Workshop Manual
Golf 2004 ➢

Heating, air conditioning

Edition 02.2008

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Repair Group

80 - Heating

87 - Air conditioning system

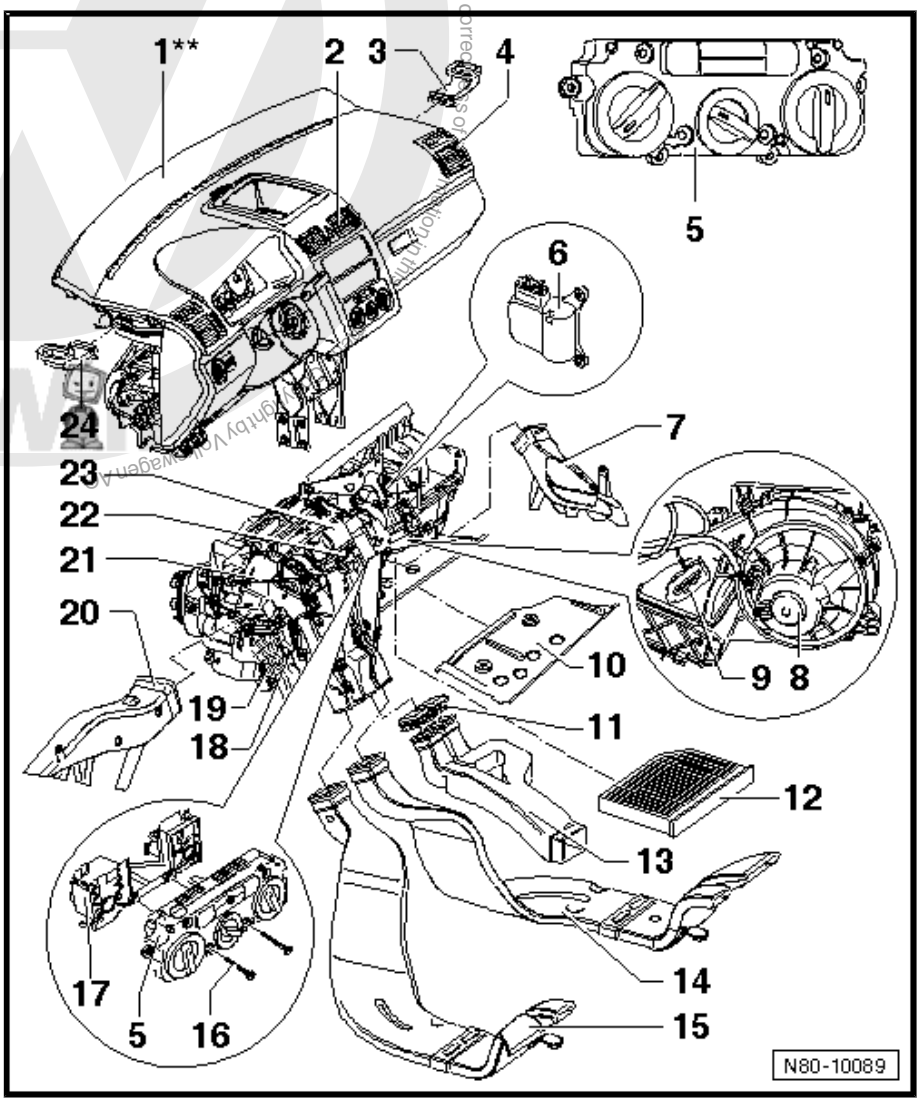
Contents

80 – Heating

1 Repairing heater

1.1 Passenger compartment heating

Disconnect battery before removing components marked ** ⇒ Rep. Gr. 27 .



1 - Dash panel**

2 - Centre vents

- ❑ Removing vent ⇒ page 5 .

3 - Right side vent

4 - Right vent

- ❑ Removing vent ⇒ page 5 .

5 - Controls for fresh and heated air

- ❑ With fresh air and air recirculation flap switch -E159- .
- ❑ With heated driver seat regulator -E94- and heated front passenger seat regulator -E95-
- ❑ For vehicles with supplementary heating having instant heating button -E537- .
- ❑ Removing controls ⇒ page 7 .

6 - Fresh air and air recirculation flap control motor -V154-

- ❑ Removing ⇒ page 11

7 - Right footwell vent

- ❑ Removing and installing ⇒ page 7

8 - Fresh air blower -V2-

- ❑ Removing ⇒ page 3

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

- ❑ Removing and installing ⇒ page 3

10 - Baffle plate for heater unit

- ❑ Removing ⇒ page 2

11 - Sealing cap

- ❑ Fitted only in vehicles without air duct to vent in rear centre console.

12 - Dust and pollen filter

- ❑ With activated charcoal filter
- ❑ Removing and installing ⇒ page 4

13 - Connecting piece

- ❑ For centre console air duct (to rear vents)
- ❑ To remove, centre console must be removed ⇒ Rep. Gr. 68 .

14 - Air duct for right rear footwell

- ❑ Removing and installing ⇒ page 6

15 - Air duct for left rear footwell

- ❑ Removing and installing ⇒ page 6

16 - Securing bolt

- ❑ Qty. 8
- ❑ Various lengths.

17 - Adapter for controls

- ❑ Removing and installing ⇒ page 7

18 - Auxiliary air heater element -Z35-

- ❑ With auxiliary air heater control unit -J604- .
- ❑ Checking: with vehicle diagnostic, testing and information system -VAS 5051- (or later model), under Heating, ventilation, air conditioning; Systems capable of self-diagnosis; Auxiliary heating; Electrical components.
- ❑ Installed only in vehicles with diesel engines without supplementary heater.
- ❑ Removing and installing ⇒ page 15

19 - Heat exchanger

- ❑ After renewing heat exchanger, renew coolant completely
- ❑ Removing and installing ⇒ page 12

20 - Left footwell vent

- ❑ Removing and installing ⇒ page 7

21 - Bowden cable for temperature flap

- ❑ Removing and installing ⇒ page 10

22 - Flexible shaft for air distribution

- ❑ Removing and installing ⇒ page 9

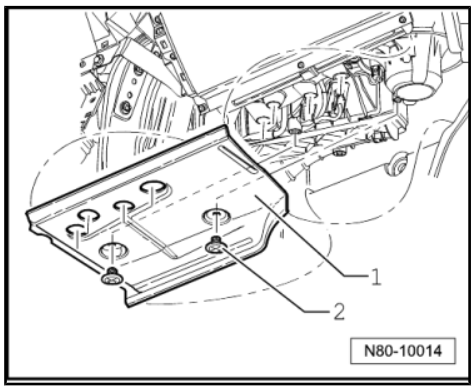
23 - Heater unit

- ❑ Removing and installing ⇒ page 19
- ❑ Dismantling and assembling ⇒ page 23

24 - Left side vent

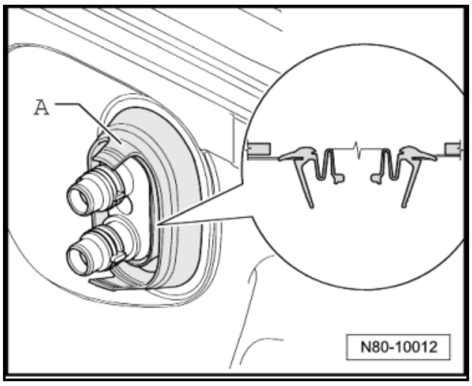
Removing heater unit baffle plate

– Remove plastic bolts -2- and remove baffle plate -1-.



