



Workshop Manual Amarok 2011 ➤

Heating, air conditioning

Edition 02.2010





List of Workshop Manual Repair GroupsList of Workshop Manual Repair Groups

Repair Group

80 - Heating

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

80 - Heating	1
1 Repairing heating system	1
1.1 Passenger compartment heating	1
1.2 Removing and installing dust and pollen filter	2
1.3 Dust and pollen filter with activated charcoal inlay	2
1.4 Removing fresh air blower V2	3
1.5 Removing and installing fresh air blower series resistor with overheating fuse N24	4
1.6 Removing vents	4
1.7 Removing and installing air recirculation flap control motor V113	5
1.8 Removing and installing heat exchanger	6
1.9 Checking passenger compartment ventilation	9
1.10 Removing and installing controls for heated and fresh air	9
1.11 Installing cables on controls for heater and fresh air	10
1.12 Removing and installing heater unit	10
1.13 Dismantling and assembling heater unit	12
87 - Air conditioning system	14
1 Notes on repair work to vehicles with air conditioning and on handling refrigerant	14
2 Climatic - air conditioning system with manual controls	15
2.1 Function of buttons on controls for heating and air conditioning "Climatic"	15
2.2 Pin assignment for multi-pin connectors on back of controls for heating and air conditioning "Climatic"	16
2.3 Climatic, passenger compartment	17
2.4 Heating and air conditioning controls, Climatic	19
2.5 Removing retaining plate for defroster flap control motor V107 and air distribution flap control motor V428	19
2.6 Removing and installing defroster flap control motor V107	19
2.7 Removing and installing air distribution flap control motor V428	20
2.8 Removing and installing retaining plate with footwell flap control motor V261 and temperature flap control motor V68	21
2.9 Removing and installing footwell flap control motor V261	21
3 Climatronic air conditioning with automatic regulation	23
3.1 Procedure for checking and adjusting components	23
3.2 Function of operating and display unit for Climatronic air conditioning system E87 with Climatronic control unit J255	24
3.3 Connectors on Climatronic control unit J255	25
3.4 Climatronic - passenger compartment	27
3.5 Removing and installing ambient temperature sensor -G17-	31
3.6 Mode of operation of air quality sensor G238	31
3.7 Removing and installing air quality sensor G238	33
3.8 Removing and installing sender for front Bitron blower regulation G462	33
3.9 Checking condensation drain hose with valve	34
3.10 Installation position of control motors on Climatronic heater and air conditioning unit	34
3.11 Renewing control motors on heater and air conditioner unit	36
3.12 Removing retaining plate for defroster flap control motor V107 and air distribution flap control motor V428	36
3.13 Removing defroster flap control motor V107	37
3.14 Removing and installing air distribution flap control motor V428	37
3.15 Removing retaining plate for footwell flap control motor V261 and left temperature flap control motor V158	38
3.16 Removing and installing left temperature flap control motor V158	39
3.17 Removing and installing footwell flap control motor V261	39
3.18 Removing and installing right temperature flap control motor V159	40



3.19	Removing and installing operating and display unit for Climatronic air conditioning system E87 with Climatronic control unit J255	41
4	Bracket for air conditioner compressor	42
5	Repair work on refrigerant circuit which may be performed only in appropriate workshops by specially trained mechanics	43
5.1	Tools	43
5.2	Renewing refrigerant circuit components	44
5.3	Removing expansion valve on front heater and air conditioner unit	48
5.4	Removing and installing dryer bag	49
5.5	Removing and installing condenser	50
5.6	Removing and installing heater and air conditioning unit	51
5.7	Dismantling and assembling heater and air conditioning unit	54
5.8	Removing and installing Denso air conditioner compressor	55
5.9	Notes on installing air conditioner compressor	58
5.10	Checking high-pressure safety valve on air conditioner compressor	59
6	Capacities	60
6.1	Refrigerant R134a	60
6.2	Refrigerant oil	60



80 – Heating

1 Repairing heating system

1.1 Passenger compartment heating

Before beginning repair work, perform the following steps:

- Switch off all electrical loads.
- Switch off ignition.
- Withdraw ignition key.

1 - Controls for fresh and heated air

- ☐ Removing and installing
⇒ [page 9](#)

- ◆ With fresh air blower switch -E9-
- ◆ With fresh air and air recirculation flap switch -E159-
- ◆ With additional heat exchanger and rear control switch -E271-
- ◆ With front interior temperature potentiometer -G276-

2 - Air recirculation flap control motor -V113-

- ☐ Removing and installing
⇒ [page 5](#)

3 - Fresh air blower -V2-

- ☐ Removing ⇒ [page 3](#)

4 - Fresh air blower series resistor with overheating fuse -N24-

- ☐ Removing ⇒ [page 4](#)

5 - Dust and pollen filter

- ☐ Removing and installing
⇒ [page 2](#)

6 - Footwell vent

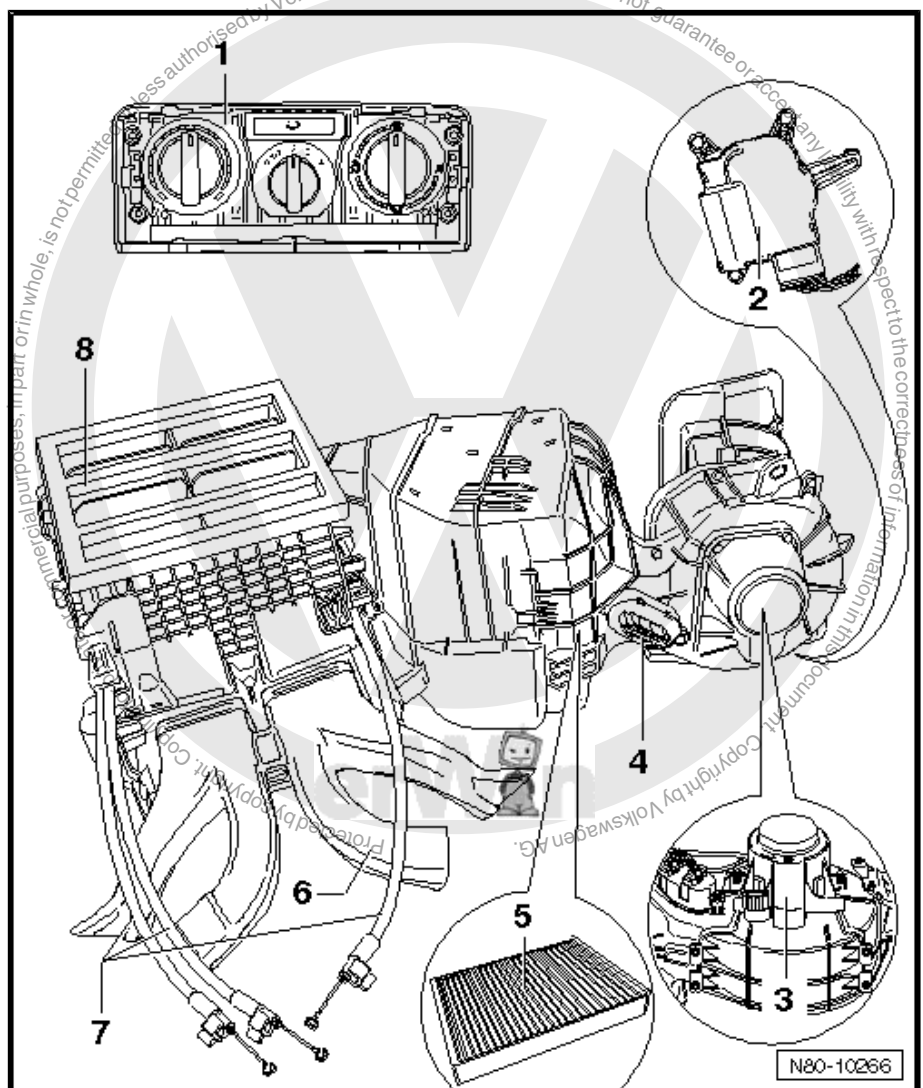
- ☐ Removing ⇒ [page 5](#)

7 - Cables on controls for heater and fresh air

- ☐ Installing ⇒ [page 10](#)

8 - Heater unit

- ☐ Removing and installing ⇒ [page 10](#)





1.2 Removing and installing dust and pollen filter



Note

Dust and pollen filter with activated charcoal filter insert is offered as optional extra.

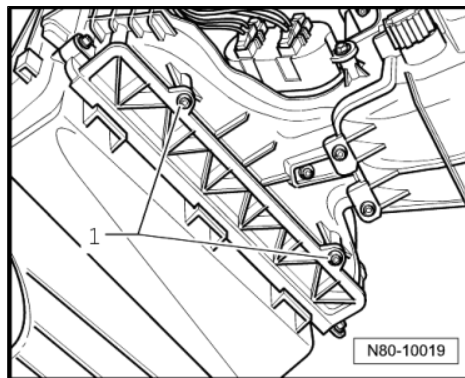
The dust and pollen filter is located in the front passenger footwell.

- Remove bolts -1-.
- First remove cover and the pull filter element out of housing.



Note

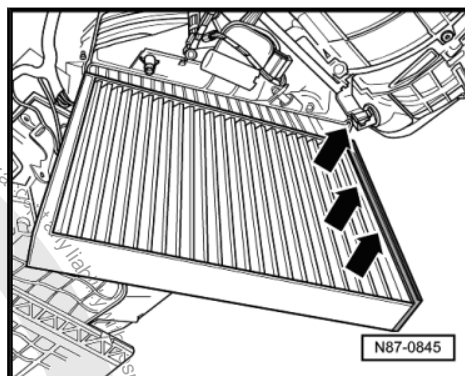
Change intervals for dust and pollen filter ⇒ Maintenance ; Booklet 19.1 .



1.2.1 Installing

Installation is carried out in the reverse order. When installing, note the following:

- Note installation position of filter -arrows-.



1.3 Dust and pollen filter with activated charcoal inlay

- ♦ The filter with activated charcoal inlay adopts the roll of the dust and pollen filter. But it can also filter harmful gasses such as ozone, benzene, nitrogen dioxide etc. out of the air flow
- ♦ The task of the activated charcoal is to absorb gaseous impurities from the air flow until the fresh air flap is closed and the system is operating in air recirculation mode. In vehicles with Climatronic, the Climatronic control unit -J255- switches from fresh air to air recirculation as soon as the air quality sensor -G238- detects gaseous impurities in the air. The function "automatic air recirculation" must be selected.
- ♦ The activated charcoal layer in the dust and pollen filter reacts with noxious substances in the air in different ways:
 - Certain noxious substances are stored permanently in the activated charcoal layer.
 - Others are converted into harmless compounds in a manner similar to that of a catalytic converter.
 - For the remaining substances, the activated charcoal functions like a condenser. As noxious substances increase, initially they



are stored until a certain level of saturation is achieved. As the portion of noxious substances in the air decreases, the activated charcoal layer gradually releases the particles.

- ◆ Because the activated charcoal layer permanently stores part of the noxious substances, renewing the dust and pollen filter before the prescribed renewal period would be advantageous, if:

- the vehicle is driven in areas with heavy air pollution.
- the vehicle is driven mainly with the "automatic recirculation mode" switched off.
- the vehicle is not equipped with an air quality sensor -G238- and consequently has no "automatic air recirculation" function.

- ◆ On vehicles with air quality sensor, the air conditioning system should always be operated with the "automatic recirculation mode" activated. However, if it is necessary or desired to switch the function off, the following should be observed:

-The activated charcoal layer in the dust and pollen filter will become saturated after a certain period of time.

-A saturated filter is not capable of absorbing any more noxious substances, and these will flow unrestricted into the vehicle.

- ◆ The main task of the dust and pollen filter and the air quality sensor -G238- is to prevent peak levels of pollution from entering the passenger compartment of the vehicle. To this end, the following should be observed:

-If the vehicle is being driven in an area with relatively clean air (with low levels of noxious substances), switching from fresh air to air recirculation mode is actuated at a different point in time than in an area with a high level of pollution (e.g. industrial area).

-The switch from fresh air to air recirculation occurs independently of the base level of pollution whenever the pollution level increases (e.g. when driving through a cloud of exhaust soot).

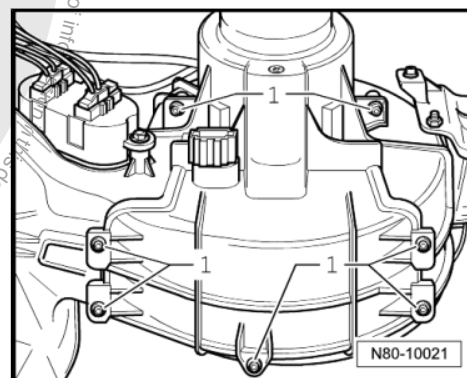
- ◆ The filter with activated charcoal can be installed in all vehicles (also vehicles without an air quality sensor -G238-). The same restrictions as those for operation of an air conditioning system with deactivated "automatic recirculation mode" apply to these vehicles.

1.4 Removing fresh air blower -V2-

1.4.1 Removing

The fresh air blower -V2- is accessible from the footwell on the front passenger side.

- Pull connector off fresh air blower -V2- .
- Remove bolts -1- (1 Nm) for fresh air blower -V2- .
- Remove fresh air blower -V2- from heater unit.





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

1.5.1 Removing

- Separate connector.



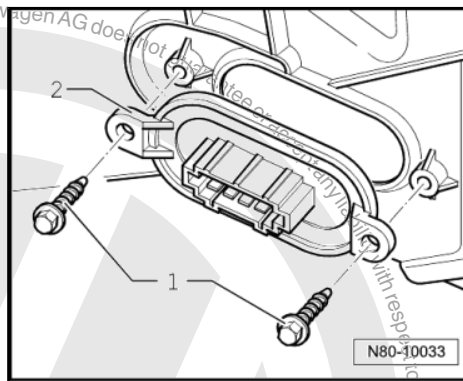
WARNING

Danger of burn injuries.

The fresh air blower series resistor with overheating fuse -N24- can be hot.

Before removing fresh air blower series resistor with overheating fuse -N24- , let it cool off.

- Remove bolts -1- (1 Nm) and remove series resistor from housing.



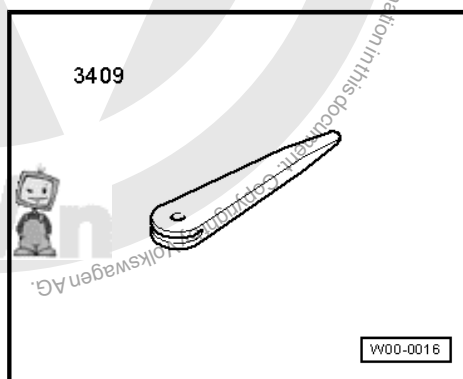
1.5.2 Installing

Install in reverse order.

1.6 Removing vents

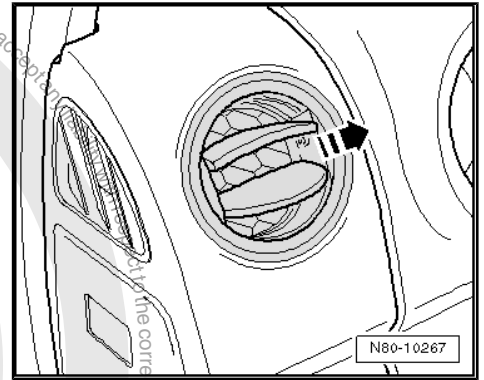
Special tools and workshop equipment required

- ◆ Removal wedge -3409-



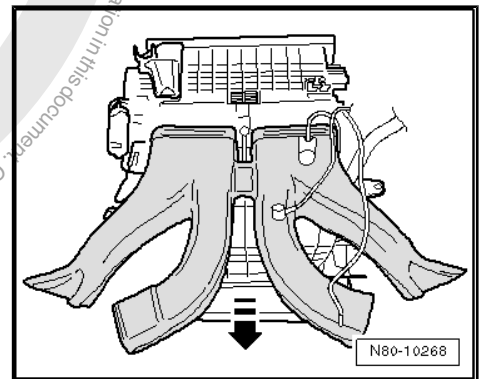


- Use removal wedge -3409- to pry vent out of dash panel -arrow-.



1.6.1 Removing footwell vent

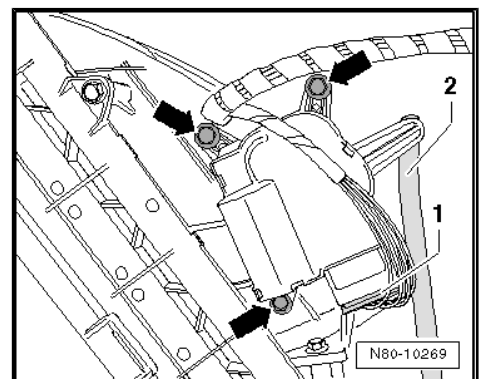
- Remove middle footwell trim => General body repairs, interior; Rep. Gr. 70 ; Removing and installing middle footwell trim .
- Pull footwell vent off heater unit -in direction of arrow-.



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

1.7.1 Removing

- Separate connector -1-.
- Unclip actuator -2-.
- Remove bolt -arrows-.



1.7.2 Installing

Install in reverse order.

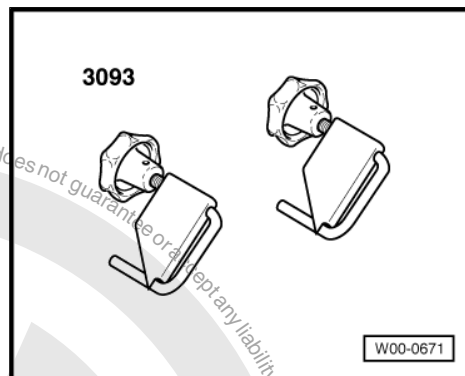


1.8 Removing and installing heat exchanger

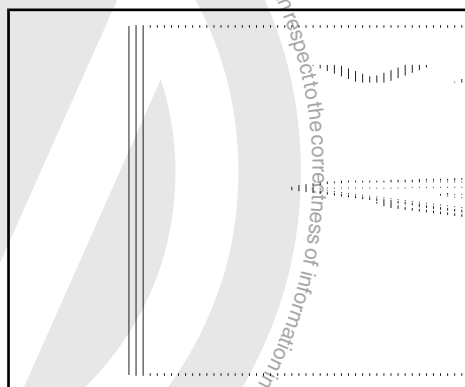
1.8.1 Removing

Special tools and workshop equipment required

- ◆ Hose clamps up to 40 mm Ø -3093-



- ◆ Drip tray for workshop hoist -VAS 6208-



- Place drip tray -VAS 6208- beneath engine.
- Clamp off coolant hoses -1- and -2- with hose clamps up to 40 mm Ø -3093- .

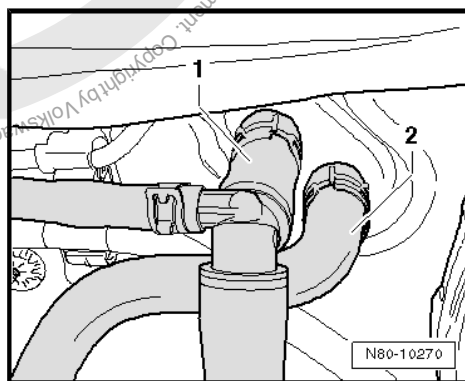


WARNING

Danger of scalding injuries.

