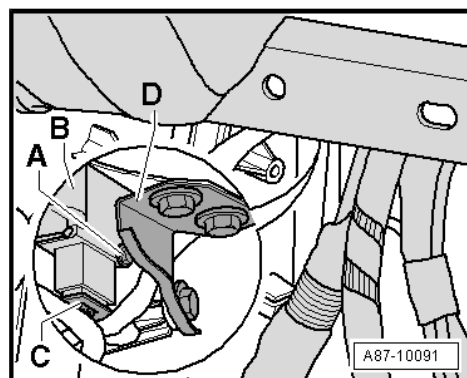
Note

- ◆ On right-hand drive vehicles, central tube of dash panel must additionally be detached from vehicle or removed ⇒ General body repairs, interior; Rep. gr. 70 .
- ◆ If applicable, obtain radio anti-theft code before disconnecting battery.

- Release fasteners -B- and remove air duct -A-.



- Remove the holder -D- between the air conditioning unit and the central tube of the dash panel.
- If necessary, mark connector -C- to control motor (to prevent interchange with other identical connectors).
- Unplug connector -C- from control motor.
- Remove bolt -A- (e.g. using ratchet ring spanner - T40083-) (tightening torque 10 Ncm).

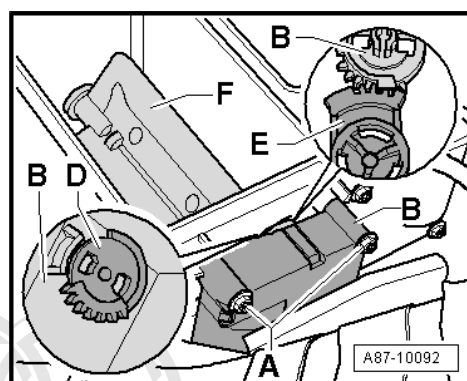


- Remove bolts -A- (tightening torque 10 Ncm).
- Detach control motor -B-.
- Use a screwdriver to carefully prise the connecting element -D- off the control motor -B-.



Note

- ◆ Leave connecting element -E- to shaft of flap -F- in position on air conditioning unit.
- ◆ Remove connecting element to shaft of flap -E- ⇒ [page 252](#)



Installing

Install in reverse order of removal; note the following.

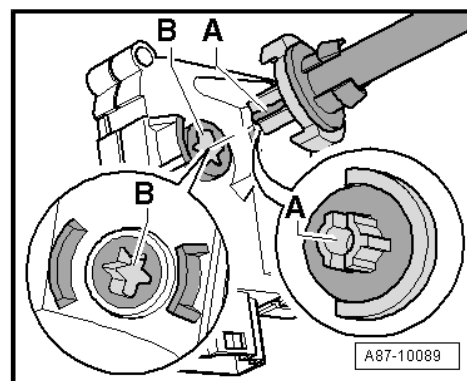


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- Check position of control motor shaft -B- (must be in position shown).
- Attach connecting element -A- to control motor shaft -B-.

i Note

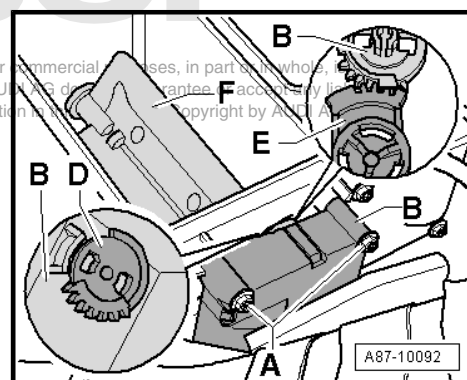
- ◆ Only attach connecting element -A- in the position that enables it to engage without exertion of force. If the connecting element can only be inserted with force, check the motor shaft -D- (it may be 180° out of position).
- ◆ Check positioning of connecting element. It must engage in shaft of motor and there must not be any clearance between control motor shaft and connecting element.
- ◆ If motor shaft -B- is not in the position shown (only position in which the connecting element can be attached), use an adapter cable, for example, ⇒ [page 40](#) or a test lead from the adapter set - V.A.G 1594/C- to connect contacts "5" and "6" of the control motor by way of a 5 A fuse to a 12 V battery. Turn control motor until shaft is in position shown (no force required to attach connecting element). Direction of rotation can be reversed by interchanging positive and negative.
- ◆ The shaft of the control motor -B- has no stop. It rotates constantly if voltage is applied between contacts "5" and "6". Consequently, voltage should only be applied with control motor detached if connecting element -A- has been attached or to move shaft to correct position if connecting element cannot be attached.
- ◆ Shaft may be incorrectly positioned if pre-tension is required to insert connecting element -A- in control motor.



- Install control motor -B-, paying attention to correct mutual positioning of the two connecting elements -D- and -E-.

i Note

- ◆ If necessary, reach into vent and move flap -F- into correct position.
- ◆ In case of doubt regarding the correct mutual positioning of the two connecting elements -D- and -E-, use an adapter cable, for example, ⇒ [page 40](#) or a test lead from the adapter set - V.A.G 1594/C- to connect contacts "5" and "6" of the control motor by way of a 5 A fuse to a 12 V battery. Turn the control motor until an end position is reached (direction of rotation can be reversed by interchanging positive and negative) and in doing so observe the two connecting elements.

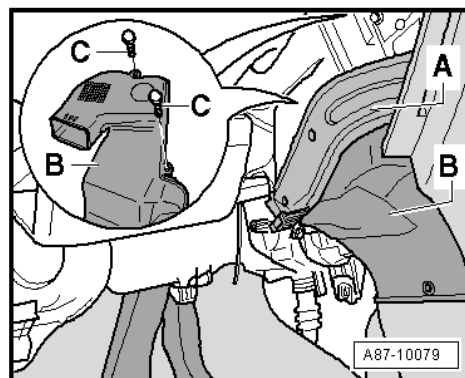


- Re-install components in reverse order of removal.
- Interrogate fault memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .
- Perform basic setting and final control diagnosis for air conditioner ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .

11.10 Removing and installing left vent temperature sender - G150-

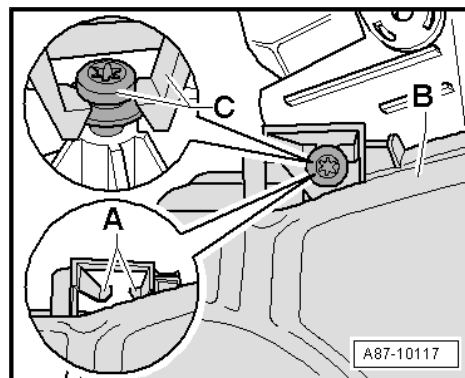
Removing

- Switch off ignition.
- Remove driver's storage compartment. ⇒ General body repairs, interior; Rep. gr. 70
- Remove lower left trim of centre console ⇒ General body repairs, interior; Rep. gr. 68
- On left side, remove holder for dash panel -A- and bolts -C- ⇒ General body repairs, interior; Rep. gr. 68 .
- Remove air duct to footwell vent -B- for driver's side.



Note

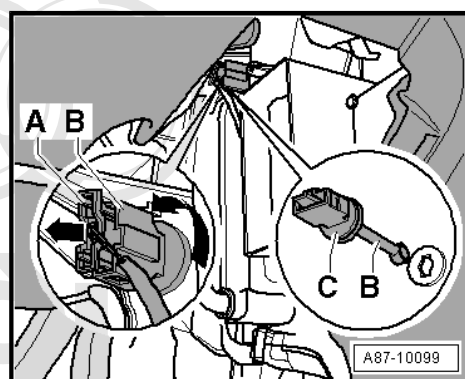
- ♦ Depending on the vehicle equipment and the positional tolerance between the air conditioning unit and the bracket for the pedal cluster, removal of the footwell vent -B- for the driver's side may involve detaching the pedal cluster from the vehicle and sliding it slightly to the left ⇒ Brake system; Rep. gr. 46 .
- ♦ In Model Year 2005, the air duct fastening to the footwell vent -B- has been modified (gradual introduction). Bolt -C- must then no longer be removed, and the air duct is clipped in via retainer tab -A-.



- Mark connector -A- to left vent temperature sender - G150- to prevent interchange with other identical connectors.
- Unplug connector -A- from left vent temperature sender - G150- .
- Give left vent temperature sender - G150- -B- approx. 90° turn in direction of arrow.
- Take left vent temperature sender - G150- -B- out of air conditioning unit.

Installing

Install in reverse order of removal; note the following.



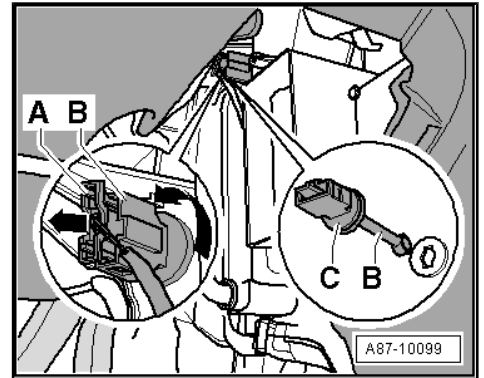
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- Insert left vent temperature sender - G150- -B- in correct position in mounting bracket -D- of air conditioning unit
- Check correct positioning of left vent temperature sender - G150- in mount -D-.

Note

- ◆ *Left vent temperature sender - G150- -B- can only be inserted in one position in mount -D-; turn through 180° if necessary.*
- ◆ *If left vent temperature sender - G150- does not fit firmly in mount -D-, an O-ring -C- can additionally be fitted if necessary.*

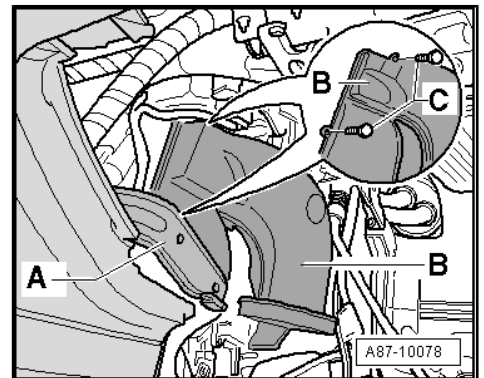
- Re-install components in reverse order of removal.
- Interrogate fault memory of operating and display unit (Climatronic control unit - J255-) and erase any faults displayed
⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") .



11.11 Removing and installing right vent temperature sender - G151-

Removing

- Switch off ignition.
- Remove the glove compartment. ⇒ General body repairs, interior; Rep. gr. 70
- Remove lower right trim of centre console ⇒ General body repairs, interior; Rep. gr. 68
- On right side, remove holder for dash panel -A- and bolts -C- ⇒ General body repairs, interior; Rep. gr. 68 .
- Remove air duct to footwell vent -B- for front passenger's side.

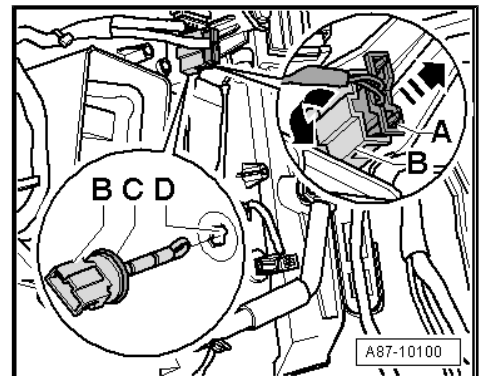


- Mark connector -A- to right vent temperature sender - G151- to prevent interchange with other identical connectors.
- Unplug connector -A- from right vent temperature sender - G151- .
- Give right vent temperature sender - G151- -B- approx. 90° turn in direction of arrow.
- Take right vent temperature sender - G151- -B- out of air conditioning unit.

Installing

Install in reverse order of removal; note the following.

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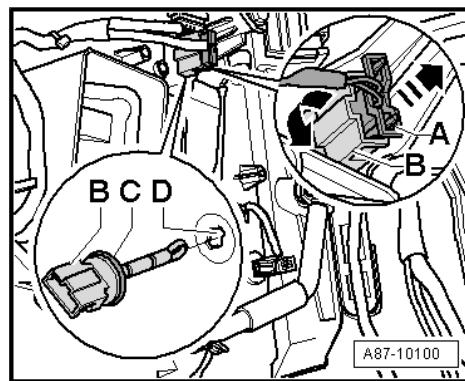


- Insert the right vent temperature sender - G151- -B- in the correct position in mounting bracket -D- of air conditioning unit.
- Check correct positioning of right vent temperature sender - G151- in mounting bracket -D-.



Note

- ◆ *Right vent temperature sender - G151- -B- can only be inserted in one position in mounting bracket -D-; turn through 180° if necessary.*
- ◆ *If right vent temperature sender - G151- does not fit firmly in mounting bracket -D-, an O-ring -C- can additionally be fitted if necessary.*
- Re-install components in reverse order of removal.
- Interrogate fault 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") .



11.12 Removing and installing centre vent temperature sender - G191-



Note

- ◆ *As of Model Year 2006, the vent temperature sender, centre - G191- is being gradually discontinued. Vehicles with no such temperature sender are only to be fitted with operating and display units, Climatronic control unit - J255- with part number 4F1 820 043 as of index "M" (for left-hand drive vehicles) or 4F2 820 043 as of index "F" (for right-hand drive vehicles) ⇒ Electronic parts catalogue .*
- ◆ *If vehicles with no centre vent temperature sender - G191- are fitted with an operating and display unit, Climatronic control unit - J255- with part no. 4F1 820 043 up to and including index "L" (for left-hand drive vehicles) or 4F2 820 043 up to and including index "E" (for right-hand drive vehicles), the absence of the sender is displayed as a fault.*
- ◆ *Operating and display units, Climatronic control unit - J255- with part no. 4F1 820 043 as of index "M" (for left-hand drive vehicles) or 4F2 820 043 as of index "F" (for right-hand drive vehicles) have gradually also been introduced since 05.2005 for vehicles with vent temperature sender, centre - G191- (with these operating and display units, the sender measured value is no longer required for control purposes and is therefore not evaluated).*

Removing

- Switch off ignition.
- Remove operating and display unit, Climatronic control unit - J255- ⇒ [page 96](#) .

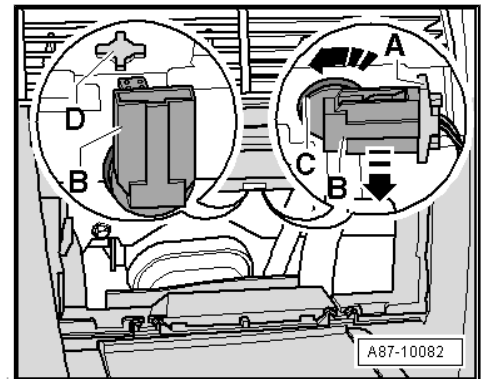
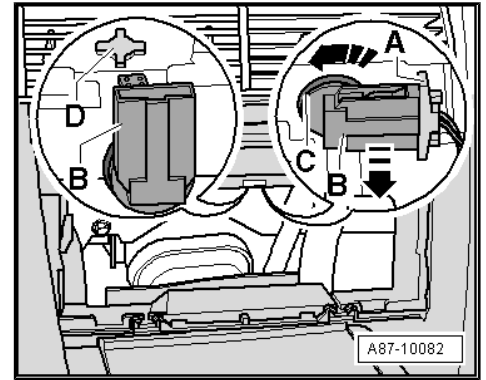
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- Reach through mounting slot for operating and display unit, Climatronic control unit - J255- , and unplug connector -A-.
- Turn vent temperature sender -B- approx. 90° in direction of arrow.
- Pull vent temperature sender -B- out of air conditioning unit.

Installing

Install in reverse order of removal; note the following.

- Check seal -C- for damage and correct positioning.
- Insert centre vent temperature sender - G191- -B- in correct position in mounting bracket -D- of air conditioning unit
- Re-install components in reverse order of removal.
- Interrogate fault 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") .

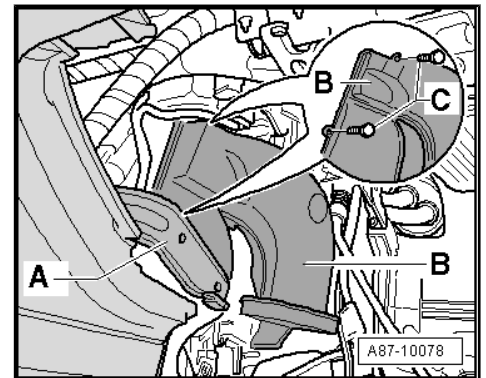


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11.13 Removing and installing evaporator output temperature sender - G263-

Removing

- Switch off ignition.
- Remove the glove compartment. ⇒ General body repairs, interior; Rep. gr. 70
- Remove lower right trim of centre console ⇒ General body repairs, interior; Rep. gr. 68
- On right side, remove holder for dash panel -A- and bolts -C- ⇒ General body repairs, interior; Rep. gr. 68 .
- Remove air duct to footwell vent -B- for front passenger's side.

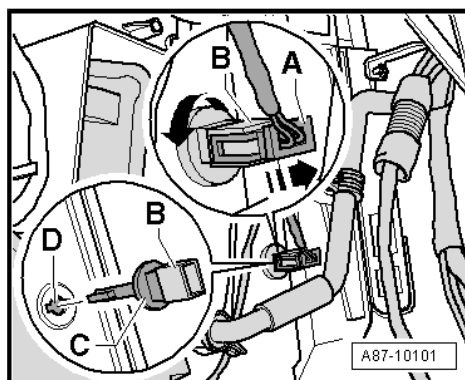
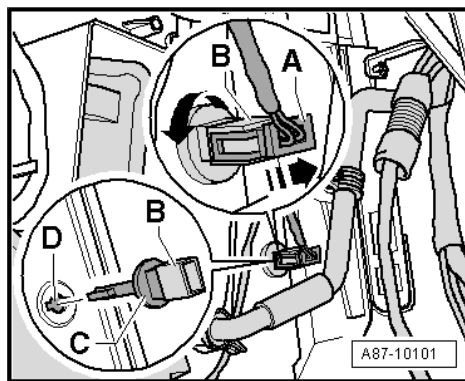


- Mark connector -A- to evaporator outflow temperature sender - G263- to prevent interchange with other identical connectors.
- Unplug connector -A- from evaporator output temperature sender - G263- .
- Turn evaporator output temperature sender - G263- -B- approx. 90° in direction of -arrow-.
- Take evaporator output temperature sender - G263- -B- out of air conditioning unit.

Installing

Install in reverse order of removal; note the following.

- Check seal -C- for damage and correct positioning.
- Insert evaporator outflow temperature sender - G263- -B- in correct position in mounting bracket -D- of air conditioning unit
- Re-install components in reverse order of removal.
- Interrogate fault 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") .



11.14 Removing and installing supplementary air heater element - Z35-



Note

- ◆ *Check operation of supplementary air heater element - Z35- ⇒ [page 112](#) .*
- ◆ *Vehicles with diesel engine are currently fitted with an electric supplementary heater (heat energy is added to the air flow immediately after exiting from the air conditioning unit heat exchanger). ⇒ Audi Sales Range*
- ◆ *Depending on the vehicle control system, vehicles with diesel engine and "auxiliary heater" as optional extra may not be fitted with an electric supplementary heater. On such vehicles, this function is assumed by the auxiliary heater, which operates as a fuel-driven supplementary heater (by adding additional heat energy to the coolant) ⇒ Audi Sales Range and ⇒ Auxiliary heater; Rep. gr. 82 .*
- ◆ *Vehicles with petrol engine are not fitted with an additional heater at present.*
- ◆ *Different replacement air conditioning units are available (with/ without opening for a supplementary heater element - Z35-) ⇒ [Electronic parts catalogue](#) .*

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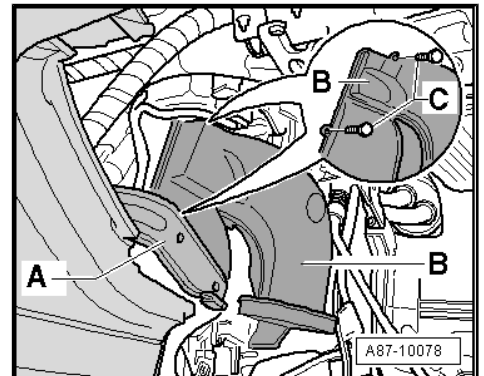
Removing



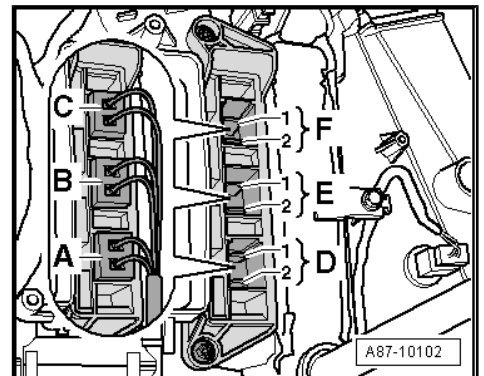
Note

- ◆ *On right-hand drive vehicles, removal of heater element for supplementary air heater - Z35- additionally involves unfastening steering column at front and setting it down ⇒ Running gear; Rep. gr. 48 . All other operations are essentially the same.*
- ◆ *Supplementary air heater element - Z35- is also removed to right from air conditioning unit on right-hand drive vehicles.*

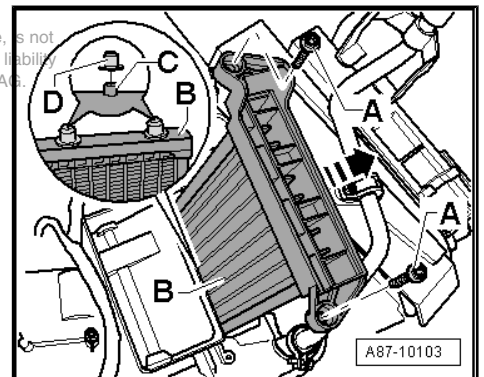
- Switch off ignition.
- Remove the glove compartment. ⇒ General body repairs, interior; Rep. gr. 70
- Remove lower right trim of centre console ⇒ General body repairs, interior; Rep. gr. 68
- On right side, remove holder for dash panel -A- and bolts -C- ⇒ General body repairs, interior; Rep. gr. 68 .
- Remove air duct to footwell vent -B- for front passenger's side.



- Unplug connectors -A-, -B- and -C- from supplementary air heater element - Z35- -D-.



- Remove bolts -A- (tightening torque 10 Ncm) and pull heater element for supplementary air heater - Z35- -B- out of air conditioning unit.

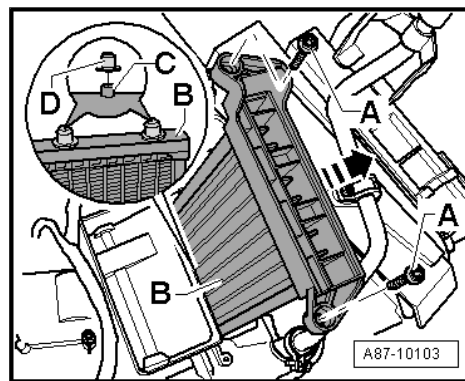


Installing

Install in reverse order of removal; note the following.

- Only install supplementary heater element -B- in air conditioning unit with rubber mounts -D- at lugs -C-.

Re-install all components removed in reverse order.



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12 Removing and installing heat exchanger of air conditioning unit

Special tools and workshop equipment required

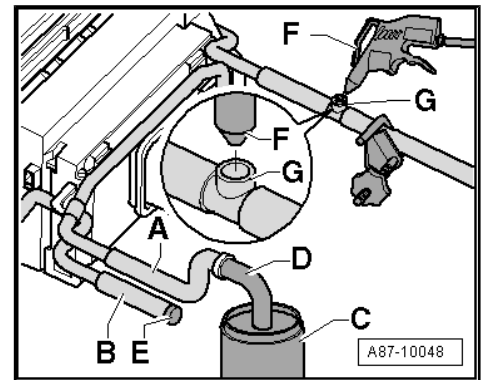
- ◆ Hose clamps up to Ø 25 mm - 3094- or hose clamps up to Ø 40 mm - 3093-
- ◆ Commercially available compressed-air gun with rubber mouthpiece
- ◆ Hand pump - V.A.G 1274- (and appropriate adapters)
- ◆ Preparations for removing heat exchanger ⇒ [page 145](#)
- ◆ Removing and installing heat exchanger ⇒ [page 148](#)

12.1 Preparations for removing heat exchanger



Note

- ◆ With ignition on, valves of pump valve unit (left heat regulation valve - N175- and right heat regulation valve - N176-) are constantly actuated as a function of temperature setting on operating and display unit, Climatronic control unit - J255- . Valves may therefore be warm or even hot despite engine being cold.
- ◆ The coolant pipe to the hose -A- (supply to heat exchanger on driver's side) can only be replaced with the air conditioning unit removed (it crosses the air conditioning unit in the passenger compartment). The coolant pipe to the hose -B- (supply to heat exchanger on front passenger's side) can be replaced with the air conditioning unit in position after detachment from the heat exchanger. The coolant pipe to the vent connection -G- (return from heat exchanger) can also be replaced with the air conditioning unit in position after removing the accelerator pedal module, detaching the pipe from the heat exchanger and unfastening the holders.



- Switch off ignition.
- Dissipate the pressure in the coolant circuit by opening the cap at the coolant expansion tank. ⇒ Relevant Engine, Mechanics Workshop Manual; Repair group 19
- Remove plenum chamber cover.

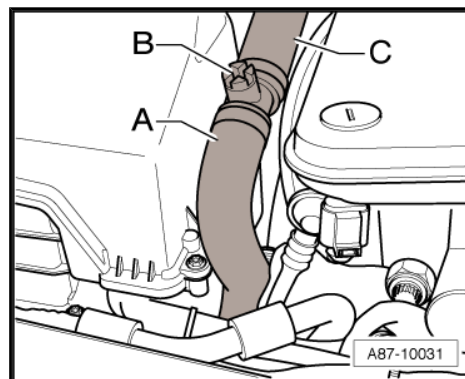


WARNING

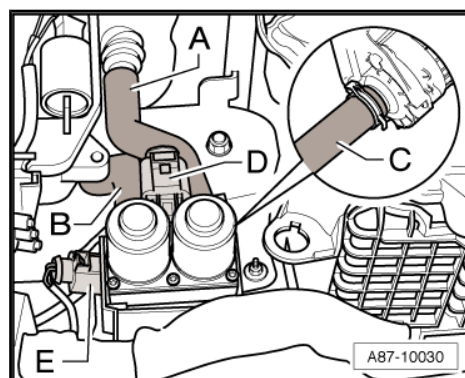
The two valves of the pump valve unit may be hot even if the engine is cold.

- Remove wiper arms and scuttle panel trim ⇒ Rep. gr. 92 ; Electrical system
- Remove strut brace if necessary (not installed in all vehicles). ⇒ Rep. gr. 40 ; Running gear

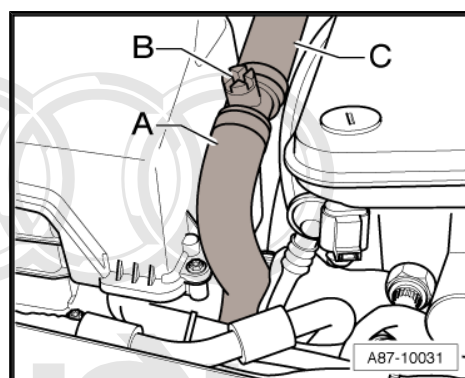
- Pinch off coolant hose -A- (return from heat exchanger to engine), e.g. with hose clamps up to Ø 25 mm - 3094- .



- Mark arrangement of coolant hoses -A- (supply to left heat exchanger) and -B- (supply to right heat exchanger).
- Unplug connector -D- (to left heat regulation valve - N175- and right heat regulation valve - N176-).
- Unplug connector -E- (to coolant circulation pump - V50-).
- Pinch off coolant hose -C- (supply from engine to coolant circulation pump - V50-), e.g. with hose clamps up to Ø 25 mm - 3094- .
- Detach coolant hoses -A- and -B- from connections of pump valve unit.

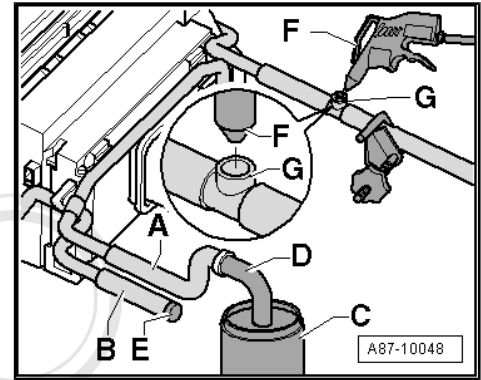


- Remove screw plug from bleeder valve -B-.

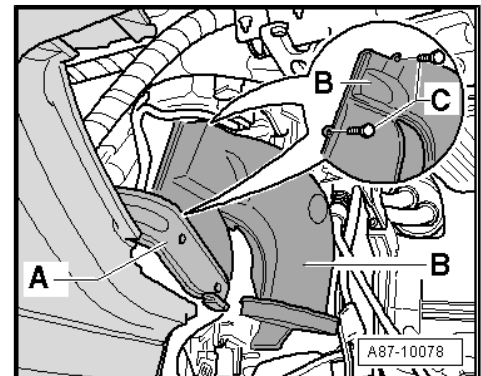


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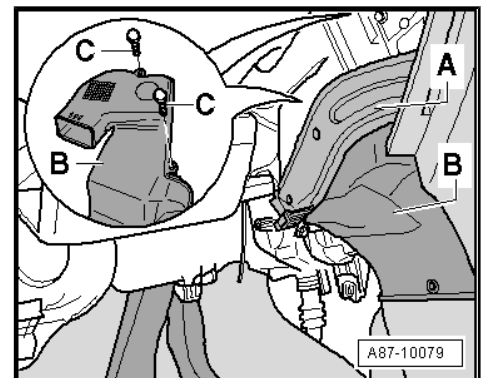
- Connect hose section -D- (as extension) to coolant hose -A-.
- Seal coolant hose -B- (e.g. with plug -E-).
- Place vessel -C- beneath extension hose -D-.
- Use compressed-air gun (with rubber mouthpiece) -F- to carefully blow coolant by way of open connection for bleeder valve -G- out of "driver's" heat exchanger (into vessel -C-).
- Remove plug -E- from coolant hose -B- and insert it in coolant hose -A-.
- Connect hose section -D- (as extension) to coolant hose -B-.
- Use compressed-air gun (with rubber mouthpiece) -F- to carefully blow coolant by way of open connection for bleeder valve -G- out of "front passenger's" heat exchanger (into vessel -C-).
- Remove glove compartment and lower dash panel trim (on driver's side) ⇒ General body repairs, interior; Rep. gr. 68 .
- Depending on vehicle equipment, remove electrical control units and possibly corresponding holders impeding heat exchanger removal (e.g. front information control unit -J523- and corresponding holder) ⇒ Electrical system; Rep. gr. 91
- Remove centre console side trim on right and left ⇒ General body repairs, interior; Rep. gr. 68



- On right side, remove holder -A- for glove compartment ⇒ General body repairs, interior; Rep. gr. 68 .
- Unscrew bolts -C-.
- Remove air duct to footwell vent -B- for front passenger's side.



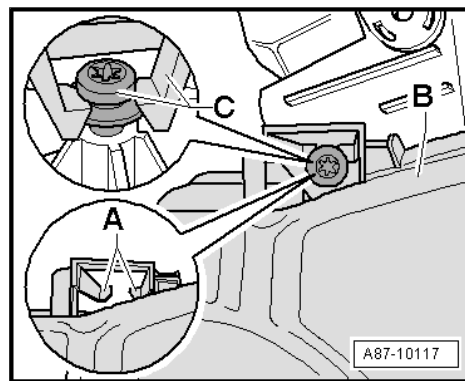
- On left side, remove holder -A- for trim beneath dash panel ⇒ General body repairs, interior; Rep. gr. 68 .
- Unscrew bolts -C-.
- Remove accelerator pedal module ⇒ Brake system; Rep. gr. 46 .
- Remove air duct to footwell vent -B- for driver's side.





Note

- ◆ Depending on the vehicle equipment and the positional tolerance between the air conditioning unit and the bracket for the pedal cluster, removal of the footwell vent -B- for the driver's side may involve detaching the pedal cluster from the vehicle and sliding it slightly to the left ⇒ Brake system; Rep. gr. 46 .
- ◆ In Model Year 2005, the air duct fastening to the footwell vent -B- has been modified (gradual introduction). Bolt -C- must then no longer be removed, and the air duct is clipped in via retainer tab -A-.



12.2 Removing and installing heat exchanger

- ◆ Notes for right-hand drive vehicles ⇒ [page 148](#)
- ◆ Removing heat exchanger ⇒ [page 148](#)
- ◆ Installing heat exchanger ⇒ [page 150](#)

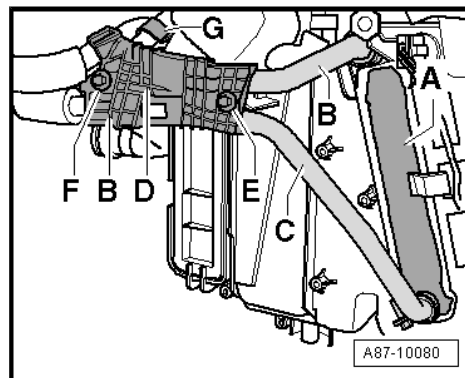
12.2.1 Notes for right-hand drive vehicles



Note

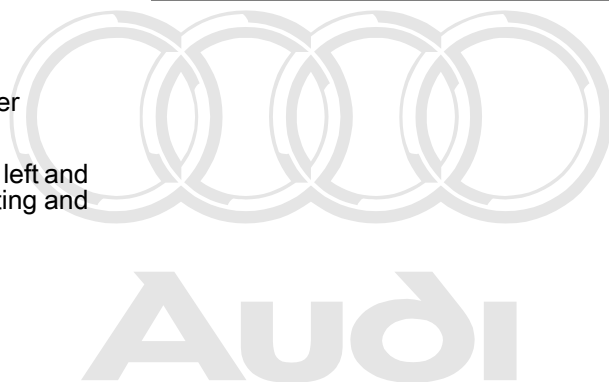
As opposed to left-hand drive vehicles, heat exchanger is not removed to right on right-hand drive vehicles, but rather to left out of air conditioning unit. On right side of heat exchanger there is only a connection at the bottom.

- ◆ On right-hand drive vehicles, coolant pipes are routed to left of air conditioning unit into plenum chamber. Removal of heat exchanger -A- thus involves the following operations differing from left-hand drive vehicles:
 - Remove bolts -E- and -F- and detach holder -D- (to enable coolant pipes to be moved).
 - Slacken off bolt at holder -G- (for coolant return pipe -B-).
 - Remove grommet at penetration for coolant return pipe -B- into plenum chamber.
 - Perform remaining operations as for left-hand drive vehicles (largely identical).

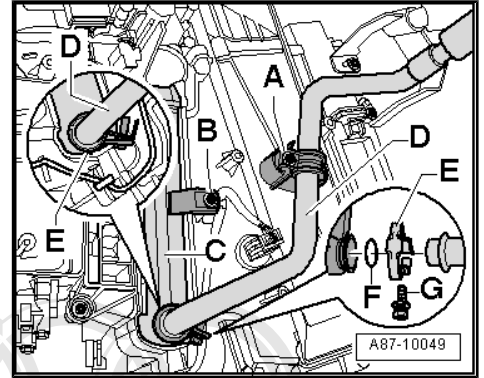


12.2.2 Removing heat exchanger

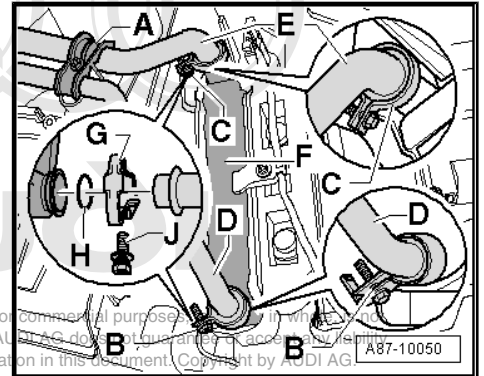
- Perform preparatory work for removing heat exchanger ⇒ [page 145](#) .
- Protect floor covering in area of transmission tunnel on left and right beneath heat exchanger with impermeable sheeting and absorbent paper.



- Remove holder -A- for coolant pipe -D- and holder -B- for heat exchanger -C-.
- Slacken off bolt -G- at clamp -E- for coolant pipe -D-.
- Remove clamp -E-.
- Place vessel beneath connection for coolant pipe -D- at heat exchanger.
- Take coolant pipe -D- out of heat exchanger.

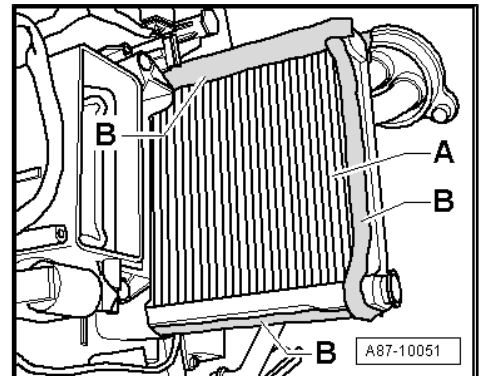


- Remove holder -A- for coolant pipes -D- and -E-.
- Remove clamps -B- and -C-.
- Place vessel beneath connection for coolant pipe -D- at heat exchanger.
- Take coolant pipe -D- out of heat exchanger.
- Take the coolant pipe -E- out of the heat exchanger.



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- Slide heat exchanger -A- to right out of air conditioning unit.