Installation position of seal between heater unit and engine compartment

– First insert seal between heater unit and engine compartment -A- in bulkhead and then attach to heat exchanger.



Note

To prevent water from entering vehicle interior, installation position must be observed.

1.2 Removing fresh air blower -V2-

1.2.1 Removing

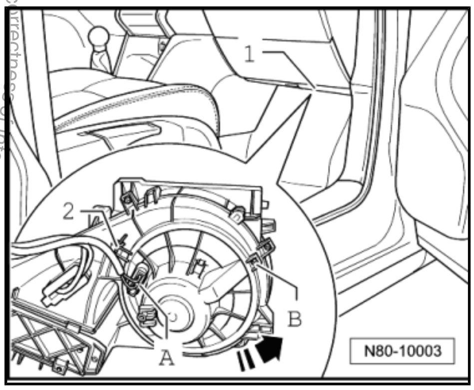
Fresh air blower -V2- is accessible from footwell on front passenger side.

– Remove heater unit baffle plate ⇒ page 2 .

– Pull connector -A- off fresh air blower -V2- .

– Remove bolt -B- for fresh air blower -V2- (1 Nm).

– Release catch -2-, turn fresh air blower -V2- in direction of -arrow- and remove.



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

1.3.1 Removing

WARNING

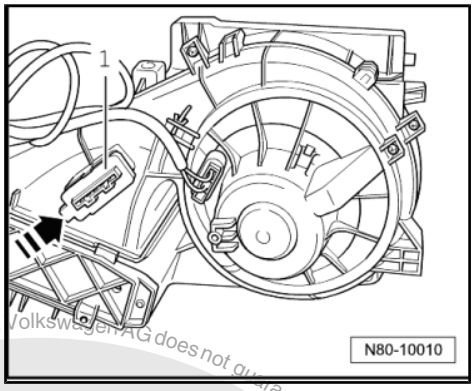
Danger of burn injuries.

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.

First carry out the following work:

– Remove heater unit baffle plate ⇒ page 2 .
– Pull connector -1- off fresh air blower series resistor with overheating fuse -N24- .
– Press catch in -direction of arrow- and remove fresh air blower series resistor with overheating fuse -N24- from heater unit.



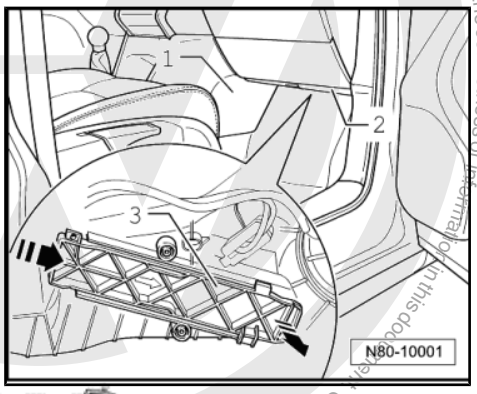
1.3.2 Installing

Install in reverse order.

1.4 Removing and installing dust and pollen filter

1.4.1 Removing

– Remove footwell trim -1- on front passenger side.
– Remove baffle plate -2- from heater unit ⇒ page 2 .
– Release cover -3- in direction of arrow.
– Remove dust and pollen filter from heater unit downwards.

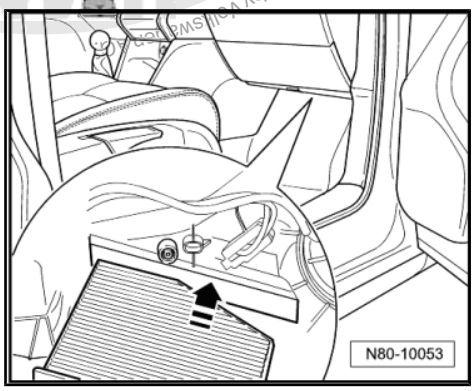


1.4.2 Installing

Install in reverse order.

Note

Observe installation position of dust and pollen filter.



1.5 Removing vents

Note

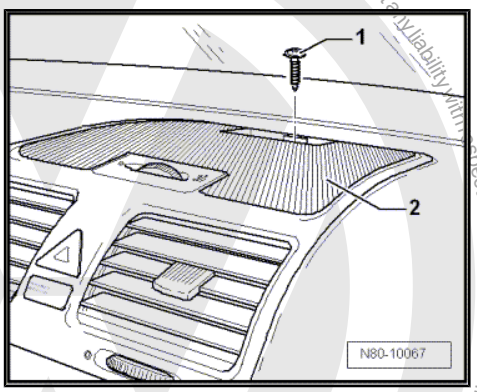
Removal and installation of rear vents (in arm rest) is described in ELSA under General body repairs, interior; ⇒ Rep. Gr. 68 ; Removing and installing centre console (Highline version).

1.5.1 Removing centre vents

– On vehicles with a storage compartment in the centre vent trim, the rubber mat must be removed to reach bolt -1-.

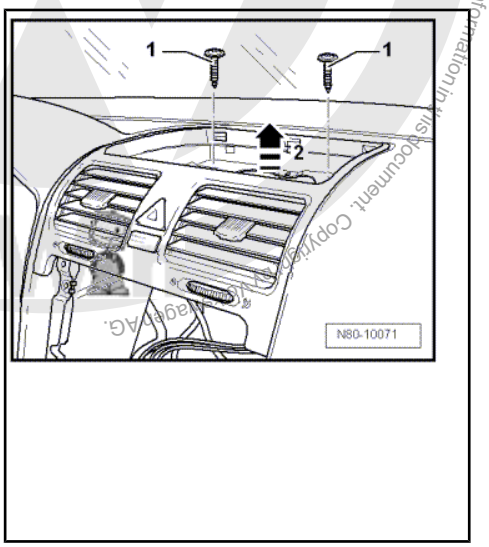
– On vehicles with Climatronic, first remove the sunlight penetration photosensor -G107- or the sunlight penetration photosensor 2 -G134- ⇒ page 59 .

– Remove bolt -1-.



– Remove cover -2- (only in vehicles with Climatronic).

– Remove securing bolts -1-.



Note

For vehicles with a storage compartment in dash panel, bolts are beneath a trim mat.

– Remove compartment from dash panel.

– Remove central vents -2- upwards -arrow-.

– Separate connectors from central vents.

1.5.2 Installing

Install in reverse order.