When the engine is warm, the coolant temperature may be above 100 °C. The cooling system is pressurised.

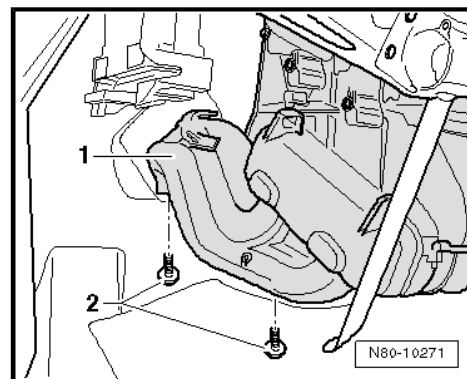
If necessary, reduce temperature and release pressure.



- Disconnect coolant hoses -1- and -2- leading to heat exchanger.
- Carefully blow remaining coolant out of heat exchanger via connections using a compressed air pistol.
- Remove left and right dash panel trim and middle footwell trim
⇒ General body repairs, interior; Rep. Gr. 70 ; Dash panel .



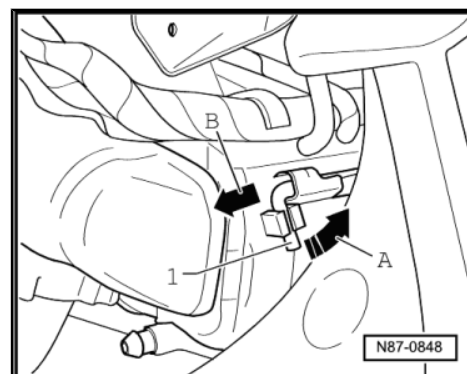
- Remove bolts -2- and remove trim -1-.
- Lay trim -1- to side.



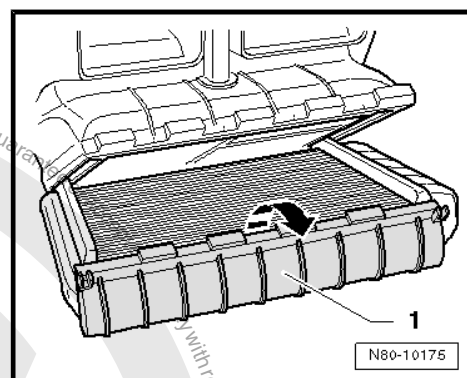
Note

A retaining pin connects the lower heat exchanger cover to the heater unit.

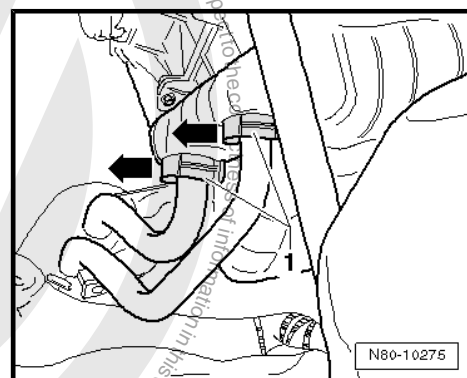
- Remove retaining pin -1- from catch -arrow A- and pull out in direction of -arrow B-.



- Fold down cover -1-.

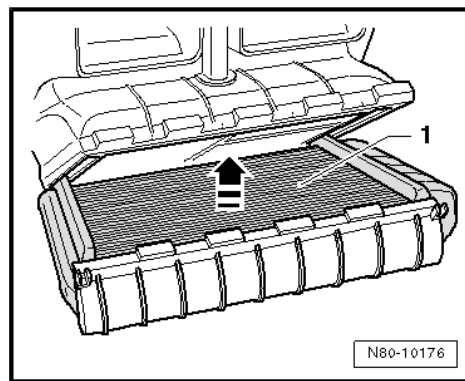


- Cover carpet in area under heat exchanger with waterproof foil and water absorbing paper.
- Pull retaining clips -1- off coolant lines.
- Slowly pull coolant lines out of heat exchanger and collect coolant that leaks out in a container.





- Remove heat exchanger -1-.

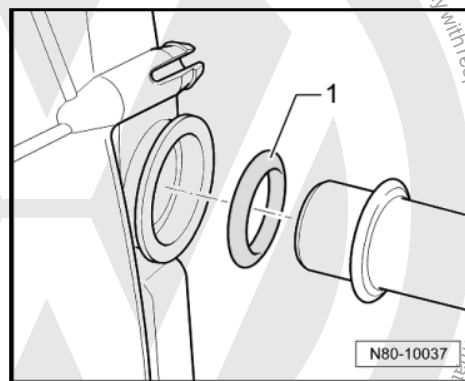
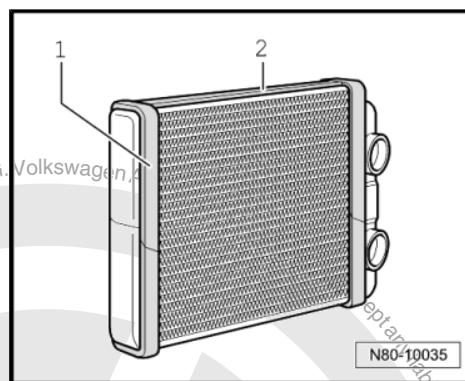


1.8.2 Installing

Installation is carried out in the reverse order. When installing, note the following:

Seals -1- must be bonded left and right without gaps around the edges. Bond seals -2- to upper and lower edge.

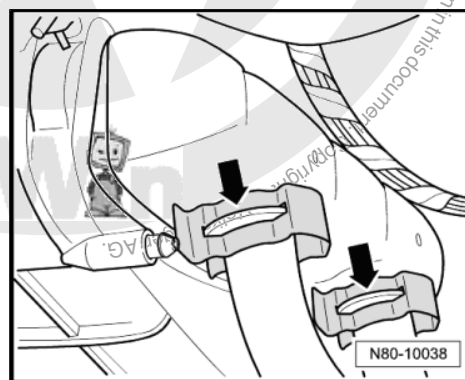
- Moisten seals -1- with coolant before installing.



Note

Always renew seals.

- Ensure that clips are seated correctly after they have been installed -arrows-.
- Renew coolant after installing a new heat exchanger ⇒ Rep. Gr. 19 .





1.9 Checking passenger compartment ventilation

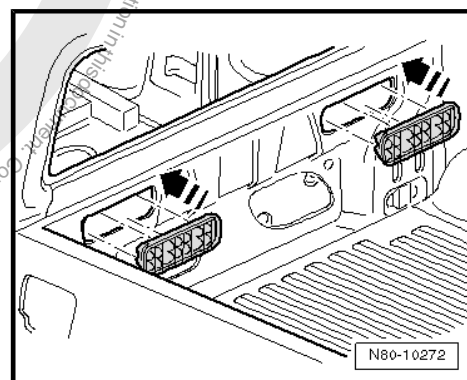


Note

- ◆ The stale air escapes via ventilation openings in the trim behind the rear seat bench.
- ◆ If the ventilation is to function properly, the exhaust openings must not be covered.
- ◆ Ventilation frame is located in rear window frame.
- ◆ Remove load area in order to remove ⇒ Rep. Gr. 55

1.9.1 Checking

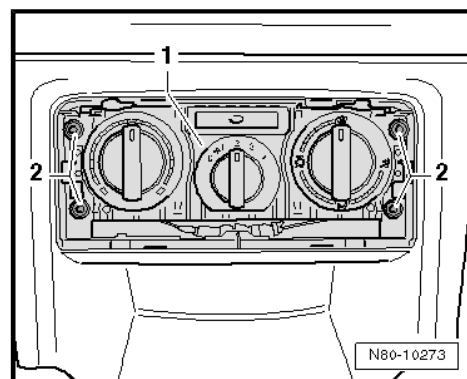
- The sealing lips in the ventilation frame must be free to move and close by themselves.
- Note installation position.



1.10 Removing and installing controls for heated and fresh air

1.10.1 Removing

- Remove lower centre dash panel trim panels ⇒ Rep. Gr. 68 .
- Remove bolts -2- (1.5 Nm) and remove controls -1- from dash panel.
- Separate connectors.
- Release cables on controls.



1.10.2 Installing

Installation is carried out in the reverse order. When installing, note the following:

- Attach cables to controls ⇒ [page 10](#) .

Specified torque for bolts 1.5 Nm.



1.11 Installing cables on controls for heater and fresh air



Note

- ◆ Cables are colour coded.
- ◆ When rotary knobs are turned, all flaps must audibly contact stop.

1 - Controls for fresh and heated air

- Removing and installing
→ [page 9](#)

2 - Temperature flap cable

- Cable is colour coded red.



Note

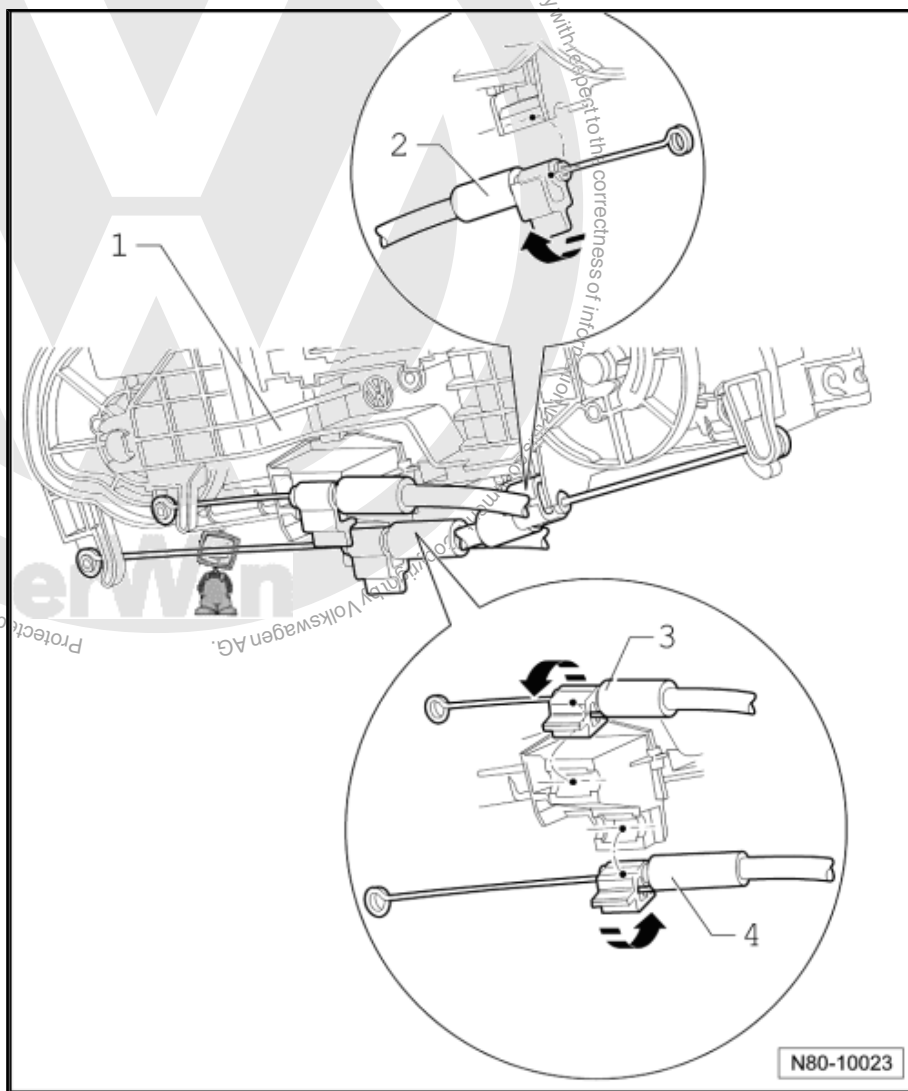
- Clip in, in direction of arrow.

3 - Footwell flap cable

- Cable is colour coded yellow.
- Clip in, in direction of arrow.

4 - Defroster flap cable

- Cable is colour coded green.
- Clip in, in direction of arrow.



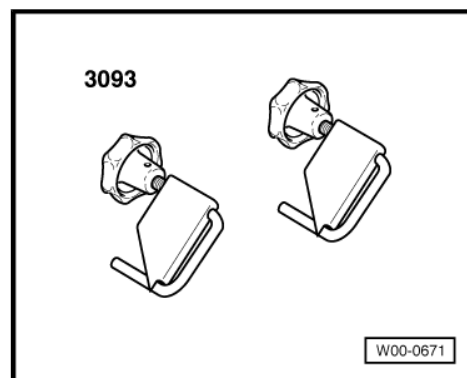
1.12 Removing and installing heater unit

1.12.1 Removing

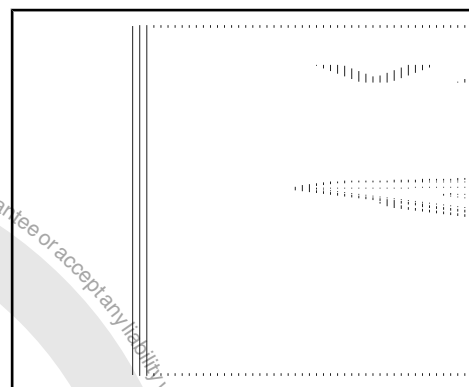
Special tools and workshop equipment required



- ◆ Hose clamps up to 40 mm Ø -3093-



- ◆ Drip tray for workshop hoist -VAS 6208-



- Switch off all electrical loads.
- Switch off ignition.
- Withdraw ignition key.
- Place drip tray -VAS 6208- beneath engine.
- Clamp off coolant hoses -1- and -2- with hose clamps up to 40 mm Ø -3093- .

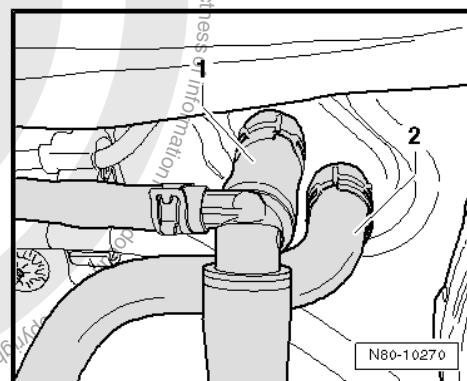


WARNING

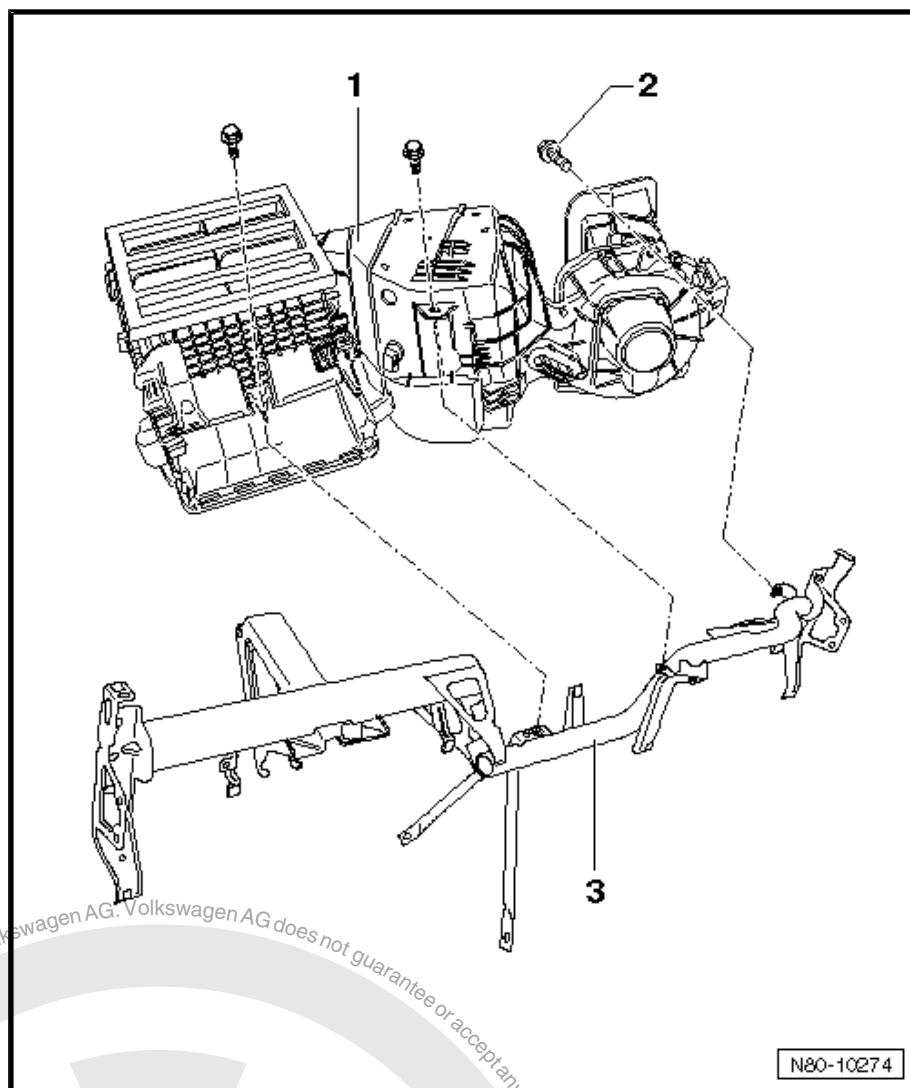
Danger of scalding injuries.

When the engine is warm, the coolant temperature may be above 100 °C. The cooling system is pressurised.

If necessary, reduce temperature and release pressure.



- Disconnect coolant hoses -1- and -2- leading to heat exchanger.
- Carefully blow remaining coolant out of heat exchanger via connections using a compressed air pistol.
- Remove dash panel ⇒ Rep. Gr. 70 .



- Remove bolts -2- (9 Nm).
- Remove assembly carrier for dash panel -3- → Rep. Gr. 70 .
- Disconnect connectors to heater -1- and remove heater unit.

1.12.2 Installing

Installation is carried out in reverse order.

After installation, refill coolant → Rep. Gr. 19 .



Note

Ensure that seal is properly seated between heat exchanger and bulkhead.

1.13 Dismantling and assembling heater unit

Perform following jobs:

- Remove heater unit → [page 10](#) .



1 - Upper part of distribution box

- The upper part is connected by securing bolts -3- and retaining clips -2-

Connected to lower part.

