Workshop Manual
Audi A8 2003 ➢
Air conditioning

Edition 09.2010

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Repair Group

87 - Air conditioning system

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.

Contents

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1 Safety precautions when working on vehicles fitted with an air conditioner and for handling refrigerant

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

1.1.1.2 tetrafluoroethane (CF_3-CH_2F or CH_2F-CF_3)

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

1.1 Safety precautions

The following safety precautions are to be heeded in Germany for this refrigerant (additional regulations may apply in other countries).

The refrigerant circuit is to be drained first should repair work require the refrigerant circuit to be opened ⇒ page 2 . All contact with liquid refrigerant or refrigerant vapours is to be avoided. Should refrigerant escape despite compliance with all safety precautions, take care never to inhale the mixture of refrigerant and air which forms.

Extraction systems are therefore to be switched on and use made of rubber gloves and safety goggles.

Reason:

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

> **WARNING**
>
> ***It is advisable to 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 no pain is felt.***
>
> ***The doctor should be informed of the type of refrigerant which caused the frostbite.***

Should refrigerant come into contact with other parts of the body despite compliance with all safety precautions, these must likewise be thoroughly rinsed without delay for at least 15 minutes with cold water.

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 refrigerant gas to undergo chemical decomposition. The inhalation of the toxic decomposition products results in dry coughing and nausea.

1.2 Draining refrigerant circuit

Refrigerant must not be allowed to escape into the environment. It should be extracted from the refrigerant circuit by means of a suction unit or service station. The refrigerant removed is then either to 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 is to be taken to a workshop equipped with the necessary tools where the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a .

Reason:

Should it escape into the earth's atmosphere, refrigerant R134a will have a detrimental effect in terms of »global warming«.

Note

- *Refrigerant R134a has far less of a greenhouse effect than refrigerant R12.*
- *The refrigerant R134a does not affect the ozone layer in the earth's atmosphere (-R134a- is an H-FC with no chlorine atoms). The depletion of the ozone in the upper atmosphere is however only caused by the splitting of carbon-chlorine bonds (as is the case, for example, with the refrigerant R12).*

After draining the air conditioner, unplug the connector from the air conditioner compressor regulating valve -N280- or from the high-pressure sender -G65- .

Reason:

The air conditioner compressor regulating valve -N280- is then no longer actuated and the compressor runs at idle. The compressor is designed such that lubrication of the compressor components is guaranteed by way of an internal oil circuit at idle (provided there is sufficient refrigerant oil in the compressor).

1.3 Working on refrigerant circuit

Work on the refrigerant circuit is only to be performed in well ventilated areas. Care should be taken to ensure that there are no inspection pits, shafts or cellar entrances within a radius of 5 metres. Extraction systems are to be switched on.

Reason:

The refrigerant which emerges is not only colourless and odourless, but also heavier than air and therefore displaces oxygen. Should refrigerant gas escape despite compliance with all safety precautions, there will be a previously impercepible risk of asphyxiation in poorly ventilated areas and inspection pits.

Note

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

Welding, brazing and soldering operations are not to be performed on air conditioner components when filled. The same applies to welding and soldering work on the vehicle if there is a risk that parts of the air conditioner could become warm.

Reason:

Heat generation causes considerable pressure to build up in the system and this could lead to rupturing of the system.

Remedy:

Drain the refrigerant circuit (⇒ page 2).

Note

Damaged or leaking air conditioner components are not to be repaired by welding or soldering, but should be replaced.

When servicing the air conditioner, all open components and pipe connections are to be immediately re-sealed.

Reason:

Moisture will ingress into the air conditioner components if they are left open for a lengthy period. If this is the case, air conditioners cannot be re-filled without having to replace parts of the system.

1.4 Painting work on vehicles fitted with an air conditioner

When performing paintwork repairs, the temperature in the drying booth or preheating zone must not exceed 80 °C.

Reason:

Heat generation causes considerable pressure to build up in the system and this could lead to rupturing of the system.

1.5 Further information

- In the vehicle diagnostic, testing and information system - VAS 5051 A- , „Guided fault-finding“ routine ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- The appropriate current flow diagrams can be found in the Current flow diagrams, Electrical fault-finding and Fitting locations binder ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- A label in the engine compartment indicates the refrigerant used as well as the capacity.
- Further information on repair work for vehicles fitted with an air conditioner and on handling refrigerant is stored in ⇒ Air conditioner with refrigerant R134a .

2 Notes on general repairs

DANGER!

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

Note

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

It is only permissible if so required by the pertinent safety regulations (⇒ page 2), or if parts of the air conditioner refrigerant circuit have to be replaced, to drain and open the air conditioner refrigerant circuit (⇒ page 2).

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

Service work which can be performed on the heater and air conditioner without opening the refrigerant circuit is described in this Workshop Manual ⇒ page 26 .

Note

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

Air conditioner servicing work which requires drainage of the refrigerant circuit and which thus cannot be performed at all Audi and VW workshops is also described in this workshop manual ⇒ page 135 (for drainage of the refrigerant circuit, the vehicle is to be taken to a workshop equipped with the necessary tools where the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a).

2.1 Note on vehicles with auxiliary heater (poor heating output)

In the event of problems with poor heat output, check the air conditioner heat output and operation of the pump valve unit ⇒ page 132 .

In the event of problems relating to poor or inadequate heat output at low engine speeds on vehicles fitted with an auxiliary heater as optional extra, check actuation of the auxiliary/supplementary heater circulation pump -V55- by the supplementary heater control unit -J364- ⇒ Auxiliary/supplementary heater; Rep. gr. 82 and ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051 (auxiliary heater guided fault-finding).

- Actuation of the circulation pump -V55- increases the flow of coolant through the air conditioner heat exchanger at low engine speeds and thus improves heat output.
- The supplementary heater control unit -J364- switches on the circulation pump -V55- for example if it receives the following information via the convenience data bus system (⇒ Auxiliary/supplementary heater; Rep. gr. 82 and ⇒ "Guided fault-find-

ing" function of vehicle diagnostic, testing and information system VAS 5051).

– Ignition on and engine running
– Ambient temperature less than 20 °C
– Engine speed less than 2000 rpm
– Front operating and display unit, Climatronic control unit -J255- switched on (OFF button not pressed)
– Heat output requested for at least one side (driver or front passenger side)

♦ The circulation pump -V55- is switched on as soon as all activation conditions are fulfilled. To stop the circulation pump being constantly switched off and on, it remains activated for at least 30 s even if - for example in the event of rapid changes in vehicle speed - a request is only applied for a few seconds (e.g. on accelerating after standing at traffic lights).

♦ For incorporation of the auxiliary/supplementary heater (and circulation pump -V55-) into the coolant circuit, refer to ⇒ Auxiliary/supplementary heater; Rep. gr. 82

2.2 Notes on air conditioner self-diagnosis

♦ There are different versions of the front operating and display unit, Climatronic control unit -J255- and the rear Climatronic operating and display unit -E265- . Pay attention to precise assignment on replacement. ⇒ Electronic parts catalogue

♦ Air conditioner self-diagnosis is to be performed by way of the „Guided fault-finding“ function using the vehicle diagnostic, testing and information system -VAS 5051 A- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

♦ Front operating and display units can no longer be exchanged in the familiar manner. Component protection is activated as soon as a front operating and display unit, Climatronic control unit -J255- has been matched to a vehicle. The component protection feature can only be cancelled by entering certain vehicle data ⇒ ”Guided fault-finding” function of vehicle diagnostic, testing and information system VAS 5051.

♦ If a front operating and display unit 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 ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

♦ If a front operating and display unit, Climatronic control unit -J255- (or the rear Climatronic operating and display unit -E265-) is to be replaced, interrogate the encoding (of the front operating and display unit, Climatronic control unit -J255-) and the adaption (of the front operating and display unit, Climatronic control unit -J255- and the rear Climatronic operating and display unit -E265-) by way of the „Control unit replacement“ function in the guided fault-finding routine for this operating and display unit prior to removal ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

♦ The „Electrical checks“ function is not described in this Workshop Manual. When implementing electrical checks by way of the „Guided fault-finding“ function, information is given on the functions to be checked ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

♦ The temperature-dependent resistance values of the various temperature sensors are stored in tables which can be called

up via the „Guided fault-finding“ function ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

♦ Lengthy pressing of the buttons on the front operating and display unit, Climatronic control unit -J255- or the rear Climatronic operating and display unit -E265- (e.g. caused by objects resting on them) may lead to the fault "buttons sticking" being stored in the fault memory. If applicable, check operation of the buttons and erase the fault memory if no problem is found.

♦ Depending on vehicle equipment, various control units actuated by the front operating and display unit, Climatronic control unit -J255- / rear Climatronic operating and display unit -E265- are displayed on entering the self-diagnosis routine (e.g. driver seat ventilation control unit -J672- , heated windscreen control unit -J505-).

♦ As of Model Year 2009, front operating and display units, Climatronic control unit -J255- with part number 4E0 820 043 as of index „J“ are gradually being introduced ⇒ Electronic parts catalogue . On vehicles with such front 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 front operating and display unit. The air conditioner functions selected are incorporated into the current display. On these vehicles, certain air conditioner functions are selected and activated by way of the rotary knob/pushbutton of the operating unit for the „MMI“ ⇒ Owner's manual and ⇒ Operating instructions for „Infotainment / MMI“ . In addition, front operating and display units of this type feature an A/C button instead of the Setup button and an OFF button instead of the ON/OFF button ⇒ Owner's manual .

♦ Pay attention to correct assignment of the front operating and display unit, Climatronic control unit -J255- to control unit 1 for information electronics -J794- (different versions) ⇒ Electronic parts catalogue . In the event of incorrect assignment, the various air conditioner functions cannot be displayed in the MMI and selected.

♦ With front operating and display units, Climatronic control unit -J255- as of software version „X078“, the type of engine is encoded (on vehicles with FSI engine, the transmission ratio at the pulleys and thus the torque for driving the compressor are different than for other engines) ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

♦ The assignment and display in the various display groups differ depending on whether the rear Climatronic operating and display unit -E265- was installed prior to or as of November 2002. On the version fitted as of November 2002, certain display groups are also no longer used ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

2.3 Electrical checking of air conditioner components

♦ The air conditioner „Electrical checks“ function is not described in this Workshop Manual. When implementing electrical checks by way of the „Guided fault-finding“ function, information is given on the functions to be checked ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

♦ The temperature-dependent resistance values of the various temperature sensors are stored in a table which can be called up via the „Guided fault-finding“ function ⇒ "Guided fault-find-

ing" function of vehicle diagnostic, testing and information system VAS 5051.

3 Servicing refrigerant circuit

Note

- *For servicing work on refrigerant circuit, refer to ⇒ page 135 .*
- *All parts/operations marked 1)*

  can be serviced and replaced/performed in any workshop (work not involving the refrigerant circuit).
- *All parts of the refrigerant circuit not marked 1) as well as all refrigerant hoses and lines pipes can only be serviced or replaced at workshops equipped with the necessary tools where the work can be performed by appropriately qualified personnel (the refrigerant circuit has to be drained) ⇒ Air conditioner with refrigerant R134a .*

3.1 General view of components

HD = High-pressure end

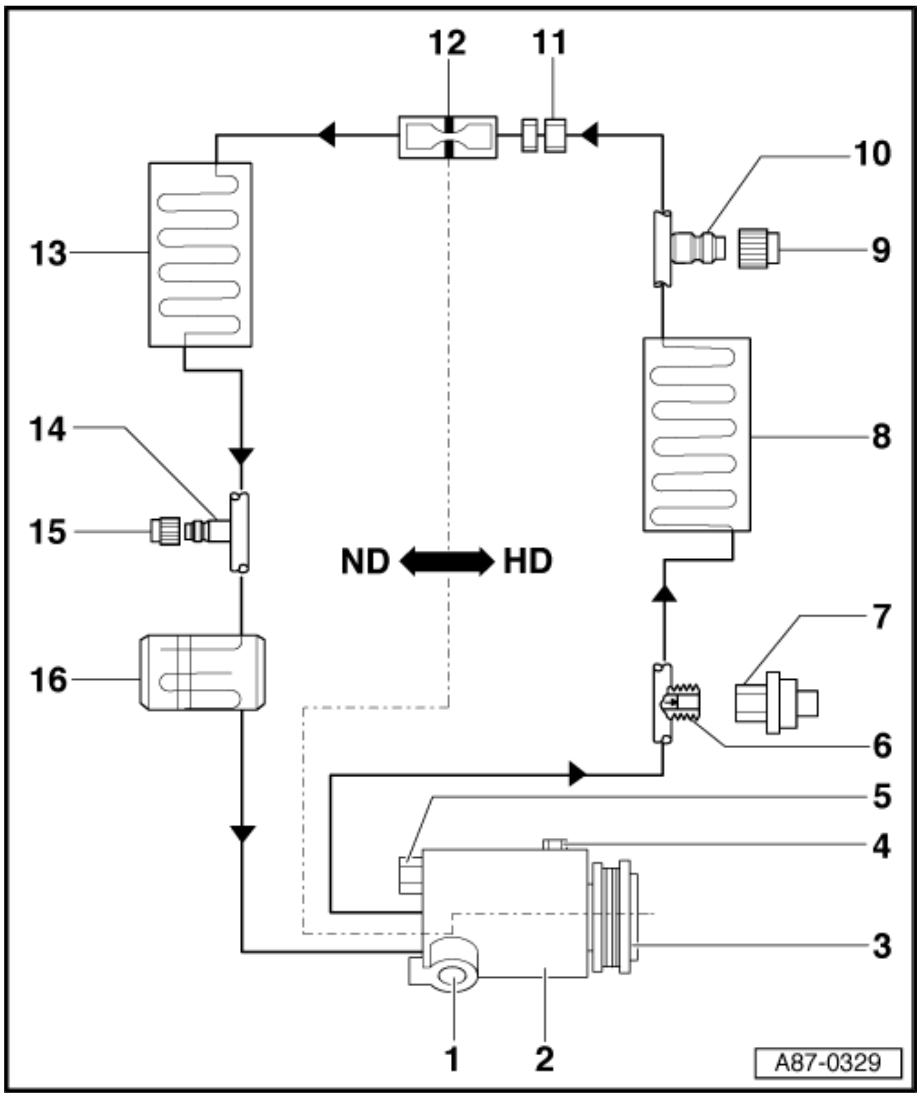
ND = Low-pressure end

1 - Air conditioner compressor regulating valve -N280-

- ❑ Checking actuation and operation ⇒ page 16 1) ⇒ page 8

2 - Compressor

- ❑ Detaching compressor from holder/re-attaching on vehicles with 6-cyl. engine, 8-cyl. MPI engine or 8-cyl. diesel engine ⇒ page 14 1) and ⇒ page 8
- ❑ Detaching compressor from holder/re-attaching on vehicles with 12-cyl. engine ⇒ page 149 and ⇒ page 8
- ❑ Removing and installing compressor on vehicles with 8-cyl. FSI engine ⇒ page 141
- ❑ Removing and installing compressor on vehicles with 10-cyl. engine ⇒ page 153
- ❑ When installing the refrigerant lines and the corresponding holder, make sure there is sufficient distance between the belt, holder and pulley.
- ❑ The type of compressor differs depending on the engine (6, 8, 10 or 12-cyl. engine, diesel or



petrol engine) ⇒ Electronic parts catalogue

Different refrigerant oil capacities apply to the refrigerant circuit depending on the type of compressor („6 SEU 14“, „7 SEU 16“ or „7 SEU 17“) ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a

3 - Pulley/drive unit for compressor

- ❑ Replacing compressor pulley [1] ⇒ page 19
- ❑ Removing and installing poly V-belt [1] ⇒ Engine, mechanics; Rep. gr. 13
- ❑ Poly V-belt assignment ⇒ Electronic parts catalogue
- ❑ Replacing compressor drive unit (vehicles with 8-cyl. FSI or 10-cyl. engine) ⇒ page 161

Note

4 - Oil drain plug

5 - Pressure relief valve

6 - Connection with valve

- ❑ Use an adapter from the adapter set for service connections -T10364- for example for removing and installing the valve insert with the refrigerant circuit drained.

WARNING

The refrigerant circuit must always be drained before removing the valve insert.

7 - High-pressure sender -G65- [1] ⇒ page 8

- ❑ Removing and installing ⇒ page 10
- ❑ Checking signal ⇒ page 10

8 - Condenser

9 - Cap

- ❑ With seal
- ❑ Always to be screwed on

10 - Service connection

- ❑ High-pressure end
- ❑ For service station for measuring, draining and filling ⇒ Air conditioner with refrigerant R134a
- ❑ For measurement, drainage and filling; the vehicle is to be taken to a workshop equipped with the necessary tools where the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a
- ❑ Different versions (with primary sealing valve or Schrader valve) depending on the refrigerant line; distinguishing features ⇒ Air conditioner with refrigerant R134a
- ❑ Use an adapter from the adapter set for service connections -T10364- for example for removing and installing the service connection or valve insert with the refrigerant circuit drained.

11 - Union in refrigerant line

12 - Restrictor

- ❑ Fitted in union ⇒ Item 11 (page 9)

13 - Evaporator

14 - Service connection

- ❑ Low-pressure end
- ❑ For service station for measurement and drainage ⇒ Air conditioner with refrigerant R134a
- ❑ For measurement and drainage; the vehicle is to be taken to a workshop equipped with the necessary tools where the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a

- ❑ Different versions (with primary sealing valve or Schrader valve) depending on the refrigerant line; distinguishing features ⇒ Air conditioner with refrigerant R134a
- ❑ Use an adapter from the adapter set for service connections -T10364- for example for removing and installing the service connection or valve insert with the refrigerant circuit drained.

WARNING

The refrigerant circuit must be drained before removing the service connections (the connection has no valve).

15 - Cap

- ❑ With seal
- ❑ Always to be screwed on

16 - Reservoir

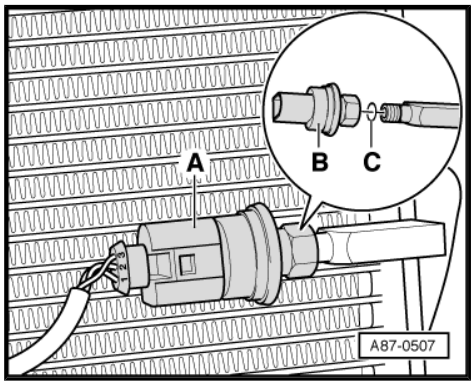
3.2 Removing and installing air conditioner high-pressure sender -G65-

– Remove the radiator grille ⇒ General body repairs, exterior; Rep. gr. 50 .

– Unplug the connector -A-.

– Remove the high-pressure sender -G65- -B- (tightening torque: 5 Nm).

– Replace the O-ring -C- (10.8 mm; 1.8 mm) ⇒ page 13 .



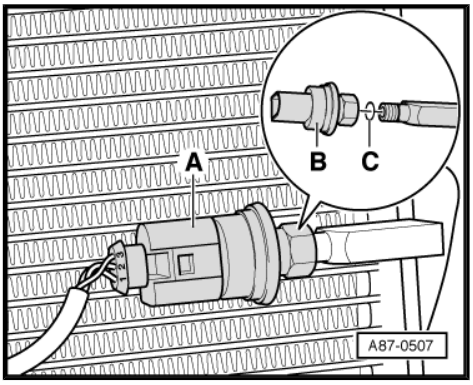
Note

- ♦ *The cooling output cannot be checked with the high-pressure sender -G65- removed. The front operating and display unit, Climatronic control unit -J255- does not switch on the compressor.*
- ♦ *There are different versions of the high-pressure sender -G65- (different signals). Attention is therefore to be paid to correct assignment ⇒ Electronic parts catalogue .*
- ♦ *The refrigerant circuit is to be left closed, connection with valve.*
- ♦ *Checking operation of high-pressure sender -G65- and signal supplied ⇒ page 10 .*
- ♦ *Moisten the O-ring with a small quantity of refrigerant oil before installing ⇒ page 13 .*

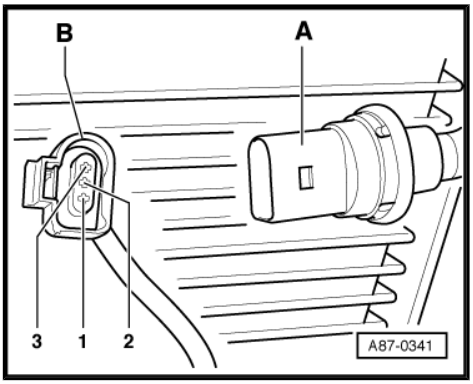
3.3 Checking pressure signal from high-pressure sender -G65-

– Remove the radiator grille ⇒ General body repairs, exterior; Rep. gr. 50 .

– Unplug the connector -A-.



3.3.1 Pin assignment at high-pressure sender -G65-



-Contact 1- Earth

-Contact 2- Signal output (square-wave signal to front operating and display unit, Climatronic control unit -J255-)

-Contact 3- Positive (terminal 75)

Note

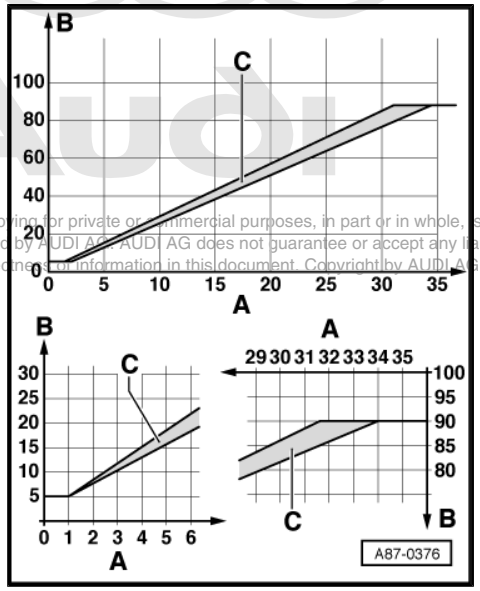
- *The compressor is not switched on if the connector -B- is unplugged.*
- *The high-pressure sender -A- is an electronic control unit which generates a square-wave signal with a ratio which varies with the pressure in the refrigerant circuit* ⇒ page 12 .
-

3.3.2 Pressure signal from high-pressure sender -G65-

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

-B- Ratio of square-wave signal

-C- Characteristic curve



Note

- *As soon as there are no compressor shut-off criteria, the front operating and display unit, Climatronic control unit -J255- switches on the compressor (by actuating the air conditioner compressor regulating valve -N280-):*
- *The signal generated by the high-pressure sender -G65- is also used for engine control. The front operating and display unit, Climatronic control unit -J255- transmits the information via the convenience data bus system to the engine control unit (the torque required for driving the compressor is governed by the pressure in the refrigerant circuit). Depending on the version of the engine control unit, the signal is displayed as a ratio in the measured value block ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051 (for engine control unit)*

- The pressure in the refrigerant circuit is OK (the front operating and display unit, Climatronic control unit -J255- does not detect any compressor shut-off criteria)

– If the ratio is greater than 12 % (corresponding to approx. 1.8 bar absolute) and less than 87.5% (corresponding to approx. 32 bar absolute)

Note

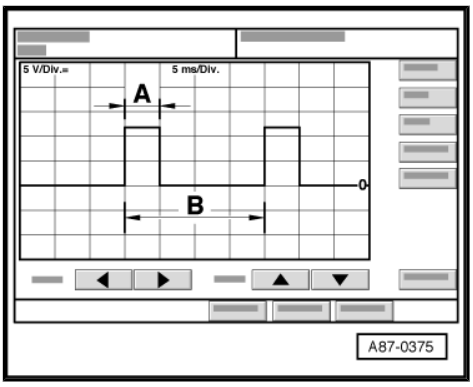
- *If the signal ratio is less than 12 % or greater than 87.5%, the compressor is not switched on (the air conditioner compressor regulating valve -N280- is not actuated).*
- *The signal ratio and the pressure calculated by the front operating and display unit, Climatronic control unit -J255- are indicated in the measured value block ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *At absolute pressure, 0 bar corresponds to an absolute vacuum. Normal ambient pressure thus corresponds to roughly 1 bar absolute. 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 front operating and display unit, Climatronic control unit -J255- transmits the request for radiator fan actuation via the convenience data bus system to the engine control unit, which then switches on the radiator fan by way of the fan control unit:

– Irrespective of the pressure in the refrigerant circuit as soon as the compressor is switched on

– Depending on the pressure calculated in the refrigerant circuit, the front operating and display unit, Climatronic control unit - J255- transmits the request for increased radiator fan speed to the engine control unit via the convenience data bus system with the compressor actuated. The fan speed determined by the front operating and display unit, Climatronic control unit - J255- is displayed in the measured value block ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

This pattern will appear on the oscilloscope screen (e.g. on the vehicle diagnostic, testing and information system -VAS 5051 A-) if the following conditions are satisfied.



– Ignition on (positive at contact „3“ and earth at contact „1“ at high-pressure sender -G65-)
– Setting on oscilloscope: 5 V/div. DC (5 V per unit DC voltage) 5 ms/div. (5 milliseconds per unit)
– Test lead (signal wire) connected to contact „2“ at high-pressure sender -G65-
– Test lead (screen) connected to contact „1“ (earth at high-pressure sender -G65-)

Note

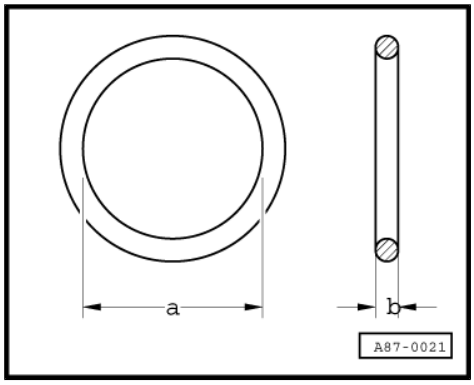
- *Use can be made for connection of the high-pressure sender -G65- of test leads from the Adapter set -V.A.G 1594 C- for example.*
- *The illustration shows the signal transmitted at a refrigerant circuit pressure of approx. 7 bar absolute, corresponding to a signal ratio of approx. 25% (level occurring with compressor not running, ambient temperature of 30 °C and refrigerant circuit charged).*
- *The pulse width -A- is governed by the pressure in the refrigerant circuit (area -A- becomes broader as pressure increases).*
- *The signal distance -B- is always 20 milliseconds (corresponding to a frequency of 50 hertz).*
- *The signal ratio is derived from the ratio of pulse width -A- to signal distance -B-.*

3.4 O-rings for refrigerant circuit

- Always replace, only to be used once.
- Moisten with refrigerant oil before fitting.
- Ensure correct positioning on pipe/in groove.
- Ensure cleanliness when working.

Note

- *Use is only to be made of O-rings which are resistant to refrigerant R134a and the corresponding refrigerant oil. Such O-rings are colour coded to prevent mix-ups (currently „red“, „lilac“ or „violet“): ⇒ Electronic parts catalogue*
- *Dimensions -a- and -b- differ depending on the fitting location of the O-ring: ⇒ Electronic parts catalogue*
- *In addition to the coloured O-rings, use is also made at the factory of black O-rings for certain connections.*



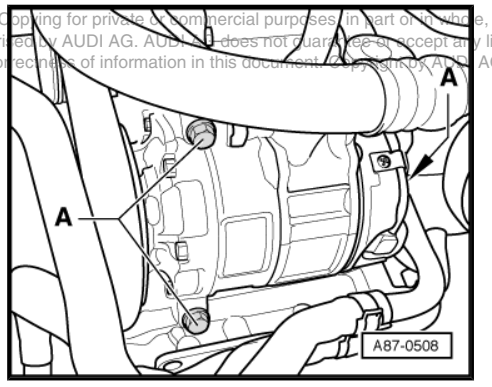
3.5 Detaching compressor from holder/attaching on vehicles with 6-cyl. engine, 8-cyl. MPI engine or 8-cyl. diesel engine

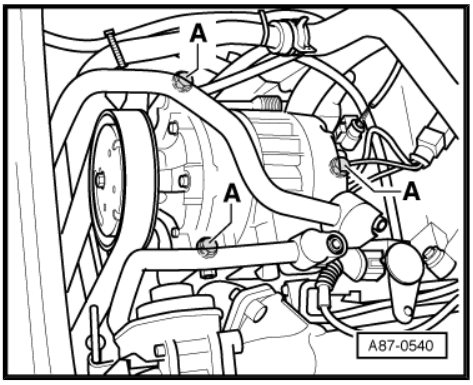
Compressor drive via poly V-belt

Note

- *The compressor can be detached from the holder and re-attached without opening up the refrigerant lines.*
- *Do not drain the refrigerant circuit, do not detach the refrigerant hoses and lines at the compressor.*
- *After detaching, use a piece of wire for example to attach the compressor to the longitudinal member. Never leave hanging from the refrigerant lines.*
- *Before removing, mark the direction of the poly V-belt with chalk or a felt-tip pen. Running a used belt in the opposite direction could destroy it.*
- *Different compressors are fitted depending on the engine and country version (6, 8, 10 or 12-cyl. engine, petrol or diesel engine). ⇒ Electronic parts catalogue*
- *On vehicles with 8-cyl. diesel engine, the compressor is fitted at the top between the two cylinder heads.*
- *Detaching compressor from holder/re-attaching on vehicles with 12-cyl. engine* ⇒ page 149

3.5.1 Detaching compressor from holder/re-attaching





Note

- *Do not unfasten the refrigerant lines and corresponding clamps.*
- *This illustration shows the compressor for the 8-cyl. MPI engine. The layout for the other engine versions only differs slightly from this illustration (e.g. different refrigerant lines). ⇒ Engine, mechanics; Rep. gr. 13*
- *Depending on the vehicle model, it may be necessary to press aside or detach certain hoses in the area of the compressor.*
- *This illustration shows the compressor for the 8-cyl. diesel engine.*
- *Depending on the type of bolts -A- and the routing of the refrigerant line, it may be necessary to detach the refrigerant lines from the compressor (drain the refrigerant circuit) to slacken off and remove the bolts -A- on vehicles with an 8-cyl. diesel engine ⇒ page 138 .*

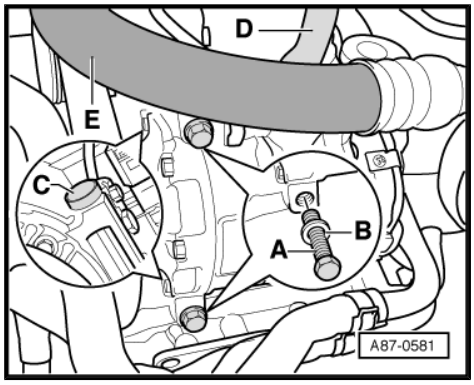
– Remove the top engine cover (vehicles with 8-cyl. diesel engine only): ⇒ Engine, mechanics; Rep. gr. 13
– Remove the noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 .
– Move the lock carrier to the service position ⇒ General body repairs, exterior; Rep. gr. 50 .
– Remove the oil filter if necessary. Protect the sealing surfaces to prevent damage (certain vehicles with 6-cyl. petrol engine only). ⇒ Engine, mechanics; Rep. gr. 17
– Slacken off the poly V-belt (poly V-belt for air conditioner compressor on vehicles with 6-cyl. diesel engine) and detach the belt. ⇒ Engine, mechanics; Rep. gr. 13
– Mark the connector to the air conditioner compressor regulating valve -N280- to prevent possible interchange with the connector to the electric engine mounting.

Note

If the connectors to the air conditioner compressor regulating valve -N280- and the electric engine mounting are interchanged, no entry is made in the fault memory, but the evaporator could ice up as the compressor is constantly actuated.

– Unplug the air conditioner compressor regulating valve -N280- at the connector.

– Screw out the bolts -A- (25 Nm).



Note

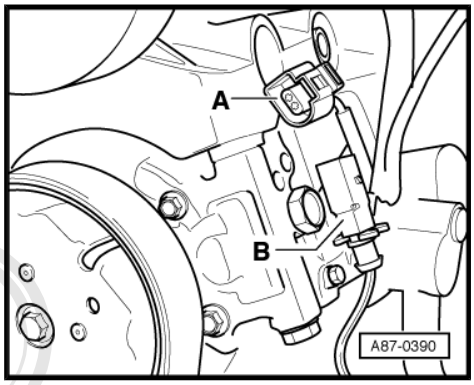
- *Fit one washer -B- at each of the bolts -A-.*
- *Before attaching the compressor, check the position of both bushes -C- in the holder or compressor.*
- *After attaching the compressor, check the routing of the refrigerant lines -D- and -E-. They must be inserted in the holders provided (if fitted, depends on engine).*
- *After attaching the compressor, also check the refrigerant lines and the corresponding holders for adequate clearance with respect to the other components, ensuring a sufficient distance between the belt, holder and pulley.*

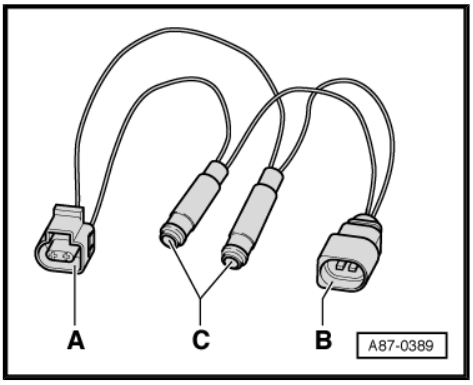
3.6 Checking activation signal for air conditioner compressor regulating valve - N280-

– Switch off ignition.

– Unplug the connector at the air conditioner compressor.

– Use an adapter cable from the adapter set -V.A.G 1594 C- to re-establish the connection between connector -A- and connector -B- at the regulating valve.





Note

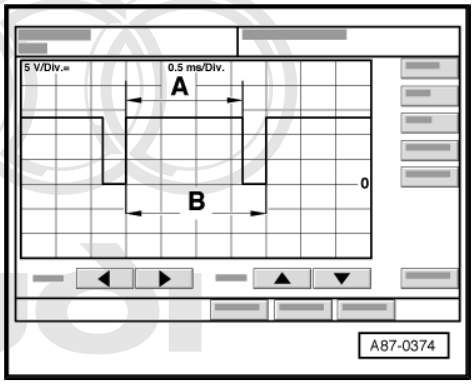
- *Actuation of the air conditioner compressor regulating valve -N280- and the current measured by the front operating and display unit, Climatronic control unit -J255- which flows via the air conditioner compressor regulating valve -N280- are displayed in the measured value block of the front operating and display unit, Climatronic control unit -J255- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *An adapter cable can also be produced for this test. This requires, for example, one connector -A- and -B- each (with part number 1J0 973 702 and 1J0 973 802 and the corresponding plug contacts), two commercially available sockets for banana plugs -C- and two wires with a cross section of 0.5 mm^2.*

– Connect the probe -VAS 5051/8- to the adapter leads.
– Test lead (signal wire) to contact -2-
– Test lead (screen, earth) to contact -1-
– On the vehicle diagnostic, testing and information system -VAS 5051 A- set Measurement mode: DSO (digital storage oscilloscope).
– Settings 5V/div DC, 0.5 ms/div (5 V DC and 0.5 milliseconds per unit)
– Start the engine.
– On the front operating and display unit, Climatronic control unit -J255- , set the temperature to „Lo“.
– On the front operating and display unit, Climatronic control unit -J255- , press the buttons „Auto“ and „Off/On“ to activate and deactivate the air conditioner compressor regulating valve -N280- .

The display on the oscilloscope screen will be as follows depending on the setting on the front operating and display unit, Climatronic control unit -J255- :

– In „OFF“ mode: No square-wave signal (regulating valve is not actuated)

– In „Auto“ mode and „Lo“ temperature setting: Square-wave signal with pulse width -A- between 75% and 100% (regulating valve is actuated)



Note

- *The illustration shows a signal with a signal ratio of approx. 80%.*
- *The pulse width -A- is governed by the required cooling output, the electrical system voltage etc. (over the width of area -A-, the current is controlled via the air conditioner compressor regulating valve -N280- by the front operating and display unit, Climatronic control unit -J255-).*
- *The signal distance -B- is always 2 milliseconds (corresponding to a frequency of 500 hertz).*
- *The signal ratio is derived from the ratio of pulse width -A- to signal distance -B-.*

– The setting on the front operating and display unit, Climatronic control unit -J255- and the measured ambient influences govern the pulse width of the square-wave signal (signal ratio between 100% and greater than 30%, the regulating valve is actuated such that the compressor output required to obtain the specified temperatures is achieved).

Note

- *In „Auto“ mode with „Lo“ temperature setting, the air conditioner compressor regulating valve -N280- is actuated such 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 actuation time is governed by the required cooling output and the vehicle electrical system voltage, for example. It is however always of sufficient duration to achieve a mean current of 0.3 A.*

4 Replacing compressor pulley

4.1 Replacing pulley

(Version „1“)

Note

- *Various pulley designs are fitted depending on the type of compressor and the engine version ⇒ Electronic parts catalogue .*
- *Detaching pulley from compressor/re-attaching ⇒ page 20*
- *Pulley version „1“ is attached for example to the type „7 SEU 16“ compressor.*

1 - Bolt

- ❑ Replace
- ❑ Tightening torque 20 Nm
- ❑ Slackening off and tightening ⇒ page 20

2 - Drive plate

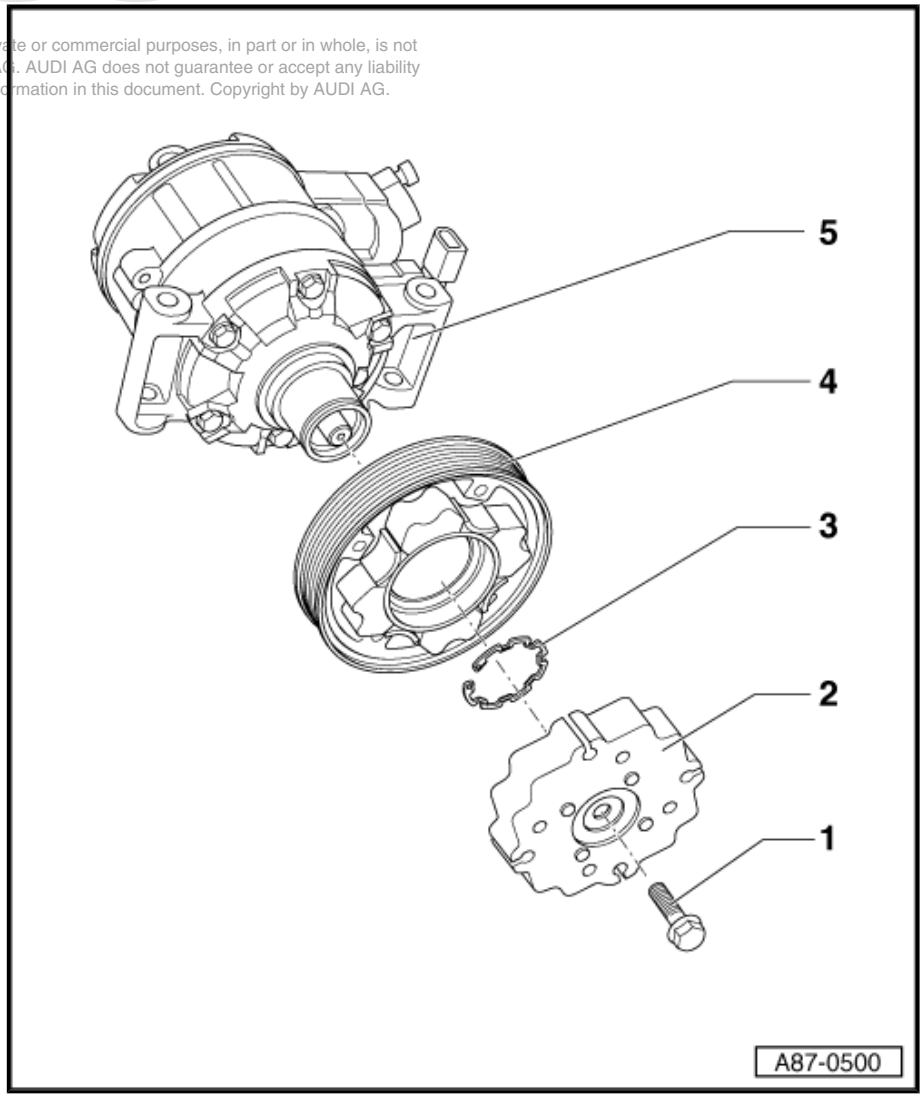
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Detaching/attaching ⇒ page 20
- ❑ Tripped in the event of excessive torque (e.g. compressor stiff)

3 - Circlip

- ❑ Replace
- ❑ Ensure correct positioning (flat side facing compressor)
- ❑ Removing and installing ⇒ page 20

4 - Pulley

- ❑ Rubber element of pulley is tripped in the event of excessive torque (e.g. stiff compressor) and pulley just turns without driving compressor
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Detaching/attaching ⇒ page 20



Note

5 - Compressor

- ❑ Different models are fitted depending on engine and country version of vehicle ⇒ Electronic parts catalogue
- ❑ Clean the flange of the compressor before fitting the pulley.

4.2 Detaching pulley from compressor/re-attaching

(Version „1“)

Note

- *If the pulley overload safeguard has been tripped, check the freedom of movement of the compressor before replacing the pulley. Replace the entire compressor if stiff.*
- *The pulley overload protection function is described e.g. in ⇒ Self-study programme No. 240 ; Audi A2 Technology .*
- *Depending on the engine version, detachment of the pulley may involve separating the compressor from the engine ⇒ page 14 .*
- *On most vehicles (except certain vehicles with 8-cyl. diesel engine), the compressor can be detached from the holder and re-attached without opening up the refrigerant lines.*
- *Prior to removal, mark the direction of the poly V-belt with chalk or a felt-tip pen. Running a used belt in the opposite direction could destroy it.*
- *Different compressors are fitted depending on engine and country version (6, 8 or 12-cyl. engine, petrol or diesel engine) ⇒ Electronic parts catalogue*

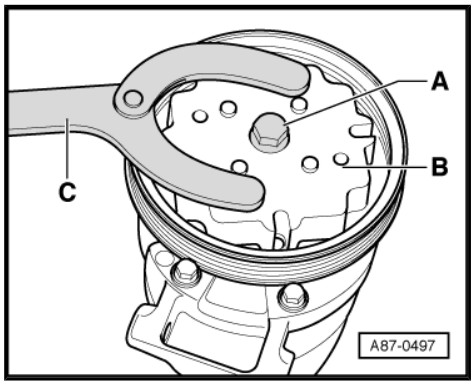
– Remove the top engine cover (vehicles with 8-cyl. diesel engine only): ⇒ Engine, mechanics; Rep. gr. 13

– Remove the noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 .

– Move the lock carrier to the service position ⇒ General body repairs, exterior; Rep. gr. 50 .

– Slacken off and detach the poly V-belt. ⇒ Engine, mechanics; Rep. gr. 13

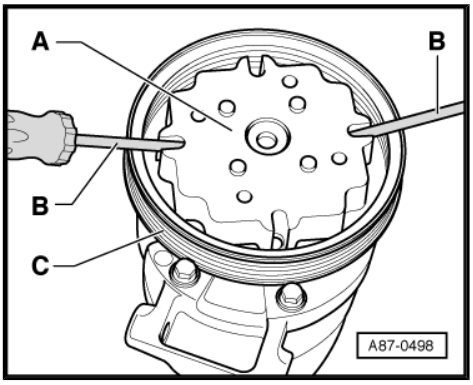
– Screw out the bolt -A- (tightening torque 20 Nm).



Note

- *When slackening off and tightening the bolt -A-, provide support with a commercially available pin wrench -C- (pin diameter 5.0 mm) at the drive plate -B-.*
- *The bolt -A- is to be replaced (on account of locking fluid).*
- *Clean the thread in the shaft of the compressor before inserting the new bolt.*
- *Should it not be possible to detach the pulley with the compressor in position, separate the compressor from the engine ⇒ page 14 .*

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

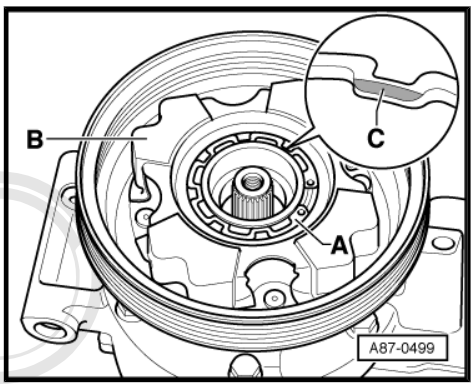


Note

- *When prising off the drive plate -A-, take care not to damage the collar of the pulley -C-.*
- *There are different types of pulley -C- and drive plate -A-. Attention must therefore be paid to precise assignment. ⇒ Electronic parts catalogue*

– Remove the circlip -A-.

– Detach the pulley -B-.



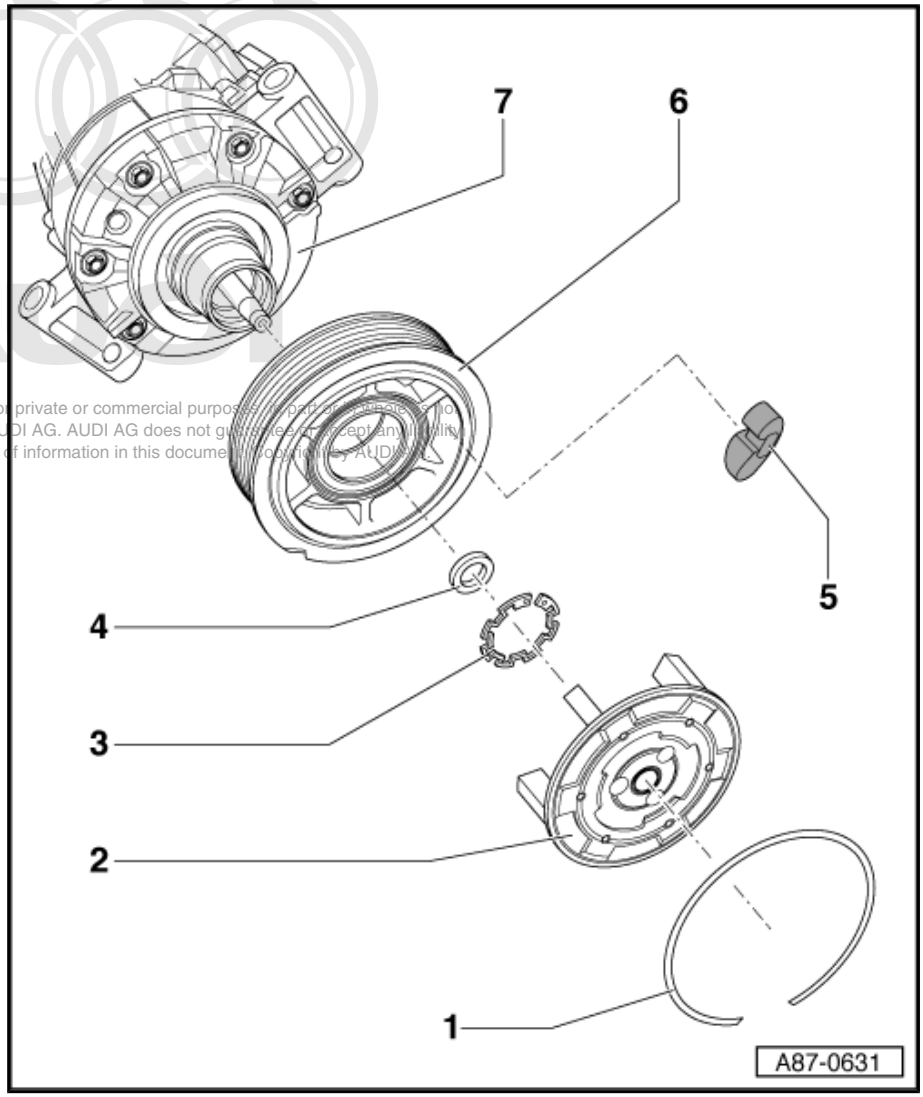
Note

- *Replace the circlip -A-.*
- *On fitting the circlip -A-, take care not to bend it open more than necessary.*
- *Ensure correct insertion of the circlip -A-. The bevelled side -C- faces away from the compressor (flat side faces compressor).*
- *Make sure the circlip is properly positioned in the groove at the compressor flange.*
- *Clean the compressor flange before fitting the pulley. The pulley must be easy to fit (without having to exert force).*

4.3 Replacing pulley (Version „2“)

Note

- *Various pulley designs are fitted depending on the type of compressor and the engine version ⇒ Electronic parts catalogue .*
- *Detaching pulley from compressor/re-attaching ⇒ page 23*
- *Pulley version „2“ is attached for example to type „6 SEU 14“ and „7 SEU 17“ compressors.*



1 - Circlip

- ❑ Remove carefully using a small screwdriver or pointed-nose pliers (paying particular attention to the pulley)
- ❑ Detaching/attaching ⇒ page 23
- ❑ As of Model Year 2006, circlips are being gradually introduced which are provided with a vulcanised rubber disc to replace the plastic disc which may be bonded on at present (not applicable to all compressors) ⇒ page 23

2 - Drive plate

- ❑ Screwed to compressor drive shaft
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ With overload safeguard, tripped in the event of excessive torque (e.g. stiff compressor) and pulley just freewheels without driving compressor
- ❑ Detaching/attaching ⇒ page 23
- ❑ Tightening torque 35 Nm
- ❑ A plastic disc may have been affixed depending on production period ⇒ page 23 .

3 - Circlip

- ❑ Replace
- ❑ Ensure correct positioning (flat side facing compressor)
- ❑ Removing and installing ⇒ page 23

4 - Spacer

- ❑ Dimensions: 17.5 x 10 x 3 mm

5 - Rubber element

- ❑ 6x, ensure correct installation ⇒ page 23
- ❑ Decouples pulley from compressor drive shaft, damps vibration and noise
- ❑ On installation, moisten the rubber elements slightly with tyre assembly paste or soap solution for example to provide lubrication.

6 - Pulley

- ❑ The pulley is made of plastic, is sensitive to impact and should therefore be treated with extreme care.
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Detaching/attaching ⇒ page 23

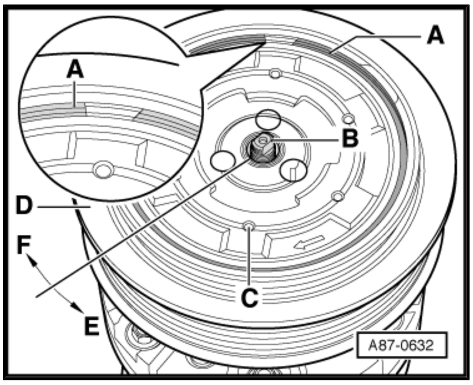
7 - Compressor

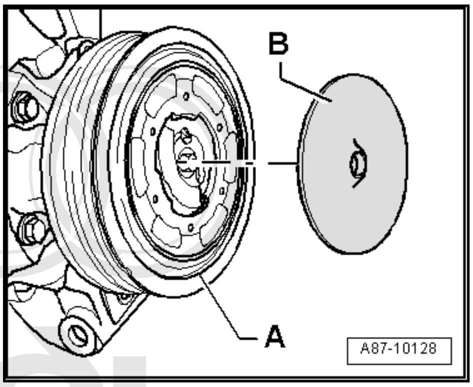
- ❑ Different models are fitted depending on engine and country version of vehicle ⇒ Electronic parts catalogue

❑ Clean the flange of the compressor before fitting the pulley.

4.4 Detaching pulley from compressor/re-attaching

(Version „2“)



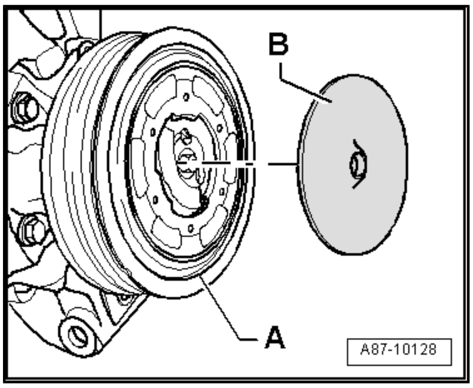


Note

- *Heed the notes on removal of the version „1“ pulley, as these also apply to version „2“* ⇒ page 20 *.*
- *Perform preparatory work as described for detaching the version „1“ pulley* ⇒ page 20 *.*
- *The pulley is made of plastic, is sensitive to impact and should therefore be treated with extreme care.*
- *If the overload safeguard of the drive plate -C- has been tripped, remove the circlip -A- and then prise the drive plate off the pulley -D-.*
- *For noise optimisation, a plastic disc -B- may have been affixed to the drive plate of the pulley -A- or a circlip with a vulcanised rubber disc may have been 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“ (A/C mode off) (in air conditioner full load operation the noise is scarcely audible).*

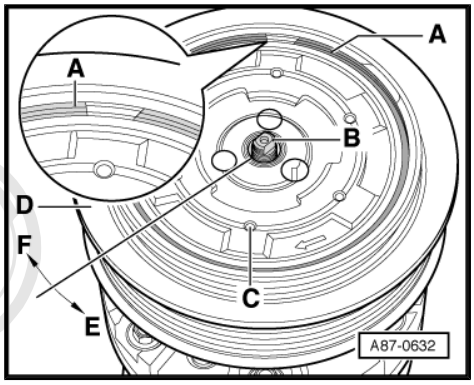
Detaching pulley

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



– Use a small screwdriver or pointed-nose pliers, for example, to carefully remove the circlip -A- (possibly with vulcanised rubber disc), taking particular care not to damage the pulley.

– Hold the compressor drive shaft -B- in position for example with a socket attachment or a socket wrench -T10001/10- from the wrench set (depending on version) and turn the drive plate -C- with the pulley -D- in the direction of arrow -E- (tightening torque 35 Nm).



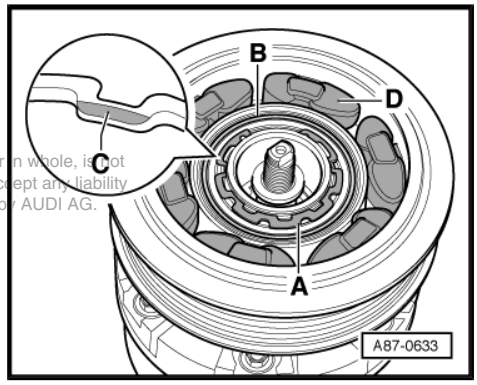
– Remove the circlip -A-.

– Detach the pulley -B-.

Attaching pulley

Note

- *Replace the circlip -A-.*
- *Clean the compressor flange before attaching the pulley.*
- *On fitting the circlip -A-, take care not to bend it open more than necessary.*



– Fit the pulley -B-.

– Ensure correct insertion of the circlip -A-. The bevelled side -C- faces away from the compressor (flat side faces compressor).

– Insert the rubber elements -D- in the pulley -B- as shown.

– For fitting the drive plate, moisten the rubber elements -D- slightly with tyre assembly paste or soap solution for example to provide lubrication.

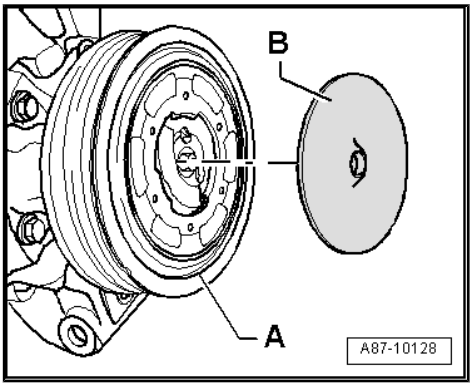
– Insert the drive plate -C- in the rubber elements -D- (refer to illustration above) until it makes contact with the shaft of the compressor -B-.

– Screw the drive plate -C- onto the compressor shaft -B- by turning it in direction of arrow -F-.

– Tighten the drive plate -C- to 35 Nm by turning it with a commercially available strap wrench (with fabric strap) in the direction of arrow -F-. Provide support for the compressor shaft -A- by applying a counterhold -B- (e.g. socket attachment or socket wrench -T10001/10- from wrench set) to the compressor shaft -A-.

– Fit the circlip -A-.

– Clean the drive plate of the pulley -A- and affix the plastic disc -B- to the centre of the drive plate (compressors with no rubber disc at circlip only).