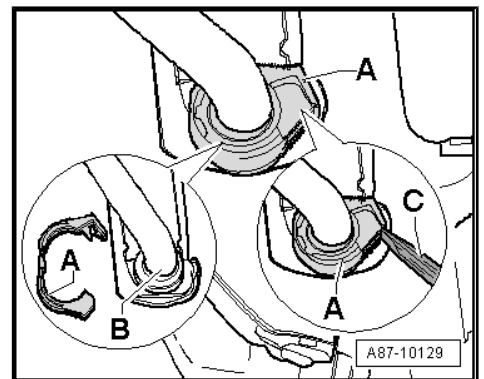
Note

Instead of a screw-type clip, vehicles with a radial seal at the coolant pipes -B- to the heat exchanger may be fitted with a plastic clamp -A-, which is to be unfastened using a screwdriver -C- for example.

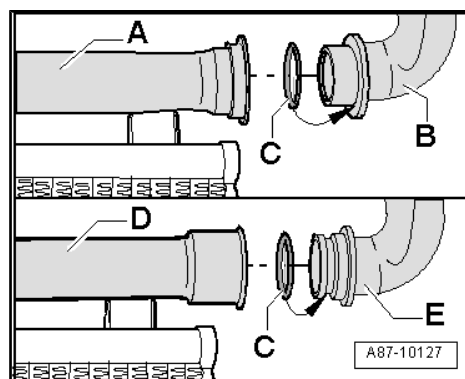


WARNING

A plastic clamp -A- is only to be fitted on vehicles with a radial seal at the coolant pipes -B-.

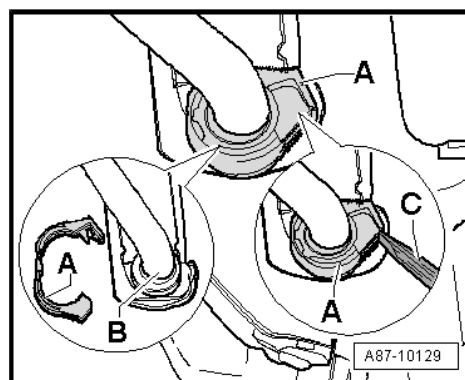


12.2.3 Installing heat exchanger



Note

- ◆ There are different versions of the heat exchanger and the corresponding coolant pipes. In Model Year 2006, the seal between the connections at the heat exchanger and the coolant pipes was gradually switched from an axial/radial seal -A- and -B- to a radial seal -D- and -E-. Pay attention to the correct version on replacing the heat exchanger ⇒ *Electronic parts catalogue*.
- ◆ Instead of a screw-type clip, vehicles with a radial seal at the coolant pipes -B- to the heat exchanger may be fitted with a plastic clamp -A- ⇒ *Electronic parts catalogue*.



WARNING

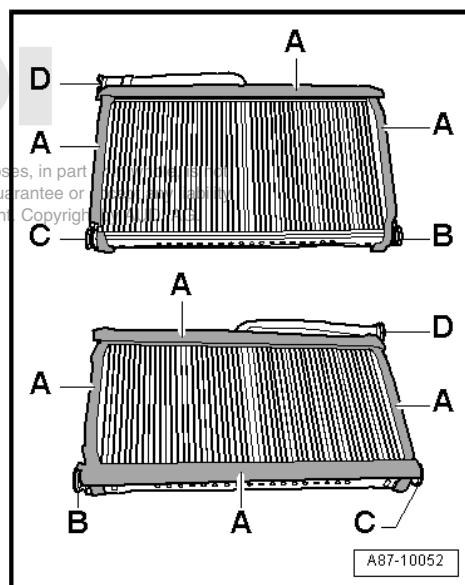
A plastic clamp -A- is only to be fitted on vehicles with a radial seal at the coolant pipes -B-.

- ◆ Check the following before installing heat exchanger:
 - Foam seals -A- of heat exchanger for damage and proper attachment (foam seals must not become detached on fitting heat exchanger)

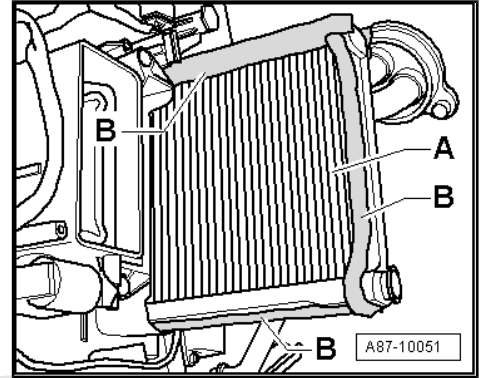


Note

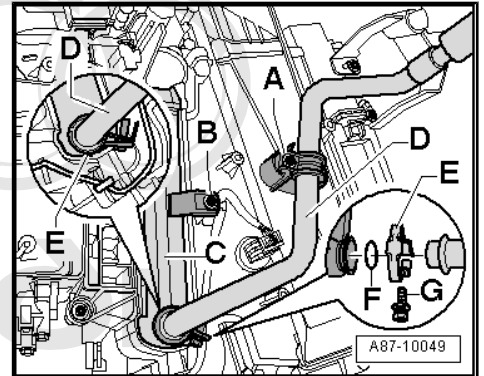
- ◆ The seal may curl up when it is inserted if it has not been bonded on properly.
- ◆ Cold air may flow past the heat exchanger if the seal is damaged or not properly fitted.
- ◆ Always replace sealing rings and clamps. ⇒ *Electronic parts catalogue*
- Check connections at heat exchanger -B-, -C- and -D- for damage or contamination.
- By way of heat exchanger mounting slot, check air conditioning unit for dirt or residual coolant and clean if necessary.



- Working from right, slide heat exchanger -A- into air conditioning unit such that it is flush with housing of air conditioning unit on right and left. When doing so, make sure seal -B- does not curl up or become damaged.



- Install holder -B- for heat exchanger -C-.
- Remove bolt -G- from new clamp -E-.
- Position new clamp -E- on coolant pipe such that clamp can be fastened as shown.
- Moisten sealing ring -F- with small quantity of coolant and attach sealing ring to coolant pipe -D-.
- Insert coolant pipe -D- in heat exchanger.
- Press coolant pipe -D- into heat exchanger and fit clamp -E- as shown at joint with heat exchanger.



Note

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Clamp -E- engages on being pressed together.

- Fit bolt -G- in clamp and secure clamp by tightening bolt.
- Install holder -A- for coolant pipe -D-.

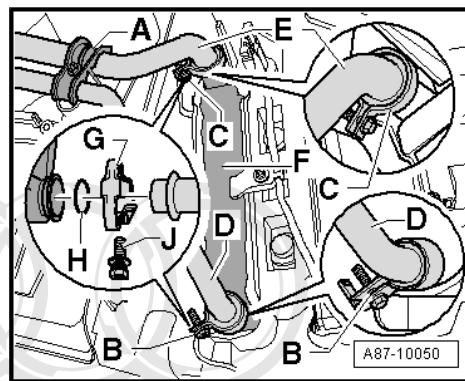
- Install coolant pipe -E- in heat exchanger as described for coolant pipe on right side.



Note

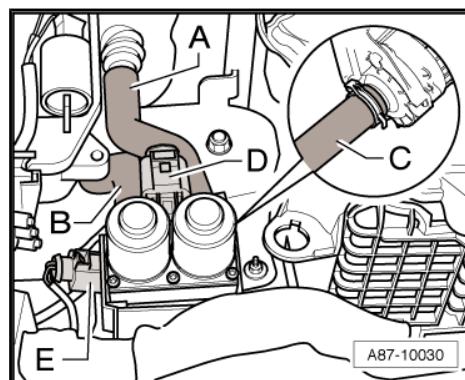
Sealing rings and clamp for coolant pipes -D- and -E- have different diameters

- Install coolant pipe -D- in heat exchanger in same manner as described for coolant pipe on right side.
- Install holders -A- for coolant pipes.
- Check position of grommets in coolant pipe penetrations to plenum chamber.



Note

- ◆ *Bleed cooling circuit before plugging in 2-pin connector to coolant circulation pump - V50- of pump valve unit.*
- ◆ *Coolant circuit must be bled before starting up coolant circulation pump - V50- of pump valve unit.*
- ◆ *Dry running of pump in pump/valve unit will lead to destruction.*
- Re-install all components removed in reverse order except plenum chamber cover, glove compartment and driver's storage compartment.
- Filling and bleeding coolant circuit ⇒ Engine, mechanics; Rep. gr. 19
- After bleeding, check cooling system for leaks, paying particular attention to coolant pipe joints to heat exchanger ⇒ Engine, mechanics; Rep. gr. 19 .
- Following installation, check correct positioning of grommet between engine compartment and plenum chamber at coolant hose -C-.
- Check pump valve unit; it must not make contact with other components (noise).
- Plug in connectors -D- to left heat regulation valve - N175- and right heat regulation valve - N176- and -E- to coolant circulation pump - V50- after bleeding coolant circuit.
- Remove residual coolant from plenum chamber.
- Install the remaining removed components in reverse sequence.
- Interrogate fault 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") .



Note

When bleeding the coolant circuit, take particular care to ensure that the heat exchangers are 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.

13 Block diagram of air distribution and air routing in air conditioning unit and air intake unit

- ◆ Air inlet and vents of air conditioning unit ➔ [page 153](#)
- ◆ Air routing in air intake unit and air conditioning unit ➔ [page 154](#)
- ◆ Routing of air flow and air distribution in passenger compartment ➔ [page 155](#)



Note

- ◆ *Fitting locations of individual components not installed in passenger compartment ➔ [page 21](#).*
- ◆ *Fitting locations of individual components in passenger compartment ➔ [page 75](#).*

13.1 Air inlets and vent outlets of air conditioning unit

1 - Air conditioning unit

- ☐ Different versions depending on vehicle model and equipment (operating and display unit, Climatronic control unit - J255- of "Basic" or "Convenience" type, left or right-hand drive, with/without supplementary heater element - Z35-) ➔ Electronic parts catalogue
- ☐ Components of air conditioning unit ➔ [page 83](#)
- ☐ Air routing in passenger compartment ➔ [page 155](#)
- ☐ Removing and installing air conditioning unit ➔ [page 236](#)

2 - To centre dash panel vent (chest vent)

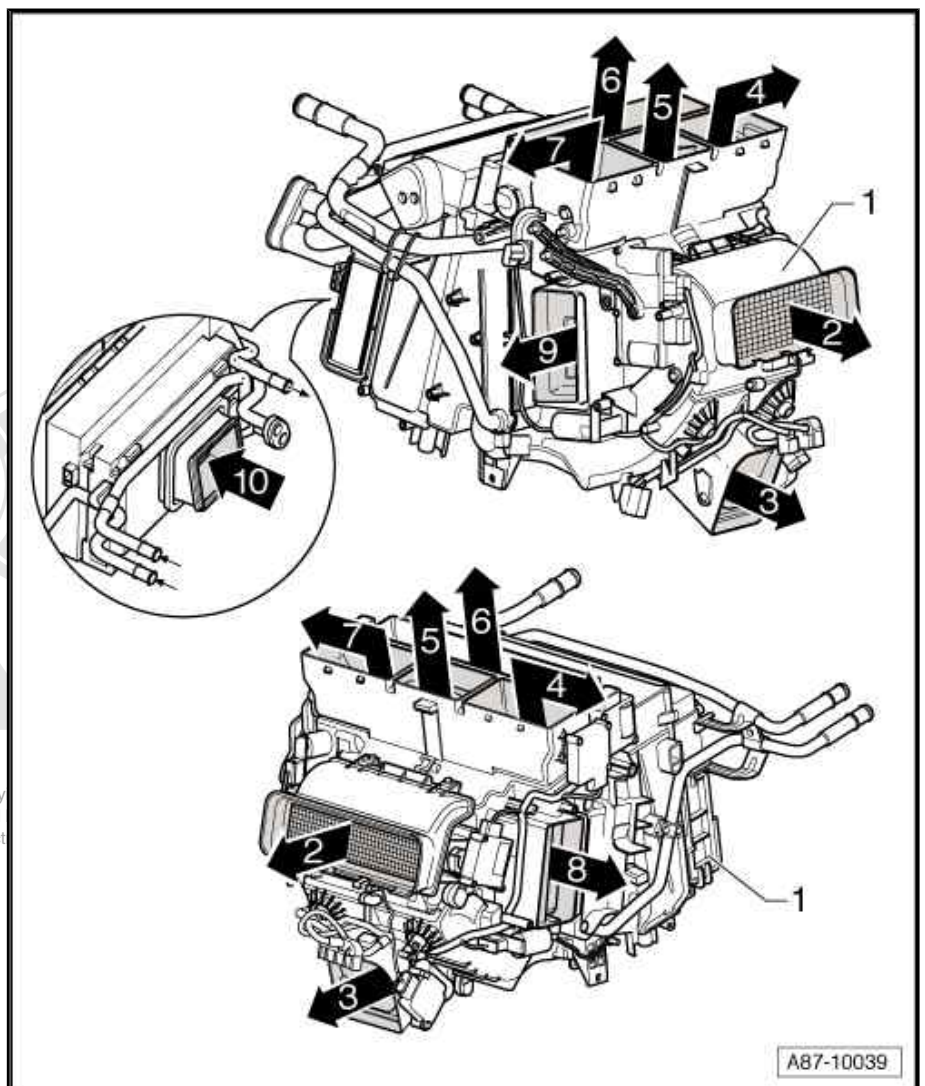
3 - To vent in rear centre console (rear footwell vent)

4 - To dash panel vent (right-side)

- ☐ Via air duct in dash panel to right dash panel vent (chest vent)

5 - To indirect ventilation vent

- ☐ Via air ducts in dash panel to vent in upper dash panel trim
- ☐ Air only emerges via these vents in vehicles with operating and display unit, Climatronic control unit - J255- of "Convenience" type. The opening in



the air conditioning unit is sealed in vehicles with an operating and display unit, Climatronic control unit - J255- of "Basic" type (different air conditioning unit versions).

- ❑ Flap in air conditioning unit is opened if operating and display unit, Climatronic control unit - J255- of "Convenience" type is set to "air to dash panel chest vents", for example

6 - To dash panel defroster vent

- ❑ Via air ducts in dash panel to windscreen and vents in left and right front doors

7 - To dash panel vent (left-side)

- ❑ Via air duct in dash panel to left dash panel vent (chest vent)

8 - To right footwell vents

9 - To left footwell vents

10 - Air inlet from air intake unit

13.2 Air routing in air intake unit and air conditioning unit

1 - Plenum chamber (engine compartment)

2 - Passenger compartment

3 - Air intake unit

4 - Air conditioning unit

5 - Section through air intake unit

- ❑ Sectional view shows air intake unit as if it were cut away at this line

6 - Fresh-air intake from plenum chamber

- ❑ In fresh-air mode, air is drawn in beneath plenum chamber cover

7 - Recirculated-air intake behind dash panel

- ❑ In recirculated-air mode, air is drawn in via opening in plenum chamber wall beneath dash panel

8 - Air outlet from air intake unit into air conditioning unit

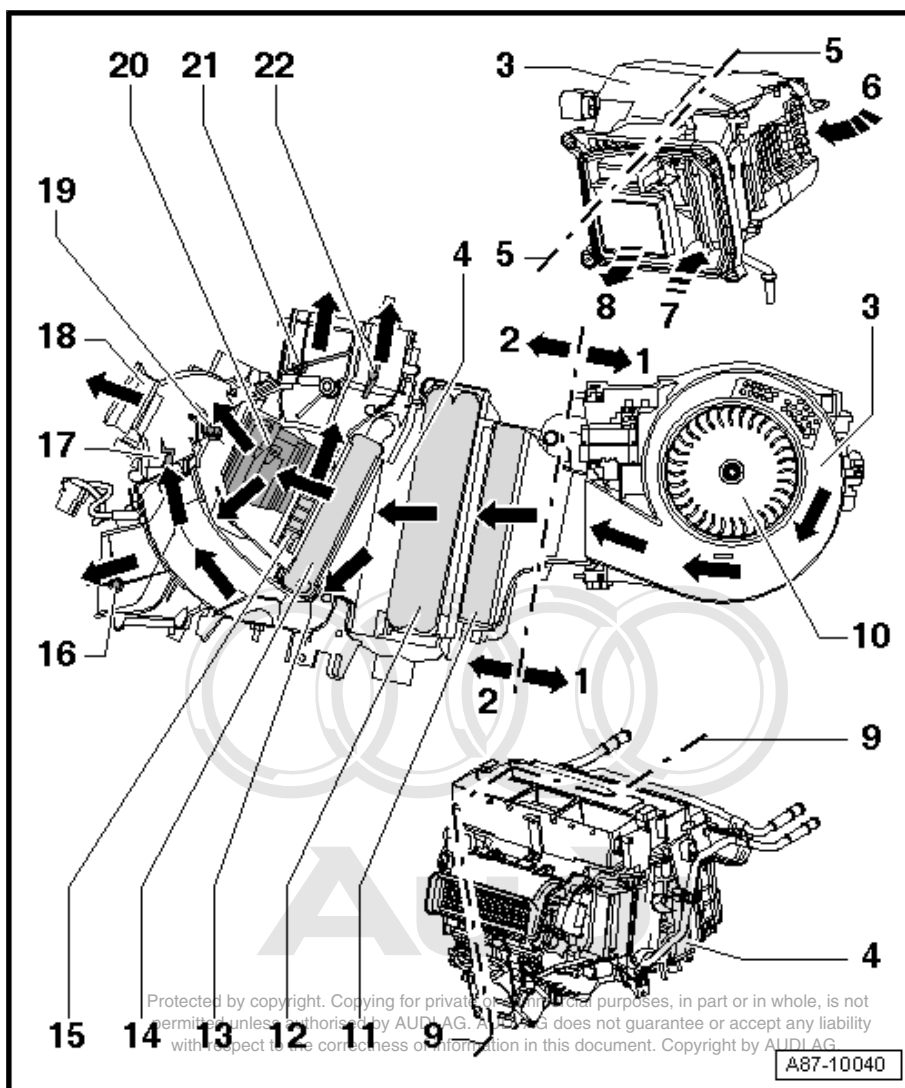
- ❑ An air duct grommet is fitted between air conditioning unit and opening in plenum chamber wall

9 - Section through air conditioning unit

- ❑ Sectional view shows air conditioning unit as if it were cut away at this line

10 - Fresh air blower - V2-

- ❑ Removing and installing ⇒ [page 42](#)



11 - Dust and pollen filter

- ☐ Observe replacement intervals ⇒ Maintenance tables
- ☐ Different versions depending on vehicle equipment and production period ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 88](#)

12 - Evaporator

13 - Cold air duct

- ☐ This duct routes air past heat exchanger to centre dash panel vent

14 - Heat exchanger for heater

- ☐ Removing and installing ⇒ [page 145](#)

15 - Supplementary air heater element - Z35-

- ☐ Only fitted on diesel models.
- Only fitted on certain vehicle models with diesel engine and “auxiliary heater” as optional extra
- ☐ Removing and installing ⇒ [page 142](#)

16 - To vent in rear centre console (rear footwell vent)

- ☐ Also to the vents in the “B-pillars” (only provided on vehicles with an operating and display unit, Climatronic control unit - J255- of “Convenience” type)

17 - Cold air flap

- ☐ This flap is actuated by front cold air flap control motor - V197-

18 - To dash panel vent (centre)

19 - Flap for centre vent

- ☐ This flap is actuated by central vents control motor - V102-

20 - To left footwell vents

21 - To dash panel vent (right-side)

- ☐ Via air duct in dash panel to right dash panel vent

22 - To dash panel defroster vent

- ☐ Via air ducts in dash panel to windscreen and vents in left and right front doors

13.3 Routing of air flow and air distribution in passenger compartment



Note

- ◆ *Air intake and routing of air flow in air conditioning unit*
⇒ [page 153](#)
- ◆ *Fitting locations of individual components in passenger compartment* ⇒ [page 75](#).

1 - Air conditioning unit

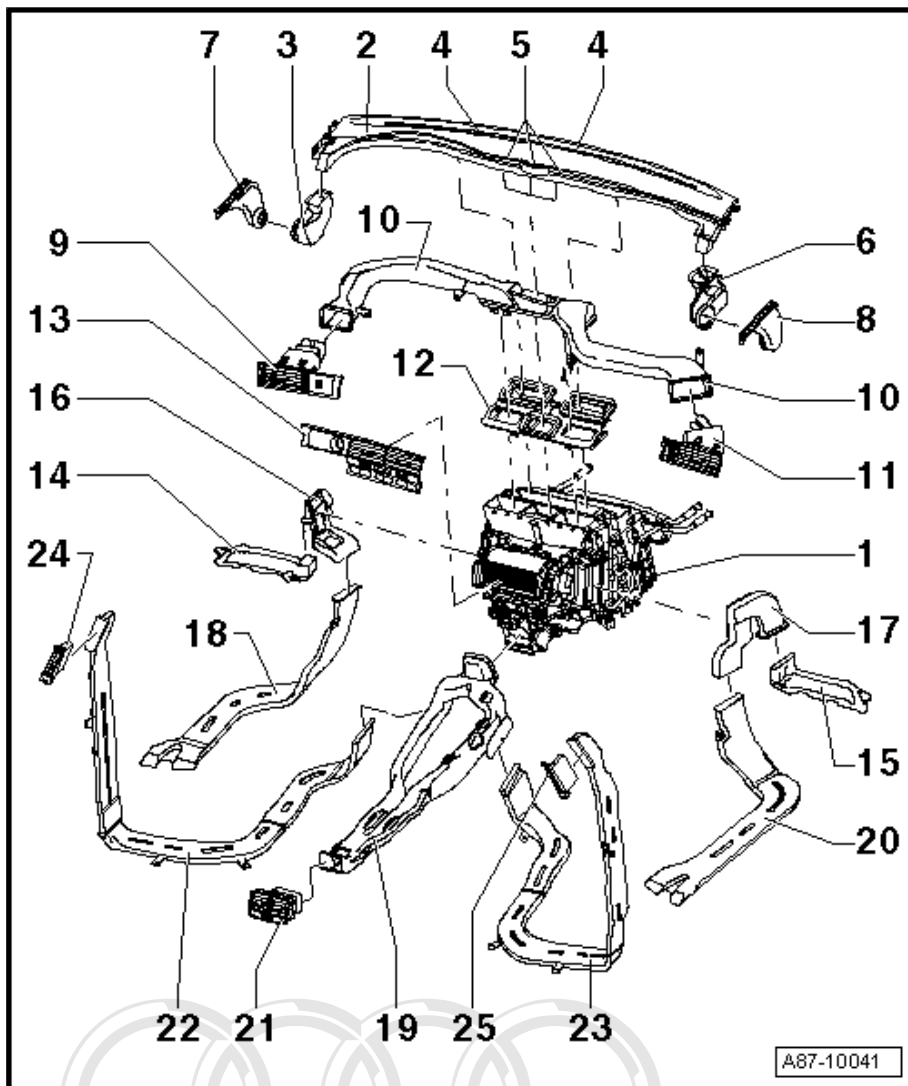
- ❑ Different versions (operating and display unit, Climatronic control unit - J255- of "Basic" or "Convenience" type, left or right-hand drive vehicle, vehicle without/with supplementary heater element - Z35-) ⇒ Electronic parts catalogue
- ❑ Components of air conditioning unit ⇒ [page 83](#)

Air routing in air intake unit and air conditioning unit
⇒ [page 154](#)

- ❑ Removing and installing air conditioning unit
⇒ [page 236](#)

2 - Dash panel air duct

- ❑ To windscreen "defrost" vent, to vents in front doors
- ❑ In addition to indirect ventilation vents on vehicles with operating and display unit, Climatronic control unit - J255- of "Convenience" type
- ❑ Air duct forms part of dash panel and cannot be replaced separately
⇒ General body repairs, interior; Rep. gr. 70
- ❑ Removing and installing dash panel trim and vents ⇒ General body repairs, interior; Rep. gr. 70



3 - To intermediate piece to vent in front left door

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

4 - Vent to windscreen "Defrost"

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

5 - Indirect ventilation vent

- ❑ Air only emerges via these vents in vehicles with operating and display unit, Climatronic control unit - J255- of "Convenience" type, the opening in the air conditioning unit is sealed on vehicles with an operating and display unit, Climatronic control unit - J255- of "Basic" type (different air conditioning unit versions)
- ❑ Via air ducts in dash panel to vent in upper dash panel trim

6 - To intermediate piece to vent in front right door

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

7 - Intermediate piece to vent in front left door

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

8 - Intermediate piece to vent in front right door

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

9 - Left dash panel vent (chest vent)

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

10 - Air duct to left and right dash panel vents

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

11 - Right dash panel vent (chest vent)

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

12 - Centre dash panel vent (chest vent)

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

13 - Intermediate piece to dash panel air ducts

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

14 - Front left footwell vent

- ☐ Footwell vent is part of driver's storage compartment

15 - Front right footwell vent

- ☐ Footwell vent is part of glove compartment/corresponding trim

16 - Intermediate piece to left footwell vents

17 - Intermediate piece to right footwell vents

18 - Footwell vent (rear left)

- ☐ Air emerges beneath seat

19 - Air duct to vent in rear centre console (rear footwell vent)

- ☐ On vehicles with an operating and display unit, Climatronic control unit - J255- of "Convenience" type provided in addition to the vents in the "B-pillars"
- ☐ On vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type, connections for air ducts to vents in "B-pillars" are sealed

20 - Footwell vent (rear left)

- ☐ Air emerges beneath seat

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21 - Vent in centre console (rear footwell vent)

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

22 - Air duct to vent in left "B-pillar"

- ☐ Only fitted in operating and display unit, Climatronic control unit - J255- of "Convenience" type.

23 - Air duct to vent in left "B-pillar"

- ☐ Only fitted in operating and display unit, Climatronic control unit - J255- of "Convenience" type.

24 - Vent in left "B-pillar"

- ☐ Only fitted in operating and display unit, Climatronic control unit - J255- of "Convenience" type.
- ☐ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70

25 - Vent in left "B-pillar"

- ☐ Only fitted in operating and display unit, Climatronic control unit - J255- of "Convenience" type.
- ☐ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70

14 Checking cooling output of air conditioner

Special tools and workshop equipment required

- ◆ Vehicle diagnostic, testing and information system - VAS 5051- (or Service Information System - VAS 5052-) ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051
- ◆ Commercially available thermometer (for temperature measurement; if applicable use thermometer with 2 probes for simultaneous measurement of temperature e.g. on right and left)
- ◆ Test requirements ⇒ [page 158](#)
- ◆ Checking cooling output ⇒ [page 159](#)
- ◆ Perform fault finding if results do not match specifications ⇒ [page 165](#)
- ◆ Perform fault finding if temperature increases downstream of evaporator ⇒ [page 167](#)

14.1 Test requirements:

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- ◆ Ambient temperature above 15°C
 - ◆ Radiator and condenser clean (clean if necessary)
 - ◆ Poly V-belt for compressor drive is OK and correctly tensioned, pulley is actually driving compressor (vehicles with 4-cyl. engine or 6-cyl. engine) ⇒ [page 16](#) .
 - ◆ Compressor drive unit correctly installed, compressor actually being driven (vehicles with 8 or 10-cyl. engine) ⇒ [page 202](#) .
 - ◆ All air ducts, covers and seals OK and fitted properly
 - ◆ Air flow through dust and pollen filter not impeded by dirt ⇒ [page 88](#) .
 - ◆ Vehicle not exposed to direct sunlight
 - ◆ Engine at operating temperature
 - ◆ Fault memory of operating and display unit (Climatronic control unit - J255-) interrogated and erased, basic setting performed ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051
 - ◆ Encoding and adaption of 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
 - ◆ Make the following settings on operating and display unit, Climatronic control unit - J255- of "Basic" type:
 - Lowest possible temperature setting for driver's and front passenger's side (both rotary temperature controls in "left stop" position)
 - Compressor on ("Econ" function not active or "A/C" function active)
 - Rotary air distribution control in position "A" (automatic air distribution)

- Rotary fresh air blower speed control in position “A” (automatic regulation of fresh air blower speed)
- ◆ Make the following settings on operating and display unit, Climatronic control unit - J255- of “Convenience” type:
 - “Auto” mode
 - “LO” temperature setting (for driver's and front passenger's side)
 - Compressor on (“Econ” function not active or “A/C” function active)
- ◆ Check the following functions with engine running:
 - Operation of radiator fans - V7- (speed governed by pressure in refrigerant circuit and engine coolant temperature)

 Note

Depending on the version of the operating and display unit, Climatronic control unit - J255- , the request is made at a specific pressure in the refrigerant circuit or as soon as the compressor is switched on regardless of the pressure.

- Fresh air blower - V2- running at maximum speed
- Switching of air conditioner to recirculated air mode (approx. 1 minute after starting engine, air flow/fresh-air flaps are closed, recirculated-air flap is opened and air is drawn in by fresh air blower - V2- from passenger compartment beneath dash panel)
- Coolant circulation pump - V50- not running
- Left heat regulation valve - N175- and right heat regulation valve - N176- closed (coolant hoses/coolant pipes to heating system heat exchangers in air conditioning unit cool down)

 Note

If one of these test requirements is not satisfied, interrogate the fault memory, perform final control diagnosis and read out the measured value block of the operating and display unit, Climatronic control unit - J255- ⇒ “Guided Fault Finding” function of vehicle diagnostic, testing and information system VAS 5051.

14.2 Checking cooling output

Test requirements met ⇒ [page 158](#)

- **Measure the ambient temperature (must be above 15 °C).**
- Close doors, bonnet, windows and sunroof.
- Open all dash panel vents.
- Switch on ignition.
- Set “Econ” mode on the operating and display unit, Climatronic control unit - J255- of “Basic” type (or deactivate “A/C” mode).
- Set “Econ” mode on vehicles with operating and display unit, Climatronic control unit - J255- of “Convenience” type by pressing the “Econ” button or using the rotary knob/pushbutton of the MMI operating unit ⇒ Owner's Manual and ⇒ operating instructions for “Infotainment/MMI” (or disable “A/C” mode).



Note

"Econ" or "A/C" mode is active when the lamp in the corresponding button is lit.

- On vehicles with air conditioner of "Convenience" type, close vents in "B" pillars.
- On the MMI terminal, set the temperature for the adjustable centre vent to "Warm" (on vehicles with an air conditioner of "Convenience" type).
- Start engine.
- Initialise Guided Fault Finding for air conditioner ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .
- In the "Reading measured value block" function, select the display group with the following values (actuation of the air conditioner compressor regulating valve - N280- and measured value of the refrigerant pressure/temperature sender - G395-) and check the display ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.
- ◆ Activation of compressor via air conditioner compressor regulating valve - N280- disabled (compressor switched off, 0% shown on display)
- ◆ Pressure in the refrigerant circuit transmitted by the refrigerant pressure/temperature sender - G395- ; equal to or greater than the value in the table below at the measured ambient temperature

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Ambient temperature in °C Pressure display (in bar absolute)

15	4.7
20	5.6
25	6.6
30	7.6
35	8.8



Note

- ◆ *On the absolute pressure scale, 0 bar corresponds to an absolute vacuum. Normal ambient pressure therefore corresponds to an absolute pressure of approx. 1 bar. On the scales of most pressure gauges, 0 bar corresponds to an absolute pressure of one bar (can be seen from -1 mark below 0).*
- ◆ *The pressure in the refrigerant circuit depends on the ambient temperature. Due to heat emitted by components (e.g. radiator fan) pressure displayed with warm engine is slightly higher than that indicated for the relevant ambient temperature.*
- ◆ *If the pressure displayed is lower than that indicated in the table, check the signal of the refrigerant pressure/temperature sender - G395- ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051. If no fault is found at -G395- , there is not enough refrigerant in the circuit. The vehicle must be taken to a workshop which is equipped with the necessary tools and at which the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a .*

- ◆ If pressure in refrigerant circuit is OK:
 - Switch on compressor (to do so, select “Auto” mode on operating and display unit, Climatronic control unit - J255- of “Convenience” type, or disable “Econ” function with “Basic” type).
 - Select “Lo” temperature (for driver's and front passenger's side) on operating and display unit, Climatronic control unit - J255- of “Convenience” type or set lowest possible temperature with “Basic” type.
 - Set air outflow direction to “dash panel vents” on operating and display unit, Climatronic control unit - J255- .
 - With operating and display unit, Climatronic control unit - J255- of “Basic” type, check rotary fresh air blower speed control; this must be set to position “A” (automatic regulation of fresh air blower speed).
 - Select function “Read measured value block” ⇒ Vehicle diagnostic, testing and information system VAS 5051 (“Guided Fault Finding”) .
 - Check the various display zones on the display of the diagnosis tester:
 - Display zone for activation of air conditioner compressor regulating valve - N280- shows a duty cycle greater than 30% (- N280- activated, compressor switched on).
 - Display zone for current to air conditioner compressor regulating valve - N280- shows a current greater than 0.3 A (current flowing via -N280- , compressor switched on).
 - The pressure measured by the refrigerant pressure/temperature sender - G395- and displayed increases above the value with the compressor switched off.

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**Note**

- ◆ *Air conditioner compressor regulating valve - N280- is actuated by Climatronic control unit - J255- operating and display unit such that temperature of air downstream of evaporator reaches specified value (approx. 2 to 5 °C).*
- ◆ *After starting the vehicle, a value greater than 75% (0.55 A) is displayed depending on the measured temperature, engine speed and electrical system voltage.*
- ◆ *As soon as temperature measured by evaporator outflow temperature sender - G263- approaches specified value, actuation of air conditioner compressor regulating valve - N280- is cancelled and compressor output thus reduced.*
- ◆ *Connectors to air conditioner compressor regulating valve - N280- and electric engine mounting are identical. If the connectors are interchanged, no entry is made in the fault memory, but the evaporator may ice up as the compressor is constantly actuated by the engine control unit.*
- ◆ *If no or an insufficient current is displayed in the display zone for actuation of the air conditioner compressor regulating valve - N280- , check actuation of -N280- .*
- ◆ *If the pressure measured by the refrigerant pressure/temperature sender - G395- and displayed does not change and if actuation of the compressor is OK, check whether the compressor is actually being driven (an overload protection is fitted between the compressor and the pulley / drive unit; if this has been tripped, the compressor is not driven). If no fault can be detected, there is a problem with the refrigerant circuit. Take the vehicle to a workshop which is equipped with the necessary tools and at which the work can be performed by appropriately qualified personnel (there may be problems with compressor control) ⇒ Air conditioner with refrigerant R134a . Inform the workshop of the problem detected.*
- Press “recirculated-air mode” button on operating and display unit, Climatronic control unit - J255- (symbol for “recirculated-air mode” in button lights).
- Set engine speed to 2000 rpm (start of time measurement).
- In “Read measured value block” function, select display group with measured value of the evaporator output temperature sender - G263- ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .



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

A - Air temperature measured by -G263-

B - Measured ambient temperature

C - Permissible tolerance range

Depending on ambient temperature, air temperature measured at evaporator outflow temperature sender - G263- must be within stated tolerance range after 5 minutes.



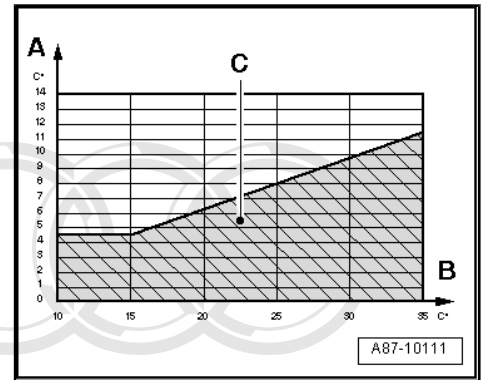
Note

- ◆ If the required values are not attained, check the measured value of the evaporator outflow temperature sender - G263- , the left vent temperature sender - G150- and the right vent temperature sender - G151- and compare the measured values displayed ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.
- ◆ If the measured values for -G150- and -G151- only differ slightly from the measured value for -G263- ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051 , Perform fault finding if readout does not match specification ⇒ [page 165](#) .
- ◆ If the measured value for -G263- is greater than the measured value for -G150- and -G151- , check for proper installation of -G263- and perform the electrical checks for this sender ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.
- ◆ Operation of air conditioner can be established, for example, from cooling down of refrigerant pipe on low pressure end (thick pipe).

If the measured value for -G263- (and thus the air conditioner cooling output) is OK:

- Compare the measured value displayed for the evaporator outflow temperature sender - G263- to the measured values for the left vent temperature sender - G150- and the right vent temperature sender - G151- .

After 5 minutes, the measured values for -G150- and -G151- may be max. 3 °C higher than the measured value for the evaporator outflow temperature sender - G263- .



**Note**

- ◆ *If the required values are not attained, compare the measured values displayed for -G150-, -G151- and -G263-. If the measured value for -G150- and / or -G151- is not OK, check actuation and operation of the left heat regulation valve - N175-, the right heat regulation valve - N176- and the coolant circulation pump - V50- ⇒ [page 167](#) and ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- ◆ *If no fault is found at the left vent temperature sender - G150-, the right vent temperature sender - G151-, the left heat regulation valve - N175-, the right heat regulation valve - N176- and the coolant circulation pump - V50-, perform the "Measures to be taken in the event of temperature increase downstream of evaporator" ⇒ [page 167](#) and ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- ◆ *If the measured value for one or both senders (-G150- and/or -G151-) is lower than the measured value for the evaporator outflow temperature sender - G263-, check -G263-, -G150- and -G151- for proper installation and contact resistance in the electrical connections. Replace the defective sender if applicable ⇒ [page 167](#) and ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- ◆ *The temperature of the air emerging from the "centre" dash panel vents can be measured using a commercially available thermometer for example (depending on vehicle equipment, it can also be read out in the measured value block) ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- ◆ *If the air emerging from the adjustable centre vent (only fitted with an air conditioner of "Convenience" type, in "Lo" setting or with the rotary temperature control on the "cold" stop for the driver's and front passenger's side on the operating and display unit, Climatronic control unit - J255-) is colder in the MMI "cold" setting for the adjustable centre vent than in the "warm" setting, check operation of the left heat regulation valve - N175- and the right heat regulation valve - N176- ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- ◆ *If cooling output on one side (e.g. driver's side) is still adequate, but values are no longer attained on other side (e.g. front passenger's side), this is an indication of insufficient refrigerant in refrigerant circuit (stratification in evaporator due to lack of refrigerant).*

Problems relating to differences between the temperature of the air emitted from the vents with an identical setting in air conditioner control mode may be due to the following:

- ◆ Cold or warm air flaps in air ducts not closing fully or not attaining end position ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051
- ◆ Air in heat exchangers (different flow on either side of heat exchanger and uneven heat distribution)
- ◆ During installation of the heat exchangers, a foam seal became detached, allowing air to flow past heat exchanger.