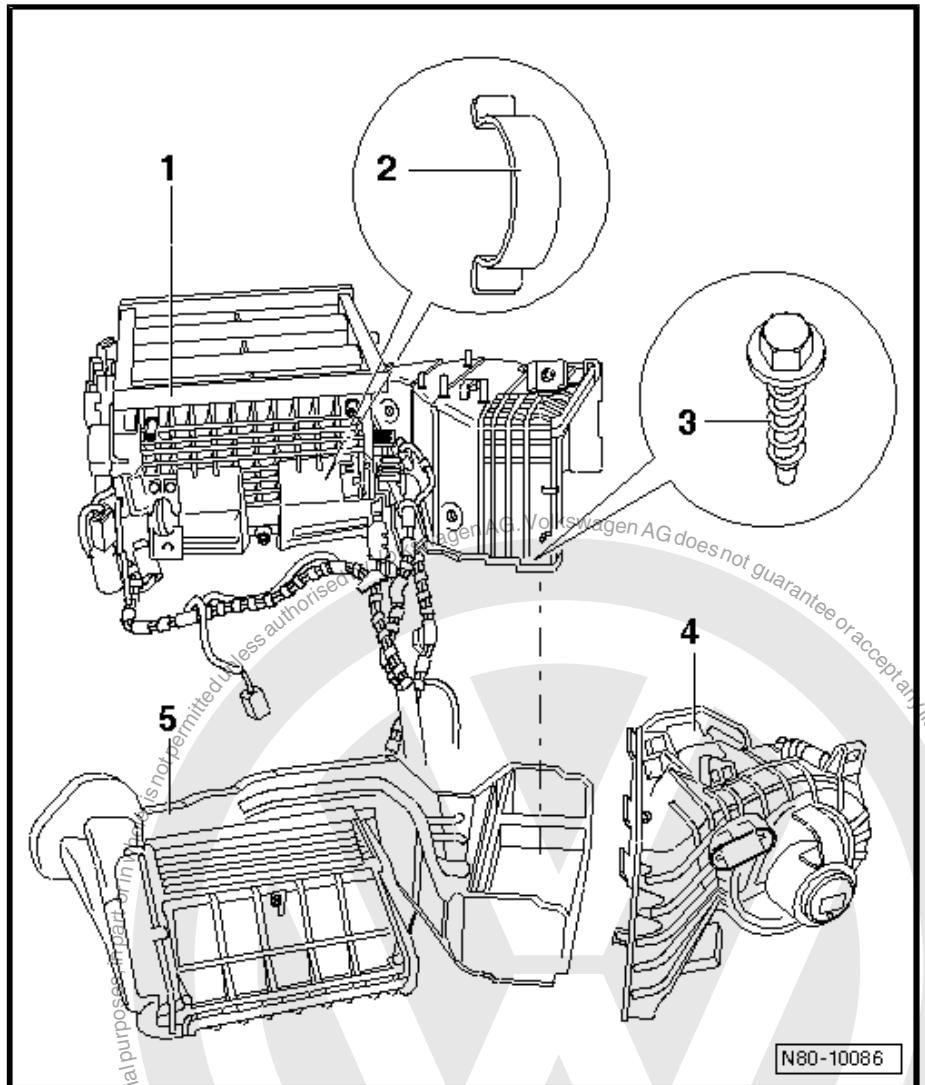
2 - Retaining clip

- Qty. 3

3 - Securing bolts

4 - Blower housing

5 - Lower part of distribution box





87 – Air conditioning system

1 Notes on repair work to vehicles with air conditioning and on handling refrigerant



Note

- ◆ *Notes on repair work to vehicles with air conditioning and on handling refrigerant can be found in ELSA under repair group ⇒ Air conditioning system with refrigerant R134a; Rep. Gr. 00; Technical data.*
- ◆ *Notes on testing equipment and tools for repair work to vehicles with air conditioning can be found in ELSA under Heating, ventilation, air conditioning system; Air conditioning system with refrigerant R134a ⇒ Rep. Gr. 00; Technical data.*
- ◆ *Under certain conditions, it is no longer necessary to renew the dryer cartridge each time the refrigerant circuit is opened ⇒ Air conditioning system with refrigerant R134a; Rep. Gr. 00; Technical data; Renewing components.*



Caution

Do not kink or severely bend refrigerant lines.
There is a film in the refrigerant lines which can be destroyed.
Refrigerant lines must not be bent to a radius less than $r = 100$ mm.

Additional information:

- ◆ ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ◆ Repairs to evacuated refrigerant circuit which may be performed only by competent mechanics with appropriate equipment in the workshops ⇒ Service Division/ServiceNet; Handbooks (SOH); Chapter 2, Environment.




2 Climatic - air conditioning system with manual controls

2.1 Function of buttons on controls for heating and air conditioning "Climatic"

1 - Rotary knob for interior temperature

2 - Heated rear window button
-E230-

3 -  button

- ☐ Press  button to switch cooling on and off.
- ☐ The warning lamp in the button lights up yellow when the air conditioner compressor is switched on.

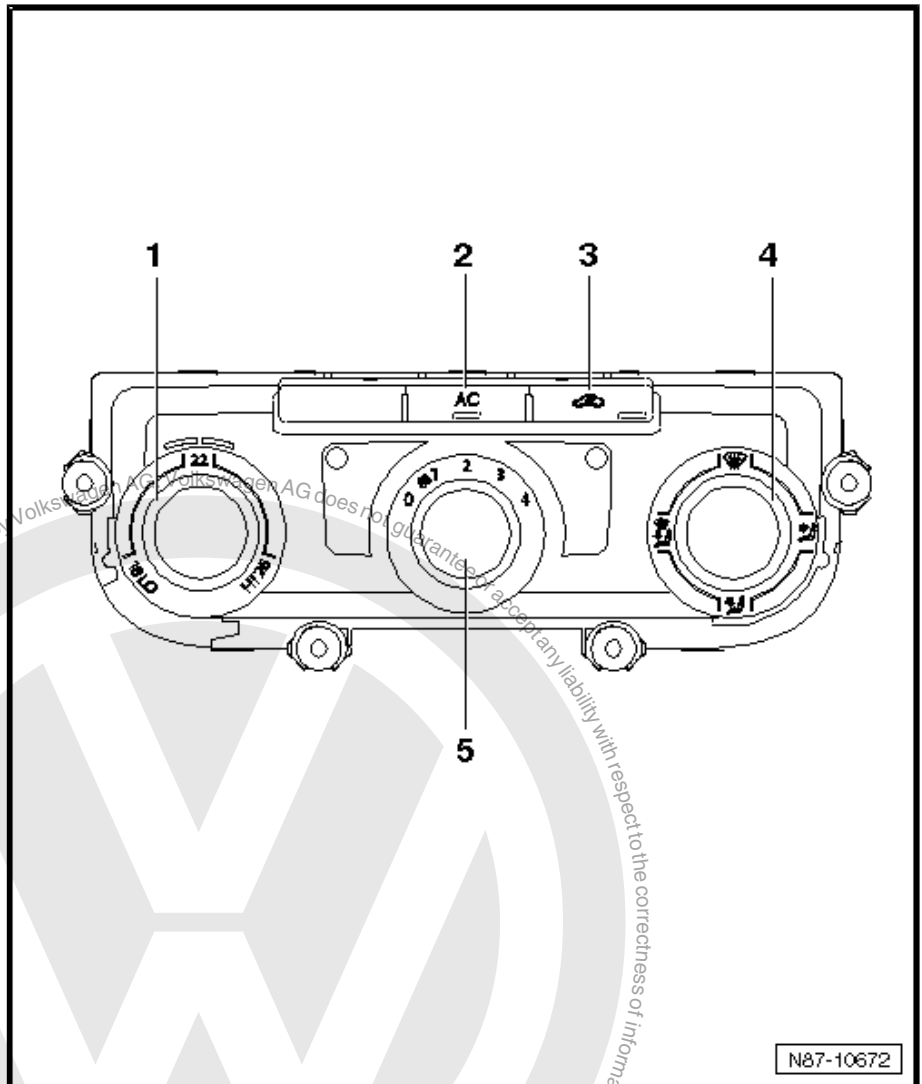


Note

4 - Air recirculation button

5 - Rotary regulator for air distribution

6 - Fresh air blower switch -E9-



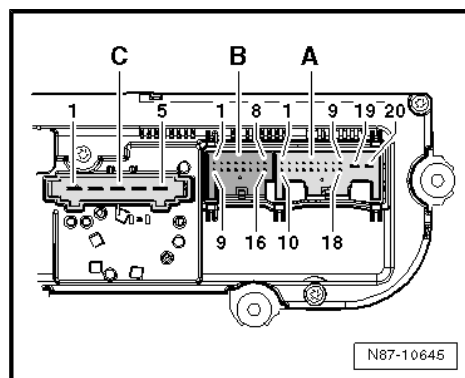
N87-10672



2.2 Pin assignment for multi-pin connectors on back of controls for heating and air conditioning "Climatic"

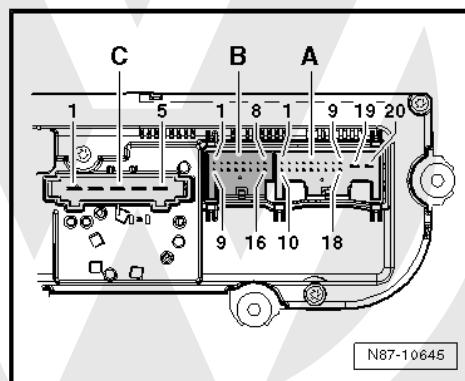
2.2.1 20-pin connector, connector housing -A-, T20 in current flow diagram

- 1 - Air distribution flap control motor -V428- closed
- 2 - Air distribution flap control motor -V428- open
- 3 - Front vent temperature sender -G152-
- 4 - Potentiometer for front air distribution control motor -G470-
- 5 - Air conditioning system pressure switch -F129-
- 7 - CAN, low
- 8 - CAN, high
- 9 - Footwell flap control motor -V261- , closed
- 10 - Footwell flap control motor -V261- , open
- 11 - Potentiometer for footwell vent control motor -G468-
- 14 - Circulation pump -V55-
- 16 - Air conditioner compressor regulating valve -N280-
- 18 - Signal, earth
- 19 - Terminal 30
- 20 - Terminal 31



2.2.2 16-pin connector, connector housing -B-, T16k in current flow diagram

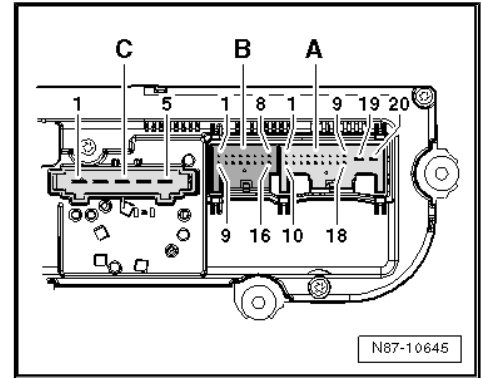
- 1 - Temperature flap control motor -V68- , warm
- 2 - Evaporator output temperature sender -G263-
- 3 - Potentiometer for defroster flap control motor -G135-
- 4 - Footwell vent temperature sender -G192-
- 5 - Temperature flap control motor potentiometer -G92-
- 7 - + 5 volt
- 8 - Earth signal for potentiometer
- 9 - Air recirculation flap control motor -V113- open
- 10 - Air recirculation flap control motor -V113- closed
- 11 - Temperature flap control motor -V68- , cold
- 12 - Defroster flap control motor -V107- , open
- 13 - Defroster flap control motor -V107- , closed





2.2.3 5-pin connector, connector housing -C-, T5n in current flow diagram

- 1 - 3rd blower speed
- 2 - 2nd blower speed
- 3 - 1st blower speed
- 4 - 4th blower speed
- 5 - X terminal



2.3 Climatic, passenger compartment

Before beginning repair work on electrical system, perform the following steps:

- Switch off all electrical loads.
- Switch off ignition.
- Withdraw ignition key.

1 - Heating and air conditioning controls, Climatic

- ☐ With fresh air and air recirculation flap switch - E159- .
- ☐ With heated rear window button -E230- .
- ☐ With fresh air blower switch -E9-
- ☐ For vehicles with seat heating, also with heated driver seat regulator -E94- and heated front passenger seat regulator -E95- .
- ☐ With air conditioning system control unit - J301- .
- ☐ Removing and installing [⇒ page 19](#)

2 - Air recirculation flap control motor -V113-

- ☐ Removing [⇒ page 5](#)

3 - Fresh air blower -V2-

- ☐ Removing [⇒ page 3](#)

4 - Fresh air blower series resistor with overheating fuse - N24-

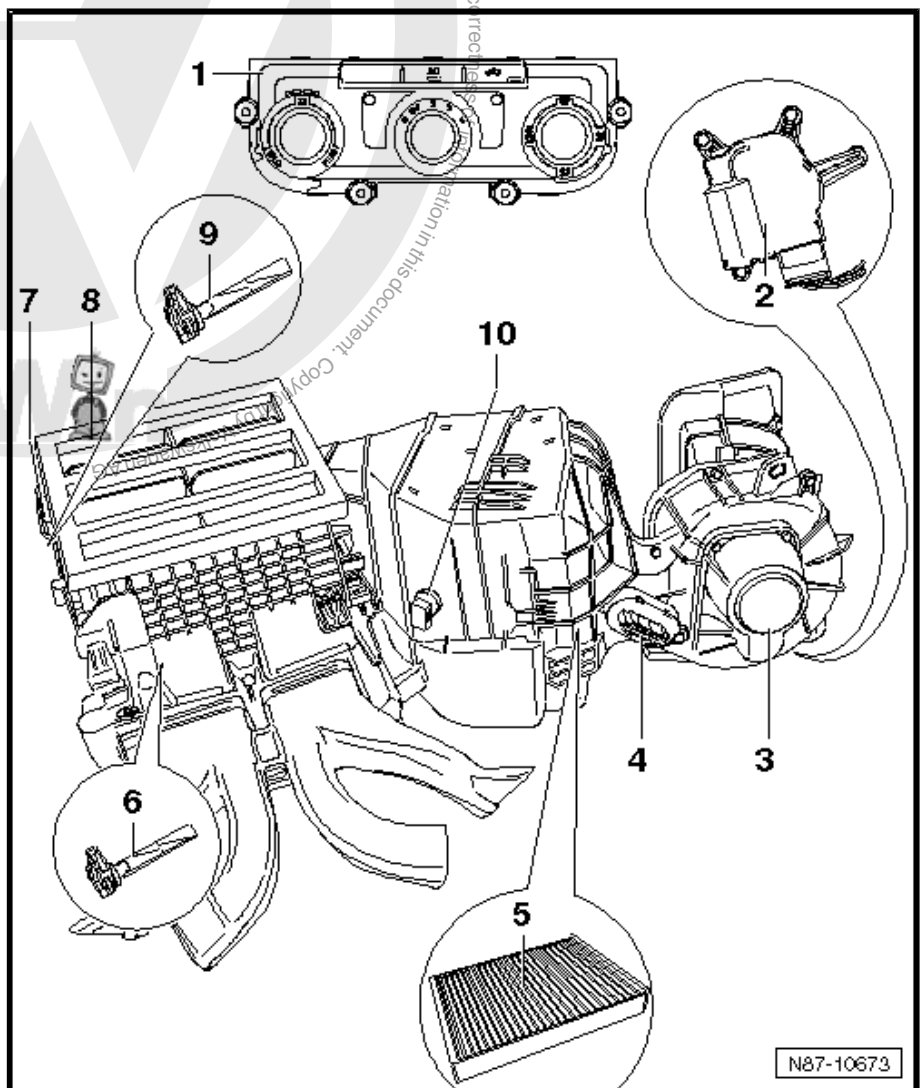
- ☐ Removing [⇒ page 4](#)

5 - Dust and pollen filter

- ☐ Removing [⇒ page 2](#)

6 - Footwell vent temperature sender -G192-

- ☐ Removing [⇒ page 18](#)





7 - Control motors

- ❑ Installation position of control motors ⇒ [page 19](#) .

8 - Heater and air conditioning unit

- ❑ Removing ⇒ [page 51](#)

9 - Front vent temperature sender -G152-

- ❑ Removing and installing ⇒ [page 18](#) .

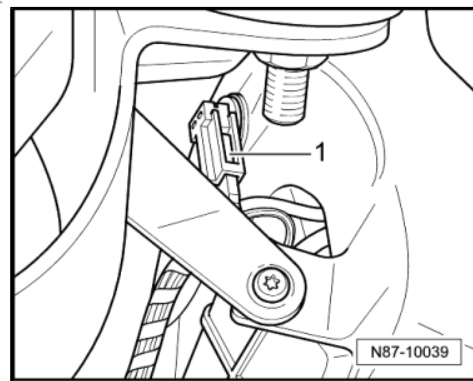
10 - Evaporator temperature sensor -G308-

- ❑ Removing ⇒ [page 30](#)

2.3.1 Removing footwell vent temperature sender -G192-

Perform following jobs:

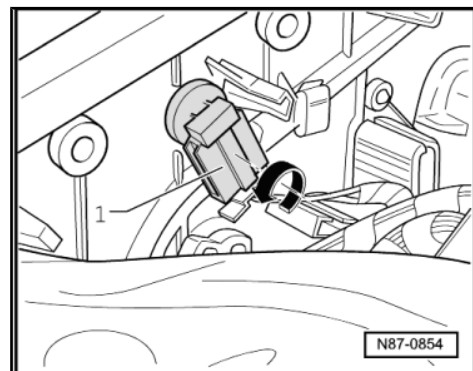
- Remove heating and air conditioning controls, Climatic and installation frame ⇒ [page 19](#) .
- Pull connector off sender -1- for footwell vent temperature sender -G192- .
- Turn footwell vent temperature sender -1- 90° and remove from footwell vent.



2.3.2 Removing front vent temperature sender -G152-

Perform following jobs:

- Remove passenger side airbag unit ⇒ General body repairs, interior; Rep. Gr. 69 ; Removing and installing passenger side airbag unit or remove dash panel storage compartment ⇒ General body repairs, interior; Rep. Gr. 68 ; Removing and installing dash panel storage compartment
- Pull connector off vent temperature sender -1-.
- Turn front vent temperature sender -G152- -1- 90° and remove it from housing.



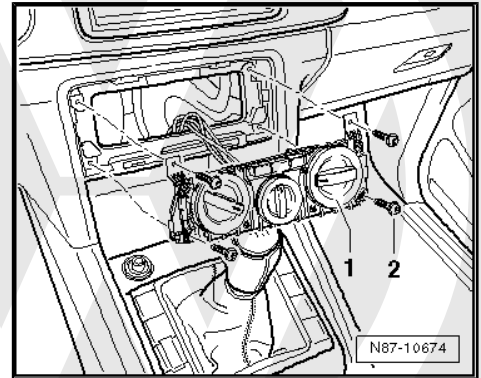


2.4 Heating and air conditioning controls, Climatic

2.4.1 Removing

Perform following jobs:

- Remove lower centre dash panel trim panels ⇒ Rep. Gr. 68 .
- Remove bolts -2- (1.5 Nm) and remove controls -1- from dash panel.
- Separate connectors.



2.4.2 Installing

Install in reverse order.

Specified torque for bolts 1.5 Nm.

2.5 Removing retaining plate for defroster flap control motor -V107- and air distribution flap control motor -V428-

Perform following jobs:

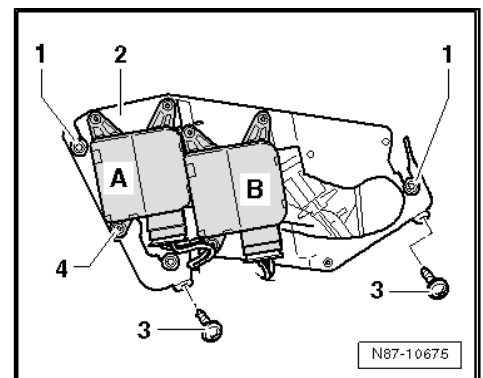
- Remove dash panel ⇒ Rep. Gr. 70 .
- Removing lower retaining plate for footwell flap control motor -V261- and temperature flap control motor -V68- ⇒ [page 21](#) .
- Remove bolts -3-.