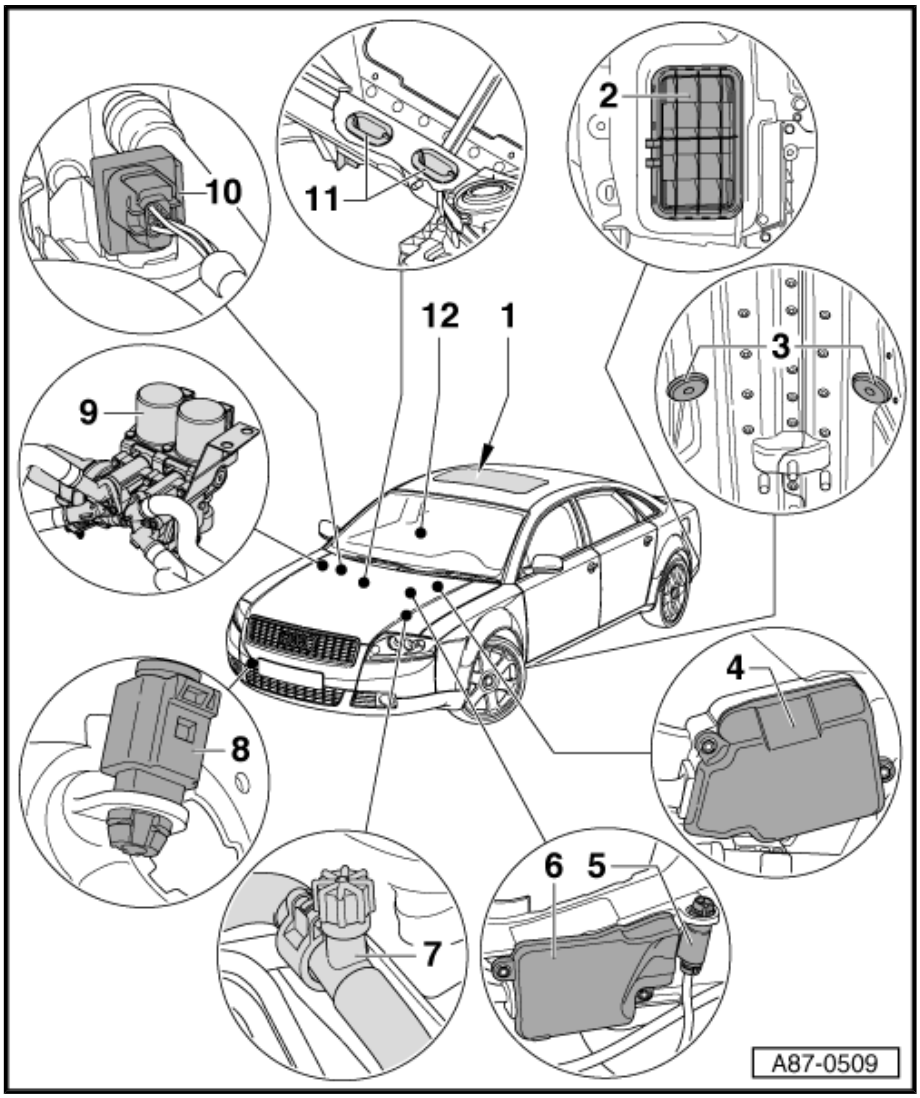
5 Components for control and regulation of air conditioner not located in passenger compartment

Note

- *If there is a fault in the system, start by reading out the fault memory of the front operating and display unit, Climatronic control unit -J255- (and the rear Climatronic operating and display unit -E265-) ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *If no fault is displayed, read out the measured value block of the front operating and display unit, Climatronic control unit -J255- and actuate any problematic component by way of the „Final control diagnosis“ function ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *Refrigerant circuit servicing work is described as of ⇒ page 135 .*
- *Perform the following operations on completion of repair work ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051 :*

– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- (and the rear Climatronic operating and display unit -E265-) and erase any faults displayed.
– Check encoding of front operating and display unit, Climatronic control unit -J255- .
– If necessary, check adaption of front operating and display unit, Climatronic control unit -J255- and rear Climatronic operating and display unit -E265- (not fitted on all vehicles).
– Perform air conditioner basic setting

5.1 Components not located in passenger compartment



1 - Sun roof (with solar cells)

- ❑ Checking operation of solar cells ⇒ page 60
- ❑ Removing and installing ⇒ General body repairs, exterior; Rep. gr. 60
- ❑ Depending on the setting in the MMI (Multi Media Interface), the sun roof closes as soon as the front operating and display unit, Climatronic control unit -J255- effects switching 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 and introduction has not yet been finalised ⇒ Owner's manual

2 - Forced air extractor

- ❑ Fitted on left and right beneath rear bumper
- ❑ Sealing lips of vent frame must move freely and close automatically
- ❑ To ensure proper functioning of the passenger compartment ventilation, the air ducts must not be blocked by the luggage compartment lining
- ❑ Checking ⇒ page 41

3 - Condensation drain hose

- ❑ 1 condensation drain each for driver's and front passenger's side.
- ❑ Checking, removing and installing ⇒ page 90

4 - Air recirculation flap control motor -V113-

- ❑ With potentiometer for air recirculation flap control motor -G143-
- ❑ Removing and installing ⇒ page 47

5 - Fresh air intake duct temperature sensor -G89-

- ❑ Removing and installing ⇒ page 47
- ❑ Checking resistance value ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051

6 - Air flow flap control motor -V71-

- ❑ With potentiometer for air flow flap control motor -G113-
- ❑ Removing and installing ⇒ page 45

7 - Service connection

- ❑ Low-pressure end
- ❑ For measurement and drainage ⇒ Air conditioner with refrigerant R134a
- ❑ Cap with seal, always to be screwed on

8 - Ambient temperature sensor -G17-

- Removing: Remove the bumper ⇒ General body repairs, exterior; Rep. gr. 50
- Unplug the connector at the temperature sensor and unclip from the mount in the air duct.
- The measured value of the ambient temperature sensor -G17- is evaluated by the control unit with display in dash panel insert -J285- and transmitted via the convenience data bus system to the front operating and display unit, Climatronic control unit -J255- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

9 - Pump valve unit

- Consists of left heat regulation valve - N175- and right heat regulation valve - N176- and coolant circulation pump -V50-
- Checking operation ⇒ page 132
- Removing and installing ⇒ page 55
- Replacing ⇒ page 58

10 - Air quality sensor -G238-

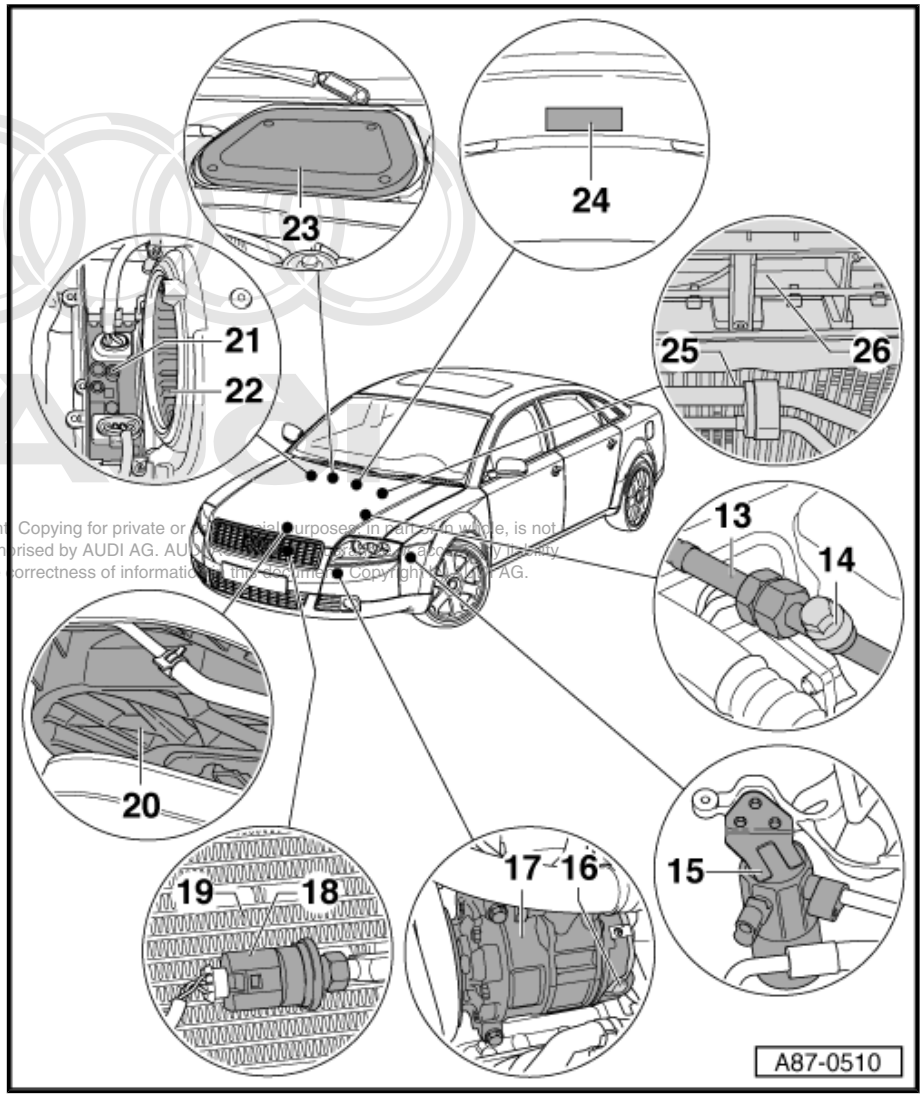
- Operation ⇒ page 36
- Checking ⇒ page 37
- Removing and installing ⇒ page 35
- Depending on the setting in the Multi Media Interface, the sun roof closes as soon as the front operating and display unit, Climatronic control unit -J255- effects switching to air recirculation mode (automatic air recirculation via air quality sensor or manual air recirculation by pressing air recirculation button). This function is equipment-specific and introduction has not yet been finalised ⇒ Owner's manual

11 - Plenum chamber water drain

- Checking, cleaning, removing and installing ⇒ page 41

12 - Heated windscreen -Z2-

- Actuation is effected by way of the heated windscreen control unit -J505- (in luggage compartment on right beneath battery -A-) ⇒ page 63 and ⇒ Electrical system; Rep. gr. 97
- Operation ⇒ page 63
- Removing and installing windscreen ⇒ General body repairs, exterior; Rep. gr. 64



13 - Screw connection in refrigerant line (with restrictor)

- ❑ The refrigerant circuit must be drained before unfastening the screw connection (draining refrigerant circuit ⇒ Air conditioner with refrigerant R134a).

14 - Service connection

- ❑ High-pressure end
- ❑ For measurement, drainage and filling ⇒ Air conditioner with refrigerant R134a
- ❑ Cap with seal, always to be screwed on

15 - Reservoir

- ❑ Only to be removed after draining the refrigerant circuit (draining refrigerant circuit ⇒ Air conditioner with refrigerant R134a).
- ❑ Removing and installing ⇒ page 169

16 - Air conditioner compressor regulating valve -N280-

- ❑ Checking actuation and operation ⇒ page 16

17 - Compressor

- ❑ Detaching compressor from holder/re-attaching on vehicles with 6-cyl. engine, 8-cyl. MPI engine or 8-cyl. diesel engine ⇒ page 14
- ❑ Detaching compressor from holder/re-attaching on vehicles with 12-cyl. engine ⇒ page 149
- ❑ Removing and installing compressor on vehicles with 8-cyl. FSI engine ⇒ page 141
- ❑ Removing and installing compressor on vehicles with 10-cyl. engine ⇒ page 153
- ❑ Detaching refrigerant line at compressor/attaching ⇒ page 138
- ❑ Removing and installing compressor (basic information) ⇒ page 140
- ❑ Detaching compressor with drive unit (shaft) from holder/re-attaching (vehicles with 8-cyl. FSI engine or 10-cyl. engine) ⇒ page 161
- ❑ Replacing compressor drive unit (vehicles with 8-cyl. FSI engine and 10-cyl. engine) ⇒ page 161
- ❑ The type of compressor differs depending on the engine (6, 8, 10 or 12-cyl. engine, diesel or petrol engine) ⇒ Electronic parts catalogue
- ❑ Removing and installing poly V-belt (compressor drive via poly V-belt) ⇒ Engine, mechanics; Rep. gr. 13
- ❑ Replacing pulley (compressor drive via poly V-belt) ⇒ page 19
- ❑ Different refrigerant oil capacities apply to the refrigerant circuit depending on the type of compressor („6 SEU 14“, „7 SEU 16“ or „7 SEU 17“) ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a

18 - High-pressure sender -G65-

- ❑ Function, removing and installing ⇒ page 10
- ❑ The sender measured value is displayed in the „Reading measured value block“ function by the front operating and display unit, Climatronic control unit -J255- ⇒ page 12 and ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051

19 - Condenser

- Only to be removed after draining the refrigerant circuit, the vehicle is to be taken to a workshop equipped with the necessary tools where the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a .
- Different versions (depending on vehicle equipment, power steering fluid cooler may also be fitted) ⇒ Running gear; Rep. gr. 48 and ⇒ Electronic parts catalogue
- Detaching and re-attaching refrigerant lines ⇒ page 166
- Removing and installing condenser ⇒ page 167

20 - Radiator fan -V7-

- The request for fan cut-in is transmitted by the front operating and display unit, Climatronic control unit -J255- via the data bus system to the engine control unit. The engine control unit then actuates the fans or the radiator fan control unit -J293- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051 and ⇒ Engine, mechanics.; Rep. gr. 19
- The relevant engine control unit switches the radiator fans (via the radiator fan control unit -J293-) infinitely to the desired output. ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051
- Different versions are fitted depending on vehicle equipment ⇒ Electronic parts catalogue
- Check actuation by the front operating and display unit, Climatronic control unit -J255- (reading measured value block) ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051 and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

21 - Fresh air blower control unit -J126-

- Removing and installing ⇒ page 55
- Checking ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051

22 - Fresh air blower -V2-

- Removing and installing ⇒ page 54
- Checking ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051

23 - Dust and pollen filter

- Removing and installing ⇒ page 31
- Heed replacement intervals ⇒ Maintenance tables
- With activated charcoal filter element ⇒ page 31

24 - Label

- Indicates type of refrigerant and intended capacity
- For refrigerant R134a capacity and additional information for working on the refrigerant circuit, refer to ⇒ Air conditioner with refrigerant R134a
-

Note

The adhesive label was gradually discontinued in Model Year 2003 on certain vehicles. For refrigerant R134a capacity and notes on refrigerant, refer to ⇒ Air conditioner with refrigerant R134a

25 - Evaporator

- Only to be removed after draining the refrigerant circuit, the vehicle is to be taken to a workshop equipped with the necessary tools where the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a
- Removing and installing ⇒ page 173
- Cleaning evaporator of air conditioner with ultrasonic A/C cleaner -VAS 6189- ⇒ page 32

26 - Opening for air recirculation mode

5.2 Removing and installing dust and pollen filter

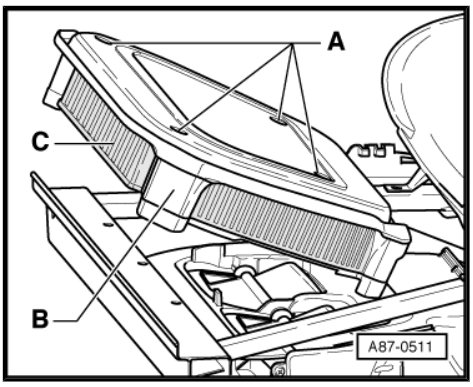
Note

- *Replacement interval for dust and pollen filter ⇒ Maintenance tables*
- *The filter element has an activated charcoal layer acting as integrated odour filter.*
- *Clean the plenum chamber after replacing the dust and pollen filter. Pay particular attention to the area beneath the air conditioning unit.*
- *Clean the area around the dust and pollen filter before fitting a new filter.*

– Remove the plenum chamber cover on the left and right.

– Release the clamping pins -A- by turning through 180° and detach the cover -B- with the dust and pollen filter -C-.

– Take the dust and pollen filter -C- out of the housing.



5.3 Dust and pollen filter with activated charcoal filter element

- The dust and pollen filter with additional activated charcoal filter element is fitted in addition to the air quality sensor -G238- (⇒ page 36).
- 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 flow.

- The purpose of the activated charcoal is to absorb the gaseous pollutants in the air flow until the fresh-air flap is closed and the air conditioner is operating in air recirculation mode. Switching from fresh-air to air recirculation mode is implemented by the front operating and display unit, Climatronic control unit -J255- as soon as the air quality sensor -G238- detects gaseous pollutants in the ambient atmosphere (the „automatic air recirculation“ function must have been selected).
- The charcoal layer in the dust and pollen filter has a different effect on the various pollutants in the air:

- Certain pollutants are bonded in the activated charcoal layer.

- Others are converted into harmless compounds as in a catalytic converter.

- Otherwise, the activated charcoal acts as a condenser. As the impact level increases, pollutants are initially absorbed until a certain degree of saturation is attained. If the pollutant content decreases, the activated charcoal layer continuously emits the absorbed particles again.

- As the activated charcoal layer permanently bonds some of the pollutant particles, it is appropriate to replace the dust and pollen filter sooner than prescribed under the following usage conditions:

- Vehicle operation in areas with severe air pollution

- Vehicle operation with „Automatic air recirculation“ function predominantly deactivated

- On vehicles with air quality sensor -G238- , the air conditioner should be operated as far as possible in „automatic air recirculation“ mode. Should it however be necessary or desirable to deactivate the function, attention must be paid to the following:

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

– A saturated filter can no longer absorb pollutants and allows them to pass unhindered.

- The main function of a dust and pollen filter and air quality sensor is to prevent peak pollution levels entering the passenger compartment. The following must however be heeded:

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

– Irrespective of the basic impact level, switching from fresh air to air recirculation mode always takes place if there is an increase in pollutant level (e.g. on driving through a cloud of diesel emissions from a lorry).

5.4 Cleaning air conditioner evaporator

Note

- *A wide variety of evaporator cleaning methods which act in different ways are available on the market. The currently approved evaporator cleaning method authorised by Audi employs the ultrasonic A/C cleaner -VAS 6189- . Information on any other methods checked and approved by Audi over the course of time will be made available in the „Audi ServiceNet“ for example.*

- *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 6189- for example.*

5.4.1 Possible cause of odour formation

- 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 ingressing into the passenger compartment e.g. on reversing (on driving through cloud of exhaust fumes)

- Fishy smell of coolant

– Caused by leakage at engine cooling system or air conditioner heat exchanger

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 the plenum chamber or air conditioning unit.

Note

Check the water drains of the plenum chamber and the air conditioning unit ⇒ page 41 .

- ♦ Odour from air conditioning unit

Note

- ♦ *Odours occurring in the air conditioning unit are usually perceptible in both fresh air and air recirculation mode. If an odour nuisance only occurs 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 condensate in the air conditioning unit

Note

Check both condensation drains ⇒ page 90 .

– Caused by old or severely contaminated dust and pollen filter.

Note

Check the dust and pollen filter ⇒ page 31

– Caused by deposits on evaporator fins

Note

Clean the evaporator with the ultrasonic A/C cleaner -VAS 6189- ⇒ page 34 .

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

Tools required

- Ultrasonic A/C cleaner -VAS 6189-
- Cleaning fluid -VAS 6189/1-

Preparation

– 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 ultrasonic A/C cleaner -VAS 6189- if it actually occurs in the evaporator.

– Check the plenum chamber and the water drain valves fitted in it and clean these if necessary ⇒ page 41 .

– Check for odour from and contamination of the dust and pollen filter ⇒ page 31 .

Note

On this vehicle, the dust and pollen filter is installed at the fresh air intake upstream of the fresh air blower -V2- and does not therefore have to be removed for cleaning.

– Start the engine.

– In the operating and display unit, Climatronic control unit -J255- „air recirculation mode“ setting, switch off the compressor („Econ mode on“ or „A/C mode off“).

– Open the dash panel vents and, on the operating and display unit, Climatronic control unit -J255- , set the lowest possible temperature for the driver and front passenger side (e.g. „Lo“ temperature setting).

– Close the vehicle windows and sun roof.

– Select the lowest fresh air blower speed on the operating and display unit, Climatronic control unit -J255- and set the air outflow direction to the „dash panel vents“.

Cleaning

– Shake the bottle of cleaning fluid -VAS 6189/1- and pour the fluid into the ultrasonic A/C cleaner -VAS 6189- . In doing so, heed the operating instructions for the ultrasonic A/C cleaner -VAS 6189- .

– Position the ultrasonic A/C cleaner -VAS 6189- in the passenger's footwell.

– Start up the ultrasonic A/C cleaner -VAS 6189- (in accordance with the appropriate operating instructions) and position the outlet hose such that the vapour emerging is drawn in by the fresh air blower -V2- via the air recirculation opening of the air conditioning unit (beneath the dash panel).

– Close the vehicle doors.

Note

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

Concluding operations

– Switch off the ultrasonic A/C cleaner -VAS 6189- .

– Open the vehicle doors and vent the vehicle for at least 10 minutes.

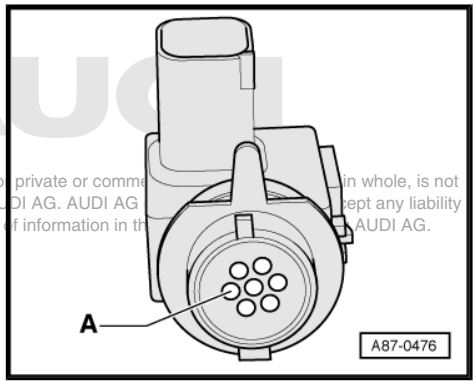
– Remove the ultrasonic A/C cleaner -VAS 6189- from the vehicle and clean it in line with the appropriate operating instructions.

– Switch off ignition.

5.5 Removing and installing air quality sensor -G238-

Note

- *The air quality sensor -G238- is a highly sensitive electronic component which could be destroyed by direct exposure to solvents, fuels and certain chemical compounds (contamination can ingress by way of area -A- for example).*
- *For this reason, never fit sensors which have been kept in tool chests or the like.*
- *Following removal, do not set down the sensor 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- . Attention is therefore to be paid to the correct assignment ⇒ Electronic parts catalogue . The mode of operation of the air quality sensor -G238- is however essentially the same for all versions.*

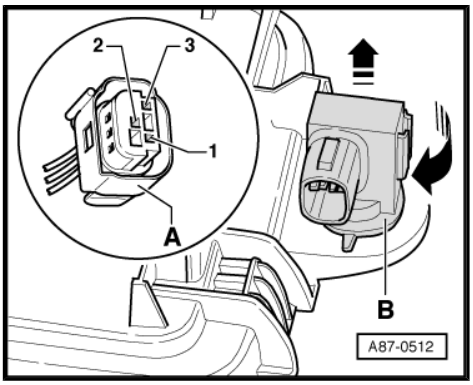


5.5.1 Removing and installing

– Remove the plenum chamber cover on the right.

– Unplug the connector -A- from the sensor.

– Turn the sensor through 90° and lift the sensor -B- out of the mount.



Contact assignment in connector -A-

1 - Positive (terminal „15“)

2 - Negative (terminal „31“)

3 - Signal wire to front operating and display unit, Climatronic control unit -J255- ; the measured value is indicated in the measured value block of the front operating and display unit, Climatronic control unit -J255- . The square-wave signal cannot be evaluated using workshop equipment ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

5.6 Mode of operation of air quality sensor - G238-

- Depending on the setting in the MMI (Multi Media Interface), the sun roof closes as soon as the front operating and display unit, Climatronic control unit -J255- effects switching 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 and introduction has not yet been finalised ⇒ Owner's manual
- The air quality sensor -G238- detects pollutants in the ambient atmosphere (generally petrol and/or diesel emissions) and causes the front operating and display unit, Climatronic control unit -J255- to switch the air conditioner to air recirculation mode.
- The front operating and display unit, Climatronic control unit -J255- recognises the nature and level of the air pollution from the sensor signal. Depending on the ambient temperature and the degree of air pollution, the front operating and display unit, Climatronic control unit -J255- effects the following:

– At ambient temperatures greater than approx. + 2 °C, even a slight increase in pollutant concentration causes switching to air recirculation mode.

– At ambient temperatures between approx. + 2 °C and approx. -8 °C, switching to air recirculation mode and simultaneous cut-in of the compressor only take place in the event of a considerable increase in pollutant concentration.

– At ambient temperatures below approx. -8 °C, switching likewise only takes place in the event of a considerable increase in pollutant concentration and the time period is restricted to approx. 15 s (compressor is not switched on).

– A decrease in concentration results in the air conditioner being switched back to fresh-air mode.

- The „automatic air recirculation“ function can be deactivated at any time. If the function is active, the compressor is switched on in the event of a request for „automatic air recirculation“ even at ambient temperatures below + 2 °C. At temperatures below approx. -8 °C compressor operation is however no longer possible again.
- In the „automatic air recirculation“ setting on the front operating and display unit, Climatronic control unit -J255- or in the MMI (Multi Media Interface), the compressor may be switched on even with manual activation of air recirculation (via „air recirculation button“) down to a temperature of approx. - 8 °C.
- To prevent constant air conditioner air recirculation mode in areas with a persistently high level of pollutant emissions, the sensor is adaptive (sensitivity is matched to environmental impact).
- If the pollutant level in the ambient air remains relatively high for a lengthy period, the sensor starts to adapt to the change in ambient conditions by way of an adaption program, with the result that an air recirculation request is generally applied for less than 12 minutes given uniform ambient air pollution. In the event of several consecutive peak impact levels, the air conditioner may also operate in air recirculation mode for a longer period.
- Switching of the air conditioner flaps takes a certain length of time. To prevent gaseous pollutants entering the passenger compartment with the fresh air drawn in prior to closure of the fresh air flaps in the event of a sudden increase in pollutant level (e.g. on driving through a cloud of diesel exhaust fumes), use is made of a dust and pollen filter with ACF layer. Once a

filter is saturated with pollutants, it can no longer perform this function and is to be replaced ⇒ page 31 .

- To stop the air recirculation/fresh air flaps being switched too frequently, switching does not take place immediately in the event of a slight increase in the pollutant level in the ambient atmosphere (sensor does not transmit request to front operating and display unit, Climatronic control unit -J255-). In such cases, the filter effect of the activated charcoal element in the dust and pollen filter suffices ⇒ page 31 .
- To stop the air recirculation/fresh-air flaps being switched too frequently, a sensor 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 again to such an extent that air recirculation mode would no longer be necessary.
- If the compressor is switched off (e.g. in „Econ“ mode / A/C mode off), the maximum duration for „Automatic air recirculation mode“ is restricted by the front operating and display unit, Climatronic control unit -J255- to approx. 15 seconds to stop the windows misting up.
- To clear misted windows as quickly as possible, the front operating and display unit, Climatronic control unit -J255- does not permit air recirculation mode during „defrost“ operation.
- The air quality sensor -G238- requires approx. 30 seconds to warm up after the ignition is switched on. During this period no request is sent by the sensor to the front operating and display unit, Climatronic control unit -J255- for „automatic air recirculation“.
- The air quality sensor -G238- is a highly sensitive electronic component which could be destroyed by direct exposure to solvents, fuels and certain chemical compounds. The vehicle should therefore not be fitted with sensors which have been in contact with such substances.

5.7 Checking air quality sensor -G238-

Special tools, testers and other items required

- Vehicle diagnostic, testing and information system -VAS 5051 A- with diagnostic cable -VAS 5051/5A-
- Commercially available gas cigarette lighter

5.7.1 Test requirements

Note

- *Vehicle standing in a clean atmosphere (away from running engines, exhaust vents, etc.)*
- *Engine compartment and plenum chamber clean (not contaminated with oil or fuel)*
- *Engine compartment and plenum chamber not sprayed with cleaning agents or preservatives containing solvents*

5.7.2 Checking

– With the ignition switched off, connect up the vehicle diagnostic, testing and information system -VAS 5051 A- with the diagnostic cable -VAS 5051/5A- to the 16-pin diagnostic socket in the vehicle ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

– Start the engine.

– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– On the front operating and display unit, Climatronic control unit -J255- , set „Auto“ mode.
– By way of the front operating and display unit, Climatronic control unit -J255- , activate the „Automatic air recirculation“ function (function is indicated on display of Multi Media Interface).
– Wait 30 s to allow the air quality sensor -G238- to warm up.
– Use the vehicle diagnostic, testing and information system -VAS 5051 A- to select „Reading measured value block“. ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Read out the displays with the signal from the air quality sensor -G238- and for the position of the air recirculation flap ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

Note

The air conditioner operating status (position of air recirculation and fresh air flap) and the status of the signal from the air quality sensor -G238- are displayed. For explanatory notes on the possible displays, refer to ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

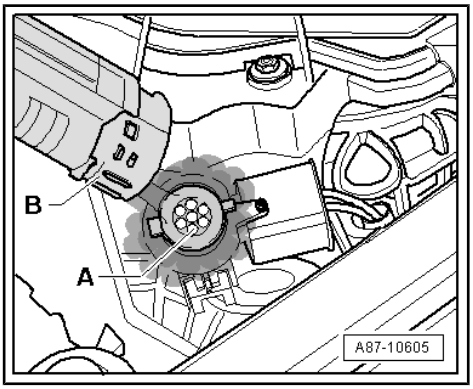
♦ Specification: No request for „air recirculation mode“ (air conditioner in fresh-air mode)

or

♦ Specification: No request for „autom. air recirculation mode“, request for „partial air recirculation mode“ (fresh-air and air recirculation flap roughly in centre position)

– Remove the air quality sensor -G238- from the mount ⇒ page 35 .

– Allow a small quantity of gas from a cigarette lighter -B- to flow from above past area -A- of the air quality sensor -G238- .



Note

- *The air quality sensor -G238- reacts when exposed to cigarette smoke or cigarette lighter gas. As cigarette lighter gas is heavier than air, the air quality sensor -G238- is to be removed and the gas applied from above.*
- *There are different housings for and versions of the air quality sensor -G238- . Attention is therefore to be paid to the correct assignment ⇒ Electronic parts catalogue .*

– Read out the display with the measured value for the air quality sensor -G238- and for the position of the air recirculation and fresh air flap ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051 .

- The specification for the position of the air recirculation 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 the display with the measured value for the air quality sensor -G238- and for the position of the air recirculation and fresh air flap ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051 .

- The specification for the position of the air recirculation and fresh-air flap switches from air recirculation mode to fresh-air or partial air recirculation mode (no longer request for „autom. air recirculation mode“, air conditioner in fresh-air or partial air recirculation mode).

Note

To stop the air recirculation/fresh-air flap being switched too frequently, a sensor 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.

– Actuate the windscreen wash/wipe switch until the washer pump -V5- has conveyed fluid for approx. 2 s.

– Read out the display with the measured value for the air quality sensor -G238- and for the position of the air recirculation and fresh air flap ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051 .

- Specification: („Air recirculation mode“ requested on account of windscreen washer system, air conditioner switches to air recirculation mode for approx. 10 sec.)

– Wait briefly.

– Read out the display with the measured value for the air quality sensor -G238- and for the position of the air recirculation and fresh air flap ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051 .

- Specification: No request for „autom. air recirculation mode“, air conditioner in fresh air mode.

or

- Specification: No request for „autom. air recirculation mode“, request for „partial air recirculation mode“ (fresh-air and air recirculation flap roughly in centre position)

Note

- *Depending on the composition of the windscreen washer fluid, the sensor may detect air pollution and request „Automatic air recirculation“.*
- *If switching to air recirculation mode does not take place on actuating the windscreen wipe/wash switch, check operation („windscreen wash“ information is received via convenience data bus system from steering column electronics control unit -J527-) ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*

Proceed as follows if the air quality sensor -G238- functions properly in this test but a customer complaint has been received:

– Check for contamination of the dust and pollen filter.

– Connect up the fault reader and select the self-diagnosis function „Reading measured value block“ ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

– A second person is required, as the display values have to be read out whilst driving.

– Heed the safety instructions ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

– Read out the display with the measured value for the air quality sensor -G238- and for the position of the 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 (system in fresh-air mode).

– Then drive into a polluted area (e.g. uphill road with lorry traffic).

– Read out the displays with the measured value for the air quality sensor -G238- and for the position of the air recirculation and fresh air flap ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051 . The display with the measured value for the air quality sensor -G238- and for the position of the air recirculation and fresh air flap must change when driving through a cloud of diesel fumes for example.

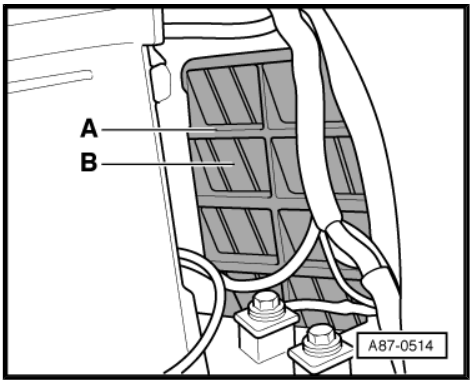
– Also pay attention to the descriptions ⇒ page 31 (dust and pollen filter with activated charcoal filter element) and ⇒ page 36 (mode of operation of air quality sensor -G238-).

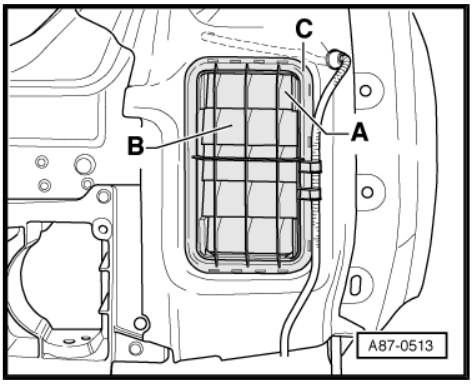
5.8 Checking vent frame

– Check the air ducts to both vent frames -A- in the luggage compartment for blockage (left and right).

♦ The sealing lips -B- in the vent frame -A- must move freely and close automatically.

♦ Clogged ducts or gummed sealing lips could cause the windows to mist up.





Note

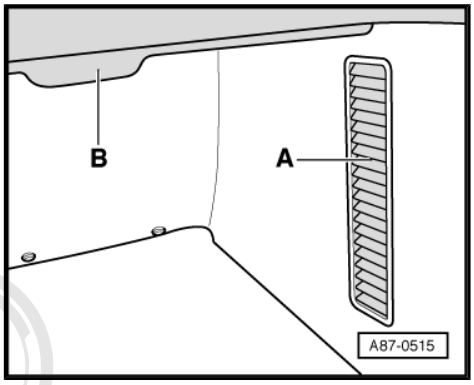
♦ *This Fig. shows the vent frame with the rear bumper removed.*

♦ *One vent frame each is installed on the left and right for forced air extraction.*

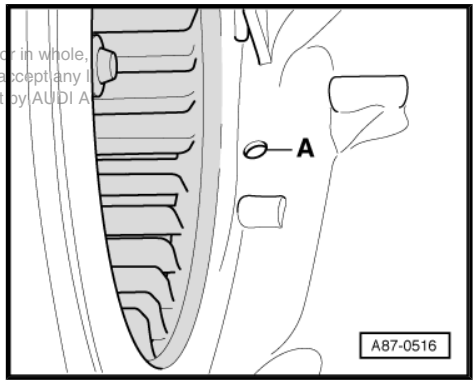
♦ *The sealing lips -B- only close properly if the vent frame -A- has been installed correctly (smaller radius -C- at top).*

♦ *To ensure proper functioning of the passenger compartment ventilation, the vent openings -C- in the left and right luggage compartment lining are never to be sealed off.*

♦ *The air from the passenger compartment flows via vent slits in the rear shelf and through slits incorporated into the upper lining -B- into the luggage compartment.*

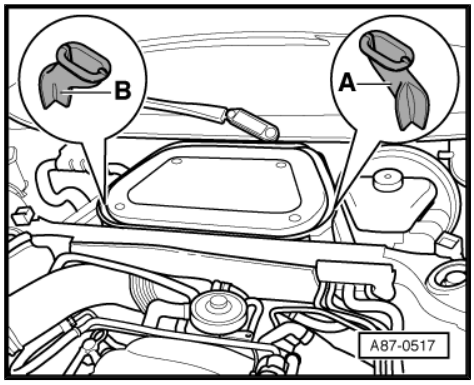


5.9 Checking and cleaning plenum chamber water drain

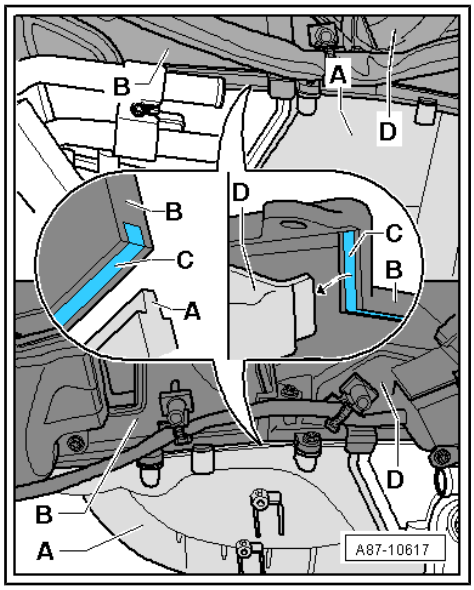


Note

- *The drainage of water out of the 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, water will ingress into the air conditioning unit through the openings -A- (on the right and left next to the fresh air blower), which are actually intended for water drainage, and will be blown by the fresh air blower onto the evaporator together with the air conveyed.*
- *The two water drain sockets -A- and -B- in the plenum chamber can only be replaced after removing the gearbox or air conditioning unit.*
- *Coarse dirt can be removed from the drains and the area beneath the air conditioning unit with a commercially available flexible gripper tool, for example, without removing the air conditioning unit, gearbox, pump valve unit and brake servo. 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 flexible nylon probe -V.A.G 1538/2- . In the event of particularly stubborn dirt, better access can be achieved for example by removing the pump valve unit.*
- *If the water drain sockets -A- and -B- are clogged with leaves and pine needles, the drains may freeze up in winter and prevent water drainage. After a short journey, the heat emitted by the engine and exhaust system melts the ice in the drains again. By the time the vehicle arrives at the workshop, the water may have drained out of the plenum chamber again.*
- *Metal clips are inserted from above in both the water drain sockets -A- and -B-. These clips hold the water drain sockets -A- and -B- in position in the penetration at the bottom of the plenum chamber ⇒ Electronic parts catalogue .*

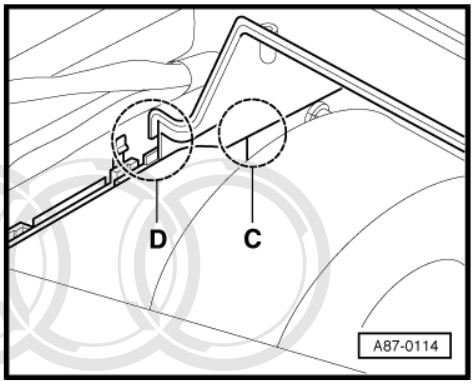


5.10 Removing and installing intake housing with air flow flap



Note

- *As of Model Year 2008, a foam strip (3 x 3 mm, 130 mm long) -C- is gradually being introduced at the factory in the left and right tongue-and-groove joint between the bottom part of the housing -A- and the intake housing -B-. The foam strips -C- are designed to prevent the ingress of moisture into the air conditioning unit by way of these joints.*
- *On fitting the intake housing -B-, insert a foam strip (3 x 3 mm, 130 mm long) -C- in the left and right tongue-and-groove joint between the bottom part of the housing -A- and the cover -D- and the intake housing -B- or seal these joints with adhesive sealant (e.g. silicone adhesive sealant -D 176 001 A3-) ⇒ Electronic parts catalogue .*
- *In the event of moisture problems (misting-up of windscreen, odour formation, moisture at motor of fresh air blower -V2-) on vehicles on which a foam seal -C- has not yet been fitted at the factory, the joint between the cover with the air recirculation flap and the bottom part of the housing is to be sealed with a foam strip in addition to performing the sealing measures described above ⇒ page 52 . The joint between the cover for the evaporator and the bottom part of the housing must also be sealed with adhesive sealant (e.g. silicone adhesive sealant -D 176 001 A3-) ⇒ page 173*
- *Before fitting the intake housing, carefully also seal the housing joint in areas -C- and -D- with adhesive sealant (e.g. silicone adhesive sealant -D 176 001 A3-).*



Removing

– Remove the plenum chamber cover on the left and right.

– Remove the dust and pollen filter ⇒ page 31 .

– Remove the body brace with the reinforcement to the scuttle panel trim. ⇒ Running gear; Rep. gr. 40

– Switch on the ignition and set the air conditioner to fresh-air mode (e.g. by way of „Defrost“ setting on front operating and display unit, Climatronic control unit -J255-).

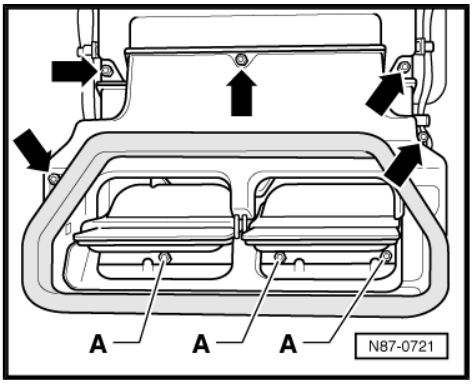
Note

The air flow flap must be open to gain access to the bolts -A-.

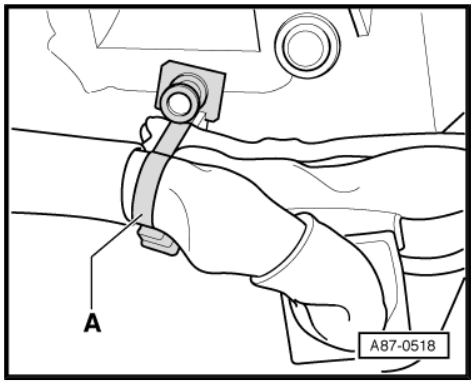
– Screw out the bolts -A-.

– Switch off ignition.

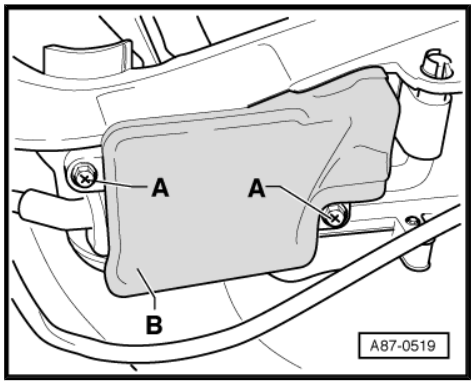
– Then screw out the remaining bolts -arrows-.



– Release the fasteners for the wiring harness -A- on the right and left at air conditioning unit.
– Detach the intake housing with air flow flap.
– If necessary for further work, release the remaining wiring harness fasteners at the air conditioning unit.



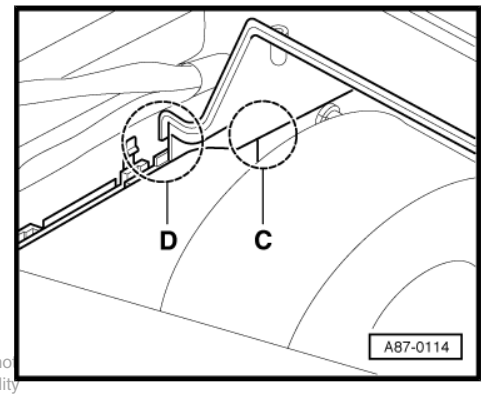
– Screw out the bolts -A-.
– Detach the cover -B-.
– Detach the temperature sensor from the intake housing ⇒ page 47 .
– Remove the air flow flap control motor -V71- ⇒ page 45 .



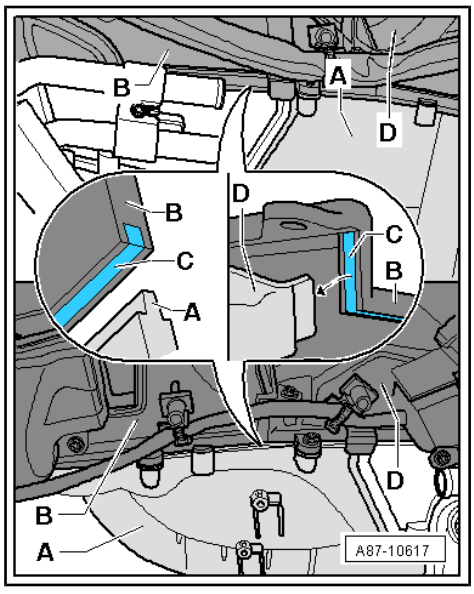
Installing

Install in reverse order, paying attention to the following:

– Before fitting the intake housing, carefully seal the housing joints on the left and right in areas -C- and -D- with adhesive sealant (e.g. silicone adhesive sealant -D 176 001 A3-) ⇒ Electronic parts catalogue .
– Seal the grommet through which the wiring harness is routed into the air conditioning unit (to the fresh air blower control unit -J126-) with adhesive sealant (e.g. silicone adhesive sealant -D 176 001 A3- (to stop water running through the grommet or past the grommet into the air conditioning unit).



– On fitting the intake housing -B-, insert a foam strip (3 x 3 mm, 130 mm long) -C- in the left and right tongue-and-groove joint between the bottom part of the housing -A- and the cover -D- and the intake housing -B- or seal these joints with adhesive sealant (e.g. silicone adhesive sealant -D 176 001 A3-) ⇒ Electronic parts catalogue .
– Re-install the components removed in reverse order.
– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Perform air conditioner basic setting and final control diagnosis ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.



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

Note

- *Mark the motor/flap connecting element on removal to avoid interchange with the connecting elements of other control motors.*
- *In the event of the fault „Upper or lower limit value exceeded“, check the motor/flap connecting element. It must be properly attached to the motor and there must not be any clearance between the control motor mount and the connecting element.*

– Remove the intake housing with air flow flap ⇒ page 42 .

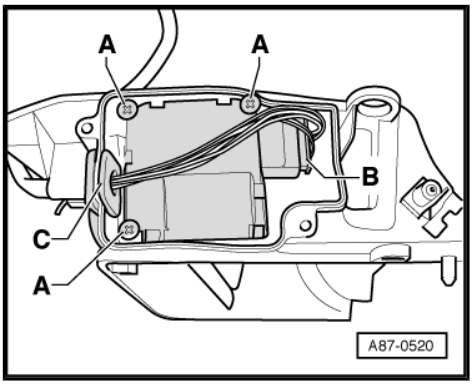
5.11.1 Removing

– Screw out the bolts -A-.

– Take the socket -C- out of the mount.

– Detach the control motor.

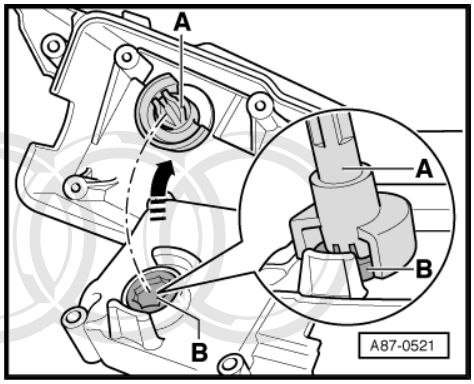
– Unplug the connector -B- from the control motor.



5.11.2 Installing

– Before installing the control motor, check the mounting of the air flow flap.

– Detach the connecting piece -A- from the shaft of the air flow flap and position it as shown on the control motor -B-.



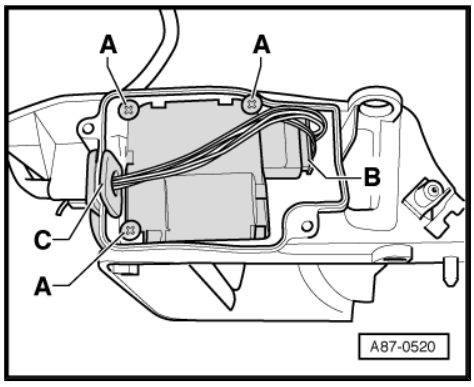
Note

- *The shaft of the control motor -B- has no stop. It rotates constantly if voltage is applied to contacts 5 and 6. When the control motor has been detached, voltage is therefore only to be applied with the connecting element -B- attached.*
- *The motor may be incorrectly positioned if pre-tension is required to insert the connecting element -A- in the control motor.*
- *If the shaft is so awkwardly positioned that the connecting element cannot be attached, use an adapter cable for example ⇒ page 47 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 no pre-tension is required to attach the connecting element. The direction of rotation can be reversed by interchanging positive and negative.*
- *Check the positioning of the connecting element. There must not be any clearance between the mount of the control motor and the connecting element.*

– Re-attach the connecting element -A- to the shaft of the air flow flap.

– Install the control motor -B-.

– Hand-tighten the bolts -A- (10 Ncm).



– Before fitting the cover, check correct positioning of the connector -B-, the routing of the wiring as illustrated and the position of the socket -C-.

– Seal the socket through which the wiring harness is routed beneath the cover to the control motor e.g. with silicone adhesive sealant -D 176 001 A3- (to stop water running through the socket or past the socket to the connector or control motor).

– Re-install the components removed in reverse order.

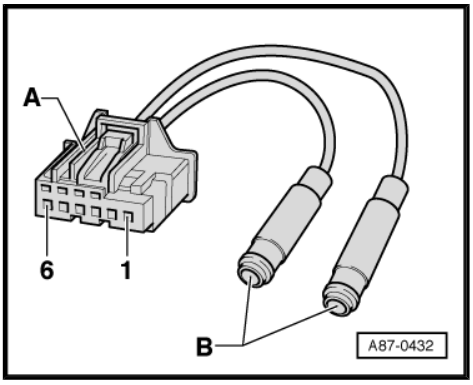
– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

– Perform air conditioner basic setting and final control diagnosis ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

5.12 Preparing adapter cables for control motor actuation

– Make connection to contacts „5“ and „6“ of connector -A- (part number 6Q0 972 706) using wire with a cross section of 0.25 mm^2 in each case. ⇒ Electronic parts catalogue

– Connect the other end of each wire to a commercially available banana plug -B-.

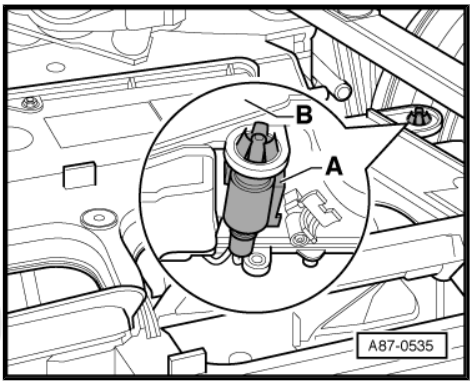


5.13 Removing and installing fresh air intake duct temperature sensor -G89-

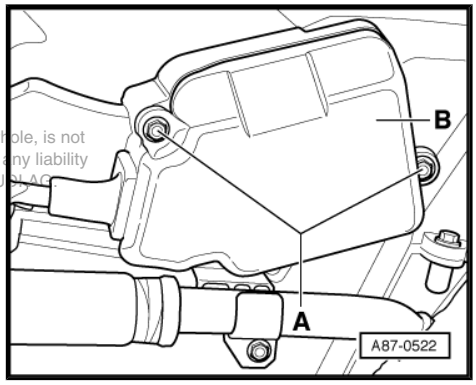
– Remove the plenum chamber cover on the left and right.

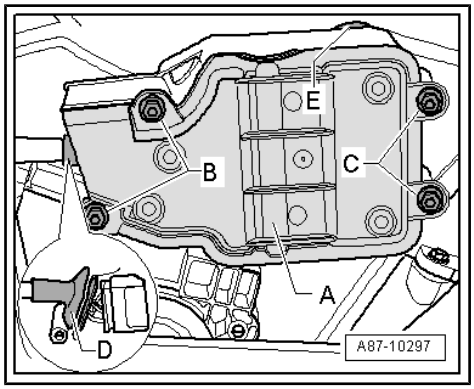
– Remove the dust and pollen filter ⇒ page 31 .

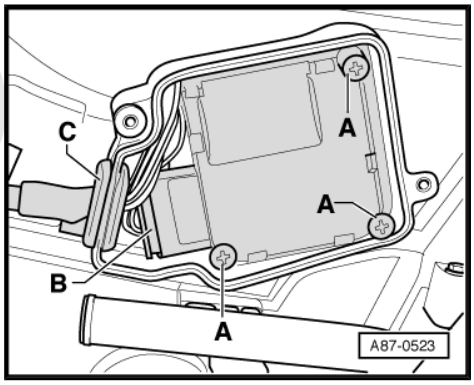
– Detach the temperature sensor -A- from the intake housing -B-.



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







Note

- *Mark the motor/flap connecting element on removal to avoid interchange with the connecting elements of other control motors.*
- *In the event of the fault „Upper or lower limit value exceeded“, check the motor/flap connecting element. It must be properly attached to the motor and there must not be any clearance between the control motor mount and the connecting element.*
- *The position of the air recirculation flap control motor -V113- beneath the scuttle panel trim is such that rainwater may drip onto the cover -B- and ingress by way of the separation point between the air conditioning unit and the cover into the housing and onto the control motor or into the connector at the control motor.*
- *To prevent the ingress of water, the joint between the housing sections has been sealed at the factory as of 02.2003 with adhesive sealant (e.g. silicone adhesive sealant -D 176 001 A3-) and/or round butyl packing (diameter 3 mm). The packing is inserted in the joint between the cover -B- for the control motor and the cover with air recirculation flap to provide a seal.*
- *As of 12.2003, a modified cover -A- was gradually introduced (with an additional sealing lip) for the air recirculation flap control motor -V113- with 4 attachment points for the bolts -B- and -C- (instead of 2 attachment points), an appropriately modified cover with air recirculation flap -E- and a wiring harness with a modified socket -D- ⇒ Electronic parts catalogue .*
- *If water has ingressed into the connector -B- or the control motor, this can no longer adjust the air recirculation flap and faults may be stored in the fault memory for this control motor. In addition, corrosion at the plug contacts may cause contact resistance at the connector. On vehicles with a sun roof with solar cells, such contact resistance may lead to an increased air conditioner no-load current input.*

5.14.1 Removing

– Switch off ignition.

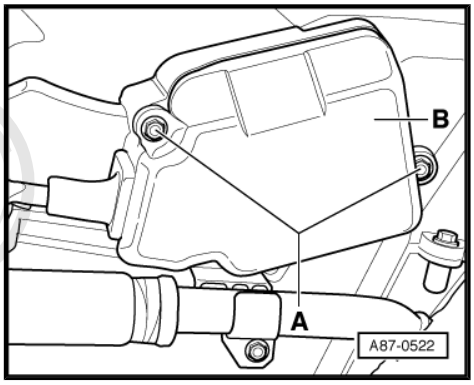
– Remove the plenum chamber cover on the left and right.

– Remove the dust and pollen filter ⇒ page 31 .

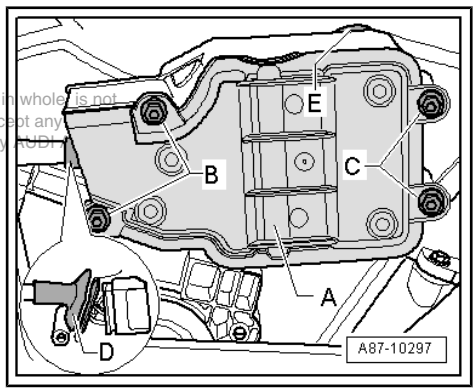
– Remove the body brace with the reinforcement to the scuttle panel trim. ⇒ Running gear; Rep. gr. 40

– Remove the windscreen wipers and scuttle panel trim: ⇒ Electrical system; Rep. gr. 92

– Screw out the bolts -A- (on the version with 2 attachment points).



– Screw out the bolts -B- and -C- (on the version with 4 attachment points).



Note

Vehicles with a diesel engine as of Model Year 2006 are fitted with an additional body brace which cannot be removed. This impedes access to the two rear bolts -C-. The bolts can only be slackened off and removed using the ratchet ring spanner - T40083- , an open-ended wrench or a box wrench (size 5.5 mm) for example.

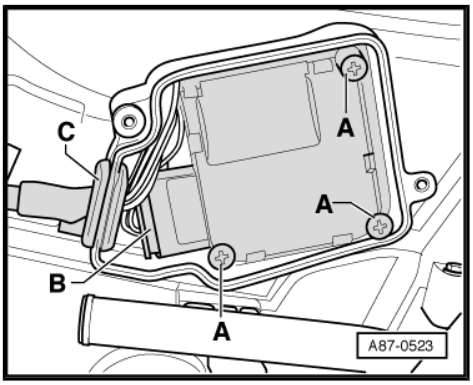
– Detach the cover -A-.

– Screw out the bolts -A-.