Possible causes of problems which may occur even though cooling output is OK:

- Air conditioner fails repeatedly or sporadically (no cooling/heating output) after long journeys; after ignition is switched off and waiting a short while, air conditioner functions properly again.
- Misting up of windows on inside after a long journey; windows are initially not cleared even by pressing “Defrost” button; air conditioner functions properly again after a short delay after engine is switched off.

Under certain operating conditions residual moisture in the coolant circuit may lead to the formation of ice at air conditioner compressor regulating valve - N280-. Such ice formation impairs compressor control, the evaporator is cooled excessively and ices up. Icing-up of the evaporator may be the cause of these problems.

◆ Remedy:

- Check measured value of evaporator output temperature sender - G263- via the “Read measured value block” function
⇒ Vehicle diagnostic, testing and information system VAS 5051 (“Guided Fault Finding”).
- If sender measured value is too high under usage conditions described by customer (greater than e.g. 10 °C although air conditioner is functioning properly), check evaporator outflow temperature sender - G263- (incorrect measured value can cause evaporator to ice up).
- If the sender measured value is too low under the usage conditions described by the customer (colder than 0 °C for a lengthy period at an ambient temperature greater than 0 °C), there is a fault in 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
- Check refrigerant line between evaporator and reservoir (thick line, low-pressure side) with engine running. If this pipe is severely iced up when the problem occurs (a thin ice layer is permissible), this is also an indication that the temperature in the evaporator is too low. 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 (compressor control may not be OK). Inform the workshop of the problem encountered. The necessary work can only be performed by such specialists (draining of refrigerant circuit, replacement of reservoir and subsequent evacuation of refrigerant circuit for at least 3 hours).

14.3 Fault Finding if results do not match specifications

The cooling output required is not attained in the cooling output test ⇒ [page 159](#)

- Select the “Reading measured value block” function ⇒ “Guided Fault Finding” function of vehicle diagnostic, testing and information system VAS 5051.
- Repeat cooling output test.
- During cooling output test, observe display for pressure in refrigerant circuit and activation of air conditioner compressor regulating valve - N280-. Is -N280- deactivated during cooling output test (control current dropped below 0.50 A)?

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yes
↓

no
↓

Interrogate the fault memory, eliminate the faults displayed and erase the fault memory. ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").

↓
Read out measured-value block with compressor shut-off criteria and eliminate cause of deactivation ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .

↓
Repeat cooling output test.

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

yes
↓

no
↓

Continued:
Pressure in refrigerant circuit increases
⇒ [page 166](#)

Take the vehicle to a workshop equipped with the necessary tools, where the work can be performed by appropriately qualified personnel (inform the workshop of the problem) ⇒ Air conditioner with refrigerant R134a .

- Pressure in refrigerant circuit increases
- Open bonnet.
- Repeat cooling output test.
- Do radiator fans - V7- run during cooling output test (speed is governed by coolant temperature and pressure in refrigerant circuit; determined by engine control unit)?
- Depending on the version of the operating and display unit, Climatronic control unit - J255- as of a specific pressure in the refrigerant circuit (approx. 9 bar) or as soon as the compressor is switched on regardless of the pressure

yes
↓

Read out pressure in refrigerant circuit and actuation of radiator fans in measured value block ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").

no
↓

Check actuation of the radiator fans - V7- , e.g. in "Final control diagnosis" function. ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").

- Operation of radiator fan - V7- at higher speed as pressure in refrigerant circuit increases (as of approx. 16 bar)?

Repair actuation of radiator fan - V7- .

Repeat cooling output test.

yes
↓

Take the vehicle to a workshop equipped with the necessary tools, where the work can be performed by appropriately qualified personnel (inform the workshop of the problem) ⇒ Air conditioner with refrigerant R134a .

no
↓

Check actuation of the radiator fans - V7- , e.g. in "Final control diagnosis" function. ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
– Repair actuation of radiator fan - V7- . ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding"). (for relevant engine control unit).



Note

- ◆ *The pressure in the refrigerant circuit is governed by various factors of influence. As a general rule, however, the pressure should not exceed 20 bar at an ambient temperature of 20 to 25 °C. Under extreme conditions of use (e.g. in hot countries with high ambient temperatures, "stop and go traffic" and high relative humidity), the extremely high refrigeration capacity 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 (the radiator fan runs and cools the condenser).*
- ◆ *The measured value of the refrigerant pressure/temperature sender - G395- is used by the operating and display unit, Climatronic control unit - J255- to calculate the pressure in the refrigerant circuit, which it then displays ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- ◆ *At absolute pressure 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 compressor (air conditioner compressor regulating valve - N280- is not activated). The compressor is only re-activated once the absolute pressure has risen above 1.8 bar or dropped below 16 bar.*
- ◆ *For further information on the pressure in the refrigerant circuit, refer to ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- ◆ To prevent abrupt compressor shut-off on account of excessive pressure in the refrigerant circuit or excessive coolant temperature, the compressor output is reduced by the operating and display unit, Climatronic control unit - J255- :
 - As soon as pressure in refrigerant circuit exceeds 30 bar (absolute) (full compressor output is not released again until pressure has dropped below 27 bar)
 - As soon as coolant temperature exceeds 115 °C (full shut-off at 118 °C)
 - If pressure in refrigerant circuit exceeds 32 bar in spite of regulation, operating and display unit, Climatronic control unit - J255- does not switch compressor back on until pressure has dropped below 29 bar.

14.4 Fault Finding if temperature increases downstream of evaporator

The cooling output required is attained in the cooling output test, the temperature of the air emerging from the vents is too high
⇒ [page 159](#)

- Pinch off coolant hose from heat exchanger of air conditioning unit to engine, or from engine to pump valve unit. e.g. with hose clamps up to Ø 25 mm - 3094- ⇒ [page 145](#)
- Repeat cooling output test.
- Do measured values for left vent temperature sender - G150- and right vent temperature sender - G151- deviate by less than 3 °C from measured value for evaporator output temperature sender - G263- ? ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").

↓
yes
↓

↓
no
↓

Detach the hose clamps up to Ø 25 mm - VAS 3094- from coolant hose.



Check actuation of heat regulation valves - N175- , -N176- and coolant circulation pump - V50- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").

Continued: ⇒ [page 168](#)

Check correct installation of the sender with measured value deviation, and check its electrical connections for contact resistance.



Eliminate cause of incorrect measured value and replace defective sender if necessary ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").

Actuation of -N175- , -N176- and -V50- OK?

↓
yes
↓

Connect test box - V.A.G 1598 A- to adapter - V.A.G 1598/11- and adapter - V.A.G 1598/12- to wiring harness to operating and display unit, Climatronic control unit - J255- . ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").



Perform electrical checks for the left heat regulation valve - N175- , the right heat regulation valve - N176- and the coolant circulation pump - V50- . ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").



- Is operation of left heat regulation valve - N175- , right heat regulation valve - N176- and coolant circulation pump - V50- OK?

↓
Yes
↓

Replace operating and display unit, Climatronic control unit J255- ⇒ [page 96](#) and ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").



- Repeat cooling output test ⇒ [page 158](#) .

↓
no
↓

Eliminate cause of malfunction ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .



⇒ Current flow diagrams, Electrical fault finding and Fitting locations
Repeat cooling output test.

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15 Checking heating output of air conditioner and operation of pump valve unit

- If the coolant circuit is not completely bled after filling, air may accumulate in the heat exchangers of the air conditioning unit and thus reduce the heat output. In addition, noise may occur or complaints may be received about differences in the temperature of the air from the driver's and front passenger's vents despite identical setting ⇒ Engine, mechanics; Rep. gr. 19 .
- In the event of complaints about blubbling noise from the heat exchanger of the air conditioning unit or poor air conditioner heat output under certain ambient conditions (a coolant circulation pump - V50- fault may also have been stored), check the incorporation of the pump valve unit into the coolant circuit. If air bubbles are visible in the upper connection of the coolant expansion tank with the engine running, additionally check for the correct version of the coolant expansion tank ⇒ Engine, mechanics; Rep. gr. 19 and ⇒ Electronic parts catalogue .

Remedy:

- ◆ On operating and display unit, Climatronic control unit - J255- set air conditioner to max. heat output for driver's and front passenger's side ("Hi" temperature setting or both rotary temperature controls on right stop).
- ◆ Perform a road test (at least 10 minutes) at high engine speeds (above 2500 rpm). 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 pump valve unit into coolant circuit. If both coolant hoses (supply and return) from the engine to the pump valve unit or the electrical connections in the connector to the coolant circulation pump - V50- have been interchanged, the engine coolant pump works in opposition to the pump in the pump valve unit and there will be no flow of coolant into the heat exchanger at certain engine speeds ⇒ Engine, mechanics; Rep. gr. 19 and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ◆ Checking operation of pump valve unit ⇒ [page 169](#)

15.1 Checking operation of pump valve unit

This test is used to check the operation of the pump valve unit (left heat regulation valve - N175- , right heat regulation valve - N176- and coolant circulation pump - V50-).

- ◆ If temperatures determined are below specified value (insufficient heating output):
- Check operation of the pump valve unit (-N175- , -N176- and -V50-) ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.

If no fault is found:

- Check for interchange and cross-sectional constriction of the coolant hoses (from engine to pump valve unit or from pump valve unit to heat exchangers of the conditioning unit) ⇒ Engine, mechanics; Rep. gr. 19
- Check for interchanged electrical contacts of coolant circulation pump - V50- of pump valve unit (direction of pump operation) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

- On vehicles with auxiliary heater, check actuation of circulation pump - V55- of auxiliary heater as well as incorporation of auxiliary heater into coolant circuit ⇒ Auxiliary heater; Rep. gr. 82 and ⇒ Engine, mechanics; Rep. gr. 19 .
- ◆ Test requirements ⇒ [page 170](#)
- ◆ Checking operation ⇒ [page 170](#)

15.1.1 Test requirements:

- ◆ Coolant circuit bled as specified ⇒ Engine, mechanics; Rep. gr. 19
- ◆ All air ducts, covers and seals OK and fitted properly
- ◆ Air throughput of dust and pollen filter not impaired by dirt ⇒ [page 88](#) .
- ◆ Engine at operating temperature
- ◆ Vehicle battery (battery - A-) is OK and adequately charged (to prevent energy management control unit - J644- from switching off operating and display unit, Climatronic control unit - J255- during the test).
- ◆ Fault memory of operating and display unit, Climatronic control unit - J255- , was interrogated and erased, basic setting was performed and encoding of operating and display unit, Climatronic control unit - J255- was checked ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
- ◆ Adaption of operating and display unit, Climatronic control unit - J255- , checked ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
- ◆ Vehicle not exposed to direct sunlight

15.1.2 Checking operation

Test requirements met ⇒ [page 170](#)

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Special tools and workshop equipment required

- ◆ Vehicle diagnostic, testing and information system - VAS 5051- (or Service Information System - VAS 5052-)
- ◆ Battery charger - VAS 5900-
- Close bonnet.
- Close doors, windows and sunroof.
- Start engine and leave it running for several minutes at maximum cooling output (compressor on, "Lo" temperature setting for driver's and front passenger's side or both rotary temperature controls on left stop).
- Switch off ignition.
- Connect battery charger - VAS 5900- to vehicle (to prevent excessive discharge of battery - A- ⇒ Electrical system; Rep. gr. 91).
- With the ignition switched off, connect the vehicle diagnostic, testing and information system - VAS 5051- to the 16-pin diagnostic socket in the vehicle with the diagnostic cable - VAS 5051/5A- ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding") . .
- Switch on ignition.
- Select air conditioner/heater electronics ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051. .

Operating and display unit, Climatronic control unit - J255- , starts up, coolant circulation pump - V50- is not actuated and does not run (left heat regulation valve - N175- and right heat regulation valve - N176- are actuated and closed).

- Read out the measured value block. There must not be any deactivation requests from the energy management control unit - J644- ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .
- Read out the measured value block with the measured values for the left vent temperature sender - G150- and the right vent temperature sender - G151- ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051.
- Check the display with the measured values for -G150- and -G151- .
- ◆ Specification: Ambient temperature plus max. 15 °C
- On operating and display unit, Climatronic control unit - J255- set temperature for left side (driver's side) to maximum heat output ("Hi" temperature setting or turn left rotary temperature control to right stop).
- Read out the measured values for -G150- (the temperature value increases).
- ◆ Specification: approx. engine temperature (operation of coolant circulation pump - V50- , left heat regulation valve - N175- open)
- Read out the measured value for -G151- (the temperature value remains roughly constant).
- ◆ Temperature increase less than 15 °C (right heat regulation valve - N176- closed)
- On operating and display unit, Climatronic control unit - J255- , set temperature for right side (front passenger's side) to maximum heat output ("Hi" temperature setting or turn right rotary temperature control to right stop).
- Read out the measured value for -G151- (the temperature value increases).
- ◆ Specification: approx. engine temperature (operation of coolant circulation pump - V50- , left heat regulation valve - N175- and right heat regulation valve - N176- open)
- On operating and display unit, Climatronic control unit - J255- set temperature for driver's and front passenger's side to "cold" (no heat output, "Lo" temperature setting or turn both rotary temperature controls to left stop).
- Read out the display with the measured values for -G150- and -G151- .
- ◆ The temperature drops within 5 minutes to ambient temperature (plus max. 15 °C) (no operation of coolant circulation pump - V50- , left heat regulation valve - N175- and right heat regulation valve - N176- closed)

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16 Servicing refrigerant circuit



Note

- ◆ *Refrigerant in refrigerant circuit must never be topped up (discharge, evacuate and refill circuit). ⇒ Air conditioner with refrigerant R134a*
- ◆ *The compressor is always driven when the engine is running; there is no magnetic clutch. Therefore do not start the engine unless the refrigerant circuit has been properly assembled. If, for example, refrigerant pipes have not been connected to compressor, heat generation inside compressor with engine running may lead to destruction of compressor. Internal heating is caused by the compressor operating even at almost 0 % delivery rate in opposition to a fixed resistance (sealed circuit).*
- ◆ *To stop the compressor being destroyed when the refrigerant circuit is empty, it is designed such that delivery is reduced to roughly 0 % and lubrication is maintained by way of an internal oil circuit with the oil left in the compressor.*
- ◆ *Replacement compressors contain the full quantity of refrigerant oil required for the refrigerant circuit ⇒ Air conditioner with refrigerant R134a .*
- ◆ *Different types of refrigerant oil are specified for Zexel, Valeo, Sanden and Denso compressors ⇒ Air conditioner with refrigerant R134a and ⇒ Electronic parts catalogue .*
- ◆ *Coat O-rings lightly with refrigerant oil before fitting ⇒ [page 10](#) .*
- ◆ *The specified diameters of the O-rings and the tightening torques also apply to the bolted joints of the refrigerant pipes/hoses between the individual components ⇒ Electronic parts catalogue .*
- ◆ *Only fit O-rings approved for refrigerant R134a ⇒ Air conditioner with refrigerant R134a and ⇒ Electronic parts catalogue .*
- ◆ *Check cooling output of air conditioner ⇒ [page 158](#) .*
- ◆ *Checking pressures in refrigerant circuit ⇒ Air conditioner with refrigerant R134a*
- ◆ *All other service and testing work on the refrigerant circuit not described in this Workshop Manual ⇒ Air conditioner with refrigerant R134a .*
- ◆ *Servicing refrigerant circuit ⇒ [page 172](#)*

16.1 Servicing refrigerant circuit

HD = High-pressure side

ND = Low-pressure side

1 - Air conditioner compressor regulating valve - N280-

- ☐ Checking activation and function ⇒ [page 12](#)
- ☐ Do not remove



Note

Air conditioner compressor regulating valve - N280- is activated by operating and display unit, Climatronic control unit - J255- and controls pressure on low-pressure side of refrigerant circuit.

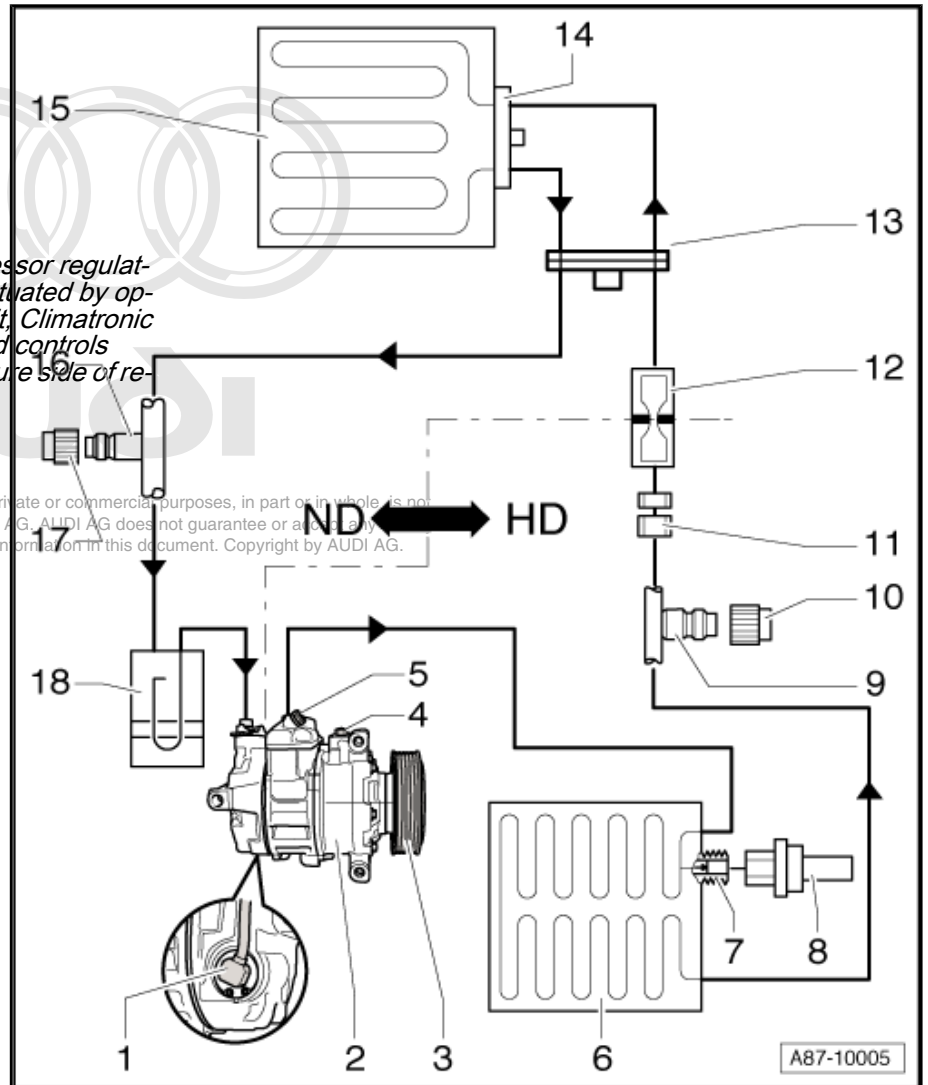
2 - Compressor

- ☐ Different versions depending on engine ⇒ [Electronic parts catalogue](#)
- ☐ Detaching pulley from mount/re-attaching ⇒ [page 11](#)
- ☐ Detaching compressor with drive unit (shaft) from holder/re-attaching ⇒ [page 182](#)
- ☐ Detaching and attaching refrigerant line at compressor ⇒ [page 177](#)
- ☐ Detaching poly V-belt ⇒ Engine, mechanics; Rep. gr. 13
- ☐ Removing and installing compressor - vehicles with 4-cyl. or 6-cyl. engine ⇒ [page 180](#)
- ☐ Removing and installing compressor - vehicles with 8-cyl. engine ⇒ [page 182](#)
- ☐ Removing and installing compressor - vehicles with 10-cyl. engine ⇒ [page 191](#)



Note

- ◆ *To protect the compressor, the engine must only be started with the refrigerant circuit completely assembled.*
- ◆ *When installing the refrigerant lines and the corresponding bracket, make sure there is sufficient distance between the belt, bracket and pulley*



- ◆ *After installing compressor and before fitting belt/screwing in drive shaft, crank compressor roughly 10 times by hand (to prevent compressor damage). Any refrigerant oil which may have collected in the compression chamber after the compressor is removed or after pouring in fresh refrigerant oil (e.g. after flushing refrigerant circuit) is forced out of the compression chamber by cranking the compressor.*



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3 - Pulley/drive unit for compressor

- ☐ Different versions depending on engine ⇒ Electronic parts catalogue
- ☐ Renewing compressor pulley ⇒ [page 16](#)
- ☐ Removing and installing poly V-belt ⇒ Engine, mechanics; Rep. gr. 19
- ☐ Poly V-belt allocation ⇒ Electronic parts catalogue
- ☐ Renewing compressor drive unit ⇒ [page 202](#)



Note

- ◆ *An overload protection is fitted between the pulley/drive unit and the drive shaft of the compressor to protect the belt/engine if the compressor becomes jammed or stiff.*
- ◆ *If compressor is not operating smoothly, overload protection device interrupts power transmission to compressor.*
- ◆ *Rubber damper elements are fitted between pulley/drive unit and compressor drive shaft to absorb any vibration occurring during compressor operation (damper function in the event of torque fluctuations).*

4 - Oil drain plug

- ☐ The Denso compressor is fitted with an oil seal which has to be replaced ⇒ Electronic parts catalogue
- ☐ Tightening torque: 30 Nm
- ☐ Compressor must be removed before screwing out to drain off refrigerant oil. Crank compressor by way of pulley/drive unit to accelerate drainage of refrigerant oil ⇒ Air conditioner with refrigerant R134a .

5 - High-pressure safety valve

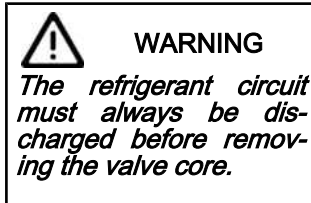
- ☐ Do not remove
- ☐ Tightening torque: 10 Nm

6 - Condenser

- ☐ Detaching and attaching refrigerant lines ⇒ [page 208](#)
- ☐ Removing and installing condenser ⇒ [page 211](#)
- ☐ Different versions ⇒ Electronic parts catalogue

7 - Connection with valve

- ☐ When removing and installing valve core with refrigerant circuit discharged, use e.g. an adapter from adapter set for service connections - T10364- .



8 - Refrigerant pressure and temperature sender - G395-

- ☐ Removing and installing ⇒ [page 9](#)
- ☐ Check signal ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").



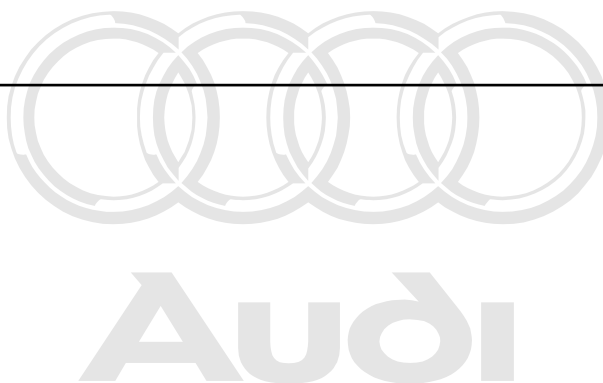
Note

- ◆ *The measured values for the refrigerant pressure/temperature sender - G395- can be read out by way of the "Reading measured value block" function in two display groups ⇒ "Guided Fault Finding" function of vehicle diagnostic, testing and information system VAS 5051 .*
- ◆ *The refrigerant pressure and temperature sender - G395- exchanges information via the air conditioner data bus system "Lin bus" with the operating and display unit (Climatronic control unit - J255-). For this reason, the Audi A6 must not be fitted with an high-pressure sender - G65- (only emits square-wave signals) ⇒ Electronic parts catalogue .*
- ◆ *On account of the design of the refrigerant pressure/temperature sender - G395- and its fitting location, the temperature measured by the refrigerant pressure/temperature sender - G395- differs from the actual temperature of the refrigerant in the refrigerant circuit. At present this is therefore not evaluated and used for air conditioner regulation ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").*

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9 - Service connection

- ☐ High-pressure side
- ☐ For service station for measuring, discharging and charging ⇒ Air conditioner with refrigerant R134a
- ☐ For measuring, discharging and charging; the vehicle must be taken to a workshop which is equipped with the necessary tools and at which the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a .
- ☐ Different versions (with primary sealing valve or Schrader valve) depending on refrigerant line; distinguishing features ⇒ Air conditioner with refrigerant R134a
- ☐ When removing and installing service connection or valve core with refrigerant circuit discharged, use e.g. an adapter from adapter set for service connections - T10364- .

**WARNING**

Refrigerant circuit must be discharged before removing service connections (connection without valve).

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10 - Cap

- ☐ With seal
- ☐ Always screw on

11 - Bolt connection in refrigerant line (with restrictor)

- ☐ Replace O-ring; for version, refer to ⇒ Electronic parts catalogue
- ☐ Tightening torque: 15 Nm
- ☐ The union is only to be opened if the refrigerant circuit is empty.

12 - Restrictor

- ☐ Fitted in screw connection ⇒ [Item 11 \(page 176\)](#) .
- ☐ O-ring: 7.5 mm / 1.5 mm
- ☐ Replace restrictor with O-ring ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 214](#)
- ☐ Moisten O-ring slightly with refrigerant oil before fitting restrictor

13 - Refrigerant pipe screw connection at air conditioning unit

- ☐ Only release bolt connection after refrigerant circuit has been discharged; take vehicle to a workshop equipped with the necessary tools where work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a
- ☐ Detaching refrigerant line to air conditioning unit/attaching ⇒ [page 223](#)

14 - Bolt connection in refrigerant line (at evaporator)

- ☐ Unfastening and assembling screw connection ⇒ [page 225](#) (removing and installing evaporator)
- ☐ Tightening torque: Hexagon socket-head bolt 25 Nm
- ☐ Only release bolt connection after refrigerant circuit has been discharged; take vehicle to a workshop equipped with the necessary tools where work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a

15 - Evaporator

- ☐ Removing and installing evaporator ⇒ [page 225](#) .
- ☐ Renew O-rings; version ⇒ Electronic parts catalogue
- ☐ Detaching refrigerant line to air conditioning unit/attaching ⇒ [page 223](#)

16 - Service connection

- ☐ Low-pressure side
- ☐ For service station (for measuring and discharging) ⇒ Air conditioner with refrigerant R134a
- ☐ For measuring and discharging; the vehicle should be taken to a workshop which is equipped with the necessary tools and at which the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a
- ☐ Different versions (with primary sealing valve or Schrader valve) depending on refrigerant line; distinguishing features ⇒ Air conditioner with refrigerant R134a
- ☐ When removing and installing service connection or valve core with refrigerant circuit discharged, use e.g. an adapter from adapter set for service connections - T10364- .



WARNING

Refrigerant circuit must be discharged before removing service connections (connection without valve).

17 - Cap

- ☐ With seal
- ☐ Always screw on

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18 - Reservoir

- ☐ Different versions ⇒ Electronic parts catalogue
- ☐ Renew O-rings; version ⇒ Electronic parts catalogue
- ☐ Moisten O-rings slightly with refrigerant oil before fitting
- ☐ Tightening torque: Hexagon socket-head bolt at block connection: 10 Nm
- ☐ Removing and installing ⇒ [page 221](#)

16.2 Removing and installing refrigerant lines at compressor



Note

- ◆ *The compressor is always driven when the engine is running; there is no magnetic clutch. Therefore do not start the engine unless the refrigerant circuit has been properly assembled. If, for example, refrigerant pipes have not been connected to compressor, heat generation inside compressor with engine running may lead to destruction of compressor. Internal heating is caused by the compressor operating even at almost 0 % delivery rate in opposition to a fixed resistance (closed circuit).*
- ◆ *On vehicles with electric engine mountings, pay attention to correct assignment of connectors at engine mounting and air conditioner compressor regulating valve - N280- ; these components have identical connectors. If connectors are interchanged, no fault is stored (components have approx. the same electrical values). Engine mounting is then actuated by operating and display unit (Climatronic control unit - J255-), and air conditioner compressor regulating valve - N280- is actuated by engine control unit.*
- ◆ *The following illustration shows the compressor on a vehicle e.g. with 6-cyl. petrol direct-injection FSI engine and 10-cyl. engine. The position of the compressor varies slightly on vehicles with other engines. However, the tightening torques and further procedure for detaching and attaching are virtually the same. On vehicles with 8 or 10-cyl. engine, the compressor is driven for example via a drive shaft and the installation position is 180 ° offset ⇒ [page 182](#) . Refrigerant pipes are however detached and attached in the same manner irrespective of installation position.*
- ◆ *Seal open lines and connections at the compressor with suitable caps (to prevent the ingress of dirt and moisture).*

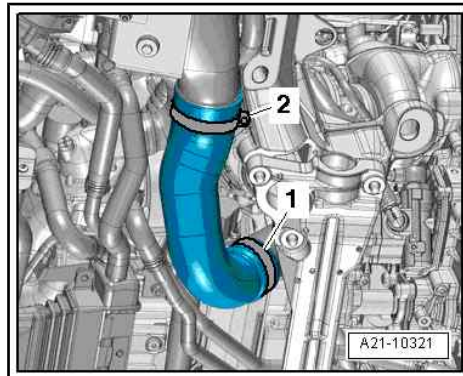
Detaching refrigerant lines

- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a .

- Depending on engine version, detach compressor from holder if necessary.

Additional work on vehicles with 10-cyl. engine (e.g. in the Audi RS6)

- Drain the coolant ⇒ Engine, mechanics; Rep. gr. 19 .
- Unfasten hose clamps -1- and -2- and detach air hose.



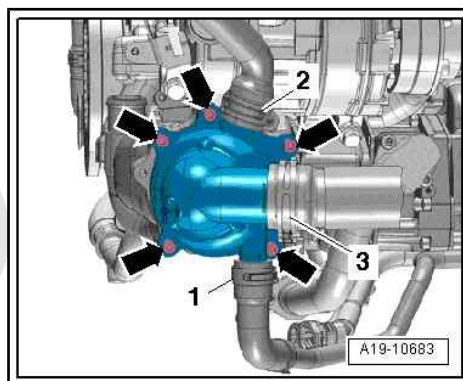
- Unfasten the hose clamps -2- and -3- and detach the coolant hoses from the thermostat housing.



Note

-Item 1- and -arrows- can be disregarded.

All vehicles (continued):



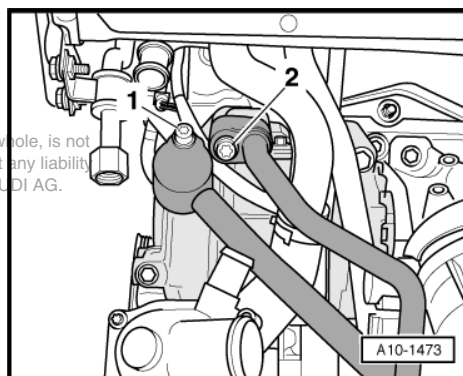
- Fully unscrew bolts -1- and -2- (this illustration shows the arrangement for a 10-cyl. engine).
- Detach refrigerant lines from air conditioner compressor.



Caution

Risk of damage to refrigerant lines and hoses.

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



- Seal the open lines and connections at the compressor with suitable caps (to prevent the ingress of dirt and moisture).

Attaching refrigerant lines

Install in reverse order of removal; note the following.

- Replace O-rings -D- and -E-, Version. ⇒ Electronic parts catalogue
- Check guide ring -F- at connections of both refrigerant pipes -B- and -C- for damage.
- Insert appropriate O-ring -D- and -E- in groove -G- at connections of both refrigerant pipes -B- and -C-.

Note

- ◆ *Do not use O-rings from caps of replacement compressor connections.*
- ◆ *Coat O-rings lightly with refrigerant oil before fitting*
⇒ [page 10](#).
- ◆ *Make sure O-rings are correctly seated in groove -G- of corresponding refrigerant line.*
- ◆ *After attaching the refrigerant lines to the 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.*
- Insert both refrigerant pipes -B- and -C- in appropriate connection on compressor.
- Tighten the bolts -A- to 9 Nm (bolts with M6 thread) and 25 Nm (bolts with M8 thread).

Additional work on vehicles with 10-cyl. engine (e.g. in the Audi RS6)

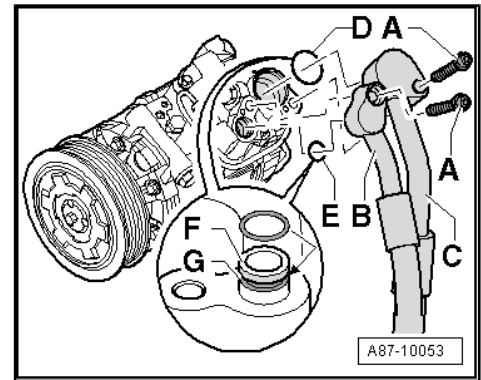
- Fit the air hose ⇒ Engine, mechanics; Rep. gr. 21.

All vehicles (continued):

- Re-install all other components removed in reverse order.
- Evacuate and refill the refrigerant circuit ⇒ Air conditioner with refrigerant R134a
- Add coolant and bleed the coolant circuit (e.g. on the Audi RS6) ⇒ Engine, mechanics; Rep. gr. 19.
- Interrogate fault 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 234](#).

Note

Also observe notes on starting up air conditioner after charging
⇒ *Air conditioner with refrigerant R134a*.



16.3 Removing and installing compressor (vehicles with 4 or 6-cyl. engine)



Note

- ◆ *On account of possible interchange with connector to electric engine mounting, mark connector to air conditioner compressor regulating valve - N280- (interchanging connectors does not result in entry in fault memory, but evaporator could ice up as compressor is constantly actuated).*
- ◆ *On vehicles with electric engine mountings, pay attention to correct assignment of connectors at engine mounting and air conditioner compressor regulating valve - N280- ; these components have identical connectors. If connectors are interchanged, no fault is stored (components have approx. the same electrical values). Engine mounting is then actuated by operating and display unit (Climatronic control unit - J255-), and air conditioner compressor regulating valve - N280- is actuated by engine control unit.*

Removing

- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a .
- Detach refrigerant lines from compressor ⇒ [page 177](#) .
- Detach compressor from holder ⇒ [page 11](#) .



Note

Seal open lines and connections at condenser with suitable caps (to prevent of dirt and moisture from entering).

Installing

Before fitting compressor ⇒ Air conditioner with refrigerant R134a

Install in reverse order of removal; note the following.

- Attach compressor to holder ⇒ [page 11](#)



Note

- ◆ *Tightening torques for bolts between compressor and holder ⇒ [page 11](#) .*
- ◆ *The removed compressor contains an indeterminate amount of refrigerant oil. Therefore, pay attention to the notes on compressor replacement. ⇒ Air conditioner with refrigerant R134a*
- ◆ *Assemble refrigerant circuit before starting engine.*
- ◆ *Only start engine with refrigerant circuit full if at all possible.*
- Replace O-rings on the open connections. Version ⇒ [ELECTRONIC parts catalogue](#)
- Attach refrigerant pipes to compressor ⇒ [page 177](#) .
- Before fitting poly V-belt, crank compressor 10 times by hand following installation (to prevent damage to compressor when switched on for the first time).

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If it is necessary to start the engine with an empty refrigerant circuit, pay attention to the following to prevent damage to the compressor ⇒ [page 234](#)



Note

- ◆ Any refrigerant oil which may have collected in the compression chamber after the compressor is removed or after pouring in fresh refrigerant oil (e.g. after blowing out refrigerant circuit) is forced out of the compression chamber by cranking the compressor.
- ◆ Different compressors depending on country version and engine ⇒ *Electronic parts catalogue*
- ◆ Coat O-rings lightly with refrigerant oil before fitting.
- ◆ The compressor is always driven by the pulley/drive unit (there is no magnetic clutch).
- ◆ The 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 compressor. However, as there is no refrigerant in the circuit, the oil required for the lubrication of the compressor is not transported to the compressor.
- ◆ Engine is not to be started unless refrigerant circuit has been properly assembled. If, for example, the refrigerant lines are not connected to the 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.
- ◆ Air conditioner compressor regulating valve - N280- is not activated if refrigerant circuit is empty and compressor runs at idle with engine.
- Evacuate and charge refrigerant circuit. ⇒ Air conditioner with refrigerant R134a
- Interrogate fault memory of operating and display unit, Climatronic control unit - J255- and erase any faulty displayed. ⇒ Vehicle diagnostic, testing and information system VAS 5051 ("Guided Fault Finding").
- Start up air conditioner after charging refrigerant circuit ⇒ [page 234](#).



Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a .

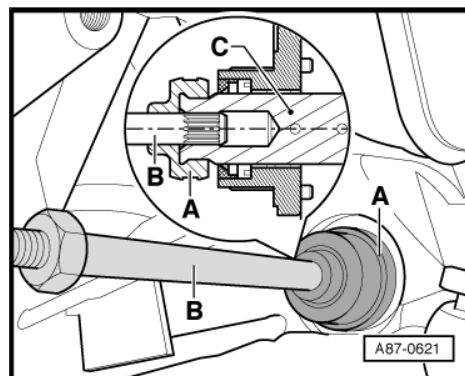
16.4 Removing and installing compressor (vehicles with 8-cyl. engine)

Detaching compressor with pulley from mount



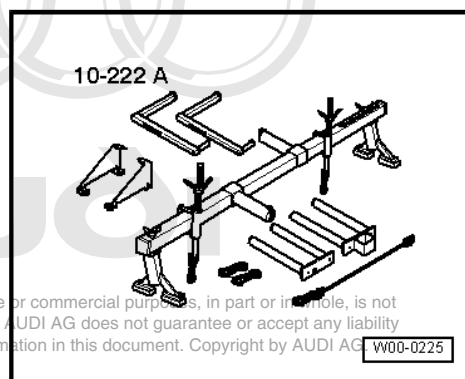
Note

- ◆ The compressor is driven via a gear wheel and a drive shaft -B-.
- ◆ Removing compressor ⇒ [page 183](#)
- ◆ Detaching compressor holder from engine/attaching ⇒ Engine, mechanics; Rep. gr. 13
- ◆ On vehicles with 8 or 10-cyl. engine, detaching the compressor involves draining the refrigerant circuit and then detaching both the refrigerant pipes from the compressor ⇒ [page 177](#) and ⇒ Air conditioner with refrigerant R134a .