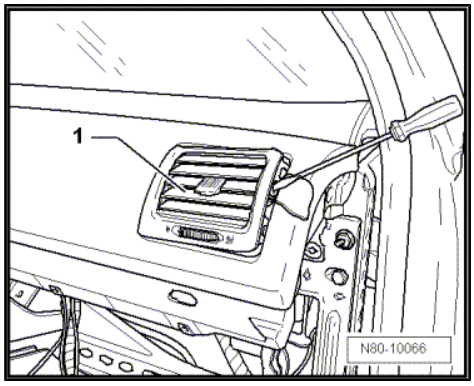
1.5.3 Removing right or left vent

Note

- *The procedure for removal of vents is identical on both sides.*
- *To avoid damage to dash panel, use a pad when levering out components.*

1.5.4 Removing

– Using an appropriate tool, lever out vent -1-.
– Separate connector from vent.



1.5.5 Installing

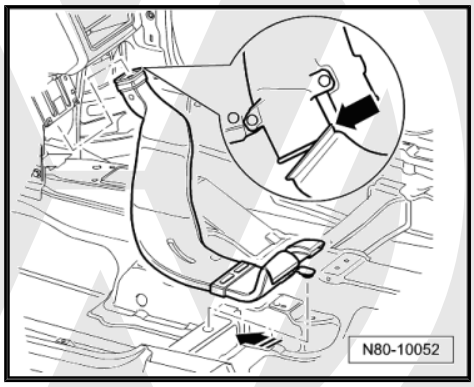
Install in reverse order.

1.5.6 Removing and installing right and left rear footwell air ducts

Note

The procedure for removal of footwell air ducts is identical on both sides.

– Remove driver or front passenger seat ⇒ Rep. Gr. 72 .
– Remove centre console ⇒ Rep. Gr. 68 .
– Raise floor covering, unclip rear footwell air duct from underbody and pull off heater unit.

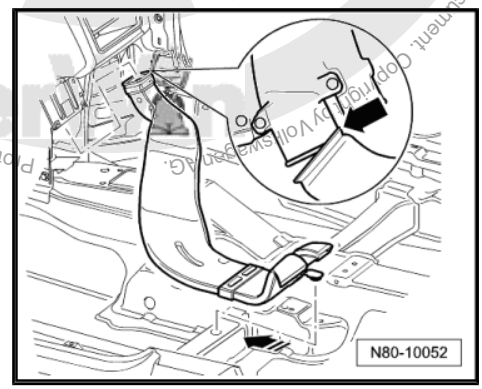


1.5.7 Installing

Install in reverse order.

Note

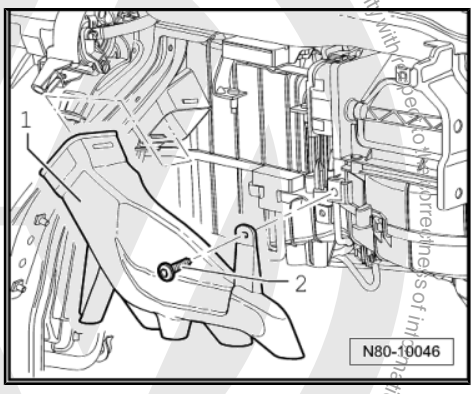
When installing rear footwell air duct, ensure that duct is first pushed onto heater unit -arrow- and then clipped to underbody.



1.5.8 Removing right footwell vent

– Remove glove compartment ⇒ Rep. Gr. 68 .

– Remove securing bolt -2- (1.5 ± 0.2 Nm) and remove right footwell vent -1-.



1.5.9 Installing

Install in reverse order.

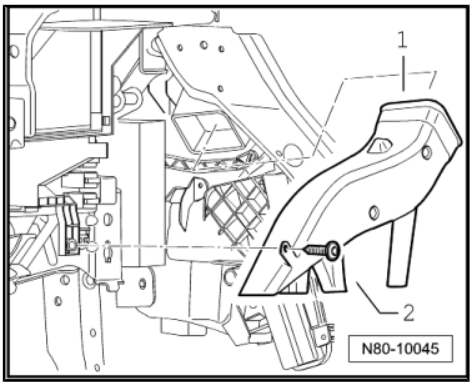
Note

If vehicle has glove box cooling, ensure that refrigerant hose is properly seated.

1.5.10 Removing left footwell vent

– Remove driver side footwell cover ⇒ Rep. Gr. 68 .

– Remove securing bolt -2- (1.5 ± 0.2 Nm) and remove left footwell vent -1-.



1.5.11 Installing

Install in reverse order.

1.6 Removing and installing controls for heated and fresh air

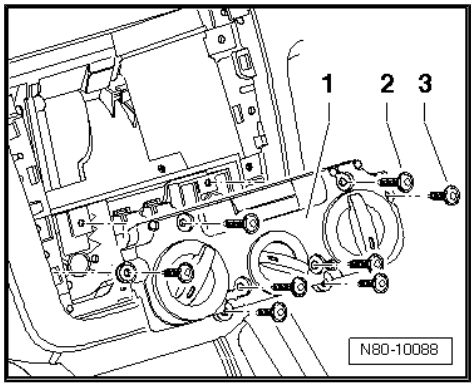
1.6.1 Removing

Note

- *The control consists of two separable housings. Before removing controls, set rotary knobs to the following positions:*
- *Heater control to “cold”*
- *Blower to “0”*
- *Vent direction to “footwell”*

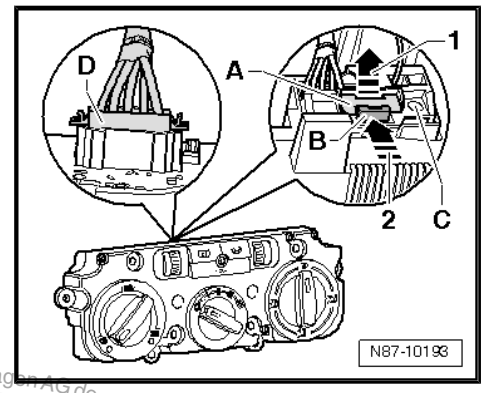
– Remove radio ⇒ Rep. Gr. 91 .

– For vehicles without radio, remove centre dash panel trim ⇒ Rep. Gr. 68 .
– Remove bolts -2- (4.2 x 45) and -3- (4.2 x 16) and remove the controls -1- from centre console.



Specified torque for bolts -2- and -3- (1.5 ± 0.2 Nm).

– Release connector catch -A- by pulling in direction of arrow -1-.
– Push connector catch -B- to connector -arrow 2- and remove connector -C-.
– Release connector catch -D- and remove connector -D-.



Note

Figure shows "Climatic" version. The procedure for releasing connector is the same.

1.6.2 Installing

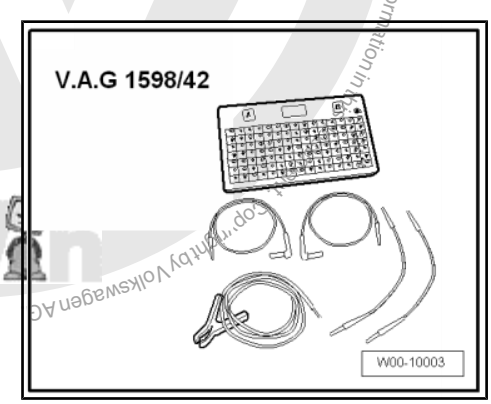
Installation is performed in the reverse order. Ensure that rotary knobs are in the same positions as when removed.