Note

To remove the retaining plate, the bolts -1- are not loosened or removed. They are used for guiding the retaining plate.

- Separate connectors.
- Pull out retaining plate with control motors downwards.



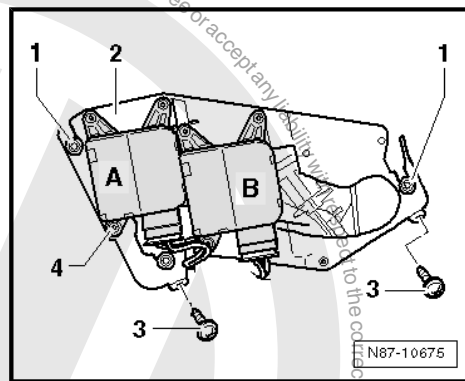
2.6 Removing and installing defroster flap control motor -V107-

2.6.1 Removing

- Remove retaining plate -2- ⇒ [page 19](#) .



- Remove bolts -4- (Qty. 3) from defroster flap control motor - V107- -A-.
- Remove control motor from retaining plate -2-.



2.6.2 Installing

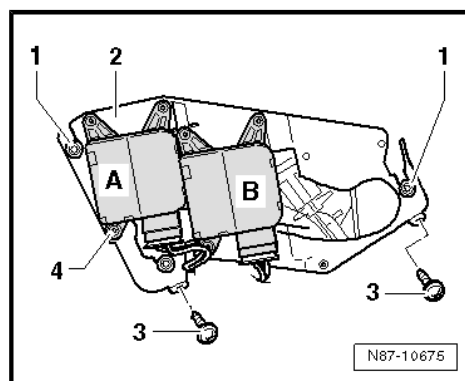
Install in reverse order. Note the following when doing this:

- For example, use vehicle diagnosis, testing and information system -VAS 5051B- or vehicle diagnosis and service information system -VAS 5052 A- to initiate basic settings function ⇒ [page 23](#) .

2.7 Removing and installing air distribution flap control motor -V428-

2.7.1 Removing

- Remove retaining plate -2- ⇒ [page 19](#) .
- Remove bolts -4- (Qty. 3) from air distribution flap control motor -V428- -B-.
- Remove control motor from retaining plate -2-.



2.7.2 Installing

Install in reverse order. Note the following when doing this:

- For example, use vehicle diagnosis, testing and information system -VAS 5051B- or vehicle diagnosis and service information system -VAS 5052 A- to initiate basic settings function ⇒ [page 23](#) .



2.8 Removing and installing retaining plate with footwell flap control motor -V261- and temperature flap control motor -V68-

2.8.1 Removing retaining plate with footwell flap control motor -V261- and temperature flap control motor -V68-

Perform following jobs:

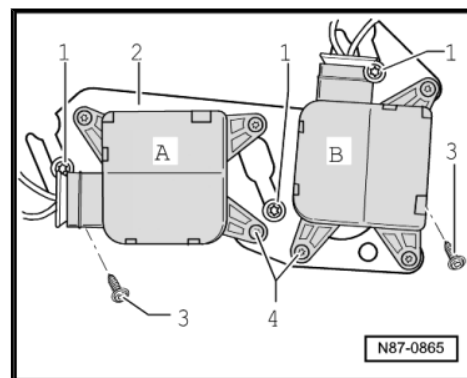
- Remove dash panel ➔ Rep. Gr. 70 .
- Remove bolts -3-.



Note

To remove the retaining plate, the bolts -1- are not loosened or removed. They are used for guiding the retaining plate.

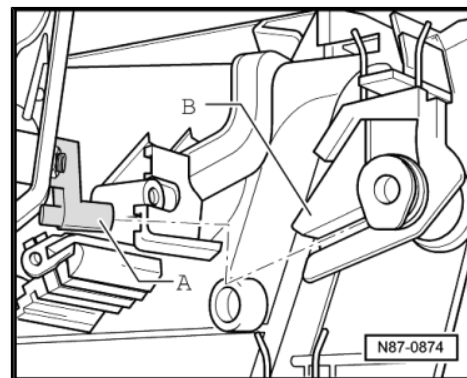
- Separate connectors.
- Pull out retaining plate with control motors downwards.



2.8.2 Installing

Install in reverse order. Note the following when doing this:

- During installation, ensure that control motor drive -A- is pushed into mounting -B-.
- For example, use vehicle diagnosis, testing and information system -VAS 5051B- or vehicle diagnosis and service information system -VAS 5052 A- to initiate basic settings function ➔ [page 23](#) .



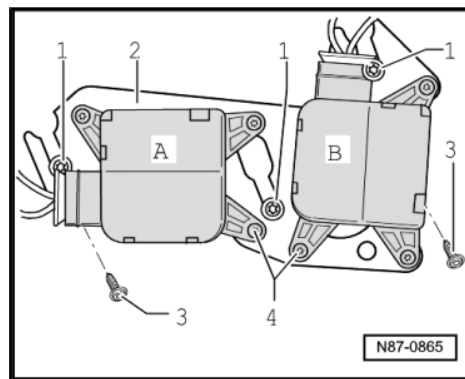
2.9 Removing and installing footwell flap control motor -V261-

2.9.1 Removing

- Remove lower retaining plate -2- for footwell flap control motor -V261- and temperature flap control motor -V68- ➔ [page 21](#) .



- Remove bolts -4- (Qty. 3) from temperature flap control motor -V68- -B-.
- Remove control motor from retaining plate -2-.



2.9.2 Installing

Install in reverse order. Note the following when doing this:

- For example, use vehicle diagnosis, testing and information system -VAS 5051B- or vehicle diagnosis and service information system -VAS 5052 A- to initiate basic settings function
⇒ [page 23](#) .



3 Climatronic air conditioning with automatic regulation



Note

- ◆ The vehicle has two-zone automatic air conditioning.
- ◆ The air flow and the temperature can be set individually for the driver, the front passenger and the rear passengers within a specific temperature range.
- ◆ Pressing the **AUTO** button will cancel all individual settings which deviate from automatic operation.
- ◆ In ECON operation, only the air conditioner compressor is switched to almost zero delivery. The heating and ventilation operations continue to be controlled electronically.
- ◆ Modifications made to automatic operation before the engine is switched off will be saved.
- ◆ Deviations from automatic operation ⇒ appropriate operating instructions.
- ◆ If there is a fault in the system, first read the fault memory. For example, use the vehicle diagnosis, testing and information system -VAS 5051B- or the vehicle diagnosis and service information system -VAS 5052 A- in the "guided fault finding" function.

3.1 Procedure for checking and adjusting components

Select "guided fault finding" in vehicle diagnosis, testing and information system -VAS 5051B- or vehicle diagnosis and service information system -VAS 5052 A-.

After all control units have been read:

- Press "GoTo" button.
- Select "Function/component selection".
- Select "Body".
- Select "Heating, ventilation, air conditioning (Repair group 01; 80...87)".
- Select "01-On Board Diagnostic (OBD) capable systems".
- Select "Climatronic".
- Select "Functions".
- Select "Basic settings".
- Select "Service position".



3.2 Function of operating and display unit for Climatronic air conditioning system - E87- with Climatronic control unit -J255-



Note

- ◆ A warning lamp in the instrument panel controls will indicate that the selected function is active. In addition, the display of the radio or of the radio navigation system will indicate the selected function for a short time when a button is pressed or a regulator is operated.
- ◆ If a new operating and display unit for Climatronic air conditioning system -E87- with Climatronic control unit -J255- is installed, the basic setting and an adaptation ("Compressor first run") must be carried out in the Guided Fault Finding or in the Guided Functions.

1 - Rotary knob for interior temperature, left

2 - **AUTO** button

- ❑ Pressing **AUTO** button causes the Climatronic to maintain the selected interior temperature completely automatically. With this setting, the vent air temperature, the blower speed and the air distribution are controlled automatically.

3 - Defrost function button for windscreen

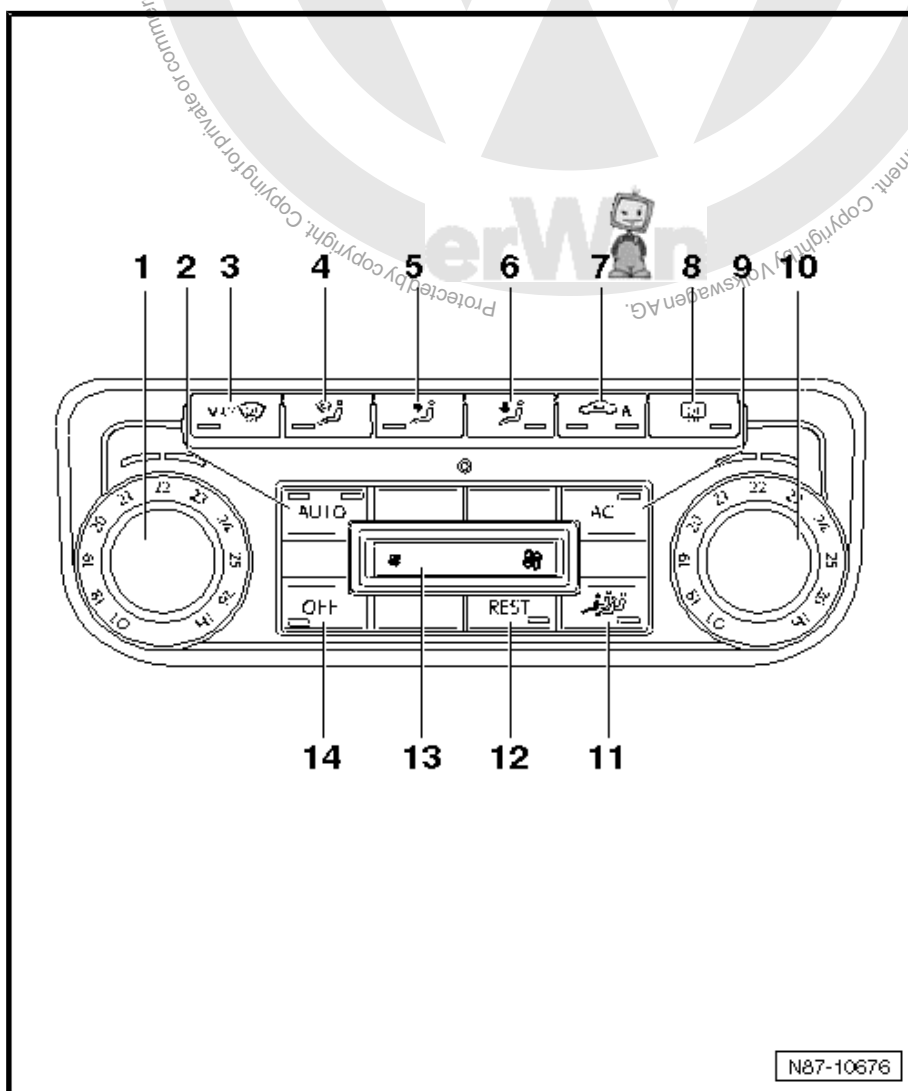
4 - Upper air distribution button

5 - Centre air distribution button

6 - Lower air distribution button

7 - Button for air recirculation mode or button for automatic recirculation mode

- ❑ Pressing the button for air recirculation mode will switch on the air recirculation mode and prevent polluted air from entering the interior.
- ❑ Pressing the air recirculation mode button again will activate the automatic recirculation mode.



Note



8 - Rear window heating button

9 - **AC** button

- ☐ Press **AC** button to switch cooling on and off.
- ☐ The warning lamp in the button lights up when the air conditioner compressor is switched on.

10 - Rotary knob for interior temperature, right

11 - **Synchronisation** button

- ☐ If the lamp in the button is not on, the left and right temperatures may be adjusted independently.
- ☐ If the **Synchronisation** button is pressed (the warning lamp lights up), the passenger side will assume the temperature setting for the driver side.

12 - **Rest** button

- ☐ When residual heat function is switched on, the residual heat of the engine is pumped by a coolant pump to the heat exchanger.

13 - Blower regulator

- ☐ Press briefly to change blower speed.

14 - Air conditioner **OFF** button

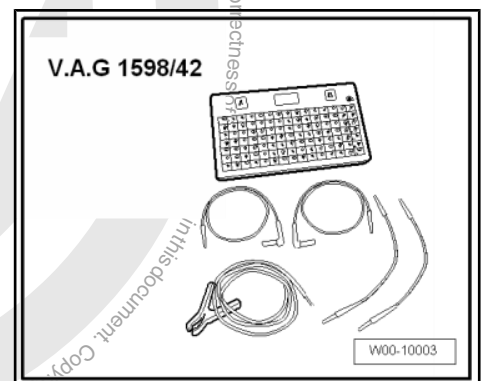
- ☐ For switching Climatronic on or off

3.3 Connectors on Climatronic control unit - J255-

3.3.1 Pin assignment for multi-pin connectors A, B and C on back of Climatronic control unit -J255-

Special tools and workshop equipment required

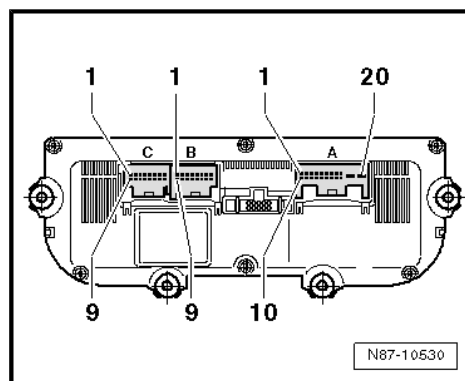
- ◆ Test box -V.A.G 1598/42-
- ◆ Test adapter for air conditioner control panel - Touran -V.A.G 1598/47-



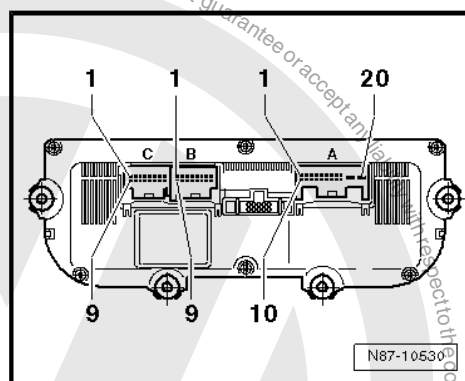
- ◆ Template -1598/47-2-

**20-pin connector, T20a in current flow diagram -A-**

- 1 - Sunlight penetration photosensor -G107- , signal
- 2 - Air conditioning system pressure switch -F129-
- 3 - Sunlight penetration photosensor -G107- , signal
- 4 - Air quality sensor -G238-
- 5 - CAN, high
- 6 - CAN, low
- 9 - + 5 V for sunlight penetration photosensor 2 -G107-
- 13 - Vent temperature sender -G150-
- 14 - Right vent temperature sender -G151-
- 17 - Earth signal for sunlight penetration photosensor -G107- , vent temperature sender -G150- , right vent temperature sender -G151- ; evaporator temperature sensor -G308- ; left footwell vent temperature sender -G261- and right footwell vent temperature sender -G262-
- 18 - Air conditioner compressor regulating valve -N280-
- 19 - Terminal 31
- 20 - Terminal 30

**16-pin connector, T16I in current flow diagram -B-**

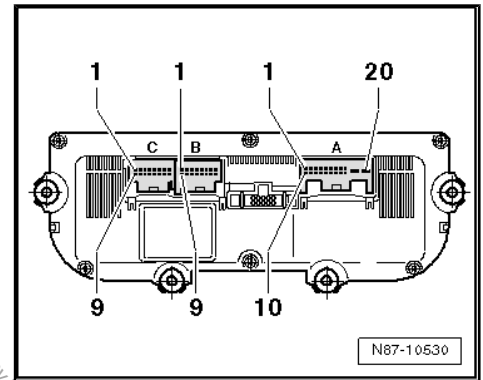
- 1 - + 5V for control motors
- 2 - Potentiometer for left temperature flap control motor -G220-
- 3 - Potentiometer for right temperature flap control motor -G221-
- 4 - Potentiometer for defroster flap control motor -G135-
- 5 - Potentiometer for left footwell flap control motor -G139-
- 6 - Potentiometer for front air distribution control motor -G470-
- 7 - Potentiometer for fresh air/recirculated air, air flow flap control motor -G644-
- 8 - Footwell vent temperature sender -G261-
- 9 - Right footwell vent temperature sender -G262-
- 11 - Evaporator temperature sensor -G308-
- 12 - Fresh air blower control unit -J126- , signal
- 14 - Signal earth, potentiometer
- 15 - Auxiliary coolant heater relay -J493-





16-pin connector, T16m in current flow diagram -C-

- 1 - Left temperature flap control motor -V158- , cold
- 2 - Left temperature flap control motor -V158- , warm
- 3 - Defroster flap control motor -V107- , closed
- 4 - Defroster flap control motor -V107- , open
- 5 - Left footwell flap control motor -V108- , open
- 6 - Left footwell flap control motor -V108- , closed
- 7 - Air distribution flap control motor -V428- , closed
- 8 - Air distribution flap control motor -V428- , open
- 9 - Air recirculation flap control motor -V113- , open
- 10 - Air recirculation flap control motor -V113- , closed
- 11 - Right temperature flap control motor -V159- , cold
- 12 - Right temperature flap control motor -V159- , warm
- 15 - Fresh air blower control unit -J126-



3.4 Climatronic - passenger compartment

Before beginning repair work on electrical system, perform the following work:

- Switch off all electrical loads.
- Switch off ignition.
- Withdraw ignition key.

**1 - Climatronic operating and display unit -E87- with Climatronic control unit -J255-**

- ❑ Removing ⇒ [page 41](#)
- ❑ The appearance of the operating and display unit for Climatronic air conditioning system - E87- may differ depending on the equipment installed.

2 - Control motors

- ❑ Installation position of control motors ⇒ [page 34](#).