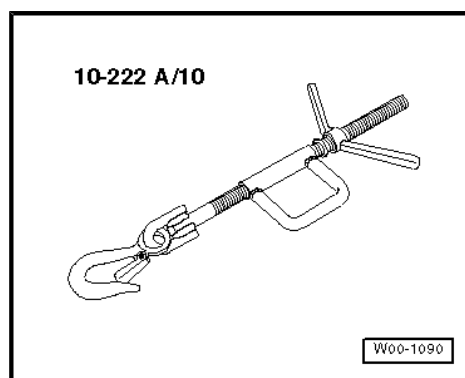


Special tools and workshop equipment required

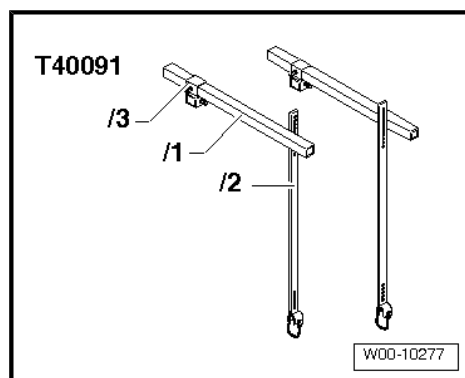
- ◆ Support bracket - 10 - 222 A-



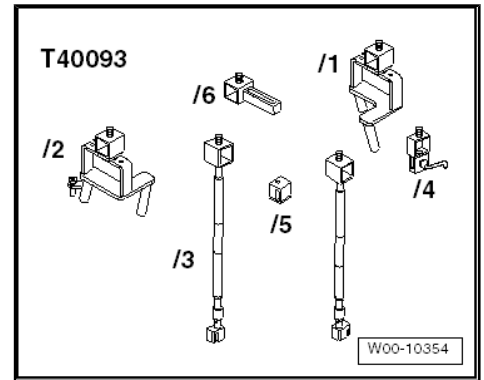
- ◆ Hook - 10 - 222 A /10-



- ◆ Engine support basic set - T40091-



- ◆ Engine support supplement set - T40093-



- ◆ Removing and installing compressor ⇒ [page 183](#)

16.4.1 Removing and installing compressor

Removing



Note

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- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a .



Note

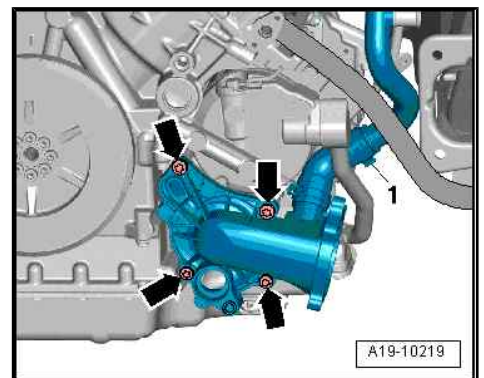
Depending on vehicle equipment it may be necessary on certain vehicles to remove the front bumper and to unfasten the front end module and pull it forwards as far as possible ⇒ Body Repairs; Rep. gr. 63

- Drain the coolant ⇒ Engine, mechanics; Rep. gr. 19 .
- Unfasten the hose clamp -1- at the coolant hose.

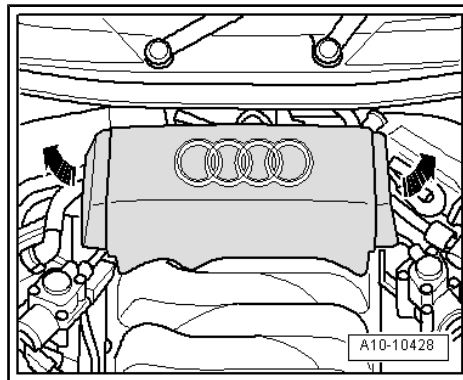


Note

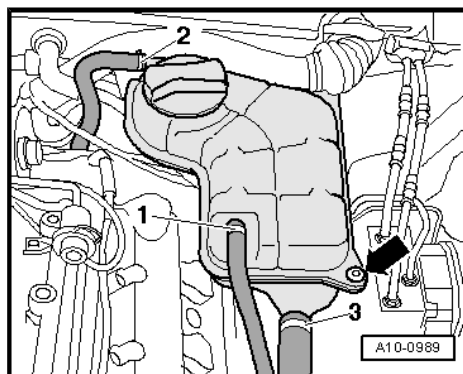
Disregard -arrows-.



- Pull off rear engine cover panel -arrows-.



- Detach the coolant hose -2- from the coolant expansion tank.
- Detach coolant expansion tank -arrow- and unplug electrical connector from coolant shortage indicator switch - F66- at bottom of coolant expansion tank.
- Lay aside the coolant expansion tank with the coolant hoses -1- and -3- connected.

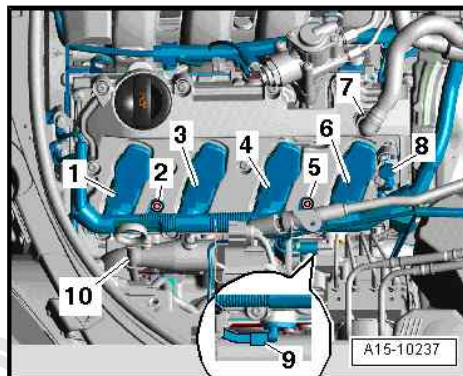


- Pull oil dipstick -10- out of guide tube.
- Remove bolts -2- and -5-.
- Unplug the connectors -1, 3, 4, 6, 8, 9- and lay bare the wiring harness.
- Remove the Hall sender 2 - G163- -Item 9-.



Note

Disregard -item 7-.

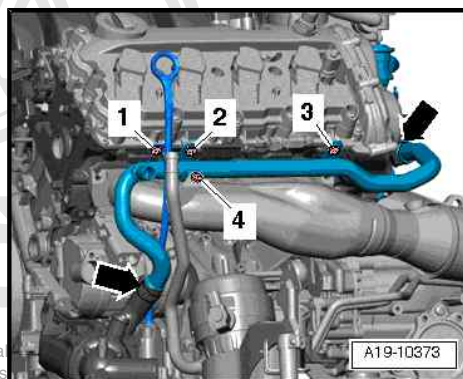


- Screw out the bolt -1- and lift off the guide tube for the dipstick ⇒ Engine, mechanics; Rep. gr. 10 .
- Fully unscrew bolts -2, 3, 4- and detach left coolant pipe from the coolant hose -bottom arrow- ⇒ Engine, mechanics; Rep. gr. 19 .
- Swivel the left coolant pipe upwards slightly.



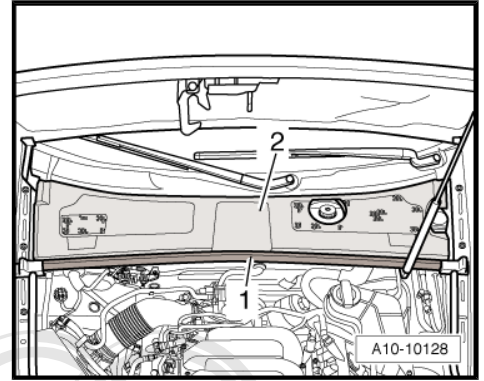
Note

-Top arrow- can be ignored.

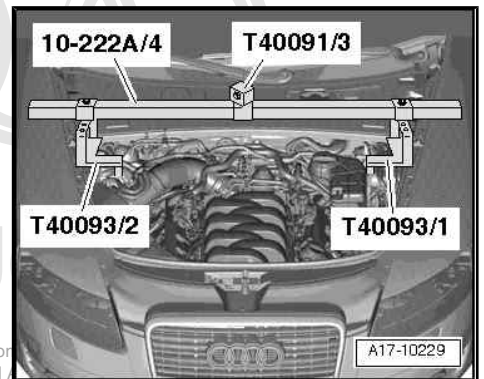


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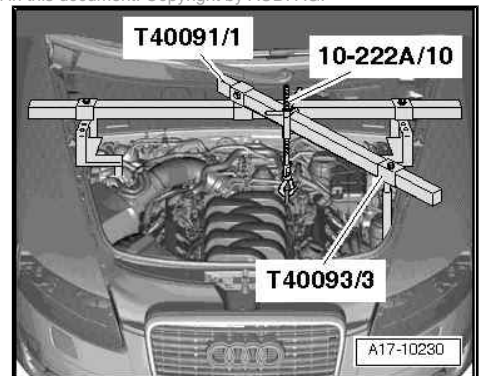
- Pull off the rubber seal -1- and detach the plenum chamber cover -2-.



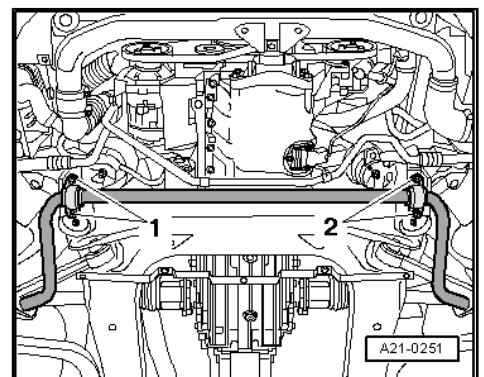
- Attach the adapter - 10 - 222 A /4- with the connector - T40091/3- and the supports -T40093/1- and -T40093/2- to the suspension strut domes.
- The supports are marked for the left and right sides of the vehicle.



- Set up the other parts of the support bar as shown. To do so, position the support -T40093/3- on the seam of the longitudinal member.
- Engage the hook - 10 - 222 A /10- at the left engine lifting eye.
- Pretension the engine with the spindle.

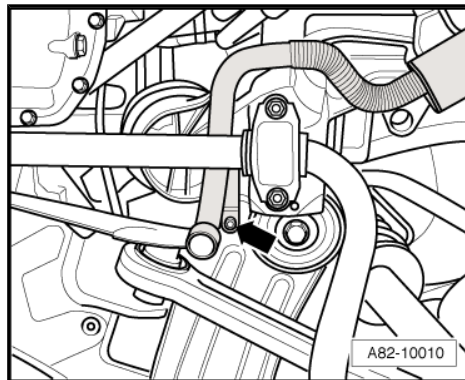


- Screw out the bolts -1- and -2- for the anti-roll bar mount on the left and right.

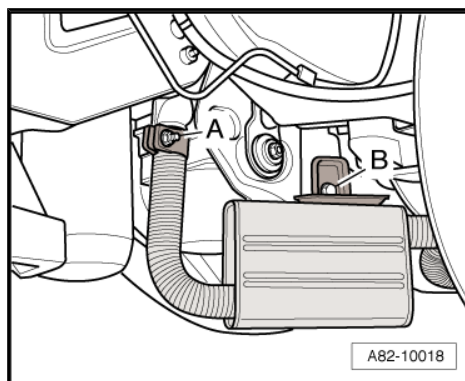


Additional operations for vehicles with auxiliary heater:

- Remove the front left wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 .
- Remove bolt -arrow- for corrugated exhaust pipe.

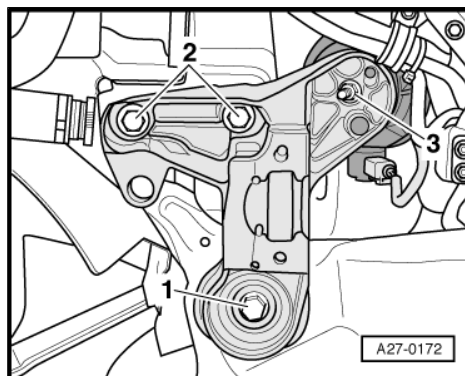


- Unfasten nut -A- on clamp of corrugated exhaust pipe.
- Unscrew bolt -B- and remove silencer and corrugated exhaust pipes.



All vehicles (continued):

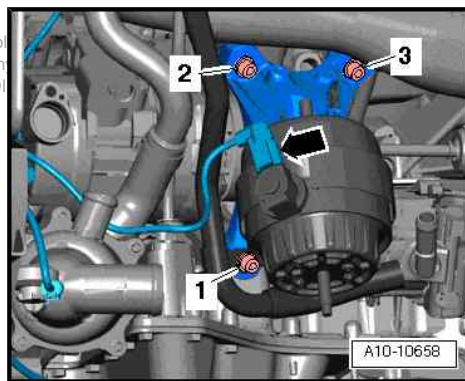
- Unscrew the nut -3- at the bottom of the left engine mounting ⇒ Engine, mechanics; Rep. gr. 10 .
- Screw out the bolts -1- and -2- and detach the left engine mounting bracket ⇒ Engine, mechanics; Rep. gr. 10 .



- Unplug the connector -arrow- at the left engine mounting.

- Remove bolts -1...3-.

- Detach the left engine support with engine mounting.



Caution

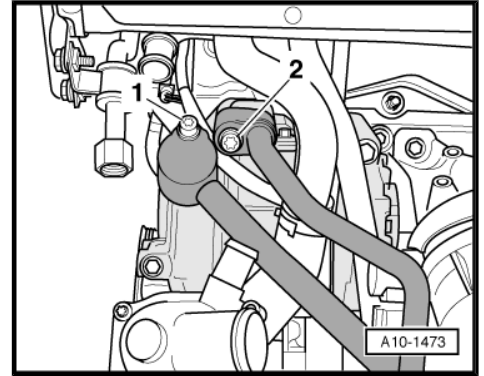
Risk of damage to refrigerant lines and hoses.

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

- Screw out the bolts -1- and 2- and detach the refrigerant pipes from the air conditioner compressor ⇒ [page 177](#) .

 Note

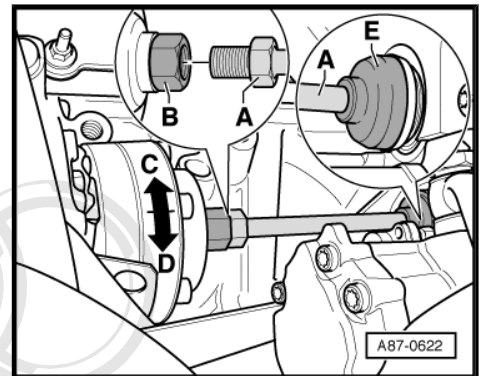
Seal off disconnected pipes and open connections with clean plugs or sealing caps to keep out dirt and moisture.



- Use an open-ended wrench to hold the compressor drive shaft -A- in position and turn the compressor drive unit -B- in the direction of -arrow C-.

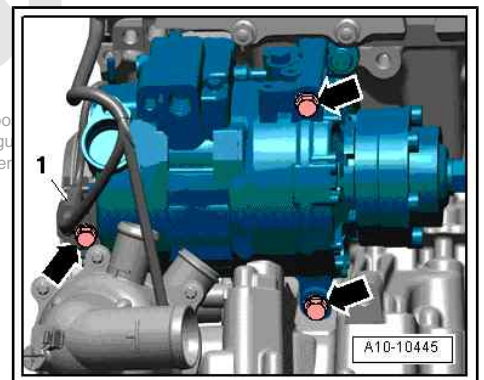
 Note

- ◆ *Do not turn the compressor drive shaft -A-.*
- ◆ *After unfastening the bolt connection, the compressor drive shaft -A- can be pushed through the grommet -E- into the drive gear.*
- Mark 2-pin connector to air conditioner compressor regulating valve - N280- (to avoid confusion with connector to engine mounting).



- Remove the connector -1- for the air conditioner compressor regulating valve - N280- from the holder and unplug.
- Remove bolt -arrow-.
- Take out air conditioner compressor

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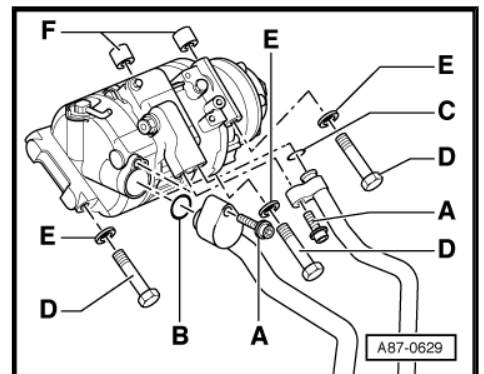


- If necessary, remove the dowel sleeves -F- from the compressor.

Installing

Before installing compressor ⇒ Air conditioner with refrigerant R134a .

Install in reverse order of removal; note the following:

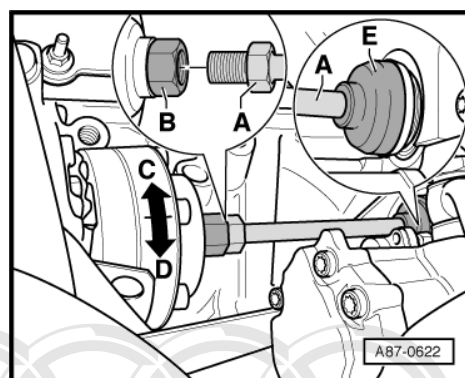
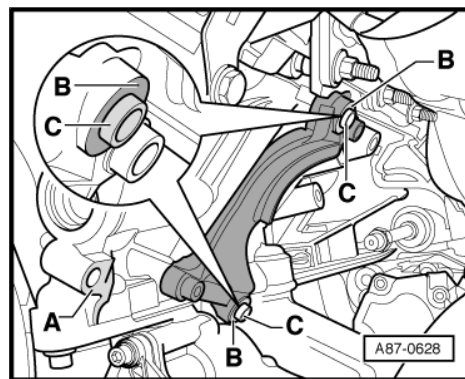


- If necessary, remove the dowel sleeves -C- from the compressor holder.
- Thoroughly clean contact surfaces -A- and -B- at holder (as well as contact surfaces at compressor).
- Fit the dowel sleeves -C- in the compressor holder (or the compressor).

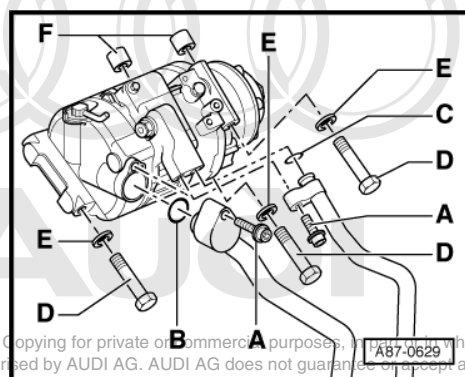


Note

- ◆ *Make sure that dowel sleeves -C- are correctly positioned and contact surfaces are clean. Incorrectly fitted dowel sleeves or dirty/damaged contact surfaces could lead to misalignment between the compressor and engine. After a period of operation, misalignment will cause damage to the drive shaft or the compressor.*
- ◆ *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue .*
- ◆ *The removed compressor contains an indeterminate amount of refrigerant oil. Therefore, pay attention to the notes on compressor replacement. ⇒ Air conditioner with refrigerant R134a*
- If applicable, install the compressor drive shaft -A- (in the drive gear) and check both proper attachment and the corresponding socket -E- ⇒ [page 204](#) .



- Check whether the dowel sleeves -F- have been inserted in the compressor holder (or in the compressor).
- Check connections of compressor and refrigerant lines for damage or dirt ⇒ [page 177](#) .
- Attach the compressor with the bolts -D- (and washers -E-) to the holder.



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- Tighten bolts -arrows- to torque (25 Nm).
- Attach electrical connector -1- at air conditioner compressor regulating valve - N280- .



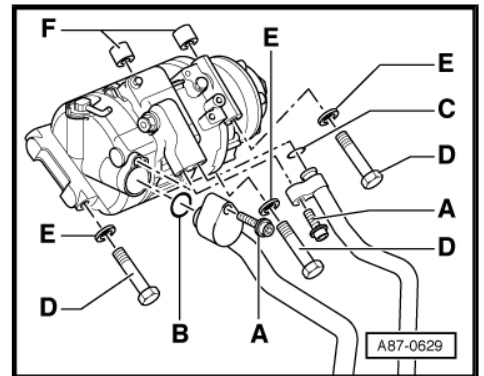
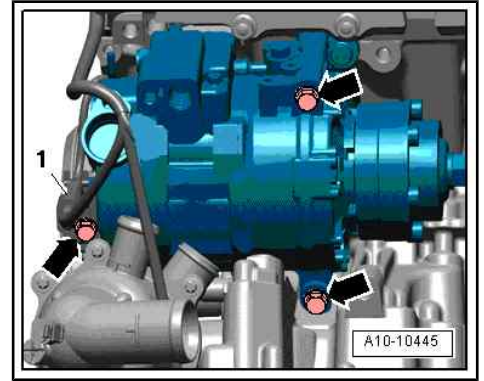
- Attach the refrigerant pipes to the compressor (tightening torque of bolts -A-) ⇒ [page 177](#) . For dimensions of O-rings -B- and -C- and further information, refer to ⇒ [page 177](#) and ⇒ Electronic parts catalogue .



Note

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Check refrigerant lines and corresponding holders to ensure adequate clearance from other components.

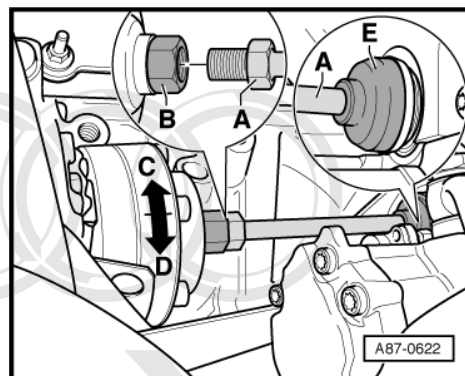


- After installing the compressor and before screwing in the drive shaft -A-, crank the compressor 10 times by hand in the direction of arrow -C- by way of the compressor drive unit -B- (to prevent compressor damage on initial activation).



Note

Any refrigerant oil which may have collected in the compression chamber during removal of the compressor or after pouring in fresh refrigerant oil (e.g. after flushing the refrigerant circuit) is forced out of the compression chamber when the compressor is cranked.



- Use an open-ended wrench to hold the compressor drive shaft -A- in position and turn the compressor drive unit -B- in the direction of -arrow D-.

- Tightening torque: 60 Nm

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Note

- ♦ The compressor drive shaft -A- must not be turned when tightening the bolt connection.
- ♦ After installation, check position of boot -E- on drive gear.
- ♦ After fitting drive shaft -A-, check installation position of grommet -E-.
- ♦ The grommet -E- is secured with a clamp at the flange of the power steering pump to stop it slipping (gradual introduction of clamp at factory in Model Year 2006, retrofit clamp if necessary) ⇒ *Electronic parts catalogue*.

- Fit the engine support with the left engine mounting ⇒ Engine, mechanics; Rep. gr. 10.
- Fit the left engine mounting bracket ⇒ Engine, mechanics; Rep. gr. 10.
- Re-install remaining components removed before.
- Evacuate and charge refrigerant circuit. ⇒ Air conditioner with refrigerant R134a
- Add coolant and bleed the coolant circuit ⇒ Engine, mechanics; Rep. gr. 19.
- Interrogate fault 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 234](#).



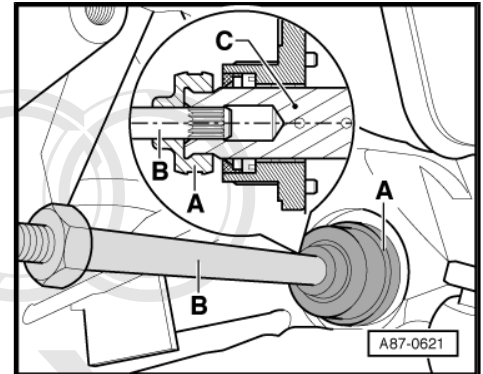
Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a.

16.5 Removing and installing compressor on vehicles with 10-cyl. engine (Audi S6 and RS6)

Note

- ◆ The compressor is driven via a gear wheel and a drive shaft -B-.
- ◆ Detaching compressor holder from engine/attaching ⇒ *Engine, mechanics; Rep. gr. 13*
- ◆ On vehicles with a 10-cyl. FSI engine (Audi S6), detaching the compressor involves draining the refrigerant circuit and then detaching both refrigerant pipes from the compressor ⇒ [page 177](#) and ⇒ *Air conditioner with refrigerant R134a*.
- ◆ On vehicles with a 10-cyl. TFSI engine (Audi RS6), detaching the compressor involves draining the refrigerant circuit and removing the engine ⇒ *Engine, mechanics; Rep. gr. 10*.
- ◆ On account of the different test bench procedure for the engine, the compressor fitted at the factory for the 10-cyl. TFSI engine (Audi RS 6) contains less refrigerant oil than that for the 10-cyl. FSI engine (Audi S6) (at present the compressors only differ in terms of the part number and the quantity of refrigerant oil; refer also to the compressor rating plate). To make up the same total oil quantity in the refrigerant circuit, the amount of oil missing in the compressor on the 10-cyl. TFSI engine (Audi RS 6) is added at the factory to a different part of the refrigerant circuit (only necessary when performing service work if a new compressor with the reduced oil quantity is fitted) ⇒ *Electronic parts catalogue* and ⇒ *Air conditioner with refrigerant R134a*.
- ◆ Removing and installing compressor on vehicles with 10-cyl. FSI engine (Audi S6) ⇒ [page 191](#)
- ◆ Removing and installing compressor on vehicles with 10-cyl. TFSI engine (Audi RS6) ⇒ [page 198](#)



16.5.1 Removing and installing compressor on vehicles with 10-cyl. FSI engine (Audi S6)

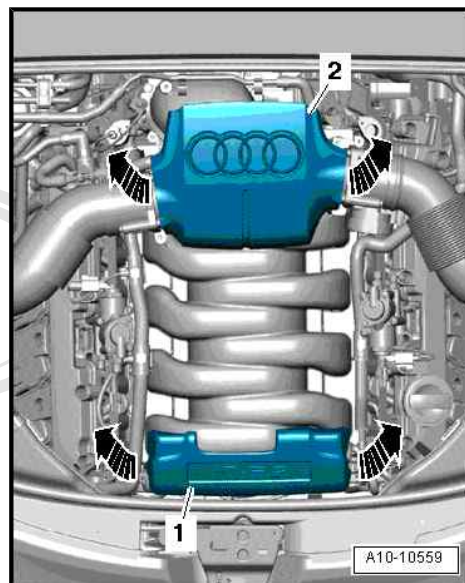
Special tools and workshop equipment required

- ◆ Support bracket - 10-222 A-
- ◆ Used oil collection and extraction unit - V.A.G 1782-
- ◆ Hose clip pliers - V.A.G 1921-
- ◆ Spring-type clip pliers - VAS 5024A-
- ◆ Engine support supplement set - T40093-

Removing

- Discharge refrigerant circuit ⇒ *Air conditioner with refrigerant R134a*.
- Drain coolant ⇒ *Engine, mechanics; Rep. gr. 19*.

- Detach the front -1- and rear -2- engine cover panels -arrows-.
- Remove air cleaner housing (left-side) ⇒ Engine, mechanics; Rep. gr. 24 .
- Draw off power steering hydraulic fluid from reservoir with used oil collection and extraction unit - V.A.G 1782- . ⇒ Running gear; Rep. gr. 48

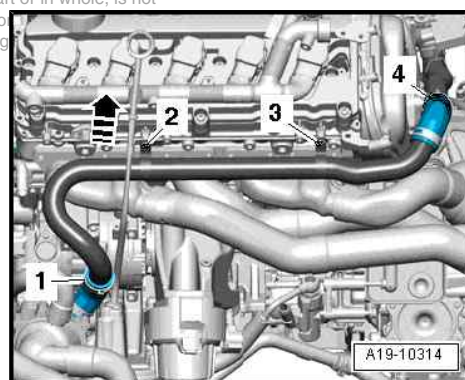


- Remove bolts -2- and -3-.
- Lift off guide tube for dipstick -arrow-.

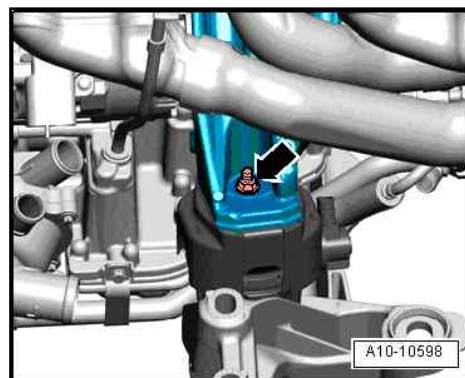


Note

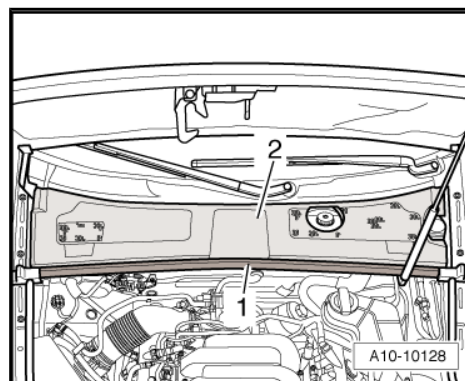
Disregard items -1- and -4-.



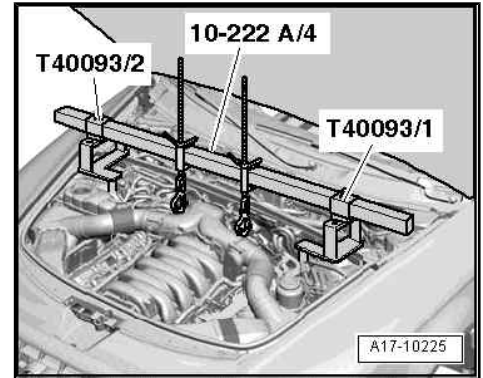
- Screw out the bolt -arrow- for the left engine mounting.



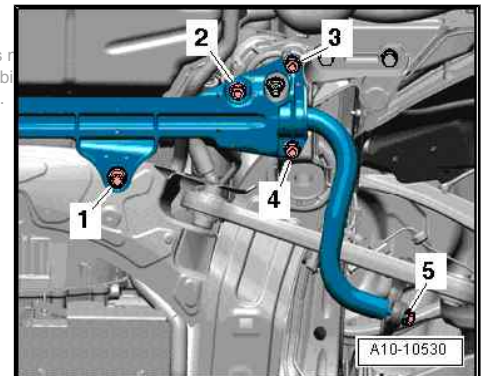
- Pull off the rubber seal -1- and detach the plenum chamber cover -2-.



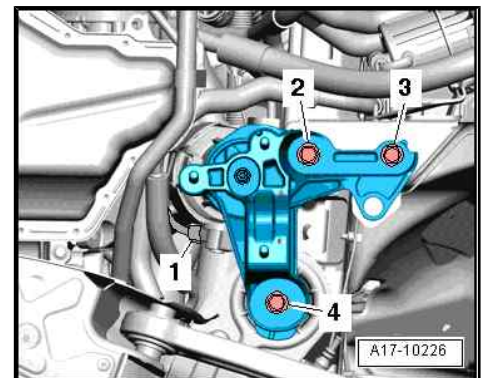
- Attach the support bar - 10-222 A- with the supports - T40093/1- and -T40093/2- to the suspension strut domes.
- The supports are marked for the left and right sides of the vehicle.
- Attach the spindles of the support bar - 10-222 A- to the rear engine lifting eyes.
- Take up weight of engine by tightening spindles.



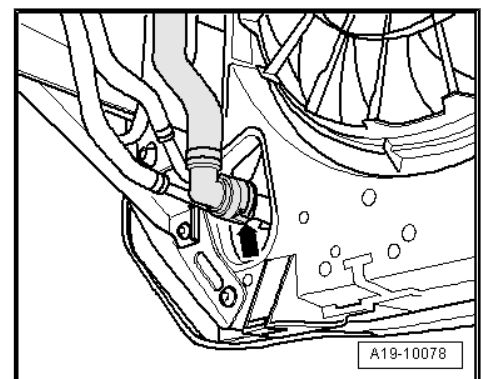
- Evenly unscrew the bolts and nuts -1 ... 5- on the left and right.
- Detach the anti-roll bar with cross member ⇒ Running gear.



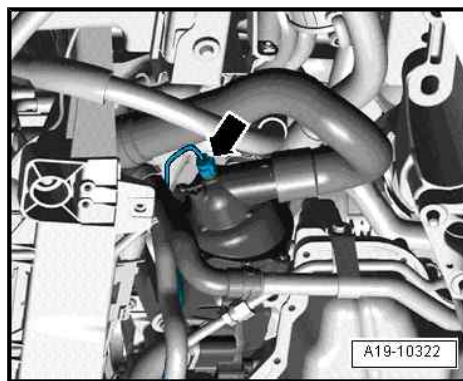
- Unplug electrical connector -1- (mark connector to ensure it is not interchanged on assembly).
- Screw out the bolts -2, 3, 4- and detach the left engine mounting bracket with engine mounting.



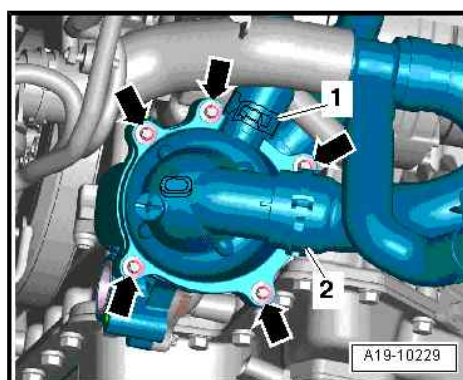
- Detach the lower left coolant hose -arrow- from the radiator.



- Unplug electrical connector -arrow- at radiator outlet coolant temperature sender - G83- .



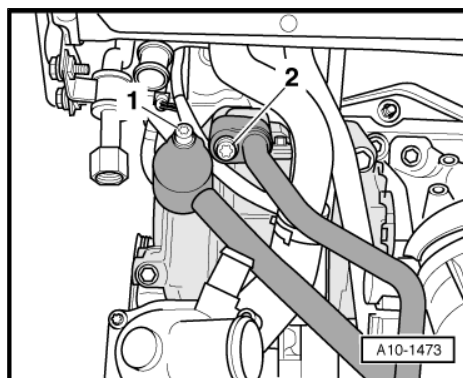
- Detach coolant hose -2- (bottom) from thermostat housing.
- Remove bolts -arrows-.
- Detach thermostat housing and disconnect coolant hose -1- (top) from thermostat housing.



Note

To prevent damage to the refrigerant lines/hoses, take care to avoid stretching, kinking or bending the lines and hoses.

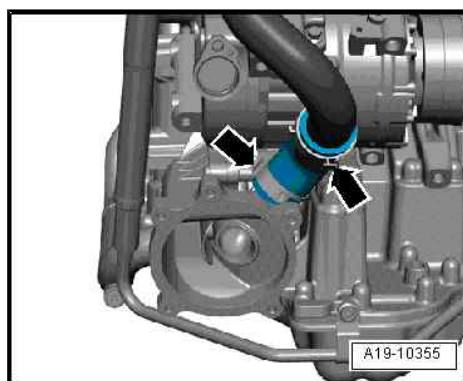
- Remove bolts -1- and -2-.
- Disconnect refrigerant lines from air conditioner compressor.



Note

Seal the open lines and connections at the air conditioner compressor with suitable caps (to prevent dirt and moisture from entering).

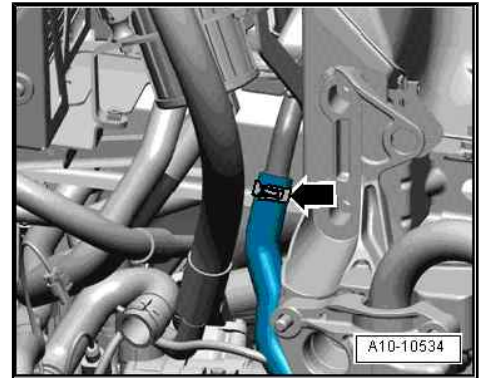
- Remove coolant hose -arrows- and move coolant pipe upwards.



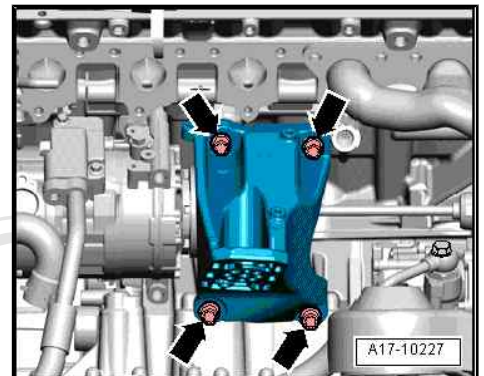
i Note

Place a cloth beneath the separating point to catch any hydraulic fluid escaping.

- Detach the hydraulic hose -arrow- from the pipe at the left longitudinal member.



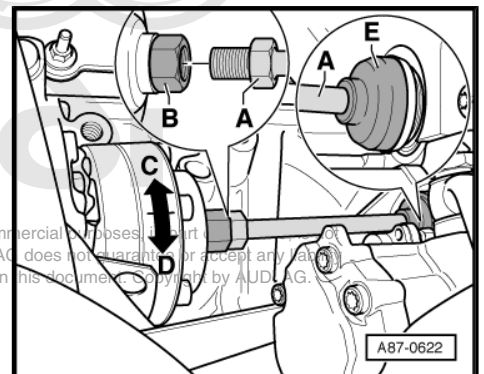
- Screw out the bolts -arrows- and detach the left engine support.