1.7 Connectors on controls for heated and fresh air

1.7.1 Pin assignment for multi-pin connectors on back of controls for heated and fresh air

Special tools and workshop equipment required

- Test box -V.A.G 1598/42-
- Adapter cable -V.A.G 1598/47-



- Template -1598/47-2-

The 16-pin connector is vacant.

5-pin connector, T5 in current flow diagram

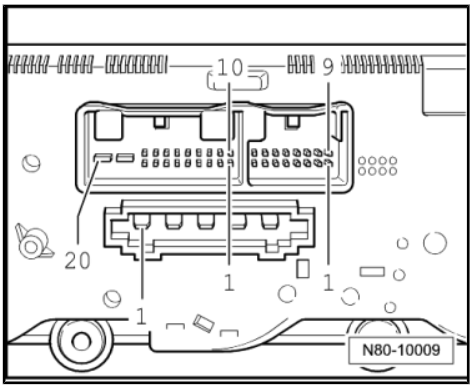
1 - 3rd blower speed

2 - 2nd blower speed

3 - 1st blower speed

4 - 4th blower speed

5 - X terminal



20-pin connector, T20c in current flow diagram

3 - Fresh air and air recirculation flap control motor -V154-

6 - Fresh air and air recirculation flap control motor -V154-

7 - With auxiliary air heater control unit -J604-

8 - Rear window

11 - Heated driver seat control unit -J131-

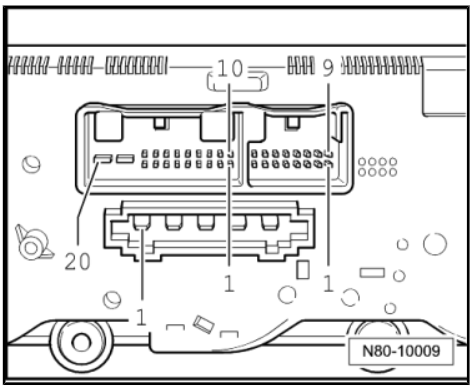
15 - Heated front passenger seat control unit -J132-

16 - Terminal 75, seat heating (optional)

18 - Terminal 30

19 - Terminal 15

20 - Terminal 31



1.8 Removing and installing flexible shaft for air distribution

1.8.1 Removing

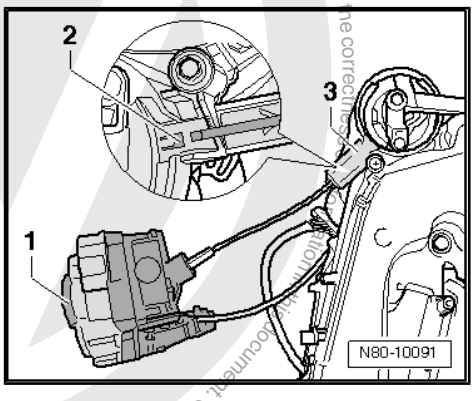
– Remove radio ⇒ Rep. Gr. 91 .

– For vehicles without radio, remove centre dash panel trim ⇒ Rep. Gr. 68 .

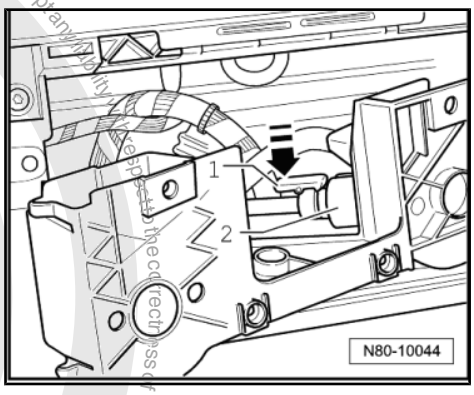
– Remove glove compartment ⇒ Rep. Gr. 68 .

– Move flexible shaft to following position:

– Turn rotary switch for air distribution -1- until catch in shaft -2- is visible in gears -3-.



– Remove controls for fresh and heated air ⇒ page 7 .
– Reach into centre console and release locking lug -1- by pressing in direction of arrow.
– Pull flexible shaft out of adapter -2-.



Note

When flexible shaft is installed, the adapter and the rotary knobs of the controls for heated and fresh air must be aligned in a specific position to one another or the system will malfunction ⇒ page 10 .

1.8.2 Checking

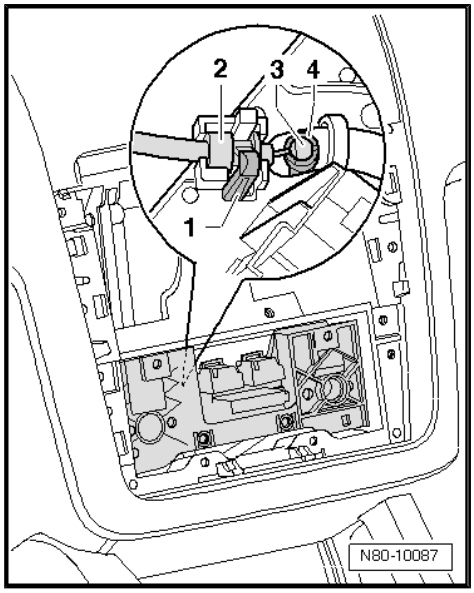
Flexible shaft for air distribution flap actuator:

– Run fresh air blower at highest speed. If air flows out of defroster jet in the “defrost” position and no air flows out of footwell vent, then the flexible shaft is correctly installed. Otherwise, remove flexible shaft from adapter. Position controls for heated and fresh air on adapter and turn rotary knob for air distribution $^{1}/_{2}$ turn (180°). Then reconnect flexible shaft. Repeat check.

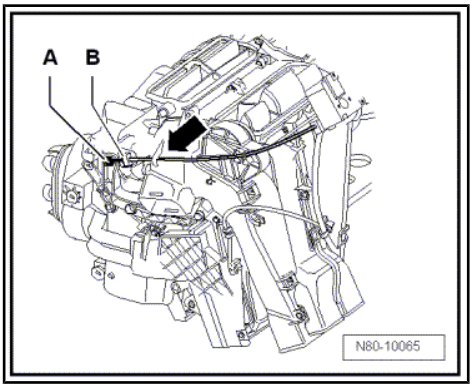
1.9 Removing and installing Bowden cable for temperature flap

1.9.1 Removing

– Remove controls for fresh and heated air ⇒ page 7 .
– Reach into centre console and release catch -1- of Bowden cable sheath -2- and remove Bowden cable sheath from support.
– Release ball on Bowden cable -3- from operating lever -4-.



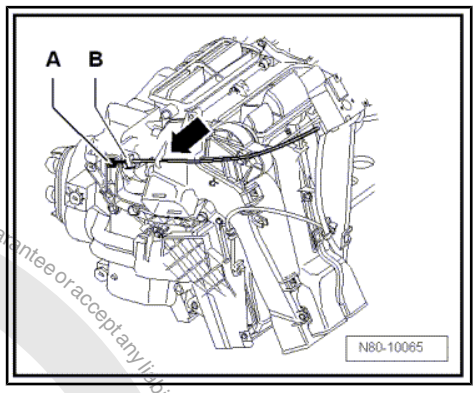
– Remove driver side footwell trim ⇒ Rep. Gr. 68 .
– Unclip Bowden cable from control unit for temperature flap -A- and heater unit -B-.