– Take the socket -C- out of the mount.

– Detach the control motor.

– Unplug the connector -B- from the control motor.

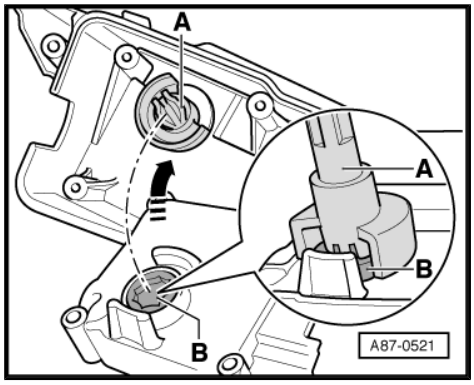


5.14.2 Installing

Install in reverse order, paying attention to the following:

– Remove any remnants of black silicone adhesive sealant or round packing at the cover for the control motor or at the air conditioning unit.

– Before installing the control motor, check the mounting of the air recirculation flap.
– Detach the connecting element -A- from the shaft of the air recirculation flap and position it as shown on the control motor -B-.

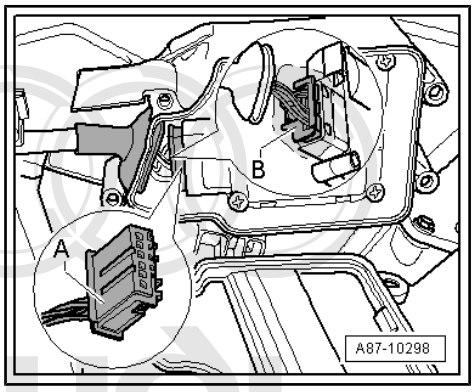


Note

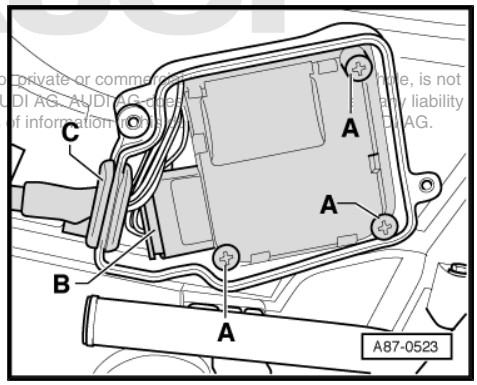
- *The shaft of the control motor -B- has no stop. It rotates constantly if voltage is applied to contacts 5 and 6. When the control motor has been detached, voltage is therefore only to be applied with the intermediate piece -B- attached.*
- *The motor may be incorrectly positioned if pre-tension is required to insert the connecting element -A- in the control motor.*
- *If the shaft is so awkwardly positioned that the connecting element cannot be attached, use an adapter cable for example ⇒ page 47 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 no pre-tension is required to attach the connecting element. The direction of rotation can be reversed by interchanging positive and negative.*
- *Check the positioning of the connecting element. There must not be any clearance between the mount of the control motor and the connecting element.*

– Re-attach the intermediate piece -A- to the shaft of the air recirculation flap.

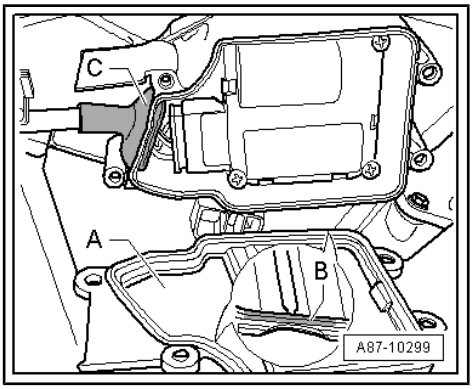
– Check the connector -A- and the corresponding contacts (at the control motor and in the connector) for contamination or corrosion and replace any damaged components ⇒ Electronic parts catalogue .
– Plug in the connector -A- at the control motor.
– After plugging in the connector at the control motor, coat the connector -A-, the control motor (around the connector) and the wiring into the connector -A- in area -B- with preservation paste „G 052 174 A1“ for example ⇒ Electronic parts catalogue (to prevent the ingress of moisture).



– Install the control motor -B-.
– Hand-tighten the bolts -A- (10 Ncm).
– Before inserting the socket -C-, fill the groove of the cover with air recirculation flap (at the air conditioning unit, tongue-and-groove joint to cover) and of the socket -C- all round with exactly the amount of adhesive sealant (e.g silicone adhesive sealant -D 176 001 A3- required to reliably seal the connection with the cover.

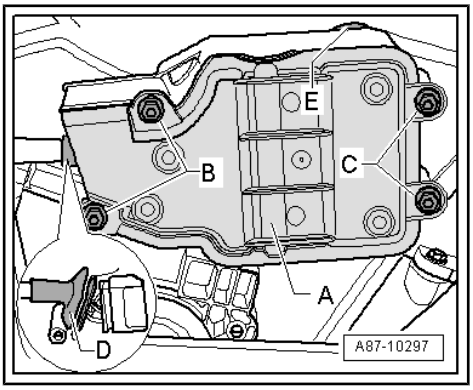


– Before fitting the cover -A-, check for damage to the sealing lip -B- on the version with 4 attachment points.
– Check proper fitting of the socket -C- and the routing of the wiring to the control motor as shown.
– Also fill the open groove of the socket -C- with exactly the amount of adhesive sealant (e.g. silicone adhesive sealant -D 176 001 A3-) required to reliably seal the connection with the cover.

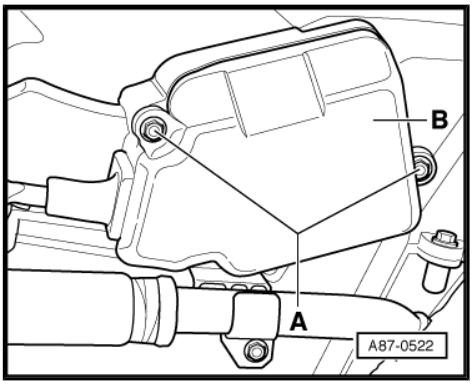


Note

As of 12.2003, a modified cover for the control motor (with 4 instead of 2 attachment points), a suitably adapted cover with air recirculation flap -E- and a wiring harness with a modified socket -D- were gradually introduced ⇒ Electronic parts catalogue . The connection between the air conditioning unit, the cover and the socket is however still to be additionally sealed with adhesive sealant on this version as well.



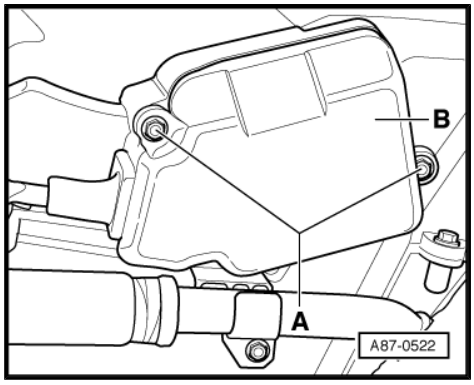
– Fit the cover -B- (this illustration shows the version with 2 attachment points).
– Check the connection between the air conditioning unit and the cover -B- (reliable sealing is only provided if adhesive sealant emerges all round).
– The location at which the wiring harness enters the socket -C- (refer to Fig. above) is also to be sealed with adhesive sealant (e.g. silicone adhesive sealant -D 176 001 A3-).
– Remove the adhesive sealant emerging at the connections to the air conditioning unit on screwing on the cover -B-.
– Re-install the components removed in reverse order.
– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Perform air conditioner basic setting and final control diagnosis ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

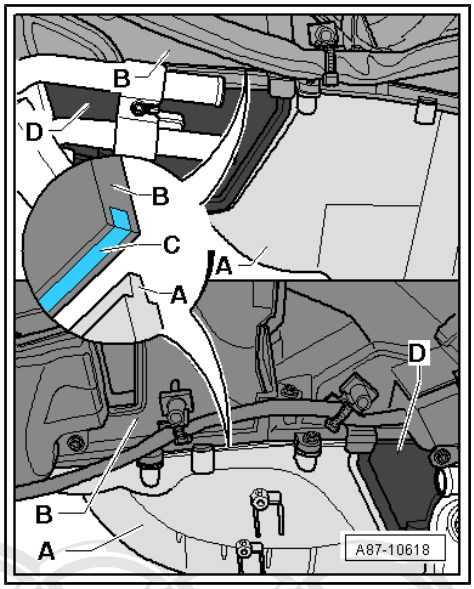


Note

In the event of problems with moisture in the passenger compartment, additionally check the air recirculation flap (must close completely).

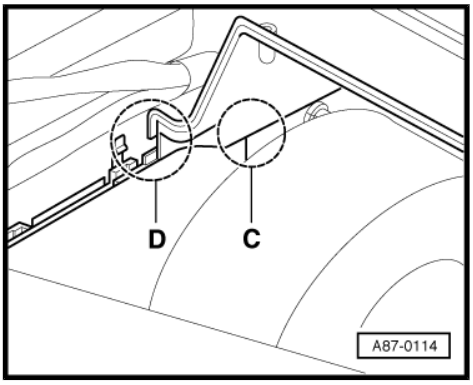
5.15 Removing and installing cover with air recirculation flap





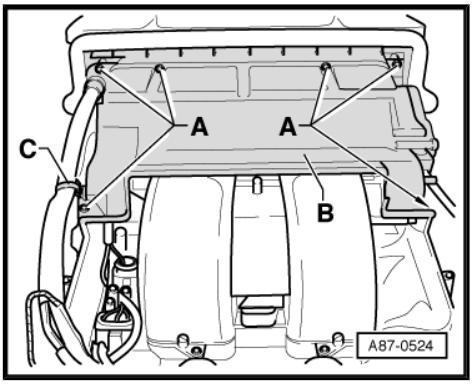
Note

- *As of 12.2003, a modified cover for the control motor (with 4 instead of 2 attachment points ⇒ page 47), a suitably adapted cover with air recirculation flap and a wiring harness with a modified socket -C- were gradually introduced ⇒ Electronic parts catalogue .*
- *As of Model Year 2008, a foam strip (3 x 3 mm, 130 mm long) -C- is gradually being introduced at the factory in the left and right tongue-and-groove joint between the bottom part of the housing -A-, the cover with air recirculation flap -B- and the cover for the evaporator -D-. The foam strips -C- are designed to prevent the ingress of moisture into the air conditioning unit by way of these joints.*
- *On fitting the cover with air recirculation flap -B-, insert a foam strip (3 x 3 mm, 130 mm long) -C- in the left and right tongue-and-groove joint between the bottom part of the housing -A- and the cover with air recirculation flap -B- or seal these joints with adhesive sealant (e.g. silicone adhesive sealant -D 176 001 A3-) ⇒ Electronic parts catalogue .*
- *In the event of moisture problems (misting-up of windscreen, odour formation, moisture at motor of fresh air blower -V2-) on vehicles on which a foam seal -C- has not yet been fitted at the factory, the joint between the cover for the evaporator and the bottom part of the housing is to be sealed with adhesive sealant (e.g. silicone adhesive sealant -D 176 001 A3-) in addition to performing the sealing measures described ⇒ page 173 .*
- *Before fitting the intake housing, carefully also seal the housing joint in areas -C- and -D- with adhesive sealant (e.g. silicone adhesive sealant -D 176 001 A3-).*



Remove the plenum chamber cover on the left and right.

– Remove the dust and pollen filter ⇒ page 31 .
– Remove the body brace with the reinforcement to the scuttle panel trim. ⇒ Running gear; Rep. gr. 40
– Remove the windscreen wipers and scuttle panel trim: ⇒ Electrical system; Rep. gr. 92
– Screw out the bolts -A-.
– Release the fasteners for the wiring harness -C- on the right and left at the air conditioning unit.
– Detach the cover -B-.



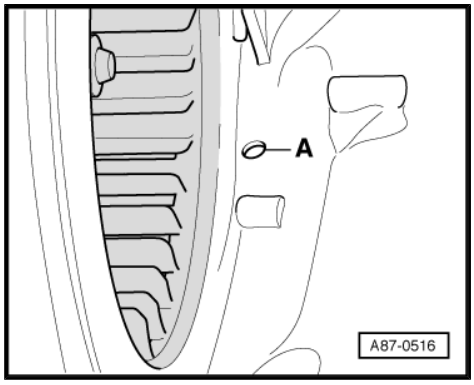
Note

- *Should it be necessary to remove the cover completely, the control motor for the air recirculation flap must also be taken out ⇒ page 47 .*
- *Install in reverse order.*

5.16 Removing and installing fresh air blower -V2-

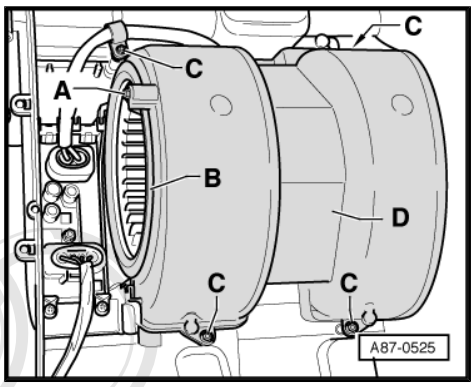
Note

Deposits in the water drain openings (in the area beneath the two impellers of the fresh air blower -V2-) in the air conditioning unit may cause whistling noise in air conditioner air recirculation mode. Air conditioning units with slightly larger drain openings -A- have therefore been fitted since 06.2003.

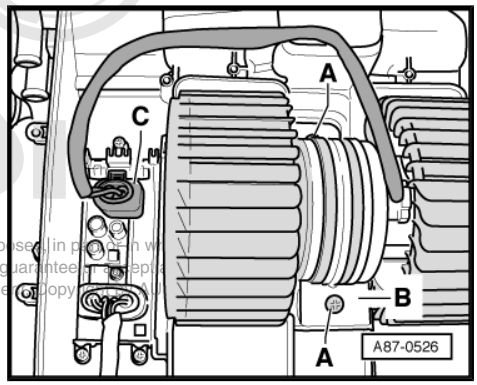


5.16.1 Removing

- Remove the plenum chamber cover on the left and right.
- Remove the dust and pollen filter ⇒ page 31 .
- Remove the intake housing with air flow flap ⇒ page 42 .
- Remove the windscreen wipers and the scuttle panel trim ⇒ Electrical system; Rep. gr. 92 .
- Remove the cover with air recirculation flap ⇒ page 52 .
- Remove the bolts -A- and detach the two air guide rings -B- (on the left and right).
- Screw out the bolts -C-.
- Detach the air duct -D-.



- Screw out the bolts -A- and detach the bracket -B-.
- Unplug the connector -C- from the fresh air blower control unit -J126- .
- Remove the fresh air blower -V2- .



Caution

Do not grasp hold of the impellers of the fresh air blower -V2- . Applying force to the impellers or moving the balancing weights attached to the impellers could cause imbalance and thus operating problems.

5.16.2 Installing

Install in reverse order, paying attention to the following:

- On installation, pay attention to correct routing of the wiring to the connector -C-.
- Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- and erase any faults dis-

played ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

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

5.17.1 Removing

– Remove the plenum chamber cover on the left and right.

– Remove the dust and pollen filter ⇒ page 31 .

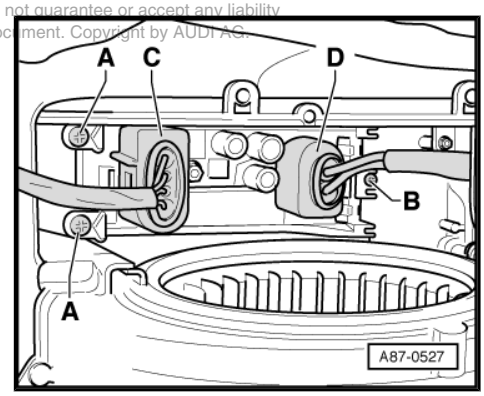
– Remove the body brace with the reinforcement to the scuttle panel trim ⇒ Running gear; Rep. gr. 40 .

– Remove the intake housing with air flow flap ⇒ page 42 .

WARNING

The heat sink may be hot.

– Screw out the bolts -A- and -B-.



Note

- *Use can be made for removing the bolt -B- of a 1/4 inch socket wrench attachment for example.*
- *Should it not be possible to remove the bolt -B- with the cover with air recirculation flap in position, the cover must be taken out as well ⇒ page 52*

– Unplug the connectors -C- and -D- from the fresh air blower control unit -J126- .

Caution

Do not grasp hold of the impellers of the fresh air blower -V2- . Applying force to the impellers or moving the balancing weights attached to the impellers could cause imbalance and thus operating problems.

– Remove the fresh air blower control unit -J126- .

5.17.2 Installing

Install in reverse order.

– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

5.18 Removing and installing pump valve unit

In the event of a problem with „poor heat output“, check the following before removing the pump valve unit:

– Connection to coolant circuit (proper connection of supply and return to engine) ⇒ Engine, mechanics; Rep. gr. 19 .

– Wiring to pump for possible interchange („+“ and „-“).⇒ Current flow diagrams, Electrical fault finding and Fitting locations

– Complete bleeding of coolant circuit ⇒ Engine, mechanics; Rep. gr. 19

Note

- *Bleed the coolant circuit again if necessary, paying attention to the notes ⇒ page 132 .*
- *If the coolant circulation pump -V50- is noisy, check for complete bleeding of the cooling system prior to removal of the pump valve unit (noise may be caused by air in the coolant circuit): ⇒ Engine, mechanics; Rep. gr. 19*
- *The valves of the pump valve unit are open when deenergised. If the power supply or the valve connection to the front operating and display unit, Climatronic control unit -J255- is interrupted, the air conditioner heat output cannot be regulated.*

5.18.1 Removing

Special tools and workshop equipment required

- Hose clamps -3090 bzw. 3094-
- Compressed air gun, commercially available
- Hand pump -V.A.G 1274- (and appropriate adapters)

– Switch off ignition.

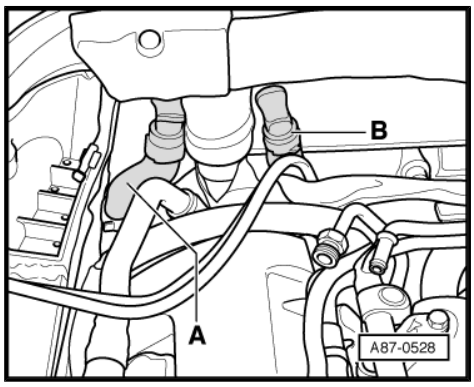
– Remove the plenum chamber cover on the right.

– Dissipate the pressure in the coolant circuit by opening the cap at the coolant expansion tank ⇒ Engine, mechanics; Rep. gr. 19 .

– Mark the arrangement of the coolant hoses -A- (supply to pump valve unit) and -B- (return to engine).

– Pinch off both coolant hoses between the engine and pump valve unit (e.g. using hose clamps -V.A.G 3094-).

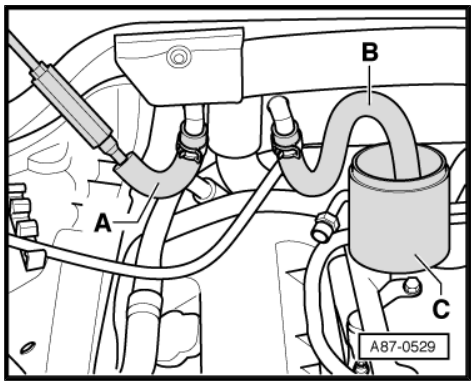
– Detach the coolant hoses -A- and -B- from the connections.



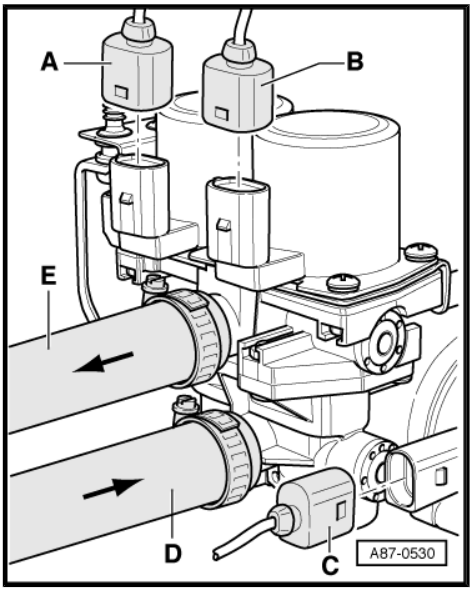
– Connect one tubing section -A- and -B- to each of the two connections.

– Place a vessel -C- beneath the hose -B-.

– Use a compressed-air gun to carefully blow coolant out of the heat exchanger and pump valve unit (into the vessel).



– Unplug the connectors -A- (to the right heat regulation valve -N176-), -B- (to the left heat regulation valve -N175-) and -C- (to the coolant circulation pump -V50-) from the pump valve unit.



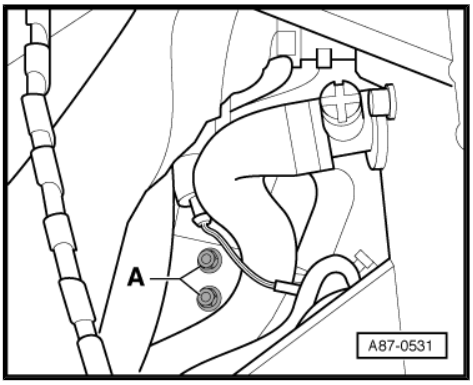
Note

The connectors are designed so as to prevent interchange:

– Mark the arrangement of the coolant hoses -D- (supply to pump valve unit) and -E- (return to engine).

– Detach the coolant hoses -D- and -E- from the pump valve unit.

– Remove the two hexagon nuts -A-.

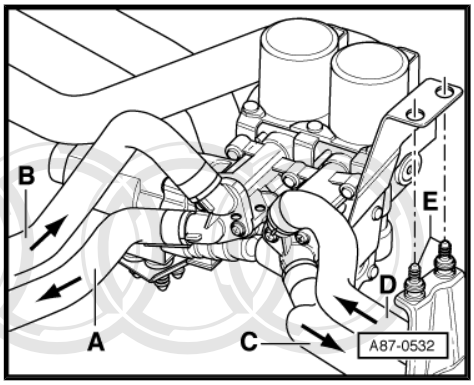


– Mark the coolant hoses to the heat exchangers (-A- supply to driver side heat exchanger, -B- return from driver side heat exchanger, -C- supply to passenger side heat exchanger and -D- return from passenger side heat exchanger).

– Detach the pump valve unit from the rubber elements -E-.

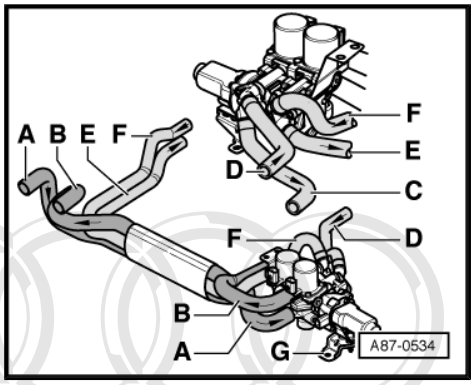
– Detach the coolant hoses from the pump valve unit.

– Detach the pump valve unit.



On RHD vehicles, the coolant hoses are connected as follows to the pump valve unit:

- Supply from engine to pump valve unit -A-
- Return from pump valve unit to engine -B-
- Supply to passenger side heat exchanger -C-
- Return from passenger side heat exchanger -D-
- Supply to driver side heat exchanger -E-
- Return from driver side heat exchanger -F-



Note

On these vehicles, removal involves taking out the hexagon nuts at the holder -G-.

5.18.2 Installing

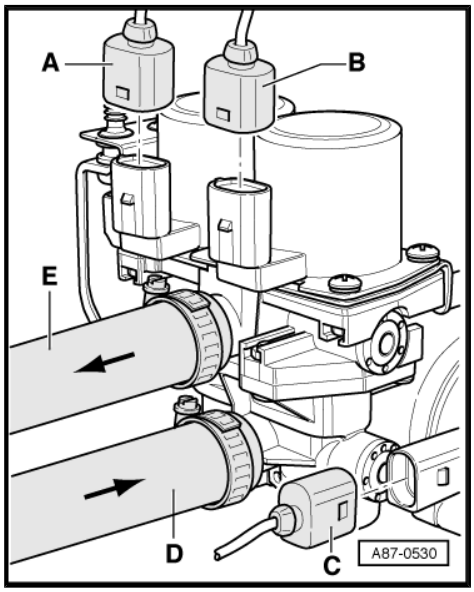
Install in reverse order, paying attention to the following:

- The coolant circuit must be bled before starting up the coolant circulation pump -V50- of the pump valve unit.
- Dry running of the pump in the pump valve unit would lead to destruction.

– Bleed the coolant circuit before plugging in the 2-pin connector -C- to the pump: ⇒ Engine, mechanics; Rep. gr. 19

– Following installation, check correct positioning of the socket between the engine compartment and plenum chamber.

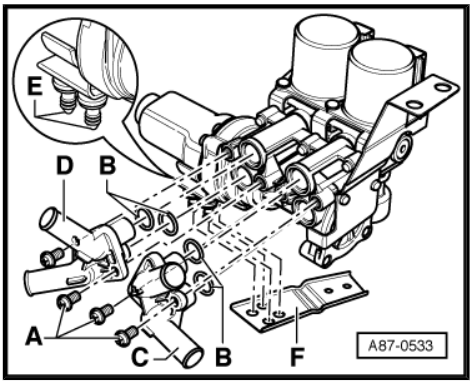
– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.



5.18.3 Replacing pump valve unit

– Remove the pump valve unit ⇒ page 55 .

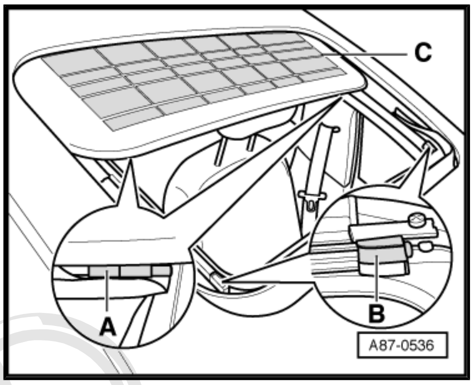
– Screw out the bolts -A- (tightening torque 2 Nm).
– Detach the coolant pipes:
♦ Pipes -C- to passenger side heat exchanger
♦ Pipes -D- to driver side heat exchanger



Note

♦ *Replace the O-rings -B-.*
♦ *Moisten both O-rings with coolant before fitting.*
♦ *Insert the rubber bushes -E- in the pump valve unit and in the holder -F- as shown.*

5.19 Operation of solar roof



Note

- *Solar mode is only possible with the sun roof closed or tilted (the solar energy converted into electrical energy by the solar roof -C- is supplied to the vehicle electrical system via the contacts -A- (at the front edge of the sun roof) and -B- (at the sun roof frame)).*
- *Solar mode is not possible with the ignition on and in auxiliary heating/auxiliary ventilation mode (the fresh air blower control unit -J126- interrupts the link between the solar panel and the fresh air blower -V2-) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *If solar operation of the fresh air blower is not required, the function can be deactivated on the front operating and display unit, Climatronic control unit -J255- or in the MMI (Multi Media Interface) ⇒ Owner's manual and ⇒ Operating instructions for „Infotainment / MMI“ .*
- *The measured value block of the front 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.*
- *The „Adaption“ function can be used to enter the temperature in the front operating and display unit, Climatronic control unit -J255- as of which the „solar roof“ function is deactivated/activated ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*

- *The design of the fresh air blower control unit -J126- is such that in solar mode the fresh air blower -V2- is only actuated given generation of sufficient operating energy by the solar cells (at present, the minimum voltage with fresh-air blower -V2- actuated must be greater than 2 V).*
- *For the current generated by the solar cells of the solar roof to be switched from the fresh air blower control unit -J126- to the fresh air blower -V2- , the voltage generated by the solar cells must be greater than approx. 12.3 V (no-load voltage). Once -J126- has detected a voltage greater than approx. 12.3 V, the fresh air blower -V2- is actuated as long as the voltage supplied by the solar cells remains in excess of roughly 2 V (or the ignition, auxiliary ventilation or auxiliary heating is switched on).*
- *The energy supplied by the solar cells -C20- is transferred via the fresh air blower control unit -J126- directly to the fresh air blower -V2- . The fresh air blower converts the electrical energy generated into blower power.*
- *On vehicles with no solar panel, all air conditioner control motors come to a halt in their instantaneous position when the ignition is switched off. Ventilation of the passenger compartment in solar mode does however require the fresh air and air recirculation flaps to be set to „fresh air mode“. On vehicles with solar roof, the front operating and display unit, Climatronic control unit -J255- is therefore informed that solar cells are fitted by way of the encoding. The front operating and display unit, Climatronic control unit -J255- then moves the flaps in the air conditioning unit to the „fresh air mode“ position after switching off the 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 front 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.*

- *Contacts -A- and -B- (at the sun roof and sun roof frame) for transferring the electrical energy generated must be clean and*

Example:

500 W/m^2 (sunlight penetration) x 0.21 m^2 (sun roof solar area) x 0.13 (efficiency of solar cells -C20-) x 0.9 (efficiency of fresh air blower control unit -J126-)

5.19.1 Checking operation of solar roof

– Move the vehicle into the sun.

Note

- *If the 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 solar 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 energy supplied is only approx. 1.5 W on shining halogen lamps onto the solar roof (fresh air blower -V2- rotates but air flow is hardly perceptible).*
- *Depending on the version, the measured value block of the front operating and display unit, Climatronic control unit -J255- indicates the power currently being supplied by the solar cells -C20- (voltage and current) immediately after switching off the ignition ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*

– Open the „centre“ dash panel vents and close all other vents.
– Check the setting at the front operating and display unit, Climatronic control unit -J255- or MMI (Multi Media Interface); the „Solar mode“ function must have been set.
– Close the sun roof.
– Switch off the ignition (front operating and display unit 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 the fault memory of the front operating and display unit, Climatronic control unit -J255- and check the encoding of the front operating and display unit ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Check the setting (and if necessary the adaption) at the front operating and display unit, Climatronic control unit -J255- and at the MMI (the „Solar mode“ function must have been activated) ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051 .
– Switch off ignition.
– Remove the intake housing with air flow flap ⇒ page 42 .

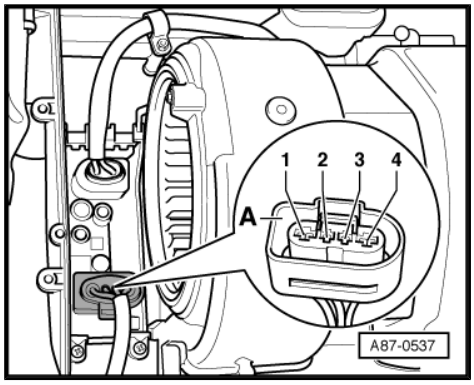
– Unplug the connector -A- from the fresh air blower control unit -J126- .

– Measure the voltage between contact -2- (of solar roof) and contact -4- (earth) at the connector -A-.

♦ Specification: Greater than 12.3 V DC (depending on sunlight intensity)

– Connect up a test lamp (12 V, max. 5 W) between contacts -2- and -4- at the connector -A-.

– The test lamp glows or lights (depending on sunlight intensity).



Note

♦ *For the current generated by the solar cells of the solar roof to be switched from the fresh air blower control unit -J126- to the fresh air blower -V2- , the voltage generated by the solar cells must be greater than approx. 12.3 V (no-load voltage). Once -J126- has detected a voltage greater than approx. 12.3 V, the fresh air blower -V2- is actuated as long as the voltage supplied by the solar cells remains in excess of roughly 2 V (or the ignition, auxiliary ventilation or auxiliary heating is switched on).*

♦ *The solar roof function is OK if the test lamp glows or lights. If the fresh air blower does not run, check the freedom of movement of the fresh air blower -V2- and actuation of the fresh air blower control unit -J126- by the front operating and display unit. Replace the front operating and display unit, Climatronic control unit -J255- if no fault is found.*

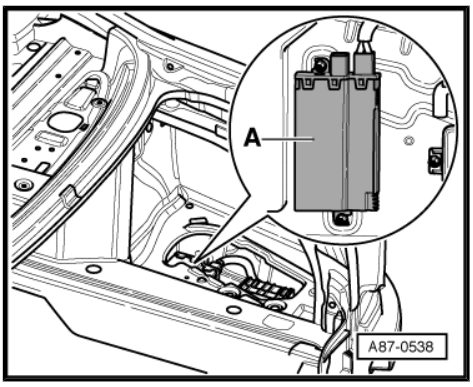
♦ *If the test lamp does not glow or light, check the wiring to the two contacts at the sun roof opening. If no fault is found, check the solar panel ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ General body repairs, exterior; Rep. gr. 60 .*

♦ *The electrical energy supplied is only approx. 1.5 W on shining halogen lamps onto the solar roof (fresh air blower rotates but air flow is hardly perceptible).*

♦ *The current supplied by the sun roof with solar cells -C20- to the fresh air blower -V2- can be read out, depending on the version of the operating and display unit, Climatronic control unit -J255- , in the measured value block. 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).*

6 Heated windscreen

6.1 Operation of heated windscreen



- The heated windscreen control unit -J505- -A- is installed in the luggage compartment on the left beneath the battery -A- (vehicle battery).
- The heated windscreen control unit -J505- -A- is actuated by the front operating and display unit, Climatronic control unit -J255- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051 (Reading measured value block).

– After starting a cold engine if the ambient temperature is less than + 5° C and the front operating and display unit, Climatronic control unit -J255- is set to „Auto" mode. The temperature setting on the front operating and display unit, Climatronic control unit -J255- must be such that the air conditioner is in heating mode and the temperature measured by the senders (left vent temperature sender -G150- , right vent temperature sender -G151-) must not be in excess of +35 °C. The heating period is governed by the ambient temperature (max. 6 minutes at -40°).

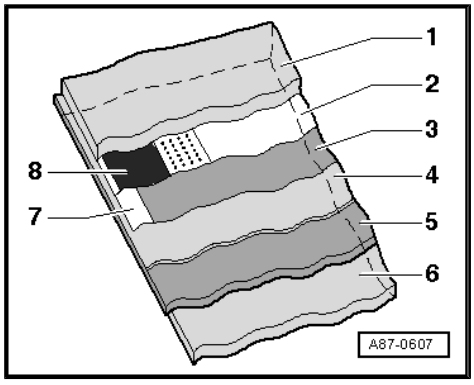
– On selecting „Defrost" mode on the front operating and display unit, Climatronic control unit -J255- if the ambient temperature is less than + 5° C. The heating period is between 2 and 6 minutes depending on the ambient temperature. The lamp in the Defrost button flashes as long as the heated windscreen is switched on. Actuation only takes place with the engine running.

- The heated windscreen control unit -J505- -A- switches on the heated windscreen if the following conditions are fulfilled:

– Front 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 front operating and display unit, Climatronic control unit -J255- by way of a signal wire. If a condition exists in the heated windscreen control unit -J505- which does not permit activation of the heated windscreen, this signal wire is used to inform the front operating and display unit, Climatronic control unit -J255- that the heated windscreen is not to be activated ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051 (Reading measured value block).
- The resistance of the metal foil -1- in the heated windscreen -Z2- is approx. 1.9 ohms. A voltage greater than the electrical system voltage is required to attain the maximum possible heat output of approx. 1000 W (watts) at the windscreen. The heated windscreen control unit -J505- for the heated windscreen -Z2- converts the electrical system voltage into a variable voltage of between 25 and 48 V depending on the electrical system voltage. If the voltage at the heated windscreen control unit -J505- is greater than 13.10 V, the heated windscreen -Z2- is actuated with a voltage greater than 41 V (up to max. 48 V) ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- To prevent electrical system overload, the heated windscreen control unit -J505- regulates the heat output of the heated windscreen. 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. The 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 the heated windscreen.
- To prevent actuation of the heated windscreen -Z2- in the event of a short circuit or open circuit in the wiring, the heated windscreen control unit -J505- interrogates the resistance of the heated windscreen -Z2- . If the resistance measured is less than approx. 1.5 ohms (short circuit) or greater than approx. 3.3 ohms (open circuit or contact resistance), the heated windscreen control unit -J505- does not switch on the heating or switches it off ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- During final control diagnosis, the heated windscreen -Z2- is only actuated up to a passenger compartment temperature of 40 °C. If the temperature is higher, „Function unknown“ or „Function cannot be implemented at present“ appears on the display of the fault reader for example ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- The activation function of the heated windscreen control unit -J505- can be checked for example using the multimeter -V.A.G 1715- . To do so, connect the current probe of the multimeter -V.A.G 1715- to the positive wire from the heated windscreen control unit -J505- to the heated windscreen -Z2- and set the multimeter -V.A.G 1715- to the function „Current measurement with current probe“. The reading on the multimeter -V.A.G 1715- changes from approx. 0 A to greater than 7 A.

7 Electrical checking of components actuated by the air conditioner

By the front operating and display unit, Climatronic control unit -J255- (and the rear Climatronic operating and display unit -E265-)

7.1 Checking of 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 front operating and display unit, Climatronic control unit -J255-) are stored as faults in the front operating and display unit, Climatronic control unit -J255- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *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 rear window heating is completely deactivated at present (or the power is reduced) to relieve the load on the alternator (the electronics system of the front 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.*
- *If the heated rear window has to be deactivated on account of undervoltage, the indicator lamp in the button for the heated rear window in the front operating and display unit, Climatronic control unit -J255- remains on. However if deactivation lasts longer than approx. 150 s, the front operating and display unit, Climatronic control unit -J255- switches off the indicator lamp.*
- *The measured value block of the front operating and display unit, Climatronic control unit -J255- shows that the heated rear window 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.*
- *Checking actuation of heated rear window operation is described in the air conditioner guided fault-finding ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *At ambient temperatures below 0 °C, the heated rear window remains switched on until the ignition is switched off (manual deactivation is possible at any time). If the temperature during a driving cycle rises above 0 °C, the heated rear window is deactivated on completion of the operating period stored in the front operating and display unit, Climatronic control unit -J255- (approx. 10 minutes).*
- *At ambient temperatures above 0 °C, the heated rear window is deactivated automatically on completion of the operating period stored in the front operating and display unit, Climatronic control unit -J255- (approx. 10 minutes) by the front operating and display unit, Climatronic control unit -J255- (on vehicles with standard glass, for example, the actuation time is governed by the encoding of the front operating and display unit, Climatronic control unit -J255-) ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*

7.2 Checking of heated seats and seat ventilation

7.2.1 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 front operating and display unit, Climatronic control unit -J255-) are stored as faults in the front operating and display unit, Climatronic control unit -J255- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *Checking of heated seat actuation is described in the air conditioner guided fault-finding routine ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *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 power is reduced (at present to approx. 50%) or the seat heating is completely deactivated to relieve the load on the alternator (the electronics system of the front operating and display unit, Climatronic control unit -J255- / rear Climatronic operating and display unit -E265- reduces the actuation duty cycle from 100% to 90....0%) ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *The measured value block of the front 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.*
- *The measured value block of the rear Climatronic operating and display unit -E265- shows that the rear seat heating is being actuated or indicates why there is no actuation in spite of a corresponding request . The front operating and display unit, Climatronic control unit -J255- indicates that the rear seat heating has been deactivated, e.g. on account of electrical system overload ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *On vehicles with no rear Climatronic operating and display unit -E265- , actuation of the heated rear seats is not displayed in the self-diagnosis; checking actuation ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*

The specified seat heating temperatures differ for vehicles with and without seat ventilation (the values given in the following table are approximate; the exact value depends on the version of the control unit concerned). At present the permissible tolerance range is * / - 4 °C (* / - 6 °C for stage „6“ on vehicles with seat ventilation). As regulation is performed by way of a characteristic curve, the specified temperature of the next highest stage is always greater than for the lower stage ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

Seat heating stage selected	Specified temperature for seat heating without seat ventilation	Specified temperature for seat heating with seat ventilation

Stage „1“	19 °C	29 °C
Stage „2“	25 °C	32 °C
Stage „3“	31 °C	36 °C
Stage „4“	38 °C	40 °C
Stage „5“	48 °C	43 °C
Stage „6“	60 °C	46 °C

7.2.2 Checking seat ventilation (interrogation of information from seat ventilation control units)

This applies to the following control units (driver seat ventilation control unit -J672- , front passenger seat ventilation control unit -J673- , driver side rear seat ventilation control unit -J674- and front passenger side rear seat ventilation control unit -J675-)

Note

- ♦ *Information on these control units is displayed in the measured value block of the front operating and display unit, Climatronic control unit -J255- and the rear Climatronic operating and display unit -E265- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- ♦ *The front seat ventilation and heating stage currently selected is indicated in the measured value blocks of the front operating and display unit, Climatronic control unit -J255- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- ♦ *The rear seat ventilation and heating stage currently selected is indicated in the measured value blocks of the rear Climatronic operating and display unit -E265- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*

- ♦ Actuation of the seat ventilation blower is not displayed directly. Actuation of the corresponding blower or of the appropriate seat ventilation control unit can be checked for example as follows:

- – Switch off electrical equipment with a high current input (e.g. heated rear window).
- – Select the lowest possible speed setting for the fresh air blower -V2- .
- – Set the ventilation control for the corresponding seat (in the front or rear operating and display unit) to the maximum setting.
- – Check the corresponding seat by listening for the blower running noise in the seat.
- – Set the heating control for the corresponding seat (in the front or rear operating and display unit) to the maximum setting. The relevant measured value block indicates activation of the seat heating ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- ♦ The following must be heeded at present with regard to seat ventilation operation:
- – Ventilation is not possible at seat temperatures below 15 °C (deactivation on account of inadequate seat temperature).

– Depending on the seat temperature and the seat ventilation setting selected, seat heating may be switched in automatically by the control unit after approx. 5 minutes in seat ventilation mode. In seat ventilation mode only the seat cushion is however heated if necessary, heating of the side bolsters is not activated ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

– Depending on the seat ventilation stage selected, the seat may be heated up to the following temperature in seat ventilation mode (measured value of temperature sensor in seat cushion) ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

Seat ventilation stage selected	Seat temperature
Stage „1“	33 °C
Stage „2“	30 °C
Stage „3“	27 °C
Stage „4“	25 °C
Stage „5“	23 °C
Stage „6“	18 °C

7.3 Checking fuel-driven supplementary heater

Note

- *Vehicles with diesel engine are currently fitted with a fuel-driven supplementary heater (in the event of a request from the front operating and display unit, Climatronic control unit - J255- , heat energy is added to the coolant used for engine cooling) ⇒ Audi sales range and ⇒ Auxiliary/supplementary heater; Rep. gr. 82 .*
- *On vehicles with diesel engine and „auxiliary heater“ optional extra, the function is assumed by the auxiliary heater, which operates as fuel-driven supplementary heater. ⇒ Audi sales range and ⇒ Auxiliary/supplementary heater; Rep. gr. 82 .*
- *Checking of supplementary heater actuation is described in the air conditioner guided fault-finding routine ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *The measured value block of the front operating and display unit, Climatronic control unit -J255- shows that the supplementary heater 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.*
- *Vehicles with petrol engine are currently not fitted with a supplementary heater or the auxiliary heater is not actuated as supplementary heater. ⇒ Auxiliary/supplementary heater; Rep. gr. 82*

7.4 Checking electric supplementary heater for rear footwell

Note

- *The rear left footwell heater element -Z42- and the rear right footwell heater element -Z43- are actuated by the front operating and display unit, Climatronic control unit -J255- by way of a signal wire. Actuation is displayed in the measured value block ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *The electric supplementary heater element is only fitted on vehicles with rear Climatronic operating and display unit -E265- .*
- *Checking actuation of electric supplementary heating elements ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*

7.5 Checking actuation of heated windscreen -Z2-

Note

- *The heated windscreen control unit -J505- is actuated by the front operating and display unit, Climatronic control unit -J255- by way of a signal wire. Actuation is indicated in the measured value block of the front 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 windscreen ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *Description of operation of heated windscreen -Z2-* *⇒ page 63*

Note

- *If the resistance value calculated by the front operating and display unit, Climatronic control unit -J255- (and displayed in the measured value block) is greater than 2.4 ohms or less than 1.5 ohms, check for short circuit or contact resistance in the wiring between the heated windscreen control unit -J505- and the heated windscreen -Z2- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *If the resistance value calculated by the front operating and display unit, Climatronic control unit -J255- (and displayed in the measured value block) is greater than 3.4 ohms or less than 1.4 ohms, the front operating and display unit, Climatronic control unit -J255- does not actuate the heated windscreen control unit -J505- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*

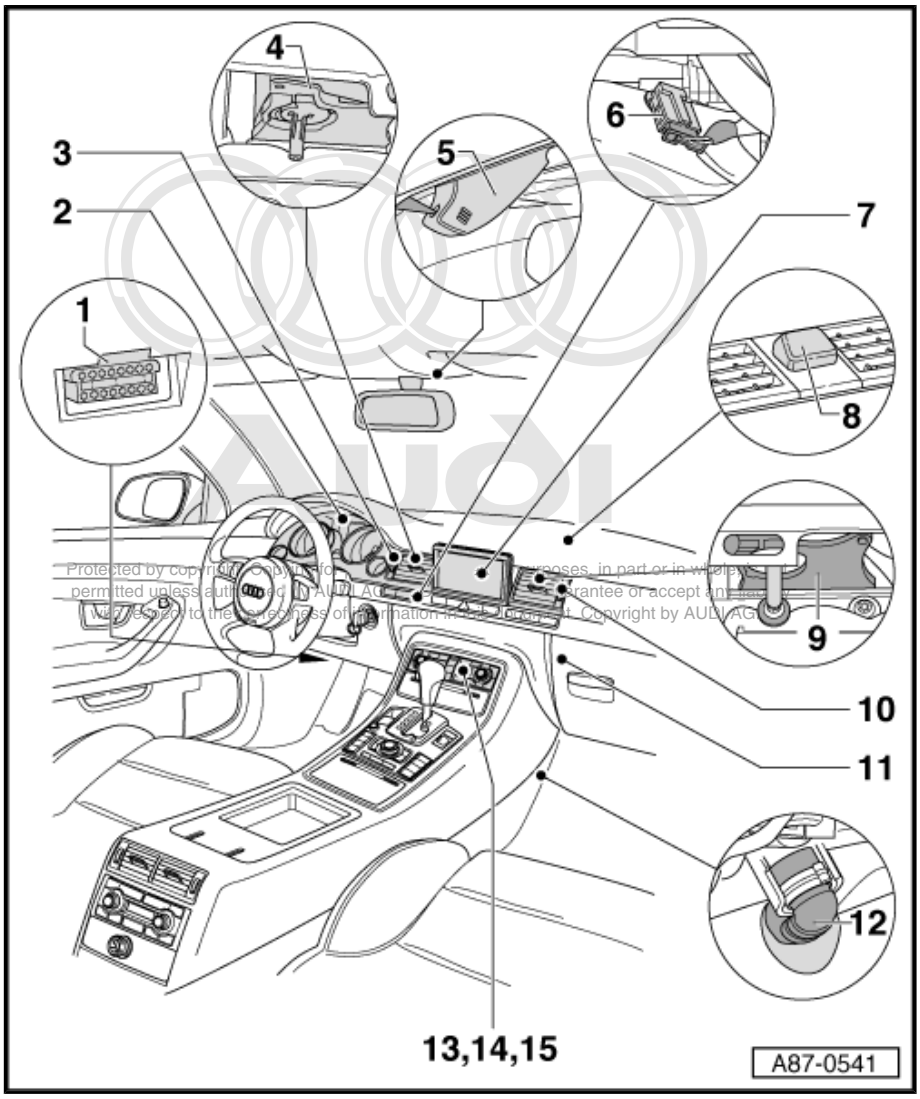
8 Components for control and regulation of air conditioner located in passenger compartment

Note

- *If there is a fault in the system, start by reading out the fault memory of the front operating and display unit, Climatronic control unit -J255- (and the rear Climatronic operating and display unit -E265-) ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *If no fault is displayed, read out the measured value block of the front operating and display unit, Climatronic control unit -J255- (and the rear Climatronic operating and display unit -E265-) and actuate any problematic components by way of the „Final control diagnosis“ function ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *For servicing work on refrigerant circuit, refer to ⇒ page 135 .*
- *Perform the following operations on completion of repair work ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051 :*

- Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- (and the rear Climatronic operating and display unit -E265-) and erase any faults displayed.
- Check encoding of front operating and display unit, Climatronic control unit -J255- .
- If necessary, check adaption of front operating and display unit, Climatronic control unit -J255- and rear Climatronic operating and display unit -E265- (not fitted on all vehicles).
- Perform air conditioner basic setting
- Electrical checking of the various control motors, potentiometers and senders is described in the guided fault-finding routine ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

8.1 Components located in passenger compartment



1 - Diagnostic socket

- Air conditioner guided fault-finding procedure ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051

2 - Dash panel insert

- With ambient temperature indicator -G106-
- The ambient temperature output by the front operating and display unit, Climatronic control unit -J255- is indicated
- In the event of an incorrect temperature display, check the measured values of the temperature sensors ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- The measured value of the ambient temperature sensor -G17- is evaluated by the control unit in dash panel insert and transmitted by way of the convenience data bus system to the front operating and display unit, Climatronic control unit -J255- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

3 - Dash panel vent with centre left vent sender -G347-

- The potentiometer is installed in the dash panel vent.
- Removing and installing dash panel vent ⇒ General body repairs, interior; Rep. gr. 70

4 - Left centre vent control motor -V110-

- With potentiometer -G136-
- Removing and installing ⇒ page 76

5 - Humidity sender -G355-

- Operation of the humidity sender -G355- is described in the relevant self study programme for this vehicle ⇒ Self-study programme No. 282 ; Audi A8 Technology
- The humidity sender -G355- is installed in the area of the interior mirror at the windscreen and connected to the roof electronics control unit -J528- . ⇒ General body repairs, exterior; Rep. gr. 64
- Removing and installing ⇒ General body repairs, exterior; Rep. gr. 64
- The humidity sender -G355- determines the windscreen temperature by way of an infrared signal and the humidity level by way of a built-in condenser. The front operating and display unit, Climatronic control unit -J255- uses the measured values to calculate the temperature/humidity level at which the windows start to mist up and alters the settings (outflow temperature of air, outflow direction of air and air flow rate). The measured values of the sender are indicated in the measured value block of the front operating

and display unit, Climatronic control unit -J255- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

6 - Centre vent temperature sender -G191-

- ❑ Removing and installing ⇒ page 79

7 - Multi Media Interface (MMI)

- ❑ The MMI display indicates the functions selected on the front operating and display unit, Climatronic control unit -J255- (and various additional air conditioner functions) ⇒ Owner's manual and ⇒ Operating instructions for „Infotainment / MMI“ .
- ❑ The Se-up button on the front operating and display unit, Climatronic control unit -J255- can be used to call up and alter the setting of various additional air conditioner functions ⇒ Owner's manual
- ❑ On vehicles 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 front operating and display units, Climatronic control unit -J255- are being gradually introduced (with no Setup button) ⇒ Item 13 (page 72) and ⇒ Electronic parts catalogue . On vehicles with such front 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 front operating and display unit. The air conditioner functions selected are incorporated into the current display. On these vehicles, certain air conditioner functions are selected and activated by way of the rotary knob/pushbutton of the operating unit for the „MMI“ ⇒ Owner's manual and ⇒ Operating instructions for „Infotainment / MMI“ .

Note

8 - Sunlight penetration photosensor -G107-

- ❑ Removing and installing ⇒ page 80

9 - Right centre vent control motor -V111-

- ❑ With potentiometer -G137-
- ❑ Removing and installing ⇒ page 79

10 - Dash panel vent with centre right vent sender -G348-

- ❑ The potentiometer is installed in the dash panel vent
- ❑ Removing and installing dash panel vent ⇒ General body repairs, interior; Rep. gr. 70

11 - Air conditioning unit

- ❑ Different versions for vehicles with and without rear Climatronic operating and display unit -E265- ⇒ page 118 and ⇒ page 183
- ❑ Air routing in air conditioning unit and vehicle ⇒ page 118
- ❑ Air conditioning unit components located in passenger compartment ⇒ page 92
- ❑ Removing and installing ⇒ page 179

12 - Condensation drain hose

- ❑ Right (front passenger side)
- ❑ Checking, removing and installing ⇒ page 90

13 - Front operating and display unit, Climatronic control unit -J255-

- ❑ Different versions (without or with seat heating, seat heating without or with seat ventilation, with A/C button or with Setup button etc.); for assignment refer to ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ page 80
- ❑ The dash panel temperature sensor -G56- is integrated into the front operating and display unit, Climatronic control unit -J255- .
- ❑ The temperature sensor blower -V42- is installed in the front operating and display unit, Climatronic control unit -J255- but can be replaced separately ⇒ page 80
- ❑ Also heed additional notes on operating and display unit ⇒ page 80
- ❑ Front operating and display unit, Climatronic control unit -J255- self-diagnosis is to be performed as described in the guided fault-finding routine ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

- ❑ The buttons and display zones are illuminated by LEDs which cannot be replaced
- ❑ The two rotary controls are clipped on; they can be carefully detached and replaced separately ⇒ Electronic parts catalogue
- ❑ Front operating and display units, Climatronic control unit -J255- with software number „026“ fitted in Model Year 2003: With these front operating and display units, Climatronic control unit -J255- , settings assigned to a specific person by way of a fingerprint may be lost on starting the vehicle by way of the „one-touch memory“. On vehicles with „one-touch memory“, service installation of front operating and display units, Climatronic control unit -J255- with this software number is therefore not permitted.
- ❑ As of Model Year 2009, front operating and display units, Climatronic control unit -J255- with part number 4E0 820 043 as of index „J“ are gradually being introduced ⇒ Electronic parts catalogue . On vehicles with such front 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 front operating and display unit. The air conditioner functions selected are incorporated into the current display. On these vehicles, certain air conditioner functions are selected and activated by way of the rotary knob/pushbutton of the operating unit for the „MMI“ ⇒ Owner's manual and ⇒ Operating instructions for „Infotainment / MMI“ . These front operating and display units also have an A/C button instead of the Setup button ⇒ Owner's manual .

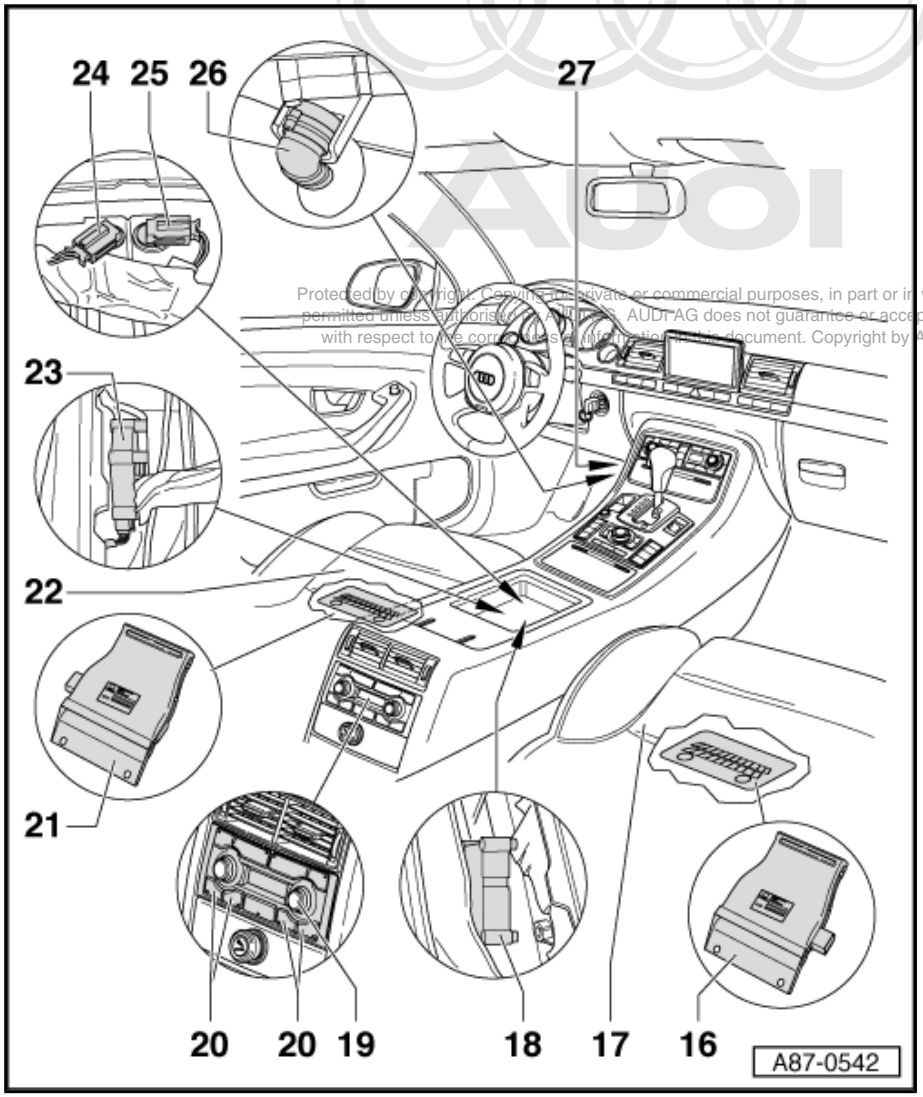
Note

14 - Temperature sensor blower -V42-

- ❑ Installed in front operating and display unit, Climatronic control unit -J255-
- ❑ Removing and installing blower ⇒ page 80

15 - Temperature sensor -G56-

- ❑ Installed in front operating and display unit, Climatronic control unit -J255- ; cannot be replaced separately



16 - Rear right footwell heater element -Z43-

- ❑ Removing and installing ⇒ page 83
- ❑ Only installed on vehicles with rear Climatronic operating and display unit -E265- (optional extra).