- Use an open-ended wrench to hold the compressor drive shaft -A- in position and turn the compressor drive unit -B- in the direction of -arrow C-.

i Note

- ◆ *Do not turn the compressor drive shaft -A-.*
- ◆ *After unfastening the bolt connection, the compressor drive shaft -A- can be pushed through the grommet -E- into the drive gear.*



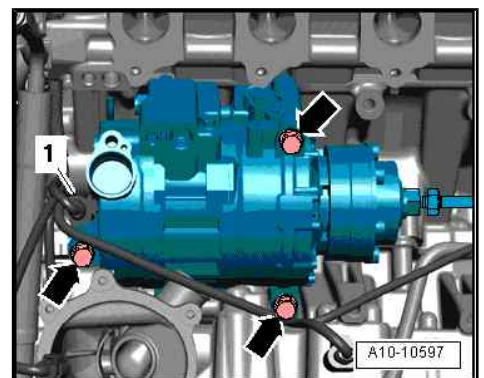
- Unplug the connector -1- to the air conditioner compressor regulating valve -N280- (mark the connector to prevent interchange with the engine mounting connector).
- Remove bolts -arrows-.
- Take out air conditioner compressor.

Installing

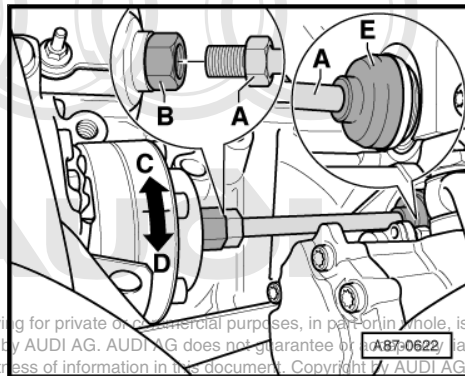
Install in reverse order of removal; note the following:

i Note

- ◆ *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue .*
- ◆ *The removed compressor contains an indeterminate amount of refrigerant oil. Therefore, pay attention to the notes on compressor replacement. ⇒ Air conditioner with refrigerant R134a*



- Fit compressor drive shaft -A- (in drive gear on engine) and check both proper attachment and corresponding grommet -E- ⇒ [page 204](#) .



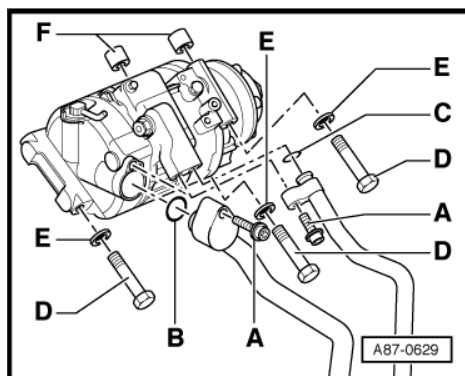
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- Thoroughly clean contact surfaces on bracket and on compressor. To do so, remove bushes -F- from compressor bracket or from compressor if necessary.
- Check connections of compressor and refrigerant lines for damage or dirt ⇒ [page 177](#) .
- Make sure that bushes -F- are fitted in air conditioner compressor or in bracket.



Note

Make sure that bushes -F- are positioned correctly and that contact surfaces are clean. Incorrectly fitted bushes or dirty/damaged contact surfaces could lead to misalignment between compressor and engine. After a period of operation, misalignment will cause damage to the drive shaft or the compressor.



- Attach compressor with bolts -D- (and washers -E-) to bracket (tightening torque 25 Nm).
- Replace the sealing rings -B- and -C- ⇒ [page 10](#) .
- Attach refrigerant lines to compressor ⇒ [page 177](#) (tightening torque of bolts -A- 25 Nm). For dimensions of O-rings -B- and -C- and further information, refer to ⇒ [page 177](#) and ⇒ Electronic parts catalogue .

- After installing the compressor and before screwing in the drive shaft, crank the compressor 10 times by hand in the direction of arrow -C- by way of the compressor drive unit -B- (to prevent compressor damage on initial activation).

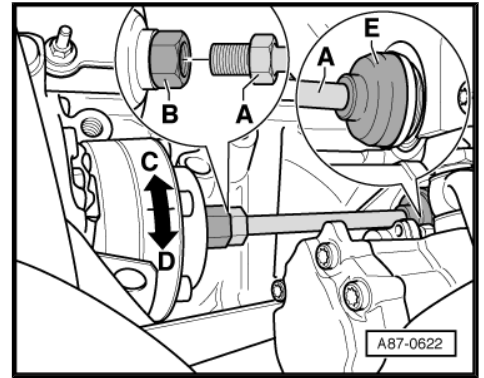
 Note

Any refrigerant oil which may have collected in the compression chamber after the compressor is removed or after pouring in fresh refrigerant oil (e.g. after flushing refrigerant circuit) is forced out of the compression chamber by cranking the compressor.

- Tighten drive shaft. Use open-ended wrench to hold compressor drive shaft -A- in position and turn compressor drive unit -B- in direction of arrow -D- (tightening torque 60 Nm).

 Note

- ◆ *Drive shaft -A- must not be turned.*
- ◆ *After fitting drive shaft -A-, check installation position of grommet -E-.*
- ◆ *The grommet -E- is secured in position on the power steering pump flange with a clamp to prevent it from slipping ⇒ Electronic parts catalogue .*



- Fit the engine support ⇒ Engine, mechanics; Rep. gr. 10 .
- Install the thermostat housing ⇒ Engine, mechanics; Rep. gr. 19 .
- Fit the engine mounting bracket ⇒ Engine, mechanics; Rep. gr. 40 .
- Install anti-roll bar ⇒ Running gear; Rep. gr. 40 .
- Fit the left air cleaner housing ⇒ Engine, mechanics; Rep. gr. 24 .
- Fill up hydraulic fluid in power steering reservoir ⇒ Running gear; Rep. gr. 48 .
- Re-install remaining components removed before.
- Evacuate and charge refrigerant circuit. ⇒ Air conditioner with refrigerant R134a
- Add coolant and bleed the coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 .
- Interrogate fault 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 234](#) .

 Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a .

16.5.2 Removing and installing compressor on vehicles with 10-cyl. TFSI engine (Audi RS6)



Note

On vehicles with a turbocharger, the left engine support can only be removed after taking out the exhaust manifold and turbocharger. Compressor removal and installation operations thus require removal of the engine ⇒ Engine, mechanics; Rep. gr. 10 .

Removing

- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a .
- Engine/gearbox unit removed and set down on the scissors-type jack - VAS 6131 A ⇒ Engine, mechanics; Rep. gr. 10



Note

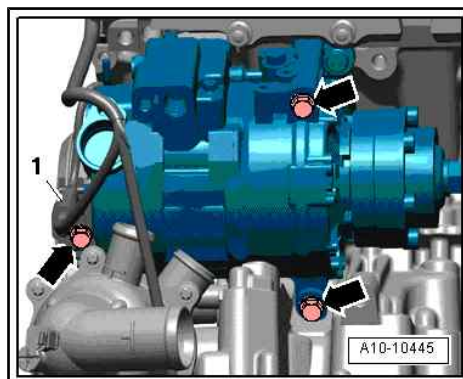
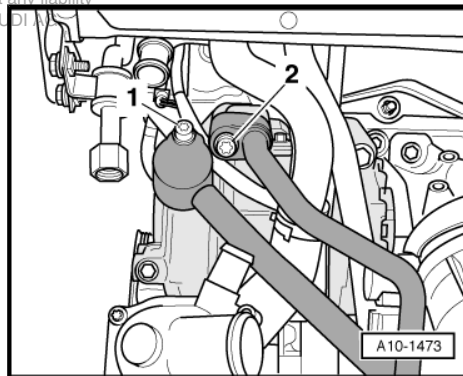
- ♦ Before the engine can be removed, the bolts -1- and -2- must be removed and the refrigerant pipes detached from the compressor ⇒ [page 177](#) (leave the refrigerant pipes in the vehicle).
- ♦ To prevent damage to the refrigerant lines/hoses, take care to avoid stretching, kinking or bending the lines and hoses.
- ♦ Seal any open pipes and the connections at the compressor as well as the refrigerant pipes with suitable caps or clean plugs (to prevent the ingress of dirt and moisture).

- Remove the left turbocharger ⇒ Engine, mechanics; Rep. gr. 21 .



Note

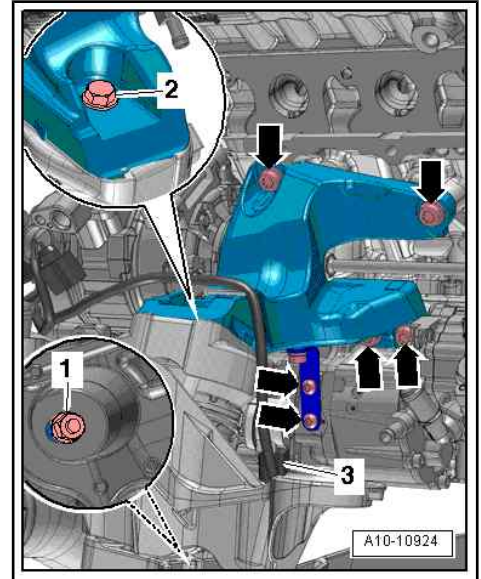
Before unplugging, mark the connector -1- for the air conditioner compressor regulating valve - N280- and the left electrohydraulic engine mounting solenoid valve - N144- (to avoid possible interchange).



- Unplug the connector -3- at the left electrohydraulic engine mounting solenoid valve - N144- and lay bare the wire.
- Screw out the bolts -arrows- and detach the engine support with engine mounting and engine mounting bracket.

i Note

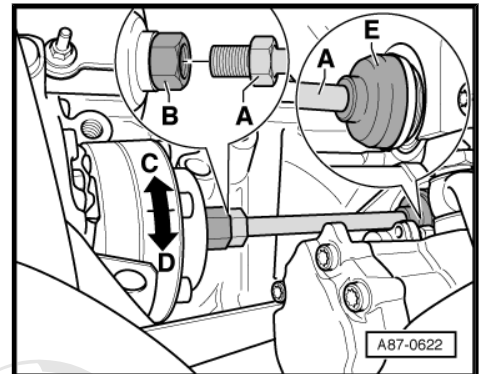
-Items 1, 2- can be disregarded.



- Use an open-ended wrench to hold the compressor drive shaft -A- in position and turn the compressor drive unit -B- in the direction of -arrow C-.

i Note

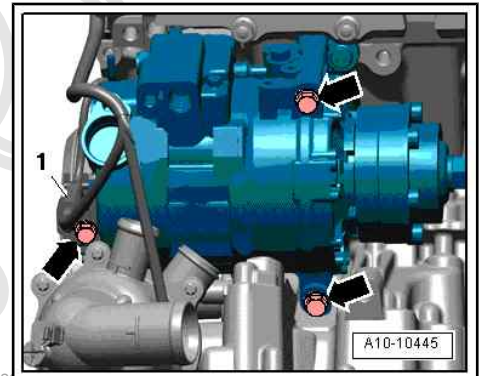
- ◆ Do not turn the compressor drive shaft -A-.
- ◆ After unfastening the bolt connection, the compressor drive shaft -A- can be pushed through the grommet -E- into the drive gear.



- Remove the connector -1- for the air conditioner compressor regulating valve - N280- from the holder and unplug.
- Remove bolts -arrows-.
- Take out air conditioner compressor.

Installing

Install in reverse order of removal; note the following:



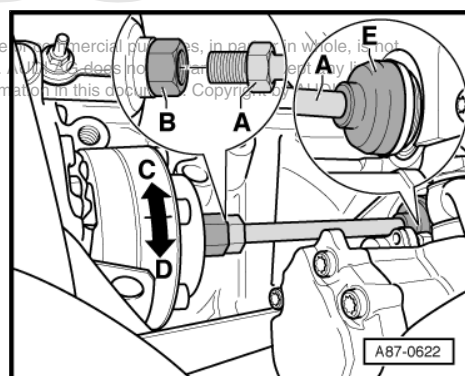
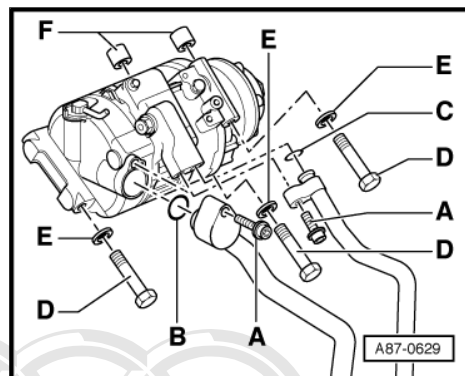
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- If necessary, remove the dowel sleeves -F- from the compressor.
- Thoroughly clean the contact surfaces at the compressor and holder.
- Fit the dowel sleeves -F- in the compressor.

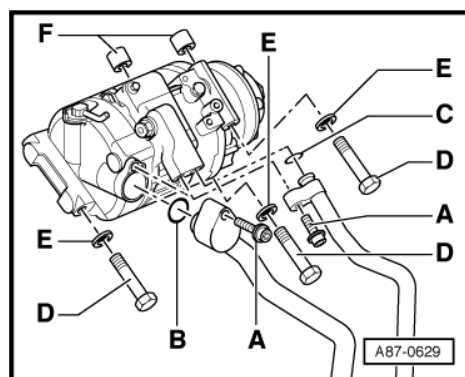


Note

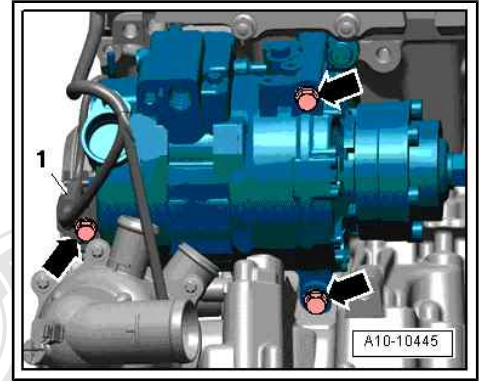
- ◆ *Make sure that the dowel sleeves are positioned correctly and that the contact surfaces are clean. Incorrectly fitted dowel sleeves or dirty/damaged contact surfaces could lead to misalignment between the compressor and the engine. After a period of operation, misalignment will cause damage to the drive shaft or the compressor.*
- ◆ *When it is removed, the compressor contains an indeterminate amount of refrigerant oil. For this reason it is important to observe the notes on compressor replacement ⇒ Air conditioner with refrigerant R134a .*
- Check the connections of the compressor and the refrigerant pipes for damage or dirt ⇒ [page 177](#) .
- If applicable, install the compressor drive shaft -A- (in the drive gear) and check both proper attachment of the drive shaft and the corresponding socket -E- ⇒ [page 204](#) .



- Attach the compressor with the bolts -D- (and washers -E-) to the holder.



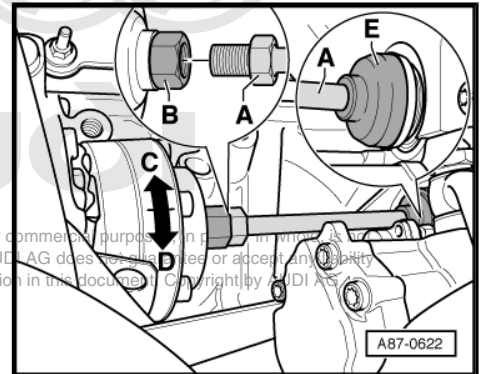
- Tighten bolts -arrows-.
- Tightening torque: 25 Nm
- Plug in the connector -1- at the air conditioner compressor regulating valve - N280- (heed the mark).



- After installing the compressor and before screwing in the drive shaft -A-, crank the compressor 10 times by hand in the direction of arrow -C- by way of the compressor drive unit -B- (to prevent compressor damage on initial activation).

i Note

Any refrigerant oil which may have collected in the compression chamber on removing the compressor or after pouring in fresh refrigerant oil (e.g. after purging the refrigerant circuit) is forced out of the compression chamber by the cranking action.



- Use an open-ended wrench to hold the compressor drive shaft -A- in position and turn the compressor drive unit -B- in the direction of -arrow D-.
- Tighten the drive shaft.
- Tightening torque: 60 Nm

i Note

- ◆ The compressor drive shaft -A- must not be turned when tightening the bolt connection.
- ◆ After installation, check position of boot -E- on drive gear.
- ◆ After fitting drive shaft -A-, check installation position of boot -E-.
- ◆ The socket -E- is secured in position at the power steering pump flange with a clamp to stop it slipping; this must be of the standard type ⇒ Electronic parts catalogue .

- Fit the engine support with the left engine mounting ⇒ Engine, mechanics; Rep. gr. 10 .
- Install the exhaust manifold with the left turbocharger ⇒ Engine, mechanics; Rep. gr. 21 .

Fit the engine/gearbox unit ⇒ Engine, mechanics; Rep. gr. 10 .

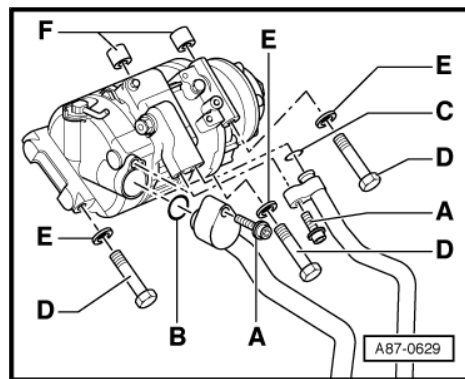
- Attach the refrigerant pipes to the compressor ⇒ [page 177](#) .



Note

For dimensions of O-rings -B- and -C- and further information, refer to [⇒ page 177](#) and [⇒ Electronic parts catalogue](#) .

- Re-install remaining components removed before.
- Evacuate and charge refrigerant circuit. [⇒ Air conditioner with refrigerant R134a](#)
- Add coolant and bleed the coolant circuit [⇒ Engine, mechanics; Rep. gr. 19](#) .
- Interrogate fault 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 234](#) .



Note

Also observe notes on starting up air conditioner after charging [⇒ Air conditioner with refrigerant R134a](#) .

16.6 Checking/replacing compressor drive unit



Note

If the drive plate overload protection device has been tripped, check that compressor runs freely before renewing drive unit. If the compressor does not rotate freely, renew the complete unit.



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1 - Compressor drive shaft

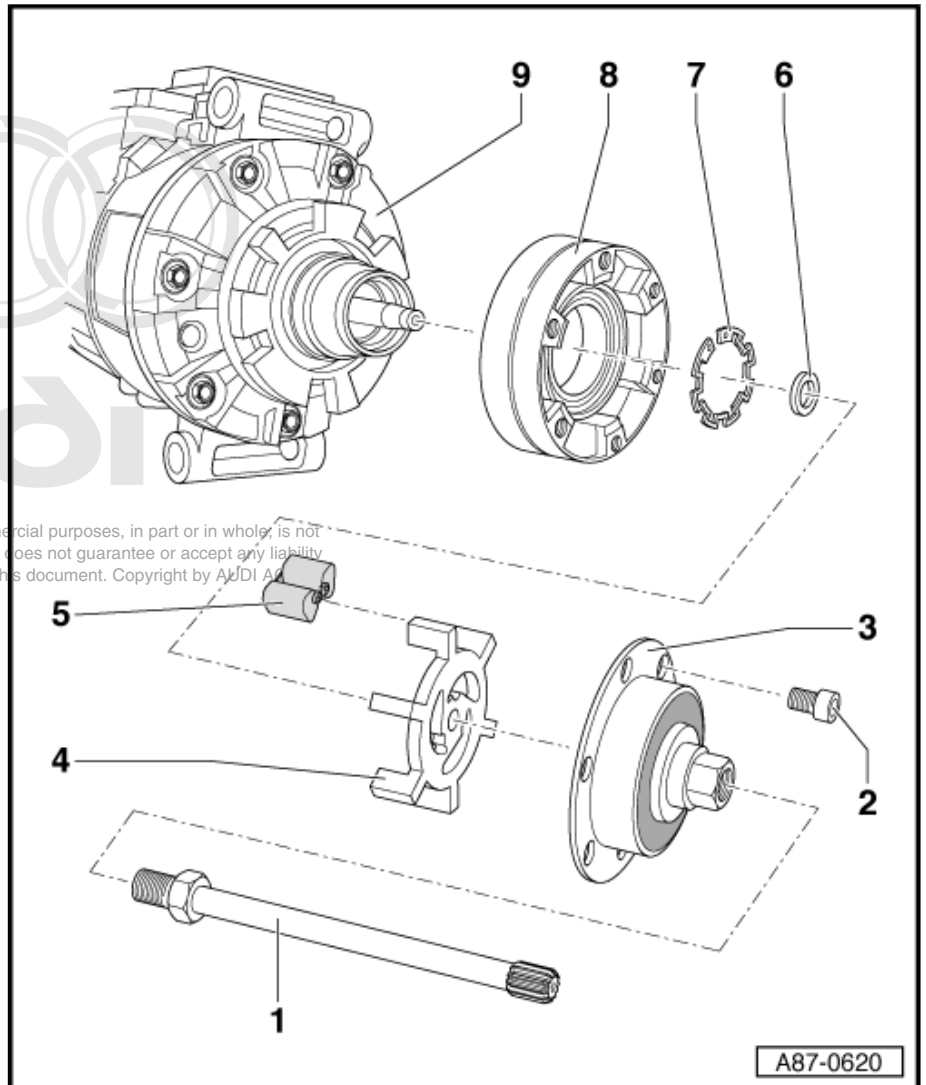
- ☐ Check; after tightening bolt connection, drive shaft must engage snugly in splines of drive gear on engine
⇒ [page 205](#)
- ☐ Tightening torque: 60 Nm
- ☐ Loosening and tightening ⇒ [page 204](#)
- ☐ Removing and installing ⇒ [page 205](#)
- ☐ Lubricate drive gear splines, e.g. with grease - G 000 100- ⇒ Electronic parts catalogue

2 - Hexagon socket head bolt

- ☐ Tightening torque: 10 Nm

3 - Drive plate

- ☐ Incorporates overload protection device, which is tripped in the event of excessive torque (e.g. stiff compressor) so that drive shaft just free-wheels without driving compressor
- ☐ Checking concentricity and adjusting ⇒ [page 206](#)
- ☐ Detaching and attach-



A87-0620

ing ⇒ [page 205](#)

4 - Drive plate

- ☐ Screwed onto compressor shaft
- ☐ Incorporates overload protection device, which is tripped in the event of excessive torque (e.g. stiff compressor) so that drive shaft just free-wheels without driving compressor
- ☐ Tightening torque: 30 Nm
- ☐ Detaching and attaching ⇒ [page 206](#)

5 - Rubber element

- ☐ Isolates drive unit, dampens vibration and noise
- ☐ When installing, coat rubber elements slightly with soap solution or similar to provide lubrication
- ☐ Detaching and attaching ⇒ [page 206](#)

6 - Spacer

- ☐ The original spacer must be fitted
- ☐ Dimensions: 17.5 x 10 x 3 mm

7 - Circlip

- ☐ Renew
- ☐ Ensure correct installation position (flat side facing compressor)
- ☐ Removing and installing ⇒ [page 207](#)

8 - Drive plate

- ☐ With roller bearing
- ☐ Detaching and attaching ⇒ [page 207](#)
- ☐ Clean flange of compressor before fitting drive plate

9 - Compressor

- ☐ Different versions may be fitted, depending on engine type and country-specific version of vehicle ⇒ Electronic parts catalogue

16.7 Unfastening and tightening compressor drive shaft



Note

- ◆ *Extensive preparation is required before the compressor drive shaft can be unfastened ⇒ [page 183](#) (removing and installing compressor on vehicles with 8-cyl. engine), ⇒ [page 191](#) . (removing and installing compressor on vehicles with 10-cyl. engine)*
- ◆ *On vehicles with an 8-cyl. engine for example, the drive shaft can also be checked and tightened without opening the refrigerant circuit.*

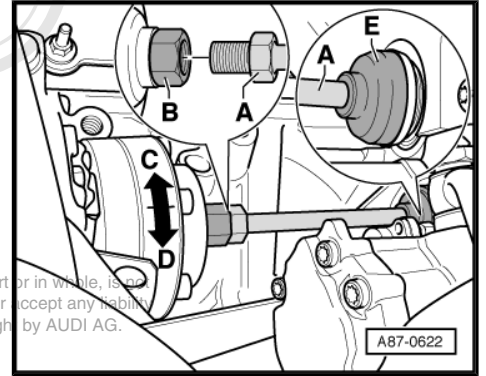
Slackening drive shaft

- Remove the components impeding access to the drive shaft ⇒ [page 183](#) (removing and installing compressor on vehicles with 8-cyl. engine), ⇒ [page 191](#) (removing and installing compressor on vehicles with 10-cyl. engine).

- Use an open-ended wrench to hold the compressor drive shaft -A- in position and turn the compressor drive unit -B- in the 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 the drive shaft -A-, check the installation position of the socket -E- and the clamp fitted.



Tightening drive shaft

- Use open-ended wrench to hold compressor drive shaft -A- in position and turn compressor drive unit -B- in direction of arrow -D- (tightening torque 60 Nm).
- After tightening the compressor drive shaft, check the installation position of socket -E- and the clamp fitted there.

16.8 Removing and installing compressor drive shaft

Removing drive shaft

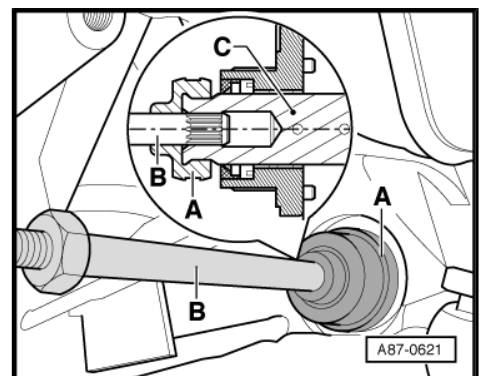
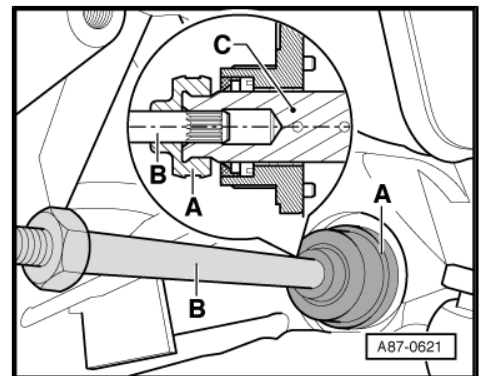
- Remove the compressor ⇒ [page 183](#) (vehicles with 8-cyl. engine), ⇒ [page 191](#) (vehicles with 10-cyl. engine).
- Detach grommet -A-
- Pull drive shaft -B- out of splines of drive gear -C-.

Installing drive shaft

Install in reverse order of removal; note the following.

- Check drive shaft -B-. The splines must not exhibit signs of wear and must engage snugly in the splines of the drive gear -C-.
- Before fitting, lubricate splines of drive shaft -B- with grease - G 000 100- ⇒ Electronic parts catalogue .
- Before fitting compressor, insert drive shaft -B- and slide it home in drive gear -C-.
- After fitting the compressor, check the installation position of the socket -A- and the clamp fitted.

Socket -A- is secured with a clamp to the flange of the power steering pump to stop it slipping (gradual introduction of the clamp at the factory in Model Year 2005, retrofit the clamp if necessary) ⇒ Electronic parts catalogue .



16.9 Detaching and attaching drive plate with overload protection device

- Remove compressor ⇒ [page 183](#) (vehicles with 8-cyl. engine), ⇒ [page 191](#) (vehicles with 10-cyl. engine)

Removing

- Remove bolts -A-.

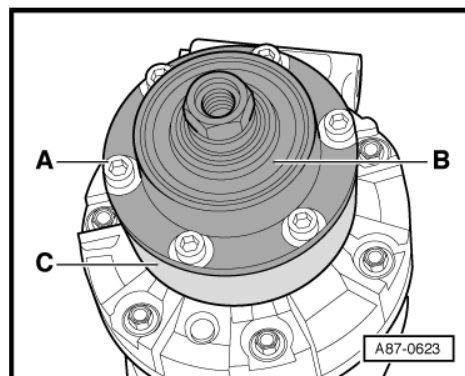


Note

Use commercially available strap wrench (with fabric strap) to counterhold drive plate -C-.

Installing

- Locate drive plate with overload protection device -B- on drive plate -C-.
- Insert and hand-tighten bolts -A-.
- Check concentricity of drive plate -B- ⇒ [page 206](#) .
- Tighten bolts -A- to final torque (10 Nm).
- Check concentricity of drive plate -B- again ⇒ [page 206](#) .

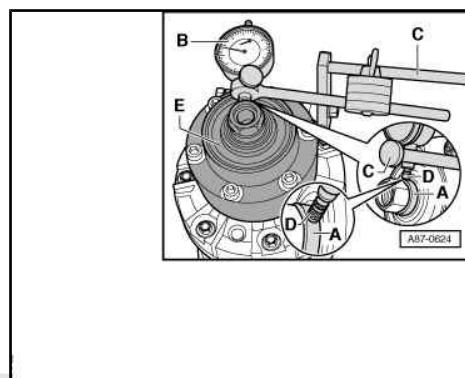


16.10 Checking concentricity of drive plate with overload protection device / adjusting

- Remove compressor ⇒ [page 183](#) .
- Clean flange on drive plate -A-.
- Attach dial gauge -B- to 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.
- Give compressor drive unit -E- several turns.

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 205](#) and re-adjust drive plate.



16.11 Removing and installing drive plate on compressor

- Unbolt drive plate with overload protection device ⇒ [page 205](#) .

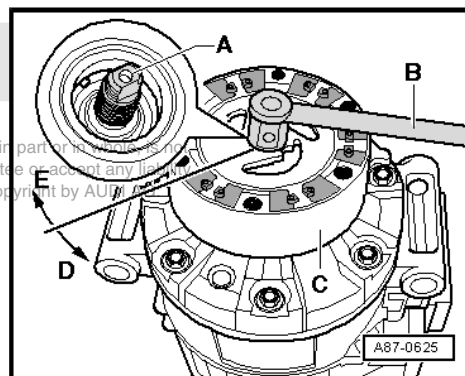
Removing

- Unfasten drive plate -C- by turning it with a commercially available strap wrench (with fabric strap) in direction of arrow -D-. Counterhold compressor shaft -A- by applying counterhold tool -B- to compressor shaft -A-.



Note

Depending on the type of 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.

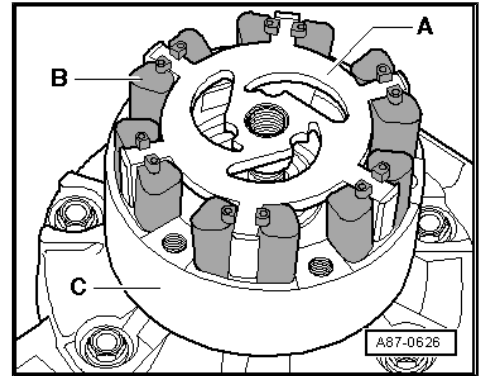


Installing

- When installing, moisten rubber elements -B- slightly with soap solution or similar to provide lubrication.
- Fit rubber elements -B- in drive plate -A- as shown.
- Fit drive plate -A- with rubber elements -B- in drive plate -C- as shown until it makes contact with compressor shaft.

Note

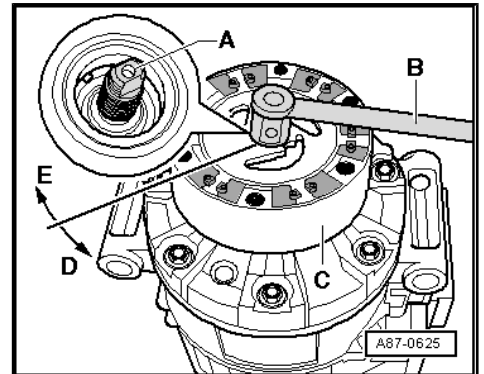
This illustration shows rubber elements -B-, version "1". Rubber elements -B- in version "2" are connected at the top.



- Screw drive plate -C- onto compressor shaft -A- by turning it in direction of arrow -E-.
- Tighten the drive plate -C- (30 Nm) by turning it with a commercially available strap wrench (with fabric strap) in the direction of arrow -E-. Counterhold the compressor shaft -A- by applying a counterhold tool -B- to the compressor shaft -A-.

Note

Depending on the type of 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.

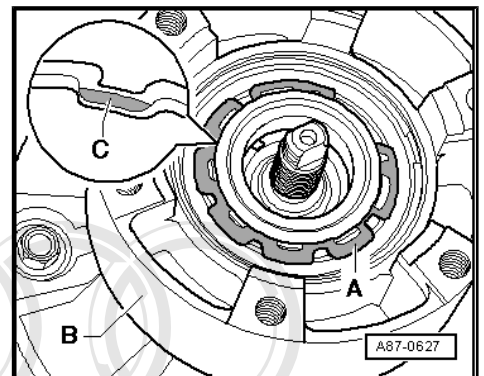


16.12 Removing and installing drive plate with roller bearing

- Detach drive plate from compressor shaft ⇒ [page 206](#) .
- Remove circlip -A-.
- Pull off drive plate -B-.

Note

- ◆ Renew circlip -A-.
- ◆ Clean compressor flange before fitting 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 compressor (flat side faces compressor).

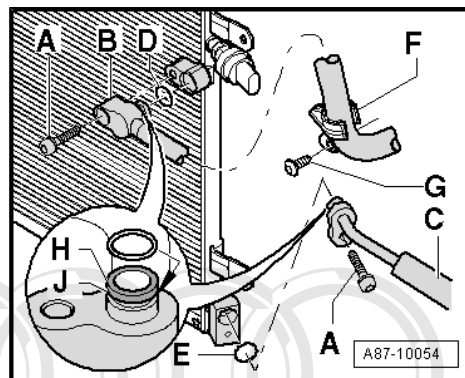


16.13 Detaching and attaching refrigerant lines at condenser



Note

- ◆ There are different condenser versions depending on the vehicle model ⇒ *Electronic parts catalogue*.
- ◆ The condenser fitted on vehicles with a 10-cyl. TFSI engine (Audi RS 6) has a smaller internal volume than the condenser with other engines. For vehicles with a 10-cyl. TFSI engine the refrigerant capacity is thus also slightly less than for other vehicles ⇒ *Electronic parts catalogue* and ⇒ *Air conditioner with refrigerant R134a*.
- ◆ On vehicles with 6-cyl. diesel engine, refrigerant pipe from compressor to condenser is additionally attached with holder -F- and bolt -G- to front end module.

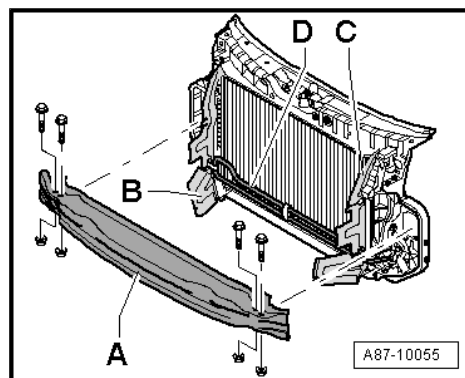


Detaching refrigerant lines

- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a.
- Remove front bumper casing and cover ⇒ General body repairs, exterior; Rep. gr. 63

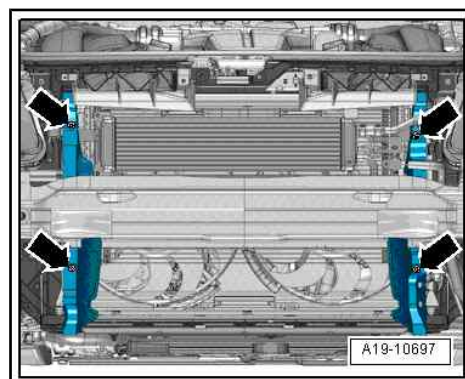
Remove the following components depending on the vehicle model

- Remove carrier for bumper casing -A- and air duct -C- (not required e.g. in the Audi RS6) ⇒ General body repairs, exterior; Rep. gr. 63



- Screw out the bolts at the left air duct -arrows in illustration on right- (e.g. on the Audi RS 6).
- Press aside the left air duct (e.g. on the Audi RS 6).

All vehicles (continued):



- Unscrew bolts -A-.
- On vehicles with 6-cyl. diesel engine, detach refrigerant pipe between compressor and condenser from holder -F-.
- Detach refrigerant lines -B- and -C- from condenser.

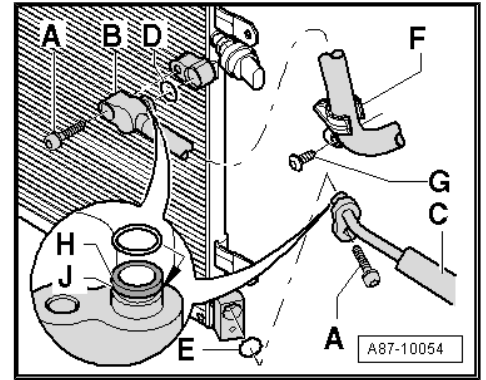


Seal open lines and connections at condenser with suitable caps (to prevent of dirt and moisture from entering).

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Attaching refrigerant lines

Install in reverse order of removal; note the following.



- Replace the O-rings -D- and -E-, for version refer to ⇒ Electronic parts catalogue .
- Check guide ring -H- at connections of both refrigerant pipes -B- and -C- for damage.
- Insert appropriate O-ring (-D- and -E-) in groove -J- at connections of both refrigerant pipes -B- and -C-.
- Check the fitted pin -F- (not provided with all connections) and the refrigerant pipe connection -E- for damage and proper fit.