3 - Heater and air conditioning unit

- ❑ Removing ⇒ [page 51](#)

4 - Left vent temperature sender -G150-

- ❑ Removing ⇒ [page 29](#)

5 - Right vent temperature sender -G151-

- ❑ Removing ⇒ [page 30](#)

6 - Right temperature flap control motor -V159-

- ❑ Removing ⇒ [page 40](#)

7 - Evaporator temperature sensor -G308-

- ❑ Removing ⇒ [page 30](#)

8 - Air recirculation flap control motor -V113-

- ❑ Removing ⇒ [page 5](#)

9 - Fresh air blower -V2-

- ❑ Removing ⇒ [page 3](#)

10 - Sender for front Bitron blower regulation -G462-

- ❑ Removing ⇒ [page 33](#)

11 - Right footwell vent

- ❑ Removing ⇒ [page 5](#)

12 - Dust and pollen filter

- ❑ Removing ⇒ [page 2](#)

13 - Right footwell vent temperature sender -G262-

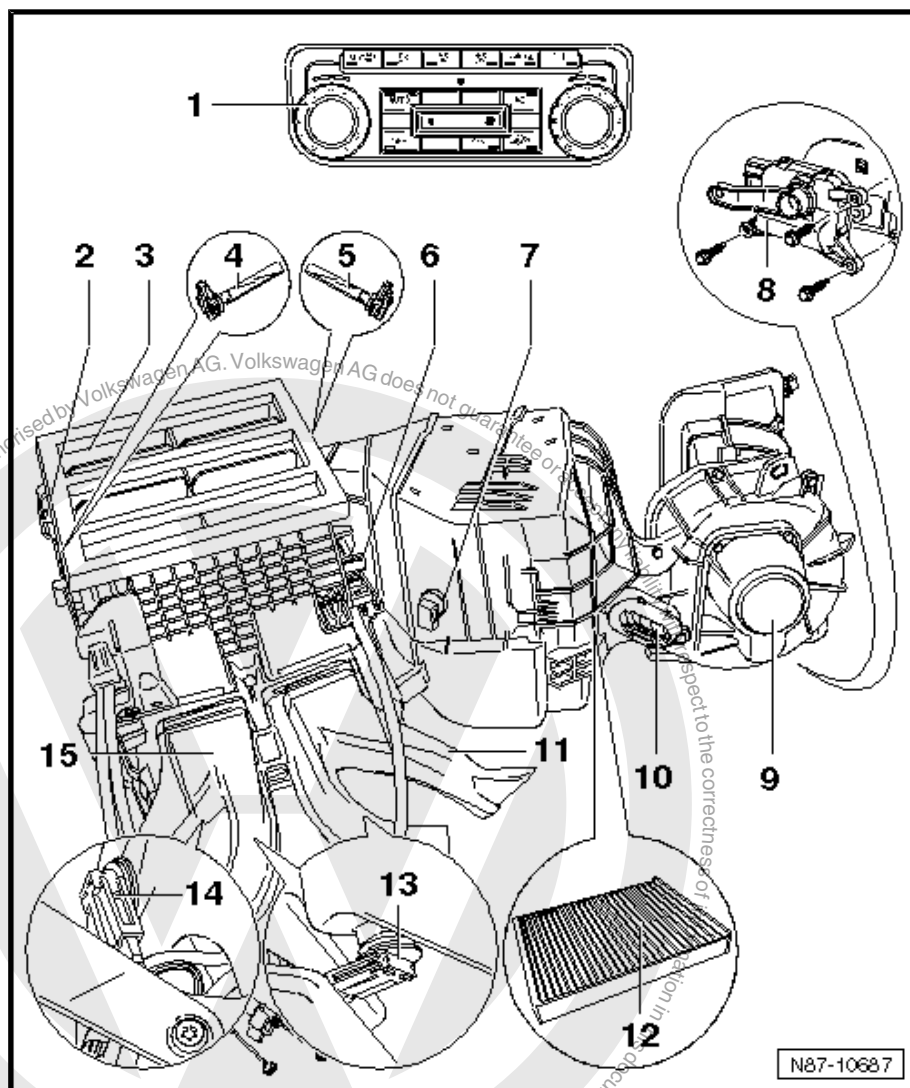
- ❑ Right footwell vent temperature sender -G262- is installed in right footwell vent.
- ❑ Removing ⇒ [page 29](#)

14 - Left footwell vent temperature sender -G261-

- ❑ Left footwell vent temperature sender -G261- is installed in left footwell vent.
- ❑ Removing ⇒ [page 29](#)

15 - Left footwell vent

- ❑ Removing ⇒ [page 4](#)

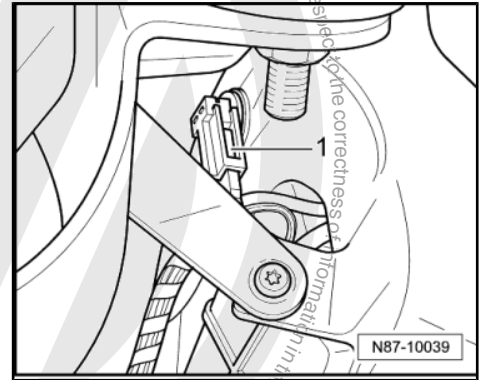




3.4.1 Removing left footwell vent temperature sender -G261-

Perform following jobs:

- Removing operating and display unit for Climatronic air conditioning system -E87- with Climatronic control unit -J255- [⇒ page 19](#) .
- Pull connector off sender -1- for footwell vent temperature sender -G192- .
- Turn footwell vent temperature sender -1- 90° and remove from footwell vent.



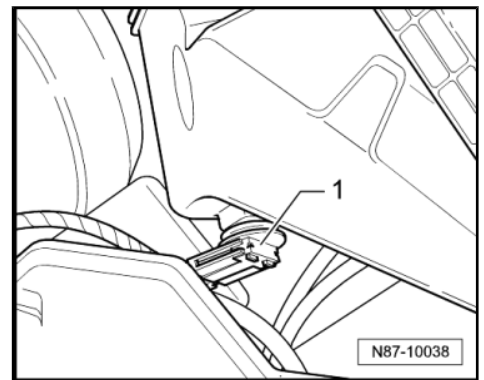
3.4.2 Removing right footwell vent temperature sender -G262-



Note

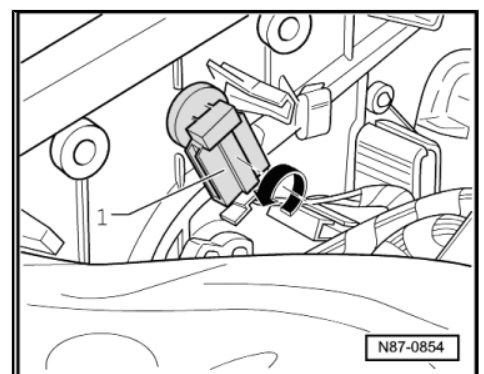
Right footwell vent temperature sender -G262- can be reached from front passenger footwell.

- Pull connector off right footwell vent temperature sender - G262- -1-.
- Turn right footwell vent temperature sender -G262- -1- 90° and remove from footwell vent.



3.4.3 Removing left vent temperature sender -G150-

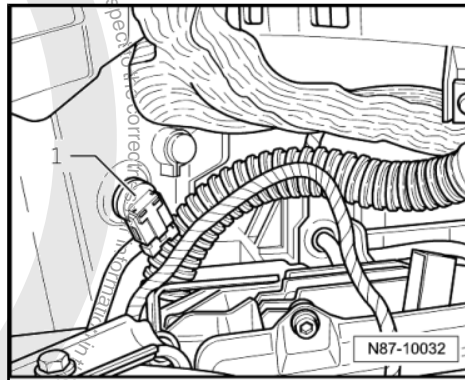
- Remove retaining plate for control motors V107 and V428 [⇒ page 36](#) .
- Pull connector off vent temperature sender -1-.
- Turn left vent temperature sender -G150- -1- 90° and remove it from housing.





3.4.4 Removing right vent temperature sender -G151-

- Remove passenger side airbag unit ⇒ General body repairs, interior; Rep. Gr. 69 ; Removing and installing passenger side airbag unit .
- Pull connector off vent temperature sender -1-.
- Turn right vent temperature sender -G151- -1- 90° and remove it from housing.



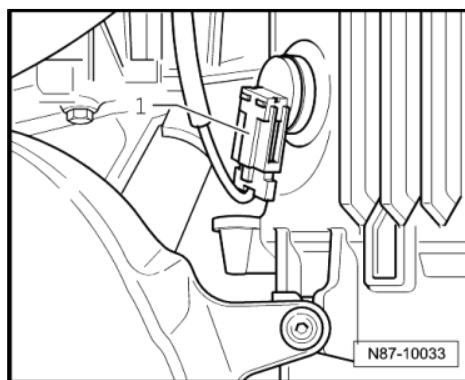
3.4.5 Removing evaporator temperature sensor -G308-



Note

Evaporator temperature sensor -G308- can be reached from front passenger footwell.

- Separate connector on evaporator temperature sensor -G308- -1-.
- Turn evaporator temperature sensor -G308- -1- 90° and remove it from housing.



3.4.6 Removing sunlight penetration photo-sensor -G107-

For example, check using vehicle diagnosis, testing and information system -VAS 5051B- or vehicle diagnosis and service information system -VAS 5052 A- in "guided fault finding" function.

Functions:

- ◆ Controls the temperature flap and the fresh air blower based on the intensity of the light

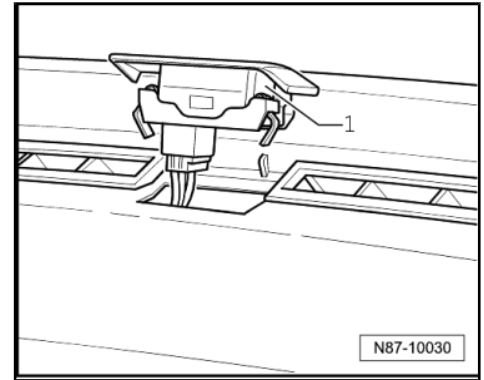
Emergency operation in the event of a failure:

- ◆ The Climatronic control unit -J255- takes on a fixed value.

Removing:



- Unclip sensor -1- from dash panel.



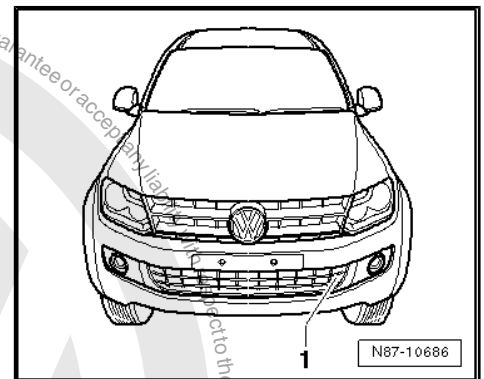
3.5 Removing and installing ambient temperature sensor -G17-

3.5.1 Removing

Location

The ambient temperature sensor -G17- is located behind the bumper.

- Remove bumper cover ⇒ General body repairs, exterior; Rep. Gr. 63 ; Removing and installing bumper cover .
- Separate connector.
- Remove retaining clip from ambient temperature sensor -G17- and remove sensor.



3.5.2 Installing

Install in reverse order.

3.6 Mode of operation of air quality sensor -G238-

- ◆ The air quality sensor -G238- detects pollutants in the ambient air (mostly petrol and/or diesel fumes).
- ◆ The Climatronic control unit -J255- evaluates the signal from the air quality sensor -G238- . The air conditioning system is actuated depending on the degree and manner of ambient air pollution.

At an ambient temperature higher than approx. + 3 °C, air recirculation mode is activated even when there is a minimal increase in noxious substances in the ambient air.

At an ambient temperature less than approx. + 3 °C, air recirculation is not actuated until there is a strong increase in noxious substances in the outside air, but only for approx. 15 seconds. The air conditioner compressor is not actuated. When the concentration decreases, the air conditioning system is switched back to fresh air mode.

- ◆ The “automatic recirculation mode” can be switched off at any time.
- ◆ So that the air conditioning system does not operate continually in air recirculation mode in areas with consistently high levels of pollutants, the “intelligent” sensor adapts its sensitiv-



ity to the prevailing environmental pollution. It adapts its sensitivity to the environmental pollution.

- ◆ If the level of pollutants in the outside air remains high over a longer period the intelligent sensor starts to adapt to the change in environmental conditions. Therefore the requirement for recirculated air in an uniformly polluted outside air environment usually less than 12 minutes. If a series of pollution peaks occur, the air conditioning system may operate over a longer period of time in air recirculation mode.
- ◆ A certain amount of time is required for repositioning of the air conditioning system flaps. To prevent noxious substances from entering the passenger compartment while the flaps are closing (e.g. when driving through a cloud of diesel smoke), a dust and pollen filter with an activated charcoal layer is installed. A saturated filter cannot perform this task and should be renewed ⇒ [page 2](#).
- ◆ To prevent frequent operation of the recirculation/fresh air flap, the flap is not actuated immediately if there is a nominal increase in harmful substances in the outside air. The sensor does not send a request to the Climatronic control unit -J255-. The effect of the activated charcoal filter in the dust and pollen filter is adequate for this.
- ◆ To prevent frequent operation of the air recirculation/fresh air flap, the request from the "automatic recirculation mode" sensor continues for at least 25 seconds (minimum waiting period). This also applies when the concentration of noxious substances in the air has reduced to a level where the air recirculation mode is no longer required.
- ◆ If the air conditioner compressor is switched off (e.g. in ECON mode), the maximum period of "automatic air recirculation" is limited to approx. 15 seconds by the Climatronic control unit -J255-, so that condensation does not develop on the windows.
- ◆ To clear condensation from windows as quickly as possible, the Climatronic control unit -J255- does not permit air recirculation when the "defrost function" is activated.
- ◆ The air quality sensor -G238- requires approx. 30 seconds to become operational once the ignition has been switched on (warm-up period). During this time, the sensor can send no request for "automatic recirculation mode" to the Climatronic control unit -J255-.
- ◆ The air quality sensor -G238- is a highly sensitive electronic component which direct contact with solvents, fuels and certain chemical compositions could damage beyond repair. For this reason, do not install sensors that may have come into contact with these substances.

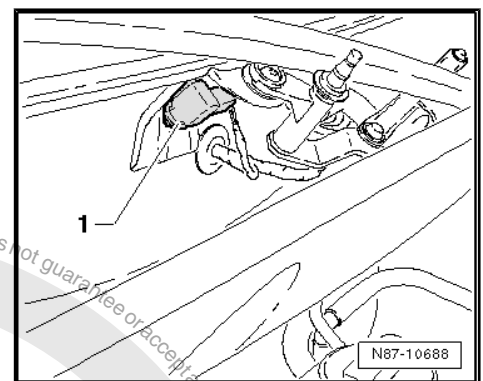


3.7 Removing and installing air quality sensor -G238-



Note

- ◆ *Air quality sensor -G238- is installed in plenum chamber.*
- ◆ *The air quality sensor -G238- is a highly sensitive electronic component which direct contact with solvents, fuels and certain chemical compositions could damage beyond repair.*
- ◆ *Do not install a sensor that has been kept, for example, in a tool box.*
- ◆ *Do not place a removed sensor in an area where it can come into contact with solvents, fuels and certain chemical compounds (fluids or vapours).*
- Remove plenum chamber cover.
- Unclip air quality sensor -G238- -1-.
- Separate connector.



3.7.1 Installing

- Install in reverse order.

3.8 Removing and installing sender for front Bitron blower regulation -G462-

3.8.1 Removing

First carry out the following work:

- Separate connectors from sender for front Bitron blower regulation -G462-.

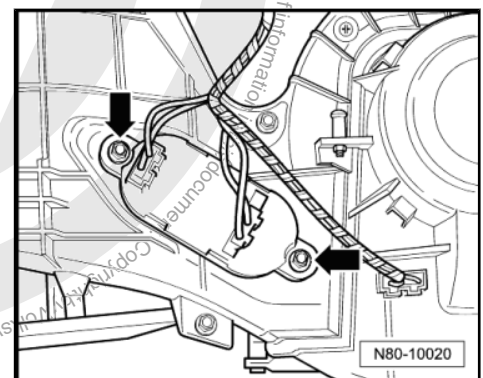


WARNING

Danger of burn injuries.

The sender for front Bitron blower regulation -G462- can be hot.

Before removing sender for front Bitron blower regulation -G462-, let it cool down.



- Remove bolts -arrows- (1 Nm) and remove sender from housing.

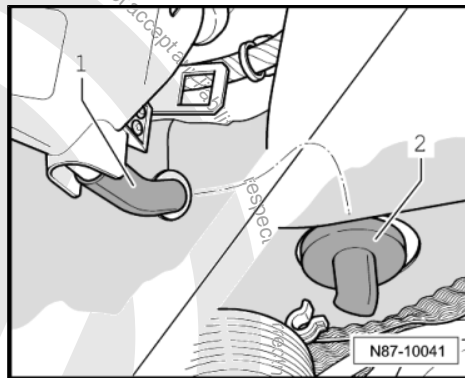
3.8.2 Installing

Install in reverse order.



3.9 Checking condensation drain hose with valve

- Remove footwell trim on front passenger side ⇒ Rep. Gr. 68 .
- ◆ It must be possible to push condensation drain hose -1- onto heater and air conditioner unit connection without tension.
- ◆ The condensation drain hose must not be pinched by the insulation mat.
- Rework insulation mat if necessary.
- ◆ The condensation drain hose must fit securely on the condensation drain hose connector on the heater and air conditioner unit.
- The valve on the condensation drain hose -2- is located on the bulkhead on the right in the engine compartment.



Note

The function of the valve must not be impaired by conservation wax or underseal. It must open and close properly.

3.10 Installation position of control motors on Climatronic heater and air conditioning unit



Note

To check control motors, for example, use vehicle diagnosis, testing and information system -VAS 5051B- or vehicle diagnosis and service information system -VAS 5052 A- in "guided fault finding" function



1 - Defroster flap control motor -V107-

- ☐ With potentiometer for front cold air flap control motor -G315- .
- ☐ Removing and installing ➔ [page 37](#)

2 - Air distribution flap control motor -V428-

- ☐ With potentiometer for front air distribution control motor -G470- potentiometer for side vent control motor -G469-
- ☐ Removing and installing ➔ [page 37](#)

3 - Retaining plate with defroster flap control motor -V107- and air distribution flap control motor -V428-

- ☐ Removing and installing ➔ [page 36](#)

4 - Retaining plate with right temperature flap control motor -V159-

- ☐ On right side of air distribution housing.

5 - Right temperature flap control motor -V159-

- ☐ On right side of air distribution housing.
- ☐ With potentiometer for right temperature flap control motor -G221-
- ☐ Removing and installing ➔ [page 40](#)

6 - Footwell flap control motor -V261-

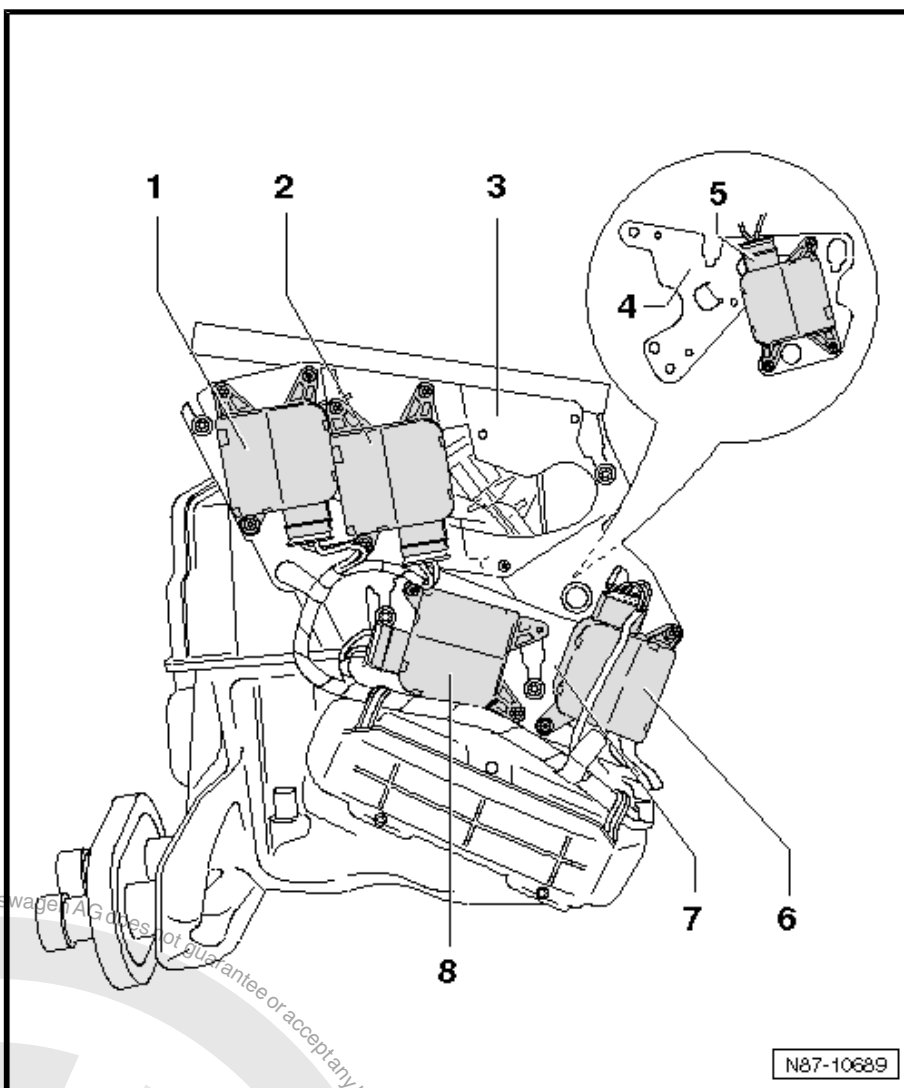
- ☐ With potentiometer for footwell vent control motor -G468- .
- ☐ Removing and installing ➔ [page 39](#)

7 - Retaining plate with footwell flap control motor -V261- and left temperature flap control motor -V158- .