17 - 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)
- ❑ Actuation of the seat heating and seat ventilation is indicated in the measured value block of the front operating and display unit, Climatronic control unit -J255- , checking ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- ❑ Servicing seat heating and seat ventilation ⇒ General body repairs, interior; Rep. gr. 74

18 - Rear right vent warm air and cold air flap control motor -V221-

- ❑ With potentiometer -G352-
- ❑ Removing and installing ⇒ page 87
- ❑ Only installed on vehicles with rear Climatronic operating and display unit -E265- (optional extra).
- ❑ On vehicles with no rear Climatronic operating and display unit -E265- (no rear right vent warm air and cold air flap control motor -V221-), the flaps for the right side are moved by way of a joint shaft by the rear left vent warm air and cold air flap control motor -V220- ⇒ page 118 .
- ❑ The connecting element between the flap and motor is „blue“ coloured.

19 - Rear Climatronic operating and display unit -E265-

- ❑ Not fitted on all vehicles (optional extra)
- ❑ Different versions (without or with rear seat heating, rear seat heating without or with seat ventilation), for assignment refer to ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ page 80 and ⇒ page 87
- ❑ Also heed additional notes on rear operating and display unit ⇒ page 80 and ⇒ page 87
- ❑ Rear Climatronic operating and display unit -E265- self-diagnosis is to be performed as described in the guided fault-finding routine ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- ❑ Adaption of the rear Climatronic operating and display unit -E265- is to be checked as described in the guided fault-finding routine and altered if necessary ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- ❑ The buttons and display zones are illuminated by LEDs which cannot be replaced
- ❑ The two rotary controls are clipped on; they can be carefully detached and replaced separately ⇒ Electronic parts catalogue

20 - Actuation of rear seat heating and ventilation

- Not all vehicles feature rear seat heating and ventilation (optional extra)
- On vehicles with no rear Climatronic operating and display unit -E265- , the rear seat heating is actuated by way of 2 rotary switches ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- The measured values of the rear left seat temperature sensor -G94- and rear right seat temperature sensor -G95- are displayed in the measured value block of the rear Climatronic operating and display unit -E265- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- Actuation of the rear seat heating (heated bench seat cushion for rear left seat -Z10- to heated backrest for rear right seat -Z13-) and seat ventilation is displayed in the measured value block of the rear Climatronic operating and display unit -E265- , checking ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- Servicing rear seat heating and ventilation ⇒ General body repairs, interior; Rep. gr. 74

21 - Rear left footwell heater element -Z42-

- Removing and installing ⇒ page 83
- Only installed on vehicles with rear Climatronic operating and display unit -E265- (optional extra).

22 - 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)
- Actuation of the seat heating and seat ventilation is indicated in the measured value block of the front operating and display unit, Climatronic control unit -J255- , checking ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- Servicing seat heating and seat ventilation ⇒ General body repairs, interior; Rep. gr. 74

23 - Rear left vent warm air and cold air flap control motor -V220-

- With potentiometer -G351-
- Removing and installing ⇒ page 85
- Only actuates flaps for left side on vehicles with rear Climatronic operating and display unit -E265- (optional extra)
- The connecting element between the flap and motor is „red“ coloured.
- On vehicles with no rear Climatronic operating and display unit -E265- (no rear right vent warm air and cold air flap control motor -V221-), the flaps for the right side are also moved by way of a joint shaft by the rear left vent warm air and cold air flap control motor -V220- ⇒ page 118 .

24 - Rear right centre console temperature sensor -G312-

- Only installed on vehicles with rear Climatronic operating and display unit -E265- (optional extra).
- The mounting hole is sealed with a plug on vehicles with no rear right centre console temperature sensor -G312- .
- Removing and installing ⇒ page 84

25 - Rear left centre console temperature sensor -G311-

- Only installed on vehicles with rear Climatronic operating and display unit -E265- (optional extra).
- The mounting hole is sealed with a plug on vehicles with no rear left centre console temperature sensor -G311- .
- Removing and installing ⇒ page 84

26 - Condensation drain hose

- Left (driver side)
- Checking, removing and installing ⇒ page 90

27 - Accelerator mechanism

- Kick-down deactivation of the compressor by the front 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 (data are exchanged via the data bus system). The current status can be read off in the measured value block of the front operating and display unit, Climatronic control unit -J255- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051

8.2 Removing and installing left centre vent control motor -V110-

Note

- *Mark the motor/flap connecting element on removal to avoid interchange with the connecting elements of other control motors.*
- *In the event of the fault „Upper or lower limit value exceeded“, check the motor/flap connecting element. It must be properly attached to the motor and there must not be any clearance between the control motor mount and the connecting element.*
- *In the event of „clicking noise“ from the area of the control motor, check the connection of the lug of the connecting element at the control motor to the vent adjustment levers. Such noise may be produced if the lug does not engage properly between the two adjustment levers.*

8.2.1 Removing

– Remove the storage compartment beneath the dash panel on the left ⇒ General body repairs, interior; Rep. gr. 70 .

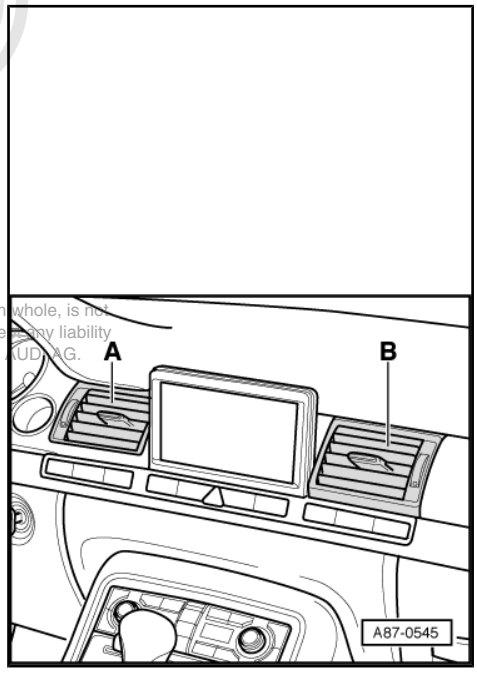
– Switch on ignition.

– Set the air distribution at the front operating and display unit, Climatronic control unit -J255- to dash panel vents and open the two dash panel vents -A- and -B-.

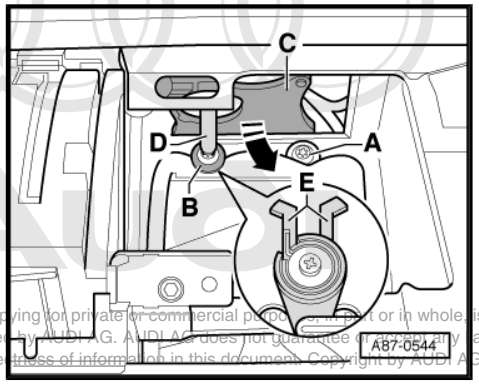
– Pull the left centre dash panel vent -A- out of the dash panel ⇒ General body repairs, interior; Rep. gr. 70 .

– Close the left -A- and right -B- centre dash panel vents by way of the corresponding knurled wheels.

– Set the air distribution to footwell on the front operating and display unit, Climatronic control unit -J255- .



– Wait until the lug -D- is positioned such that the bolt -B- can be removed.
– Switch off ignition.
– Disconnect the wiring to the left centre dash panel vent and remove the entire vent ⇒ General body repairs, interior; Rep. gr. 70 .
– Remove the bolts -A- and -B-.

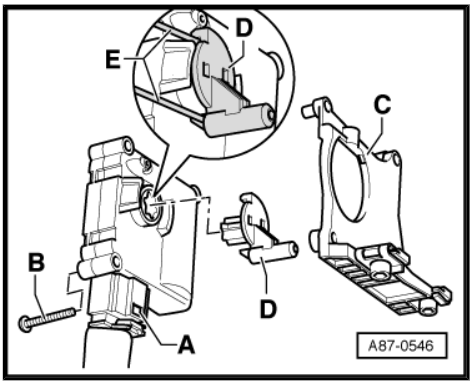


Note

- *If the control motor cannot be moved and the lug -D- is positioned such that the bolt -B- cannot be removed:*
- *Unplug the connector attached to the air conditioning unit in the wiring to the control motor.*
- *Use an adapter cable ⇒ page 47 or test lead from the adapter set -V.A.G 1594/C- for example to connect contacts 5 and 6 of the control motor to a 12 V battery by way of a 5 A fuse.*
- *Turn the control motor until the bolt -B- can be removed. The direction of rotation can be reversed by interchanging positive and negative.*

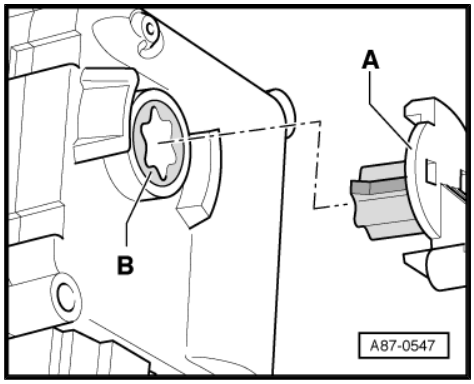
– Disconnect the wire to the control motor -C- at the attachment points.
– Tilt the control motor -C- with the holder in arrow direction out of the mount in the dash panel.

– Detach the connector -A-.
– Remove the bolts -B-.
– Detach the holder -C-.
– Use 2 screwdrivers to prise off the connecting element -D-.



8.2.2 Installing

– Attach the connecting element -A- to the control motor shaft.



Note

- *Check the positioning of the connecting element. It must engage in the shaft of the motor and there must not be any clearance between the control motor shaft and the connecting element.*
- *The connecting element is only to be attached in the position in which it engages without having to exert force. If pre-tension is required to insert the connecting element, check the mount of the motor as this may be turned through 180°.*
- *The control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. When the control motor has been detached, voltage is therefore only to be applied with the connecting element -A- attached.*
- *The motor may be incorrectly positioned if pre-tension is required to insert the connecting element -A- in the control motor.*
- *If the shaft is so awkwardly positioned that the connecting piece cannot be attached, use an adapter cable for example ⇒ page 47 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 no pre-tension is required to attach the connecting element. The direction of rotation can be reversed by interchanging positive and negative.*

– Install the control motor.

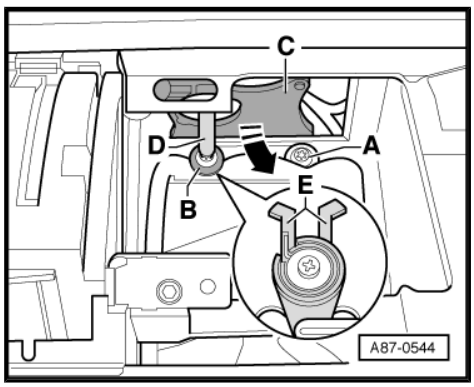
– Moisten the guide in the dash panel vent with a small quantity of lubricating paste -G 000 150- for example ⇒ Electronic parts catalogue

– After installing the control motor, perform the „Basic setting“ function in the air conditioner self-diagnosis routine. A fault will be displayed if the connecting element has not been fitted properly ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

– Switch on ignition.

– Set the air distribution to dash panel vents on the front operating and display unit, Climatronic control unit -J255- .

– Wait for the lug -D- to reach the position shown.



– Install the dash panel vent, taking care to ensure that the lug -D- is inserted between the two shut-off flap levers -E- ⇒ General body repairs, interior; Rep. gr. 70

– Re-install the components removed in reverse order.

– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

– Perform air conditioner basic setting and final control diagnosis ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

8.3 Removing and installing right centre vent control motor -V111-

Note

- *Mark the motor/flap connecting element on removal to avoid interchange with the connecting elements of other control motors.*
- *In the event of the fault „Upper or lower limit value exceeded“, check the motor/flap connecting element. It must be properly attached to the motor and there must not be any clearance between the control motor mount and the connecting element.*
- *In the event of „clicking noise“ from the area of the control motor, check the connection of the lug of the connecting element at the control motor to the vent adjustment levers. Such noise may be produced if the lug does not engage properly between the two adjustment levers.*

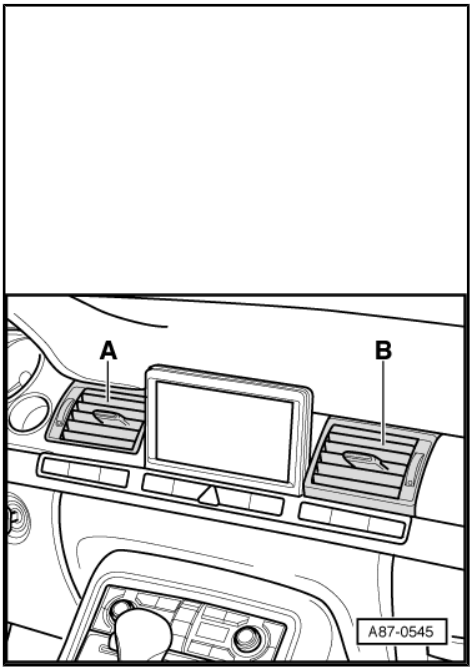
– Remove the glove compartment ⇒ General body repairs, interior; Rep. gr. 68 .

– Switch on ignition.

– Set the air distribution at the front operating and display unit, Climatronic control unit -J255- to dash panel vents and open the two dash panel vents -A- and -B-.

– Pull the right centre dash panel vent -B- out of the dash panel ⇒ General body repairs, interior; Rep. gr. 70 .

– Remove/re-install the right dash panel vent and control motor in the same manner as described for the left dash panel vent ⇒ page 76 .



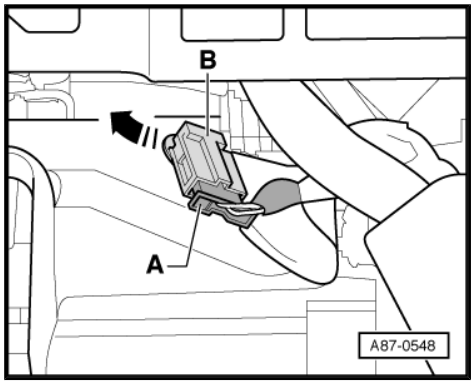
8.4 Removing and installing centre vent temperature sender -G191-

– Switch off ignition.

– Remove the centre console ⇒ General body repairs, interior; Rep. gr. 70 .

– Remove the storage compartment beneath the dash panel on the left and the steering column support to the transmission tunnel ⇒ General body repairs, interior; Rep. gr. 68

– Unplug the connector -A-.
– Give the vent temperature sender -B- an approx. 90° turn in arrow direction.
– Pull the vent temperature sender out of the air duct.

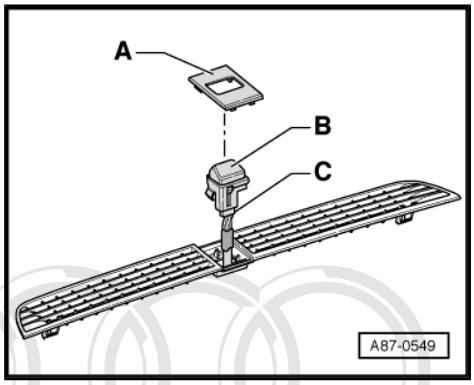


Note

Depending on the design of the air duct, the sender may also be installed at a different location in the duct.

8.5 Removing and installing sunlight penetration photosensor -G107-

– Switch off ignition.
– Carefully prise the cover -A- out of the windscreen defroster vent
– Carefully prise the sunlight penetration photosensor -B- out of the windscreen defroster vent.
– Detach the connector -C-.

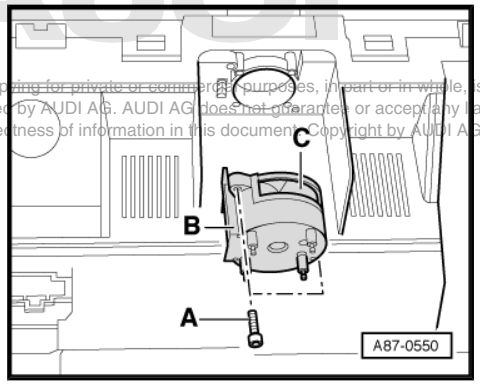


Note

Different versions of the sunlight penetration photosensor -G107- are available. Attention is therefore to be paid to correct assignment ⇒ Electronic parts catalogue .

8.6 Removing and installing temperature sensor blower -V42-

– Remove the front operating and display unit, Climatronic control unit -J255- ⇒ page 80 .
– Remove the bolts -A-.
– Pull the temperature sensor blower -V42- -B- out of the front operating and display unit, Climatronic control unit -J255-.

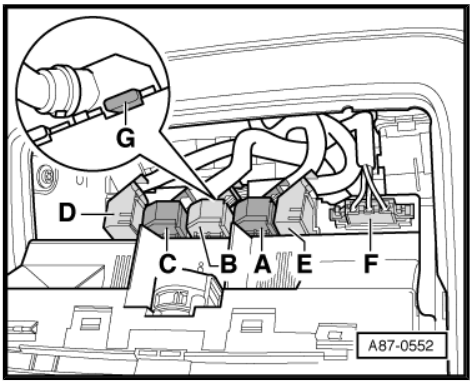


Note

When installing the temperature sensor blower -V42- , do not press on the motor -C- but rather hold the blower at the housing.

8.7 Removing and installing front operating and display unit, Climatronic control unit -J255-

– Removing and installing front operating and display unit, Climatronic control unit -J255- ⇒ page 82



Note

- *Front air conditioner operating and display units can no longer be interchanged in the familiar manner. As soon as a front operating and display unit, Climatronic control unit -J255- has been matched to a vehicle, the component protection feature is activated ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *If a front 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 ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *The component protection feature can only be cancelled by entering certain vehicle data ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*

- *The front operating and display unit, Climatronic control unit -J255- may also be referred to as „Climatronic control unit -J255“ in current flow diagrams.*
- *When replacing a front operating and display unit, Climatronic control unit -J255- , attention must be paid to the exact assignment ⇒ Electronic parts catalogue .*
- *There are different versions of the front operating and display unit, Climatronic control unit -J255- for vehicles with and without heated seats/seat heating without or with seat ventilation. The part number index must therefore be heeded. ⇒ Electronic parts catalogue*
- *After installing the front operating and display unit, Climatronic control unit -J255- , air conditioner basic setting is to be implemented in the specified manner ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *If a new front operating and display unit has been installed and basic setting not performed, front operating and display unit, Climatronic control unit -J255- control action is restricted and this is displayed as a fault in the fault memory ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *The front operating and display unit, Climatronic control unit -J255- can be started up for a certain length of time (up to approx. 30 minutes) after switching off the ignition by pressing the* `On/Off` *button (the operating time is governed by the battery charge; maximum time approx. 10 minutes). ⇒ Owner's manual*
- *The front operating and display unit, Climatronic control unit -J255- uses LEDs for illumination of the display zones and controls (LEDs cannot be replaced).*
- *In the event of incorrect dash panel temperature sensor -G56- measurements, check the intake grille of the front operating and display unit, Climatronic control unit -J255- trim panel (must not be closed off) as well as operation of the temperature sensor blower -V42- .*
- *The functions selected are indicated by lighting of LEDs in the various front operating and display unit, Climatronic control unit -J255- buttons.*
- *The unit (°C or °F) for the temperature display of the front operating and display unit is transmitted by the MMI (Multi Media Interface) via the convenience data bus system and is determined by the setting entered ⇒ Owner's manual and ⇒ Operating instructions for „Infotainment / MMI“.*
- *Front operating and display units, Climatronic control unit -J255- with software number „026“ were installed in Model Year 2003. With these front operating and display units, Climatronic*

Always perform the following operations after replacing the front operating and display unit, Climatronic control unit -J255- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051. :

– Check encoding.
– Implement basic setting.
– Check adaption.
– Interrogate fault memory.

♦ As of Model Year 2009, front operating and display units, Climatronic control unit -J255- with part number 4E0 820 043 as of index „J“ are gradually being introduced ⇒ Electronic parts catalogue . On vehicles with such front 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 front operating and display unit. The air conditioner functions selected are incorporated into the current display. On these vehicles, certain air conditioner functions are selected and activated by way of the rotary knob/pushbutton of the operating unit for the „MMI“ ⇒ Owner's manual and ⇒ Operating instructions for „Infotainment / MMI“ . In addition, front operating and display units of this type feature an A/C button instead of the Setup button and an OFF button instead of the ON/OFF button ⇒ Owner's manual .

Note

♦ *On vehicles with a front operating and display unit, Climatronic control unit -J255- with no Setup button, the additional functions are selected by way of the „Multi Media Interface (MMI) terminal“ ⇒ Owner's manual and ⇒ Operating instructions for „Infotainment / MMI“ .*

♦ *Pay attention to correct assignment of the front operating and display unit, Climatronic control unit -J255- to control unit 1 for information electronics -J794- ⇒ Electronic parts catalogue (different versions). In the event of incorrect assignment, the various air conditioner functions cannot be displayed in the MMI and selected.*

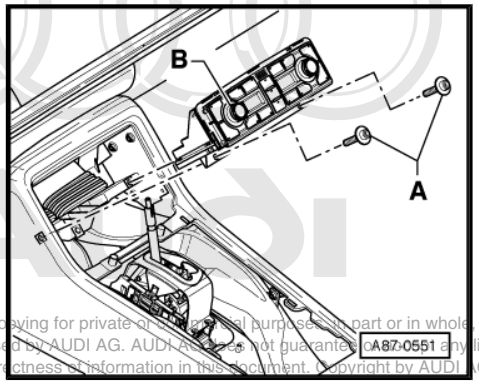
8.7.1 Removing and installing front operating and display unit, Climatronic control unit -J255-

Removing

– Interrogate the encoding and adaption of the front operating and display unit, Climatronic control unit -J255- by way of the guided fault-finding „Control unit replacement“ function (if the front operating and display unit, Climatronic control unit -J255- is to be replaced) ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Switch off ignition.
– Remove the trim for the front dash panel centre section and the ashtray ⇒ Body Repairs; Rep. gr. 68

– Screw out the 2 bolts -A-.

– Remove the front operating and display unit, Climatronic control unit -J255- from the centre console.

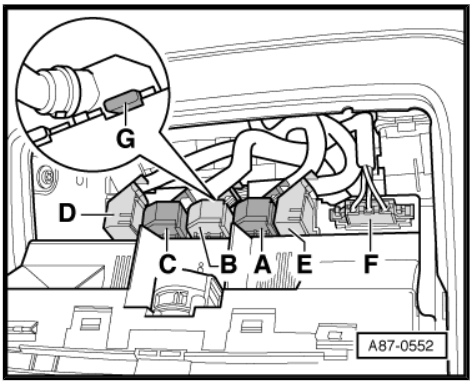


– Release the fasteners of the connector -E- by pressing the retainer tabs -G- and unplug this connector.

– Wait 30 s (to protect the electronics in the front operating and display unit, Climatronic control unit -J255-).

– Release the fasteners of the connectors -A- to -D- by pressing the retainer tabs -G- and unplug the connectors.

– Release and unplug the connector -F-.



Installing

Install in reverse order.

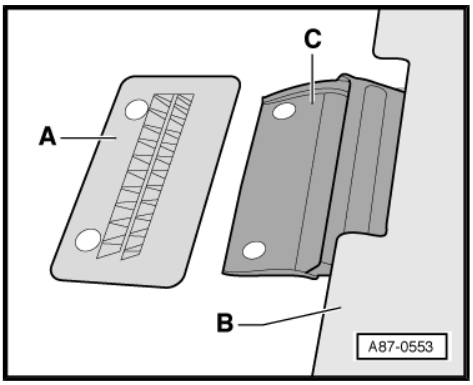
– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

– Perform air conditioner basic setting, encoding, adaption and final control diagnosis ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

8.8 Removing and installing rear left footwell heater element -Z42- / rear right footwell heater element -Z43-

Note

- *The rear left footwell heater element -Z42- and the rear right footwell heater element -Z43- are actuated by the front operating and display unit, Climatronic control unit -J255- by way of a signal wire. Actuation is displayed in the measured value block ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *The supplementary heater element consists of a control unit, a temperature sensor and at present 4 transistors with heat sinks which generate the heat and supply it to the passing air flow.*
- *The supplementary heater element is only fitted on vehicles with a rear Climatronic operating and display unit -E265- in the vent -C- (optional extra).*

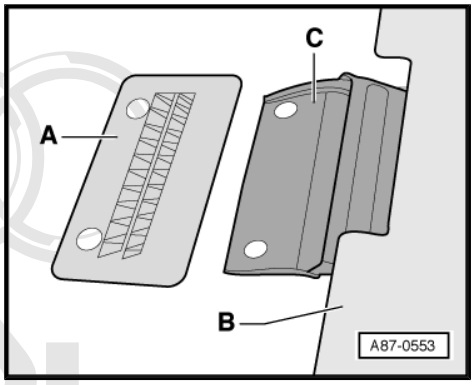


Removing

– Switch off ignition.

– Remove the left/right seat ⇒ Body Repairs; Rep. gr. 72

– Remove the cover -A-.
– Lift the floor covering -B-.
– Unplug the connector to the supplementary heater element.
– Remove the vent -C- with supplementary heater element.

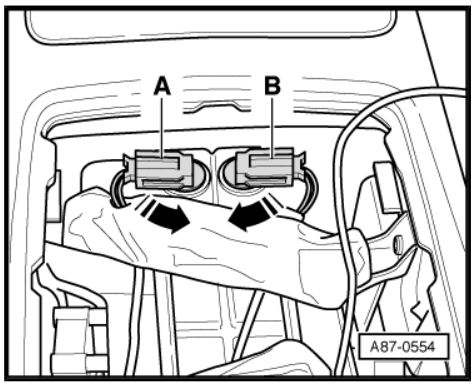


Installing

Install in reverse order.

8.9 Removing and installing rear left centre console temperature sensor -G311- and rear right centre console temperature sensor -G312-

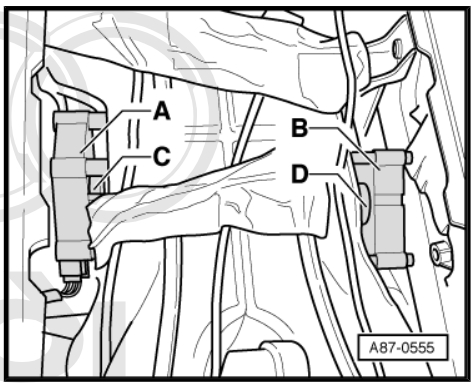
– Switch off ignition.
– Remove the rear centre console cover ⇒ Body Repairs; Rep. gr. 68
– Unplug the connector from the temperature sensor -A- or -B-.
– Turn -A- (rear left centre console temperature sensor -G311-) or -B- (rear right centre console temperature sensor -G312-) approx. 90° in arrow direction.
– Pull the corresponding temperature sensor out of the air duct.



Note

- *The rear left centre console temperature sensor -G311- and the rear right centre console temperature sensor -G312- are only fitted on vehicles with a rear Climatronic operating and display unit -E265- (optional extra). On vehicles with no rear Climatronic operating and display unit -E265- , the openings in the air duct are sealed with plugs.*
- *Pay attention to the arrangement of the connectors to the rear left centre console temperature sensor -G311- and the rear right centre console temperature sensor -G312- and mark if necessary to avoid possible interchange.*
- *In cases of doubt about correct connector assignment, unplug the connector from one temperature sensor for example and then interrogate the fault memory of the rear Climatronic operating and display unit -E265- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*

8.10 Removing and installing rear left vent warm air and cold air flap control motor -V220-



Note

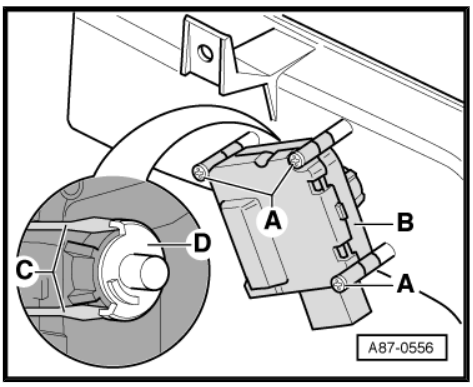
- *On vehicles with a rear Climatronic operating and display unit -E265- (optional extra), this control motor only actuates the left flap in the rear air duct.*
- *On vehicles with no rear Climatronic operating and display unit -E265- , this control motor actuates the flaps for the left and right side in the rear air duct (the shafts of the flaps are interconnected).*
- *On vehicles with a rear Climatronic operating and display unit -E265- , pay attention to the arrangement of the connectors to the two control motors -A- (rear left vent warm air and cold air flap control motor -V220-) with connecting element -C- („red“ colour) and control motor -B- (rear right vent warm air and cold air flap control motor -V221-) with connecting element -D- („blue“ colour) and mark if necessary to avoid possible interchange.*
- *In cases of doubt about correct connector assignment, unplug the connector from one control motor for example and then interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*

Removing

– Switch off ignition.

– Remove the centre console. ⇒ Body Repairs; Rep. gr. 70

– Remove the air duct from the centre console ⇒ Body Repairs; Rep. gr. 68



– Remove the bolts -A-.

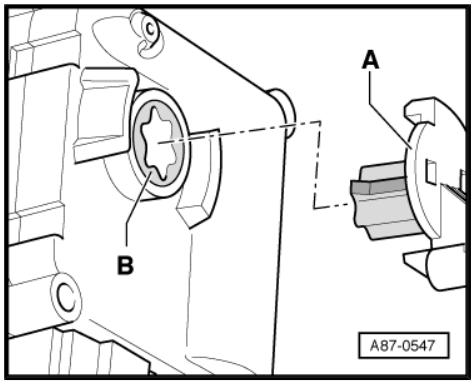
– Detach the control motor -B-.

– Use 2 screwdrivers -C- to prise off the connecting element -D-.

Installing

– Attach the connecting element -A- to the control motor shaft.

Perform further installation operations in the reverse order of removal.



Note

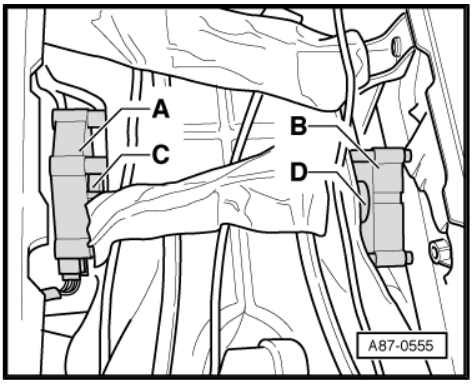
- *Check the positioning of the connecting element. It must engage in the mount of the motor and there must not be any clearance between the control motor mount and the connecting element.*
- *Pay attention to correct assignment of the connecting element („red“ colour for left control motor and „blue“ colour for right control motor).*
- *The connecting piece is only to be attached in the position in which it engages without having to exert force. If pre-tension is required to insert the connecting piece, check the mount of the motor as this may be turned through 180°.*
- *The control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. When the control motor has been detached, voltage is therefore only to be applied with the connecting element -A- attached.*
- *The motor may be incorrectly positioned if pre-tension is required to insert the connecting piece -A- in the control motor.*
- *If the shaft is so awkwardly positioned that the connecting piece cannot be attached, use an adapter cable for example ⇒ page 47 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.*
- *In the event of the fault „Upper or lower limit value exceeded“, check the motor/flap connecting element. It must be properly attached to the motor and there must not be any clearance between the control motor mount and the connecting element.*
- *Turn the control motor until no pre-tension is required to attach the intermediate piece. The direction of rotation can be reversed by interchanging positive and negative.*

– Re-install the components removed in reverse order.

– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

– Perform basic setting and final control diagnosis for the air conditioner. ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

8.11 Removing and installing rear right vent warm air and cold air flap control motor -V221-



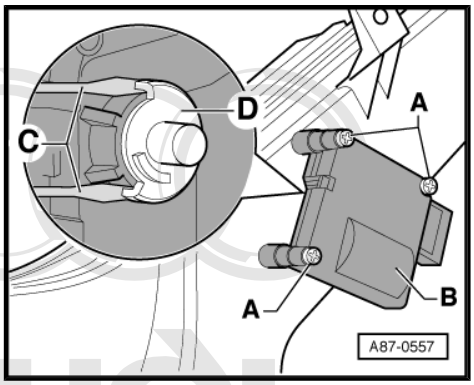
Note

- *On vehicles with no rear Climatronic operating and display unit -E265- , the rear left vent warm air and cold air flap control motor -V220- actuates the flaps for the left and right side in the rear air duct (the shafts of the flaps are inter-connected; there is no rear right vent warm air and cold air flap control motor -V221-).*
- *On vehicles with a rear Climatronic operating and display unit -E265- , pay attention to the arrangement of the connectors to the two control motors -A- (rear left vent warm air and cold air flap control motor -V220-) with connecting element -C- („red“ colour) and control motor -B- (rear right vent warm air and cold air flap control motor -V221-) with connecting element -D- („blue“ colour) and mark if necessary to avoid possible inter-change.*
- *In cases of doubt about correct connector assignment, unplug the connector from one control motor for example and then interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- . ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *In the event of the fault „Upper or lower limit value exceeded“, check the motor/flap connecting element. It must be properly attached to the motor and there must not be any clearance between the control motor mount and the connecting element.*

Removing and installing

– Switch off ignition.

– Remove/re-install the rear right vent warm air and cold air flap control motor -V221- -B- in same manner as described for the rear left vent warm air and cold air flap control motor -V220- ⇒ page 85 .



8.12 Removing and installing rear Climatronic operating and display unit -E265-

– Removing and installing rear Climatronic operating and display unit -E265- ⇒ page 89

Note

- *At present, the rear Climatronic operating and display unit -E265- can still be exchanged in the familiar manner, as component protection is not yet active for this component (introduction of component protection not yet finalised) ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *Front air conditioner operating and display units can no longer be interchanged in the familiar manner. As soon as a front operating and display unit, Climatronic control unit -J255- has been matched to a vehicle, the component protection feature is activated ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *If a front 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. This also applies to rear Climatronic operating and display unit -E265- functions ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051*
- *When replacing a rear Climatronic operating and display unit -E265- , attention must be paid to the exact assignment ⇒ Electronic parts catalogue .*
- *There are different versions of the rear Climatronic operating and display unit -E265- for example for vehicles with and without heated rear seats, rear seat heating without or with rear seat ventilation. The part number index must therefore be heeded. ⇒ Electronic parts catalogue*
- *After installing the rear Climatronic operating and display unit -E265- , air conditioner basic setting is to be implemented in the specified manner ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*
- *The functions selected are indicated by lighting of LEDs in the various rear Climatronic operating and display unit -E265- buttons.*

- *If the information „rear door childproof lock activated“ is received via the data bus system, the rear Climatronic operating and display unit -E265- is switched off and, depending on version, the display of the rear Climatronic operating and display unit -E265- shows e.g. „Passive“ (the air conditioner can then only be operated by way of the front operating and display unit, Climatronic control unit -J255-). ⇒ Owner's manual*
- *The unit (°C or °F) for the temperature display of the rear Climatronic operating and display unit -E265- is transmitted by the MMI (Multi Media Interface) via the convenience data bus system and is determined by the setting entered.*
- *The rear Climatronic operating and display unit -E265- uses LEDs for illumination of the display zones and controls (LEDs cannot be replaced).*
- *Lengthy pressing of the buttons on the rear Climatronic operating and display unit -E265- (e.g. caused by objects resting on them) may lead to a fault being stored in the fault memory on account of the buttons sticking. If applicable, check operation of the buttons and erase the fault memory if no problem is found.*
- *The two rotary controls are clipped on; they can be carefully detached and replaced separately ⇒ Electronic parts catalogue*
- *As of Model Year 2009, front operating and display units, Climatronic control unit -J255- with part number 4E0 820 043 as of index „J“ and modified versions of the rear Climatronic operating and display unit -E265- are gradually being introduced (e.g different symbols on controls). Attention is therefore to be paid to correct assignment ⇒ Electronic parts catalogue .*

Always perform the following operations after replacing the rear Climatronic operating and display unit -E265- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051. :

– Implement basic setting.
– Check adaption.
– Interrogate fault memory.

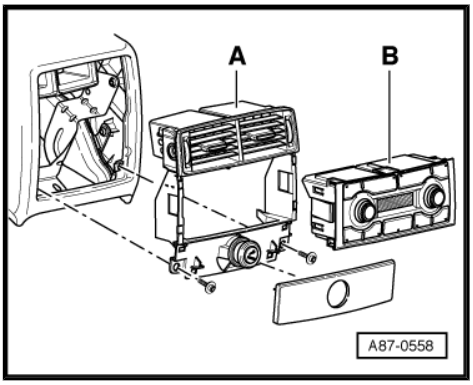
8.12.1 Removing and installing rear Climatronic operating and display unit -E265-

Note

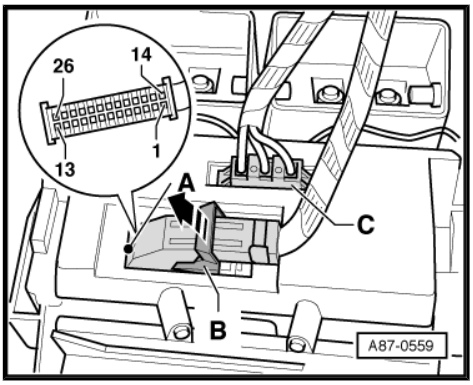
At present, the rear Climatronic operating and display unit -E265- can still be exchanged in the familiar manner, as component protection is not active (introduction of component protection not yet finalised) ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051 .

Removing

– Interrogate the adaption of the rear Climatronic operating and display unit -E265- by way of the guided fault-finding „Control unit replacement“ function (if the rear Climatronic operating and display unit -E265- is to be replaced) ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Switch off ignition.
– Remove the rear centre console vents -A-. ⇒ General body repairs, interior; Rep. gr. 68



– Release the fastener of the connector -A- by lifting the clip -B- and unplug the connector.
– Release and unplug the connector -C-.
– Pull the rear Climatronic operating and display unit -E265- -B- out of the centre console vent -A- (clipped in).

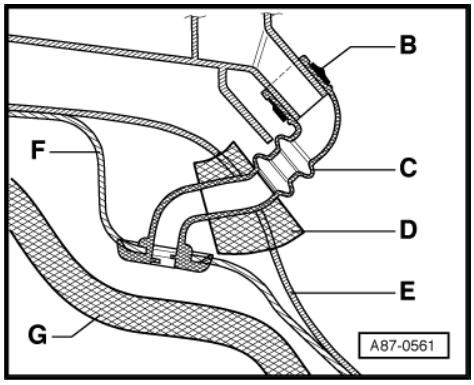


Installing

Install in reverse order.

– Interrogate the fault memory of the rear Climatronic operating and display unit -E265- and the front operating and display unit, Climatronic control unit -J255- and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Perform air conditioner basic setting, adaption and final control diagnosis ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

8.13 Removing, checking and installing condensation drain hose



Note

- *This vehicle is fitted with 2 condensation drains (on the right and left at the air conditioning unit/transmission tunnel).*
- *The condensation drain valve -C- has no flap.*

- In the event of moisture problems in the passenger compartment, check the following in addition to the condensation drains:

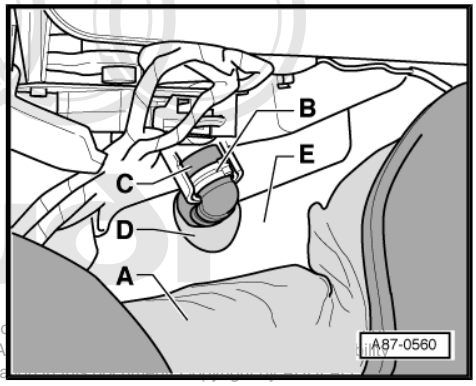
– Water drain for plenum chamber ⇒ page 41
– Proper installation of plenum chamber cover ⇒ page 31
– Dust and pollen filter for contamination and corresponding cover for correct installation ⇒ page 31
– Forced-air extraction in luggage compartment ⇒ page 41
– Operation of air flow flap ⇒ page 45 and air recirculation flap ⇒ page 47 e.g. by way of „Final control diagnosis“ function ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– The measured values and operation of the humidity sender -G355- at the front operating and display unit, Climatronic control unit -J255- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– The signal for detection of wiper operation at the front operating and display unit, Climatronic control unit -J255- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

- Check the temperature of the air flowing out of the evaporator by way of the measured values of the evaporator output temperature sender -G263- under the usage conditions described by the customer with the following settings on the front operating and display unit, Climatronic control unit -J255- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

– „Lo“ temperature set for driver and front passenger side
– Medium fresh air blower speed (approx. 7V) ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Air conditioner „fresh air mode“

Note

- *If the sender measured value is too low (at ambient temperature above 0 °C, colder than 0 °C for lengthy period) or too high (greater than e.g. 10 °C although the air conditioner is functioning properly), heed the information on checking cooling output ⇒ page 122 .*
- *Always check both condensation drains (left and right).*
- *The following illustrations show the condensation drain for the right side of the vehicle. The test procedure is however also always to be performed in the same manner for the condensation drain on the left side.*



8.13.1 Removing/installing and checking

Removing

– Remove the driver's storage compartment, glove compartment and centre console. ⇒ General body repairs, interior; Rep. gr. 68

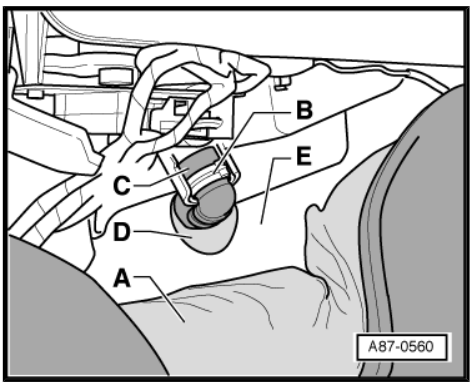
– Carefully fold back the floor covering -A- until the condensation drain is visible.

– Unfasten the clip -B-.

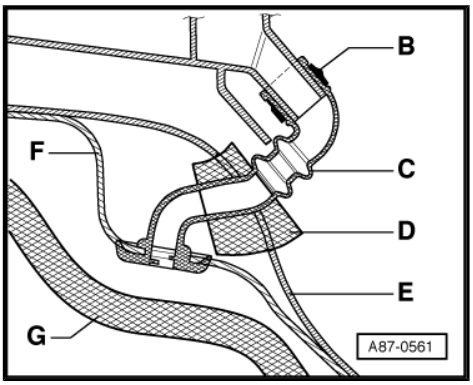
– Cover the area beneath the condensation drain -C- with absorbent paper to stop water running beneath the floor covering.

– Remove the foam sheath -D-.

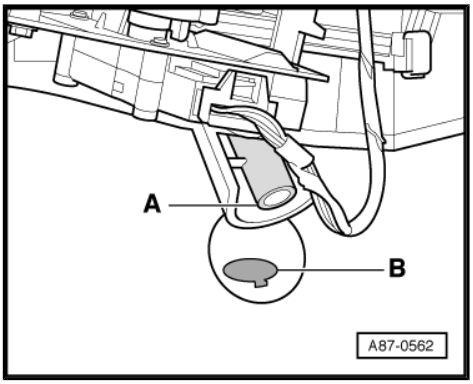
– Remove the condensation drain -C-.



– Check the gap between the lower floor panel -F- and the insulation mat -G- in the transmission tunnel; there must be sufficient space for condensate to be able to drain out of the condensation drain -C-.



– Use a piece of wire, for example, to check for contamination of the condensation drain of the air conditioning unit -A-.



Installing

Install in reverse order, paying attention to the following.

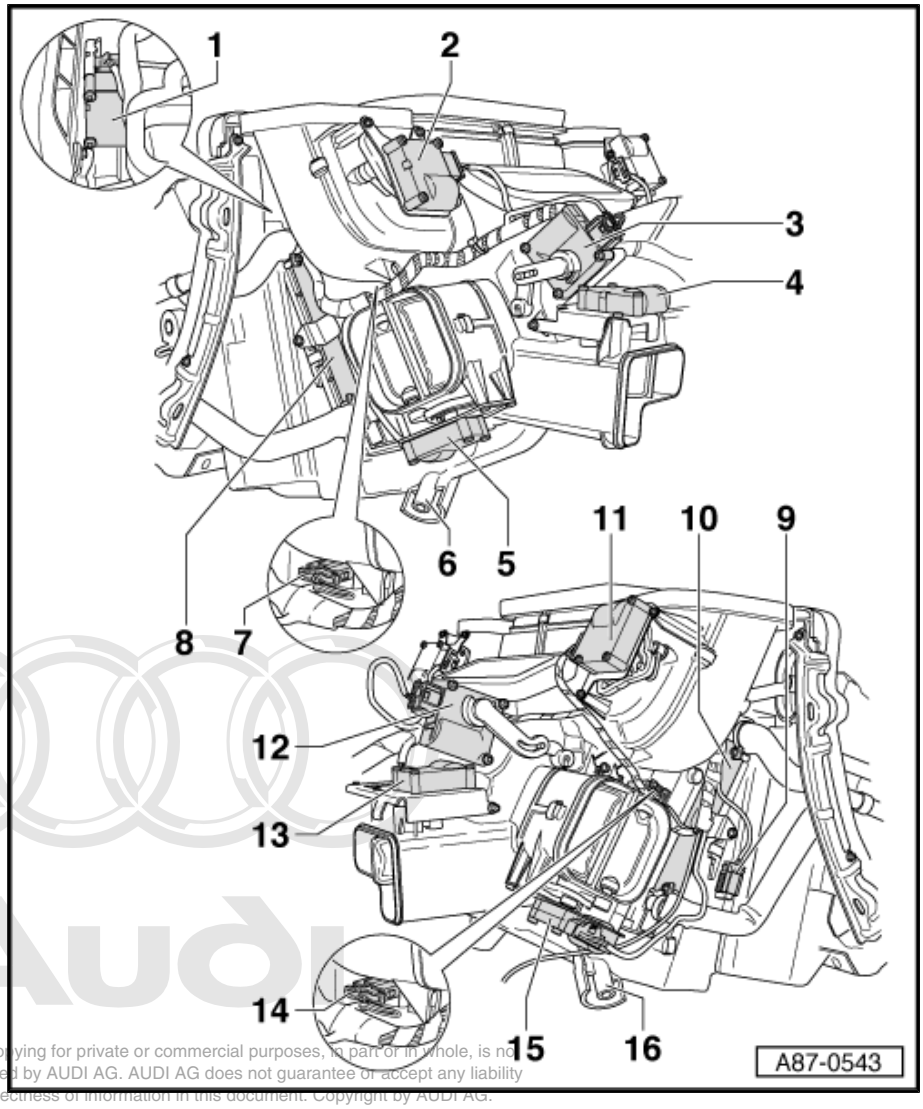
– Insert the condensation drain in the opening in the lower floor panel -B-, paying attention to the locking element.

– Insert the foam sheath -D- in the opening in the upper floor panel -E- such that the cross-section of the condensation drain is not constricted.

8.14 Air conditioning unit components located in passenger compartment

Note

- *There are different air conditioning unit versions for vehicles with and without a rear Climatronic operating and display unit -E265- ⇒ page 118 and ⇒ page 183 .*
- *Air routing in air conditioning unit and vehicle ⇒ page 118*
- *Removing and installing air conditioning unit ⇒ page 179*



1 - Defroster flap control motor -V107-

- ❑ With potentiometer -G135-
- ❑ Removing and installing ⇒ page 93

2 - Front left defroster and chest vent shut-off flap control motor -V200-

- ❑ With potentiometer -G318-
- ❑ Removing and installing ⇒ page 97

3 - Centre vent control motor -V102-

- ❑ With potentiometer -G138-
- ❑ This control motor actuates the cold air flap (flap in air duct bypassing heat exchangers) ⇒ page 118
- ❑ Removing and installing ⇒ page 95

4 - Rear left vent control motor -V218-

- ❑ With potentiometer -G349-
- ❑ Only fitted on vehicles with rear Climatronic operating and display unit -E265-
- ❑ Removing and installing ⇒ page 108

5 - Left footwell flap control motor -V108-

- ❑ With potentiometer -G139-
- ❑ Removing and installing ⇒ page 101

6 - Connection for condensation drain, left

7 - Left vent temperature sender -G150-

- ❑ Removing and installing ⇒ page 106

8 - Heating system heat exchanger

- ❑ Left
- ❑ Removing and installing ⇒ page 116

9 - Evaporator output temperature sender -G263-

- ❑ Removing and installing ⇒ page 107

10 - Heating system heat exchanger

- ❑ Right
- ❑ Removing and installing ⇒ page 112

11 - Front right defroster and chest vent shut-off flap control motor -V199-

- ❑ With potentiometer -G317-
- ❑ Removing and installing ⇒ page 99

12 - Temperature flap control motor -V68-

- ❑ With potentiometer -G92-
- ❑ This control motor actuates the warm air flap (flap in air duct starting in mixing chamber downstream of heat exchanger) ⇒ page 118
- ❑ Removing and installing ⇒ page 105

13 - Rear right vent control motor -V219-

- ❑ With potentiometer -G350-
- ❑ Only fitted on vehicles with rear Climatronic operating and display unit -E265-
- ❑ Removing and installing ⇒ page 108

14 - Right vent temperature sender -G151-

- ❑ Removing and installing ⇒ page 107

15 - Right footwell flap control motor -V109-

- ❑ With potentiometer -G140-
- ❑ Removing and installing ⇒ page 103

16 - Connection for condensation drain, right

8.15 Removing and installing defroster flap control motor -V107-

Note

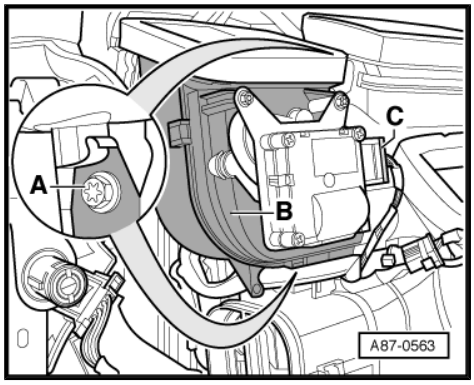
- ♦ *Mark the motor/flap connecting element on removal to avoid interchange with the connecting elements of other control motors.*
- ♦ *In the event of the fault „Upper or lower limit value exceeded“, check the motor/flap connecting element. It must be properly attached to the motor and there must not be any clearance between the control motor mount and the connecting element.*

Removing

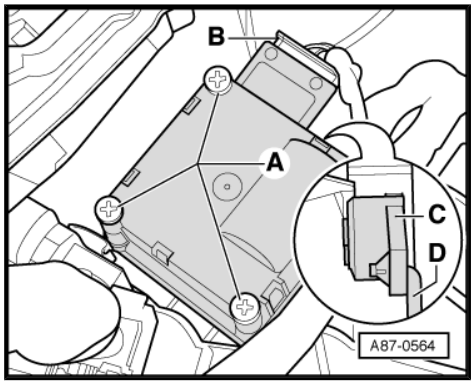
– Remove the dash panel complete with the dash panel cross-member. ⇒ General body repairs, interior; Rep. gr. 70

– Remove the left footwell vent (driver side).

– Slacken off the bolts -A- and remove the air duct -B-.
– Mark the connector -C- to the control motor (to prevent interchange with other identical connectors).
– Unplug the connector -C- from the front left defroster and chest vent shut-off flap control motor -V200- .



– Use 2 screwdrivers to carefully prise the connecting element -C- off the control motor.



Note

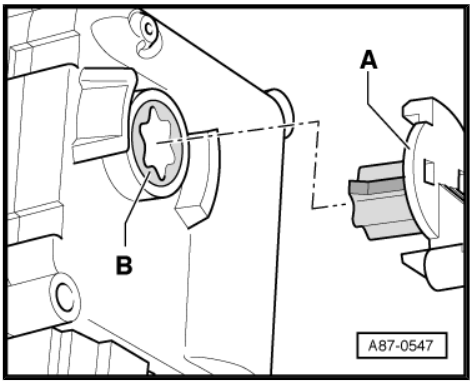
Leave the connecting element -C- and the linkage -D- with lever in position at the air conditioning unit.

– Screw out the bolts -A-.
– Mark the connector -B- to the control motor (to prevent interchange with other identical connectors).
– Unplug the connector -B- from the control motor.
– Detach the control motor.

Installing

Install in reverse order, paying attention to the following.

– Attach the connecting element -A- to the control motor shaft.



Note

- *Check the positioning of the connecting element. It must engage in the shaft of the motor and there must not be any clearance between the control motor shaft and the connecting element.*
- *The connecting element is only to be attached in the position in which it engages without having to exert force. If pre-tension is required to insert the connecting element, check the mount of the motor as this may be turned through 180°.*
- *The control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. When the control motor has been detached, voltage is therefore only to be applied with the connecting element -A- attached.*
- *The motor may be incorrectly positioned if pre-tension is required to insert the connecting piece -A- in the control motor.*
- *If the shaft is so awkwardly positioned that the connecting piece cannot be attached, use an adapter cable for example ⇒ page 47 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 no pre-tension is required to attach the connecting element. The direction of rotation can be reversed by interchanging positive and negative.*

– Re-install the components removed in reverse order.

– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

– Perform air conditioner basic setting and final control diagnosis ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

8.16 Removing and installing centre vent control motor -V102-

Note

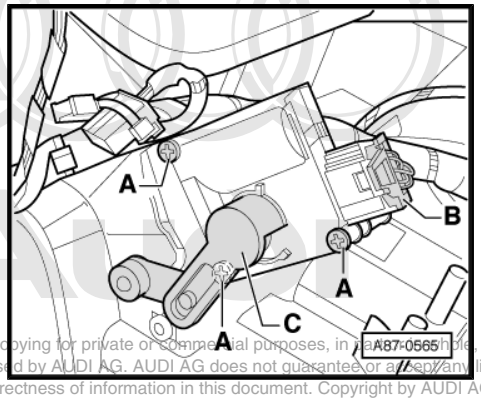
- *Mark the motor/flap connecting element on removal to avoid interchange with the connecting elements of other control motors.*
- *In the event of the fault „Upper or lower limit value exceeded“, check the motor/flap connecting element. It must be properly attached to the motor and there must not be any clearance between the control motor mount and the connecting element.*
- *This control motor actuates the cold air flap (flap in air duct bypassing heat exchangers) ⇒ page 118 .*

Removing

– Switch off ignition.

– Remove the centre console. ⇒ General body repairs, interior; Rep. gr. 68

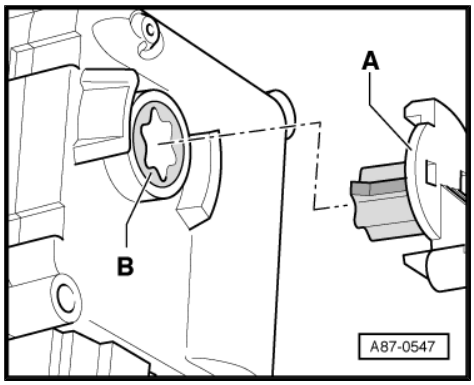
– Remove the storage compartment beneath the dash panel on the left and the steering column support to the transmission tunnel. ⇒ General body repairs, interior; Rep. gr. 68
– Use 2 screwdrivers for example to carefully prise the connecting element -C- off the control motor.
– Mark the connector -B- to the control motor (to prevent interchange with other identical connectors).
– Unplug the connector -B- from the control motor.
– Screw out the bolts -A-.
– Detach the control motor.