1.9.2 Installing

Install in reverse order. Ensure that Bowden cable lies under hook -arrow-.

– Check whether temperature knob can be easily turned from “cold” to “warm”.



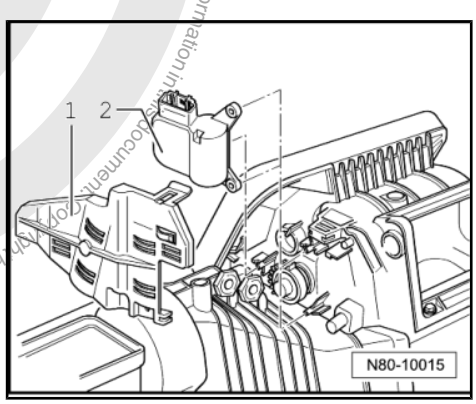
1.10 Removing and installing fresh air and air recirculation flap control motor -V154-

1.10.1 Removing

Note

The position of the air recirculation flap must not be changed.

– Remove glove compartment ⇒ Rep. Gr. 68 .
– Remove cover -1-.
– Separate connector from fresh air and air recirculation flap control motor -V154- -2-.
– Remove fresh air and air recirculation flap control motor -V154- -2- from mountings.



1.10.2 Installing

Install in reverse order.

Note

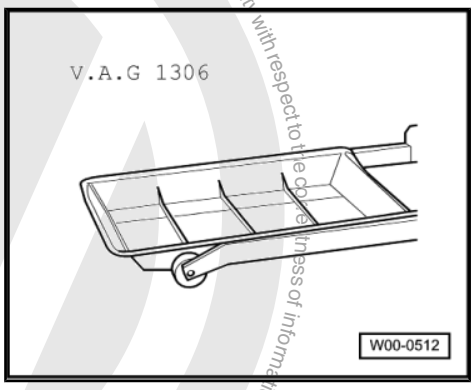
After installing fresh air and air recirculation flap control motor - V154- , check operation of air recirculation flap.

– Checking: vehicle diagnosis, testing and information system - VAS 5051- or successor models.
– Renewing: initiate basic setting using vehicle diagnosis, testing and information system -VAS 5051- or successor models ⇒ page 42 .

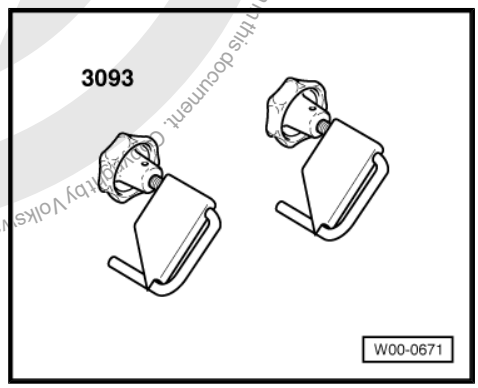
1.11 Removing and installing heat exchanger

Special tools and workshop equipment required

♦ Drip tray -V.A.G 1306-



♦ Hose clamps up to 40 mm Ø -VAS 3093-



♦ Compressed air gun, commercially available

1.11.1 Removing

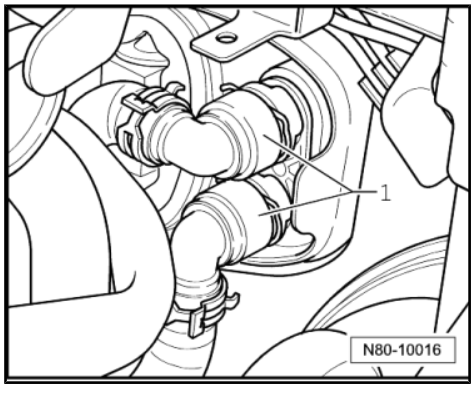
– Place drip tray -V.A.G 1306- beneath engine.

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, release pressure before carrying out repairs.

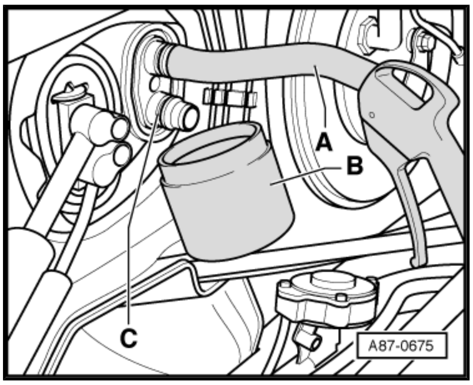


– Clamp off coolant hoses -1- using hose clamps up to 40 mm Ø -VAS 3093- and disconnect coolant hoses to heat exchanger.

– Push a piece of hose -A- onto upper connection of heat exchanger.

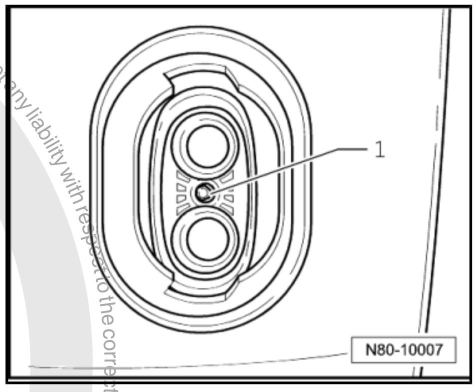
– Hold a container -B- under lower connection -C-.

– Using a compressed air pistol, carefully blow coolant out of heat exchanger into container -B-.



Depending on the engine type, some parts must be removed additionally, e.g. the charge air pipe.

– Loosen bolt (6 mm hexagon socket head) -1- on flange between heat exchanger connections, but do not remove completely.



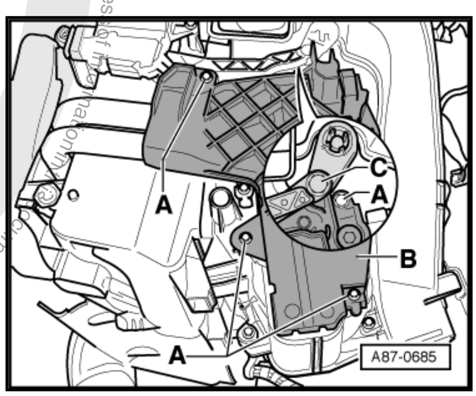
Note

Loosening the bolt -1- loosens the coolant pipe which eases the removal of the heat exchanger.

– Remove driver side footwell trim ⇒ Rep. Gr. 68 .

– Remove left footwell vent ⇒ page 7 .

– Remove bolts -A- and remove cover -B-.