- ☐ Removing and installing ➔ [page 38](#)

8 - Left temperature flap control motor -V158-

- ☐ With potentiometer for left temperature flap control motor -G220- .
- ☐ Removing and installing ➔ [page 39](#)





3.11 Renewing control motors on heater and air conditioner unit



Note

- ◆ After installing a new control motor, perform function "Basic settings" ⇒ [page 23](#).
- ◆ Check motor/connecting element for fault "adaptation limit exceeded". No play may exist between control motor shaft and connecting element.

3.12 Removing retaining plate for defroster flap control motor -V107- and air distribution flap control motor -V428-

3.12.1 Removing

Perform following jobs:

- Use vehicle diagnosis, testing and information system -VAS 5051B- to initiate service position function for control motors ⇒ [page 23](#).
- When "SF" appears on display of Climatronic operating unit, switch ignition off.



Note

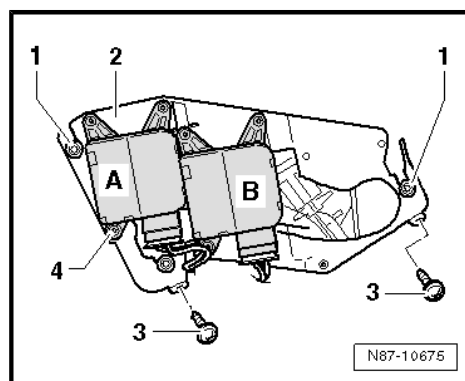
- ◆ After removal, the control motors can be reinstalled only when set in the service position "SF".
- ◆ Replacement parts are supplied set in the service position!
- Remove dash panel ⇒ Rep. Gr. 70.
- Removing lower retaining plate for footwell flap control motor -V261- and left temperature flap control motor -V158- ⇒ [page 38](#).
- Remove bolts -3-.



Note

To remove the retaining plate, the bolts -1- are not loosened or removed. They are used for guiding the retaining plate.

- Separate connectors.
- Pull out retaining plate with control motors downwards.

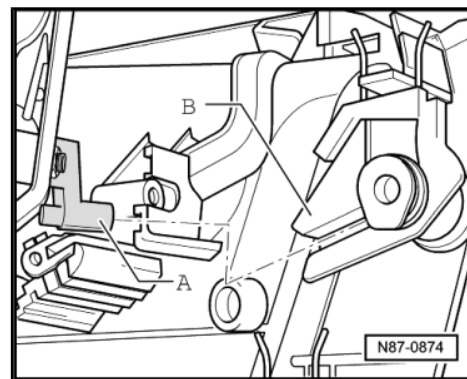


3.12.2 Installing

Installation is carried out in the reverse order. When installing, note the following:



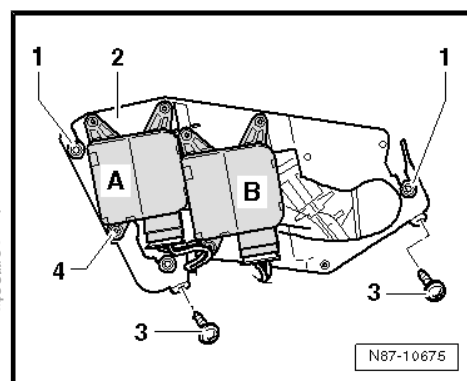
- During installation, ensure that control motor drive -A- is pushed into mounting -B-.
- For example, use vehicle diagnosis, testing and information system -VAS 5051B- or vehicle diagnosis and service information system -VAS 5052 A- to initiate basic settings function => [page 23](#) .



3.13 Removing defroster flap control motor - V107-

Perform following jobs:

- Removing upper retaining plate -2- for defroster flap control motor -V107- and air distribution flap control motor -V428- => [page 36](#) .
- Remove bolts -4- (Qty. 3) from defroster flap control motor V107- -A-.
- Remove control motor from retaining plate -2-.



3.13.1 Installing

Installation is carried out in the reverse order. When installing, note the following:

- For example, use vehicle diagnosis, testing and information system -VAS 5051B- or vehicle diagnosis and service information system -VAS 5052- to initiate basic settings function => [page 23](#) .

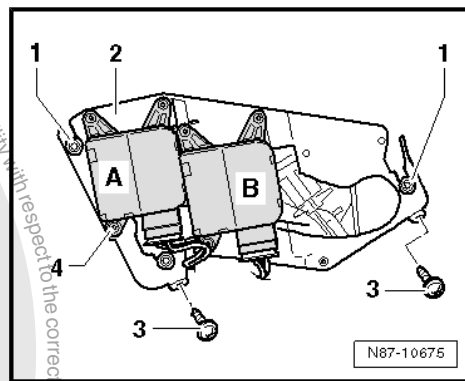
3.14 Removing and installing air distribution flap control motor -V428-

Perform following jobs:

- Removing upper retaining plate -2- for defroster flap control motor -V107- and air distribution flap control motor -V428- => [page 36](#) .



- Remove bolts -4- (Qty. 3) from air distribution flap control motor -V428- -B-.
- Remove control motor from retaining plate -2-.



3.14.1 Installing

Installation is carried out in the reverse order. When installing, note the following:

- For example, use vehicle diagnosis, testing and information system -VAS 5051B- or vehicle diagnosis and service information system -VAS 5052- to initiate basic settings function ⇒ [page 23](#).

3.15 Removing retaining plate for footwell flap control motor -V261- and left temperature flap control motor -V158-

3.15.1 Removing

Perform following jobs:

- Use vehicle diagnosis, testing and information system -VAS 5051B- to initiate service position function for control motors ⇒ [page 23](#).
- When “SF” appears on display of Climatronic operating unit, switch ignition off.



Note

- ◆ After removal, the control motors can be reinstalled only when set in the service position “SF”.
- ◆ Replacement parts are supplied set in the service position!

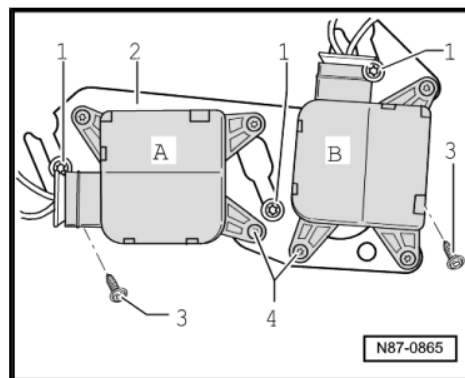
- Remove dash panel ⇒ Rep. Gr. 70.
- Remove bolts -3-.



Note

To remove the retaining plate, the bolts -1- are not loosened or removed. They are used for guiding the retaining plate.

- Separate connectors.
- Pull out retaining plate with control motors downwards.

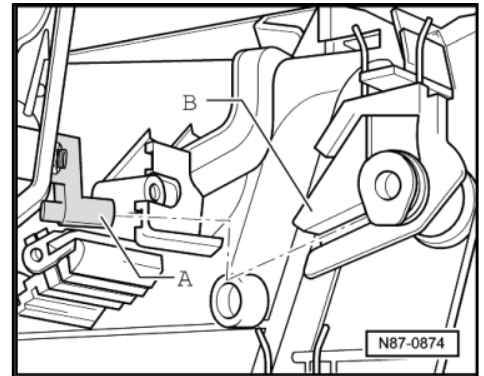




3.15.2 Installing

Installation is carried out in the reverse order. When installing, note the following:

- During installation, ensure that control motor drive -A- is pushed into mounting -B-.
- For example, use vehicle diagnosis, testing and information system -VAS 5051B- or vehicle diagnosis and service information system -VAS 5052- to initiate basic settings function
⇒ [page 23](#).

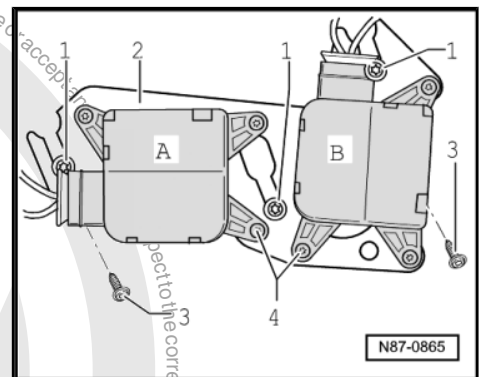


3.16 Removing and installing left temperature flap control motor -V158-

3.16.1 Removing

Perform following jobs:

- Remove lower retaining plate -2- for footwell flap control motor -V261- and left temperature flap control motor -V158-
⇒ [page 38](#)
- Remove bolts -4- (Qty. 3) from left temperature flap control motor -V158- -A-.
- Remove control motor from retaining plate -2-.



3.16.2 Installing

Installation is carried out in the reverse order. When installing, note the following:

- For example, use vehicle diagnosis, testing and information system -VAS 5051B- or vehicle diagnosis and service information system -VAS 5052- to initiate basic settings function
⇒ [page 23](#)

3.17 Removing and installing footwell flap control motor -V261-

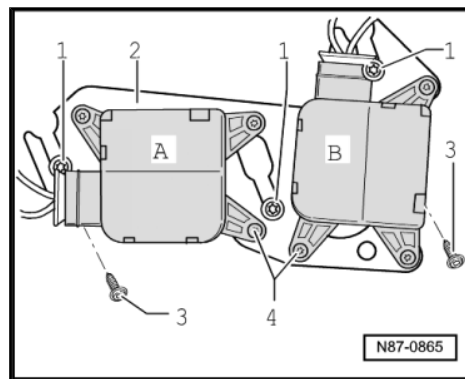
3.17.1 Removing

Perform following jobs:

- Remove lower retaining plate -2- for footwell flap control motor -V261- and left temperature flap control motor -V158-
⇒ [page 38](#).



- Remove bolts -4- (Qty. 3) from footwell flap control motor -V261- -B-.
- Remove control motor from retaining plate -2-.



3.17.2 Installing

Installation is carried out in the reverse order. When installing, note the following:

- For example, use vehicle diagnosis, testing and information system -VAS 5051B- or vehicle diagnosis and service information system -VAS 5052- to initiate basic settings function ➔ [page 23](#) .

3.18 Removing and installing right temperature flap control motor -V159-

3.18.1 Removing

- Use vehicle diagnosis, testing and information system -VAS 5051B- to initiate service position function for control motors.
- When “SF” appears on display of Climatronic operating unit, switch ignition off.



Note

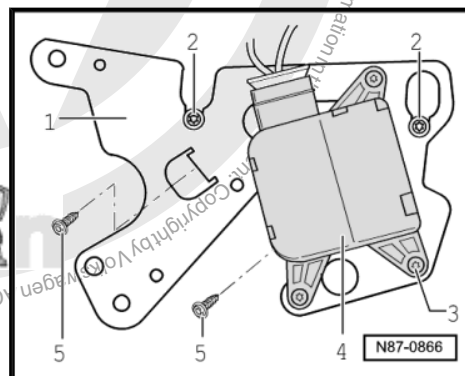
- ♦ *Once the control motors have been removed, they can be re-installed only in the service position “SF”.*
- ♦ *Replacement parts are supplied set in the service position!*
- Remove dash panel ➔ Rep. Gr. 70 .
- Remove bolts -5-.



Note

To remove the retaining plate, the bolts -2- are not loosened or removed. They are used for guiding the retaining plate.

- Separate connector.
- Pull out retaining plate with control motor downwards.
- Remove bolts -3- (Qty. 3) from temperature flap control motor -4-.
- Remove control motor from retaining plate -1-.

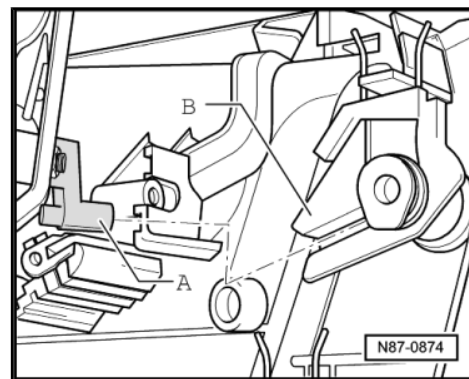


3.18.2 Installing

Installation is carried out in the reverse order. When installing, note the following:



- During installation, ensure that control motor driver -A- is pushed into mounting -B-.
- For example, use vehicle diagnosis, testing and information system -VAS 5051B- or vehicle diagnosis and service information system -VAS 5052- to initiate basic settings function ⇒ [page 23](#).



3.19 Removing and installing operating and display unit for Climatronic air conditioning system -E87- with Climatronic control unit -J255-



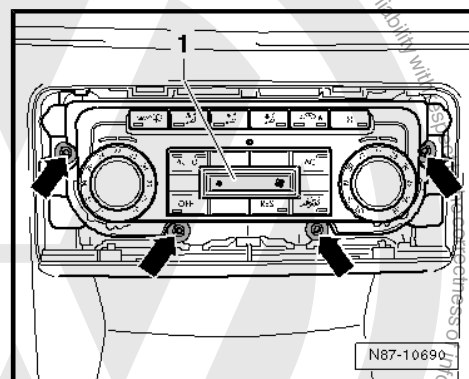
Note

Climatronic control unit -J255- and operating and display unit for Climatronic air conditioning system -E87- cannot be dismantled.

3.19.1 Removing

Perform following jobs:

- Remove lower centre dash panel trim panels ⇒ Rep. Gr. 68.
- Remove bolts -arrows- (1.5 Nm) and remove operating and display unit for Climatronic air conditioning system -E87- -1- from dash panel.
- Separate connectors.



3.19.2 Installing

Install in reverse order.

Specified torque for bolts 1.5 Nm.



4 Bracket for air conditioner compressor

Removing and installing air conditioner compressor bracket →
Rep. Gr. 13





5 Repair work on refrigerant circuit which may be performed only in appropriate workshops by specially trained mechanics

5.1 Tools

5.1.1 Required special tools, facilities, testing and measuring instruments and auxiliary items



Note

- ◆ *Notes on repair work to vehicles with air conditioning and on handling refrigerant can be found in ELSA under repair group Air conditioning system with refrigerant R134a ⇒ Rep. Gr. 00 ; Technical data.*
- ◆ *Notes on testing equipment and tools for repair work to vehicles with air conditioning can be found in ELSA under Heating, ventilation, air conditioning system; Air conditioning system with refrigerant R134a ⇒ Rep. Gr. 00 ; Technical data.*
- ◆ *Under certain conditions, it is no longer necessary to renew the dryer cartridge each time the refrigerant circuit is opened, see Air conditioning system with refrigerant R134a ⇒ Rep. Gr. 00 ; Technical data ; Renewing components.*



Caution

Do not kink or severely bend refrigerant lines.

There is a film in the refrigerant lines which can be destroyed.

Refrigerant lines must not be bent to a radius less than $r = 100 \text{ mm}$.





5.2 Renewing refrigerant circuit components



Note

- ◆ *The refrigerant must be extracted beforehand, e.g. with air conditioner service station -VAS 6007A-.*
- ◆ *The previously used air conditioner service stations can still be used ⇒ Volkswagen Workshop Equipment catalogue.*
- ◆ *Releasing refrigerant into the environment is a punishable offence.*
- ◆ *Safety measures when working on an evacuated refrigerant circuit ⇒ [page 43](#).*
- ◆ *To prevent the intrusion of moisture, all components of the refrigerant circuit which have been opened must be sealed with suitable plugs.*
- ◆ *The colour coding of O-rings for R134a refrigerant circuits has been discontinued. Coloured and black O-rings are used.*
- ◆ *Coat threaded connections of refrigerant circuit with polyethylene glycol (PEG) VW part number 294440 before installation.*
- ◆ *The dryer cartridge need not be renewed each time the refrigerant circuit is opened.*





1 - Evacuating and charging valve

- ☐ Low-pressure side
- ☐ Releasing refrigerant into the environment is a punishable offence.
- ☐ Removing and installing [⇒ page 47](#)
- ☐ Capacities [⇒ page 60](#)

2 - Evacuating and charging valve

- ☐ High-pressure side
- ☐ Releasing refrigerant into the environment is a punishable offence.
- ☐ Removing and installing [⇒ page 48](#)
- ☐ Capacities [⇒ page 60](#)

3 - High-pressure sender - G65-

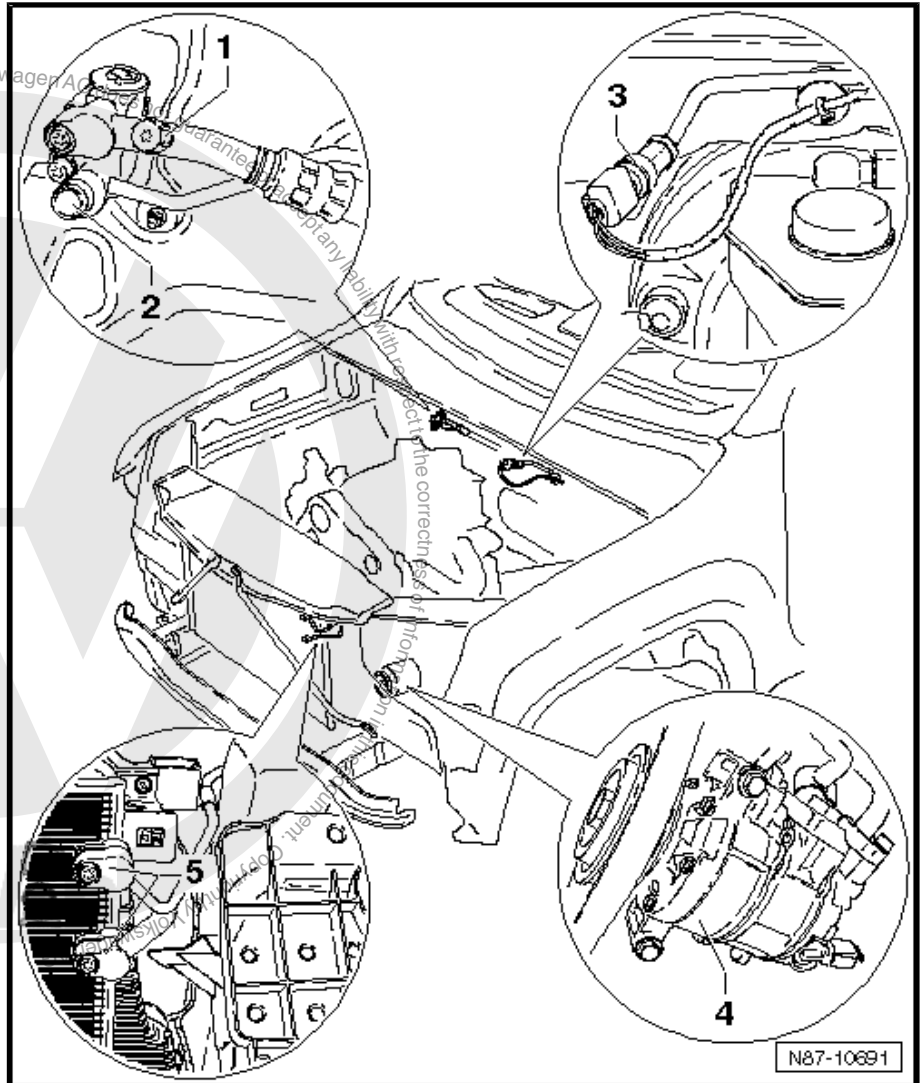
- ☐ Removing [⇒ page 46](#)

4 - Air conditioner compressor

- ☐ Observe running-in procedures for compressors that do not have a magnetic clutch [⇒ page 58](#).
- ☐ Removing [⇒ page 55](#)

5 - Refrigerant lines on condenser

- ☐ 12 Nm



5.2.1 Removing refrigerant lines on expansion valve

- First evacuate refrigerant circuit using e.g. air conditioner service station -VAS 6007A-. Then - and only then - open refrigerant circuit.
- Comply with notes [⇒ page 43](#).