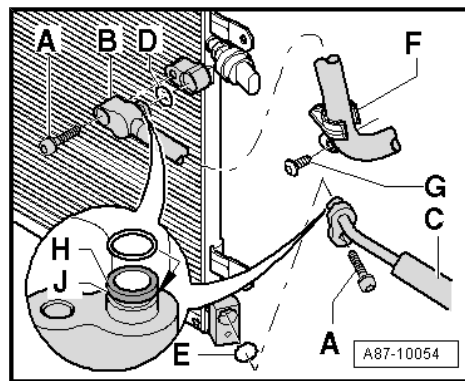
Note

- ◆ Coat O-rings lightly with refrigerant oil before fitting
⇒ [page 10](#) .
- ◆ *Make sure O-rings -D- (different versions) are seated correctly in groove -J- of corresponding refrigerant line.*
- ◆ 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.
- Tighten the bolts -A-.
- Tightening torque: 10 Nm
- After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.
- Re-install the bumper cover and the front bumper panel (as well as the other components removed) ⇒ General body repairs, exterior; Rep. gr. 63 .
- Evacuate and refill the refrigerant circuit. ⇒ Air conditioner with refrigerant R134a
- Interrogate fault 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 234](#) .



Note

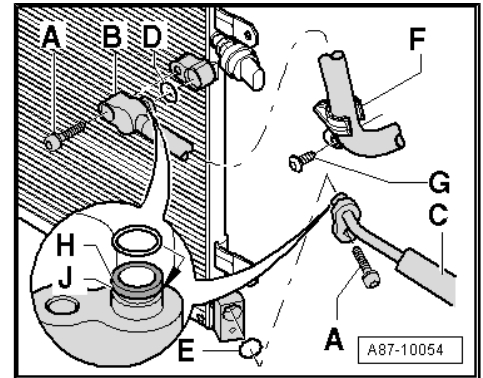
Also observe notes on starting up air conditioner after charging
⇒ Air conditioner with refrigerant R134a .



16.14 Removing and installing condenser

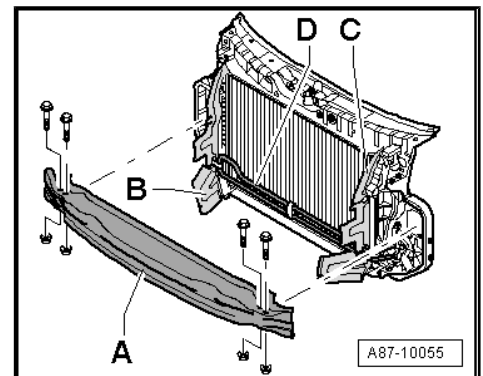
Note

- ◆ Different versions of the condenser are fitted, depending on the vehicle equipment. ⇒ *Electronic parts catalogue*
- ◆ The condenser fitted on vehicles with a 10-cyl. TFSI engine (Audi RS 6) has a smaller internal volume than the condenser with other engines. For vehicles with a 10-cyl. TFSI engine the refrigerant capacity is thus also slightly less than for other vehicles ⇒ *Electronic parts catalogue* and ⇒ *Air conditioner with refrigerant R134a*.
- ◆ On vehicles with 6-cyl. diesel engine, refrigerant pipe from compressor to condenser is additionally attached with holder -F- and bolt -G- to front end module.
- ◆ The condenser removed contains refrigerant oil which has to be returned to the refrigerant circuit ⇒ *Air conditioner with refrigerant R134a*
- ◆ 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. Neither radiator nor condenser are to be replaced on account of such minor pressure marks.



Removing

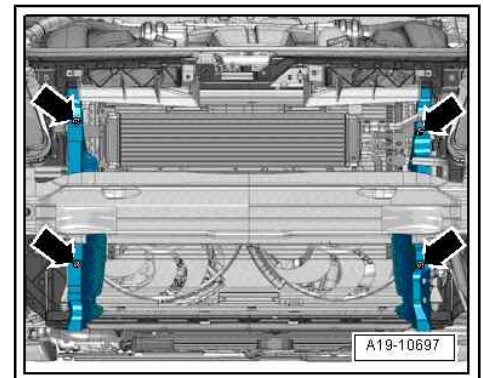
- Discharge refrigerant circuit ⇒ *Air conditioner with refrigerant R134a*
- Remove front bumper casing and carrier for bumper casing -A- ⇒ *General body repairs, exterior; Rep. gr. 63*
- Remove the two air ducts -B- and -C-.



Note

Remove the bolts -arrows- to take out the air ducts.

- Remove the upper radiator (e.g. on the Audi RS 6, not fitted on all models) ⇒ *Engine, mechanics; Rep. gr. 10*.



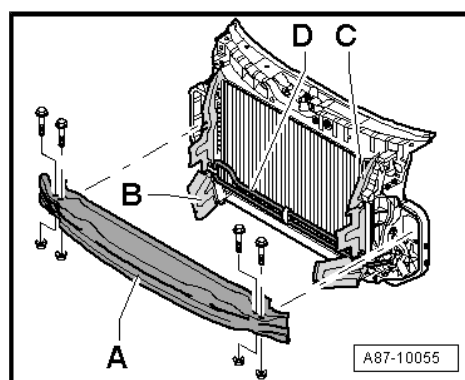
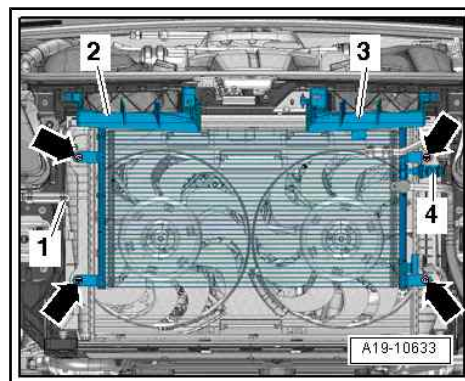
- On the Audi RS 6 additionally unfasten the hose clamp -1- and detach the right coolant hose.
- Detach the air ducts -2- and -3- (e.g. on the Audi RS 6, not fitted on all models).



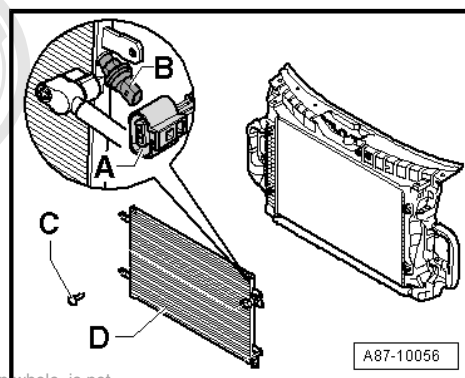
Note

Item -4- is the connector for the refrigerant pressure/temperature sender - G395-

- If necessary, detach power steering oil cooler -D- from front end module (not required with all models) ⇒ Running gear; Rep. gr. 48 .



- Unplug connector -A- from refrigerant pressure/temperature sender - G395- -B-.
- Detach refrigerant lines from condenser ⇒ [page 208](#) .
- If condenser is to be replaced, remove refrigerant pressure/temperature sender - G395- -B- ⇒ [page 9](#) .
- Unscrew bolts -C-.
- Detach the condenser -D-.



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Note

The Audi RS 6 is fitted with a smaller condenser. Screw out the bolts -arrows- here.

Installing

Note

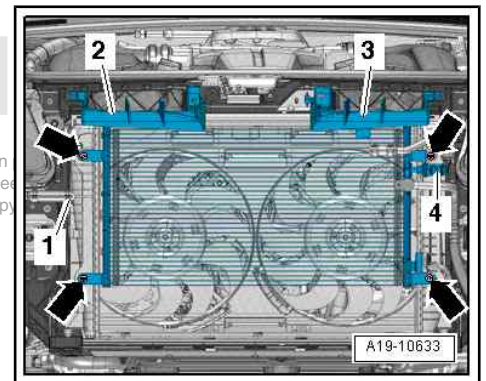
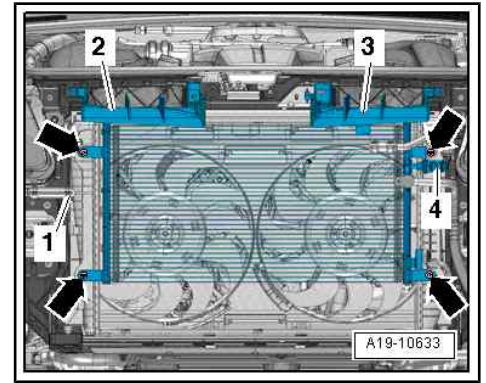
- ◆ Different versions of the condenser are fitted, depending on the version of the vehicle. ⇒ *Electronic parts catalogue*
- ◆ The condenser fitted on vehicles with a 10-cyl. TFSI engine (Audi RS 6) has a smaller internal volume than the condenser with other engines. For vehicles with a 10-cyl. TFSI engine the refrigerant capacity is thus also slightly less than for other vehicles ⇒ *Electronic parts catalogue* and ⇒ *Air conditioner with refrigerant R134a*.
- ◆ The condenser removed contains refrigerant oil which has to be returned to the refrigerant circuit ⇒ *Air conditioner with refrigerant R134a*

Install in reverse order of removal; note the following.

- Tightening torque of bolts -arrows-: condenser to radiator - 5 Nm
- Attach the condenser to the radiator.
- Attach the refrigerant pipes to the condenser ⇒ [page 208](#).
- After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.
- Re-install the components removed in reverse order (air ducts, radiator and oil cooler etc.).
- Re-install the front bumper panel (as well as the other components removed) ⇒ *General body repairs, exterior; Rep. gr. 63*.
- Evacuate the refrigerant circuit after assembly, and then refill. ⇒ *Air conditioner with refrigerant R134a*
- Add coolant and bleed the coolant circuit (e.g. on the Audi RS 6) ⇒ *Engine, mechanics; Rep. gr. 19*.
- Interrogate fault 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 234](#).

Note

Also observe notes on starting up air conditioner after charging ⇒ *Air conditioner with refrigerant R134a*.



16.15 Removing and installing restrictor



Note

- ◆ *This vehicle may only be fitted with a red coloured restrictor (depending on the manufacturer, the colour may also tend towards orange) ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a .*
- ◆ *Differently coloured replacement restrictors are available ("yellow" restrictor, diameter of bore/constriction 1.54 mm; "red" restrictor, diameter of bore/constriction 1.42 mm). Attention is therefore to be paid to assignment (different refrigerant circuit matching).*
- ◆ *There are various types of refrigerant pipe between evaporator and compressor/reservoir depending on vehicle design. ⇒ Electronic parts catalogue*

Removing

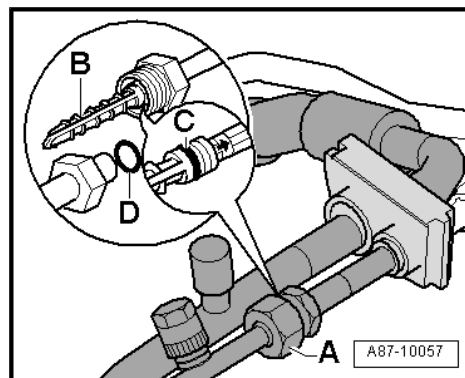
- Discharge refrigerant circuit ⇒ **Air conditioner with refrigerant R134a** .
- Detach refrigerant line at bolt connection -A- (seal open connections).
- Use pointed-nose pliers to pull restrictor -B- out of refrigerant pipe.

Installing

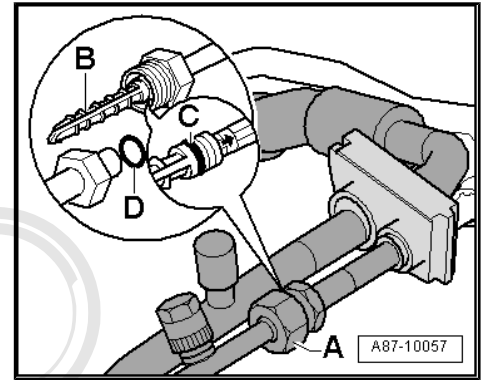


Note

Only install restrictors of same type. Restrictors of different colour have different bore diameters ⇒ Electronic parts catalogue .



- Check that O-ring -C- (7.5 mm; 1.5 mm) is seated correctly in groove.
- Before fitting, moisten the O-ring (of the restrictor and at the screw connection) with a small quantity of refrigerant oil
⇒ [page 10](#) .
- Install restrictor -B- at correct position (with arrow on restrictor pointing towards evaporator).
- Check attachment of restrictor (no clearance in refrigerant pipe).
- Replace the O-ring -D-, for version, refer to ⇒ Electronic parts catalogue .
- Install refrigerant lines so that they are free of stress.
- Tighten the screw connection -A-.
- Tightening torque: 15 Nm



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Check position of refrigerant lines after tightening bolt connection (lines must not make contact with other components)

- Evacuate and refill the refrigerant circuit. ⇒ Air conditioner with refrigerant R134a
- Interrogate fault 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 234](#) .

i Note

Also observe notes on starting up air conditioner after charging
⇒ Air conditioner with refrigerant R134a .

16.16 Removing and installing refrigerant lines

Refrigerant pipes from condenser and reservoir to air conditioning unit

- ◆ Removing and installing refrigerant pipe A (from screw connection in refrigerant pipe to connection at air conditioning unit) ⇒ [page 217](#)
- ◆ Removing and installing refrigerant pipe B (from connection at condenser to screw connection in refrigerant pipe)
⇒ [page 218](#)
- ◆ Removing and installing refrigerant pipe C (from connection at reservoir to connection at air conditioning unit) ⇒ [page 219](#)
- ◆ Removing and installing refrigerant pipes from reservoir to compressor ⇒ [page 220](#)



Note

In certain versions of the Audi RS6 (e.g. the version for certain hot countries), additional heat insulation is installed on the refrigerant pipes in the engine compartment, to protect them from the heat emitted by the engine (the refrigerant pipes have insulation wound around them or covering them) ⇒ Electronic parts catalogue .

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16.16.1 Removing and installing refrigerant pipe -A- (from screw connection in refrigerant pipe to connection at air conditioning unit)

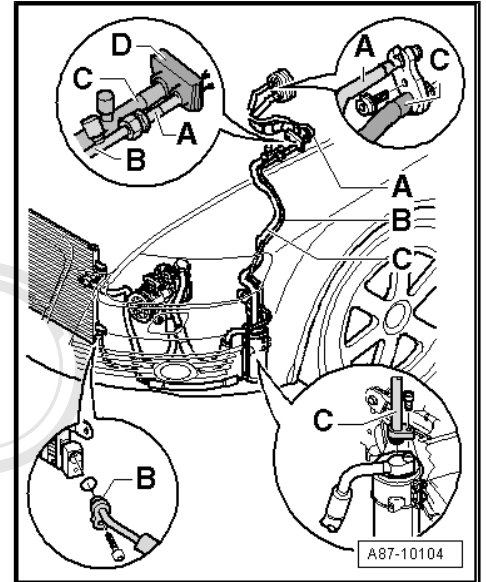
Removing

- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a .
- Remove strut brace if necessary (not installed in all vehicles).
⇒ Running gear; Rep. gr. 40
- Remove air intake unit (not necessary on right-hand drive vehicles) ⇒ [page 49](#) .
- Remove the coolant pipe to the heat exchanger of the air conditioning unit (e.g. on the Audi RS 6) ⇒ Engine, mechanics; Rep. gr. 19 .



Note

Depending on the engine, the coolant pipe from the heat exchanger of the air conditioning unit to the engine may also be routed through the socket -D- (e.g. on the Audi RS 6). The coolant pipe must therefore be removed on these vehicles.



- Detach refrigerant pipes from connection to air conditioning unit ⇒ [page 223](#) .
- Open screw connection in refrigerant pipe (between -A- and -B-) ⇒ [page 214](#) (removing and installing restrictor)
- Detach refrigerant pipe -A- from grommet -D- and remove refrigerant pipe.

Installing

Install in reverse order of removal; note the following.

- Coat O-rings lightly with refrigerant oil before fitting
⇒ [page 10](#) .
- Fit the refrigerant pipes from the connection to the air conditioning unit ⇒ [page 223](#) .
- After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.
- Install the remaining removed components in reverse sequence.
- Evacuate the refrigerant circuit after assembly, and then refill.
⇒ Air conditioner with refrigerant R134a
- Start up air conditioner after charging refrigerant circuit
⇒ [page 234](#) .



Note

*Also observe notes on starting up air conditioner after charging
⇒ Air conditioner with refrigerant R134a .*

- Add coolant and bleed the coolant circuit (e.g. on the Audi RS 6) ⇒ Engine, mechanics; Rep. gr. 19 .

- Interrogate fault 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") .

16.16.2 Removing and installing refrigerant pipe -B- (from connection at condenser to screw connection in refrigerant pipe)

Removing

- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a .
- Remove bumper cover (front) ⇒ General body repairs, exterior; Rep. gr. 63 .

Remove or detach the following components depending on the vehicle (e.g. on the Audi RS 6, not necessary with all models).

- Remove the left headlight ⇒ Electrical system; Rep. gr. 94 .
- Remove the power steering hydraulic fluid reservoir ⇒ Brake system; Rep. gr. 48 .
- Remove the ABS hydraulic unit ⇒ Brake system; Rep. gr. 45 .

All vehicles (continued):

- Open screw connection in refrigerant pipe (between -A- and -B-) ⇒ [page 214](#) (removing and installing restrictor).
- Detach refrigerant pipe -B- from connection at condenser ⇒ [page 208](#) .
- Remove refrigerant pipe -B-.

Installing

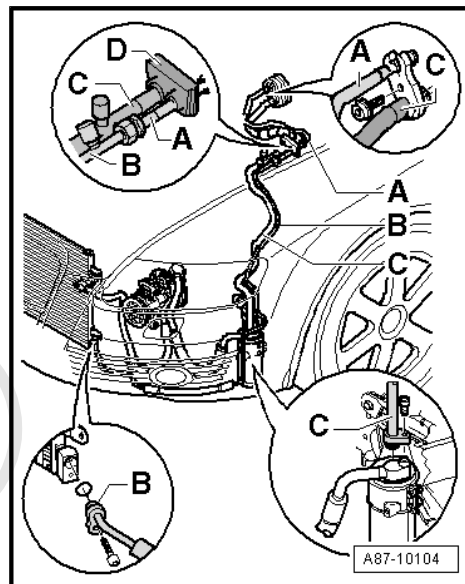
Install in reverse order of removal; note the following.

- Coat O-rings lightly with refrigerant oil before fitting ⇒ [page 10](#) .
- After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.
- Top up the fluids drained off and bleed the corresponding vehicle systems.
- Evacuate the refrigerant circuit after assembly, and then refill.
⇒ Air conditioner with refrigerant R134a
- Interrogate fault 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 234](#) .



Note

Also observe notes on starting up air conditioner after charging
⇒ Air conditioner with refrigerant R134a .



16.16.3 Removing and installing refrigerant pipe -C- (from connection at reservoir to connection at air conditioning unit)

Removing

- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a .
- Remove bumper cover (front) ⇒ General body repairs, exterior; Rep. gr. 63 .

Remove or detach the following components depending on the vehicle (not necessary with all models).

– Remove the air intake unit ⇒ [page 49](#) (not necessary for example on right-hand drive vehicles and the Audi RS 6).

- Remove the brake master cylinder and the brake servo ⇒ Brake system; Rep. gr. 47 (e.g. on the Audi RS 6).
- Remove the left headlight ⇒ Electrical system; Rep. gr. 94 .
- Remove the power steering hydraulic fluid reservoir ⇒ Brake system; Rep. gr. 48 .
- Remove the ABS hydraulic unit ⇒ Brake system; Rep. gr. 45 .



Note

- ◆ *The brake master cylinder and the brake servo have to be removed on the Audi RS 6. It is therefore not necessary to take out the air intake unit on this vehicle.*
- ◆ *Depending on the engine, the coolant pipe from the heat exchanger of the air conditioning unit to the engine may also be routed through the socket -D- (e.g. on the Audi RS 6).*

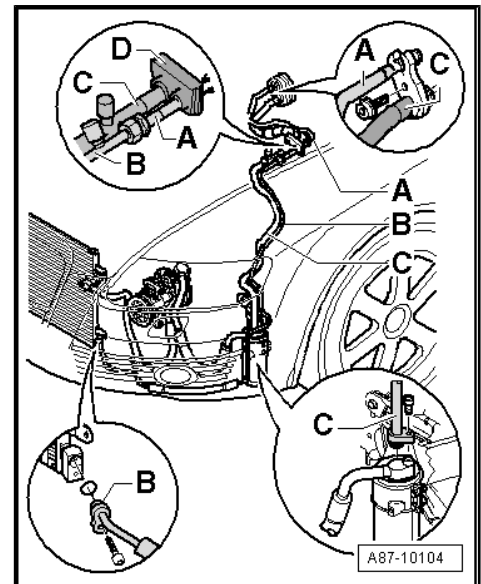
All vehicles (continued):

- Detach refrigerant pipes from connection to air conditioning unit ⇒ [page 223](#)
- Remove both brake pipes from brake master cylinder to hydraulic unit (not necessary on right-hand drive vehicles) ⇒ Brake system; Rep. gr. 47 .
- Open the screw connection in the refrigerant pipe (between refrigerant pipes -A- and -B-) ⇒ [page 214](#) (removing and installing restrictor).
- Detach refrigerant pipe -C- from connection at reservoir ⇒ [page 221](#) .
- Detach grommet -D- from plenum chamber front wall.
- Jointly remove refrigerant pipes -A- and -C-.
- Separate refrigerant pipes -A- and -C-.

Installing

Install in reverse order of removal; note the following.

- Coat O-rings lightly with refrigerant oil before fitting ⇒ [page 10](#) .
- After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.
- Top up the fluids drained off and bleed the corresponding vehicle systems.



- Evacuate the refrigerant circuit after assembly, and then refill.
⇒ Air conditioner with refrigerant R134a
- Interrogate fault 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 234](#) .



Note

Also observe notes on starting up air conditioner after charging

⇒ Air conditioner with refrigerant R134a

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16.16.4 Removing and installing refrigerant pipes from reservoir to compressor

Removing

- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a .
- Remove bumper cover (front) ⇒ General body repairs, exterior; Rep. gr. 63 .
- Detach the refrigerant pipe to the compressor from the connection at the reservoir ⇒ [page 221](#) .
- Detach the refrigerant pipe from the compressor (different procedures depending on the engine) ⇒ [page 177](#) .

Installing

Install in reverse order of removal; note the following.

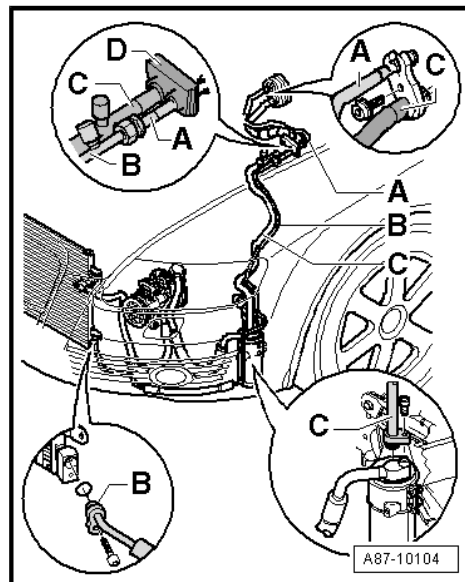
- Coat O-rings lightly with refrigerant oil before fitting
⇒ [page 10](#) .
- After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.
- Evacuate the refrigerant circuit after assembly, and then refill.
⇒ Air conditioner with refrigerant R134a
- Interrogate fault 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 234](#) .



Note

Also observe notes on starting up air conditioner after charging

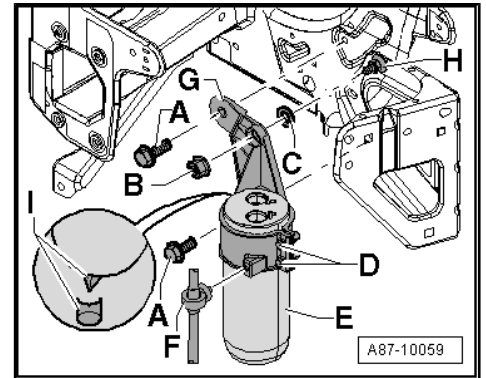
⇒ Air conditioner with refrigerant R134a .



16.17 Removing and installing reservoir

Note

- ◆ Different versions of the reservoir are fitted, depending on the vehicle equipment. ⇒ *Electronic parts catalogue*
- ◆ Up to 09.2004, use was made of reservoir holders which may transmit noise to the bodywork under certain usage conditions in air conditioner operation (howling noise from the engine compartment caused by holder vibration in air conditioning mode). As of 09.2004, production was gradually switched to an optimised holder -G- ⇒ *Electronic parts catalogue*.
- ◆ If vehicles manufactured up to 09.2004 are fitted with an optimised holder -G-, it may be necessary to remove the double bolt to which the nut -B- is attached, turn it through 180 ° and then re-install (the longer side must face the holder). It may also be necessary to use a longer version of the bolts -A-.



Removing

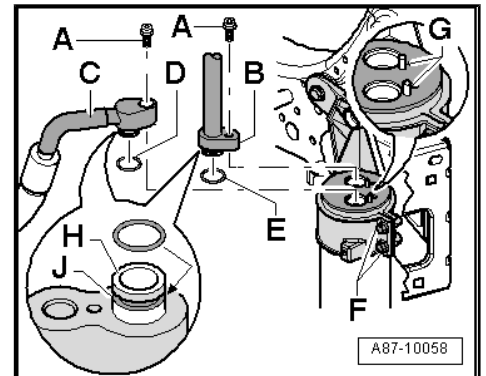
- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a .
- Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 .

Remove or detach the following components depending on the vehicle.

- Remove the left headlight ⇒ Electrical system; Rep. gr. 94 .
- Remove the charge air cooler ⇒ Engine, mechanics; Rep. gr. 21 .

All vehicles (continued):

- Unscrew bolts -A- and detach refrigerant lines -B- and -C-.

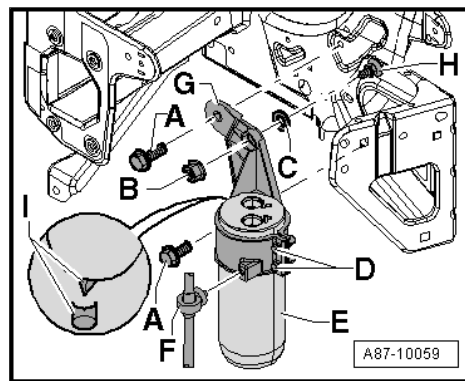


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Note

- ◆ Depending on the version it may also be possible to remove the reservoir without the holder (the bolts -A- and the nut -B- are then not to be unfastened).
- ◆ Depending on the problem and the version, it may also be possible to remove the reservoir without the holder. In this case -Items A, B, C, F- can be ignored.
- Remove the bolts -A- and the nut -B- (only if the holder -G- is to be removed).
- Unfasten the holder -F- of the refrigerant pipe from the holder -G- (only if the holder -G- is to be removed).
- Detach the reservoir -E- with the holder -G- (only if the holder -G- is also to be removed).
- Slacken off bolts -D- and remove reservoir -E- from holder -G-.



Note

- ◆ Seal the open connections at the reservoir and the pipe connections with suitable caps (to prevent the ingress of dirt and moisture).
- ◆ The reservoir version and the connection of the refrigerant pipes differ depending on the engine version: ➔ Electronic parts catalogue
- ◆ The reservoir removed contains refrigerant oil which has to be returned to the refrigerant circuit ➔ Air conditioner with refrigerant R134a

Installing

- ◆ Before fitting reservoir ➔ Air conditioner with refrigerant R134a



Note

- ◆ The removed reservoir contains refrigerant oil which must be returned to the refrigerant circuit (with the new reservoir). Adjustment of the oil quantity depends on the nature of the complaint. If, for example, reservoir has been damaged in an accident (no loss of refrigerant, no ingress of moisture and dirt into refrigerant circuit), air conditioner can be serviced by weighing old and new reservoir without the need for extensive repair work. Pour refrigerant oil into the new reservoir until it weighs the same as the removed reservoir. ➔ Air conditioner with refrigerant R134a
- ◆ Keep new reservoirs closed for as long as possible, only remove the caps immediately before installation (the reservoir contains a desiccant bag which soon becomes saturated with moisture and hence unusable when the reservoir is open).
- ◆ If, due to an accident involving refrigerant, for example, an indeterminate amount of refrigerant oil has escaped or dirt and moisture have penetrated the refrigerant circuit, clean (purge) the refrigerant circuit ➔ Air conditioner with refrigerant R134a
- ◆ Connections at reservoir may be marked "IN" (from evaporator) and "Out" (to compressor).

Install in reverse order of removal; note the following.

- Insert reservoir -E- in holder -G-, paying attention to locking and locating element -J-.
- Tighten bolts -D-.
- Tightening torque: 10 Nm
- Attach washer -C- to pin -H-.
- Install reservoir -E- with holder -G-.
- Fit the bolts -A- and the nut -B-.
- Tightening torque: 10 Nm
- Replace O-rings -D- and -E-, Version. ⇒ Electronic parts catalogue
- Check guide ring -H- at connections of both refrigerant pipes -B- and -C- for damage.
- Insert appropriate O-ring (-D- and -E-) in groove -J- at connections of both refrigerant pipes -B- and -C-.

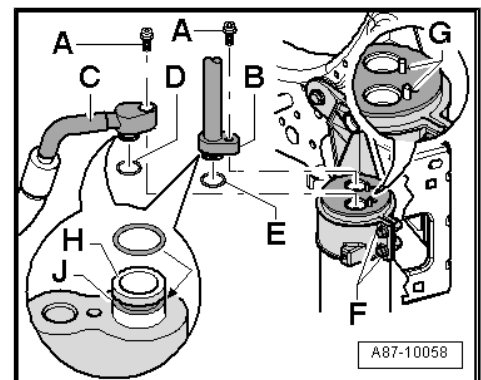
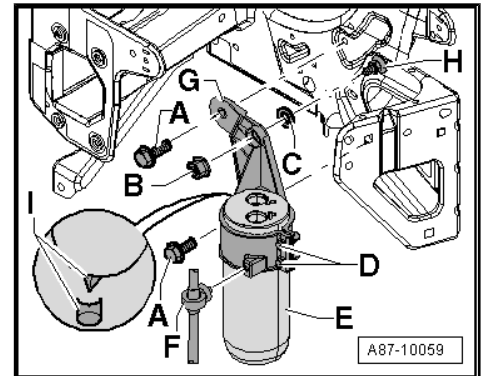
i Note

Coat O-rings lightly with refrigerant oil before fitting ⇒ [page 10](#).

- Fit refrigerant pipes -B- and -C-.
- Fit bolts -A-.
- Tightening torque: 10 Nm
- After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.
- Re-install remaining components removed before.
- Evacuate and refill the refrigerant circuit. ⇒ Air conditioner with refrigerant R134a
- Interrogate fault 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 234](#).

i Note

Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a.



16.18 Detaching refrigerant pipes from air conditioning unit/attaching

Removing

- Switch off ignition.
- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a.

- Remove plenum chamber cover.



DANGER!

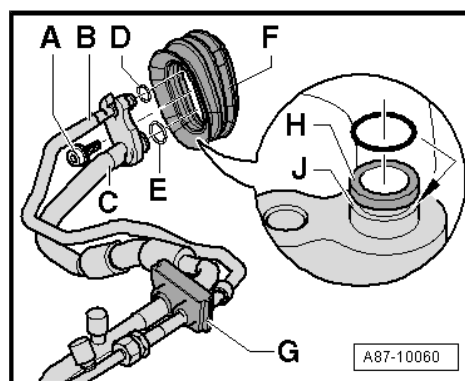
The two valves of the pump valve unit may be hot even if the engine is cold.

- Remove wiper arms, scuttle panel trim and wiper assembly ⇒ Rep. gr. 92 ; Electrical system .
- Remove strut brace if necessary (not installed in all vehicles). ⇒ Rep. gr. 40 ; Running gear
- Remove air intake unit (not necessary on right-hand drive vehicles) ⇒ [page 49](#) .
- Remove bolt - A-.
- Detach refrigerant pipes -B- and -C- from connecting flange of refrigerant pipes to air conditioning unit and seal open connections.



Note

- ♦ If the refrigerant pipes -B- and -C- cannot be detached, unfasten the coolant pipe routed through the socket -G-.
- ♦ Seal open connections at connecting flange of refrigerant pipes to air conditioning unit and refrigerant pipes -B- and -C- (to prevent ingress of dirt and moisture).



Installing

Install in reverse order of removal; note the following.



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- Check grommet -F- for damage.
- Replace O-rings -D- and -E-, Version. ⇒ Electronic parts catalogue

i Note

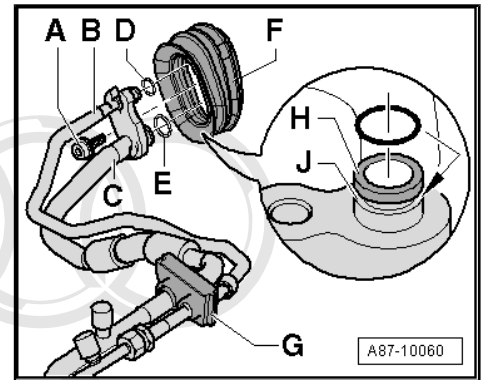
Coat O-rings lightly with refrigerant oil before fitting ⇒ [page 10](#).

- Check guide ring -H- at connections of both refrigerant pipes -B- and -C- for damage.
- Insert appropriate O-ring (-D- and -E-) in groove -J- at connections of both refrigerant pipes -B- and -C-.
- Fit refrigerant pipes -B- and -C- such that they are not strained.
- Fit the bolt -A-.

- Tightening torque: 20 Nm

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- After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.
- Check correct installation of grommet -F-.
- After attaching the refrigerant pipes, check the pipe penetration -G- and the position of the refrigerant pipes -B- and -C- (no contact with other components).
- Remove residual coolant from plenum chamber.
- Install the air intake unit ⇒ [page 49](#).
- Re-install remaining components removed before.
- Evacuate and re-fill refrigerant circuit ⇒ Air conditioner with refrigerant R134a.
- Interrogate fault 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 234](#).



i Note

Also observe notes on starting up air conditioner after charging
⇒ Air conditioner with refrigerant R134a.

16.19 Removing and installing evaporator

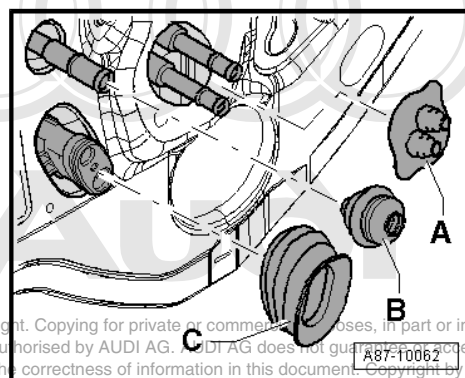
Special tools and workshop equipment required

- ◆ 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)
- ◆ Hand pump - V.A.G 1274- (and appropriate adapters)
- ◆ Cut-proof gloves
- ◆ Rigid sharp pointed knife (e.g. strong carpet knife)
- ◆ Notes for right-hand drive vehicles ⇒ [page 226](#)

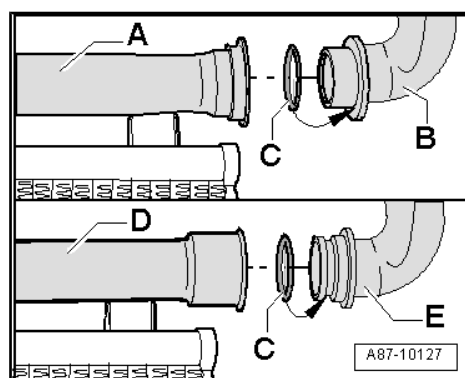
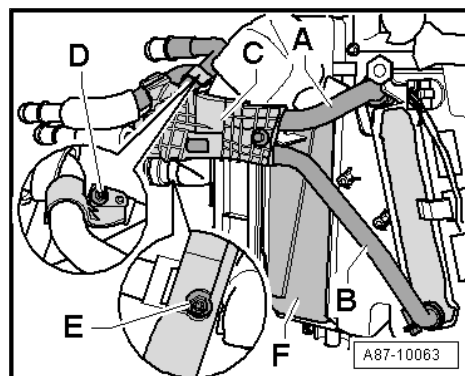
- ◆ Preparation for evaporator removal ⇒ [page 227](#)
- ◆ Removing evaporator ⇒ [page 230](#)
- ◆ Installing evaporator ⇒ [page 231](#)

16.19.1 Notes for right-hand drive vehicles

- ◆ On right-hand drive vehicles, evaporator is not removed to right from air conditioning unit, but rather to left. This gives rise to the following differences in the sequence of operations compared to left-hand drive vehicles.
- Lower dash panel trim (driver's side) does not have to be removed.
- Remove pump valve unit (to facilitate access) ⇒ [page 68](#) .
- After draining refrigerant circuit, detach refrigerant pipes from connecting flange to air conditioning unit and remove grommet -C- ⇒ [page 223](#) .
- Remove grommets -A- and -B- (at coolant pipes to heat exchanger).

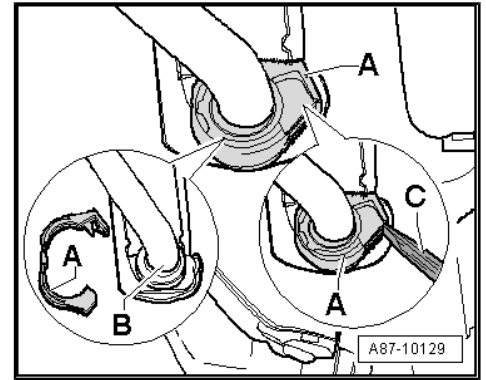


- Remove holder -C- for coolant pipes to heat exchanger.
- Remove holder -D- for coolant pipe to heat exchanger.
- After blowing out coolant, detach coolant pipes -A- and -B- from left heat exchanger ⇒ [page 148](#) and then remove.
- Remove holder -E- for refrigerant pipes to evaporator (through opening by way of which these refrigerant pipes are routed into plenum chamber).
- After detaching refrigerant pipes from evaporator and removing them, remove left housing wall -F- (as described for right side with left-hand drive vehicles) from air conditioning unit ⇒ [page 230](#) and remove evaporator to left.



i Note

- ◆ There are different versions of the heat exchanger and the corresponding coolant pipes. In Model Year 2006, the seal between the connections at the heat exchanger and the coolant pipes was gradually switched from an axial/radial seal -A- and -B- to a radial seal -D- and -E-. On replacing the heat exchanger, pay attention to the correct version ⇒ Electronic parts catalogue and the correct installation position of the O-ring -C-.
- ◆ Instead of a screw-type clip, vehicles with a radial seal at the coolant pipes -B- to the heat exchanger may be fitted with a plastic clamp -A- ⇒ Electronic parts catalogue .