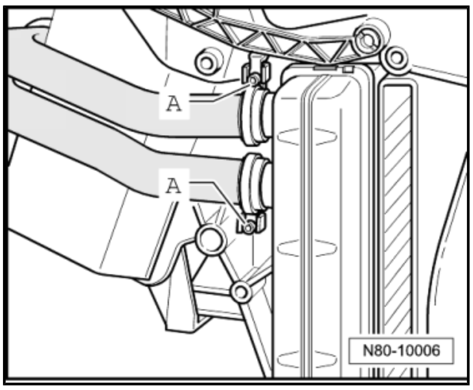
Note

- ♦ *There are two different versions of cover -B-.*
- ♦ *The figure shows the version with auxiliary air heater element -Z35- .*
- ♦ *If the lever -C- to temperature flap is positioned so the the upper bolt -A- is not accessible. Change the position of the temperature flap at the heater and fresh air controls. On vehicles with Climatronic, at the control and display unit (e.g. the setting "Hi").*

– Cover carpet in area under heat exchanger with waterproof foil and water absorbing paper.

– Open pipe clamps -A- and pull coolant pipes out of heat exchanger.

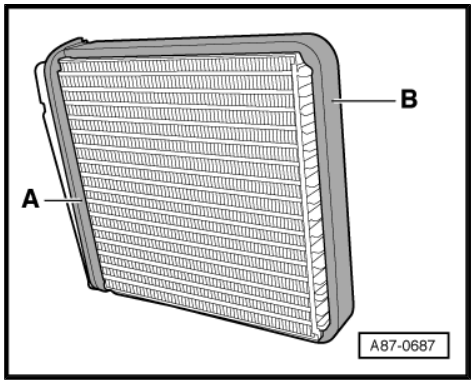
– Remove heat exchanger from heater unit.



1.11.2 Installing

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

– Check seals attached to heat exchanger -A- and -B-. Install heat exchanger only with undamaged seals.



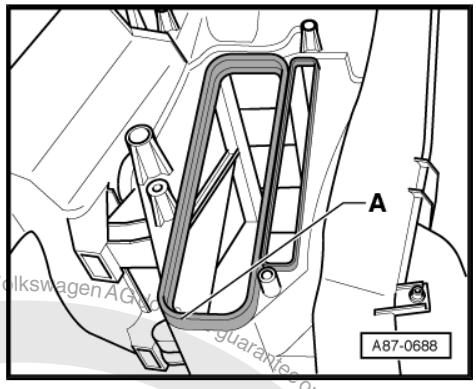
Note

- *An improperly bonded seal can roll up when heat exchanger is pushed into heater unit.*
- *If seal is damaged or improperly attached, cold air can flow past heat exchanger.*

– Check heater unit for cleanliness through shaft -A- for heat exchanger while heat exchanger is removed.

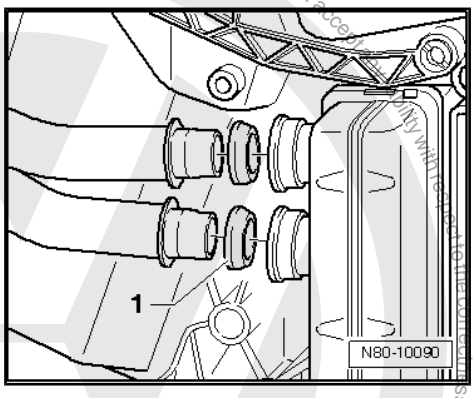
– If necessary, remove dirt or residue of leaked coolant from heater unit, e.g. after removing a leaking heat exchanger.

– Push heat exchanger into heater unit.



– Moisten seals -1- with coolant before installing.

– Set seals -1- in connection of heat exchanger.



Note

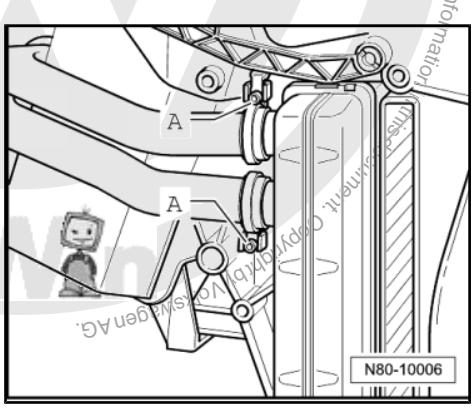
- *Ensure that seals are installed in the proper direction as shown in figure.*
- *Renew deformed pipe clamps.*

– Connect coolant pipes to heat exchanger.

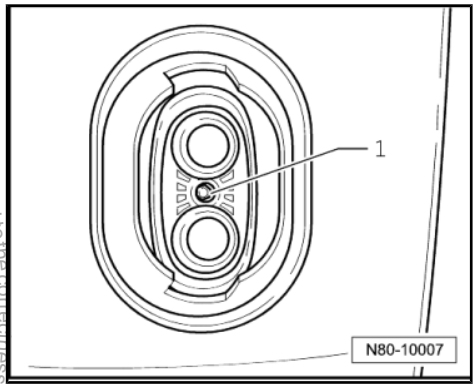
– During assembly, pipe clamps -A- must turn easily on coolant pipes.

– Pipe clamps -A- must be installed as shown in figure.

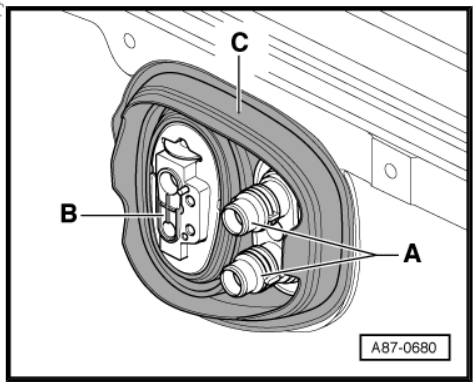
– Tighten pipe clamps -A- to 2 Nm.



– Check seating of both clamps -A- after tightening bolts. They must fully enclose the flange on the heat exchanger and the coolant pipe and the must not contact other components.
– Tighten bolt -1- on connecting flange between heat exchanger connections to 2 Nm.



– Check that grommet -C- in bulkhead is properly seated.
– If necessary, seal flanges for coolant pipes to heat exchanger -A- and for expansion valve to evaporator (only in vehicles with air conditioning) -B- at apertures in grommet -C- with silicone adhesive sealant against moisture intrusion.



Note

- *Always renew seals.*
- *After renewing heat exchanger, renew coolant completely ⇒ Rep. Gr. 19 .*
- *Check coolant circuit for leaks. Examine in particular connections between coolant pipes and heat exchanger.*

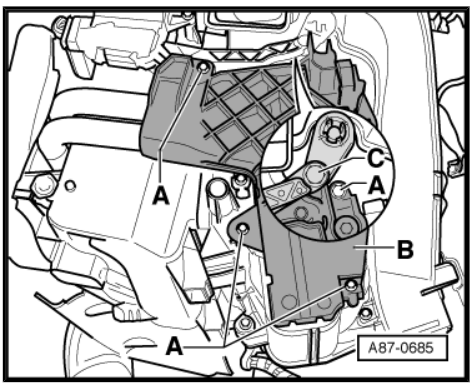
1.12 Removing and installing auxiliary air heater element -Z35- on vehicles up to 1K-7P015628 and 1K-7B084800

Note

- *Installed only in vehicles with diesel engines without supplementary heater.*
- *Checking: with vehicle diagnosis, testing and information system -VAS 5051- (or later model), under Heating, ventilation, air conditioning; Systems capable of self-diagnosis; Auxiliary heating; Electrical components.*

1.12.1 Removing

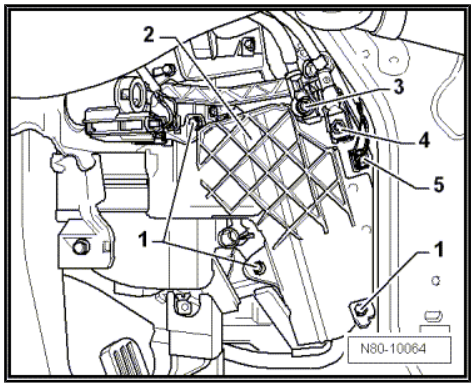
– Remove driver side footwell trim ⇒ Rep. Gr. 68 .
– Remove left footwell vent ⇒ page 7 .