Installing

Install in reverse order, paying attention to the following.

– Moisten the guide of the lever -C- or the lug at the flap lever with a small quantity of lubricating paste -G 000 150- for example ⇒ Electronic parts catalogue .
– Attach the connecting element -A- to the control motor shaft.



Note

- *Check the positioning of the connecting element. It must engage in the shaft of the motor and there must not be any clearance between the control motor shaft and the connecting element.*
- *The connecting element is only to be attached in the position in which it engages without having to exert force. If pre-tension is required to insert the connecting element, check the mount of the motor as this may be turned through 180°.*
- *The control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. When the control motor has been detached, voltage is therefore only to be applied with the connecting element -A- attached.*
- *The motor may be incorrectly positioned if pre-tension is required to insert the connecting piece -A- in the control motor.*
- *If the shaft is so awkwardly positioned that the connecting piece cannot be attached, use an adapter cable for example ⇒ page 47 or a test lead from the adapter set -V.A.G 1594/ A- 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 no pre-tension is required to attach the connecting element. The direction of rotation can be reversed by interchanging positive and negative.*

– Re-install the components removed in reverse order.
– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Perform air conditioner basic setting and final control diagnosis ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

8.17 Removing and installing front left defroster and chest vent shut-off flap control motor -V200-

Note

- *Mark the motor/flap connecting element on removal to avoid interchange with the connecting elements of other control motors.*
- *In the event of the fault „Upper or lower limit value exceeded", check the motor/flap connecting element. It must be properly attached to the motor and there must not be any clearance between the control motor mount and the connecting element.*

Removing

– Switch off ignition.

– Remove the centre console. ⇒ General body repairs, interior; Rep. gr. 68

– Remove the storage compartment beneath the dash panel on the left and the steering column support to the transmission tunnel. ⇒ General body repairs, interior; Rep. gr. 68

– Screw out the bolts -A-.

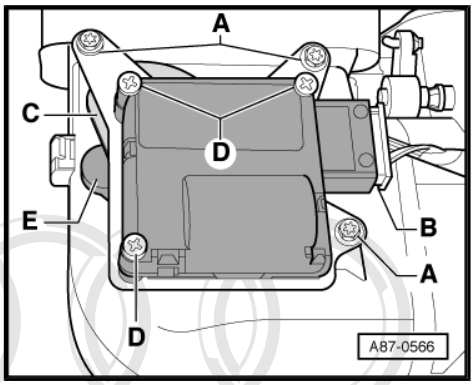
– Mark the connector -B- to the control motor (to prevent interchange with other identical connectors).

– Unplug the connector -B- from the control motor.

– Detach the control motor.

– Use 2 screwdrivers for example to carefully prise the cam plate -C- off the control motor.

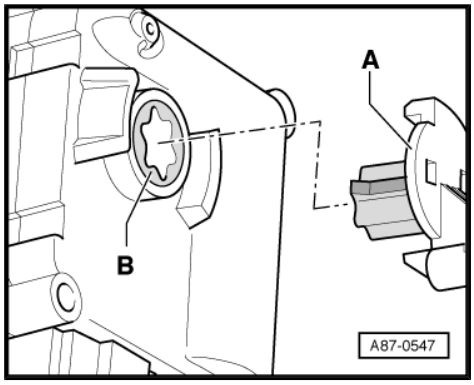
– Screw out the bolts -D-.



Installing

– Attach the metal holder to the control motor.

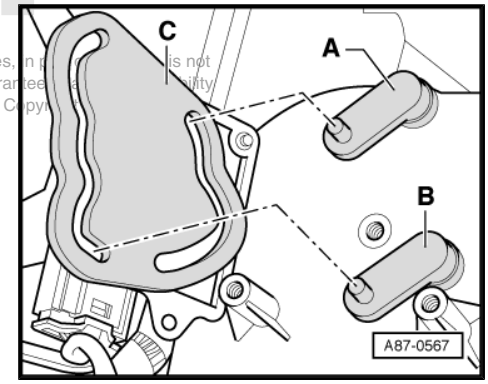
– Attach the cam plate -A- to the control motor shaft.



Note

- *Check the positioning of the cam plate. It must engage in the shaft of the motor and there must not be any clearance between the control motor shaft and the cam plate.*
- *The cam plate is only to be attached in the position in which it engages without having to exert force. If pre-tension is required to insert the cam plate, check the mount of the motor as this may be turned through 180°.*
- *The control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. When the control motor has been detached, voltage is therefore only to be applied with the cam plate -A- attached.*
- *The motor may be incorrectly positioned if pre-tension is required to insert the cam plate -A- in the control motor.*
- *If the shaft is so awkwardly positioned that the cam plate cannot be attached, use an adapter cable for example ⇒ page 47 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 no pre-tension is required to attach the connecting element. The direction of rotation can be reversed by interchanging positive and negative.*

– Moisten the guides of the cam plate -C- and the lugs at the levers of the flaps -A- and -B- with a small quantity of lubricating paste -G 000 150- for example ⇒ Electronic parts catalogue .



– Move the levers -A- and -B- of the flaps to the position shown.
– Insert the lugs of the levers as shown in the guides of the cam plate -C-.
– Attach the control motor to the air conditioning unit.
– Use an adapter cable ⇒ page 47 for example to connect contacts 5 and 6 of the control motor to a 12 V battery by way of a 5 A fuse.
– Turn the control motor until it reaches the end stop, then interchange positive and negative at the control motor and move the control motor to the other end stop.
– Re-install the other components removed in reverse order.
– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Perform air conditioner basic setting and final control diagnosis ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

8.18 Removing and installing front right defroster and chest vent shut-off flap control motor -V199-

Note

- *Mark the motor/flap connecting element on removal to avoid interchange with the connecting elements of other control motors.*
- *In the event of the fault „Upper or lower limit value exceeded“, check the motor/flap connecting element. It must be properly attached to the motor and there must not be any clearance between the control motor mount and the connecting element.*

Removing

– Switch off ignition.

– Remove the glove compartment. ⇒ General body repairs, interior; Rep. gr. 68

– Screw out the bolts -A-.

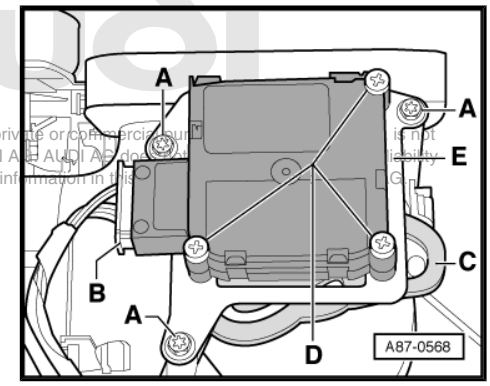
– Mark the connector -B- to the control motor (to prevent interchange with other identical connectors).

– Unplug the connector -B- from the control motor.

– Detach the control motor.

– Use 2 screwdrivers for example to carefully prise the cam plate -C- off the control motor.

– Screw out the bolts -D-.

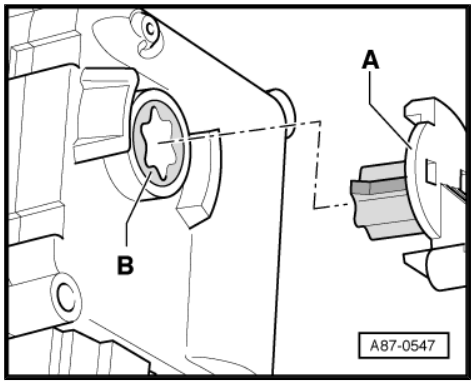


Installing

Install in reverse order, paying attention to the following.

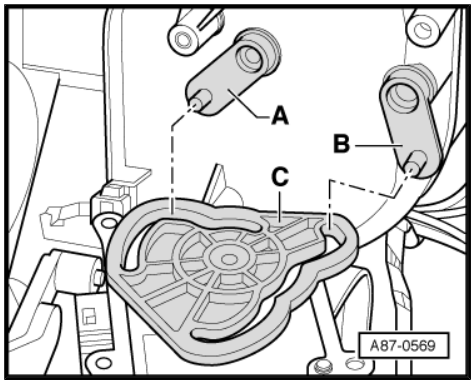
– Attach the metal holder -E- to the control motor.

– Attach the cam plate -A- to the control motor shaft.



Note

- *Check the positioning of the cam plate. It must engage in the shaft of the motor and there must not be any clearance between the control motor shaft and the cam plate.*
- *The cam plate is only to be attached in the position in which it engages without having to exert force. If pre-tension is required to insert the cam plate, check the mount of the motor as this may be turned through 180°.*
- *The control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. When the control motor has been detached, voltage is therefore only to be applied with the cam plate -A- attached.*
- *The motor may be incorrectly positioned if pre-tension is required to insert the cam plate -A- in the control motor.*
- *If the shaft is so awkwardly positioned that the cam plate cannot be attached, use an adapter cable for example ⇒ page 47 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 no pre-tension is required to attach the connecting element. The direction of rotation can be reversed by interchanging positive and negative.*



– Moisten the guides of the cam plate -C- and the lugs at the levers of the flaps -A- and -B- with a small quantity of lubricating paste -G 000 150- for example ⇒ Electronic parts catalogue .
– Move the levers -A- and -B- of the flaps to the position shown.
– Insert the lugs of the levers as shown in the guides of the cam plate -C-.
– Attach the control motor to the air conditioning unit.
– Use an adapter cable ⇒ page 47 for example to connect contacts 5 and 6 of the control motor to a 12 V battery by way of a 5 A fuse.
– Turn the control motor until it reaches the end stop, then interchange positive and negative at the control motor and move the control motor to the other end stop.
– Re-install the other components removed in reverse order.
– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Perform air conditioner basic setting and final control diagnosis ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

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

Note

- *Mark the motor/flap connecting element on removal to avoid interchange with the connecting elements of other control motors.*
- *In the event of the fault „Upper or lower limit value exceeded“, check the motor/flap connecting element. It must be properly attached to the motor and there must not be any clearance between the control motor mount and the connecting element.*

Removing

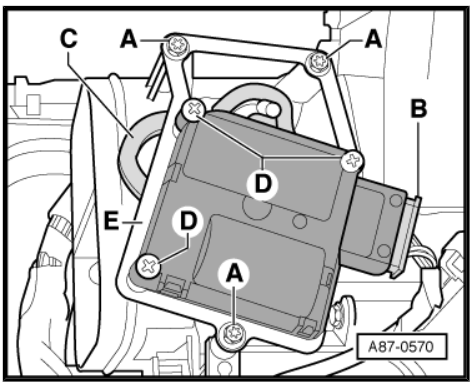
– Switch off ignition.

– Remove the storage compartment beneath the dash panel on the left. ⇒ General body repairs, interior; Rep. gr. 68

– Remove the centre console. ⇒ General body repairs, interior; Rep. gr. 68

– Remove the left footwell vent (driver side).

– Carefully fold back the floor covering in the area of the control motor.



– Screw out the bolts -A-.

– Mark the connector -B- to the control motor (to prevent interchange with other identical connectors).

– Detach the control motor.

– Unplug the connector -B- from the control motor.

– Use 2 screwdrivers for example to carefully prise the cam plate -C- off the control motor.

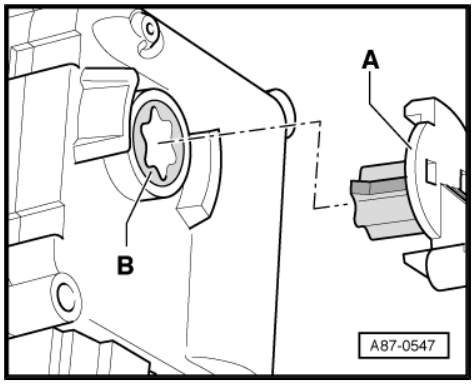
– Screw out the bolts -D-.

Installing

Install in reverse order, paying attention to the following.

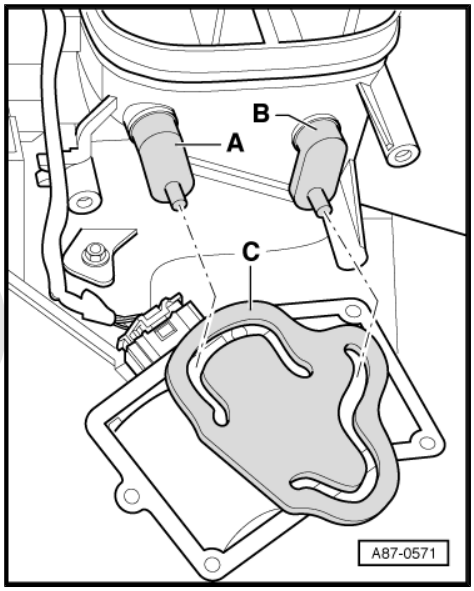
– Attach the metal holder -E- to the control motor.

– Attach the cam plate -A- to the control motor shaft.



Note

- *Check the positioning of the cam plate. It must engage in the shaft of the motor and there must not be any clearance between the control motor shaft and the cam plate.*
- *The cam plate is only to be attached in the position in which it engages without having to exert force. If pre-tension is required to insert the cam plate, check the mount of the motor as this may be turned through 180°.*
- *The control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. When the control motor has been detached, voltage is therefore only to be applied with the cam plate -A- attached.*
- *The motor may be incorrectly positioned if pre-tension is required to insert the cam plate -A- in the control motor.*
- *If the shaft is so awkwardly positioned that the cam plate cannot be attached, use an adapter cable for example ⇒ page 47 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 no pre-tension is required to attach the connecting element. The direction of rotation can be reversed by interchanging positive and negative.*



– Moisten the guides of the cam plate -C- and the lugs at the levers of the flaps -A- and -B- with a small quantity of lubricating paste -G 000 150- for example ⇒ Electronic parts catalogue .
– Move the levers -A- and -B- of the flaps to the position shown.
– Insert the lugs of the levers as shown in the guides of the cam plate -C-.
– Attach the control motor to the air conditioning unit.
– Switch on the ignition and check operation of the control motor (by altering the settings at the front operating and display unit; the control motor must reach both end stops).
– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Perform air conditioner basic setting and final control diagnosis ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Re-install the other components removed in reverse order.

8.20 Removing and installing right footwell flap control motor -V109-

Note

- *Mark the motor/flap connecting element on removal to avoid interchange with the connecting elements of other control motors.*
- *In the event of the fault „Upper or lower limit value exceeded", check the motor/flap connecting element. It must be properly attached to the motor and there must not be any clearance between the control motor mount and the connecting element.*

Removing

– Switch off ignition.

– Remove the glove compartment. ⇒ General body repairs, interior; Rep. gr. 68

– Remove the centre console. ⇒ General body repairs, interior; Rep. gr. 68

– Remove the right footwell vent (front passenger side).

– Carefully fold back the floor covering in the area of the control motor.

– Screw out the bolts -A-.

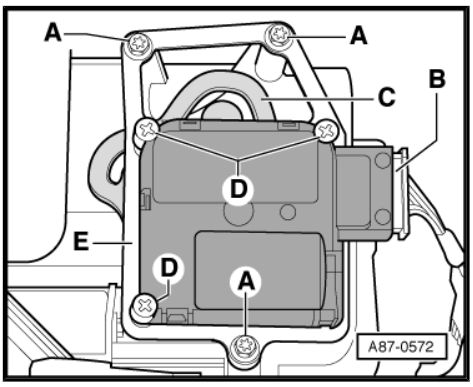
– Mark the connector -B- to the control motor (to prevent interchange with other identical connectors).

– Unplug the connector -B- from the control motor.

– Detach the control motor.

– Use 2 screwdrivers for example to carefully prise the cam plate -C- off the control motor.

– Screw out the bolts -D-.

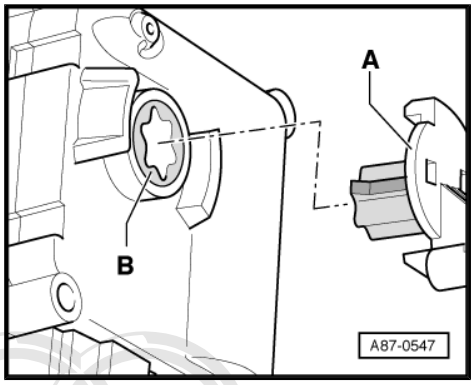


Installing

Install in reverse order, paying attention to the following.

– Attach the metal holder -E- to the control motor.

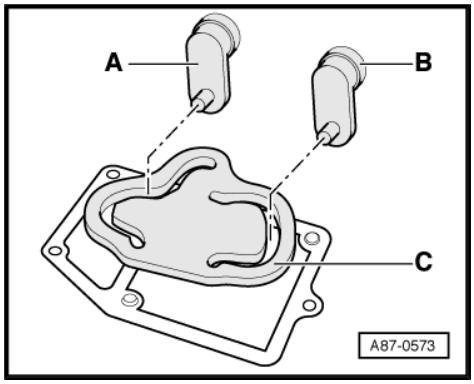
– Attach the cam plate -A- to the control motor shaft.



Note

- *Check the positioning of the cam plate. It must engage in the shaft of the motor and there must not be any clearance between the control motor shaft and the cam plate.*
- *The cam plate is only to be attached in the position in which it engages without having to exert force. If pre-tension is required to insert the cam plate, check the mount of the motor as this may be turned through 180°.*
- *The control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. When the control motor has been detached, voltage is therefore only to be applied with the cam plate -A- attached.*
- *The motor may be incorrectly positioned if pre-tension is required to insert the cam plate -A- in the control motor.*
- *If the shaft is so awkwardly positioned that the cam plate cannot be attached, use an adapter cable for example ⇒ page 47 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 no pre-tension is required to attach the connecting element. The direction of rotation can be reversed by interchanging positive and negative.*

– Moisten the guides of the cam plate -C- and the lugs at the levers of the flaps -A- and -B- with a small quantity of lubricating paste -G 000 150- for example ⇒ Electronic parts catalogue .



– Move the levers -A- and -B- of the flaps to the position shown.
– Insert the lugs of the levers as shown in the guides of the cam plate -C-.
– Attach the control motor to the air conditioning unit.
– Switch on the ignition and check operation of the control motor (by altering the settings at the front operating and display unit; the control motor must reach both end stops).
– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Perform air conditioner basic setting and final control diagnosis ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Re-install the other components removed in reverse order.

8.21 Removing and installing temperature flap control motor -V68-

Note

- *Mark the motor/flap connecting element on removal to avoid interchange with the connecting elements of other control motors.*
- *In the event of the fault „Upper or lower limit value exceeded", check the motor/flap connecting element. It must be properly attached to the motor and there must not be any clearance between the control motor mount and the connecting element.*
- *This control motor actuates the warm air flap (flap in heat exchanger air duct)* ⇒ page 118

Removing

– Switch off ignition.

– Remove the glove compartment. ⇒ General body repairs, interior; Rep. gr. 68

– Remove the right footwell vent (front passenger side).

– Use 2 screwdrivers for example to carefully prise the connecting element -C- off the control motor (only if one of the bolts -A- is not accessible).

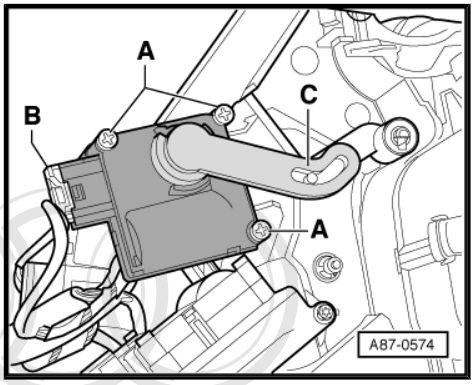
– Screw out the bolts -A-.

– Detach the control motor.

– Mark the connector -B- to the control motor (to prevent interchange with other identical connectors).

– Unplug the connector -B- from the control motor.

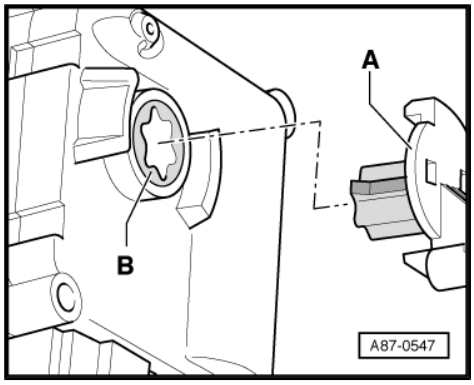
– Use 2 screwdrivers for example to carefully prise the connecting element -C- off the control motor.



Installing

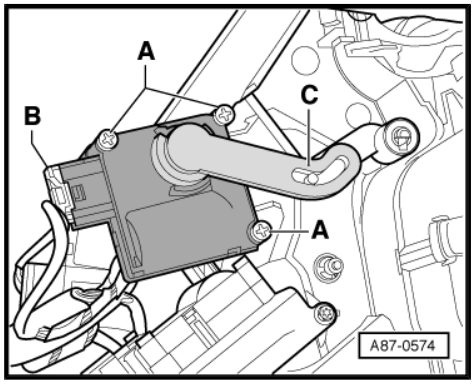
Install in reverse order, paying attention to the following.

– Attach the connecting element -A- to the control motor shaft.



Note

- *Check the positioning of the connecting element. It must engage in the shaft of the motor and there must not be any clearance between the control motor shaft and the connecting element.*
- *The connecting element is only to be attached in the position in which it engages without having to exert force. If pre-tension is required to insert the connecting element, check the mount of the motor as this may be turned through 180°.*
- *The control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. When the control motor has been detached, voltage is therefore only to be applied with the connecting element -A- attached.*
- *The motor may be incorrectly positioned if pre-tension is required to insert the connecting piece -A- in the control motor.*
- *If the shaft is so awkwardly positioned that the connecting piece cannot be attached, use an adapter cable for example ⇒ page 47 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 no pre-tension is required to attach the connecting element. The direction of rotation can be reversed by interchanging positive and negative.*



– Moisten the guide of the lever -C- or the lug at the flap lever with a small quantity of lubricating paste -G 000 150- for example ⇒ Electronic parts catalogue .
– Attach the control motor to the air conditioning unit.
– Switch on the ignition and check operation of the control motor (by altering the settings at the front operating and display unit; the control motor must reach both end stops).
– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Perform air conditioner basic setting and final control diagnosis ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Re-install the other components removed in reverse order.

8.22 Removing and installing left vent temperature sender -G150-

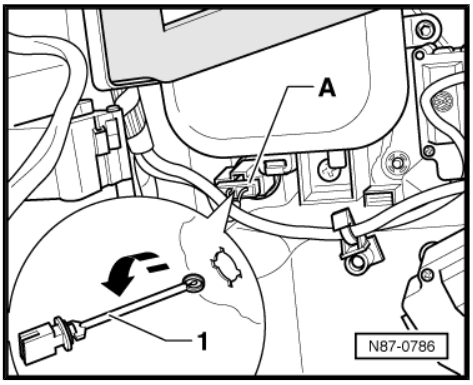
Removing

– Switch off ignition.
– Remove the driver side storage compartment. ⇒ General body repairs, interior; Rep. gr. 70
– Remove the left footwell vent (driver side).

– Unplug the connector -A- from the temperature sensor.
– Turn the temperature sensor -1- through approx. 90° in arrow direction.
– Take the temperature sensor out of the air conditioning unit.

Installing

– Install in reverse order.



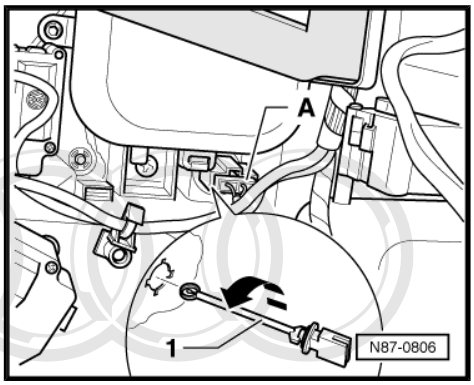
8.23 Removing and installing right vent temperature sender -G151-

Removing

– Switch off ignition.
– Remove the glove compartment. ⇒ General body repairs, interior; Rep. gr. 70
– Remove the right footwell vent (front passenger side).
– Unplug the connector -A- from the temperature sensor.
– Turn the temperature sensor -1- through approx. 90° in arrow direction.
– Take the temperature sensor out of the air conditioning unit.

Installing

– Install in reverse order.



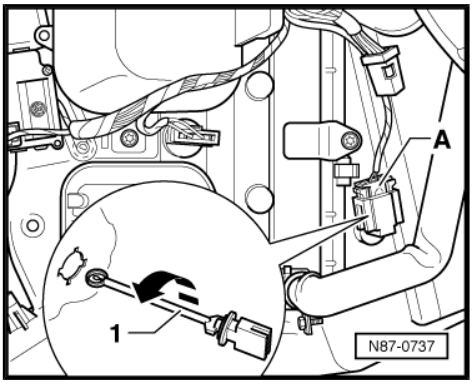
8.24 Removing and installing evaporator output temperature sender -G263-

Removing

– Switch off ignition.
– Remove the glove compartment ⇒ General body repairs, interior; Rep. gr. 68 .
– Remove the right footwell vent (front passenger side).
– Unplug the connector -A- from the sender.
– Turn the sender -1- through approx. 90° in arrow direction.
– Take the temperature sensor out of the air conditioning unit.

Installing

– Install in reverse order.



8.25 Removing and installing rear left vent control motor -V218- and rear right vent control motor -V219-

Note

- *Mark the motor/flap connecting element on removal to avoid interchange with the connecting elements of other control motors.*
- *In the event of the fault „Upper or lower limit value exceeded“, check the motor/flap connecting element. It must be properly attached to the motor and there must not be any clearance between the control motor mount and the connecting element.*
- *These control motors are only fitted on vehicles with rear Climatronic operating and display unit -E265- . Vehicles with no rear Climatronic operating and display unit -E265- have no flaps fitted at this location in the air duct of the air conditioning unit.*
- *In cases of doubt about correct connector assignment after fitting the control motors, unplug the connector from one control motor for example and then interrogate the fault memory of the rear Climatronic operating and display unit -E265- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.*

Removing

– Switch off ignition.

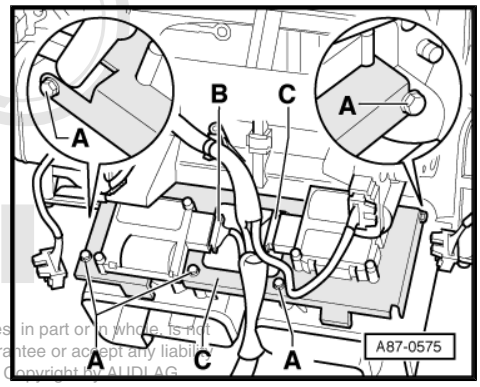
– Remove the centre console. ⇒ General body repairs, interior; Rep. gr. 68

– Mark the connector -B- to the rear left vent control motor -V218- and -C- to the rear right vent control motor -V219- to prevent possible interchange on account of identical connectors.

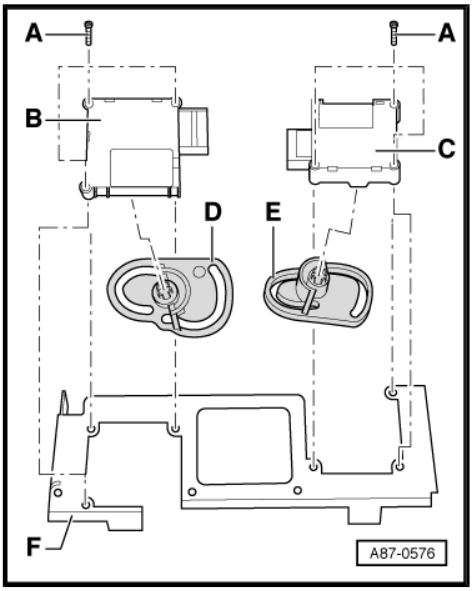
– Screw out the bolts -A-.

– Unplug the connectors -B- and -C- from the control motors.

– Detach the holder -D- with both control motors.



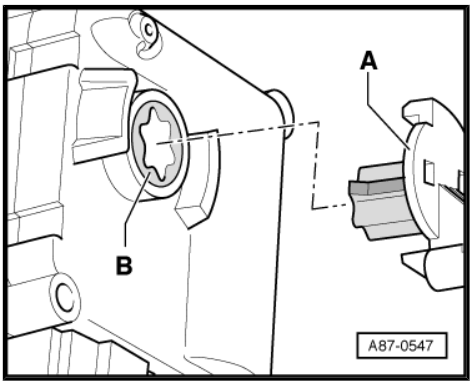
– Screw out the bolts -A- for the control motor to be removed.
– Mark the control motors (e.g. „B“ and „C“ on account of the different position of the motor shaft).
– Take the corresponding control motor out of the holder -F-.
– Mark the cam plate -D- e.g. with „D“ (to the rear left vent control motor -V218-) and -E- e.g. with „E“ (to the rear right vent control motor -V219-) on account of possible interchange (assignment ⇒ page 183).
– Use 2 screwdrivers for example to carefully prise the cam plate -D- or -E- off the corresponding control motor.



Installing

Install in reverse order, paying attention to the following.

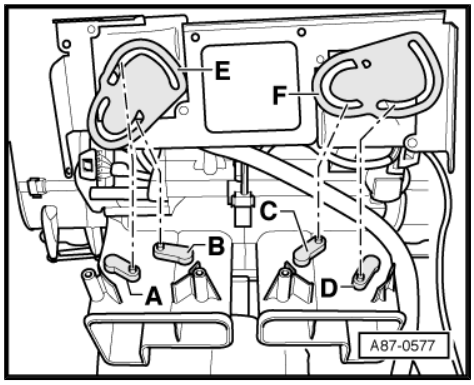
– Attach the control motors -B- and -C- to the holder -F-.
– Attach the cam plates -D- and -E- to the shaft of the corresponding control motor (pay attention to correct assignment ⇒ page 183).



Note

- *Check the positioning of the cam plate. It must engage in the shaft of the motor and there must not be any clearance between the control motor shaft and the cam plate.*
- *The cam plate is only to be attached in the position in which it engages without having to exert force. If pre-tension is required to insert the cam plate, check the mount of the motor as this may be turned through 180°.*
- *The control motor shaft -B- has no stop. It rotates constantly if voltage is applied between contacts 5 and 6. When the control motor has been detached, voltage is therefore only to be applied with the cam plate -A- attached.*
- *The motor may be incorrectly positioned if pre-tension is required to insert the cam plate -A- in the control motor.*
- *If the shaft is so awkwardly positioned that the cam plate cannot be attached, use an adapter cable for example ⇒ page 47 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 no pre-tension is required to attach the connecting element. The direction of rotation can be reversed by interchanging positive and negative.*

- Moisten the guides of the cam plates -E- and -F- and the lugs at the levers of the flaps -A- to -D- with a small quantity of lubricating paste -G 000 150- for example ⇒ Electronic parts catalogue .
- Move the levers -A- and -B- of the flaps for the left side and -C- and -D- of the flaps for the right side to the position shown.
- Insert the lugs of the levers -A- to -D- as shown in the guides of the cam plates -E- and -F-.
- Attach the holder with the control motors to the air conditioning unit.
- Re-install the other components removed in reverse order.
- Interrogate the fault memory of the rear Climatronic operating and display unit -E265- (and the front operating and display unit, Climatronic control unit -J255-) and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- Perform air conditioner basic setting and final control diagnosis ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.



9 Removing and installing heat exchanger of air conditioning unit

Special tools and workshop equipment required

- Hose clamps -3093 bzw. 3094-
- Compressed air gun, commercially available
- Hand pump -V.A.G 1274- (and appropriate adapters)

9.1 Preparation for heat exchanger removal

– Switch off ignition.

– Dissipate the pressure in the coolant circuit by opening the cap at the coolant expansion tank ⇒ Engine, mechanics; Rep. gr. 19 .

– Remove the plenum chamber cover on the left and right.

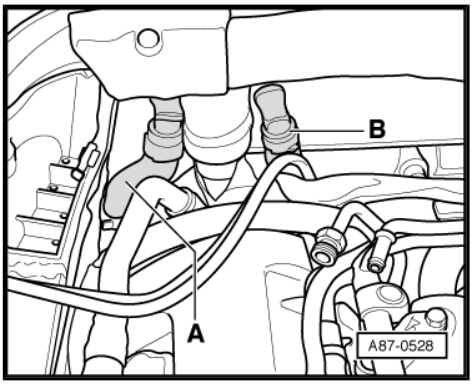
– Detach the engine control unit and the cover of the electronics box ⇒ Electrical system; Rep. gr. 97

– Unplug the 2-pin connector from the coolant circulation pump -V50- of the pump valve unit ⇒ page 55 .

– Mark the arrangement of the coolant hoses -A- (supply to pump valve unit) and -B- (return to engine).

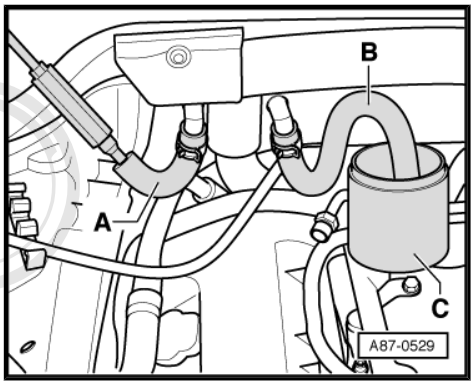
– Pinch off both coolant hoses between the engine and the pump valve unit (e.g. using a hose clamp -V.A.G 3094-).

– Detach the coolant hoses -A- and -B- from the connections.

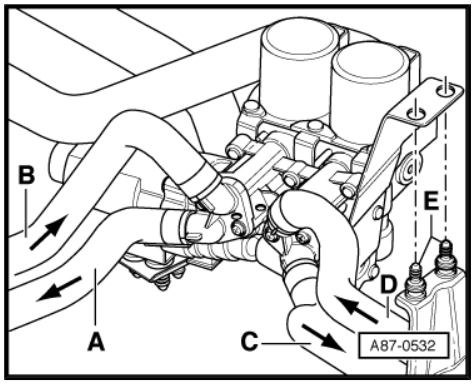


– Connect one tubing section -A- and -B- to each of the two connections.

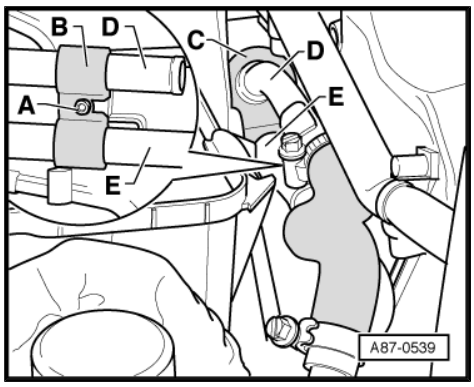
– Place a vessel -C- beneath the hose -B-.



– Use a hose clamp for example to pinch off the return from the front passenger side heat exchanger -D-.
– Use a compressed air gun to carefully blow coolant out of the driver side heat exchanger and pump valve unit (into the vessel).
– Detach the clamp from the hose -D-.
– Use a hose clamp for example to pinch off the return from the driver side heat exchanger -B-.
– Use a compressed air gun to carefully blow coolant out of the front passenger side heat exchanger and pump valve unit (into the vessel).
– Detach the clamp from the hose -B-.



– Slacken off the bolt -A- for the coolant pipe holder (in the plenum chamber) by approx. 2 turns.
– Remove the holder for the coolant pipes -B-.
– Apply a small quantity of silicone lubricant to the contact surface of both coolant pipes -D- and -E- at the socket -C- (to enable the pipes to be moved without altering the position of the socket).



9.2 Removing and installing right (front passenger side) heat exchanger

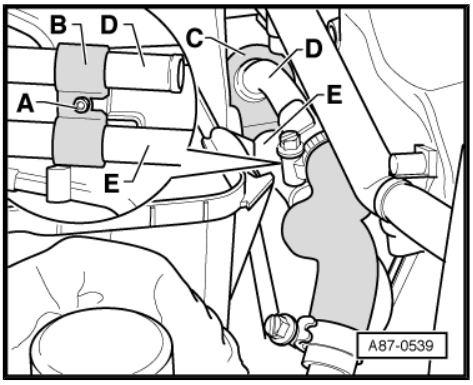
Note

- *Observe the following sequence for right-hand drive vehicles: Start by removing the left heat exchanger.*
- *Removal of the left heat exchanger on left-hand drive vehicles involves taking out the right heat exchanger beforehand.*

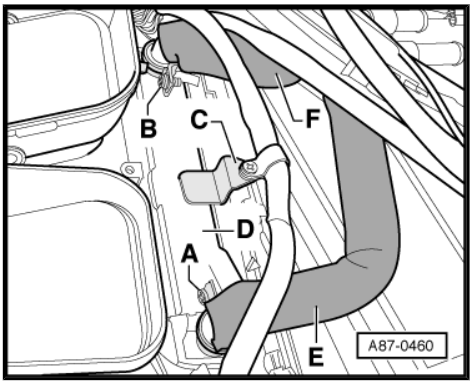
Removing

– Perform preparatory work for heat exchanger removal ⇒ page 111 .
– Remove the glove compartment: ⇒ General body repairs, interior; Rep. gr. 68
– Remove the footwell vent.
– Cover the floor covering in the area beneath the heat exchanger with impermeable sheeting and absorbent paper.

– Apply a small quantity of silicone lubricant to the contact surface of both coolant pipes -D- and -E- at the socket -C- from inside as well (to enable the pipes to be moved without altering the position of the socket; this illustration shows the pipes viewed from the plenum chamber).



– Remove the clamps -A- and -B-.
– Take both coolant pipes out of the heat exchanger.
– Slide both coolant pipes towards the „plenum chamber“.



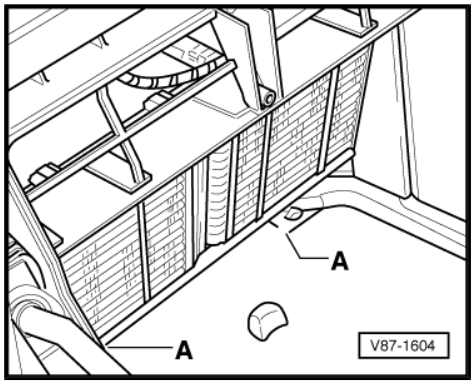
Note

As the socket has been moistened with a small quantity of silicone lubricant in the area of the coolant pipe penetration, the pipes can be moved without pushing the socket out of the air conditioning unit.

– Screw out the bolts -C-.
– Detach the holder.
– Pull the heat exchanger -D- out of the air conditioning unit.

Installing

– Before installing the heat exchanger, check the condensation drain openings -A- for dirt and clean if necessary.



Note

- *The condensation drain must not be blocked by dirt or other deposits.*
- *The Fig. shows the drain openings with heat exchangers in position.*

Cleaning condensation drain:

– Heat exchanger removed: Use an illuminated angled mirror to check both drain openings by way of the opening for the heat exchanger and clean the condensation drains if necessary with a piece of wire for example.

– Heat exchanger fitted: Use a piece of wire for example to clean the condensation drains from outside (with the condensation hose detached).

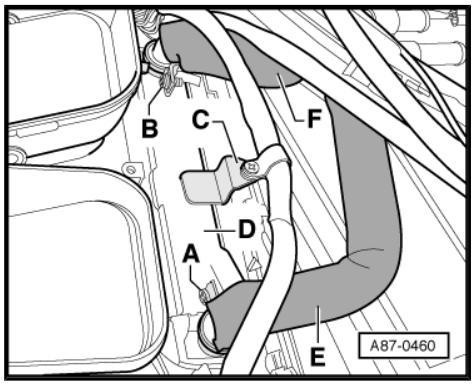
Perform the remaining installation operations in reverse order, paying attention to the following:

– Check the attached foam seal before installing the heat exchanger.

Note

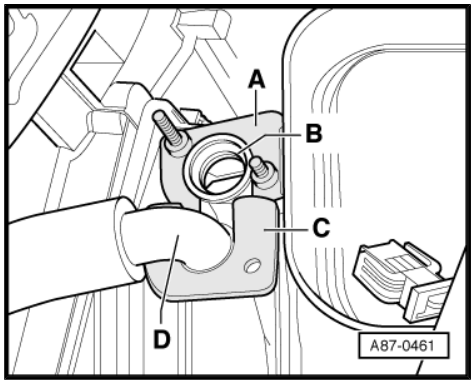
- *If not properly affixed, the seal may curl up on insertion of the heat exchanger in the air conditioning unit.*
- *Cold air may flow past the heat exchanger if the seal is damaged or not properly fitted.*

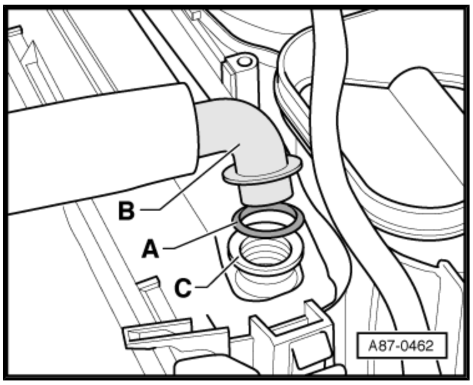
– Secure all connections with standard clips or clamps approved for this connection: ⇒ Electronic parts catalogue



Note

- *The clips -A- and -B- are difficult to fit with the unit installed.*
- *To permit service replacement of the heat exchangers with the air conditioning unit fitted, use is to be made of the clamps -A- and -C- ⇒ Electronic parts catalogue .*





– Check both coolant pipes -B- and the connections at the heat exchanger -C- for damage or contamination.

Note

Always replace sealing rings.

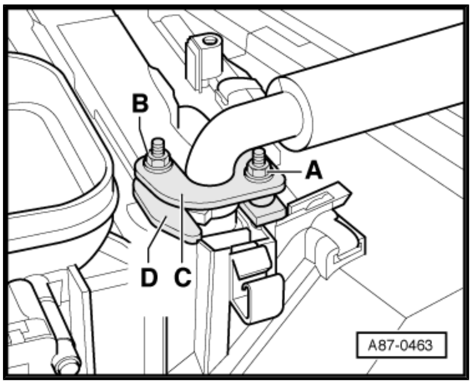
– Moisten the sealing ring -A- with a small quantity of coolant and attach the sealing ring to the coolant pipe -B-.

– Attach the clamp -A- (with studs) as shown to the connection at the heat exchanger -B-.

– Attach the clamp -C- (with holes) as shown to the coolant pipe -D-.

– Insert the coolant pipe -D- (with sealing ring) in the connection of the heat exchanger -B-.

– Secure the coolant pipe in position in the heat exchanger with the two clamps -C- and -D-.



– Tighten the two hexagon nuts -A- and -B- alternately and evenly (tightening torque 3 Nm).

Note

♦ *The clamps -C- and -D- must be fitted as shown (pay attention to outer contour).*

♦ *Take care to keep the clamps straight when tightening the hexagon nuts.*

♦ *Check the position of the clamps after securing the coolant pipes (they must not make contact with other components).*

– Fit the second coolant pipe in the same manner.

– Before fitting the glove compartment, check the cooling system for leaks: ⇒ Engine, mechanics; Rep. gr. 19

– Before fitting the glove compartment and plenum chamber cover, check the position of the socket in the coolant pipe penetration to the plenum chamber.

– Bleed the cooling circuit before plugging in the 2-pin connector to the coolant circulation pump -V50- of the pump valve unit ⇒ page 55 and ⇒ Engine, mechanics; Rep. gr. 19

Note

♦ *The coolant circulation pump -V50- of the pump valve unit is not to be started up until the coolant circuit has been bled (dry running of the pump in the pump valve unit would cause destruction).*

♦ *When bleeding the coolant circuit, take special care to ensure complete bleeding of the heat exchangers. If air bubbles remain in the heat exchangers, complaints may be received about a lack of heat output in winter or differences in the temperature of the air flowing out of the vents with the same setting in control mode ⇒ page 132 .*

9.3 Removing and installing left (driver side) heat exchanger

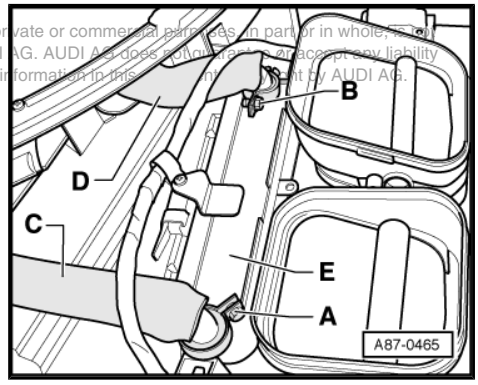
Removing

– Remove the right heat exchanger (front passenger side) ⇒ page 112 .

Note

- *On account of the pedal cluster, the left heat exchanger can only be removed in the direction of the front passenger's footwell after removing the right heat exchanger on left-hand drive vehicles.*
- *Removal of the right heat exchanger on right-hand drive vehicles involves taking out the left heat exchanger beforehand.*

– Remove the driver's storage compartment: ⇒ General body repairs, interior; Rep. gr. 68
– Remove the entire accelerator pedal module ⇒ Fuel system; Rep. gr. 20
– Remove the left footwell vent.
– Cover the floor covering in the area beneath the heat exchanger with impermeable sheeting and absorbent paper.
– Remove the clamps -A- and -B-.
– Detach the coolant pipes -C- and -D- from the heat exchanger -E-.
– Slide the heat exchanger -E- towards the front passenger side (crosswise through the air conditioning unit).



Installing

– Check the attached foam seal before installing the heat exchanger.

Note

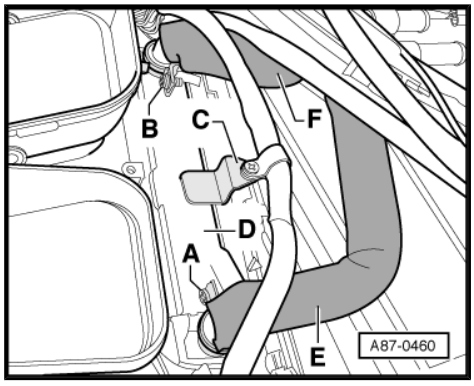
- *If not properly affixed, the seal may curl up on insertion of the heat exchanger in the air conditioning unit.*
- *Cold air may flow past the heat exchanger if the seal is damaged or not properly fitted.*

Install in reverse order, paying attention to the following:

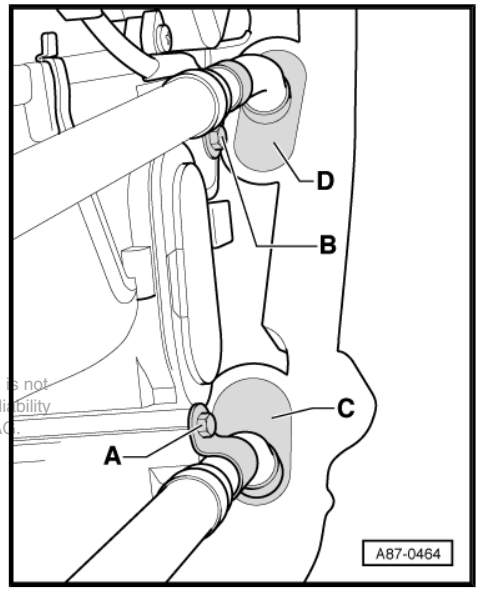
Note

- *Always replace sealing rings.*
- *To stop the heat exchanger sliding back into the air conditioning unit, it is appropriate to insert the front passenger side heat exchanger in the air conditioning unit and to secure the holder with the bolt -C-.*

– Slide the heat exchanger from the front passenger side crosswise through the air conditioning unit.
– Fit the O-rings, coolant pipes and brackets in same manner as described for the right heat exchanger ⇒ page 112 .



– Before fitting the glove compartment, driver side storage compartment and plenum chamber cover, check the position of the sockets -C- and -D- in the coolant pipe penetration to the plenum chamber.
– Before fitting the glove compartment and driver side storage compartment, check the cooling system for leaks: ⇒ Engine, mechanics; Rep. gr. 19
– Perform the remaining installation operations in the same manner as described for fitting of the front passenger side heat exchanger ⇒ page 112 .



10 Block diagram of air distribution system

Note

- *Air routing and air distribution in passenger compartment* ⇒ page 120
- *Fitting locations of individual components* ⇒ page 27 , ⇒ page 71 *and* ⇒ page 92

10.1 Air intake and air routing in air conditioning unit

I - Engine compartment (plenum chamber)

- ❑ In fresh-air mode, air is drawn in via the dust and pollen filter

II - Passenger compartment

- ❑ In air recirculation mode, air is drawn in beneath the dash panel

III - Air conditioning unit

A - Fresh-air intake from plenum chamber

- ❑ In fresh-air mode

B - Dust and pollen filter

C - Air intake beneath dash panel

- ❑ In air recirculation mode

D - Evaporator

E1 - Left heat exchanger

- ❑ For heater

E2 - Right heat exchanger

- ❑ For heater

E3 - Left mixing chamber

E4 - Right mixing chamber

F1 - To left indirect ventilation vent

- ❑ Via air ducts in dash panel to windscreen

F2 - To left dash panel vent

G1 - To right indirect ventilation vent

- ❑ Via air ducts in dash panel to windscreen

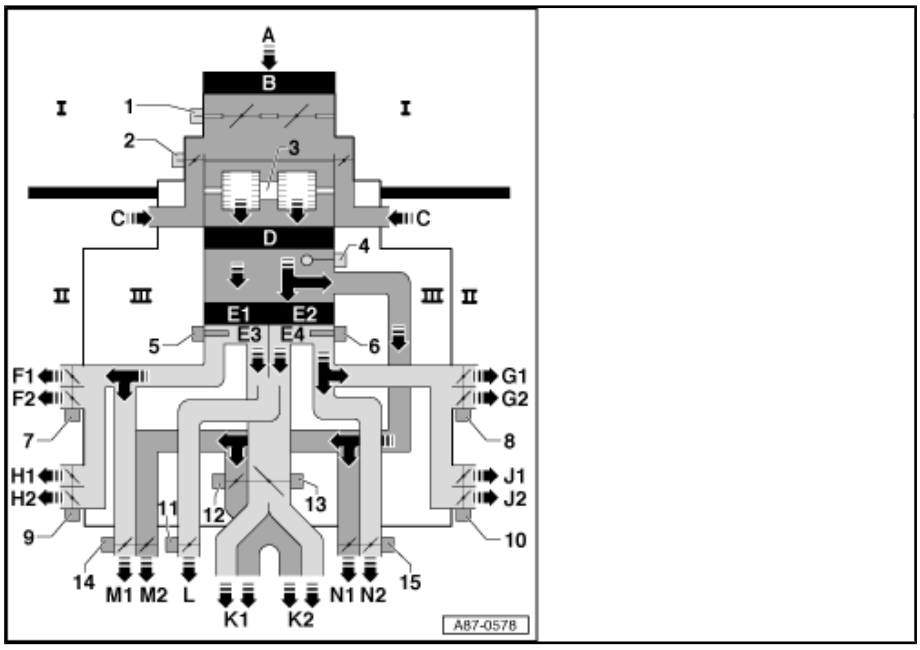
G2 - To right dash panel vent

H1 - To front left footwell vent

- ❑ To rear left footwell vent on right-hand drive vehicles

H2 - To rear left footwell vent

- ❑ To front left footwell vent on right-hand drive vehicles



J1 - To rear right footwell vent
- ❑ To front right footwell vent on right-hand drive vehicles

J2 - To front right footwell vent
- ❑ To rear right footwell vent on right-hand drive vehicles

K1 - To centre left dash panel vent

K2 - To centre right dash panel vent

L - To dash panel defroster vent
- ❑ Via air ducts in dash panel to windscreen

M1 - Rear left warm air duct

M2 - Rear left cold air duct
- ❑ Vehicles with rear Climatronic operating and display unit -E265- only
- ❑ On vehicles with no rear Climatronic operating and display unit -E265- , opening in air conditioning unit is sealed

N1 - Rear right cold air duct
- ❑ Vehicles with rear Climatronic operating and display unit -E265- only
- ❑ On vehicles with no rear Climatronic operating and display unit -E265- , opening in air conditioning unit is sealed

N2 - Rear right warm air duct

1 - Air flow flap control motor -V71-
- ❑ Flap closes completely in air recirculation mode and partially at higher vehicle speed (program-controlled)

2 - Air recirculation flap control motor -V113-
- ❑ Flap opens in air recirculation and partial air recirculation mode

3 - Fresh air blower -V2-

4 - Evaporator output temperature sender -G263-

5 - Left vent temperature sender -G150-

6 - Right vent temperature sender -G151-

7 - Front left defroster and chest vent shut-off flap control motor -V200-

8 - Front right defroster and chest vent shut-off flap control motor -V199-

9 - Left footwell flap control motor -V108-

10 - Right footwell flap control motor -V109-

11 - Defroster flap control motor -V107-

12 - Centre vent control motor -V102-
- ❑ Flap in cold air duct

13 - Temperature flap control motor -V68-
- ❑ Flap in warm air duct

14 - Rear left vent control motor -V218-
- ❑ Only fitted on vehicles with rear Climatronic operating and display unit -E265-

15 - Rear right vent control motor -V219-
- ❑ Only fitted on vehicles with rear Climatronic operating and display unit -E265-

10.2 Air routing and air distribution in passenger compartment

Note

- *Air intake and air routing in air conditioning unit* ⇒ page 118
- *Fitting locations of individual components* ⇒ page 27 , ⇒ page 71 *and* ⇒ page 92
- *Description of items „F1“ to „N2“* ⇒ page 118

1 - Air duct and front left footwell vent

2 - Air duct to rear left footwell vent

3 - Air duct to rear left footwell vent

4 - Rear left footwell vent

- ❑ Vehicles with a rear Climatronic operating and display unit -E265- are fitted with a rear left footwell heater element -Z42-

5 - Air duct and front right footwell vent

6 - Air duct to rear right footwell vent

7 - Air duct to rear right footwell vent

8 - Rear right footwell vent

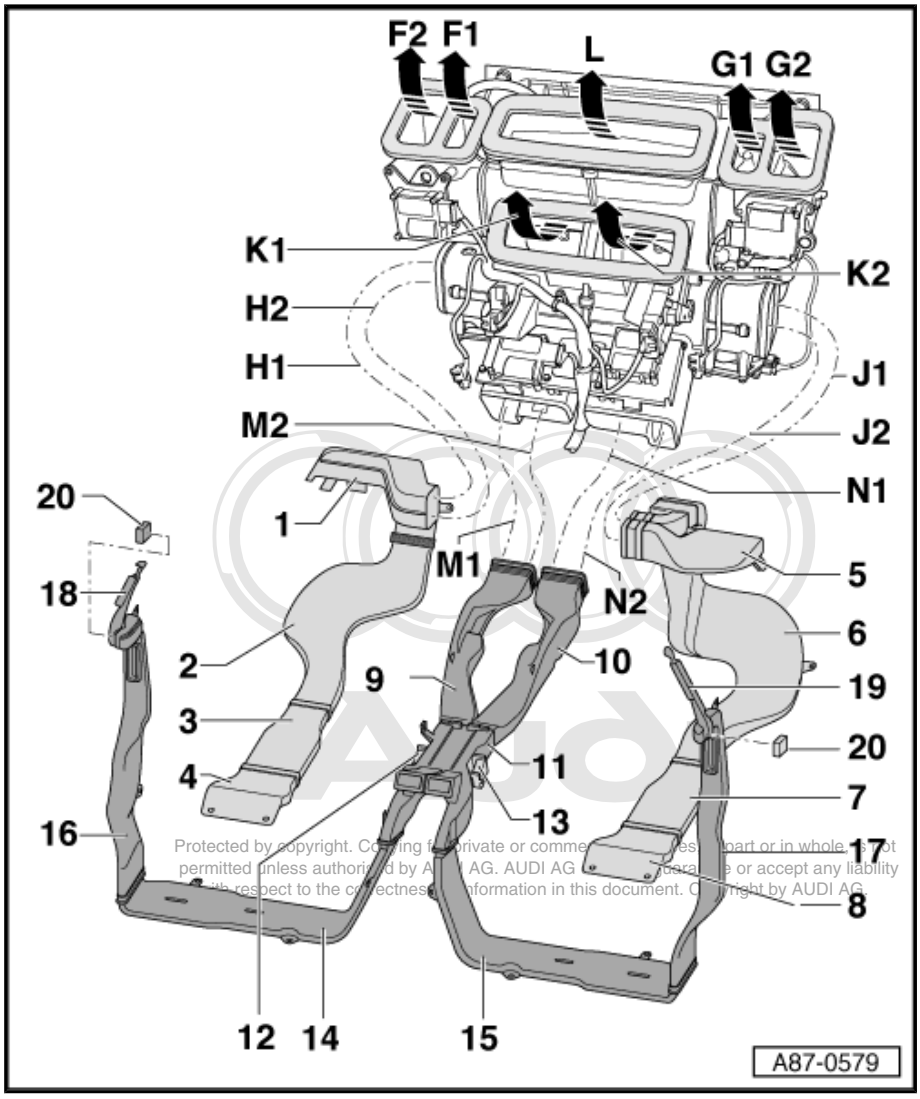
- ❑ Vehicles with a rear Climatronic operating and display unit -E265- are fitted with a rear right footwell heater element -Z43-

9 - Air duct to rear left vents

10 - Air duct to rear right vents

11 - Rear vent air distribution

- ❑ Different versions for vehicles without and with rear Climatronic operating and display unit -E265-



12 - Rear left vent warm air and cold air flap control motor -V220-

- ❑ Only actuates flaps for left side on vehicles with rear Climatronic operating and display unit -E265-
- ❑ The connecting element between the flap and motor is „red“ coloured.
- ❑ On vehicles with no rear Climatronic operating and display unit -E265- (no rear right vent warm air and cold air flap control motor -V221-), the flaps for the right side are also moved by way of a joint shaft by the rear left vent warm air and cold air flap control motor -V220- .