WARNING

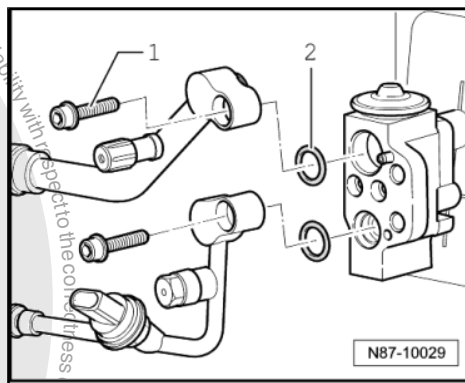
Danger of freezing injuries.

If refrigerant circuit has not been evacuated, refrigerant may escape.

Extract refrigerant before opening refrigerant circuit. If the refrigerant circuit is not opened within 10 minutes after it has been evacuated, pressure may develop in refrigerant circuit due to re-evaporation. Extract refrigerant again.



- Remove bolts from refrigerant lines -1- (10 Nm \pm 1.8 Nm).
- Renew O-rings -2- \Rightarrow Parts catalogue .



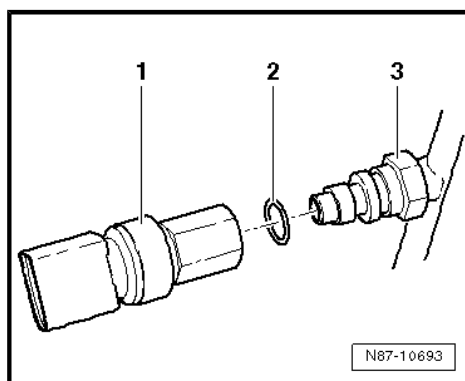
5.2.2 Removing high-pressure sender -G65-



Note

The high-pressure sender can be removed without extracting the refrigerant from the refrigerant circuit.

- Disconnect connector from high-pressure sender.
- Unscrew high-pressure sender -1- from refrigerant line connection.
- Renew O-ring -2-, \Rightarrow Parts catalogue .





5.2.3 Removing evacuating and charging valve, low-pressure side

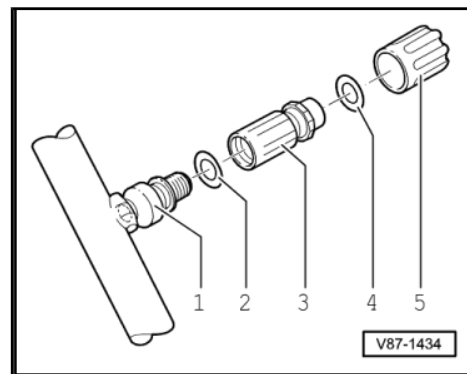


WARNING

Danger of freezing injuries.

If refrigerant circuit has not been evacuated, refrigerant may escape.

Extract refrigerant before opening refrigerant circuit. If the refrigerant circuit is not opened within 10 minutes after it has been evacuated, pressure may develop in refrigerant circuit due to re-evaporation. Extract refrigerant again.



- Evacuate refrigerant circuit, for example, with air conditioning service station -VAS 6007A- and then renew valve -3-.



Note

- ◆ *Releasing refrigerant into the environment is a punishable offence.*
- ◆ *All components of the refrigerant circuit which have been opened must be sealed with suitable plugs to prevent moisture intrusion.*

- Renew O-rings ⇒ Parts catalogue .

- 1 - Connection with external thread and groove for O-ring
- 2 - O-ring
- 3 - Evacuating and charging valve
- 4 - O-ring
- 5 - Cap



5.2.4 Removing evacuation and charging valve, high-pressure side

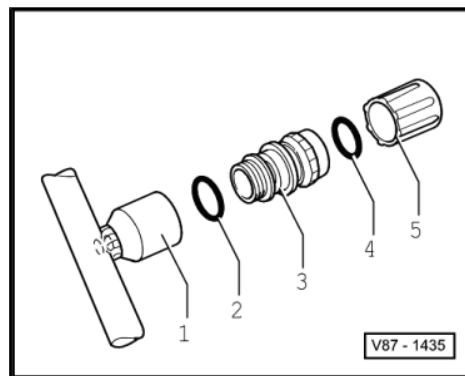


WARNING

Danger of freezing injuries.

If refrigerant circuit has not been evacuated, refrigerant may escape.

Extract refrigerant before opening refrigerant circuit. If the refrigerant circuit is not opened within 10 minutes after it has been evacuated, pressure may develop in refrigerant circuit due to re-evaporation. Extract refrigerant again.



- Evacuate refrigerant circuit, for example, with air conditioning service station -VAS 6007A- and then renew valve 3-.



Note

- ♦ *Releasing refrigerant into the environment is a punishable offence.*
 - ♦ *All components of the refrigerant circuit which have been opened must be sealed with suitable plugs to prevent moisture intrusion.*
- Renew O-rings ⇒ Parts catalogue .
 - 1 - Connection with internal thread
 - 2 - O-ring
 - 3 - Evacuating and charging valve with groove and internal thread for cap.
 - 4 - O-ring
 - 5 - Cap

5.3 Removing expansion valve on front heater and air conditioner unit

- First evacuate refrigerant circuit using e.g. air conditioner service station -VAS 6007A- . Then - and only then - open refrigerant circuit.
- Comply with notes ⇒ [page 43](#) .



WARNING

Danger of freezing injuries.

If refrigerant circuit has not been evacuated, refrigerant may escape.

Extract refrigerant before opening refrigerant circuit. If the refrigerant circuit is not opened within 10 minutes after it has been evacuated, pressure may develop in refrigerant circuit due to re-evaporation. Extract refrigerant again.

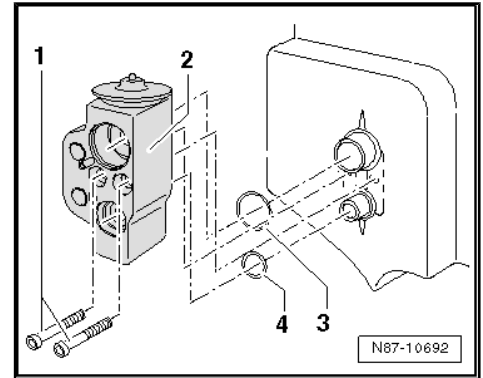


- Removing refrigerant lines on expansion valve ⇒ [page 45](#) .
- Unscrew bolts -1- from expansion valve -2-.

- 1 - Bolts (10 Nm)
- 2 - Expansion valve
- 3 - O-ring
- 4 - O-ring

Installation is carried out in the reverse order. When installing, note the following:

- Renew O-rings -3- and -4- ⇒ Parts catalogue .



5.4 Removing and installing dryer bag

Notes on repair work to vehicles with air conditioning and on handling refrigerant can be found in ELSA under repair group Air conditioning system with refrigerant R134a ⇒ Rep. Gr. 00 ; Technical data .

Notes on testing equipment and tools for repair work to vehicles with air conditioning can be found in ELSA under Heating, ventilation, air conditioning system; Air conditioning system with refrigerant R134a ⇒ Rep. Gr. 00 ; Technical data.

Under certain conditions, it is no longer necessary to renew the dryer cartridge each time the refrigerant circuit is opened, see Air conditioning system with refrigerant R134a ⇒ Rep. Gr. 00 ; Technical data ; Renewing components.

5.4.1 Removing

Perform following jobs:

- First evacuate refrigerant circuit using e.g. air conditioner service station -VAS 6007A- . Then, and only then, open refrigerant circuit.
- Comply with notes ⇒ [page 44](#) .
- Remove front bumper ⇒ Rep. Gr. 63 .
- Remove lock carrier ⇒ General body repairs, exterior; Rep. Gr. 50 ; Removing and installing lock carrier .



WARNING

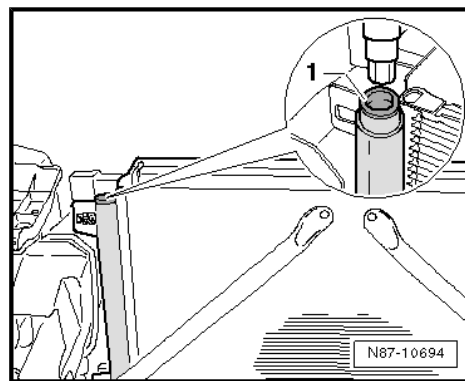
Danger of freezing injuries.

If refrigerant circuit has not been evacuated, refrigerant may escape.

Extract refrigerant before opening refrigerant circuit. If the refrigerant circuit is not opened within 10 minutes after it has been evacuated, pressure may develop in refrigerant circuit due to re-evaporation. Extract refrigerant again.



- Remove cap -1-.
- Pull the strainer with dryer bag out of the condenser using long nose pliers.



5.4.2 Installing

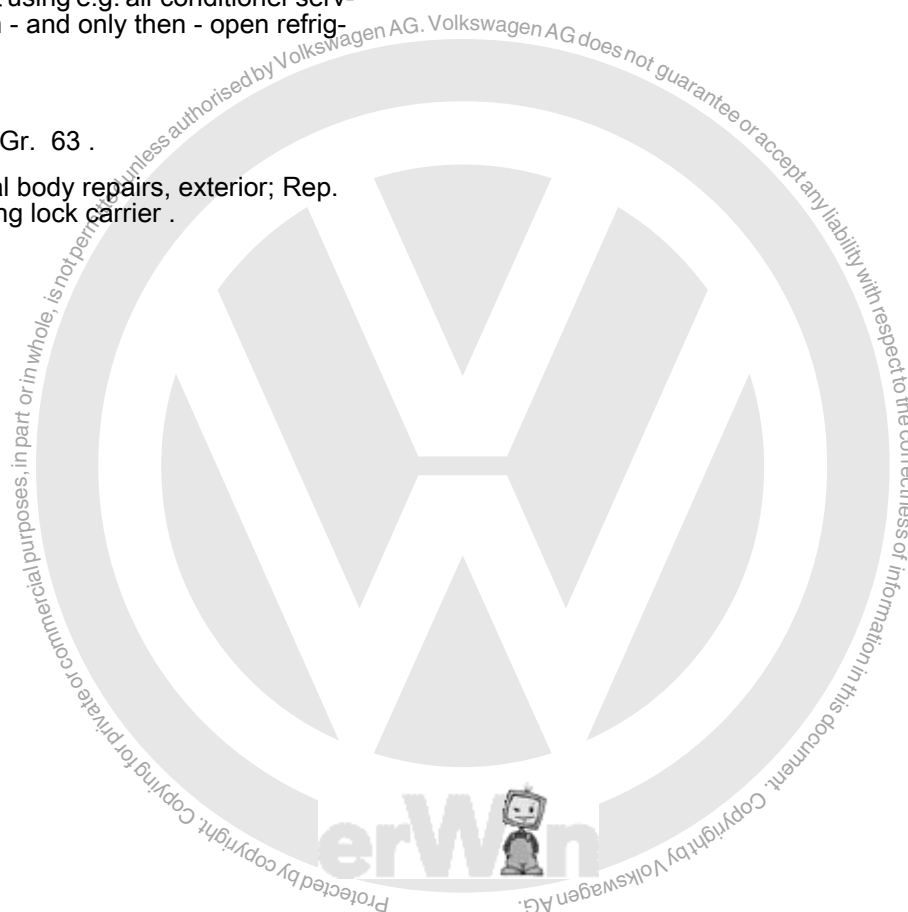
Installation is carried out in the reverse order. When installing, note the following:

- Renew dryer bag.
- Renew O-rings ⇒ Parts catalogue .

5.5 Removing and installing condenser

Perform following jobs:

- First evacuate refrigerant circuit using e.g. air conditioner service station -VAS 6007A- . Then - and only then - open refrigerant circuit.
- Comply with notes ⇒ [page 44](#) .
- Remove front bumper ⇒ Rep. Gr. 63 .
- Remove lock carrier ⇒ General body repairs, exterior; Rep. Gr. 50 ; Removing and installing lock carrier .





1 - Bolts for refrigerant line

- ☐ 12 Nm

2 - Mounting

- ☐ For condenser.

3 - Condenser with dryer bag

- ☐ Removing and installing dryer bag [⇒ page 49](#)
- ☐ Removing condenser:



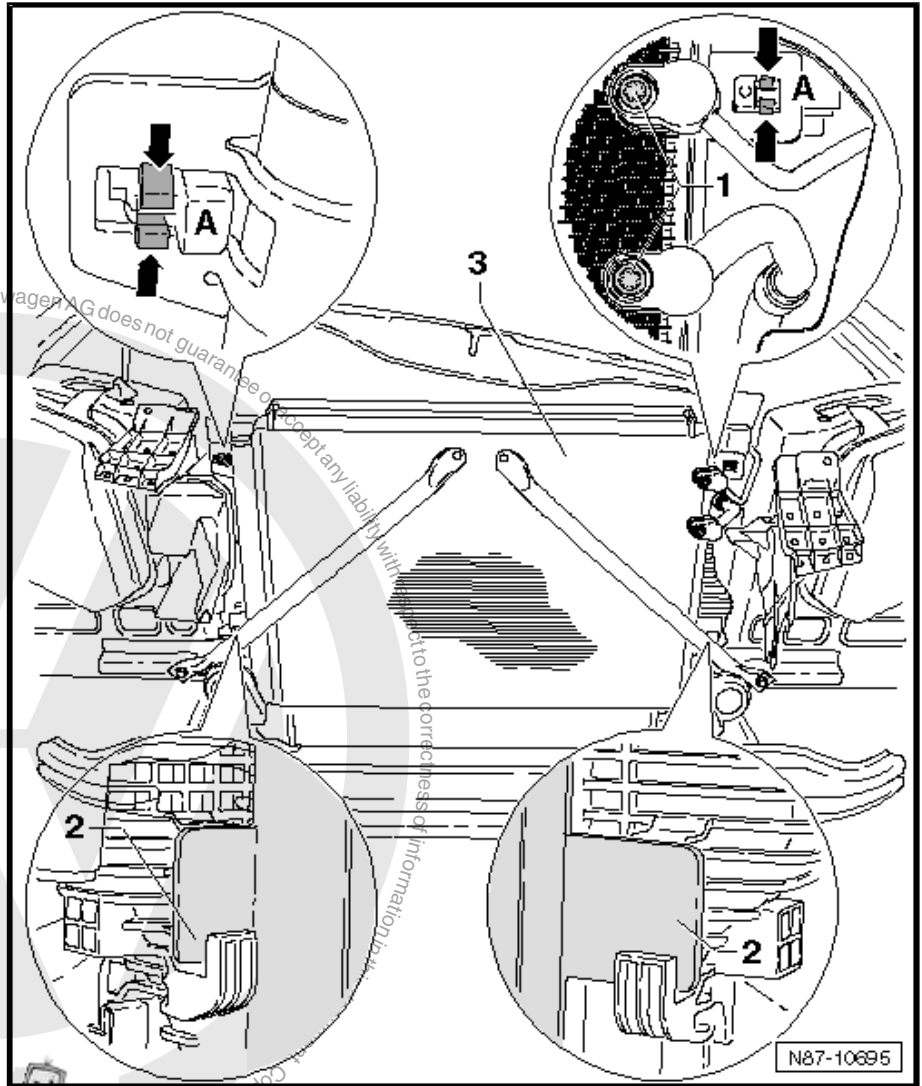
WARNING

Danger of freezing injuries.

If refrigerant circuit has not been evacuated, refrigerant may escape.

Extract refrigerant before opening refrigerant circuit. If the refrigerant circuit is not opened within 10 minutes after it has been evacuated, pressure may develop in refrigerant circuit due to re-evaporation. Extract refrigerant again.

- Loosen bolts -1- on refrigerant lines.
- Push fasteners -A- together in direction of arrow
- Remove condenser -3- from retainers -2-.



5.6 Removing and installing heater and air conditioning unit

5.6.1 Removing



Note

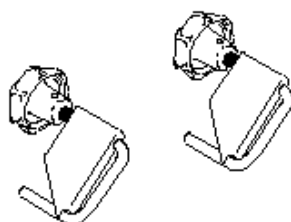
- ◆ The refrigerant must be extracted beforehand, e.g. with air conditioner service station -VAS 6007A-.
- ◆ Observe notes [⇒ page 44](#).



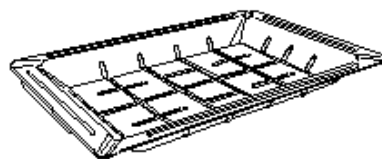
Special tools and workshop equipment required

- ◆ Hose clamps up to 40 mm Ø -3093-
- ◆ Drip tray for workshop hoist -VAS 6208-
- ◆ Torque wrench -V.A.G 1331-
- ◆ Air conditioner service station -VAS 6007A-

3093



VAS 6208



V.A.G 1331



VAS 6007 A



W87-10003

Perform following jobs:

- Switch off all electrical loads.
- Switch off ignition.
- Withdraw ignition key.
- Remove noise insulation tray from engine.



- Place drip tray -VAS 6208- beneath engine.
- Clamp off coolant hoses using hose clamps to Ø 40 mm -3093- .