Note

If the lever -C- to temperature flap is positioned so the the upper bolt -A- is not accessible. Change the position of the temperature flap at the heater and fresh air controls. On vehicles with Climatronic, at the control and display unit (e.g. the setting “Hi”).

– Disconnect the battery ⇒ Rep. Gr. 27 .
– Remove bolts -1- from cover -2-.



Caution

Danger of short circuit.

Disconnect battery before performing repair work.

– Remove securing nut for voltage supply -3- and earth connection -4- (6 ± 1 Nm).
– Pull connectors -5- off auxiliary air heater element -Z35- .

WARNING

Danger of burn injuries.

The auxiliary air heater element -Z35- may be hot.

Before removing auxiliary air heater element -Z35- , allow it to cool off.

– Pull auxiliary air heater element -Z35- out of heater unit.

1.12.2 Installing

Install in reverse order.

1.13 Removing and installing auxiliary air heater element -Z35- on vehicles from 1K-7P015629 und 1K-7B084801

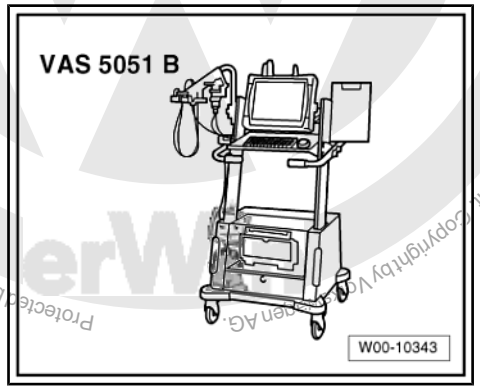
1.13.1 Checking auxiliary air heater element -Z35- with peripherals

Auxiliary air heater element -Z35- peripherals (load signal for alternator terminal DF, low heat output relay -J359- , high heat output relay -J360- , intake manifold temperature sender -G72- , coolant temperature sender -G62-) can be read via the engine control unit self-diagnosis.

1.13.2 Checking auxiliary air heater element -Z35-

Special tools and workshop equipment required

♦ Vehicle diagnostic, testing and information system -VAS 5051B- with 100 A pick-up clamp -VAS 5051B/7-



1.13.3 Test conditions

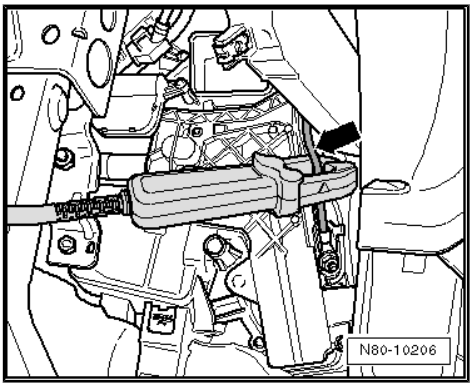
- Intake temperature less than 19° C
- Coolant temperature less than 80° C
- Passenger compartment temperature about 20° C
- Battery voltage greater than 11 V
- Alternator load not greater than 50% (terminal DF)
- Engine speed greater than 450 rpm
- Turn rotary knob for interior temperature to end position for maximum temperature.

1.13.4 Test procedure

– Remove left footwell vent ⇒ page 7 .

– Remove centre console trim from left footwell.

– Measure current consumption on earth wire -arrow- using vehicle diagnostic, testing and information system -VAS 5051B- and 100 A pick-up clamp -VAS 5051B/7- .



Low heating output: approx. 30 amps

Medium heating output: approx. 60 amps

High heating output: approx. 80 amps

1.13.5 Removing and installing

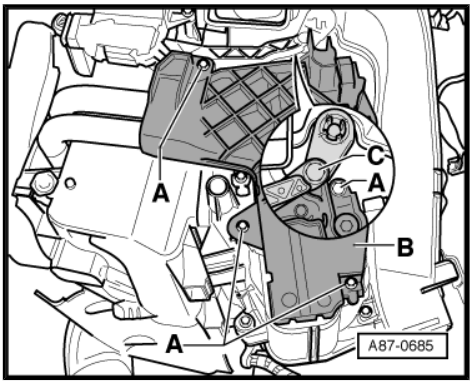
Removing

– Remove driver side footwell trim ⇒ Rep. Gr. 68 .

– Remove left footwell vent ⇒ page 7 .

Note

If the lever -C- to temperature flap is positioned so the the upper bolt -A- is not accessible. Change the position of the temperature flap at the heater and fresh air controls. On vehicles with Climatronic, at the control and display unit (e.g. the setting “Hi”).



– Disconnect the battery ⇒ Rep. Gr. 27 .

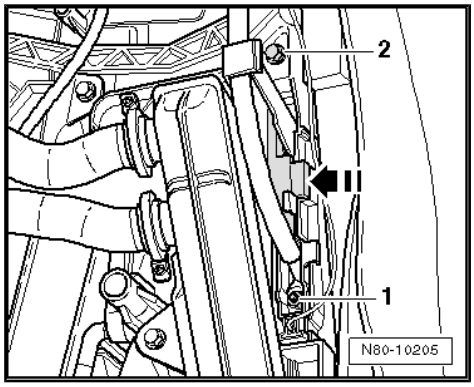
– Remove bolts -A- from cover -B-.

Caution

Danger of short circuit.

Disconnect battery before performing repair work.

– Unscrew nut -1- (9 ± 1 Nm).
– Release connector strip catch -arrow-.



WARNING

Danger of burn injuries.

The auxiliary air heater element -Z35- may be hot.

Before removing auxiliary air heater element -Z35- , allow it to cool off.

– Remove screw -2- (1.4 Nm) and pull out auxiliary air heater element -Z35- from blower box.

Installing

Note

Ensure that the earth wire is in proper position.

Install in reverse order.

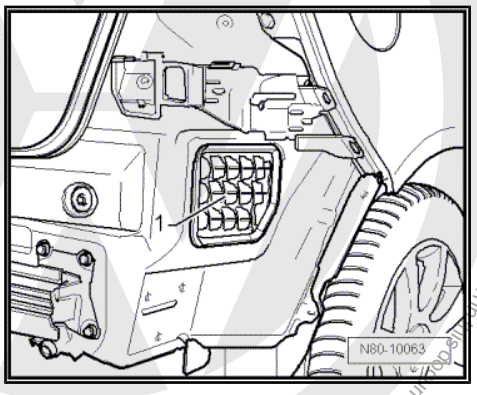
1.14 Checking ventilation

Note

- *The stale air escapes via ventilation openings in the luggage compartment trim.*
- *If the ventilation is to function properly, the ventilation openings must not be covered.*
- *The ventilation frames are located in the rear side panels behind the bumper.*

1.14.1 Checking

– Remove rear bumper ⇒ Rep. Gr. 63 .
– Sealing lips -1- in ventilation frames on both sides of vehicle must be free to move and close by themselves.
– Note installation position.