13 - Rear right vent warm air and cold air flap control motor -V221-

- ❑ Only fitted on vehicles with rear Climatronic operating and display unit -E265-

- ❑ The connecting element between the flap and motor is „blue“ coloured.
- ❑ On vehicles with no rear Climatronic operating and display unit -E265- (no rear right vent warm air and cold air flap control motor -V221-), the flaps for the right side are moved by way of a joint shaft by the rear left vent warm air and cold air flap control motor -V220- .

14 - Air duct to vents in left „B“ pillar

15 - Air duct to vents in right „B“ pillar

16 - Air duct in left „B“ pillar

17 - Air duct in right „B“ pillar

18 - Air duct to vent for demisting door window in left „B“ pillar

- ❑ Only fitted on vehicles with rear Climatronic operating and display unit -E265-

19 - Air duct to vent for demisting door window in right „B“ pillar

- ❑ Only fitted on vehicles with rear Climatronic operating and display unit -E265-

20 - Cap

- ❑ Fitted on vehicles with no rear Climatronic operating and display unit -E265- instead of air duct to vents for demisting door window in „B“ pillar

11 Checking cooling output of air conditioner

Special tools and workshop equipment required

- Vehicle diagnostic, testing and information system -VAS 5051 A- (or Service Information System -VAS 5052-)
- Commercially available thermometer (for temperature measurement; if applicable use thermometer with 2 probes for simultaneous measurement of temperature e.g. on right and left)

11.1 Prerequisites for checking cooling output

- Ambient temperature above 15 ° C.
- Radiator and condenser clean (clean if necessary)
- Poly V-belt for compressor drive OK and correctly tensioned, pulley actually driving compressor (vehicles with 6-cyl. engine, 8-cyl. MPI engine, 8-cyl. diesel engine or 12-cyl. engine)
- Compressor drive unit correctly installed, compressor actually being driven (vehicles with 8-cyl. FSI engine or 10-cyl. engine) ⇒ page 161
- All air ducts, covers and seals OK and properly fitted
- Air flow through dust and pollen filter not impeded by contamination
- Vehicle not exposed to sunlight
- Engine warm
- Fault memory of front operating and display unit, Climatronic control unit -J255- (and rear Climatronic operating and display unit -E265-) interrogated and erased, basic setting performed and encoding of front operating and display unit, Climatronic control unit -J255- checked ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- Adaption of front operating and display unit, Climatronic control unit -J255- (and rear Climatronic operating and display unit -E265-) checked ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051
- All dash panel vents open
- Front lid closed
- Settings on front operating and display unit, Climatronic control unit -J255- or on MMI (Multi Media Interface):

– „Auto“ mode.

– „LO“ temperature setting (for driver and front passenger side).

– Compressor on („Econ“ function not active in MMI, A/C mode on).

- Functions with engine running:

– Operation of radiator fans -V7- (speed governed by pressure in refrigerant circuit and engine temperature)

– Operation of fresh air blower -V2- at maximum speed

– Switching of air conditioner to air recirculation mode (approx. 1 minute after starting engine, fresh-air/air flow flaps are closed and air recirculation flap opened, air is drawn in by fresh

air blower -V2- from passenger compartment beneath dash panel)

– No operation of coolant circulation pump -V50-

– Left heat regulation valve -N175- and right heat regulation valve -N176- closed (coolant hoses/coolant pipes to heating system heat exchangers cool down)

Note

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

11.2 Checking cooling output

Prerequisites for checking cooling output satisfied ⇒ page 122

– Measure the ambient temperature (must be above 15 °C).

– Close the doors, front lid, windows and sun roof.

– Open all dash panel vents.

– Switch on ignition.

– Set „Econ“ mode on MMi (A/C mode off).

– Close the vents in the „B“ pillar.

– Set the handwheel for the variable temperature centre vent to „Warm“.

– Start the engine.

– Start air conditioner guided fault-finding ⇒ "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 high-pressure sender -G65-) and check the display ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

♦ Actuation of the compressor via the air conditioner compressor regulating valve -N280- deactivated (compressor switched off, display in display zone 0%)

♦ Pressure in refrigerant circuit transmitted by the high-pressure sender -G65- equal to or greater than the value in the table at the measured ambient temperature

Ambient temperature in °C	Displayed pressure (in bar absolute)
15	4,7
20	5,6
25	6,6
30	7,6
35	8,8

Note

- *At absolute pressure, 0 bar corresponds to an absolute vacuum. Normal ambient pressure thus corresponds to roughly 1 bar absolute. 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 is governed by the ambient temperature. Due to the radiation of heat by components (e.g. the radiator fan), the pressure displayed with a warm engine is slightly higher than that given for the corresponding ambient temperature.*

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

– Check the signal of the air conditioner high-pressure sender -G65- ⇒ page 10 .

– If no fault is found at the air conditioner high-pressure sender -G65- , there is not enough refrigerant in the 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 .

If the pressure in the refrigerant circuit is OK:

– Switch on the compressor by selecting „Auto“ mode on the front operating and display unit, Climatronic control unit -J255- or on the MMI (Multi Media Interface).

– Select „Lo“ temperature (for driver and front passenger side) on the front operating and display unit, Climatronic control unit -J255- .

– Set the air outflow direction on the front operating and display unit, Climatronic control unit -J255- to „dash panel vents“.

– Select the „Reading measured value block“ function ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

– Check the diagnosis tester display in the various display zones:

– The display zone for actuation of the air conditioner compressor regulating valve -N280- shows a duty cycle greater than 30% (-N280- actuated, compressor switched on).

– The display zone for the current to the 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 high-pressure sender -G65- and displayed increases above the value with the compressor switched off.

Note

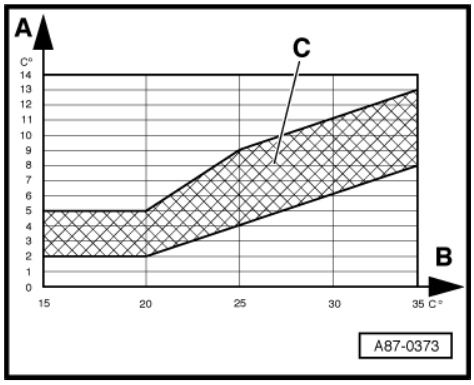
- *The air conditioner compressor regulating valve -N280- is actuated by the front operating and display unit, Climatronic control unit -J255- such that the temperature of the air downstream of the evaporator reaches the specified value (approx. 2 to 5 °C):*
- *After starting the vehicle, a value greater than 75 % (0.55A) is displayed depending on the measured temperature, engine speed and electrical system voltage.*
- *As soon as the temperature measured by the evaporator output temperature sender -G263- approaches the specified value, actuation is cancelled and the compressor output thus reduced.*
- *The connectors to the air conditioner compressor regulating valve -N280- and the electric engine mounting are identical. If the connectors are interchanged (possible for example on vehicles with 4.2 l engine), no entry is made in the fault memory, but the compressor is constantly actuated and the evaporator may ice up.*
- *If no or an insufficient current is displayed in the display zone with the values for actuation of the air conditioner compressor regulating valve -N280- , check actuation of -N280- ⇒ page 16 .*
- *If the pressure indicated in the display zone with the measured value of the high-pressure sender -G65- does not change and actuation of the compressor is OK, check whether the air conditioner compressor regulating valve -N280- is actually being actuated and the compressor actually being driven (an overload safeguard is fitted between the compressor and the pulley/drive unit; the compressor is not driven if this has been tripped). If no fault can be found, there is a problem with the refrigerant circuit. The vehicle is to be taken to a workshop equipped with the necessary tools where the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a (inform the workshop of the problem).*

– Press the air recirculation mode button on the front operating and display unit, Climatronic control unit -J255- (symbol for „air recirculation mode“ in button lights).

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

– In the „Reading measured value block“ function, select the display group with the measured value of the evaporator output temperature sender -G263- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

– Compare the measured value indicated in the display zone (for the evaporator output temperature sender -G263-) to the values in the graph.



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

B - Ambient temperature

C - Permissible tolerance range

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

◆ If the required values are not attained, check the measured value of the evaporator output temperature sender -G263- and compare the measured values displayed for the evaporator output temperature sender -G263- to the measured values for the left vent temperature sender -G150- and right vent temperature sender -G151- :

– If the measured values for the left vent temperature sender -G150- and the right vent temperature sender -G151- only deviiate slightly from the measured value for the evaporator output temperature sender -G263- : Perform the measures to be taken if the readout does not match the specification ⇒ page 128 .

– If the measured value of the evaporator output temperature sender -G263- is higher than that of the left vent temperature sender -G150- and the right vent temperature sender -G151- , check proper installation of the evaporator output temperature sender -G263- and perform the electrical check for this sender ⇒ page 107 and ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

Note

Operation of the air conditioner is apparent, for example, from the fact that the refrigerant pipe on the low pressure end (thick pipe) cools down.

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

– Compare the measured value for the evaporator output 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- must not be more than 3 °C higher than that for -G263- .

– If the measured value for the evaporator output temperature sender -G263- is OK and the measured value for the left vent temperature sender -G150- and /or the right vent temperature sender -G151- is more than 3°C higher than the measured value for -G263- , perform the measures to be taken in the event of a temperature increase downstream of the evaporator ⇒ page 130

If the required values are not attained, compare the measured values displayed for -G150- and -G151- to one another.

◆ If the measured values for -G150- and -G151- are 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 132 and ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

- If the measured value for one of the senders (-G150- or -G151-) is lower than the measured value for -G263- : Check -G263- , -G150- and -G151- for proper installation and contact resistance in the electrical connections. Replace the defective sender if applicable ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051. .

Note

- *The temperature of the air flow from the „Centre“ dash panel vents can additionally be measured for example using a commercially available thermometer.*
- *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 a temperature increase downstream of the evaporator.*
- *If the air flowing out of the variable temperature centre vent (in „Lo“ setting for driver and front passenger side on front operating and display unit, Climatronic control unit -J255-) is cooled in the „Cold“ setting and not cooled 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 the cooling output on the front passenger side is still adequate, but the values are no longer attained on the driver side, this is an indication of insufficient refrigerant in the 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 ⇒ page 118 and ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- Air in one or both heat exchangers (different flow through heat exchangers and uneven heat distribution) ⇒ page 132
- Detachment of foam seal on heat exchanger installation, allowing air to flow past heat exchanger.

Under certain operating conditions residual moisture in the refrigerant circuit may lead to the formation of ice on the compressor regulating valve. Such ice formation impairs compressor control, the evaporator is cooled excessively and ices up. Icing-up of the evaporator may give rise to the following problems:

– Repeated or sporadic failure of the air conditioner (no cooling/ heat output) after a long journey; the air conditioner functions properly again after a short delay following engine shutoff.

– Misting up of the windows on the inside after a long journey; the windows are initially not cleared even by pressing the „Defrost“ button; the air conditioner functions properly again after a short delay following engine shut-off.

Remedy:

– Check the measured value of the evaporator output temperature sender -G263- („Reading measured value block“ function) ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

- If the sender measured value is too high under the usage conditions described by the customer (greater than e.g. 10 °C although air conditioner is functioning properly), check the evaporator output 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 (at ambient temperature above 0 °C, colder than 0 °C for lengthy period), there is a fault in the refrigerant circuit. The vehicle is to be taken to a workshop equipped with the necessary tools where the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a (inform the workshop of the problem).
- Check the refrigerant line from the evaporator to the reservoir (thick pipe, low pressure end) with the engine running. If this line is severely iced up when the problem occurs (a thin layer of ice is permissible), this is also an indication that the temperature in the evaporator is too low (compressor control may not be OK). The vehicle is to be taken to a workshop equipped with the necessary tools where the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a (inform the workshop of the problem).
- 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) ⇒ Air conditioner with refrigerant R134a .

11.3 Measures to be taken if readout does not match specification

If the values required are not attained during the cooling output test ⇒ page 123 (checking cooling output).

– Select the „Reading measured value block“ function ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

– Repeat the cooling output test ⇒ page 122 .

– During the cooling output test observe the display for the pressure in the refrigerant circuit and actuation of the air conditioner compressor regulating valve -N280- . -N280- deactivated during cooling output test (control current dropped below 0.50 A) ?

↓
yes
↓

Interrogate the fault memory, eliminate the faults displayed and erase the fault memory. ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

↓

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

↓

↓
no
↓

- Increase in pressure in refrigerant circuit during cooling output test?

↓
yes
↓

↓
no
↓

Repeat the cooling output test.

Continued:
Increase in pressure in refrigerant circuit
⇒ page 129
↓

The vehicle is to be taken 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 .

Increase in pressure in refrigerant circuit

– Open the front lid.

– Repeat the cooling output test ⇒ page 122 .

• Operation of radiator fans -V7- 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 front operating and display unit, Climatronic control unit -J255- , the radiator fans -V7- may only be switched in as of a certain pressure in the refrigerant circuit

↓
yes
↓

– Read out the measured value of the high-pressure sender -G65- (pressure in refrigerant circuit) and the measured values for radiator fan actuation ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

• Operation of radiator fan -V7- at higher speed as pressure in refrigerant circuit increases?

↓
yes
↓

– The vehicle is to be taken 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. ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

– Repair actuation of the radiator fan -V7- .

↓
no
↓

– Check actuation of the radiator fans -V7- , e.g. in „final control diagnosis“ function. ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

– Repair actuation of the radiator fan -V7- .

– Repeat the cooling output test ⇒ page 122 .

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 usage conditions (e.g. in hot countries with high ambient temperatures, „stop and go traffic“ and high relative humidity), the extremely high cooling output involved may also result in pressures of up to 31 bar.*
- *At ambient temperatures below 25 °C the pressure in the refrigerant circuit does not usually rise above 16 bar (the radiator fan runs and cools the condenser).*
- *By way of the signal ratio (signal of the high-pressure sender -G65-), the front operating and display unit, Climatronic control unit -J255- calculates the pressure in the refrigerant circuit. If the ratio is less than 12.5% (corresponding to absolute pressure of approx. 1.8 bar) and greater than 87.5% (corresponding to absolute pressure of approx. 32 bar), the front operating and display unit does not switch on the compressor (the air conditioner compressor regulating valve -N280- is not actuated). The compressor is only re-activated once the ratio exceeds 12.5% (corresponding to absolute pressure of 1.8 bar) or drops below 48% (corresponding to absolute pressure of 16 bar).*

- 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 front operating and display unit:

– As soon as the pressure in the refrigerant circuit exceeds 30 bar (absolute) (full compressor output is not released again until the pressure has dropped below 27 bar)

– As soon as the coolant temperature exceeds 115° C (full shut-down at 118° C)

– If the pressure in the refrigerant circuit had been in excess of 32 bar (ratio greater than 87.5%), the front operating and display unit does not re-activate the compressor until the pressure has dropped below 29 bar (ratio less than 84%).

Note

Further information on the pressure in the refrigerant circuit can be found in the guided fault-finding routine („Reading measured value block“) ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

11.4 Measures to be taken in the event of temperature increase downstream of evaporator

If the values required for the left vent temperature sender -G150- and / or the right vent temperature sender -G151- are not attained during the cooling output test ⇒ page 123 (checking cooling output).

– Pinch off both coolant hoses between the engine and the pump valve unit using hose clamps -3093 bzw. 3094- .

– Repeat the cooling output test ⇒ page 122 .

- 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- ? ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

↓ yes ↓

Detach the hose clamps up to dia. 40 mm -VAS 3093- or the hose clamps up to dia. 25 mm -VAS 3094- at the two coolant hoses.

↓

Check actuation of the heat regulation valves -N175- , -N176- and the coolant circulation pump -V50- ⇒ page 131

↓ no ↓

Check the sender supplying the deviating measured value for correct installation, as well as the electrical connections for contact resistance ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

↓

Eliminate the cause of the incorrect measured value and replace the defective sender ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

- Actuation of heat regulation valves and coolant circulation pump OK? ⇒ page 131

↓ yes ↓

Connect the test box -V.A.G 1598/19- to the wiring harness to the front operating and display unit ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

↓

Perform electrical checks for left heat regulation valve -N175- , right heat regulation valve -N176- and coolant circulation pump -V50- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051. .

↓

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

↓ yes ↓

Replace the front operating and display unit ⇒ page 80 and ⇒ page 80 .

↓

Repeat the cooling output test ⇒ page 122 .

↓ no ↓

Replace the pump valve unit ⇒ page 58 .

↓

Repeat the cooling output test ⇒ page 122 .

↓ 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 the cooling output test ⇒ page 122 .

12 Checking heat 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 heat output. In addition, noise may occur or complaints may be received about differences in the temperature of the air from the driver side and front passenger side vents despite identical setting.

Remedy:

– At the front operating and display unit, Climatronic control unit -J255- , set the air conditioner to maximum heat output („Hi“ temperature) for the driver side and front passenger side.

– Perform a lengthy test drive at high engine speed (at least 10 minutes, engine speed above 2500 rpm). When doing so, select a low gear to prevent excessive vehicle speed.

Note

In the event of customer complaints about poor heating output at certain engine speeds, check incorporation of the pump valve unit into the coolant circuit. If the two coolant hoses (supply and return) between the engine and pump valve unit have been interchanged, the engine coolant pump works in opposition to the pump in the pump valve unit and at certain engine speeds coolant no longer flows into the heat exchangers ⇒ page 55 and ⇒ Engine, mechanics; Rep. gr. 19 .

Special tools, testers and other items required

♦ Vehicle diagnostic, testing and information system -VAS 5051 A- (or Service Information System -VAS 5052-)

12.1 Checking operation of pump valve unit

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

♦ If the temperatures determined are below the specified value (inadequate heat output):

– Check operation of the left heat regulation valve -N175- , right heat regulation valve -N176- and coolant circulation pump -V50- ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

If no fault is found:

– Check for interchanged coolant hoses (from engine to pump valve unit or from pump valve unit to heat exchangers of air conditioning unit) ⇒ page 55 and ⇒ 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/supplementary heater, check actuation of the auxiliary heater circulation pump -V55- as well as incorporation of the auxiliary/supplementary heater into the coolant circuit ⇒ Auxiliary/supplementary heater; Rep. gr. 82 and ⇒ "Guided fault-finding" function of vehicle diagnostic,

testing and information system VAS 5051 (for auxiliary heater).

12.1.1 Test requirements

- Coolant circuit bled in specified manner: ⇒ Engine, mechanics; Rep. gr. 19
- All air ducts, covers and seals OK and properly fitted
- Air flow through dust and pollen filter not impaired by dirt
- Engine warm
- Battery -A- (vehicle battery) OK and adequately charged (to prevent energy management control unit -J644- switching off front operating and display unit, Climatronic control unit -J255- during test)
- Fault memory of front operating and display unit, Climatronic control unit -J255- (and rear Climatronic operating and display unit -E265-) interrogated and erased, basic setting performed and encoding of front operating and display unit, Climatronic control unit -J255- checked ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051
- Adaption of front operating and display unit, Climatronic control unit -J255- (and rear Climatronic operating and display unit -E265-) checked ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- Vehicle not exposed to sunlight

12.1.2 Checking

Special tools and workshop equipment required

- Battery charger, 60 A -VAS 5904-

– Close the front lid.

– Close the doors, windows and sun roof.

– Start the engine and let it run for a few minutes at maximum cooling output (compressor ON, „LO“ temperature setting for left and right side).

– Switch off ignition.

– With the ignition switched off, connect up the vehicle diagnostic, testing and information system -VAS 5051 A- with the diagnostic cable -VAS 5051/5A- to the 16-pin diagnostic socket in the vehicle and select air conditioner/heater electronics ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.

– Switch on ignition.

The front operating and display unit starts up, the coolant circulation pump -V50- is not actuated and does not run, the left heat regulation valve -N175- and the 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 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.

- ♦ Specification: Both measured values indicate roughly ambient temperature (deviation plus max. 15 °C).

– Set the temperature for the left side (driver side) on the front operating and display unit to „Hi“.

– Read out the measured value for the left vent temperature sender -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 the right vent temperature sender -G151- (the temperature value remains roughly constant).

- ♦ Temperature increase less than 15 °C (right heat regulation valve -N176- closed)

– Set the temperature for the right side (front passenger side) on the front operating and display unit to „Hi“.

– Read out the measured value for the right vent temperature sender -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)

– Set the temperature for the driver side and front passenger side on the front operating and display unit to „LO“.

– Read out the measured values for -G150- and -G151- .

- ♦ Specifications: 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).

13 Servicing refrigerant circuit

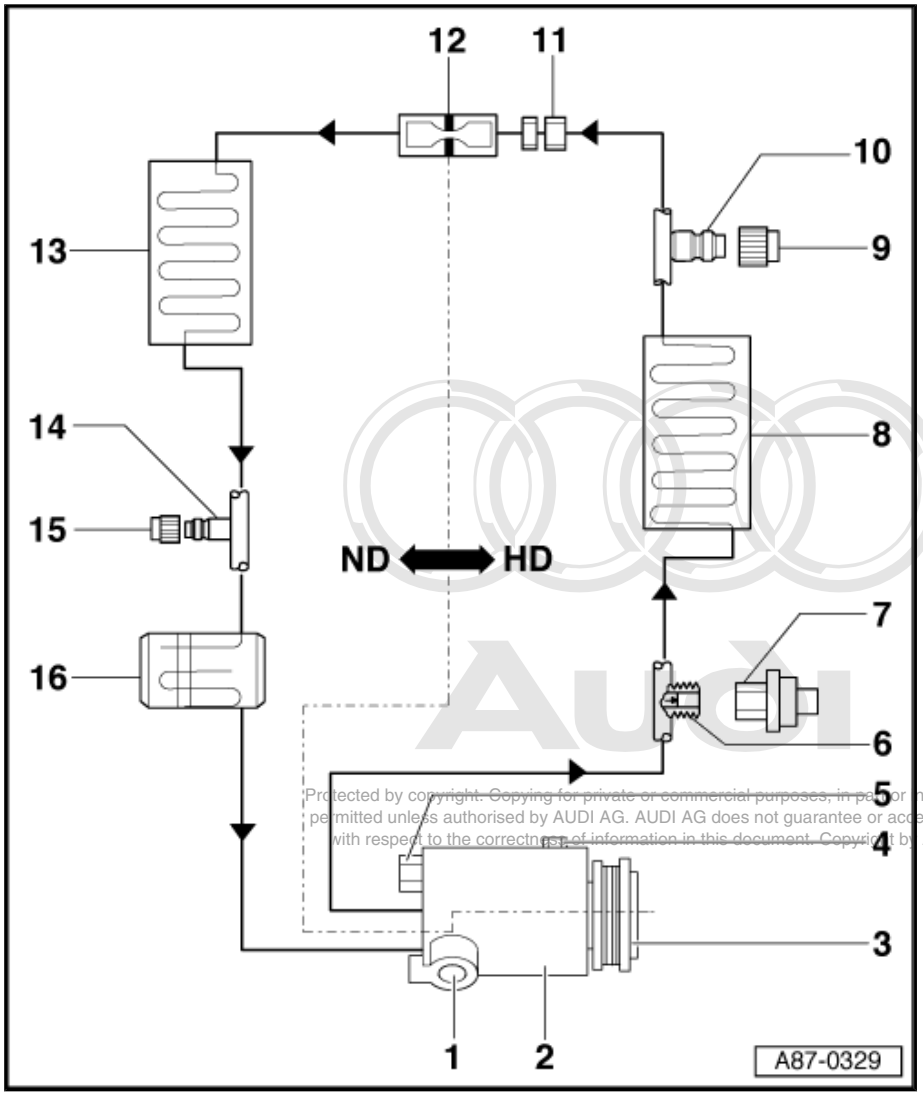
Note

- *The refrigerant in the refrigerant circuit is never to be topped up (drain, evacuate and refill circuit) ⇒ Air conditioner with refrigerant R134a .*
- *The compressor is always driven when the engine is running; there is no magnetic clutch. The engine is therefore not to be started unless the refrigerant circuit has been properly assembled. If, for example, the refrigerant lines have not been connected to the compressor, heat generation inside the compressor with the engine running may lead to the destruction of the compressor. The internal heat generation is caused by the compressor operating against a fixed resistance even at approximately 0 % delivery rate (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*
- *Different refrigerant oil capacities apply to the refrigerant circuit depending on the type of compressor („6 SEU 14“, „7 SEU 16“ or „7 SEU 17“) ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a*
- *Moisten the O-rings slightly with refrigerant oil before fitting ⇒ page 13 .*
- *The specified diameters of the O-rings and the tightening torques also apply to the bolted joints of the refrigerant lines/ hoses between the individual components.*
- *Only fit O-rings approved for refrigerant R134a ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a .*
- *Checking cooling output ⇒ page 122*
- *Checking pressures in refrigerant circuit ⇒ Air conditioner with refrigerant R134a*
- *For all other refrigerant circuit servicing and testing work not described in this Workshop Manual, refer to ⇒ Air conditioner with refrigerant R134a*

13.1 Servicing refrigerant circuit

HD = High-pressure end

ND = Low-pressure end



1 - Air conditioner compressor regulating valve -N280-

- ❑ Not to be removed
- ❑ Checking actuation and operation ⇒ page 16 .

Note

2 - Compressor

- ❑ Detaching compressor from holder/re-attaching on vehicles with 6-cyl. engine, 8-cyl. MPI engine or 8-cyl. diesel engine (compressor drive via poly V-belt) ⇒ page 14
- ❑ Detaching compressor from holder/re-attaching on vehicles with 12-cyl. engine (compressor drive via poly V-belt) ⇒ page 149
- ❑ Detaching refrigerant line at compressor/attaching ⇒ page 138
- ❑ To protect the compressor, the engine is only to be started with the refrigerant circuit completely assembled.
- ❑ Detaching poly V-belt ⇒ Engine, mechanics; Rep. gr. 13
- ❑ Removing and installing compressor (basic information) ⇒ page 140
- ❑ Removing and installing compressor on vehicles with 8-cyl. FSI engine (compressor drive via drive shaft) ⇒ page 141
- ❑ Removing and installing compressor on vehicles with 10-cyl. engine (compressor drive via drive shaft) ⇒ page 153
- ❑ The type of compressor differs depending on the engine (6, 8, 10 or 12-cyl. engine, diesel or petrol engine) ⇒ Electronic parts catalogue
- ❑ Following installation of a new compressor or after pouring in fresh refrigerant oil (e.g. after flushing the refrigerant circuit), give the compressor 10 turns by hand prior to initial start-up to prevent compressor damage.
- ❑ Different refrigerant oil capacities apply to the refrigerant circuit depending on the type of compressor („6 SEU 14“, „7 SEU 16“ or „7 SEU 17“) ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a

3 - Pulley/drive unit for compressor

- ❑ Replacing compressor pulley ⇒ page 19
- ❑ Removing and installing poly V-belt ⇒ Engine, mechanics; Rep. gr. 13
- ❑ Replacing compressor drive unit (vehicles with 8-cyl. FSI engine or 10-cyl. engine) ⇒ page 161

4 - Oil drain plug

- ❑ A sealing ring is installed on the Denso compressor and is always to be replaced
- ❑ Tightening torque: 30 Nm
- ❑ The compressor must be removed before screwing out to drain off refrigerant oil. Crank the compressor by way of the pulley to accelerate discharge of the refrigerant oil

5 - Pressure relief valve, 10 Nm

- ❑ Not to be removed

6 - Connection with valve

- ❑ Use an adapter from the adapter set for service connections -T10364- for example for removing and installing the valve insert with the refrigerant circuit drained.

> **WARNING**
> *The refrigerant circuit must always be drained before removing the valve insert.*

7 - High-pressure sender -G65-

- ❑ Removing and installing ⇒ page 10
- ❑ Checking signal ⇒ page 10

8 - Condenser

- ❑ Detaching and re-attaching refrigerant lines ⇒ page 166
- ❑ Removing and installing condenser ⇒ page 167

9 - Cap

- ❑ With seal
- ❑ Always to be screwed on

10 - Service connection/high-pressure end

- ❑ Different versions (with primary sealing valve or Schrader valve) depending on the refrigerant line; distinguishing features ⇒ Air conditioner with refrigerant R134a
- ❑ Use an adapter from the adapter set for service connections -T10364- for example for removing and installing the service connection or valve insert with the refrigerant circuit drained.
- ❑ For service station for measuring pressure and draining and charging refrigerant circuit ⇒ Air conditioner with refrigerant R134a
- ❑ Depending on the engine version, certain components may have to be removed for connection of the service coupling.

> **WARNING**
> *The refrigerant circuit must be drained before removing the service connections and valve inserts (the connection has no valve).*

11 - Union in refrigerant line

- ❑ Replace O-ring, version ⇒ Electronic parts catalogue
- ❑ Tightening torque: 15 Nm

12 - Restrictor

- ❑ Fitted in union ⇒ Item 11 (page 137)
- ❑ O-ring: 7.5 mm / 1.5 mm
- ❑ Replace restrictor with O-ring
- ❑ Removing and installing ⇒ page 168
- ❑ Moisten O-ring slightly with refrigerant oil before fitting restrictor ⇒ page 13

13 - Evaporator

- ❑ Replace O-rings, version ⇒ Electronic parts catalogue
- ❑ Removing and installing refrigerant line ⇒ page 171
- ❑ Removing and installing ⇒ page 173

14 - Service connection/low-pressure end

- ❑ Different versions (with primary sealing valve or Schrader valve) depending on the refrigerant line; distinguishing features ⇒ Air conditioner with refrigerant R134a
- ❑ Use an adapter from the adapter set for service connections -T10364- for example for removing and installing the service connection or valve insert with the refrigerant circuit drained.
- ❑ For service station for measuring pressure and draining refrigerant circuit ⇒ Air conditioner with refrigerant R134a
- ❑ Depending on the engine version, certain components may have to be removed for connection of the service coupling.

WARNING

The refrigerant circuit must be drained before removing the service connections and valve inserts (the connection has no valve).

15 - Cap

- ❑ With seal
- ❑ Always to be screwed on

16 - Reservoir

- ❑ Moisten O-rings slightly with refrigerant oil before fitting ⇒ page 13
- ❑ Replace O-rings, version ⇒ Electronic parts catalogue
- ❑ Tightening torque: Hexagon socket head bolt at block connection: 10 Nm
- ❑ Removing and installing ⇒ page 169

13.2 Detaching refrigerant lines at compressor/attaching

Note

- ♦ *The compressor is always driven when the engine is running; there is no magnetic clutch. The engine is therefore not to be started unless the refrigerant circuit has been properly assembled. If, for example, the refrigerant lines have not been connected to the compressor, heat generation inside the compressor with the engine running may lead to the destruction of the compressor.*
- ♦ *The following illustrations show a compressor attached to the left of the engine. The refrigerant lines are to be detached in the same manner for compressors installed at other locations (e.g. at the top).*
- ♦ *Seal open lines and connections at the compressor with suitable caps (to prevent the ingress of dirt and moisture).*

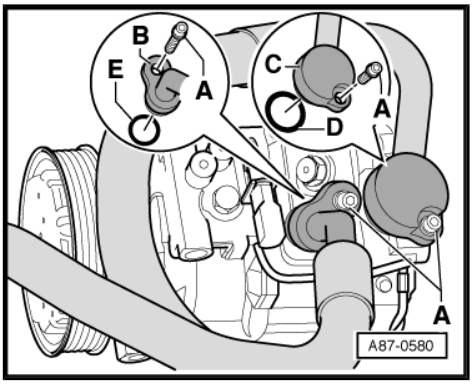
13.2.1 Removing

– Remove the upper engine cover (vehicles with 8-cyl. diesel engine only).

– Drain the refrigerant circuit: ⇒ Air conditioner with refrigerant R134a

– Perform the preparatory work described for vehicles with 8-cyl. FSI engine ⇒ page 141 .

– Perform the preparatory work described for vehicles with 10-cyl. engine ⇒ page 153 .
– Perform the preparatory work described for vehicles with 12-cyl. engine ⇒ page 149 .
– Detach the compressor from the holder (does not apply to vehicles with 8-cyl. diesel engine) ⇒ page 14 .
– Remove the bolts -A-.
– Detach the refrigerant lines -B- and -C-.



13.2.2 Installing

Install in reverse order, paying attention to the following:

– Replace the O-rings -D- and -E-; for version refer to ⇒ Electronic parts catalogue
– Tighten the bolts -B- to 25 Nm.

Note

- *Use is not to be made of the O-rings from the caps of the replacement compressor connections.*
- *Moisten the O-rings slightly with refrigerant oil before fitting ⇒ page 13 .*
- *Following attachment of the refrigerant lines to the compressor (and after installing the compressor) check the routing of the lines. They must be inserted in the holders provided and not make contact with other components.*

– Evacuate and refill the refrigerant circuit ⇒ Air conditioner with refrigerant R134a
– Start up the air conditioner after charging the refrigerant circuit ⇒ page 177 .

Note

Also heed the notes on start-up of the air conditioner after charging ⇒ Air conditioner with refrigerant R134a .

13.3 Removing and installing compressor (basic information)

Note

- *On account of possible interchange with the connector to the electric engine mounting, mark the connector to the air conditioner compressor regulating valve -N280- (interchanging the connectors does not result in an entry in the fault memory, but the evaporator could ice up as the compressor is constantly actuated).*
- *Not all replacement compressors have the same oil capacity. Attention is therefore to be paid to the exact part number ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a . The different oil capacities result from the design of the compressor (heed oil capacities). Too much oil in the circuit results in higher pressures and reduced system cooling output. Too little oil may lead to lubrication problems in the compressor.*
- *Different refrigerant oil capacities apply to the refrigerant circuit depending on the type of compressor („6 SEU 14“, „7 SEU 16“ or „7 SEU 17“) ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a*

13.3.1 Removing

– Drain the refrigerant circuit: ⇒ Air conditioner with refrigerant R134a
– Detach the compressor from the holder (does not apply to vehicles with 8-cyl. diesel engine) ⇒ page 14 .
– Perform the preparatory work described for vehicles with 12-cyl. engine ⇒ page 149 .
– Detach the refrigerant lines from the compressor ⇒ page 138 .
– Detach the compressor from the holder (vehicles with 8-cyl. diesel engine) ⇒ page 14 .

13.3.2 Installing

Install in reverse order, paying attention to the following:

Prior to compressor installation ⇒ Air conditioner with refrigerant R134a

- Tightening torques ⇒ page 14 and ⇒ page 138 .
- Replace the O-rings at the opened connections, version ⇒ Electronic parts catalogue

– Do not start the engine until the refrigerant circuit has been assembled
– After fitting a new compressor or pouring in fresh refrigerant oil and before fitting the poly V-belt / drive shaft (e.g. after flushing the refrigerant circuit), crank the compressor 10 times by hand prior to initial start-up of the engine so as to prevent compressor damage.
– If possible only start the engine with the refrigerant circuit filled

Note

- *Different compressors depending on country version, production period and engine ⇒ page 8 and ⇒ Electronic parts catalogue*
- *Moisten the O-rings slightly with refrigerant oil before fitting ⇒ page 13 .*
- *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. A prerequisite for this internal lubrication is that there is still a residual quantity of refrigerant oil in the compressor.*
- *The engine is not to be started unless the refrigerant circuit has been properly assembled. If, for example, the refrigerant lines have not been connected to the compressor, heat generation inside the compressor with the engine running may lead to the destruction of the compressor.*
- *The compressor removed contains an indeterminate amount of refrigerant oil. Attention is therefore to be paid to the notes on compressor replacement ⇒ Air conditioner with refrigerant R134a*
- *The air conditioner compressor regulating valve -N280- is not actuated if the refrigerant circuit is empty and the compressor runs at idle with the engine. However, as there is no refrigerant available, the refrigerant oil required for compressor lubrication is not conveyed. Compressor lubrication is maintained by way of an „internal oil circuit“ to prevent damage.*

Should it be necessary to start the engine with the refrigerant circuit empty, heed the following so as not to damage the compressor ⇒ page 177

– Evacuate and charge the refrigerant circuit ⇒ Air conditioner with refrigerant R134a .
– Start up the air conditioner after charging the refrigerant circuit ⇒ page 177 .

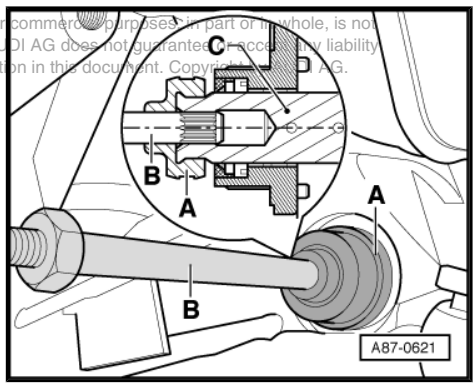
Note

Also heed the notes on start-up of the air conditioner after charging ⇒ Air conditioner with refrigerant R134a .

13.4 Removing and installing compressor (on vehicles with 8-cyl. FSI engine)

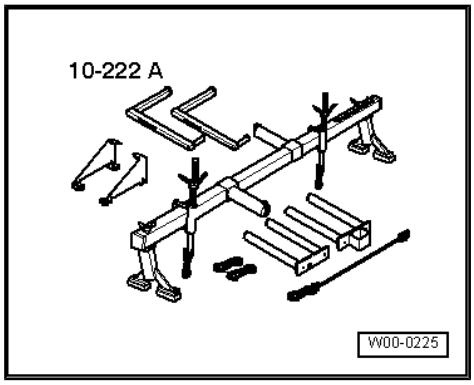
Note

- *The compressor is driven via a gear wheel and a shaft -B-.*
- *Detaching compressor holder from engine/attaching ⇒ Engine, mechanics; Rep. gr. 13*
- *On vehicles with an 8-cyl. FSI engine, detaching the compressor involves draining the refrigerant circuit and then detaching both refrigerant lines from the compressor ⇒ page 138 and ⇒ Air conditioner with refrigerant R134a .*

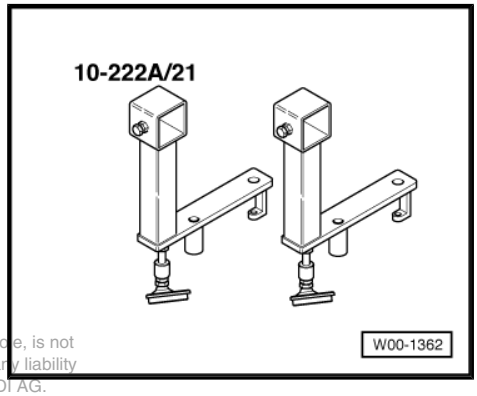


Special tools and workshop equipment required

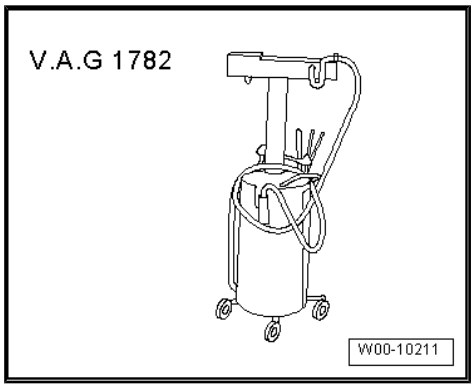
- Support bar -10 - 222 A-



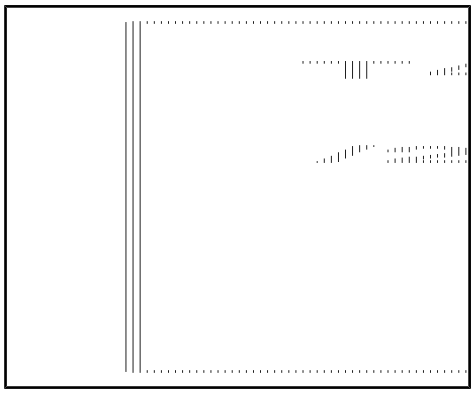
- Adapter -10 - 222 A /21-



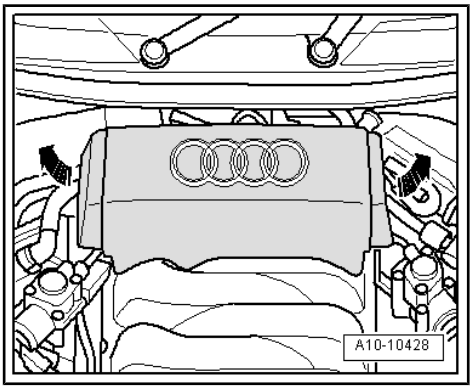
- Used oil collector and extractor -V.A.G 1782-



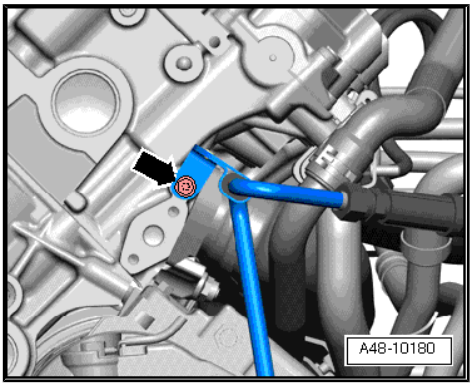
- Supplementary engine support bar set -T40093-



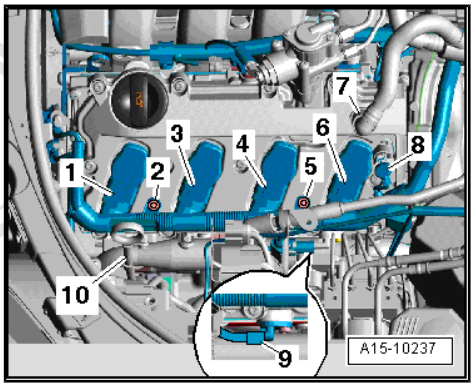
Removing



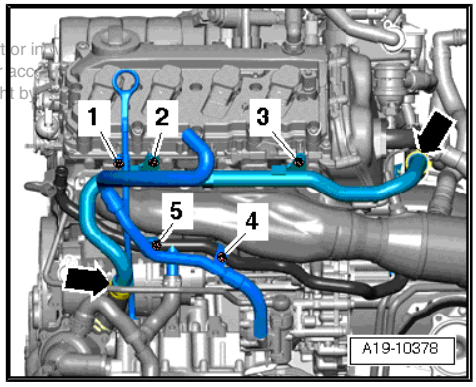
- Drain the refrigerant circuit ⇒ Air conditioner with refrigerant R134a .
- Draw off the power steering hydraulic fluid from the reservoir with the used oil collector and extractor -V.A.G 1782- .
- Detach the rear engine cover -arrows-.
- Drain the coolant ⇒ Engine, mechanics; Rep. gr. 19 .
- Remove the front coolant pipe ⇒ Engine, mechanics; Rep. gr. 19 .
- Remove the coolant pump ⇒ Engine, mechanics; Rep. gr. 19 .



- Screw out the bolt -arrow- for the hydraulic fluid pipe.



- Pull the dipstick -10- out of the guide tube.
- Screw out the bolts -2- and -5-.
- Unplug the connectors -1, 3, 4, 6, 8- and lay bare the wiring harness.
- Remove the Hall sender -9-.
- Press the release tabs and detach the crankcase breather hose -7-.
- Set down the wiring harness on the engine.

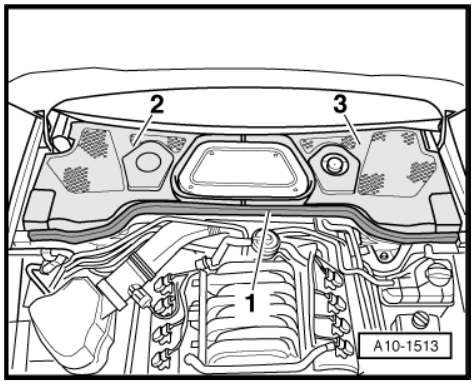


- Screw out the bolt -1- and lift off the guide tube for the dipstick.
- Screw out the bolts -2- and -3- and pull the left coolant pipe upwards slightly.

Note

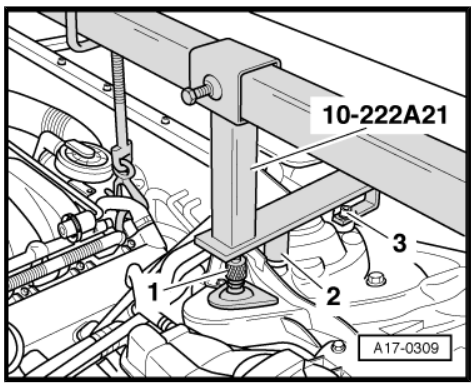
-Items 4, 5 and arrows- can be ignored.

– Pull off the rubber seal -1- and detach the plenum chamber covers -2- and -3-.

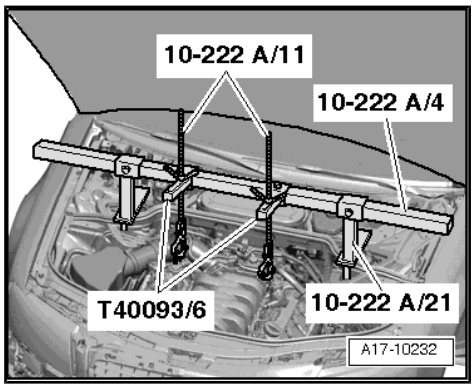


– Screw out the rear bolts -3- for the body brace.
– Secure the adapters -10 - 222 A /21- at the suspension strut domes without the cross-piece.

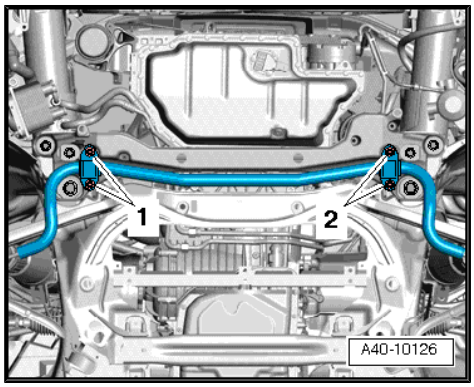
- The supports are marked for the left and right side of the vehicle.
- The centre resting point -2- of the supports is positioned on the front bolts for the body brace.
- The adapters -10 - 222 A /21- are secured with the rear bolts -3- for the body brace.
- The knurled screw -1- must be screwed down such that the support plate rests on the suspension strut dome.



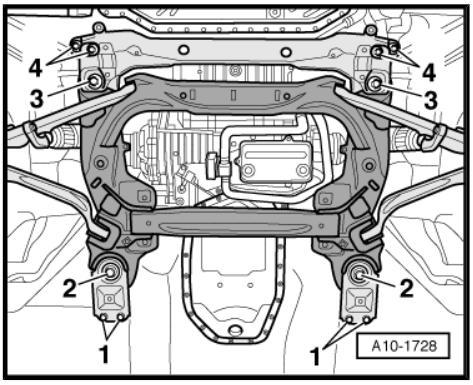
– Fit the cross-piece with 2 adapters -T40093/6- at the adapters -10 - 222 A /21- .
– Secure the spindles -10 - 222 A /11- at the engine lifting eyes.
– Pretension the engine slightly with the spindles of the support bar.



– Screw out the bolts -1- and -2- for the anti-roll bar mount on the left and right.



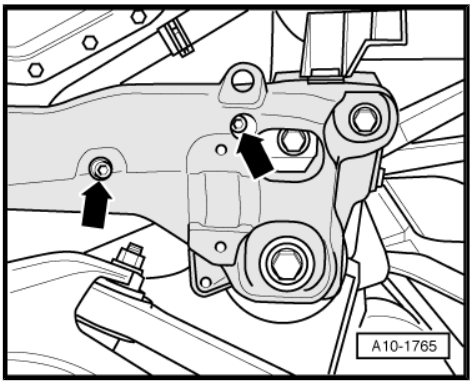
– Screw out the bolts -3- and -4-.



Note

-Items 1 and 2- can be ignored.

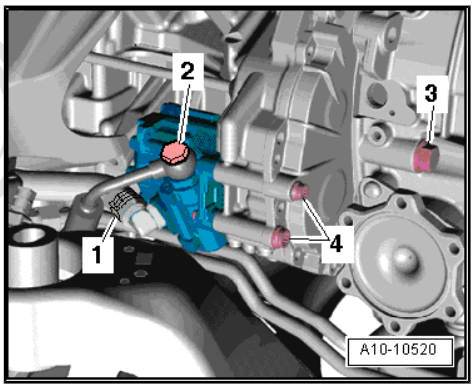
– Screw out the engine mounting bolts -arrows- on the left and right.
– Detach the engine mount.



Note

Place a cloth beneath the separation point to catch any hydraulic fluid escaping.

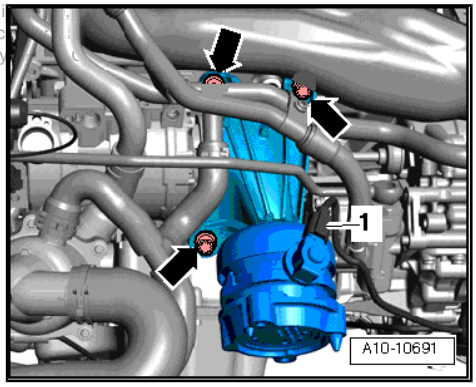
– Screw out the banjo bolt -2-.



Note

-Items 1, 3, 4- can be ignored.

– Unplug the connector at the engine mounting -1-.
– Screw out the bolts -arrows- and detach the engine support with engine mounting.

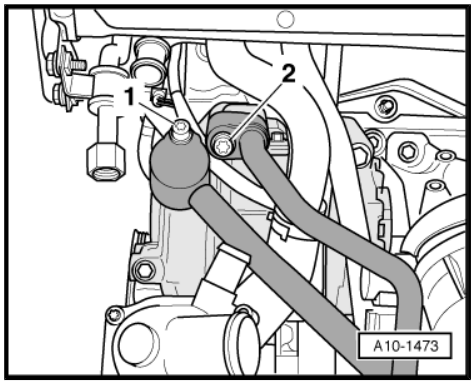


Caution

Danger of damaging refrigerant lines and hoses.

- ***Take care not to strain, kink or bend refrigerant lines and hoses.***

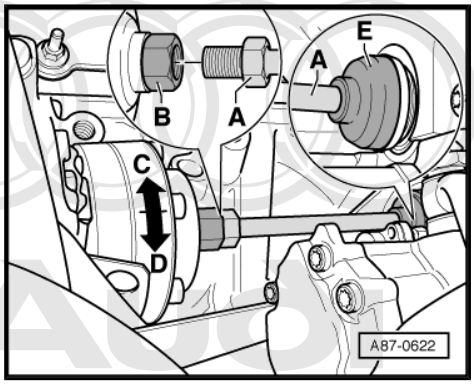
– Screw out the bolts -1 and 2-.
– Detach the refrigerant lines from the air conditioner compressor ⇒ page 138 .



Note

To prevent the ingress of dirt and moisture, seal any open lines and connections with clean plugs or caps.

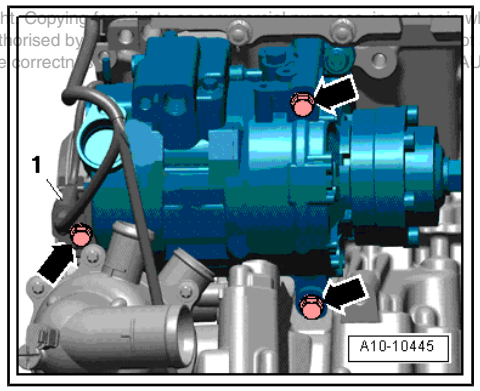
– Use an open-ended wrench to hold the compressor drive shaft -A- in position and turn the compressor drive unit -B- in the -direction of arrow C-.



Note

- *The compressor drive shaft -A- is not to be turned.*
- *After unfastening the screw connection, the compressor drive shaft -A- can be pushed through the socket -E- into the drive gear.*

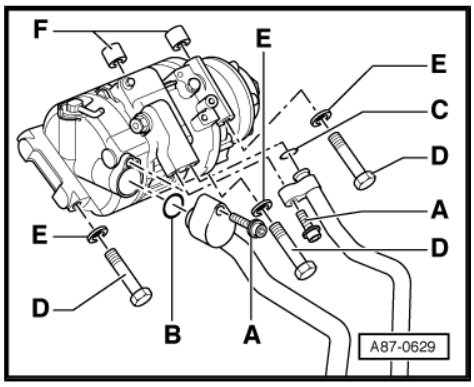
– Remove the connector -1- for the air conditioner compressor regulating valve -N280- from the holder and unplug.
– Screw out the bolt -arrow-.
– Detach the air conditioner compressor.



Installing

Install in reverse order, paying attention to the following:

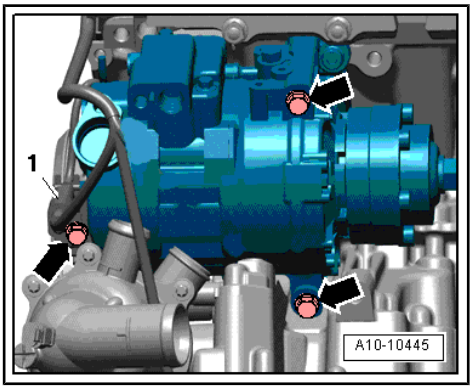
– Check whether the dowel sleeves -F- have been inserted in the compressor.



– Tighten the bolts -arrows-.

• Tightening torque: 25 Nm.

– Plug in the connector -1- at the air conditioner compressor regulating valve -N280- .

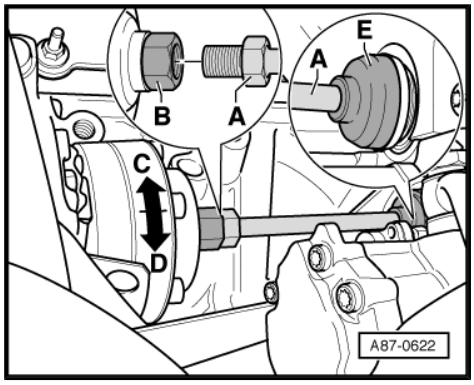


Note

Check that there is sufficient clearance between the refrigerant lines and the corresponding holders and the other components.

– Attach the refrigerant lines ⇒ page 138 .

– Before screwing in the compressor drive shaft -A-, give the compressor drive unit -B- 10 turns by hand at the compressor in -arrow direction C- to avoid compressor damage on initial switch-on.



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-.

- Tightening torque: 60 Nm.

Note

- *The compressor drive shaft -A- is not to be turned on tightening.*
- *After fitting, check the installation position of the socket -E- on the drive gear.*
- *The socket -E- is secured with a clamp at the flange of the power steering pump to stop it slipping (gradual introduction of the clamp at the factory in Model Year 2006, retrofit the clamp if necessary) ⇒ Electronic parts catalogue .*

– Fit the engine support with the left engine mounting ⇒ Engine, mechanics; Rep. gr. 10 .

– Fit the subframe and engine mount ⇒ Running gear; Rep. gr. 40 .

– Fit the anti-roll bar ⇒ Running gear; Rep. gr. 40 .

– Fit the coolant pump ⇒ Engine, mechanics; Rep. gr. 19 .

– Fit the front and left coolant pipes ⇒ Engine, mechanics; Rep. gr. 19 .

– Add coolant and bleed the coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 .

– Evacuate and charge the refrigerant circuit ⇒ Air conditioner with refrigerant R134a .