16.19.2 Preparation for evaporator removal

- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a .

i Note

With ignition on, valves of pump valve unit (left heat regulation valve - N175- and right heat regulation valve - N176-) are constantly actuated as a function of temperature setting on operating and display unit, Climatronic control unit - J255- . Valves may therefore be warm or even hot despite engine being cold.

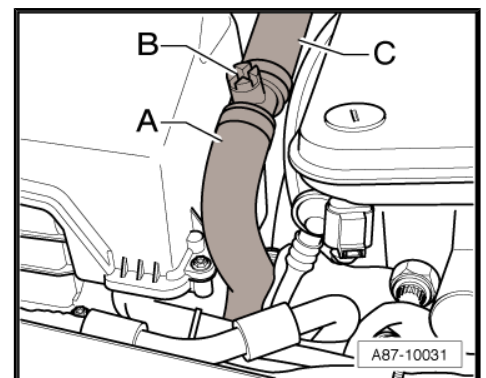
- Switch off ignition.
- Release pressure in coolant circuit by opening cap on coolant expansion tank ⇒ Engine, mechanics; Rep. gr. 19 .
- Remove plenum chamber cover.



WARNING

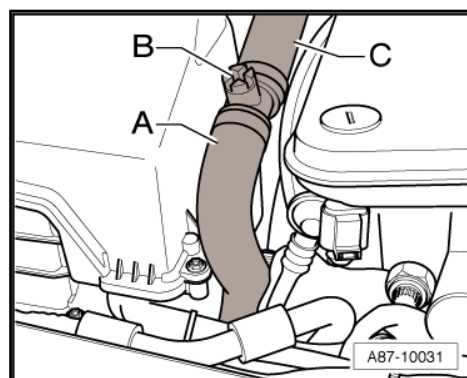
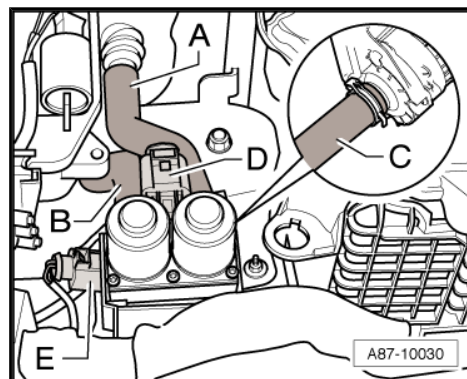
The two valves of the pump valve unit may be hot even if the engine is cold.

- Remove wiper arms and scuttle panel trim ⇒ Rep. gr. 92 ; Electrical system
- Remove strut brace if necessary (not installed in all vehicles). ⇒ Rep. gr. 40 ; Running gear
- Pinch off coolant hose -A- (return from heat exchanger to engine), e.g. with hose clamps up to Ø 25 mm - 3094- .

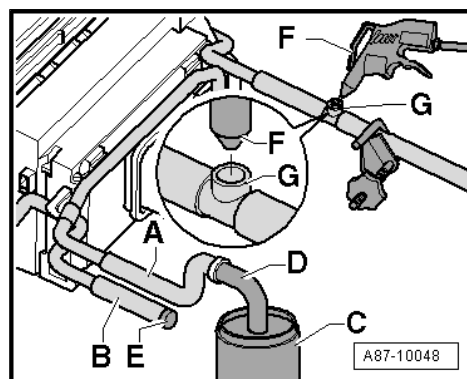


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- Mark arrangement of coolant hoses -A- (supply to left heat exchanger) and -B- (supply to right heat exchanger).
- Unplug connector -D- to left heat regulation valve - N175- and right heat regulation valve - N176- .
- Unplug connector -E- to coolant circulation pump - V50- .
- Pinch off coolant hose -C- (supply from engine to coolant circulation pump - V50-), e.g. with hose clamps up to Ø 25 mm - 3094- .
- Detach coolant hoses -A- and -B- from connections of pump valve unit.
- Remove screw plug from bleeder valve -B-.

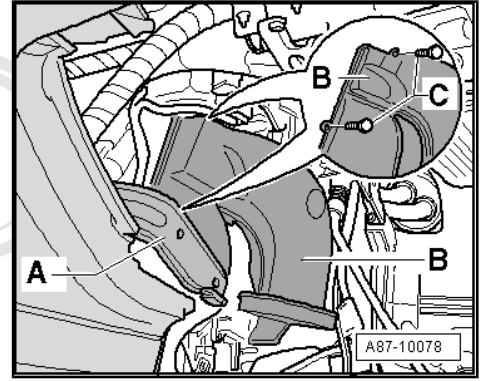


- Connect hose section -D- (as extension) to coolant hose -A-.
- Seal coolant hose -B- with plug -E-.
- Place vessel -C- beneath extension hose -D-.
- Use compressed-air gun (with rubber mouthpiece) -F- to carefully blow coolant by way of open connection for bleeder valve -G- out of "driver's" heat exchanger (into vessel -C-).
- Remove plug -E- from coolant hose -B- and insert it in coolant hose -A-.
- Connect hose section -D- (as extension) to coolant hose -B-.
- Use compressed-air gun (with rubber mouthpiece) -F- to carefully blow coolant by way of open connection for bleeder valve -G- out of "front passenger's" heat exchanger (into vessel -C-).

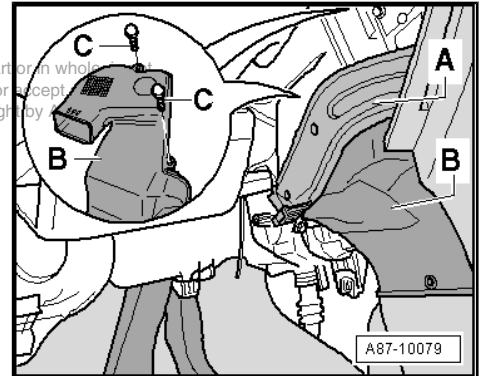


- Remove glove compartment ⇒ General body repairs, interior; Rep. gr. 68
- Remove storage compartment beneath dash panel on driver's side (not on right-hand drive vehicles) ⇒ General body repairs, interior; Rep. gr. 68 .
- Remove centre console side trim on right and left ⇒ General body repairs, interior; Rep. gr. 68

- On right side, remove holder -A- for glove compartment (not on right-hand drive vehicles) ⇒ General body repairs, interior; Rep. gr. 68 .
- Unscrew bolts -C-.
- Remove air duct to right footwell vent -B- (for front passenger's side).



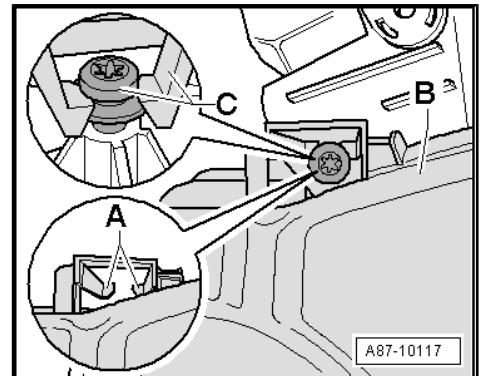
- On left side, remove holder -A- for trim beneath dash panel ⇒ General body repairs, interior; Rep. gr. 68 .
- Unscrew bolts -C-.
- Remove air duct to left footwell vent -B- (for driver's side).



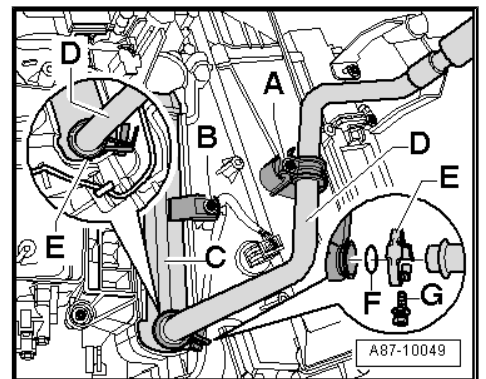
 Note

In Model Year 2005, the air duct fastening to the footwell vent -B- has been modified (gradual introduction). Bolt -C- must then no longer be removed, and the air duct is clipped in via retainer tab -A-.

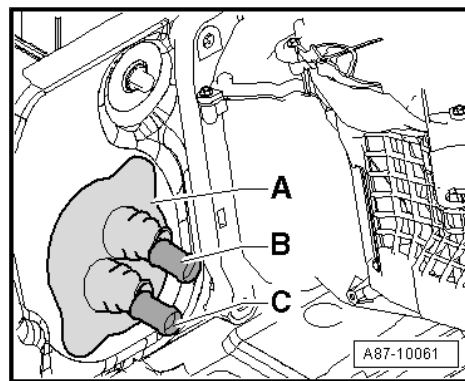
- Remove pedal cluster ⇒ Brake system; Rep. gr. 46 (not on right-hand drive vehicles).



- Protect floor covering in area of transmission tunnel on right beneath connection for coolant pipe -D- (or on left with right-hand drive vehicles) under heat exchanger with impermeable sheeting and absorbent paper.
- Remove holder -A- for coolant pipe -D- (for right-hand drive vehicles, refer to notes ⇒ [page 226](#)).
- Remove clamp -E- (for right-hand drive vehicles, refer to notes ⇒ [page 226](#)).
- Position vessel beneath connection for coolant pipe -D- at heat exchanger to catch any coolant escaping (for right-hand drive vehicles, refer to notes ⇒ [page 226](#)).
- Take coolant pipe -D- out of heat exchanger (for right-hand drive vehicles, refer to notes ⇒ [page 226](#)).

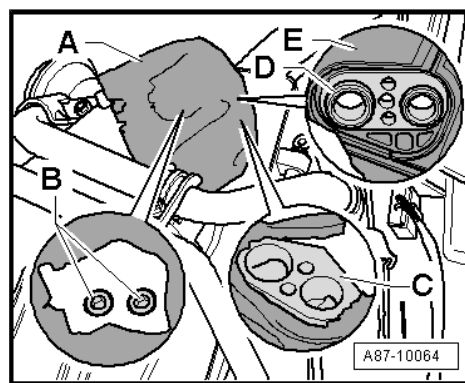


- After marking (to prevent interchange), detach coolant hoses from connections -B- and -C- (for right-hand drive vehicles, refer to notes ⇒ [page 226](#)).
- Remove grommet -A- (for right-hand drive vehicles, refer to notes ⇒ [page 226](#)).
- Depending on vehicle equipment, remove electric control units and possibly associated holders that impede removal of the evaporator (e.g. the control unit for front display and information control panel - J523-). ⇒ Radio, telephone and navigation system; Rep. gr. 91 .

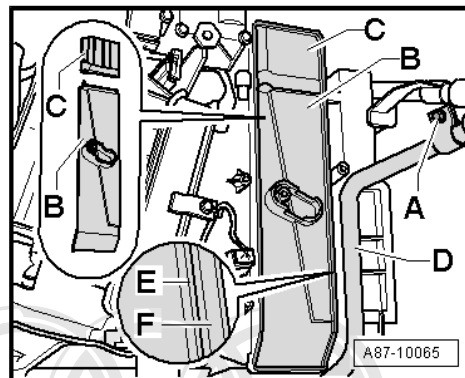


16.19.3 Removing evaporator

- Perform preparatory work for evaporator removal ⇒ [page 227](#) .
- Detach heat insulation -A- from connecting flange of refrigerant pipes at evaporator -E- (on left of air conditioning unit).
- Remove bolts -B-.
- Detach connecting flange -C- (of refrigerant pipes) from connecting flange -D- (at evaporator -E-).



- Slacken off bolt -A- at holder for coolant pipes (on right of air conditioning unit, do not remove) and lay aside coolant pipe -D-.
- Don cut-proof gloves (to protect the hands when cutting out the housing wall of the air conditioning unit).
- Use sharp knife (e.g. strong pointed carpet knife with blade safely and firmly attached in handle) to cut housing wall -B- and -C- (on right of air conditioning unit) at parting line -E- out of air conditioning unit (for right-hand drive vehicles, refer to notes ⇒ [page 226](#)).



Note

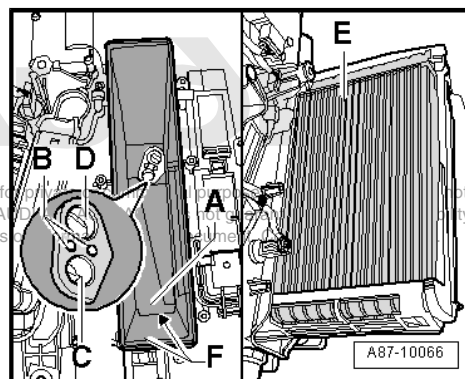
Take care not to damage flange -F- (seals air conditioning unit service cover).

- Pull evaporator -E- to right out of air conditioning unit.



Note

If evaporator is stuck in air conditioning unit because of the all-round rubber seal, remove dust and pollen filter if necessary ⇒ [page 88](#) to gain a firmer grip on evaporator.



16.19.4 Installing evaporator

Before fitting evaporator ⇒ Air conditioner with refrigerant R134a

Install in reverse order of removal; note the following.

- Clean mounting slot for evaporator in air conditioning unit -A-.
- Check both connections -C- and -D- in evaporator connecting flange of refrigerant pipes -B- for dirt and damage and clean if necessary.

Note

Replacement of refrigerant pipes -B- with evaporator connecting flange involves removing air intake unit and detaching refrigerant pipes to air conditioning unit. Coolant pipes to heat exchanger on left side must also be detached/removed (refer to notes for right-hand drive vehicles ⇒ [page 226](#)).

- Before fitting evaporator, check openings of condensation drains -F- (on left and right in air conditioning unit) for dirt and clean if necessary.
- Attach plastic tray -C- to evaporator -A-.
- Attach all-round rubber seal -B- to evaporator -A-, paying attention to correct positioning at evaporator connecting flange -D-.

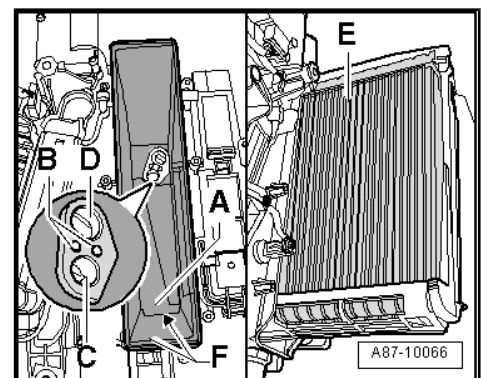
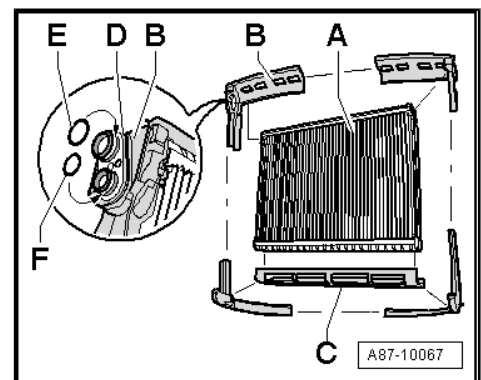
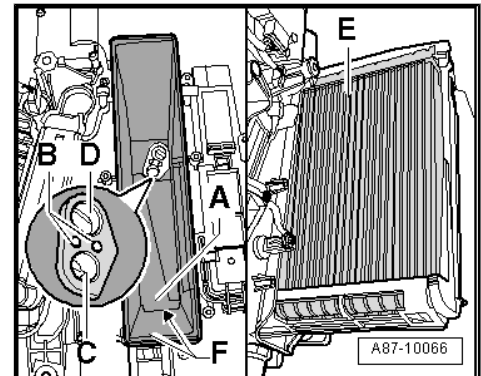
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Replace O-rings -E- and -F- at connections -D- at evaporator -A- Version ⇒ Electronic parts catalogue

Note

- ◆ *Moisten O-rings with small quantity of refrigerant oil before installing.*
- ◆ *Pay attention to correct positioning of O-rings -E- and -F- in groove in connecting pipes at evaporator connecting flange -D-.*
- ◆ *The evaporator removed contains refrigerant oil, which must be returned to refrigerant circuit ⇒ Air conditioner with refrigerant R134a .*

- Moisten rubber seal -B- at bottom and top of evaporator with a small quantity of lubricant (e.g. soap solution).
- Carefully install the evaporator -E- in the slot -A- of the air conditioning unit, taking care not to damage the evaporator connections.
- Check position of evaporator connecting flange -D- (must be flush with housing of air conditioning unit -A-).

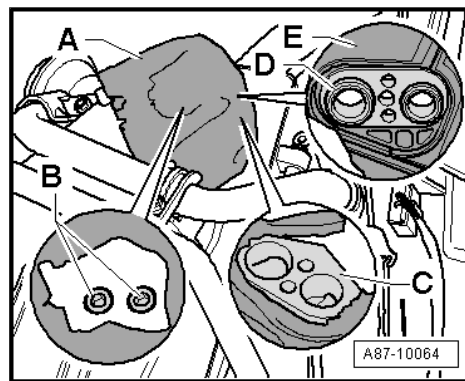


- Check connecting flange of refrigerant pipes -C- and connecting flange at evaporator -D- for dirt and damage.
- Assemble connecting flange -C- (of refrigerant pipes) and connecting flange -D- at evaporator -E-.
- Fit bolts -B- (tightening torque 10 Nm).
- Re-insulate connecting flange area at evaporator (from which insulation has been detached) with a section of self-adhesive thermal insulation mat -A-.



Note

This thermal insulation mat is available as a replacement part ⇒ Electronic parts catalogue .

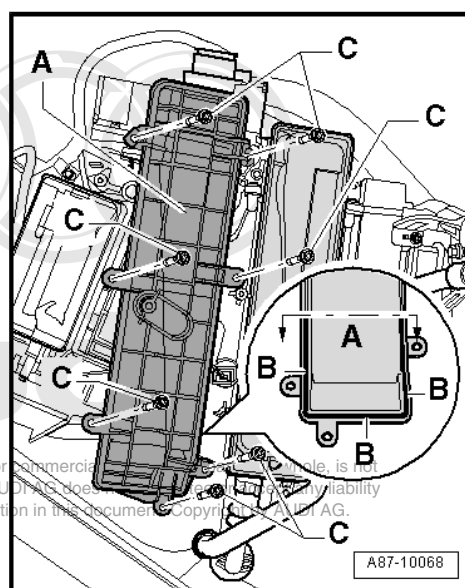


- Fill groove -B- in bottom part of service cover -A- with silicone adhesive sealant D176 001 A3 for example.



Note

- ◆ Replacement service covers -A- are available with 7 bolts -C- ⇒ Electronic parts catalogue .
- ◆ If air conditioning unit/service cover connection is not sealed, condensate may escape from air conditioning unit into footwell for example when cornering.
- Fit service cover -A- over evaporator slot of air conditioning unit.
- Re-install components removed in reverse order except lower dash panel trim (driver's side), glove compartment and plenum chamber cover.



Note

- ◆ Bleed the coolant circuit before plugging in the 2-pin connector to the coolant circulation pump - V50- of the pump valve unit.
- ◆ The coolant circuit must be bled before starting up the coolant circulation pump - V50- (in the pump valve unit).
- ◆ Dry running of pump in pump/valve unit will lead to destruction.
- Filling and bleeding coolant circuit ⇒ Engine, mechanics; Rep. gr. 19

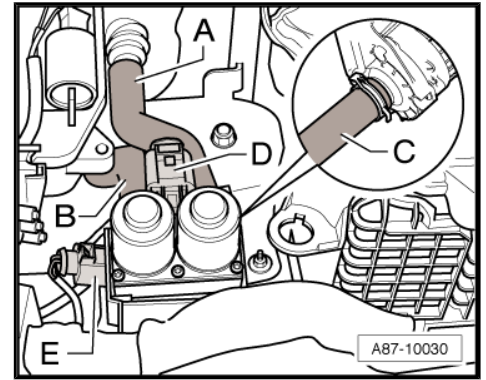


Note

When bleeding the coolant circuit, take particular care to ensure that the heat exchangers are bled completely. If air bubbles remain in heat exchanger, complaints may be received about lack of heat output in winter or differences in temperature of air flowing out of vents with same setting in control mode.

- After bleeding, check cooling system for leaks, paying particular attention to coolant pipe joints to heat exchanger ⇒ Engine, mechanics; Rep. gr. 19 .
- Check correct positioning of grommets in coolant pipe penetrations from plenum chamber to passenger compartment.

- Following installation, check correct positioning of grommet between engine compartment and plenum chamber at coolant hose -C-.
- Check pump valve unit; it must not make contact with other components (noise).
- Plug in connectors -D- to left heat regulation valve - N175- and right heat regulation valve - N176- and -E- to coolant circulation pump - V50- after bleeding coolant circuit.
- Evacuate and refill the refrigerant circuit. ⇒ Air conditioner with refrigerant R134a
- After filling refrigerant circuit, check refrigerant pipe joints in plenum chamber and at evaporator for leaks e.g. with an electronic leak detector ⇒ Air conditioner with refrigerant R134a .
- Remove residual coolant from plenum chamber.
- Install the remaining removed components in reverse sequence.
- Interrogate fault 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 234](#) .



 Note

*Also observe notes on starting up air conditioner after charging
⇒ Air conditioner with refrigerant R134a .*

16.20 Capacities

For capacities for refrigerant R134a and refrigerant oil, refer to ⇒ Air conditioner with refrigerant R134a .

- Evacuating and charging refrigerant circuit ⇒ [Air conditioner with refrigerant R134a](#)
- Start up air conditioner after charging refrigerant circuit
⇒ [page 234](#) .

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**Note**

- ◆ *Also observe notes on starting up air conditioner after charging
⇒ Air conditioner with refrigerant R134a .*
- ◆ *Always fill refrigerant circuit as far as upper tolerance limit
(some refrigerant remains in filler hoses) ⇒ Air conditioner with
refrigerant R134a .*
- ◆ *The refrigerant circuit must only be filled with approved refrigerant oils ⇒ Electronic parts catalogue . Different types of refrigerant oil are specified for Zexel, Valeo, Sanden and Denso compressors ⇒ Air conditioner with refrigerant R134a and ⇒ Electronic parts catalogue .*
- ◆ *Currently refrigerant oil - G 052 300 A2- should be used for Denso compressors ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a .*
- ◆ *Refrigerant oil (PAG oil) from containers which have been open for a long time absorbs moisture and is no longer to be used.*
- ◆ *The condenser fitted on vehicles with a 10-cyl. TFSI engine (Audi RS 6) has a smaller internal volume than the condenser with other engines. For vehicles with a 10-cyl. TFSI engine the refrigerant capacity is thus also slightly less than for other vehicles ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a .*
- ◆ *Further information ⇒ Air conditioner with refrigerant R134a .*

16.21 Starting up air conditioner after charging refrigerant circuit

**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 compressor ⇒ Air conditioner with refrigerant R134a .*
- ◆ *The compressor is always driven by the pulley or the drive shaft (there is no magnetic clutch). To prevent damage to the compressor while it runs at idle, the compressor lubrication is maintained via an "internal oil circuit".*
- ◆ *The 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 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 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.*
- ◆ *Air conditioner compressor regulating valve - N280- is not activated if refrigerant circuit is empty and compressor runs at idle with engine. However, as there is no refrigerant in the circuit, the oil required for the lubrication of the compressor is not transported to the compressor.*

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- ◆ All components removed have been re-installed.
- ◆ Refrigerant circuit has been charged ⇒ Air conditioner with refrigerant R134a .

If it is necessary to start the engine with an empty refrigerant circuit:

- ◆ The refrigerant circuit must be completely assembled.
- ◆ 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 compressor.
- ◆ Engine speed must not exceed 2500 rpm.
- ◆ Run engine only as long as absolutely necessary.

Proceed as follows when starting the engine for the first time after charging the refrigerant circuit:

- Start engine with compressor switched off (“Econ” mode set, lamp in  button not illuminated) and wait for engine idling speed to stabilise.
- Open all dash panel vents.
- Set the air conditioner operating and display unit, Climatronic control unit - J255- to the “Cold” temperature setting (for the driver's and front passenger's side).
- Switch on compressor by pressing  button (“Auto” mode selected and lamp in  button illuminated) and allow compressor to run for at least 5 minutes with engine idling.



Note

*Also observe notes on starting up air conditioner after charging
⇒ Air conditioner with refrigerant R134a .*

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17 Removing and installing air conditioning unit

Special tools and workshop equipment required

- ◆ Hose clamps up to Ø 25 mm - 3094-
- ◆ Commercially available compressed-air gun (with rubber mouthpiece)
- ◆ Hand pump - V.A.G 1274- (and appropriate adapters)
- ◆ Preparation for removing air conditioning unit ⇒ [page 236](#)
- ◆ Removing air conditioning unit ⇒ [page 238](#)
- ◆ Installing air conditioning unit ⇒ [page 240](#)

17.1 Preparation for removing air conditioning unit



Note

- ◆ *With ignition on, valves of pump valve unit (left heat regulation valve - N175- and right heat regulation valve - N176-) are constantly actuated as a function of temperature setting on operating and display unit, Climatronic control unit - J255- . Valves may therefore be warm or even hot despite engine being cold.*

- ◆ *If applicable, obtain radio anti-theft code before disconnecting battery.*

- ◆ *On vehicles with electrically adjustable seats, move seats to rearmost position before disconnecting battery.*

- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a .
- Move electrically adjustable seats to their rearmost position.
- Switch off ignition.
- Place protective covers over driver's and front passenger's seats.
- Disconnect earth connection from battery ⇒ Electrical system; Rep. gr. 27
- Remove centre console and dash panel ⇒ General body repairs, interior; Rep. gr. 70 .

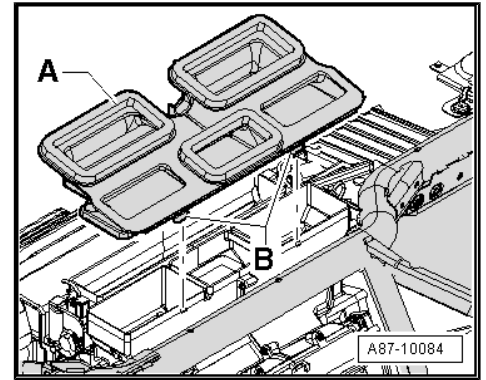


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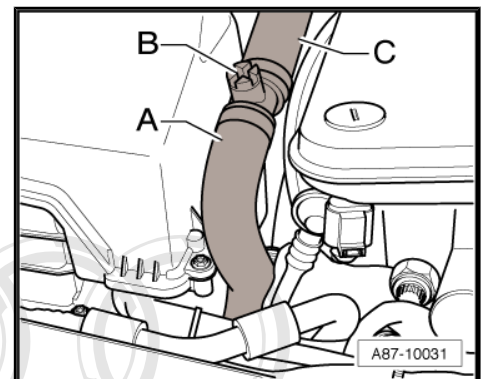
- Release fasteners -B- and remove air duct -A-.
- Remove central tube of dash panel (dash panel cross member) ⇒ General body repairs, interior; Rep. gr. 70 .

i Note

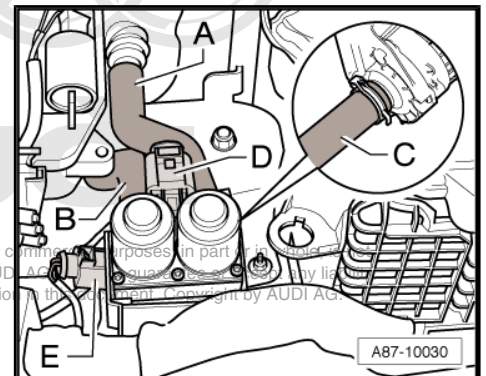
In Model Year 2008, the thread at the fastening points between the air distribution housing and the dash panel central tube is being gradually modified (discontinuation of the cast metal inserts, the bolts are screwed directly into the plastic). Pay attention to the correct version of the bolts on installation ⇒ Electronic parts catalogue .



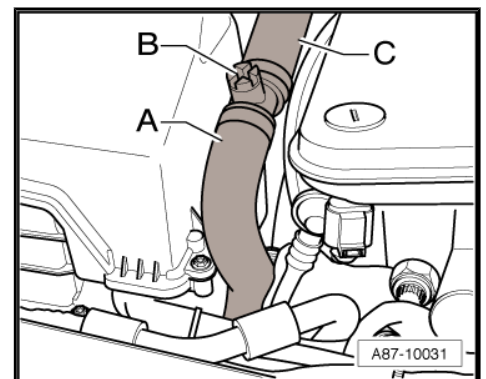
- Release pressure in coolant circuit by opening cap on coolant expansion tank ⇒ Engine, mechanics; Rep. gr. 19 .
- Pinch off coolant hose -A- (return from heat exchanger to engine), e.g. with hose clamps up to Ø 25 mm - 3094- .



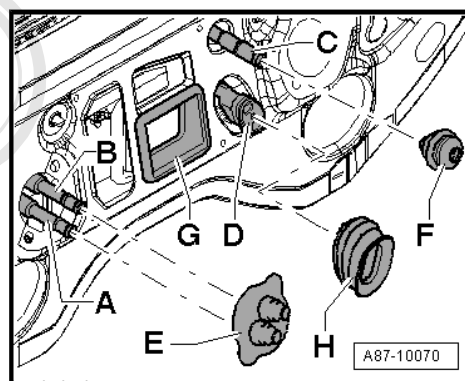
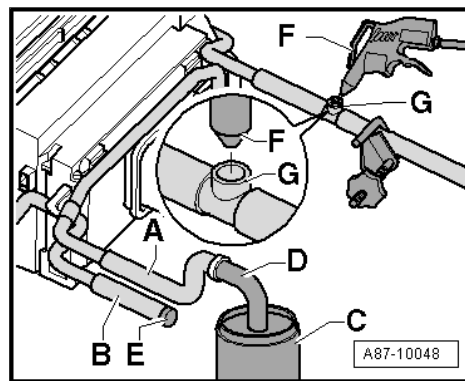
- Mark arrangement of coolant hoses -A- (supply to left heat exchanger) and -B- (supply to right heat exchanger).
- Unplug connector -D- to left heat regulation valve - N175- and right heat regulation valve - N176- .
- Unplug connector -E- to coolant circulation pump - V50- .
- Pinch off coolant hose -C- (supply from engine to coolant circulation pump - V50-), e.g. with hose clamps up to Ø 25 mm - 3094- .
- Detach coolant hoses -A- and -B- from connections of pump valve unit.



- Remove screw plug from bleeder valve -B-.



- Connect hose section -D- (as extension) to coolant hose -A-.
- Seal coolant hose -B- with plug -E-.
- Place vessel -C- beneath extension hose -D-.
- Use compressed-air gun (with rubber mouthpiece) -F- to carefully blow coolant by way of open connection for bleeder valve -G- out of "front passenger's" heat exchanger (into vessel -C-).
- Remove plug -E- from coolant hose -B- and insert it in coolant hose -A-.
- Connect hose section -D- (as extension) to coolant hose -B-.
- Use compressed-air gun (with rubber mouthpiece) -F- to carefully blow coolant by way of open connection for bleeder valve -G- out of "front passenger's" heat exchanger (into vessel -C-).
- Remove air intake unit ⇒ [page 49](#) .
- Detach refrigerant pipe from connection to air conditioning unit ⇒ [page 223](#) .
- After marking (to prevent interchange), detach coolant hoses from coolant pipes -A-, -B- and -C-.
- Detach grommets -E- and -F- from coolant pipes.
- Detach boot -H- from connecting flange of refrigerant pipes -D-.
- Remove grommet -G- of air duct to air conditioning unit.



17.2 Removing air conditioning unit

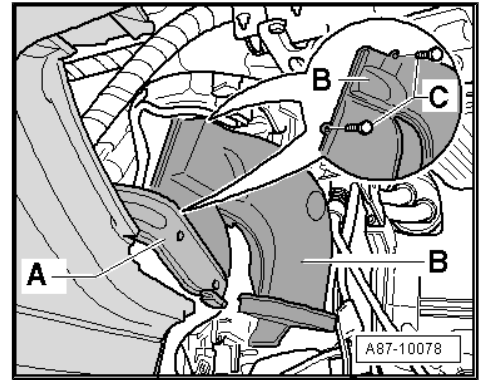
- Perform preparatory work for removing air conditioning unit ⇒ [page 236](#) .



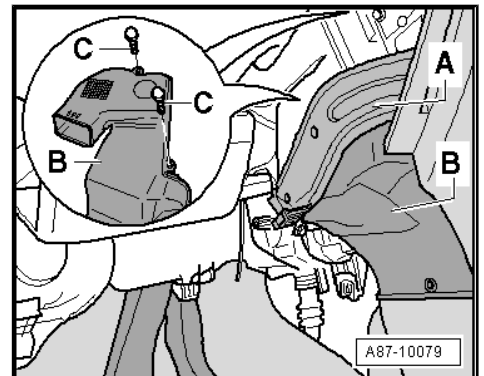
Note

- ◆ *When removing, note down bolt lengths and assignment for re-installation.*
- ◆ *All cable ties and other wiring harness fasteners released or cut open on removing air conditioner unit must be re-attached in same position on installation.*
- Remove air duct to vents in centre console ⇒ [page 155](#) .

- Remove bolts -C-.
- Remove air duct to right footwell vent -B- (for front passenger's side).

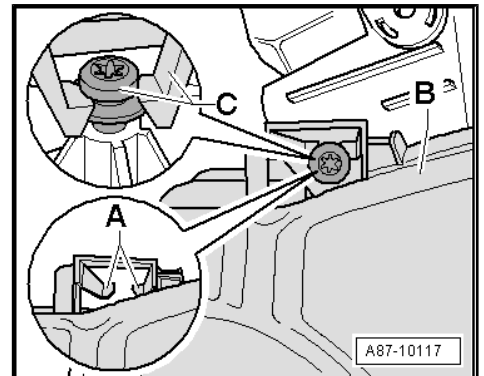


- Remove bolts -C-.
- Remove air duct to left footwell vent -B- (for driver's side).

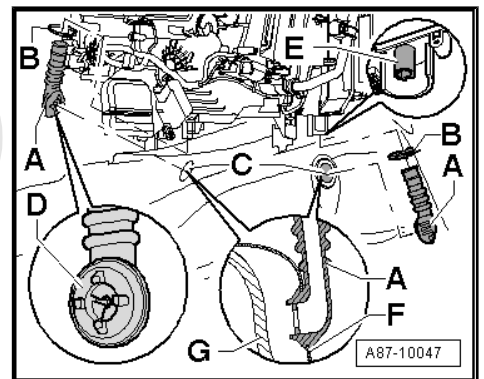


i Note

In Model Year 2005, the air duct fastening to the footwell vent -B- has been modified (gradual introduction). Bolt -C- must then no longer be removed, and the air duct is clipped in via retainer tab -A-.

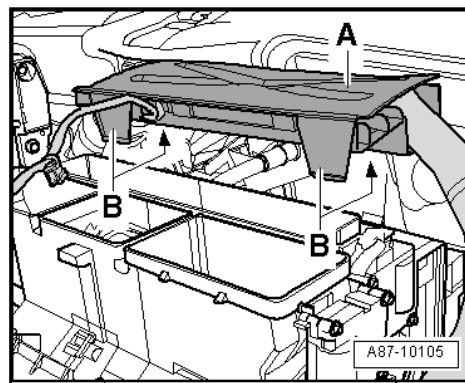


- Remove both condensation drains of air conditioning unit -A- [⇒ page 105](#).

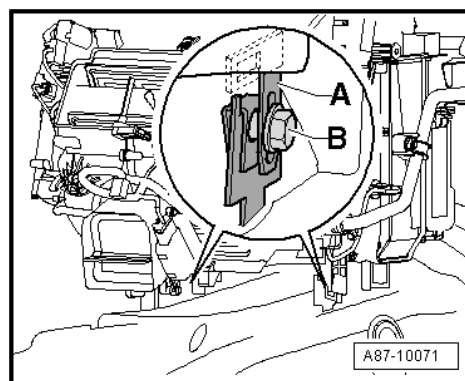


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- Detach cable duct -A- from air conditioning unit (held in position by way of fasteners -B-).



- Remove bolts -B- (on left and right at transmission tunnel) and fold back holders -A-.
- Remove air conditioning unit.



17.3 Installing air conditioning unit

Install in reverse order of removal; note the following.



Note

- ◆ On inserting air conditioning unit, pay attention to wiring to control motors and seals (must not be trapped or damaged by studs).
- ◆ Check all the seals and replace if necessary → *Electronic parts catalogue*.
- ◆ Make sure coolant hoses are properly connected to heat exchanger.
- ◆ Secure all hose connections with standard hose clamps/fasteners or ones which have been approved as replacement parts. → *Electronic parts catalogue*

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- Fit air conditioning unit.
- Install central tube of dash panel (dash panel cross member)
⇒ General body repairs, interior; Rep. gr. 70.

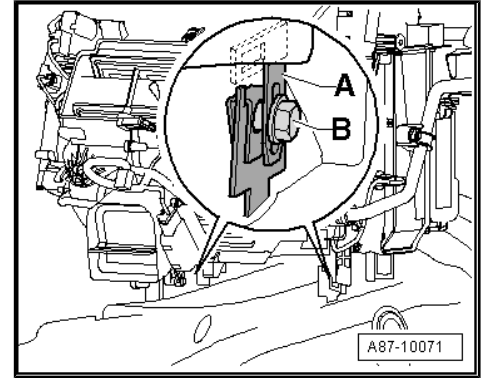


Note

In Model Year 2008, the thread at the fastening points between the air distribution housing and the dash panel central tube is being gradually modified (discontinuation of the cast metal inserts, the bolts are screwed directly into the plastic). Pay attention to the correct version of the bolts on installation → *Electronic parts catalogue*.