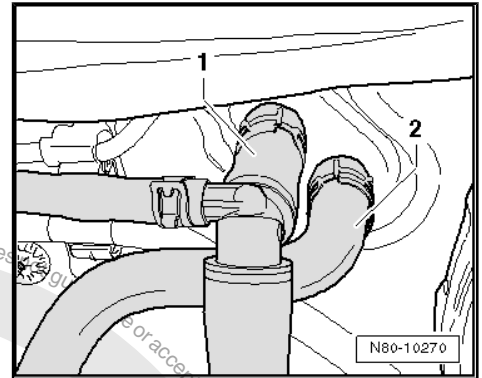


WARNING

Danger of scalding injuries.

When the engine is warm, the coolant temperature may be above 100 °C. The cooling system is pressurised.

If necessary, reduce temperature and release pressure.



- Disconnect coolant hoses -1- and -2- leading to heat exchanger.
- Carefully blow remaining coolant out of heat exchanger via connections using a compressed air pistol.



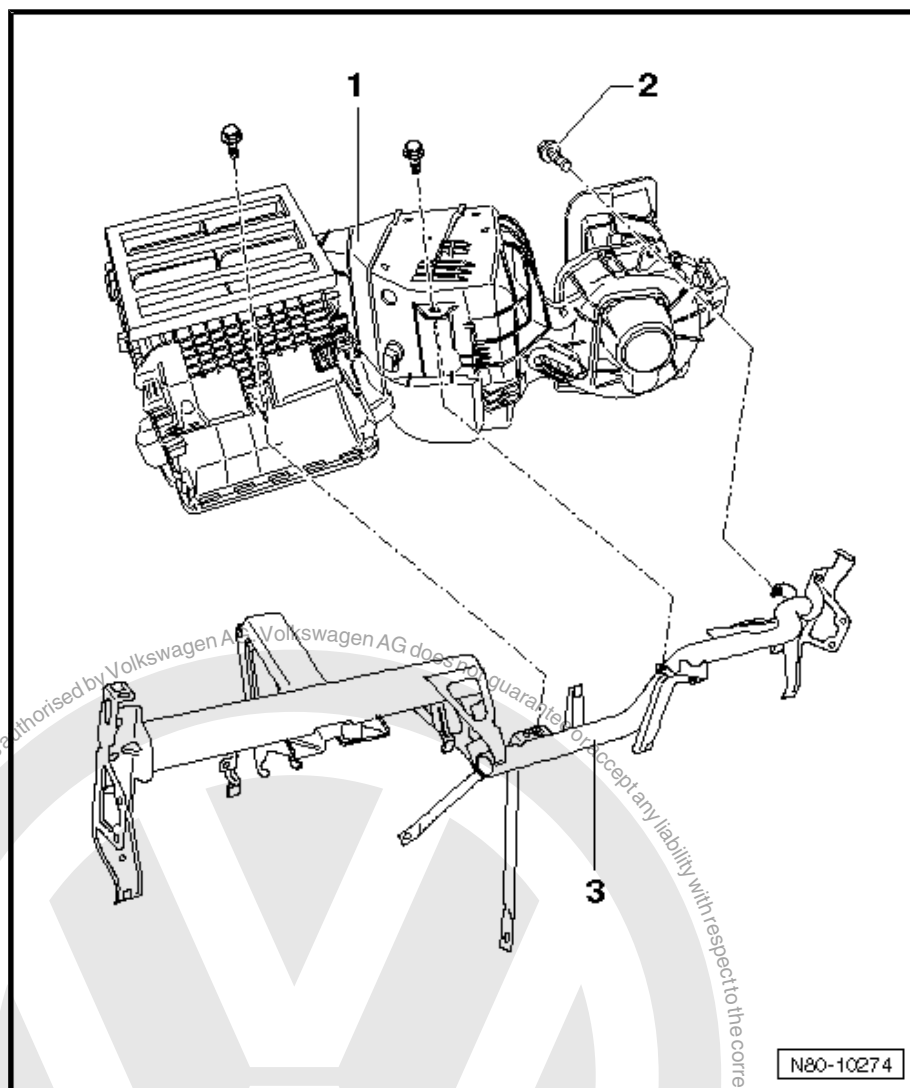
WARNING

Danger of freezing injuries.

If refrigerant circuit has not been evacuated, refrigerant may escape.

Extract refrigerant before opening refrigerant circuit. If the refrigerant circuit is not opened within 10 minutes after it has been evacuated, pressure may develop in refrigerant circuit due to re-evaporation. Extract refrigerant again.

- Disconnect refrigerant lines on expansion valve ➔ [page 45](#) .
- Remove dash panel ➔ Rep. Gr. 70 .



- Remove bolts -2-.
- Remove assembly carrier for dash panel -3- ⇒ Rep. Gr. 70 .
- Disconnect connectors to heater and air conditioning unit -1- and remove unit.

5.6.2 Installing

Installation is carried out in reverse order.

After installation, refill coolant ⇒ Rep. Gr. 19 .



Note

Ensure that seal is properly seated between heat exchanger and bulkhead.

5.7 Dismantling and assembling heater and air conditioning unit

Perform following jobs:

- Remove heater and air conditioner unit ⇒ [page 51](#) .



1 - Upper part of distribution box

- The upper part is connected by securing bolts -3- and retaining clips -2-

to lower part.

2 - Retaining clip

- Qty. 3

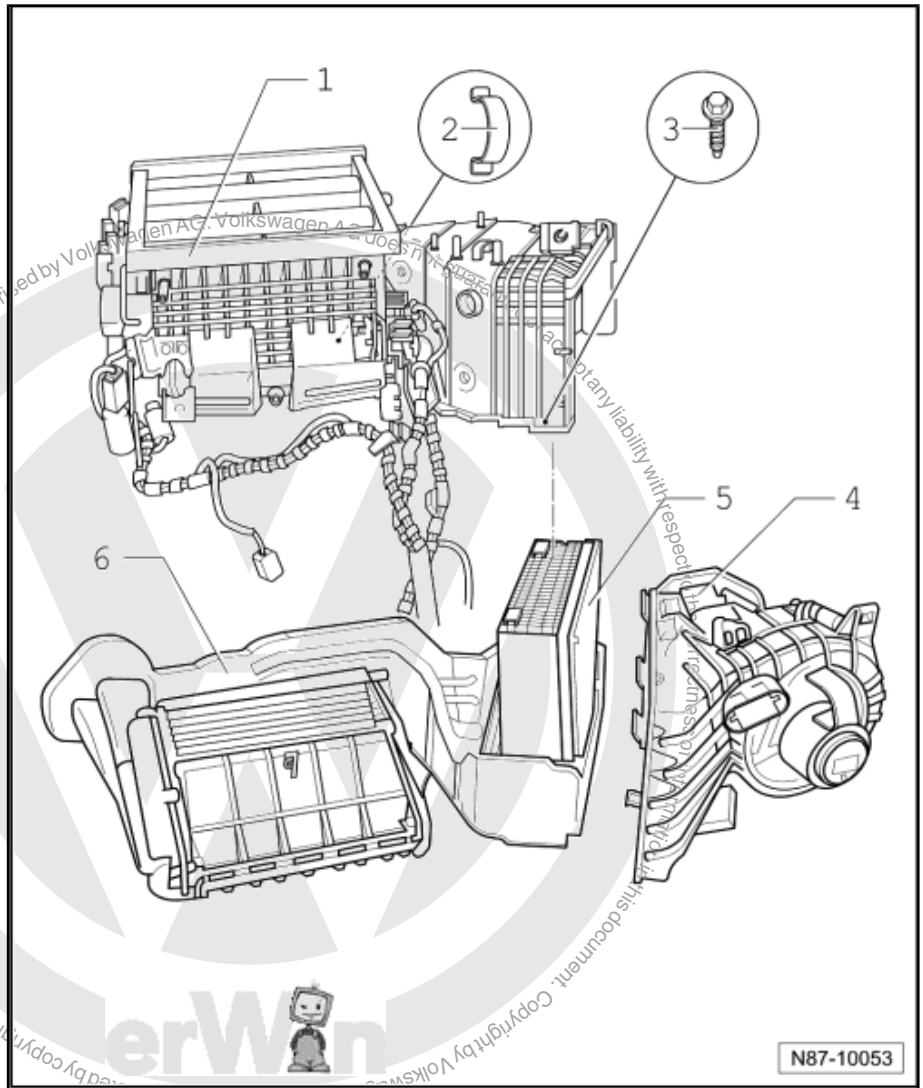
3 - Securing bolts

4 - Blower housing

5 - Evaporator

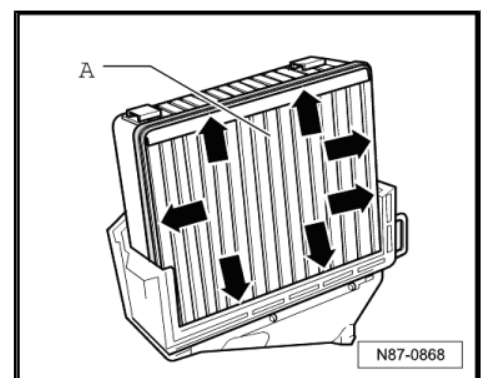
- Observe seal
⇒ [page 55](#)

6 - Lower part of distribution box



Evaporator seal

Observe seal -arrows- along perimeter of evaporator.



5.8 Removing and installing Denso air conditioner compressor

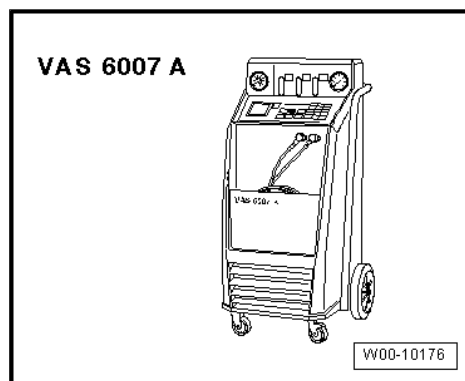
5.8.1 Removing and installing Denso air conditioner compressor

Removing

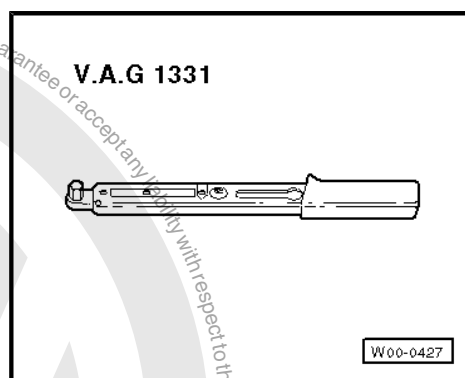
Special tools and workshop equipment required



- ◆ Air conditioner service station -VAS 6007A-

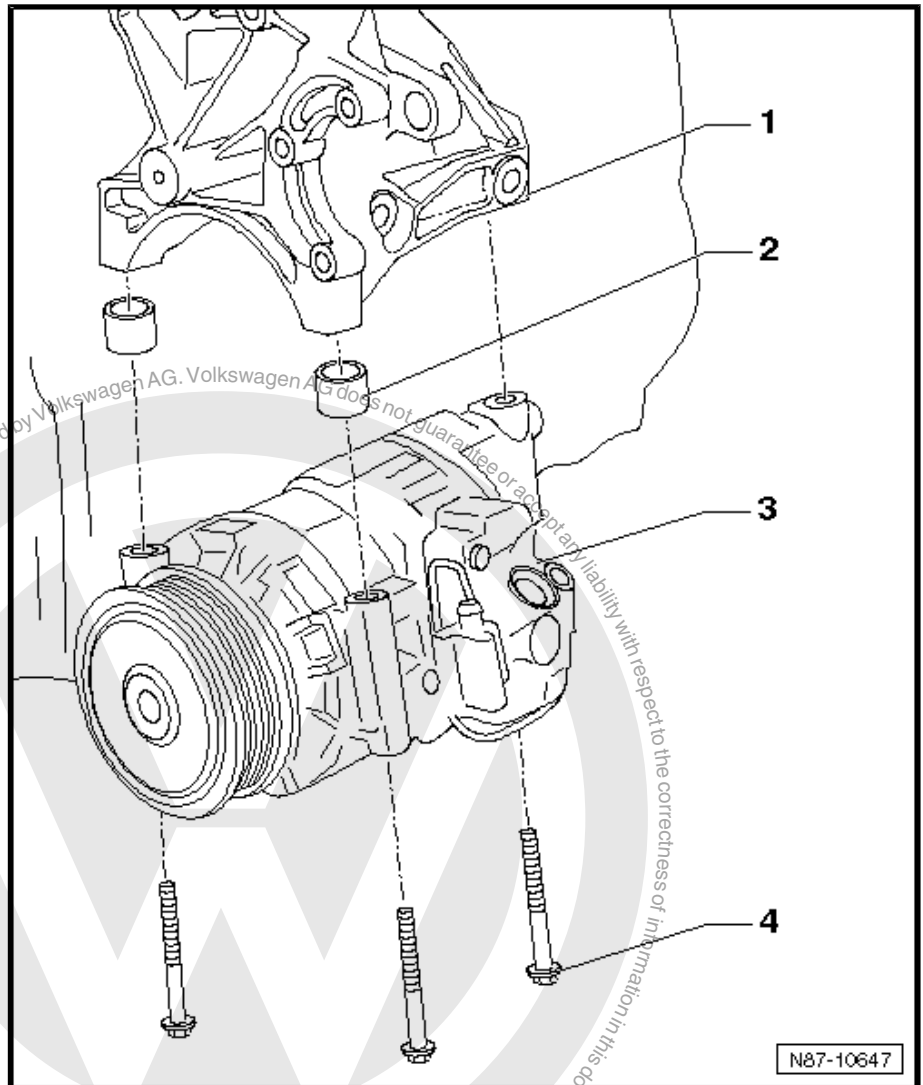


- ◆ Torque wrench -V.A.G 1331-



Note

- ◆ The refrigerant must be extracted beforehand, e.g. with air conditioner service station -VAS 6007A-.
- ◆ Observe notes ⇒ [page 43](#).



Perform following jobs:

- Switch off all electrical loads
- Switch off ignition.
- Withdraw ignition key.



WARNING

Danger of freezing injuries.

If refrigerant circuit has not been evacuated, refrigerant may escape.

Extract refrigerant before opening refrigerant circuit. If the refrigerant circuit is not opened within 10 minutes after it has been evacuated, pressure may develop in refrigerant circuit due to re-evaporation. Extract refrigerant again.

- Remove refrigerant line bolts and pull refrigerant lines out of air conditioner compressor.
- Remove bolts -4- (25 Nm) and remove air conditioner compressor from bracket -1-.



Installing



Note

Make sure dowel sleeves -2- and elastic drive coupling fit properly between air conditioner compressor and power steering vane pump.

5.9 Notes on installing air conditioner compressor

5.9.1 Installing

- Do not start engine before refrigerant circuit has been assembled.
- After installing a new air conditioner compressor or filling with fresh refrigerant oil, turn air conditioner compressor pulley 10 revolutions by hand before starting engine. This will prevent damage to the air conditioner compressor.
- Only start engine when refrigerant circuits are charged.



Note

- ◆ *The air conditioner compressor is permanently driven by the poly V-belt pulley/elastic drive coupling. It is not fitted with a magnetic clutch.*
- ◆ *If an air conditioner compressor locks up, the overload protection for the compressor shaft is triggered. A seized air conditioner compressor cannot always be identified by visible deformations in the poly V-belt pulley and overload protection. Another indication is abraded rubber material around the poly V-belt pulley or overload protection.*
- ◆ *The air conditioner compressor has an internal oil circuit to ensure that the air conditioner compressor is not damaged when the refrigerant circuit is empty. This means that about 40 to 50 cm³ refrigerant oil remain in the air conditioner compressor.*
- ◆ *The engine may be started only when the refrigerant circuit is properly assembled. If, for example, the refrigerant lines are not connected to the air conditioner compressor and the engine is running, the compressor may heat up so much through internal warming that it will be destroyed.*
- ◆ *The air conditioner compressor regulating valve -N280- is not activated when the refrigerant circuit is empty. The air conditioner compressor idles with the engine.*
- ◆ *If it is necessary to start engine with an empty refrigerant circuit:*
- ◆ *The refrigerant circuit must be fully assembled.*
- ◆ *At least ¼ of the quantity of refrigerant oil specified for this refrigerant circuit must be in the air conditioner compressor.*
- ◆ *The engine speed must not exceed 2500 rpm.*
- ◆ *Run engine only as long as absolutely necessary.*

Note the following when starting engine for first time after filling refrigerant circuit:



- Switch on ignition.
- Select “ECON” function on Climatronic operating and display unit -E87- .
- Start engine.

As soon as the idling speed stabilises.

- Open dash panel vents.
- Set temperature to “Lo” on Climatronic operating and display unit -E87- .
- Now switch to “Auto” mode and let the air conditioner run for at least 5 minutes with the engine at idling speed.

5.10 Checking high-pressure safety valve on air conditioner compressor



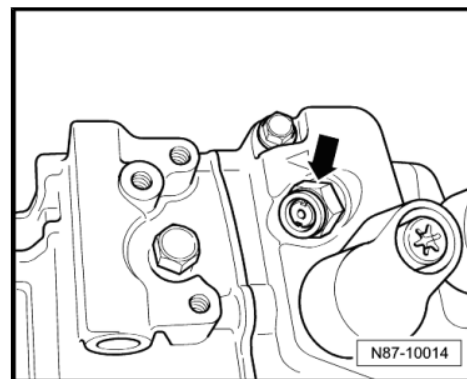
WARNING

Danger of freezing injuries.

The high-pressure safety valve releases refrigerant when the engine is running and the pressure in the refrigerant circuit is too high.

Switch off engine.

- ◆ Function: protects refrigerant circuit against excessive pressure.
- ◆ The high-pressure safety valve indicates whether the valve has been opened. An attached adhesive plate -arrow- is pushed out.





6 Capacities

6.1 Refrigerant R134a

Compressor	Manufacturer	Capacity
7SEU17	Denso	525 ± 25 grammes

6.2 Refrigerant oil



Note

- ◆ When replacing refrigerant circuit components, observe the refrigerant oil capacities in the workshop manual "Air conditioning system with refrigerant R134a".
- ◆ Select internet in ELSA. ⇒ Air conditioning system - with refrigerant R134a VW is located in technical Information.

The special refrigerant oil (for use with refrigerant circuits R134a only) can no longer be obtained on the refrigerant/machine oil market.

Refrigerant oil can be obtained using following part number for	
7SEU17C Denso compressor	G 052 300 A2

Type	Total amount of oil in refrigerant circuit **) 1)
7E0 820 803 and 2H0 820 803 Denso	140 cm ³ ± 10 cm ³

1) This amount of refrigerant oil is contained in the replacement compressor.

Important information:

Because refrigerant oil is very hygroscopic, opened containers must be closed immediately after use to prevent moisture from entering.

Because of its chemical properties, refrigerant oil must not be disposed of together with engine or gear oil.

6.2.1 Oil distribution

The oil, which is located in the sump of the air conditioner compressor before the air conditioner system is switched on for the first time, distributes itself through the refrigerant circuit as follows:

- ◆ Air conditioner compressor approx. 50 %
- ◆ Condenser approx. 10 %
- ◆ Suction hose approx. 10 %
- ◆ Evaporator approx. 20 %
- ◆ Receiver approx. 10 %