– Start up the air conditioner after charging the refrigerant circuit ⇒ page 177 .

Note

Also heed the notes on start-up of the air conditioner after charging ⇒ Air conditioner with refrigerant R134a .

Tightening torque

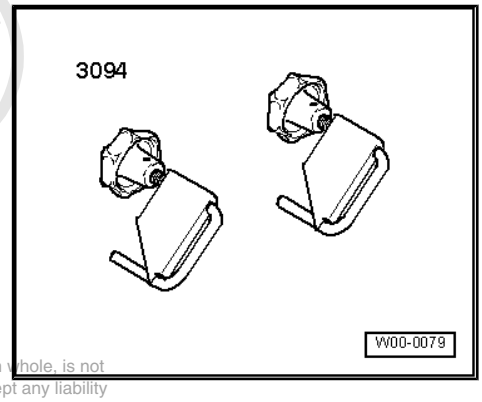
Component	Nm
Hall sender 2 -G163- to cylinder head	9

13.5 Detaching compressor from holder/removing and installing (on vehicles with 12-cyl. engine)

Compressor drive via poly V-belt

Special tools and workshop equipment required

- Hose clamps up to dia. 25 mm -3094-



13.5.1 Removing

– Drain the refrigerant circuit ⇒ Air conditioner with refrigerant R134a .

– Move the lock carrier to the service position ⇒ 12-cyl. engine, mechanics; Rep. gr. 13 .

– Remove the front left wheel.

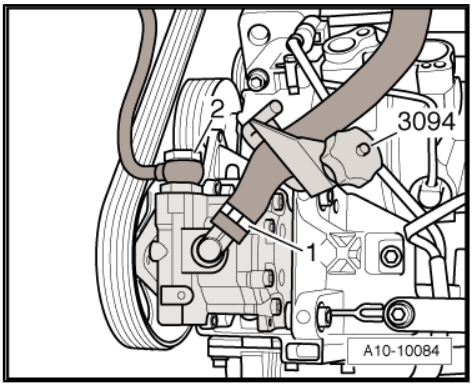
Note

- *Secure the brake disc with wheel bolts.*
- *Heed the notes on removal and installation as well as commissioning of the compressor* *⇒ page 140* *.*

– Remove the front section of the front left wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 .

– Pinch off the vane pump return hose with a hose clamp -3094- .

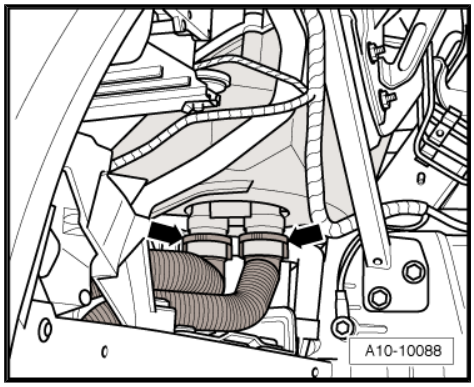
– Detach the return hose -1- from the vane pump.



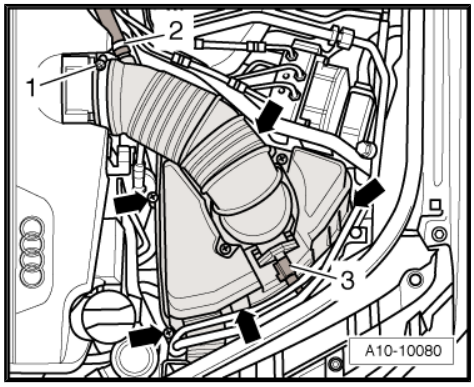
Note

-Item 2- can be ignored.

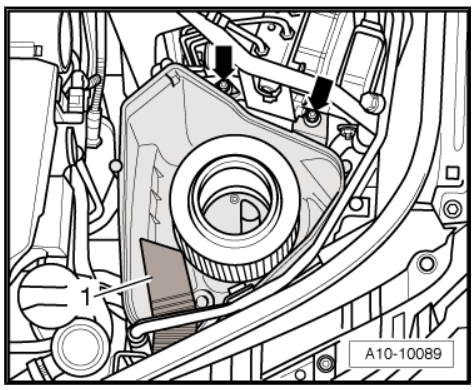
– Press the release buttons and detach both air hoses -arrows- at the bottom of the lower left section of the air cleaner housing.



– Unplug the connector -3- for air mass meter 2 -G246- .
– Detach the hose -2- from the air hose.
– Detach the air hose -1- at the intake manifold.
– Screw out the bolts -arrows-.
– Detach the top left section of the air cleaner housing.



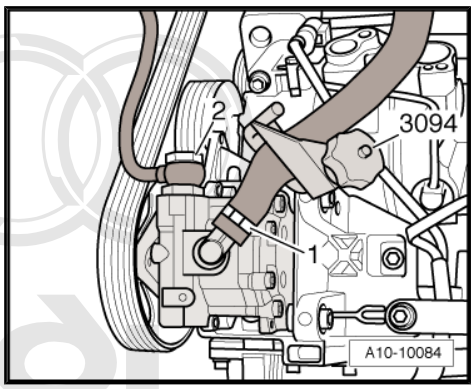
– Remove the air duct -1-.
– Screw out the bolts -arrows-.
– Take out the bottom left section of the air cleaner housing.



Note

Place a cloth beneath the hydraulic system pipe to catch any hydraulic fluid escaping.

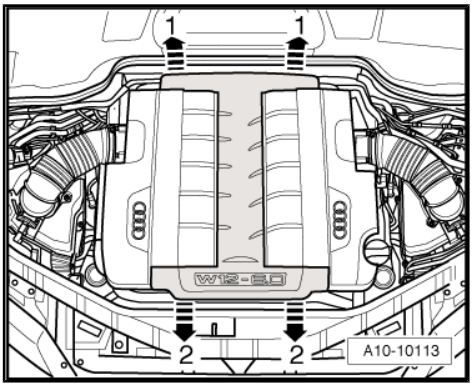
– Unscrew the hydraulic system pressure pipe -2- at the vane pump and set it down on top of the longitudinal member.



Note

-Item 1- can be ignored.

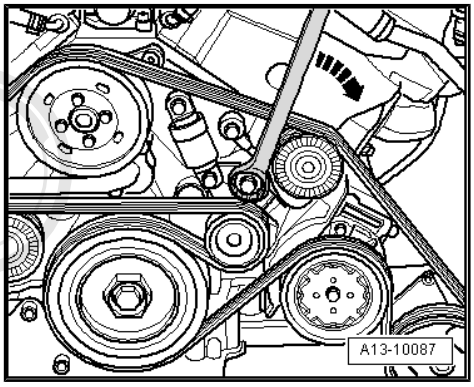
– Carefully lift off the engine cover starting at the rear and in the centre -arrows 1-.
– Then pull the engine cover forwards off the intake manifold -arrows 2-.



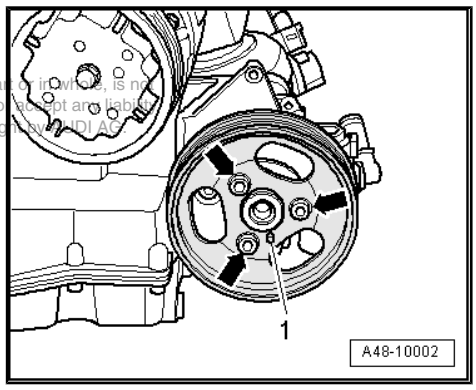
– Swivel the tensioner in -arrow direction- to slacken off the poly V-belt.
– Detach the poly V-belt from the vane pump pulley, slacken off the tensioner.

Note

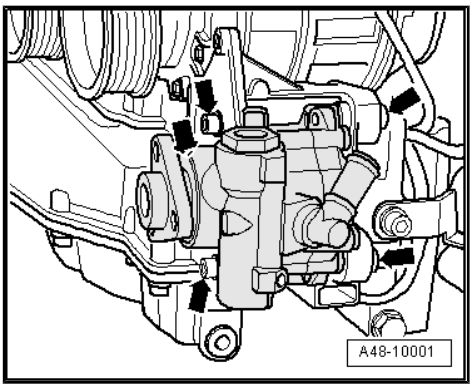
Leave the poly V-belt in position on the other pulleys.



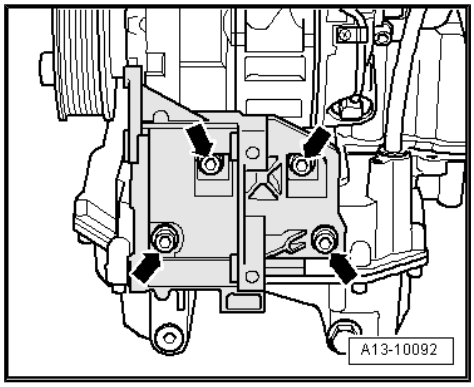
– Unscrew the pulley of the power steering vane pump -arrows-.



– Screw out the bolts -arrows- and detach the vane pump.



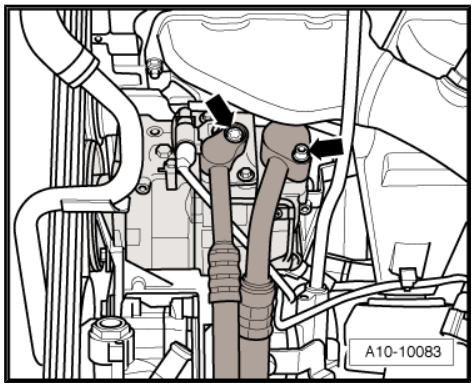
– Remove the holder for the vane pump -arrows-.



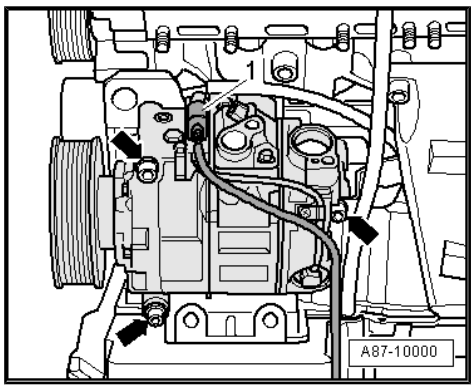
Note

To avoid damaging the air conditioner compressor and the refrigerant lines/hoses, make sure the lines and hoses are not strained, kinked or bent.

– Detach the refrigerant lines from the air conditioner compressor -arrows- ⇒ page 138 .
– Seal the openings in the air conditioner compressor.



– Unplug the connector -1-.
– Screw out the bolts -arrows- and detach the air conditioner compressor.



13.5.2 Installing

Install in reverse order, paying attention to the following:

Note

- *Heed the notes on removal and installation as well as commissioning of the compressor ⇒ page 140 .*
- *Replace oil seals and O-rings.*
- *Pay attention to dowel sleeves.*
- *Secure all hose connections with standard clamps ⇒ Electronic parts catalogue .*

– Install the vane pump ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 48 .
– Fit the poly V-belt ⇒ 12-cyl. engine, mechanics; Rep. gr. 13 .
– Install the lock carrier with attachments ⇒ General body repairs, exterior; Rep. gr. 50 .

– Evacuate and charge the refrigerant circuit ⇒ Air conditioner with refrigerant R134a .
– Check the headlight setting ⇒ Maintenance ; Booklet 4E .
– Start up the air conditioner after charging the refrigerant circuit ⇒ page 177 .

Note

Also heed the notes on start-up of the air conditioner after charging ⇒ Air conditioner with refrigerant R134a .

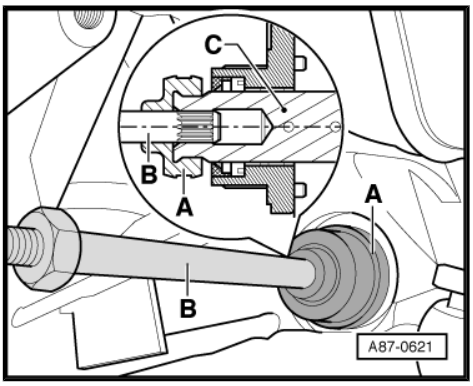
13.5.3 Tightening torques

Component	Nm
Air conditioner compressor to holder	25
Refrigerant lines to air conditioner compressor	⇒ page 138

13.6 Removing and installing compressor (on vehicles with 10-cyl. engine, Audi S8)

Note

- *The compressor is driven via a gear wheel and a shaft -B-.*
- *Detaching compressor holder from engine/attaching ⇒ Engine, mechanics; Rep. gr. 13*
- *On vehicles with 10-cyl. engine, detaching the compressor involves draining the refrigerant circuit and then detaching both refrigerant lines from the compressor ⇒ page 138 and ⇒ Air conditioner with refrigerant R134a .*



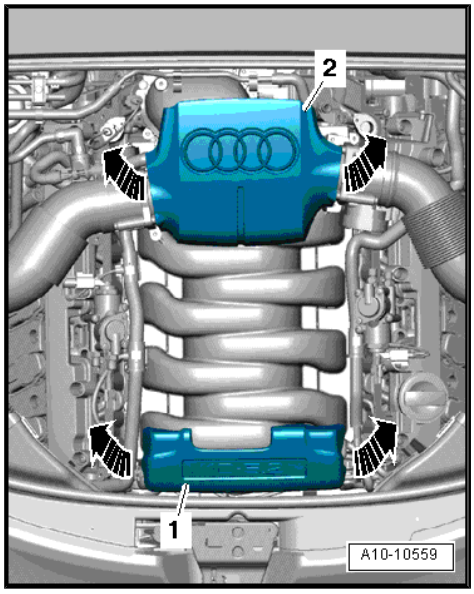
Special tools and workshop equipment required

- Support bar -10 - 222 A-
- Adapter -10 - 222 A /21-
- Used oil collector and extractor -V.A.G 1782-
- Hose clamp fitting tool -V.A.G 1921-
- Hose clip pliers -VAS 5024A-

Removing

– Drain the refrigerant circuit ⇒ Air conditioner with refrigerant R134a .
– Drain the coolant ⇒ Engine, mechanics; Rep. gr. 19 .

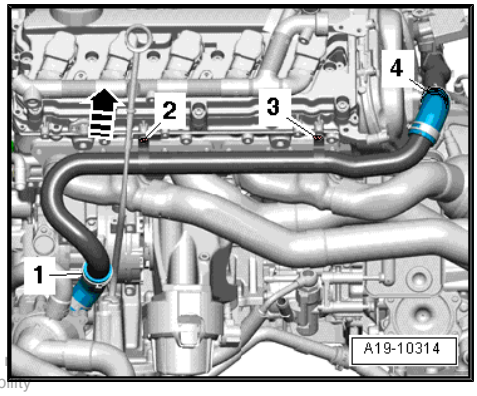
– Detach the front -1- and rear -2- engine cover -arrows-.
– Remove the left air cleaner housing ⇒ Engine, mechanics; Rep. gr. 24 .
– Draw off the power steering hydraulic fluid from the reservoir with the used oil collector and extractor -V.A.G 1782- ⇒ Running gear; Rep. gr. 48 .



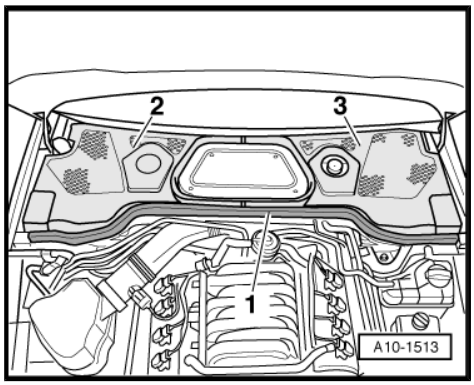
– Screw out the bolts -2- and -3-.
– Lift off the guide tube for the dipstick -arrow-.

Note

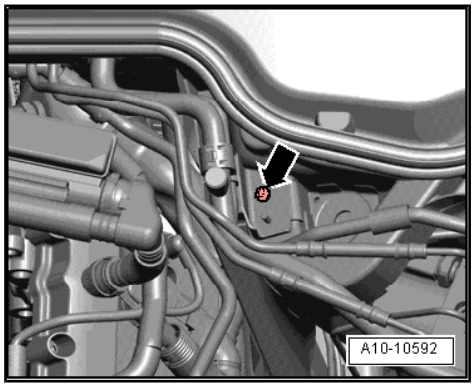
-Item 1- and -Item 4- can be ignored.



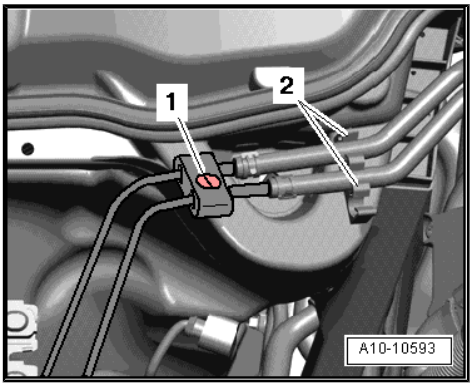
– Pull off the rubber seal -1- and detach the plenum chamber covers -2- and -3-.



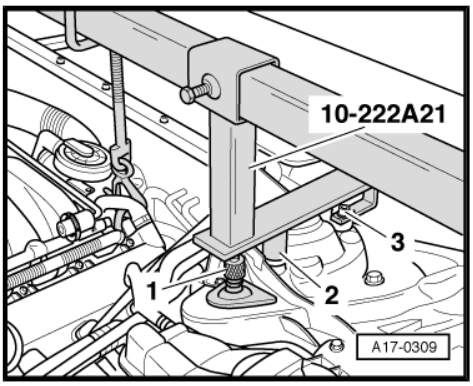
– Unscrew the holder for the refrigerant line from the left suspension strut dome -arrow-.



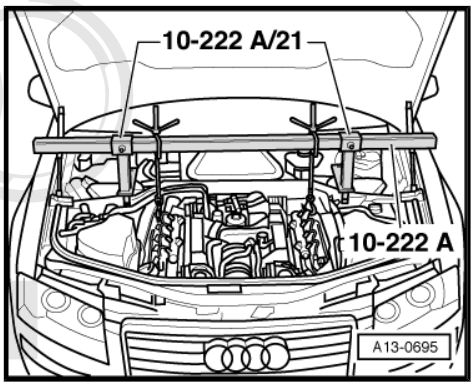
– Remove the clip -1-.
– Disengage the fuel line -2- and the line to the activated charcoal filter from the holder at the right suspension strut dome.



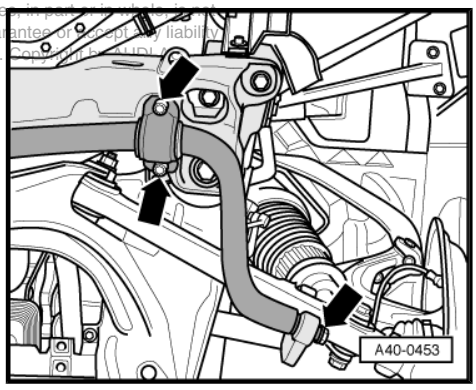
– Screw out the rear bolts -3- for the suspension strut.
– Secure the support bar -10 - 222 A- with the adapter -10 - 222 A /21- at the suspension strut domes without the cross-piece.
• The supports are marked for the left and right side of the vehicle.
• The centre resting point -2- of the supports is positioned on the front bolts for the body brace.
• The adapters -10 - 222 A /21- are secured with the rear bolts -3- for the body brace.
• The knurled screw -1- must be screwed down such that the support plate rests on the suspension strut dome.



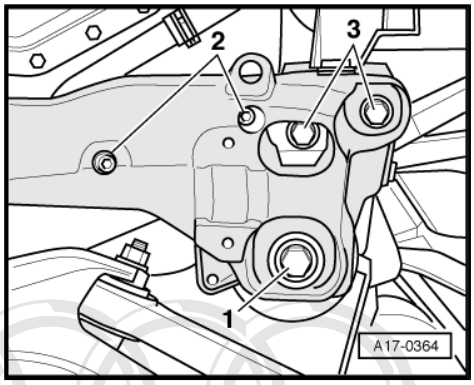
– Attach the spindles of the support bar -10 - 222 A- to the rear engine lifting eyes.
– Pretension the engine with the spindles of the support bar.



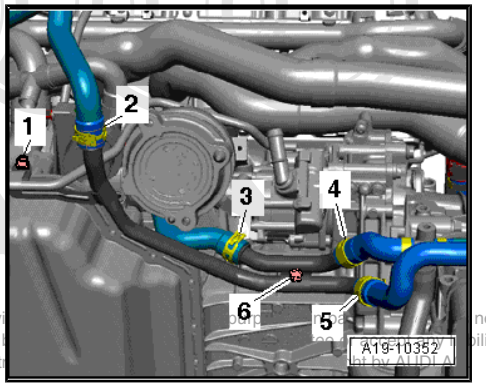
– Evenly screw out the bolts -arrows- on the left and right.
– Detach the anti-roll bar ⇒ Running gear; Rep. gr. 40 .



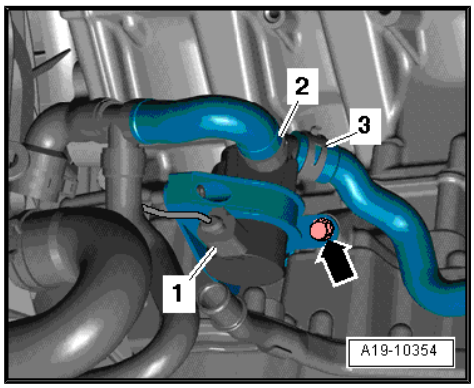
– Screw out the bolts -1 ... 3- on the left and right and detach the engine mount.



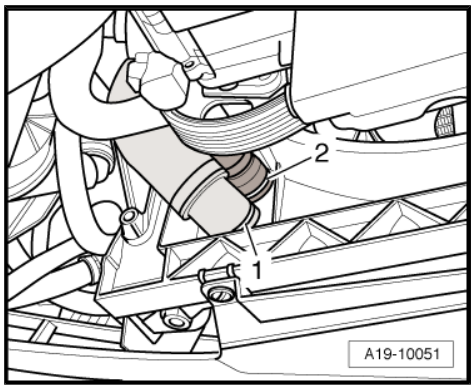
– Unscrew the nut -1- and the bolt -6- and detach the coolant pipe at the bottom left from the coolant hoses -2 ... 5-.



– Unplug the connector -1- (mark the connector to avoid possible interchange).
– Detach the coolant hose -2-.
– Screw out the bolts -arrows-.
– Swivel the continued coolant circulation pump -V51- and detach it from the coolant hose -3-.



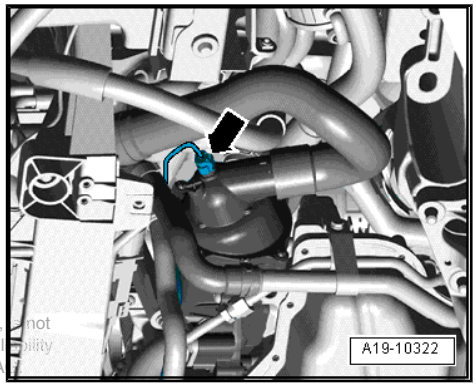
– Detach the coolant hose -1- from the radiator.



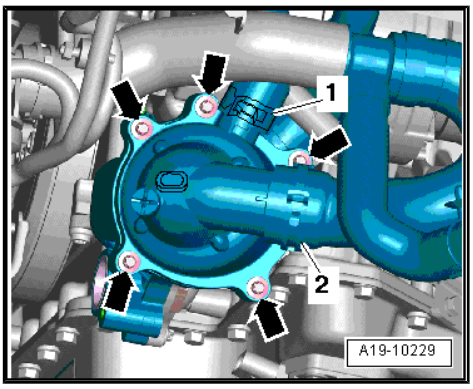
Note

-Item 2- can be ignored.

– Unplug the connector -arrow- at the radiator outlet coolant temperature sender -G83- .



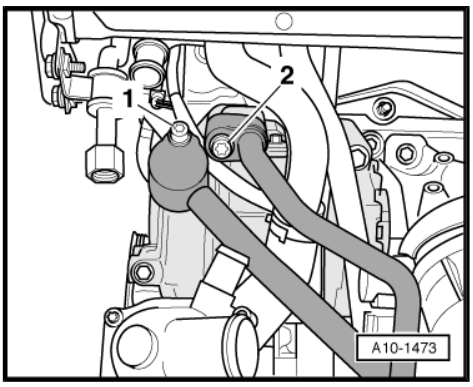
– Detach the coolant hose -2- at the bottom from the thermostat housing.
– Screw out the bolts -arrows-.
– Detach the thermostat housing and disconnect the coolant hose -1- at the top from the thermostat housing.



Note

So as not to damage the refrigerant lines/hoses, take care to avoid straining, kinking or bending the lines and hoses.

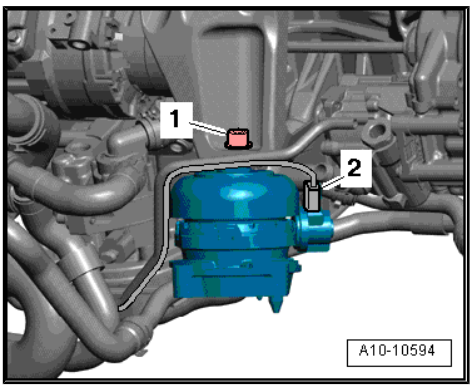
– Screw out the bolts -1- and -2-.
– Detach the refrigerant lines from the air conditioner compressor.



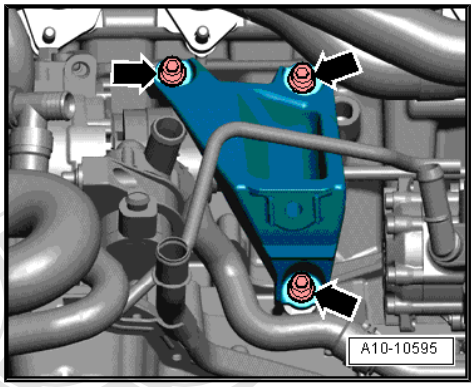
Note

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

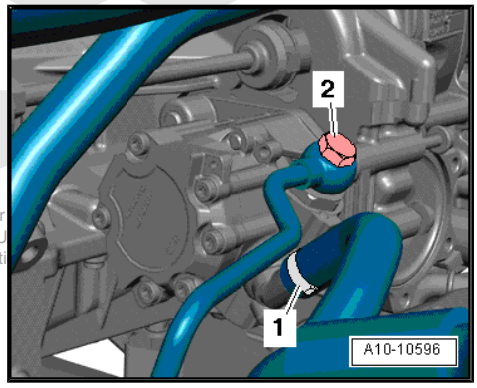
– Unplug the connector -2- and unscrew the engine mounting from the engine support.



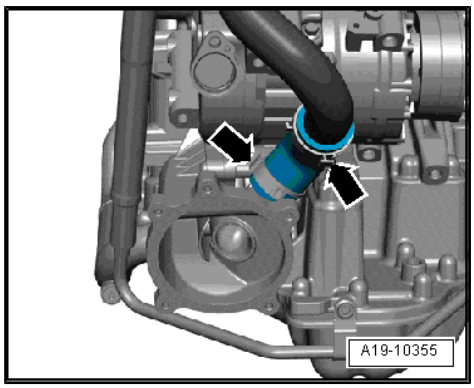
– Screw out the bolts -arrows- and detach the engine support.



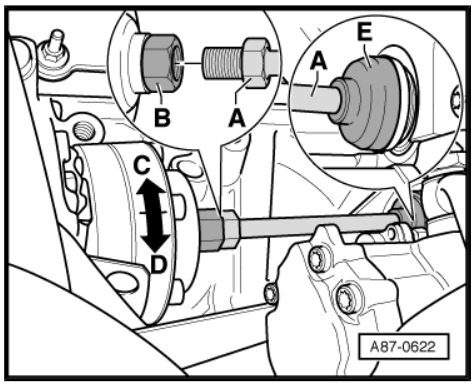
– Detach the inlet hose.
– Screw out the banjo bolt -2- for the pressure pipe.



– Remove the coolant hose -arrows- and move the coolant pipe upwards.



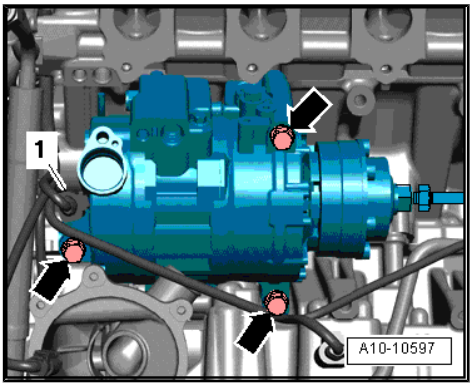
– Use an open-ended wrench to hold the compressor drive shaft -A- in position and turn the compressor drive unit -B- in the -direction of arrow C-.



Note

- *The compressor drive shaft -A- is not to be turned.*
- *After unfastening the screw connection, the compressor drive shaft -A- can be pushed through the socket -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).
– Screw out the bolts -arrows-.
– Detach the air conditioner compressor.



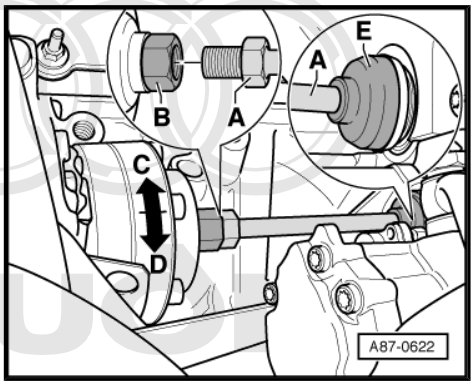
Installing

Install in reverse order, paying attention to the following:

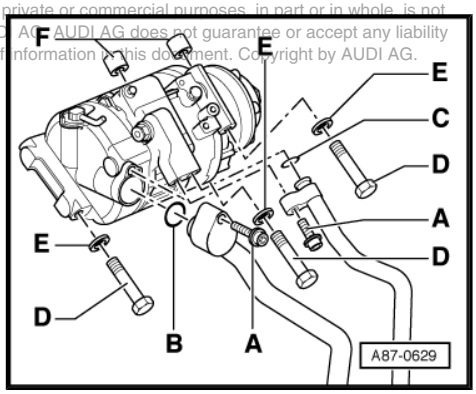
Note

- *Secure all hose connections with standard clamps ⇒ Electronic parts catalogue .*
- *The compressor removed contains an indeterminate amount of refrigerant oil. Attention is therefore to be paid to the notes on compressor replacement ⇒ Air conditioner with refrigerant R134a*

– Install the compressor drive shaft -A- (in the drive gear) and check both proper attachment and the corresponding socket -E- ⇒ page 162 .



– Thoroughly clean the contact surfaces at the holder (and the contact surfaces at the compressor). To do so, remove the bushings -F- from the compressor holder or from the compressor if necessary.
– Check the connections of the compressor and the refrigerant lines for damage or dirt ⇒ page 138 .
– Make sure the bushings -F- have been inserted in the air conditioner compressor or the holder.

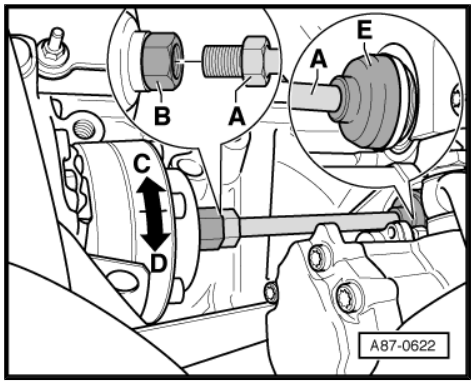


Note

Pay attention to correct positioning of the bushings -F- as well as to clean contact surfaces. Incorrectly fitted bushings or dirty/damaged contact surfaces could lead to misalignment between the compressor and engine. In the course of operation, misalignment results in drive shaft or compressor damage.

– Attach the compressor with bolts -D- (and washers -E-) to the holder (tightening torque 25 Nm).
– Attach the refrigerant lines to the compressor ⇒ page 138 (tightening torque of bolts -A- 25 Nm). For dimensions of O-rings -B- and -C- and further information, refer to ⇒ page 138 and ⇒ Electronic parts catalogue .

– After installing the compressor and before screwing in the drive shaft, crank the compressor 10 times by hand in 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 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.

– Tighten the drive shaft. Use an open-ended wrench to the 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).

Note

- *The drive shaft -A- is not to be turned.*
- *After fitting the drive shaft -A-, check the installation position of the socket -E-.*
- *The socket -E- is secured in position at the power steering pump flange with a clamp to stop it 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 mount ⇒ Engine, mechanics; Rep. gr. 10 .
– Fit the anti-roll bar ⇒ Running gear; Rep. gr. 40 .
– Fit the left air cleaner housing ⇒ Engine, mechanics; Rep. gr. 24 .
– Pour hydraulic fluid into the power steering reservoir ⇒ Running gear; Rep. gr. 48 .
– Top up the coolant ⇒ Engine, mechanics; Rep. gr. 19 .
– Re-install the other components removed.
– Evacuate and fill the refrigerant circuit ⇒ Air conditioner with refrigerant R134a
– Interrogate the fault memory of the front operating and display unit, Climatronic control unit -J255- and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
– Start up the air conditioner after charging the refrigerant circuit ⇒ page 177 .

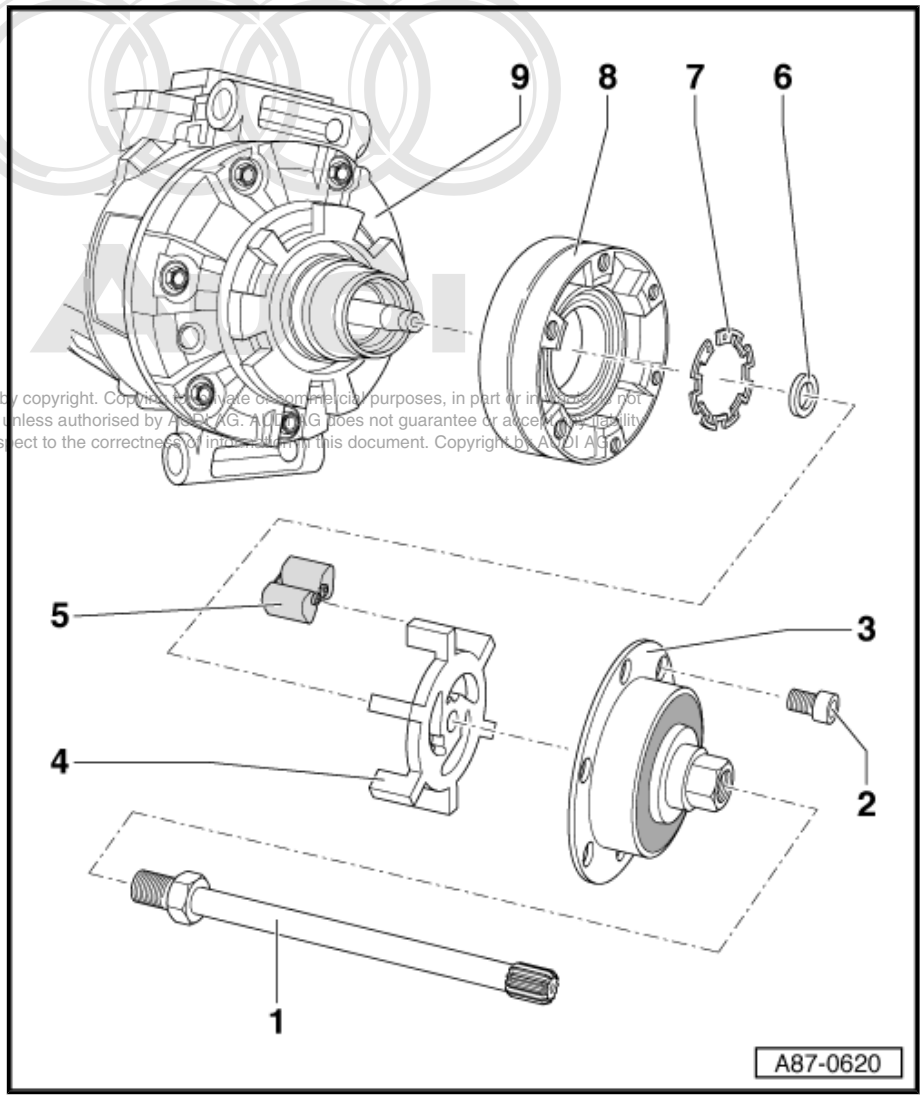
Note

Also heed the notes on start-up of the air conditioner after charging ⇒ Air conditioner with refrigerant R134a .

13.7 Checking/replacing compressor drive unit

Note

If the drive plate overload safeguard has been tripped, check the freedom of movement of the compressor before replacing the drive unit. Replace the entire compressor if it is stiff.



1 - Compressor drive shaft

- ❑ Check; after tightening screw connection, drive shaft must engage snugly in splines of drive gear ⇒ page 163
- ❑ Tightening torque 60 Nm
- ❑ Unfastening and tightening ⇒ page 162
- ❑ Removing and installing ⇒ page 163
- ❑ Lubricate the drive gear splines with grease -G 000 100- for example ⇒ Electronic parts catalogue .

2 - Hexagon socket head bolt

- ❑ Tightening torque 10 Nm

3 - Drive plate

- ❑ With overload safeguard, tripped in the event of excessive torque (e.g. stiff compressor) and drive shaft just free-wheels without driving compressor
- ❑ Checking concentricity and adjusting ⇒ page 164
- ❑ Detaching/attaching ⇒ page 163

4 - Drive plate

- ❑ Screwed to compressor drive shaft
- ❑ With overload safeguard, tripped in the event of excessive torque (e.g. stiff compressor) and drive shaft just free-wheels without driving compressor
- ❑ Tightening torque 30 Nm
- ❑ Detaching/attaching ⇒ page 164

5 - Rubber element

- ❑ Isolates drive unit, damps vibration and noise
- ❑ On installation, moisten rubber elements slightly with soap solution for example to provide lubrication
- ❑ Detaching/attaching ⇒ page 164

6 - Spacer

- ❑ Genuine spacer must be fitted

- ❑ Dimensions: 17.5 x 10 x 3 mm

7 - Circlip

- ❑ Replace
- ❑ Ensure correct positioning (flat side facing compressor)
- ❑ Removing and installing ⇒ page 165

8 - Drive plate

- ❑ With rolling bearing
- ❑ Detaching/attaching ⇒ page 165
- ❑ Clean flange of compressor before fitting drive plate

9 - Compressor

- ❑ Different models may be fitted depending on engine and country version ⇒ Electronic parts catalogue

13.8 Unfastening and tightening compressor drive shaft

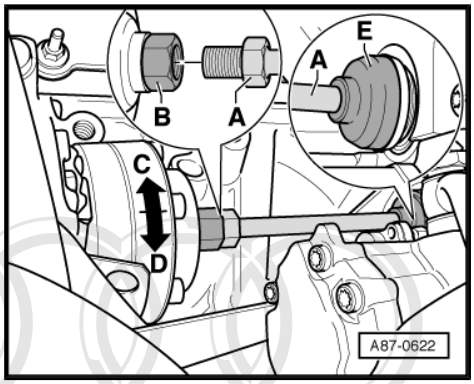
Note

- *Extensive preparation is required before the compressor drive shaft can be unfastened ⇒ page 153 (removing and installing compressor on vehicles with 10-cyl. engine) or ⇒ page 141 (removing and installing compressor on vehicles with 8-cyl. FSI engine)*
- *The drive shaft can also be checked and tightened without opening the refrigerant circuit.*

13.8.1 Unfastening drive shaft

– Remove the components impeding access to the drive shaft ⇒ page 153 (removing and installing compressor on vehicles with 10-cyl. engine) or ⇒ page 141 (removing and installing compressor on vehicles with 8-cyl. FSI 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

- *The drive shaft -A- is not to be turned.*
- *After unfastening the screw connection, the drive shaft -A- can be pushed through the socket -E- into the drive gear.*
- *After fitting the drive shaft -A-, check the installation position of the socket -E-.*
- *The socket -E- is secured in position at the power steering pump flange with a clamp to stop it slipping ⇒ Electronic parts catalogue .*

13.8.2 Tightening drive shaft

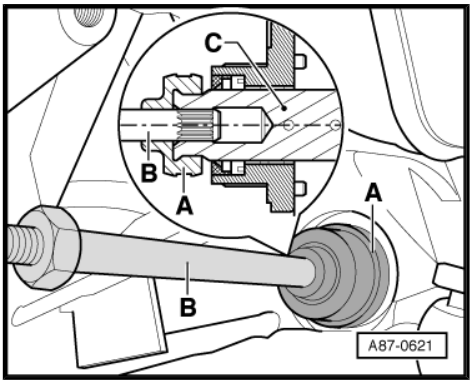
– Use an open-ended wrench to hold the compressor drive shaft -A- in position and turn the compressor drive unit -B- in the direction of arrow -D- (tightening torque 60 Nm).

– After tightening the compressor drive shaft, check the installation position of the socket -E-.

13.9 Removing and installing compressor drive shaft

13.9.1 Removing

– Remove the compressor ⇒ page 153 .
– Detach the socket -A-.
– Pull the drive shaft -B- out of the splines of the drive gear -C-.

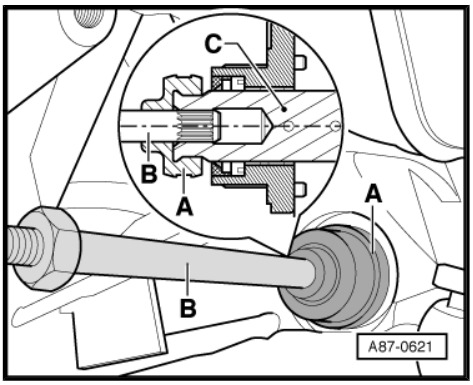


13.9.2 Installing

Install in reverse order, paying attention to the following:

– Check the 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, coat the splines of the drive shaft -B- e.g. with grease -G 000 100- ⇒ Electronic parts catalogue .
– Before fitting the compressor, insert the drive shaft -B- and slide it home in the drive gear -C-.
– After fitting the compressor, check the installation position of the socket -A-.

The socket -A- is secured in position at the power steering pump flange with a clamp to stop it slipping ⇒ Electronic parts catalogue .

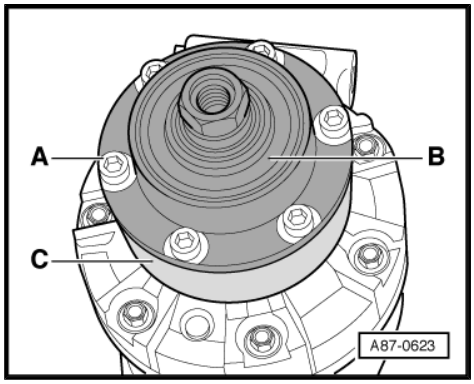


13.10 Detaching drive plate with overload safeguard/attaching

– Remove the compressor ⇒ page 153 .

13.10.1 Detaching

– Remove the bolts -A-.



Note

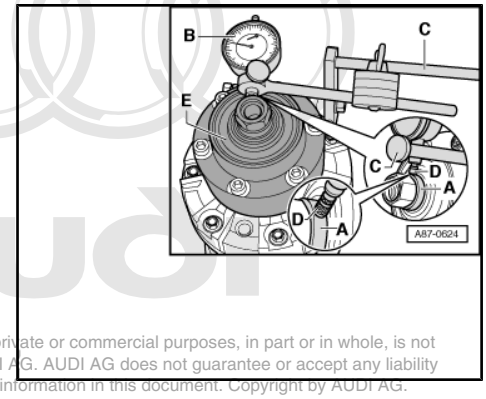
Use a commercially available strap wrench (with fabric strap) to provide support at the drive plate -C-.

13.10.2 Attaching

– Attach the drive plate with overload safeguard -B- to the drive plate -C-.
– Insert and hand-tighten the bolts -A-.
– Check the concentricity of the drive plate -B- ⇒ page 164 .
– Finish-tighten the bolts -A- (tightening torque 10 Nm).
– Check the concentricity of the drive plate -B- again ⇒ page 164 .

13.11 Checking concentricity of drive plate with overload safeguard/adjusting

– Remove the compressor ⇒ page 153 .
– Clean the flange at the drive plate -A-.
– Attach a dial gauge -B- with dial gauge holder -C- (e.g. with universal dial gauge holder -VW 387-) to the compressor.
– Position the probe of the dial gauge -D- on the flange of the drive plate -A- with a pre-tension of approx. 1.0 mm.
– Give the 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)

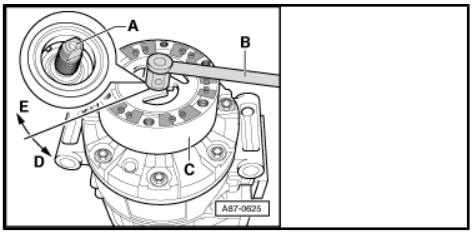
– If the eccentricity exceeds 0.2 mm, slacken off the bolts at the drive plate ⇒ page 163 and re-adjust the drive plate.

13.12 Unscrewing drive plate from compressor/screwing on

– Detach the drive plate with overload safeguard ⇒ page 163 .

13.12.1 Unscrewing

– Unfasten the drive plate -C- by turning it with a commercially available strap wrench (with fabric strap) in the direction of arrow -D-. Provide support for the compressor shaft -A- by applying a counterhold -B- to the compressor shaft -A-.



Note

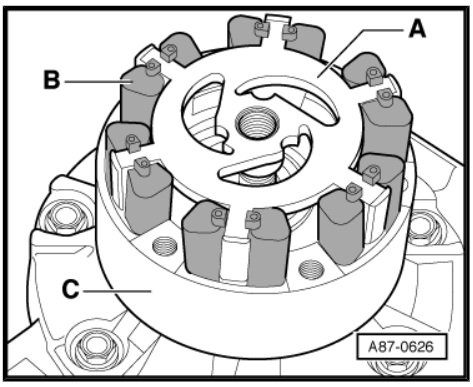
Depending on compressor design (the compressor shaft differs), use must be made to provide support of a ring spanner, or e.g. a socket wrench -T10001/10- from the damper set -T10001- or the counterhold -3079- .

13.12.2 Screwing on

– On installation, moisten the rubber elements -B- slightly with soap solution for example to provide lubrication.

– Insert the rubber elements -B- in the drive plate -A- as shown.

– Insert the drive plate -A- with the rubber elements -B- in the drive plate -C- as shown until it makes contact with the compressor shaft.

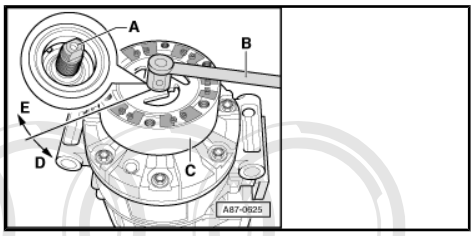


Note

This illustration shows the rubber elements -B- of type „1“. The rubber elements -B- of type „2“ are connected at the top.

– Screw the drive plate -C- onto the compressor shaft -A- by turning it in the 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-. Provide support for the compressor shaft -A- by applying a counterhold -B- to the compressor shaft -A-.



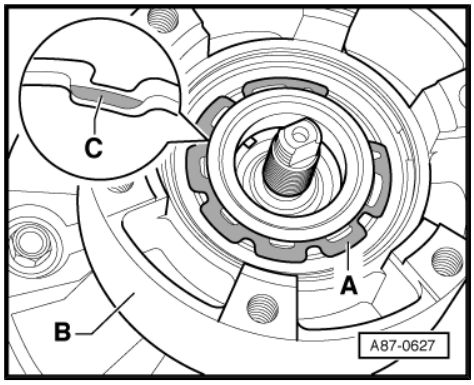
Note

Depending on compressor design (the compressor shaft differs), use must be made to provide support of a ring spanner, or e.g. a socket wrench -T10001/10- from the damper set -T10001- or the counterhold -3079- .

13.13 Removing and installing drive plate with rolling bearing

– Detach the drive plate from the compressor shaft ⇒ page 164 .

– Remove the circlip -A-.
– Detach the drive plate -B-.



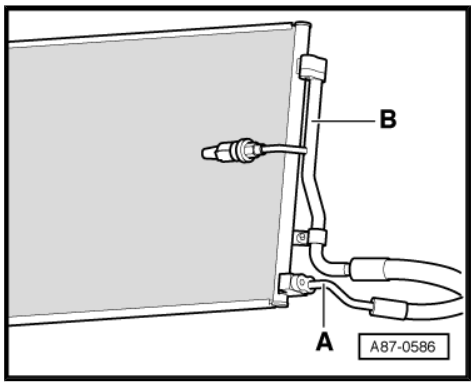
Note

- *Replace the circlip -A-.*
- *Clean the compressor flange before attaching the drive plate.*
- *On fitting the circlip -A-, take care not to bend it open more than necessary.*
- *Ensure correct insertion of the circlip -A-. The bevelled side -C- faces away from the compressor (flat side faces compressor).*

13.14 Detaching refrigerant lines from condenser/re-attaching

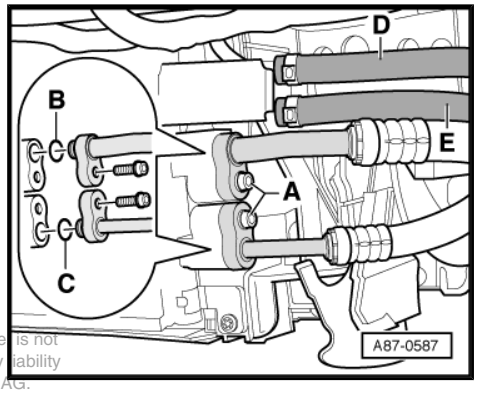
Note

- *There are different condenser versions depending on vehicle model (e.g. with and without power steering fluid cooler) ⇒ Electronic parts catalogue*
- *On vehicles with 6-cyl. diesel engine, the refrigerant lines -A- and -B- are attached for example to the top and bottom of the condenser*



13.14.1 Detaching

– Drain the refrigerant circuit: ⇒ Air conditioner with refrigerant R134a
– Remove the noise insulation. ⇒ General body repairs, exterior; Rep. gr. 50
– Remove the front bumper: ⇒ General body repairs, exterior; Rep. gr. 63
– Screw out the bolts -A- (tightening torque 10 Nm).
– Detach the refrigerant lines from the condenser.



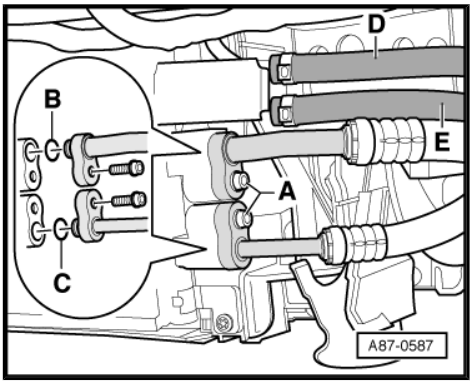
Note

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

13.14.2 Attaching

Install in reverse order, paying attention to the following:

– Replace the O-rings -B- and -C-, version ⇒ Electronic parts catalogue



Note

Moisten the O-rings slightly with refrigerant oil before fitting ⇒ page 13 .

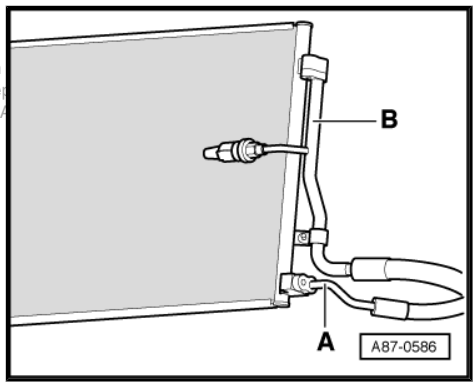
– Following attachment, check the routing of the refrigerant lines. They must be inserted in the holders provided and not make contact with other components.
– Evacuate and refill the refrigerant circuit. ⇒ Air conditioner with refrigerant R134a
– Start up the air conditioner after charging the refrigerant circuit ⇒ page 177 .

Note

Also heed the notes on start-up of the air conditioner after charging ⇒ Air conditioner with refrigerant R134a .

13.15 Removing and installing condenser

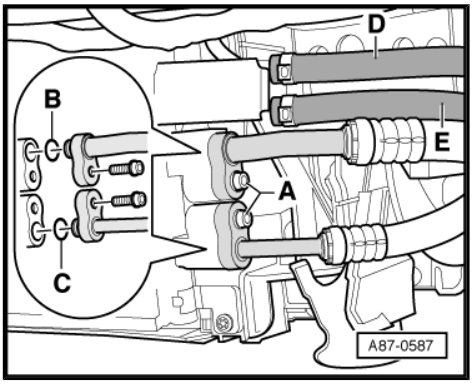
Note



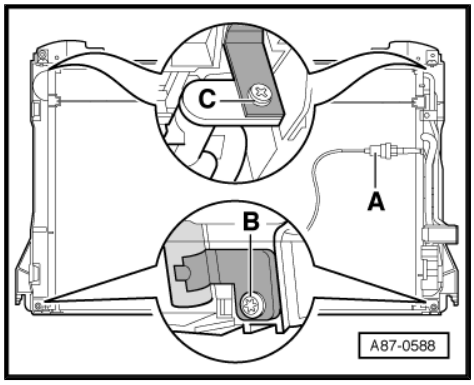
- *There are different condenser versions depending on vehicle model (e.g. with and without power steering fluid cooler) ⇒ Electronic parts catalogue*
- *On vehicles with 6-cyl. diesel engine, the refrigerant lines -A- and -B- are attached for example to the top and bottom of the condenser*
- *The condenser removed contains refrigerant oil which has to be returned to the refrigerant circuit ⇒ Air conditioner with refrigerant R134a*
- *Even if fitted correctly, the radiator and condenser fins may exhibit slight pressure marks. This is not to be viewed as damage. Neither the radiator nor the condenser is to be replaced on account of such minor pressure marks.*

13.15.1 Removing

– Drain the refrigerant circuit: ⇒ Air conditioner with refrigerant R134a
– Pinch off both hoses to the power steering fluid cooler -D- and -E- e.g. using one hose clamp -3093- for each and detach from the condenser ⇒ Running gear; Rep. gr. 48 .
– Detach the refrigerant lines from the condenser ⇒ page 166 .



– Unplug the connector -A- from the high-pressure sender - G65- .
– Screw out the bolts -B- and -C- (tightening torque 5 Nm).
– Take out the condenser downwards.



13.15.2 Installing

Install in reverse order.

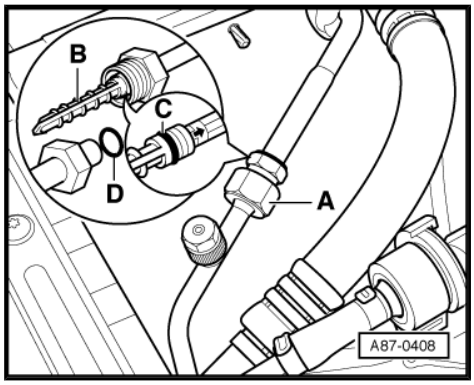
13.16 Removing and installing restrictor

Note

- *This vehicle is only to be fitted with a red coloured restrictor (depending on the manufacturer, the colour may also tend towards orange) ⇒ Electronic parts catalogue ⇒ 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 different types of refrigerant line between the evaporator and compressor/reservoir depending on the vehicle model. ⇒ Electronic parts catalogue*

13.16.1 Removing

– Drain the refrigerant circuit: ⇒ Air conditioner with refrigerant R134a
– Detach the refrigerant line at the screw connection -A- (seal open connections).
– Use pointed-nose pliers to pull the restrictor -B- out of the refrigerant line.

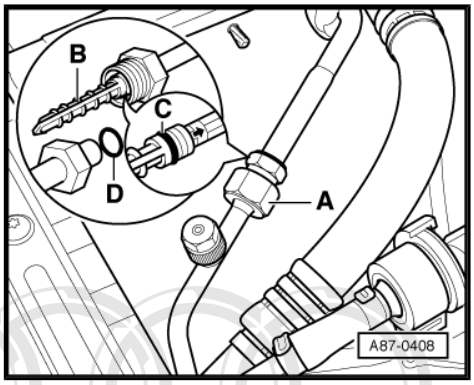


13.16.2 Installing

Note

Only fit restrictors of the same type. Restrictors of different colour have different bore diameters: ⇒ Electronic parts catalogue

– Check correct positioning of the O-ring -C- (7.5 mm; 1.5 mm) in the groove.
– Before fitting, moisten the O-ring (of the restrictor and at the screw connection) with a small quantity of refrigerant oil ⇒ page 13 .
– Ensure correct positioning of the restrictor -B- on installation (arrow on restrictor pointing towards evaporator).
– Check positioning of the restrictor (snug fit in refrigerant line).
– Replace the O-ring -D- (11.1 mm; 1.8 mm).
– Take care not to strain the refrigerant lines on installation.
– Tighten the screw connection -A- to 15 Nm.