- Fit holders between air conditioning unit and central tube of dash panel insert ⇒ General body repairs, interior; Rep. gr. 70.

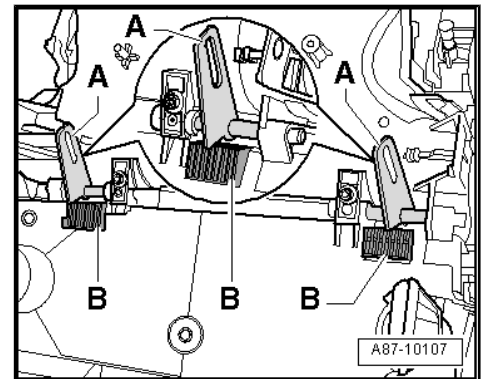
- Fold holders -B- towards transmission tunnel and fit bolts -B- (on left and right at transmission tunnel).



i Note

Moveable holders -A- attached to air conditioning unit and splines -B- provide compensation for tolerance fluctuations and permit alignment of air conditioning unit with transmission tunnel.

- Re-install components removed in reverse order except lower dash panel trim (driver's side), glove compartment and plenum chamber cover.



i Note

- ◆ *Bleed cooling circuit before plugging in 2-pin connector to coolant circulation pump - V50- of pump valve unit.*
- ◆ *Coolant circuit must be bled before starting up coolant circulation pump - V50- (in pump valve unit).*
- ◆ *Dry running of pump in pump/valve unit will lead to destruction.*

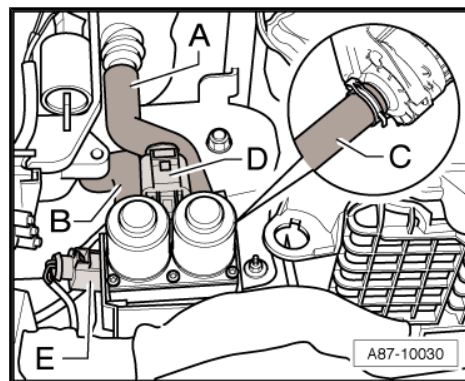
- Filling and bleeding coolant circuit ⇒ Engine, mechanics; Rep. gr. 19

i Note

When bleeding the coolant circuit, take particular care to ensure that the heat exchangers are bled completely. If air bubbles remain in heat exchangers, complaints may be received about lack of heat output in winter or differences in temperature of air flowing out of vents with same setting in control mode.

- After bleeding, check cooling system for leaks, paying particular attention to coolant pipe joints to heat exchanger ⇒ Engine, mechanics; Rep. gr. 19
- Check correct positioning of grommets in coolant pipe penetrations and at connecting flange of refrigerant pipes from plenum chamber to passenger compartment.

- Following installation, check correct positioning of grommet between engine compartment and plenum chamber at coolant hose -C-.
- Check pump valve unit; it must not make contact with other components (noise).
- Plug in connectors -D- to left heat regulation valve - N175- and right heat regulation valve - N176- and -E- to coolant circulation pump - V50- after bleeding coolant circuit.
- Evacuate and re-fill refrigerant circuit ⇒ Air conditioner with refrigerant R134a .
- After filling refrigerant circuit, check refrigerant pipe joints in plenum chamber and at evaporator for leaks e.g. with an electronic leak detector ⇒ Air conditioner with refrigerant R134a .
- Remove residual coolant from plenum chamber.
- Install the remaining removed components in reverse sequence.
- Interrogate fault 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") .
- Perform basic setting and final control diagnosis for air conditioner ⇒ Guided Fault Finding function of vehicle diagnostic, testing and information system VAS 5051 .
- Start up air conditioner after charging refrigerant circuit
⇒ [page 234](#) .



Note

Also observe notes on starting up air conditioner after charging
⇒ Air conditioner with refrigerant R134a .



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18 Dismantling and assembling air conditioning unit

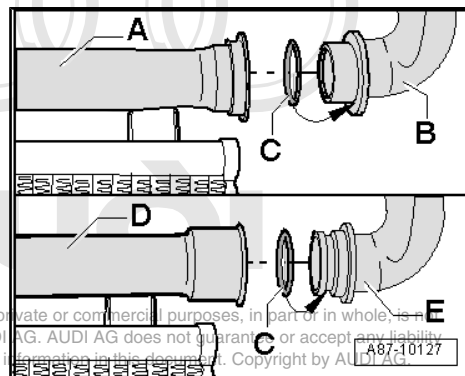


Note

- ◆ *On removal, mark the various control motors and the associated connecting elements between flap and motor to prevent mix-ups with connecting elements of other control motors.*
- ◆ *If connecting elements are interchanged, control motors with incorrect connecting elements do not attain specified end position and fault "upper or lower limit value exceeded" may be displayed in fault memory after basic setting.*
- ◆ *On detaching, mark the various connectors to the control motors to avoid interchange with identical connectors and control motors.*
- ◆ *The air conditioning unit wiring harness has various identical connectors which should be marked before unplugging to avoid interchange.*
- ◆ *The control motor housings are currently identical (exception: rear footwell vent control motor - V112-). The shaft of each motor is however positioned differently as a result of different connecting elements and attachment of connecting element may not be possible if this has been interchanged.*
- ◆ *The air conditioning unit and air intake unit are fitted with different control motors with different electrical values (e.g. potentiometer with adjustment range of 120 ° or 150°) and part number indices (at the start of production e.g. no index, index "A" or index "B") ⇒ Electronic parts catalogue . The control motors are therefore to be marked prior to removal to avoid interchange.*
- ◆ *Lubricate guides of connecting elements as well as pins and toothed segments at flap levers using small quantity of grease - G 000 150- ⇒ Electronic parts catalogue .*
- ◆ *Only remove the air conditioning unit if the refrigerant circuit is empty. If necessary, take the vehicle to a workshop which is equipped with the necessary tools and at which the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a .*
- ◆ *Removing and installing air conditioning unit ⇒ [page 236](#) .*
- ◆ *Dismantling and assembling air conditioning unit ⇒ [page 244](#)*
- ◆ *Dismantling and assembling housing for evaporator and heat exchanger ⇒ [page 246](#)*
- ◆ *Detaching electrical components and corresponding connecting elements from air distribution housing/re-attaching ⇒ [page 248](#)*
- ◆ *Removing and installing connecting elements to the various air conditioning unit flaps ⇒ [page 252](#)*
- ◆ *Connection between left and right footwell flap with air conditioning unit of "Basic" type ⇒ [page 254](#)*
- ◆ *Connection between left and right chest vent flap with air conditioning unit of "Basic" type ⇒ [page 254](#)*

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18.1 Dismantling and assembling air conditioning unit

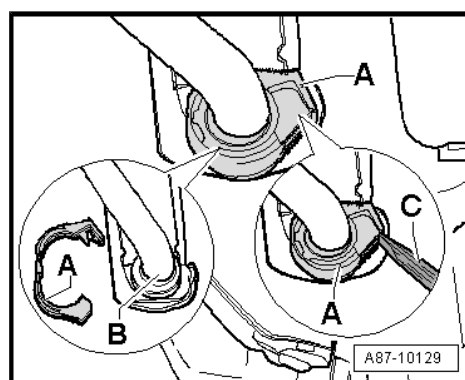


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Note

- ◆ Before dismantling, remove heating system heat exchanger from air conditioning unit ⇒ [page 246](#) and unplug connector from evaporator outflow temperature sender - G263- .
- ◆ There are different versions of the heat exchanger and the corresponding coolant pipes. In Model Year 2006, the seal between the connections at the heat exchanger and the coolant pipes was gradually switched from an axial/radial seal -A- and -B- to a radial seal -D- and -E-. On replacing the heat exchanger, pay attention to the correct version ⇒ Electronic parts catalogue and the correct installation position of the O-ring -C-.
- ◆ Instead of a screw-type clip, vehicles with a radial seal at the coolant pipes -B- to the heat exchanger may be fitted with a plastic clamp -A- ⇒ Electronic parts catalogue .
- ◆ Only remove the air conditioning unit if the refrigerant circuit is empty. If necessary, take the vehicle to a workshop which is equipped with the necessary tools and at which the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a .
- ◆ Removing and installing air conditioning unit ⇒ [page 236](#) .

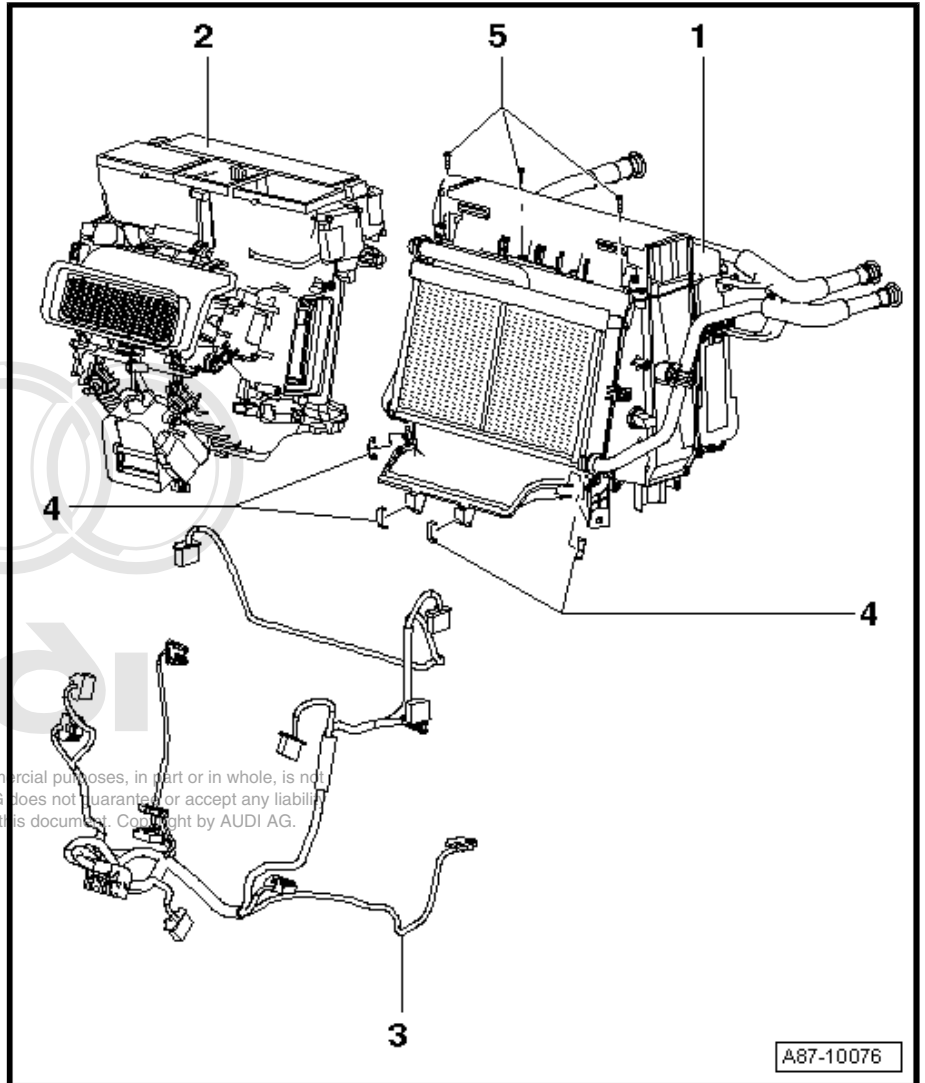


1 - Housing for evaporator and heat exchanger

- ☐ Different versions for vehicles with and without supplementary air heater element - Z35- ➔ Electronic parts catalogue
- ☐ Different versions for left-hand drive and right-hand drive vehicles ➔ Electronic parts catalogue
- ☐ Dismantling and assembling ➔ [page 246](#)

2 - Air distribution housing

- ☐ Different versions for vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" or "Convenience" type ➔ Electronic parts catalogue
- ☐ Different versions for vehicles with diesel engine (with supplementary heater element - Z35-) and petrol engine and diesel engine with "auxiliary heater" as optional extra and no supplementary heater element - Z35- ➔ Electronic parts catalogue
- ☐ Removing and installing electrical components with housing in position ➔ [page 115](#)



- ☐ Detaching electrical components and corresponding connecting elements from air distribution housing/re-attaching ➔ [page 248](#)
- ☐ In Model Year 2008, the thread at the fastening points between the air distribution housing and the dash panel central tube is being gradually modified (discontinuation of the cast metal inserts, the bolts are screwed directly into the plastic). Pay attention to the correct version of the bolts on installation ➔ Electronic parts catalogue

3 - Wiring harness of air conditioning unit

- Mark the various connectors before unplugging to avoid interchange with identical connectors and control motors.
- ☐ Different versions for vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" or "Convenience" type ➔ Electronic parts catalogue
- ☐ Different versions for left-hand drive and right-hand drive vehicles ➔ Electronic parts catalogue



Note

The air conditioning unit wiring harness has various identical connectors which should be marked before unplugging to avoid interchange.

4 - Clip

5 - Bolt

18.2 Dismantling and assembling housing for evaporator and heat exchanger

1 - Bottom part of housing

- ❑ Different versions for left-hand drive and right-hand drive vehicles ⇒ Electronic parts catalogue

2 - Top part of housing

3 - Slot cover for dust and pollen filter

- ❑ Located on left of air conditioning unit on right-hand drive vehicles
- ❑ Removing and installing ⇒ [page 88](#)

4 - Dust and pollen filter

- ❑ Removing and installing ⇒ [page 88](#)
- ❑ Different versions for vehicles with air conditioner of types "Basic" and "Convenience" ⇒ [page 88](#) and ⇒ Electronic parts catalogue
- ❑ Different versions of dust and pollen filter with ACF element depending on production period ⇒ Electronic parts catalogue

5 - Grommet

- ❑ Air emerging from air intake unit is routed into air conditioning unit through this grommet.

- ❑ Grommet is clipped into plenum chamber back wall; checking ⇒ [page 49](#)

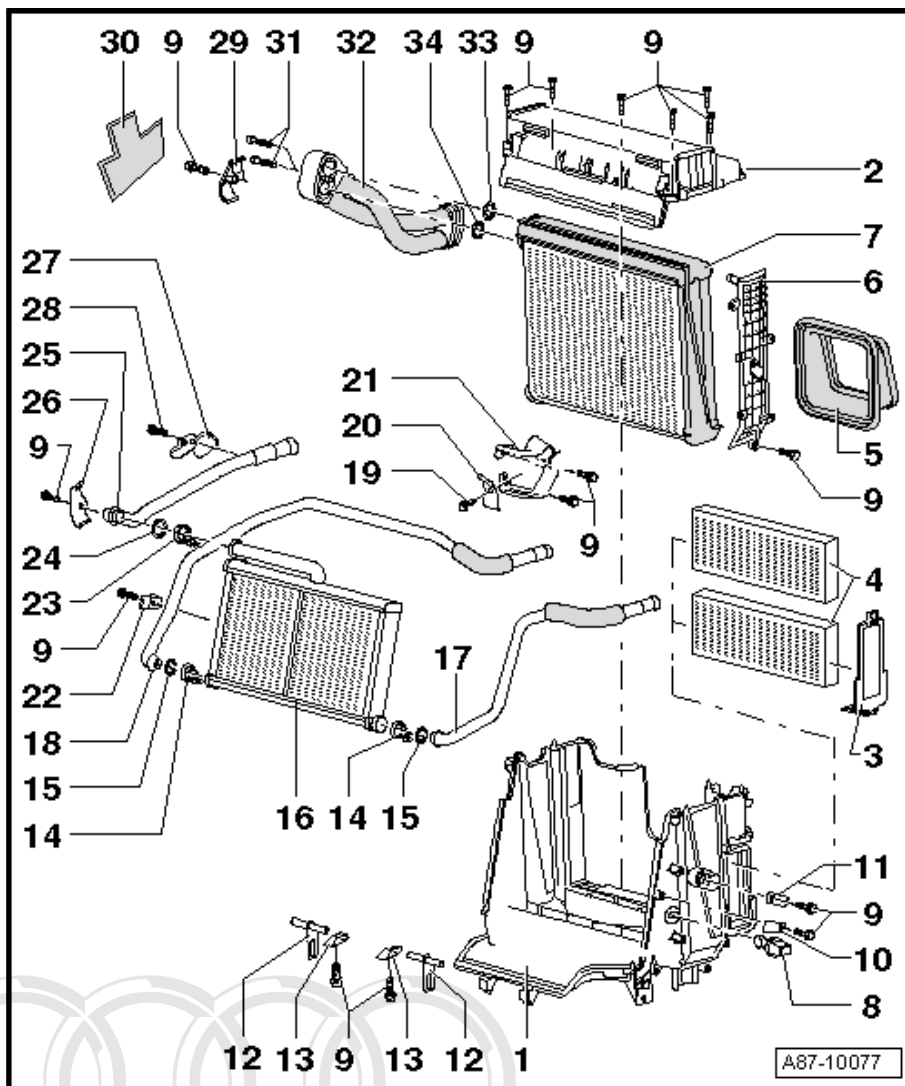
6 - Service cover

- ❑ Different versions for left or right-hand drive vehicles ⇒ Electronic parts catalogue (the evaporator is removed to the right or left with the air conditioning unit in position) ⇒ [page 225](#).
- ❑ Removing and installing ⇒ [page 225](#)



Note

On left and right hand drive vehicles, evaporator is removed from air conditioning unit to right or left respectively. ⇒ [page 225](#)



7 - Evaporator

- ❑ With rubber seal, plastic tray and O-rings ⇒ [page 225](#)
- ❑ Removing and installing ⇒ [page 225](#)

8 - Evaporator output temperature sender - G263-

- ❑ Removing and installing ⇒ [page 141](#)

9 - Bolt

10 - Holder for right heat exchanger

11 - Holder for coolant pipe to heat exchanger

12 - Bracket for air conditioning unit at centre tunnel

- ☐ This bracket is used to compensate for positional tolerance between air conditioning unit and centre tunnel

13 - Bracket

14 - Hose clip

- ☐ Renew
- ☐ Special service version ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 145](#)

15 - O-ring

- ☐ Renew ⇒ Electronic parts catalogue

16 - Heat exchanger for heater

- ☐ Removing and installing ⇒ [page 145](#)
- ☐ There are different versions of the heat exchanger and the corresponding coolant pipes. In Model Year 2006, the seal between the connections at the heat exchanger and the coolant pipes was gradually switched from an axial/radial seal to a radial seal. Pay attention to correct assignment ⇒ [page 145](#).

17 - Coolant pipe

- ☐ Supply from pump valve unit to right side of heat exchanger
- ☐ Different versions for left-hand drive and right-hand drive vehicles ⇒ Electronic parts catalogue
- ☐ There are different versions of the heat exchanger and the corresponding coolant pipes. In Model Year 2006, the seal between the connections at the heat exchanger and the coolant pipes was gradually switched from an axial/radial seal to a radial seal. Pay attention to correct assignment ⇒ [page 145](#).

18 - Coolant pipe

- ☐ Supply from pump valve unit to left side of heat exchanger
- ☐ Different versions for left-hand drive and right-hand drive vehicles ⇒ Electronic parts catalogue
- ☐ There are different versions of the heat exchanger and the corresponding coolant pipes. In Model Year 2006, the seal between the connections at the heat exchanger and the coolant pipes was gradually switched from an axial/radial seal to a radial seal. Pay attention to correct assignment ⇒ [page 145](#).

19 - Bolt

20 - Holder for coolant pipe

21 - Holder for coolant pipe

22 - Holder for left heat exchanger

23 - Hose clip

- ☐ Renew
- ☐ Special service version ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [page 225](#)

24 - O-ring

- ☐ Renew ⇒ Electronic parts catalogue

25 - Coolant pipe

- ☐ Return from heat exchanger to engine
- ☐ There are different versions of the heat exchanger and the corresponding coolant pipes. In Model Year 2006, the seal between the connections at the heat exchanger and the coolant pipes was gradually switched from an axial/radial seal to a radial seal. Pay attention to correct assignment ⇒ [page 145](#).

26 - Holder for left coolant pipes

- ☐ Different versions for left-hand drive and right-hand drive vehicles ⇒ Electronic parts catalogue

27 - Holder for left coolant pipe (return)**28 - Bolt****29 - Holder for refrigerant pipes****30 - Heat insulation**

- ☐ Self-adhesive
- ☐ For connecting flange of refrigerant pipes at evaporator ⇒ Electronic parts catalogue

31 - Bolt

- ☐ Tightening torque: 10 Nm

32 - Refrigerant pipes

- ☐ From connecting flange in plenum chamber to evaporator
- ☐ With heat insulation

33 - O-ring

- ☐ Renew ⇒ Electronic parts catalogue

34 - O-ring

- ☐ Renew ⇒ Electronic parts catalogue

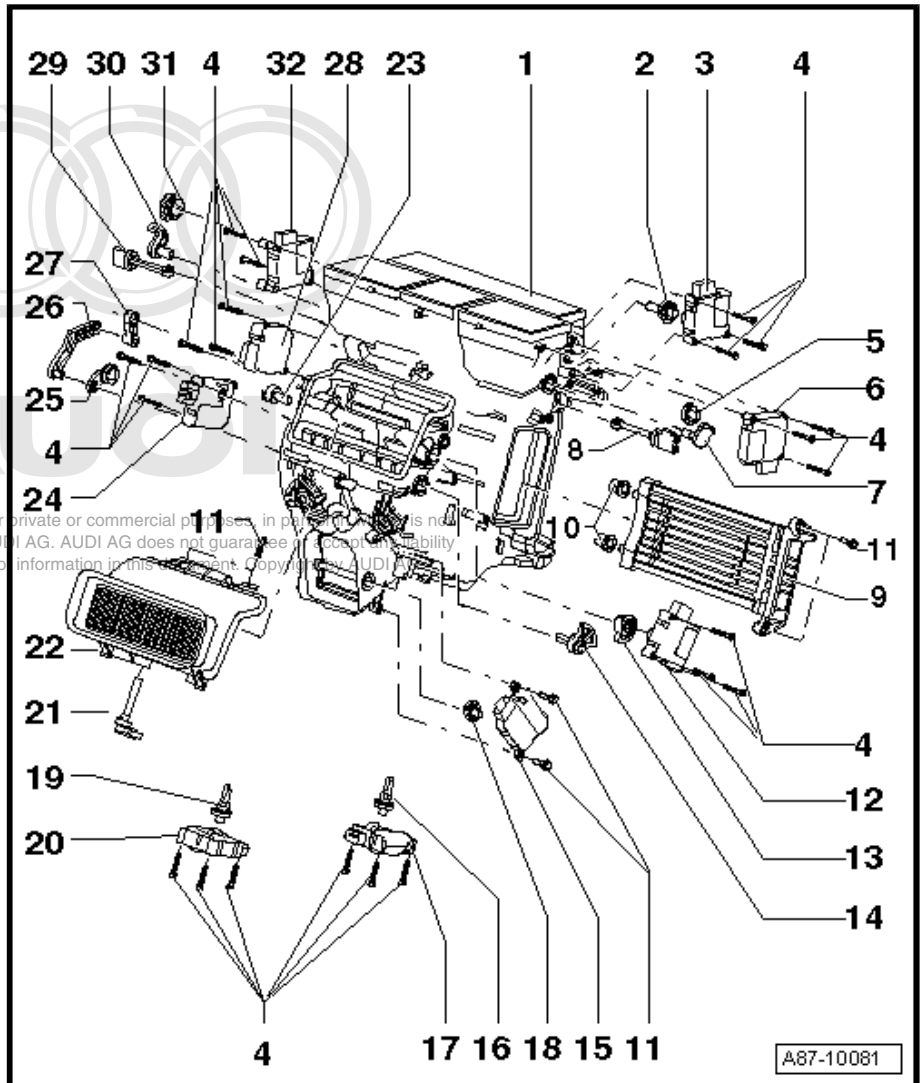
18.3 Detaching electrical components and corresponding connecting elements from air distribution housing/re-attaching

**Note**

- ◆ *On removal, mark the various control motors and the associated connecting elements between flap and motor to prevent mix-ups with connecting elements of other control motors.*
- ◆ *On detaching, mark the various connectors to the control motors to avoid interchange with identical connectors and control motors.*
- ◆ *The air conditioning unit wiring harness has various identical connectors which should be marked before unplugging to avoid interchange.*
- ◆ *If connecting elements are interchanged, control motors with incorrect connecting elements do not attain specified end position and fault "upper or lower limit value exceeded" may be displayed in fault memory after basic setting.*
- ◆ *The control motor housings are currently identical (exception: rear footwell vent control motor - V112-). The shaft of each motor is however positioned differently as a result of different connecting elements and attachment of connecting element may not be possible if this has been interchanged.*
- ◆ *The air conditioning unit and air intake unit are fitted with different control motors with different electrical values (e.g. potentiometer with adjustment range of 120 ° or 150°) and part number indices (at the start of production e.g. no index, index "A" or index "B") ⇒ Electronic parts catalogue . The control motors are therefore to be marked prior to removal to avoid interchange.*
- ◆ *Lubricate guides of connecting elements as well as pins and toothed segments at flap levers using small quantity of grease - G 000 150- ⇒ Electronic parts catalogue .*

1 - Air distribution housing

- ☐ Do not dismantle any further
- ☐ Different versions for vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" or "Convenience" type ⇒ Electronic parts catalogue
- ☐ Different versions for vehicles with diesel engine (with supplementary heater element - Z35-) and vehicles with petrol engine and diesel engine with "auxiliary heater" as optional extra and no supplementary heater element - Z35- ⇒ Electronic parts catalogue
- ☐ In Model Year 2008, the thread at the fastening points between the air distribution housing and the dash panel central tube is being gradually modified (discontinuation of the cast metal inserts, the bolts are screwed directly into the plastic). Pay attention to the correct version of the bolts on installation ⇒ Electronic parts catalogue .



2 - Connecting element (shaft/control motor)

- ☐ Mark prior to removal to avoid interchange
- ☐ Removing and installing ⇒ [page 252](#)

3 - Defroster flap control motor - V107-

- ☐ With potentiometer for defroster flap control motor - G135-
- ☐ Removing and installing ⇒ [page 118](#)

4 - Bolt

5 - Connecting element (to control motor)

- ☐ Mark prior to removal to avoid interchange
- ☐ Removing and installing ⇒ [page 135](#)

6 - Front right chest vent control motor - V238- ("Convenience" version) or front left chest vent control motor - V237- ("Basic" version)



Note

The designation of this control motor in the Guided Fault Finding routine and the current flow diagram varies depending on the version of the operating and display unit, Climatronic control unit - J255- ("Convenience" or "Basic" version).

- ☐ Front right chest vent control motor - V238- has an integrated front right chest vent potentiometer - G388- .
- ☐ Front left chest vent control motor - V237- has an integrated front left chest vent potentiometer - G387- .
- On vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type, flaps for front left and right chest vents are actuated by front left chest vent control motor - V237- (the two flaps are interconnected by a shaft) ⇒ [page 254](#) .
- ☐ Removing and installing ⇒ [page 135](#) .

7 - Connecting element (to shaft)

- ☐ Mark prior to removal to avoid interchange
- ☐ Removing and installing ⇒ [page 252](#)

8 - Right vent temperature sender - G151-

- ☐ Removing and installing ⇒ [page 139](#)

9 - Supplementary air heater element - Z35-

- ☐ Only fitted on diesel models.
- Certain models with diesel engine and auxiliary heater
- ☐ Removing and installing ⇒ [page 142](#)
- ☐ Checking function ⇒ [page 112](#) .

10 - Rubber mounting

11 - Bolt

12 - Front cold air flap control motor - V197-

- ☐ With front cold air flap control motor potentiometer - G315-
- ☐ Removing and installing ⇒ [page 127](#)

13 - Connecting element (to control motor)

- ☐ Mark prior to removal to avoid interchange
- ☐ Removing and installing ⇒ [page 127](#)

14 - Connecting element (to shaft)

- ☐ Mark prior to removal to avoid interchange
- ☐ Removing and installing ⇒ [page 252](#)

15 - Rear footwell vent control motor - V112-

- ☐ With rear footwell vent control motor potentiometer - G141-
- ☐ Removing and installing ⇒ [page 125](#)

16 - Connecting element (shaft/control motor)

- ☐ Mark prior to removal to avoid interchange
- ☐ Removing and installing ⇒ [page 125](#)

17 - Right footwell flap control motor - V109- ("Convenience" version) or left footwell flap control motor - V108- ("Basic" version)



Note

The designation of this control motor in the Guided Fault Finding routine and the current flow diagram varies depending on the version of the operating and display unit, Climatronic control unit - J255- ("Convenience" or "Basic" version).

- ☐ Right footwell flap control motor - V109- has an integrated potentiometer for right footwell flap control motor - G140- .
- ☐ Left footwell flap control motor - V108- has an integrated potentiometer for left footwell flap control motor - G139- .

- On vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type, left and right footwell flaps are actuated by left footwell flap control motor - V108- (the two flaps are linked by a connecting rod) ⇒ [page 254](#) .

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

18 - Connecting element (shaft/control motor)

- ☐ Mark prior to removal to avoid interchange
- ☐ Removing and installing ⇒ [page 252](#) .

19 - Connecting element (shaft/control motor)

- ☐ Mark prior to removal to avoid interchange
- ☐ Removing and installing ⇒ [page 252](#)

20 - Left footwell flap control motor - V108-

- ☐ With left footwell flap control motor potentiometer - G139-



Note

No control motor is fitted at this location on vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type. On such vehicles, left footwell flap control motor - V108- is attached to right of air conditioning unit (the two flaps are linked by a connecting rod) ⇒ [page 254](#) .

- ☐ This control motor is only fitted on vehicles with operating and display unit, Climatronic control unit - J255- of "Convenience" type
- On vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type, both footwell flaps are actuated by left footwell flap control motor - V108- (attached to right of air conditioning unit)
- ☐ Removing and installing ⇒ [page 120](#)

21 - Centre vent temperature sender - G191-

- ☐ Removing and installing ⇒ [page 140](#)
- ☐ The centre vent temperature sender - G191- is being gradually discontinued as of Model Year 2006. Attention is therefore to be paid to correct assignment of the operating and display unit, Climatronic control unit - J255- (different versions) ⇒ Electronic parts catalogue .

22 - Air duct to dash panel vents (centre)

- ☐ Integrated grille helps to improve swirl and mixing of air flow
- ☐ This air duct is available as replacement part with and without opening for the mount of the centre vent temperature sender - G191- ⇒ Electronic parts catalogue . Seal the mount opening or make the mount opening by breaking out the plastic at the marked location depending on vehicle equipment.

23 - Connecting element (shaft/control motor)

- ☐ Mark prior to removal to avoid interchange
- ☐ Removing and installing ⇒ [page 252](#)

24 - Centre vent control motor - V102-

- ☐ With central vent control motor potentiometer - G138-
- ☐ Removing and installing ⇒ [page 116](#)

25 - Connecting element (control motor/connecting rod)

- ☐ Removing and installing ⇒ [page 130](#)
- ☐ Only fitted on vehicles with operating and display unit, Climatronic control unit - J255- of "Convenience" type

26 - Coupling rod

- ☐ Removing and installing ⇒ [page 130](#)
- ☐ Only fitted on vehicles with operating and display unit, Climatronic control unit - J255- of "Convenience" type

27 - Connecting element (shaft/connecting rod)

- ☐ Removing and installing ⇒ [page 130](#)
- ☐ Only fitted on vehicles with operating and display unit, Climatronic control unit - J255- of "Convenience" type

28 - Indirect ventilation flap control motor - V213-

- ☐ With indirect ventilation flap control motor potentiometer - G330-
- This control motor is only fitted on vehicles with operating and display unit, Climatronic control unit - J255- of "Convenience" type. This control motor is not fitted on vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type (opening in air distribution housing is sealed off and flap not fitted).
- ☐ Removing and installing ⇒ [page 130](#)

29 - Left vent temperature sender - G150-

- ☐ Removing and installing ⇒ [page 138](#) .

30 - Connecting element (to shaft)

- ☐ Mark prior to removal to avoid interchange
- ☐ Removing and installing ⇒ [page 252](#)

31 - Connecting element (to control motor)

- ☐ Mark prior to removal to avoid interchange
- ☐ Removing and installing ⇒ [page 132](#)
- ☐ Only fitted on vehicles with operating and display unit, Climatronic control unit - J255- of "Convenience" type

32 - Front left chest vent control motor - V237-**Note**

No control motor is fitted at this location on vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type. On such vehicles, front left chest vent control motor - V237- is attached to right of air conditioning unit (the two flaps are inter-connected by a shaft) ⇒ [page 254](#) .

- ☐ This control motor is only fitted on vehicles with operating and display unit, Climatronic control unit - J255- of "Convenience" type
- On vehicles with operating and display unit, Climatronic control unit - J255- of "Basic" type, the two flaps for the front left and right chest vents are actuated by the front left chest vent control motor - V237- (attached to right of air conditioning unit).
- ☐ Removing and installing ⇒ [page 132](#)

18.4**Removing and installing connecting elements to the various air conditioning unit flaps**

- ◆ Removing connecting elements ⇒ [page 252](#)
- ◆ Installing connecting elements ⇒ [page 253](#)

18.4.1 Removing connecting elements

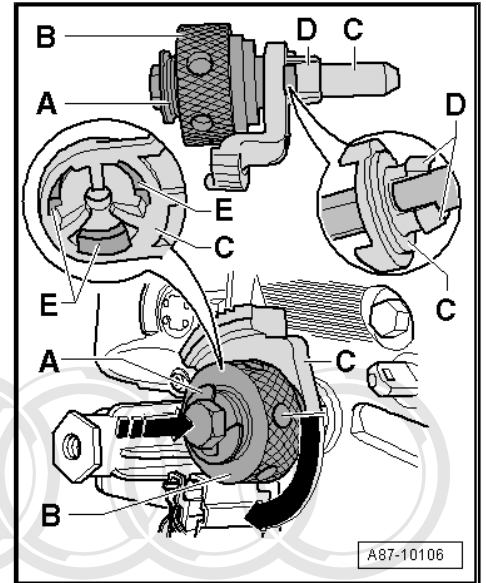
- Remove the relevant control motor ⇒ [page 115](#) (removing and installing electrical components of air conditioning unit with unit in position).

- Insert release tool - T40072- -A- as shown in openings -E- of connecting element -C-.

i Note

Due to the different types of connecting element -C-, it is not always possible to insert special release tool - T40072- -A- to the same depth.

- Press special release tool - T40072- in direction of connecting element -C- and release fasteners -D- by turning knurled wheel -B- in direction of arrow.
- Pull connecting element -C- out of air conditioning unit.



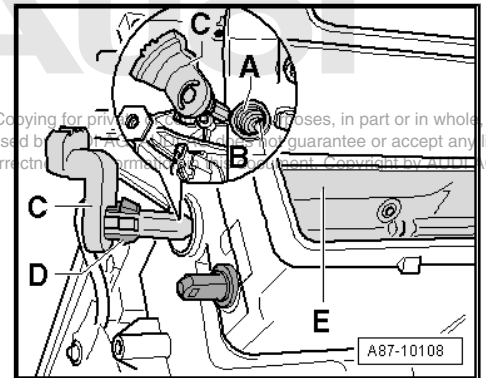
18.4.2 Installing connecting elements

- Moisten the mount of the connecting element -A- in the air conditioning unit with a small quantity of grease (e.g. lubricating paste - G 000 150-) ⇒ Electronic parts catalogue .

i Note

Fig. shows connecting element at flap for centre vent.

- Check position of flap -F- in air conditioning unit, taking care to also ensure that flap is properly located in second mount.
- Check retainer tabs -D- at connecting element -C- for damage.
- Insert connecting element -C- in mount -B- of flap -F-, paying attention to grooves of connecting element -C- and lugs in flap mount.
- Check engagement of connecting element -C- in air conditioning unit.
- Check freedom of movement of flap -F- and connecting element -C-.



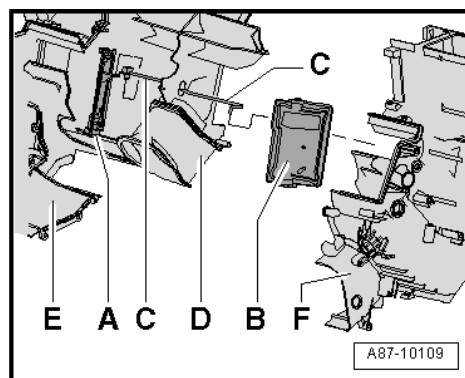
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18.5 Connection between left and right footwell flap with air conditioning unit of "Basic" type



Note

- ◆ With "Convenience" version of air conditioning unit, each flap is actuated by a separate control motor.
- ◆ With "Basic" version of air conditioning unit, right flap -B- is actuated by control motor.
- ◆ Left footwell flap -A-
- ◆ Right footwell flap -B-
- ◆ Connecting rod -C-
- ◆ Partition between left and right half of housing -D- (different versions)
- ◆ Left half of air distribution housing -E-
- ◆ Right half of air distribution housing -E-



18.6 Connection between left and right chest vent flap with air conditioning unit of "Basic" type



Note

- ◆ With "Convenience" version of air conditioning unit, each flap is actuated by a separate control motor.
- ◆ With "Basic" version of air conditioning unit, right flap -B- is actuated by control motor.
- ◆ Left centre vent flap -A-
- ◆ Right centre vent flap -B-
- ◆ Shaft -C-
- ◆ Partition between left and right half of housing -D- (different versions)
- ◆ Left half of air distribution housing -E-
- ◆ Right half of air distribution housing -E-