Note

Check the position of the refrigerant lines after tightening the screw connection (the refrigerant lines must not make contact with other components).

– Evacuate and refill the refrigerant circuit. ⇒ Air conditioner with refrigerant R134a
– Start up the air conditioner after charging the refrigerant circuit ⇒ page 177 .

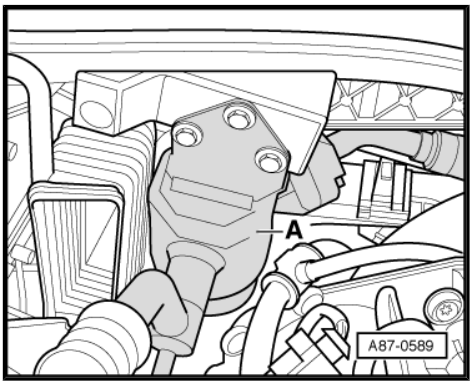
Note

Also heed the notes on start-up of the air conditioner after charging ⇒ Air conditioner with refrigerant R134a .

13.17 Removing and installing reservoir

Note

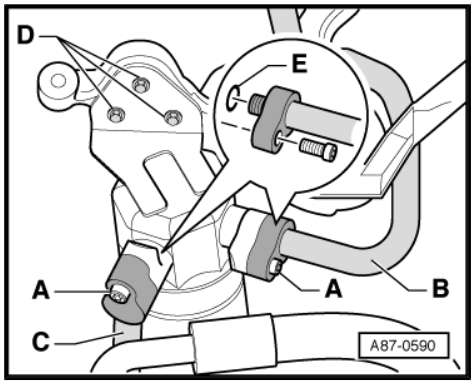
- *There are different reservoir versions and fitting locations depending on the vehicle model. ⇒ Electronic parts catalogue*
- *On vehicles with 8-cyl. diesel engine, the reservoir -A- can be taken out from above without removing the bumper.*



13.17.1 Removing

– Drain the refrigerant circuit: ⇒ Air conditioner with refrigerant R134a
– Remove the front bumper (does not apply to vehicles with 8-cyl. diesel engine). ⇒ General body repairs, exterior; Rep. gr. 63
– Move the lock carrier to the service position (does not apply to vehicles with 8-cyl. diesel engine). ⇒ General body repairs, exterior; Rep. gr. 50
– If applicable, remove the charge air cooler/secondary air pump motor (not necessary on all vehicles) ⇒ Engine, mechanics; Rep. gr. 21 and ⇒ Engine, mechanics; Rep. gr. 26 .

– Screw out the bolts -A- and detach the refrigerant lines -B- and -C-.
– Screw out the bolts -D-.
– Detach the reservoir.



Note

- *Seal open pipe connections.*
- *Connection of the refrigerant lines differs depending on the engine version: ⇒ Electronic parts catalogue*
- *Keep the reservoir closed for as long as possible. Only remove the caps immediately prior to installation (the reservoir contains a desiccant bag which soon becomes saturated with moisture and hence unusable when the reservoir is open).*
- *The reservoir removed contains refrigerant oil which has to be returned to the refrigerant circuit ⇒ Air conditioner with refrigerant R134a*

13.17.2 Installing

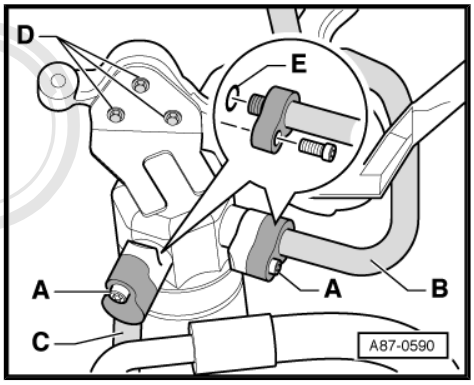
Install in reverse order, paying attention to the following:

Prior to reservoir installation: ⇒ Air conditioner with refrigerant R134a

Note

- *The connections at the reservoir may be marked „IN“ (from evaporator) and „Out“ (to compressor).*
- *The reservoir removed contains refrigerant oil which has to be returned to the refrigerant circuit (with a new reservoir).*
- *Adjustment of the oil quantity depends on the nature of the problem.*
- *If, for example, the reservoir has been damaged in an accident (no loss of refrigerant, no ingress of moisture and dirt into the refrigerant circuit), the air conditioner can be serviced by weighing the 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 reservoir removed.*
- *If an indeterminate amount of refrigerant oil has escaped or dirt and moisture have ingressed into the refrigerant circuit, the circuit must be cleaned. ⇒ Air conditioner with refrigerant R134a*

– Replace the O-rings -E-. ⇒ Electronic parts catalogue



Note

Moisten the O-rings slightly with refrigerant oil before fitting ⇒ page 13 .

– Insert both refrigerant lines -B- and -C- in the reservoir such that they are not strained. In doing so, pay attention to correct assignment of the connections.
– Insert the bolts -D- and tighten to 10 Nm.
– Use bolt -A- to attach the refrigerant line to the reservoir (tightening torque 10 Nm).
– Re-install the other components removed.
– Evacuate and refill the refrigerant circuit. ⇒ Air conditioner with refrigerant R134a
– Start up the air conditioner after charging the refrigerant circuit ⇒ page 177 .

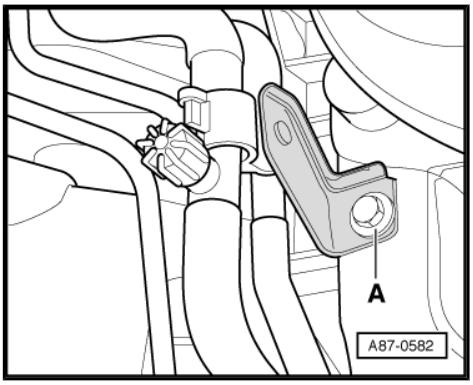
Note

Also heed the notes on start-up of the air conditioner after charging ⇒ Air conditioner with refrigerant R134a .

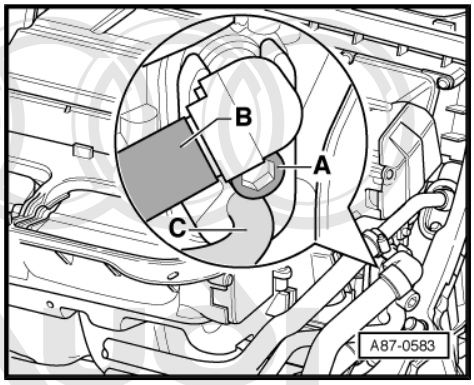
13.18 Detaching refrigerant lines at evaporator connection/attaching

13.18.1 Detaching

– Drain the refrigerant circuit: ⇒ Air conditioner with refrigerant R134a
– Remove the brake master cylinder and brake servo. ⇒ Brake system; Rep. gr. 47
– Unfasten the refrigerant lines at the suspension strut dome by removing the bolt -A-.



– Screw out the hexagon socket-head bolt -A- (tightening torque 25 Nm).
– Detach the refrigerant lines -B- and -C- from the evaporator and seal the open connections.



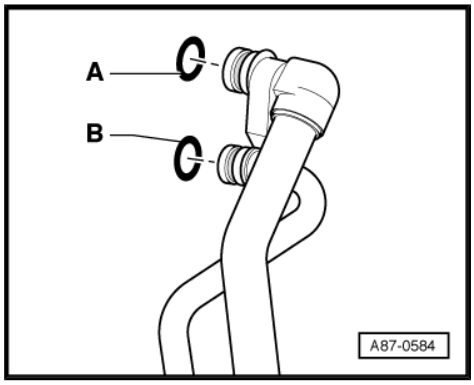
Note

The cap of the replacement evaporator for example is a suitable means of sealing the open connections at the evaporator and the lines (to prevent the ingress of dirt and moisture).

13.18.2 Attaching

Install in reverse order, paying attention to the following:

– Replace the O-rings -A- and -B-, version ⇒ Electronic parts catalogue

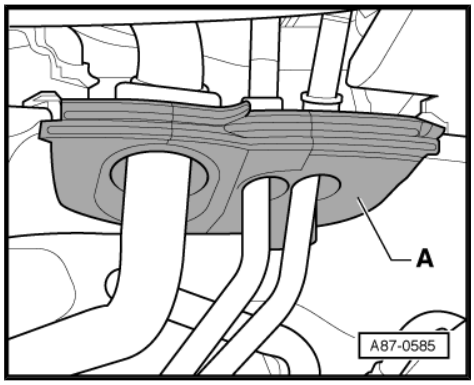


Note

Moisten the O-rings slightly with refrigerant oil before fitting *⇒ page 13* *.*

– Take care not to strain the refrigerant lines on installation.

– After attaching the refrigerant lines and installing the brake master cylinder, check proper installation of the pipe penetration -A-.
– Check the position of the refrigerant lines to the evaporator. They must not make contact with other components.
– Re-install the other components removed.
– Evacuate and refill the refrigerant circuit. ⇒ Air conditioner with refrigerant R134a
– Start up the air conditioner after charging the refrigerant circuit ⇒ page 177 .



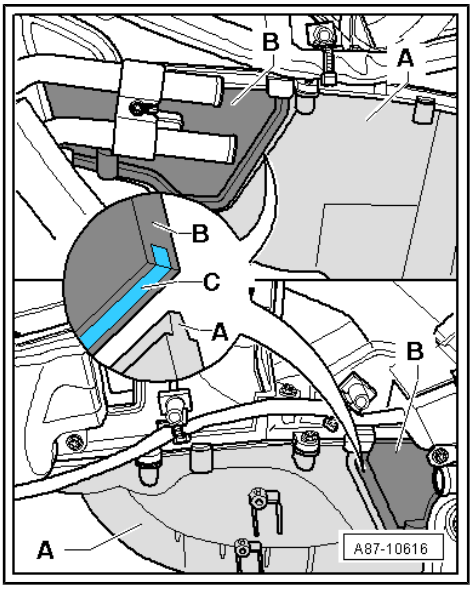
Note

Also heed the notes on start-up of the air conditioner after charging ⇒ Air conditioner with refrigerant R134a .

13.19 Removing and installing evaporator

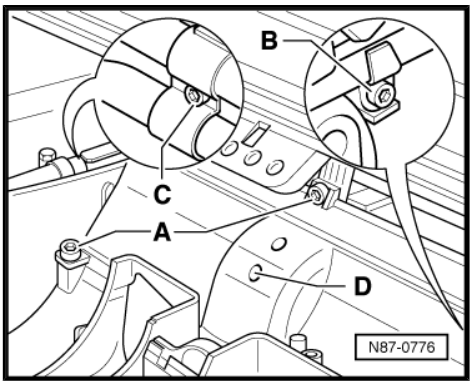
Note

As of Model Year 2008, a foam strip (3 x 3 mm, 65 mm long) -C- is gradually being introduced at the factory in the left and right tongue-and-groove joint between the bottom part of the housing -A- and the evaporator cover -B-. The foam strips -C- are designed to prevent the ingress of moisture into the air conditioning unit by way of these joints.



Removing

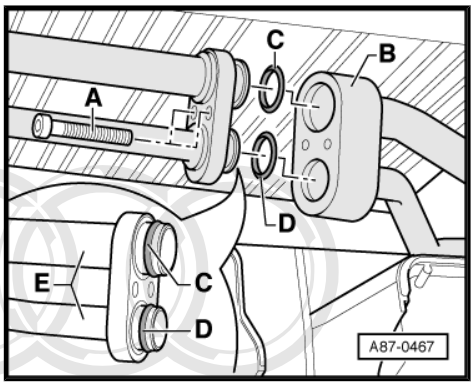
- Drain the refrigerant circuit: ⇒ Air conditioner with refrigerant R134a
- Remove the cover with air recirculation flap ⇒ page 52 .
- Remove the fresh air blower -V2- ⇒ page 54 .



- Screw out the bolts -A-.
- Slacken off the bolt -C- and detach the corresponding holder for the coolant pipes.
- Remove the bolt -B- with the holder for the coolant pipes.
- Detach the cover for the evaporator -D-.
- Detach the refrigerant lines at the evaporator connection ⇒ page 171 .

Note

On right-hand drive vehicles, remove the plenum chamber electronics box connector point if applicable.



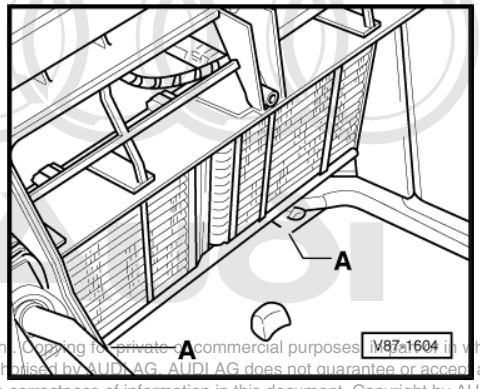
- Screw out the bolts -A-.
- Remove the connecting pipe -B-.
- Take out the evaporator.

Installing

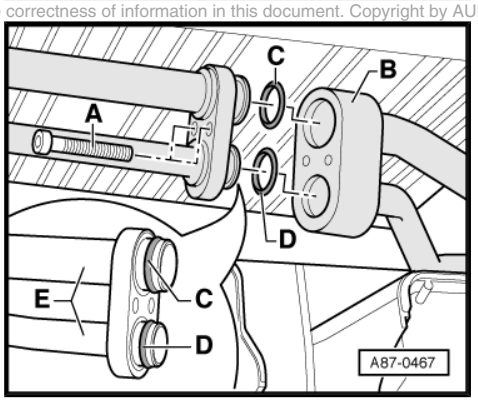
Install in reverse order, paying attention to the following:

Prior to evaporator installation: ⇒ Air conditioner with refrigerant R134a; replacing refrigerant circuit components

– Before installing the evaporator, check the condensation drain openings -A- for dirt and clean if necessary.



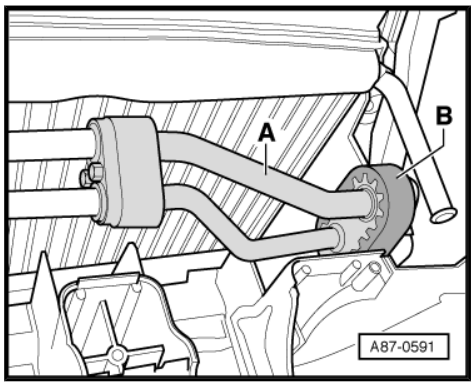
– Replace the O-rings -C- and -D- between the connecting pipe in the air conditioning unit -B- and the evaporator -E-, version ⇒ Electronic parts catalogue

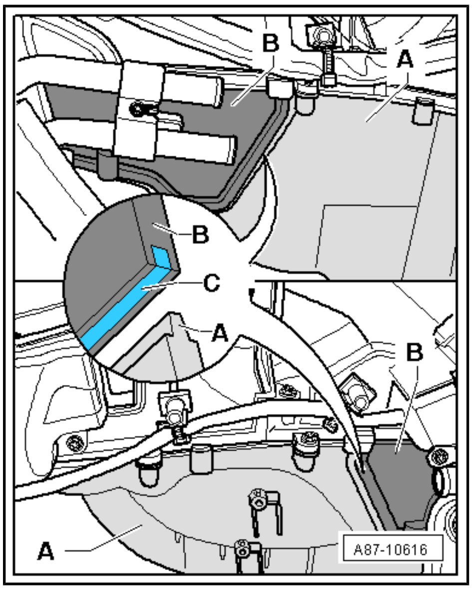


Note

Moisten the O-rings slightly with refrigerant oil before fitting *⇒ page 13* *.*

– Fit the bolts -A- (tightening torque 5 Nm).





Note

- *Pay attention to correct positioning of the O-rings -C- and -D- in the groove in the connecting pipes to the evaporator -E-.*
- *Pay attention to correct positioning of the socket -B- to the air conditioning unit and at the connecting pipe for the evaporator -A-.*
- *The evaporator removed contains refrigerant oil which has to be returned to the refrigerant circuit ⇒ Air conditioner with refrigerant R134a*
- *As of Model Year 2008, a foam strip (3 x 3 mm, 65 mm long) -C- is gradually being introduced at the factory in the left and right tongue-and-groove joint between the bottom part of the housing -A- and the evaporator cover -B-. The foam strips -C- are designed to prevent the ingress of moisture into the air conditioning unit by way of these joints.*
- *On fitting the evaporator cover -B-, insert a foam strip (3 x 3 mm, 65 mm long) -C- in the left and right tongue-and-groove joint between the bottom part of the housing -A- and the evaporator cover -B- or seal these joints with adhesive sealant (e.g. silicone adhesive sealant -D 176 001 A3-) ⇒ Electronic parts catalogue .*

– Re-install the other components removed.

– Evacuate and refill the refrigerant circuit. ⇒ Air conditioner with refrigerant R134a

– Start up the air conditioner after charging the refrigerant circuit ⇒ page 177 .

Note

Also heed the notes on start-up of the air conditioner after charging ⇒ Air conditioner with refrigerant R134a .

13.20 Capacities

Refrigerant R134a and refrigerant oil capacities ⇒ Air conditioner with refrigerant R134a

– Evacuating and charging refrigerant circuit ⇒ Air conditioner with refrigerant R134a

– Start up the air conditioner after charging the refrigerant circuit ⇒ page 177 .

Note

- *Also heed the notes on start-up of the air conditioner after charging ⇒ Air conditioner with refrigerant R134a .*
- *Different refrigerant oil capacities apply to the refrigerant circuit depending on the type of compressor („6 SEU 14“, „7 SEU 16“ or „7 SEU 17“) ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a*
- *Not all replacement compressors have the same oil capacity. Attention is therefore to be paid to the exact part number ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a . The different oil capacities result from the design of the compressor (heed oil capacities). Too much oil in the circuit results in higher pressures and reduced system cooling output. Too little oil may lead to lubrication problems in the compressor.*
- *Always fill the refrigerant circuit with refrigerant R134a as far as the upper tolerance limit (some refrigerant remains in the filler hoses).*
- *The refrigerant circuit is only to 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*
- *The refrigerant oil -G 052 300 A2- is currently to be used for Denso compressors ⇒ Electronic parts catalogue and ⇒ Air conditioner with refrigerant R134a .*
- *Refrigerant oil from containers which have been open for a long time is not suitable for use (PAG oil absorbs moisture) and is not to be re-used.*
- *For further information, refer to ⇒ Air conditioner with refrigerant R134a*

13.21 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 charged.*
- *Do not start the engine during evacuation or with the refrigerant circuit evacuated, as this could damage the compressor ⇒ Air conditioner with refrigerant R134a .*
- *The compressor is always driven by the pulley or the drive shaft (there is no magnetic clutch). In no-load operation, compressor lubrication is maintained by way of an „internal oil circuit“ to prevent damage.*
- *The compressor is equipped with an „internal oil circuit“ to prevent damage if the refrigerant circuit is empty. A prerequisite for this internal lubrication is that there is still a residual quantity of refrigerant oil in the compressor.*
- *The engine is not to be started unless the refrigerant circuit has been properly assembled. If, for example, the refrigerant lines have not been connected to the compressor, heat generation inside the compressor with the engine running may lead to the destruction of the compressor.*
- *The air conditioner compressor regulating valve -N280- is not actuated if the refrigerant circuit is empty and the compressor runs at idle with the engine. However, as there is no refrigerant available, the refrigerant oil required for compressor lubrication is not conveyed.*

- All components removed re-installed.
- Refrigerant circuit 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 quantity of refrigerant oil specified for this refrigerant circuit in the compressor.
- The engine speed must not exceed 2500 rpm.
- The engine should only run as long as is absolutely necessary.

Heed the following on starting the engine for the first time after charging the refrigerant circuit:

– Heed the notes on start-up of the air conditioner after installing the air conditioner compressor ⇒ Air conditioner with refrigerant R134a .

– Start the engine with the compressor switched off („Econ“ mode set, lamp in AC button not lit) and wait for the engine idling speed to stabilise.

– Open all dash panel vents.

– Set the air conditioner front operating and display unit, Climatronic control unit -J255- to the „Cold“ temperature setting (for the driver side and front passenger side).

– Switch on the compressor by pressing the AC button („Auto“ mode selected and lamp in AC button lights) and allow the compressor to run for at least 5 minutes with the engine idling.

14 Removing and installing air conditioning unit

Special tools, testers and other items required

- Hose clamps -3093 bzw. 3094-
- Hand pump -V.A.G 1274- (and appropriate adapters)
- Compressed air gun, commercially available

14.1 Removing

Note

- *On removal, note down bolt lengths and assignment for re-installation.*
- *All cable ties and other wiring harness fasteners released or severed on removing the air conditioning unit are to be re-attached in the same position on installation.*

– Drain the refrigerant circuit: ⇒ Air conditioner with refrigerant R134a

– Switch on ignition.

– Move electrically operated seats to rearmost position.

– Switch off ignition.

– Remove the dust and pollen filter ⇒ page 31 .

– Detach the cover of the electronics box and remove the engine control unit. ⇒ Electrical system; Rep. gr. 97

– Remove the body brace with the reinforcement to the scuttle panel trim. ⇒ Running gear; Rep. gr. 40

– Remove the windscreen wiper assembly ⇒ Electrical system; Rep. gr. 92 .

– Remove the pump valve unit ⇒ page 55 .

– Place protective covers over driver's and front passenger's seats.

– Disconnect the earth connection from the battery -A- ⇒ Electrical system; Rep. gr. 27

Note

- *If necessary, obtain the radio anti-theft code before disconnecting the battery -A- .*
- *On vehicles with electrically adjustable seats, move the seats to the rearmost position before disconnecting the battery -A- .*

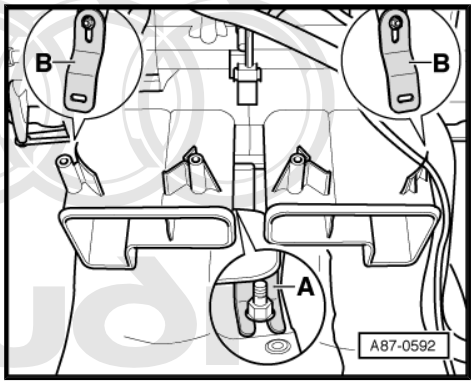
– Remove the dash panel complete with the dash panel cross-member. ⇒ General body repairs, interior; Rep. gr. 70

– Remove the brake master cylinder and brake servo. ⇒ Brake system; Rep. gr. 47

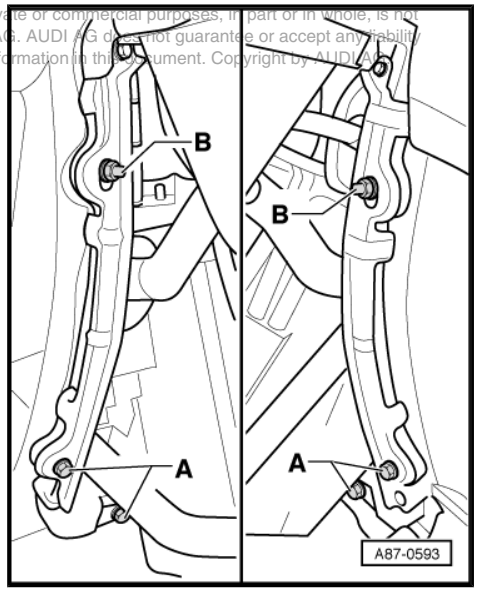
– Remove the entire pedal cluster assembly with mounting bracket. ⇒ Brake system; Rep. gr. 46

– Detach the refrigerant lines at the evaporator connection ⇒ page 171 .

– Remove the yaw rate sender -G202- ⇒ Brake system; Rep. gr. 45 .
– Remove the holders -A- and -B- (depending on the design of the air conditioning unit, only holder -B- or -A- may be fitted).
– Remove the air ducts to the footwell vents.
– Detach the condensation drain hoses from the air conditioning unit ⇒ page 90 .
– Unplug the connectors to the air conditioning unit.



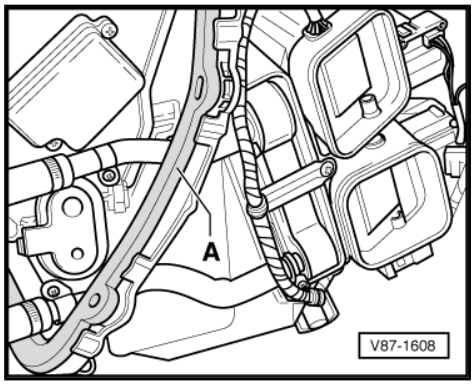
– Remove the bolts -A-.
– Unscrew the nuts -B-.
– Remove the air conditioning unit into the passenger compartment.



14.2 Installing

Install in reverse order, paying attention to the following:

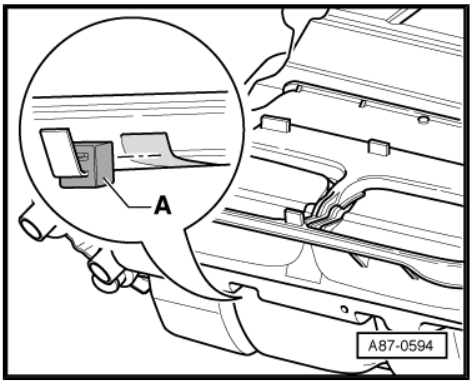
– Replace the seal -A- between the plenum chamber and the air conditioning unit.



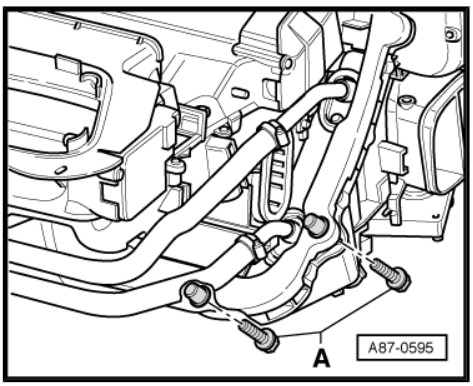
Note

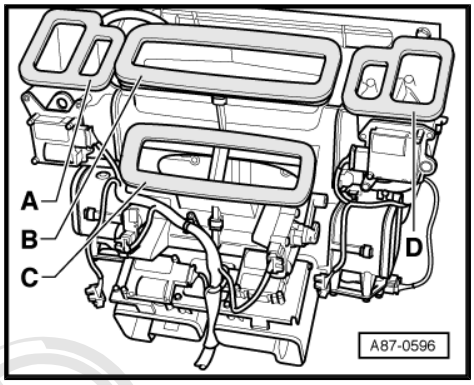
- *Check all other seals and replace if necessary ⇒ Electronic parts catalogue .*
- *Make sure the coolant hoses are properly connected to the heat exchanger ⇒ page 55 .*
- *Secure all hose connections with standard hose clamps/clips or approved replacement parts ⇒ Electronic parts catalogue*
- *On inserting the air conditioning unit, pay attention to the wiring to the control motors (in the plenum chamber) and the seal -A- (must not be trapped or damaged by studs).*

– Check correct positioning of the damper element -C-.
– Following installation, check correct positioning of the socket between the engine compartment and plenum chamber.



– Seal the 4 bolts -A- (on the left and right) in the plenum chamber (e.g. with Terolan -D 511 500 A2-). ⇒ Electronic parts catalogue
– Check correct positioning of the condensation drain hoses ⇒ page 90 .





- Before installing the dash panel, check the foam seals -A- to -D- and replace any damaged seals.
- Re-install the components removed (with the exception of the driver side storage compartment and glove compartment) in reverse order.
- Check attachment of the coolant pipes to the heat exchangers ⇒ page 116 .
- Bleed the coolant circuit - only plug in the 2-pin connector to the pump valve unit after bleeding the coolant circuit ⇒ page 55 and ⇒ Engine, mechanics; Rep. gr. 19
- Before installing the driver side storage compartment and glove compartment, check the cooling system for leaks, paying particular attention to the connection between the coolant pipes and heat exchangers ⇒ page 116 . ⇒ Engine, mechanics; Rep. gr. 19
- Re-install the glove compartment, driver side storage compartment and the remaining components removed.
- Evacuate and refill the refrigerant circuit. ⇒ Air conditioner with refrigerant R134a
- Interrogate the fault memory of the rear Climatronic operating and display unit -E265- (and the front operating and display unit, Climatronic control unit -J255-) and erase any faults displayed ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- Perform air conditioner basic setting and final control diagnosis ⇒ "Guided fault-finding" function of vehicle diagnostic, testing and information system VAS 5051.
- Start up the air conditioner after charging the refrigerant circuit ⇒ page 177 .

Note

Also heed the notes on start-up of the air conditioner after charging ⇒ Air conditioner with refrigerant R134a .

15 Dismantling and assembling air conditioning unit

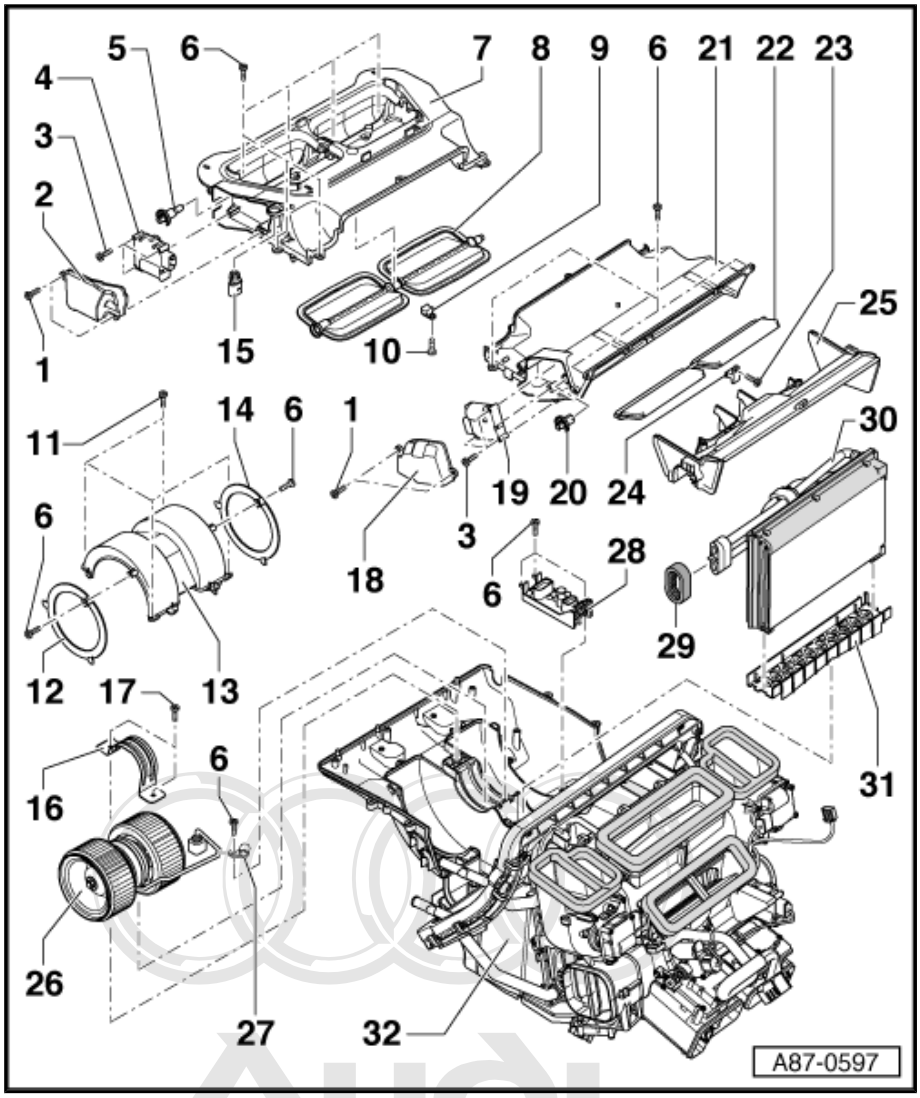
Note

- *On detaching, mark the various control motors and the corresponding connecting elements between the flap and motor to avoid interchange with the connecting elements of other control motors.*
- *On detaching, mark the various connectors to the control motors and the control motors to avoid interchange with identical connectors and control motors.*
- *If connecting elements are interchanged, the control motors with incorrect connecting elements do not attain the specified end position and the fault „upper or lower limit value exceeded“ may be displayed in the fault memory after basic setting.*
- *The levers and cam plates are provided with code numbers. In cases of doubt about assignment of one of these components, pay attention to assignment* *⇒ page 188* *.*
- *The control motors are currently identical. The shaft of each motor is however positioned differently as a result of different connecting elements and attachment of the connecting element may not be possible if this has been interchanged.*
- *Moisten the guides of the cam plates as well as the pins at the flap levers with a small quantity of e.g. lubricating paste -G 000 150- ⇒ Electronic parts catalogue .*

15.1 Removing and installing covers in plenum chamber, fresh air blower and evaporator

Note

- *The air conditioning unit is only to be removed after draining the refrigerant circuit; if applicable, the vehicle is to be taken to a workshop equipped with the necessary tools where the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a .*
- *Removing and installing air conditioning unit* *⇒ page 179*



1 - Oval head self-tapping screw

2 - Cover

3 - Bolt

4 - Air flow flap control motor -V71-

- ❑ With potentiometer -G113-
- ❑ Removing and installing ⇒ page 45

5 - Connecting element

- ❑ Mark prior to removal to avoid interchange
- ❑ Heed assignment (code number „063“)

6 - Oval head self-tapping screw

7 - Intake housing

- ❑ Removing and installing ⇒ page 42
- ❑ Dismantling and assembling ⇒ page 186
- ❑ Sealing joints ⇒ page 42 (removing and installing intake housing)

8 - Air flow flaps

- ❑ Removing from intake housing ⇒ page 186

9 - Holder

10 - Oval head self-tapping screw

11 - Oval head self-tapping screw

12 - Ring for air duct

- ❑ Left side

13 - Air duct for fresh air blower

14 - Ring for air duct

- ❑ Right side

15 - Fresh air intake duct temperature sensor -G89-

- ❑ Removing and installing ⇒ page 47

16 - Holder for fresh air blower

17 - Bolt

18 - Cover

- ❑ Seal connection between air conditioning unit and cover with black silicone adhesive sealant -D 176 001 A3- ⇒ page 47
- ❑ A modified cover for the control motor (with 4 instead of 2 attachment points) ⇒ page 47 , a suitably adapted cover with air recirculation flap and a wiring harness with a modified socket at the wiring harness to the air recirculation flap control motor was gradually introduced as of 12.2003. ⇒ Electronic parts catalogue

19 - Air recirculation flap control motor -V113-

- ❑ With potentiometer -G143-

- ❑ Removing and installing ⇒ page 47

20 - Connecting element

- ❑ Mark prior to removal to avoid interchange
- ❑ Heed assignment (code number „064“)

21 - Cover

- ❑ Removing and installing ⇒ page 52
- ❑ Dismantling and assembling ⇒ page 186
- ❑ Sealing joints ⇒ page 52 (removing and installing cover with air recirculation flap) and ⇒ page 42 (removing and installing intake housing)
- ❑ Removing air recirculation flaps from cover ⇒ page 186
- ❑ A modified cover for the control motor (with 4 instead of 2 attachment points) ⇒ page 47 , a suitably adapted cover with air recirculation flap and a wiring harness with a modified socket at the wiring harness to the air recirculation flap control motor was gradually introduced as of 12.2003. ⇒ Electronic parts catalogue

22 - Air recirculation flaps

- ❑ Removing from cover ⇒ page 186

23 - Oval head self-tapping screw

24 - Holder

25 - Cover

- ❑ For evaporator
- ❑ Sealing joints between bottom part of housing and cover ⇒ page 173 (removing and installing evaporator)

26 - Fresh air blower -V2-

- ❑ Removing and installing ⇒ page 54

> **Caution**
> *Do not grasp hold of the impellers of the fresh air blower -V2- . Applying force to the impellers or moving the balancing weights attached to the impellers could cause imbalance and thus operating problems.*

27 - Holder

- ❑ For wiring harness to fresh air blower -V2-

28 - Fresh air blower control unit -J126-

- ❑ Removing and installing ⇒ page 55

29 - Socket

- ❑ For sealing refrigerant line penetration to evaporator (in air conditioning unit)

30 - Evaporator

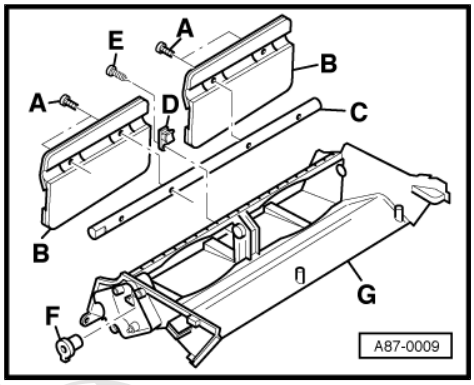
- ❑ Removing and installing ⇒ page 173
- ❑ With refrigerant lines, detaching and attaching ⇒ page 173
- ❑ With seal to air conditioning unit housing

31 - Drip tray

32 - Bottom part of housing

- ❑ With air distribution housing
- ❑ Dismantling and assembling ⇒ page 187
- ❑ Dismantling and assembling air distribution housing ⇒ page 188

Dismantling and assembling cover



A - Bolt

B - Air recirculation flap

C - Shaft

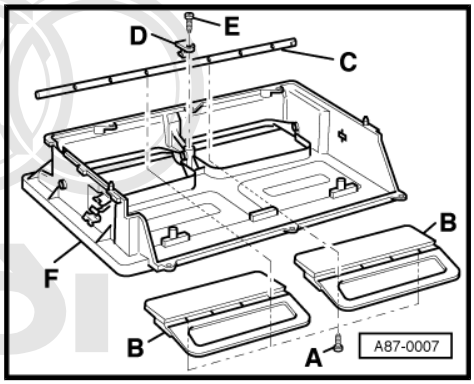
D - Holder

E - Bolt

F - Connecting element

G - Cover (different versions)

Dismantling and assembling intake housing



A - Bolt

B - Air flow flap

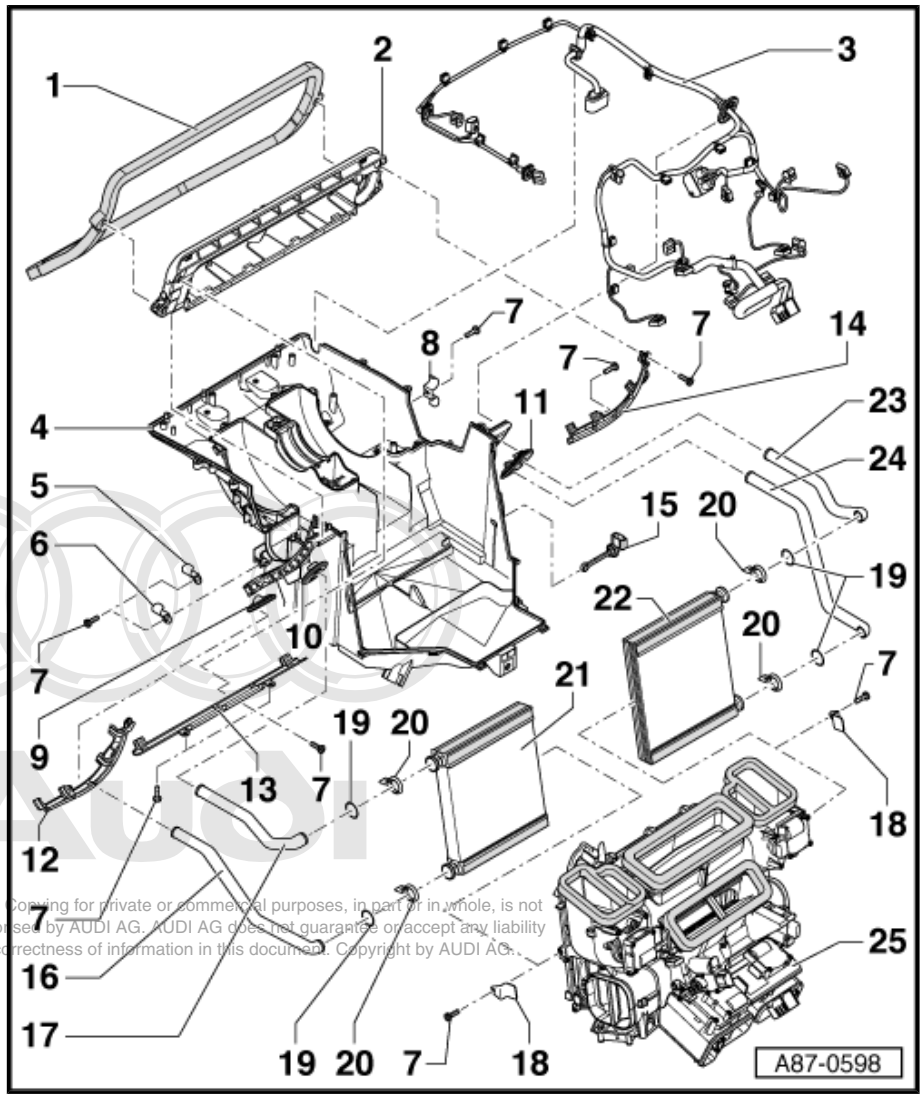
C - Shaft

D - Holder

E - Bolt

F - Intake housing with seal (to front lid)

15.2 Dismantling and assembling bottom part of housing and air distribution housing



1 - Seal

- ❑ Replace

2 - Frame with air recirculation opening

3 - Air conditioning unit wiring harness

- ❑ Different versions for vehicles with and without rear Climatronic operating and display unit -E265- , vehicles manufactured up to and as of 12.2003 (different air conditioning units and sockets, gradual introduction ⇒ page 47) ⇒ Electronic parts catalogue
- ❑ Electrical connections at air conditioning unit: ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

Note

4 - Bottom part of housing

5 - Pipe holder

- ❑ For top left coolant pipe

6 - Pipe holder

- ❑ For bottom left coolant pipe

7 - Oval head self-tapping screw

8 - Pipe holder

- ❑ For right coolant pipes

9 - Socket

- ❑ For bottom left coolant pipe

10 - Socket

- ❑ For top left coolant pipe

11 - Socket

- ❑ For right coolant pipes

12 - Holder

- ❑ Left

13 - Holder

- ❑ Bottom

14 - Holder

- ❑ Right

15 - Evaporator output temperature sender -G263-

- ❑ Removing and installing ⇒ page 107

16 - Bottom left coolant pipe

17 - Top left coolant pipe

18 - Holder

19 - O-ring

- ❑ Replace

20 - Clamp

- ❑ Replace
- ❑ Ensure correct positioning
- ❑ If heat exchanger is replaced without removing, fit clamp instead of clip ⇒ page 112

21 - Left heat exchanger

- ❑ Removing and installing ⇒ page 116
- ❑ With seal to air conditioning unit housing

Note

22 - Right heat exchanger

- ❑ Removing and installing ⇒ page 112
- ❑ With seal to air conditioning unit housing (refer to note on left heat exchanger)

23 - Top right coolant pipe

24 - Bottom right coolant pipe

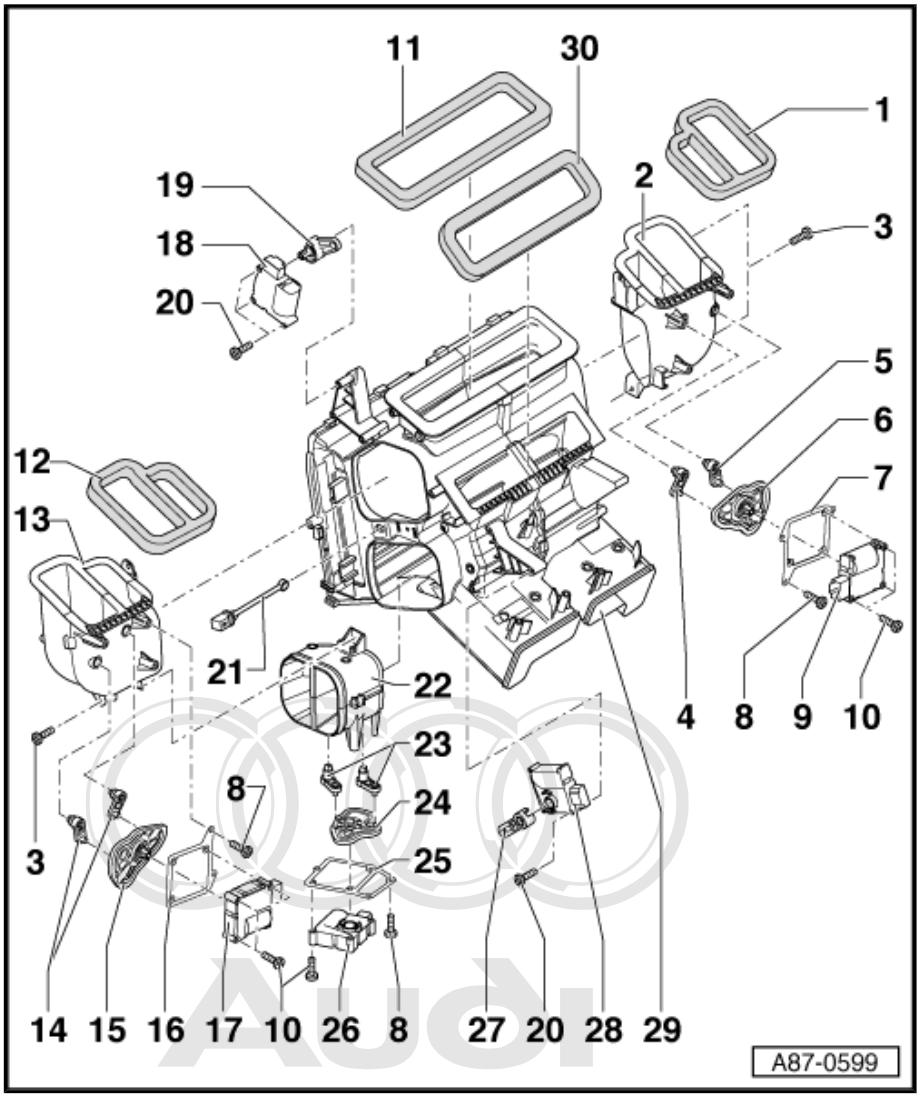
25 - Air distribution housing

- ❑ Dismantling and assembling ⇒ page 188
- ❑ Different versions for vehicles with and without rear Climatronic operating and display unit -E265-

15.3 Dismantling and assembling air distribution housing

Note

- ♦ *The levers and cam plates are provided with code numbers. In cases of doubt about assignment of one of these components, pay attention to assignment.*
- ♦ *Moisten the guides of the cam plates as well as the pins at the flap levers with a small quantity of e.g. lubricating paste -G 000 150- ⇒ Electronic parts catalogue .*



1 - Seal

2 - Air duct

- ❑ With shut-off flaps
- ❑ Air duct to right chest vent and for indirect ventilation of dash panel on right
- ❑ Do not dismantle

3 - Oval head self-tapping screw

4 - Lever

- ❑ Not to be removed (danger of interchange)
- ❑ Heed assignment (code number „862“)

5 - Lever

- ❑ Not to be removed (danger of interchange)
- ❑ Heed assignment (code number „861“)

6 - Cam plate

- ❑ Mark prior to removal to avoid interchange
- ❑ Heed assignment (code number „154“)

7 - Holder

- ❑ Mark prior to removal to avoid interchange
- ❑ Heed assignment (no code number)

8 - Oval head self-tapping screw

9 - Front right defroster and chest vent shut-off flap control motor -V199-

- ❑ With potentiometer -G317-
- ❑ Removing and installing ⇒ page 99

10 - Oval head self-tapping screw

11 - Seal

12 - Seal

13 - Air duct

- ❑ With shut-off flaps
- ❑ Air duct to left chest vent and for indirect ventilation of dash panel on left
- ❑ Do not dismantle

14 - Lever

- ❑ Not to be removed (danger of interchange)
- ❑ Heed assignment (code number „863“)

15 - Cam plate

- ❑ Mark prior to removal to avoid interchange
- ❑ Heed assignment (code number „155“)

16 - Holder

- ❑ Mark prior to removal to avoid interchange

- ❑ Heed assignment (no code number)

17 - Front left defroster and chest vent shut-off flap control motor -V200-

- ❑ With potentiometer -G318-
- ❑ Removing and installing ⇒ page 97

18 - Defroster flap control motor -V107-

- ❑ With potentiometer -G135-
- ❑ Removing and installing ⇒ page 93

19 - Lever

- ❑ Mark prior to removal to avoid interchange
- ❑ Heed assignment (code number „837“)
- ❑ Lever at flap is marked „838“ (leave with connecting rod at defroster flap in air distribution housing)

20 - Oval head self-tapping screw

21 - Left vent temperature sender -G150-

- ❑ Removing and installing ⇒ page 106

22 - Air duct

- ❑ With shut-off flaps
- ❑ Air duct to left footwell vents
- ❑ Do not dismantle

23 - Lever

- ❑ Not to be removed (danger of interchange)
- ❑ Heed assignment (code number „842“)

24 - Cam plate

- ❑ Mark prior to removal to avoid interchange
- ❑ Heed assignment (code number „157“)

25 - Holder

- ❑ Mark prior to removal to avoid interchange
- ❑ Heed assignment (no code number)

26 - Left footwell flap control motor -V108-

- ❑ With potentiometer -G139-
- ❑ Removing and installing ⇒ page 101

27 - Lever

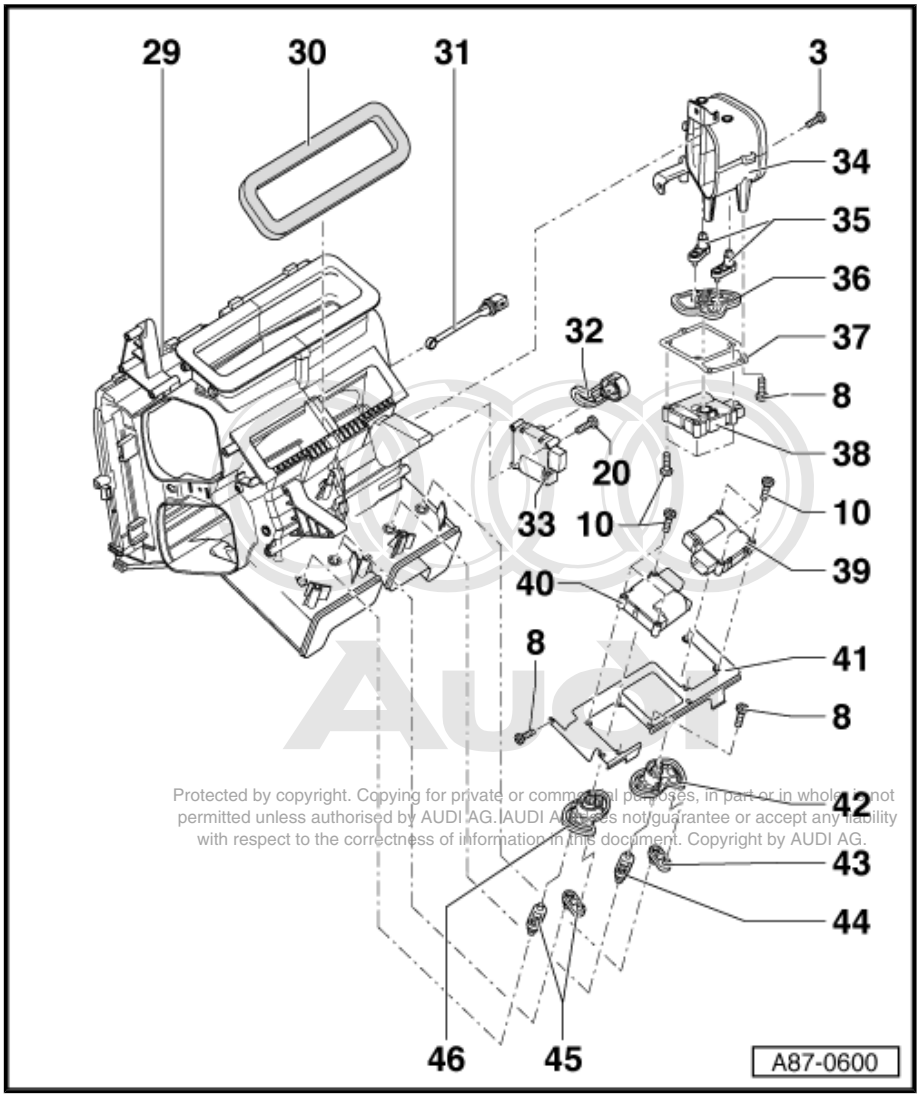
- ❑ Mark prior to removal to avoid interchange
- ❑ Heed assignment (code number „835“)
- ❑ Lever at flap is marked „836“ (leave at cold air flap in air distribution housing)

28 - Centre vent control motor -V102-

- ❑ With potentiometer -G138-
- ❑ This control motor actuates the cold air flap (flap in air duct bypassing heat exchangers) ⇒ page 118
- ❑ Removing and installing ⇒ page 95

29 - Air distribution housing

- ❑ Do not dismantle
- ❑ Different versions: ⇒ Electronic parts catalogue
- ❑ On vehicles with rear Climatronic operating and display unit -E265- , the rear air ducts are fitted with flaps and the connection to the rear cold air duct is open
- ❑ On vehicles with no rear Climatronic operating and display unit -E265- , the rear air ducts are not fitted with flaps and the connection to the rear cold air duct is sealed



30 - Seal

31 - Right vent temperature sender -G151-

- ❑ Removing and installing ⇒ page 107

32 - Lever

- ❑ Mark prior to removal to avoid interchange
- ❑ Heed assignment (code number „833“)
- ❑ Lever at flap is marked „834“ (leave at warm air flap in air distribution housing)

33 - Temperature flap control motor -V68-

- ❑ With potentiometer -G92-
- ❑ This control motor actuates the warm air flap (flap in air duct starting in mixing chamber downstream of heat exchanger) ⇒ page 118
- ❑ Removing and installing ⇒ page 105

34 - Air duct

- ❑ With shut-off flaps
- ❑ Air duct to right footwell vents
- ❑ Do not dismantle

35 - Lever

- ❑ Not to be removed (danger of interchange)
- ❑ Heed assignment (code number „840“)

36 - Cam plate

- ❑ Mark prior to removal to avoid interchange
- ❑ Heed assignment (code number „156“)

37 - Holder

- ❑ Mark prior to removal to avoid interchange
- ❑ Heed assignment (no code number)

38 - Right footwell flap control motor -V109- 2)

- ❑ With potentiometer -G140-
- ❑ Removing and installing ⇒ page 103

39 - Rear right vent control motor -V219-

- ❑ With potentiometer -G350-
- ❑ Only fitted on vehicles with rear Climatronic operating and display unit -E265-
- ❑ Removing and installing ⇒ page 108

40 - Rear left vent control motor -V218-

- ❑ With potentiometer -G349-
- ❑ Only fitted on vehicles with rear Climatronic operating and display unit -E265-
- ❑ Removing and installing ⇒ page 108

41 - Holder

- ❑ Only fitted on vehicles with rear Climatronic operating and display unit -E265-

42 - Cam plate (to rear right vent control motor -V219-)

- ❑ Mark prior to removal to avoid interchange
- ❑ Only fitted on vehicles with rear Climatronic operating and display unit -E265-
- ❑ Heed assignment (code number „158“)

43 - Lever (to rear right vent control motor -V219-)

- ❑ Not to be removed (danger of interchange)
- ❑ To warm air flap
- ❑ Heed assignment (code number „845“)
- ❑ Only fitted on vehicles with rear Climatronic operating and display unit -E265-

44 - Lever (to rear right vent control motor -V219-)

- ❑ Not to be removed (danger of interchange)
- ❑ To cold air flap
- ❑ Heed assignment (code number „844“)
- ❑ Only fitted on vehicles with rear Climatronic operating and display unit -E265-

45 - Lever (to rear left vent control motor -V218-)

- ❑ Not to be removed (danger of interchange)
- ❑ Only fitted on vehicles with rear Climatronic operating and display unit -E265-
- ❑ Heed assignment (code number „863“)

46 - Cam plate (to rear left vent control motor -V218-)

- ❑ Mark prior to removal to avoid interchange
- ❑ Heed assignment (code number „159“)
- ❑ Only fitted on vehicles with rear Climatronic operating and display unit -E265-