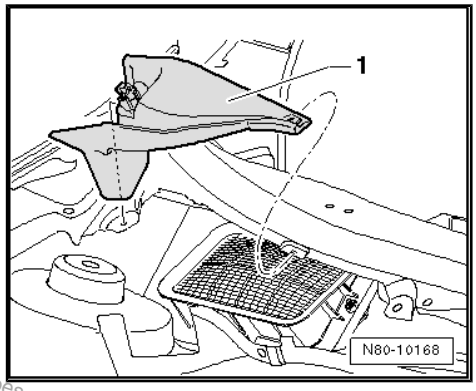


1.15 Removing and installing air intake screen

1.15.1 Removing

– Remove plenum chamber cover ⇒ Rep. Gr. 64 .

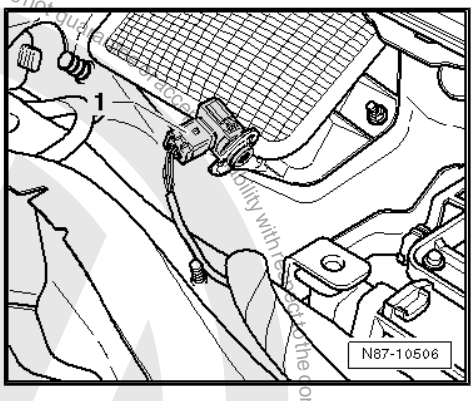
– Remove cover -1- from plenum chamber.



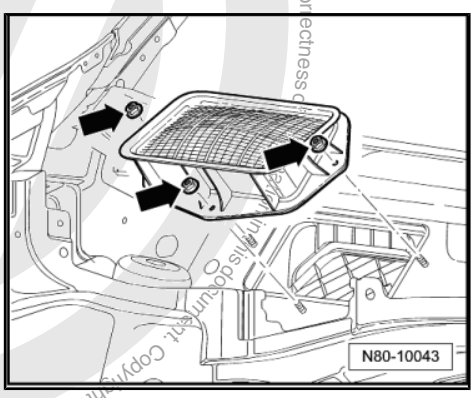
Note

- *On vehicles with Climatronic from week 45/2007, a retainer with an air quality sensor -G238- is fitted on the air intake grille.*
- *Function of air quality sensor -G238- ⇒ page 56 .*

– Release air quality sensor -G238- -1- and turn to right out of retainer.



– Unscrew collar nuts -arrows- (2.5 ± 0.4 Nm) and remove air intake grille upwards.



1.15.2 Installing

Install in reverse order.

Note

Seal must seat properly on air intake screen.

Assembly sequence:

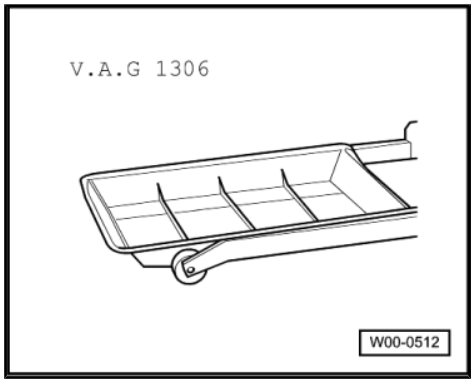
– Adjust air intake grille on metal collar.

– Hold air intake grille and first tighten lateral collar nuts (2.5 ± 0.4 Nm), then tighten middle collar nut.

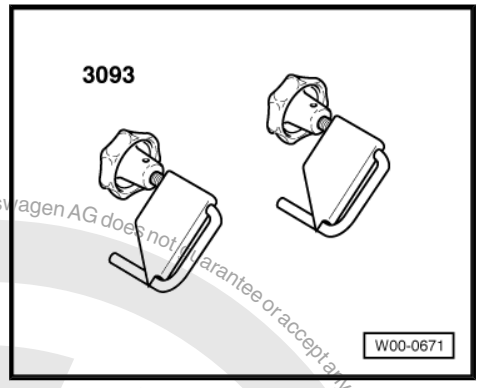
1.16 Removing and installing heater unit

Special tools and workshop equipment required

- Drip tray -V.A.G 1306-



- Hose clamps up to 40 mm Ø -VAS 3093-



- Compressed air gun, commercially available

1.16.1 Removing

Note

To improve access, depending on engine version, additional components must be removed e.g. engine cover ⇒ Rep. Gr. 10 .

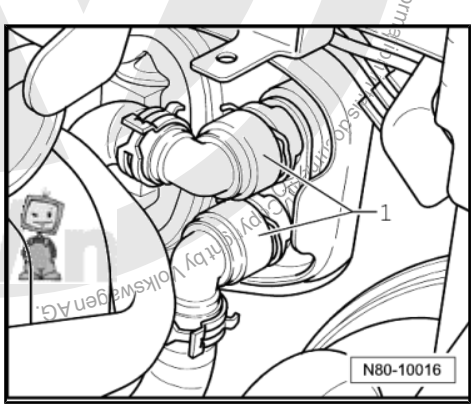
– Remove dash panel ⇒ Rep. Gr. 70 .
– Remove right and left rear footwell air ducts ⇒ page 6 .
– Place drip tray -V.A.G 1306- beneath engine.
– Mark coolant hoses -1-

WARNING

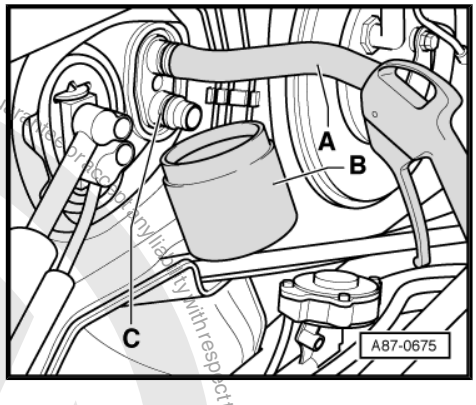
Danger of scalding injuries.

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

If necessary, release pressure before carrying out repairs.



– Clamp off coolant hoses -1- using hose clamps up to 40 mm Ø -VAS 3093- and disconnect coolant hoses to heat exchanger.
– Push a piece of hose -A- onto upper connection of heat exchanger.
– Hold a container -B- under lower connection -C-.
– Carefully blow remaining coolant out of heat exchanger using a compressed air pistol at heat exchanger connection.
– Cover carpet in vehicle interior with waterproof foil and absorbent paper.



Note

During removal, note lengths and locations of bolts for later installation.

1 - Bolt
- ❑ 4,5 ± 0.7 Nm
- ❑ Lower right on cable retainer to heater unit, near bulkhead

2 - Bolts
- ❑ 4,5 ± 0.7 Nm

3 - Cable retainer

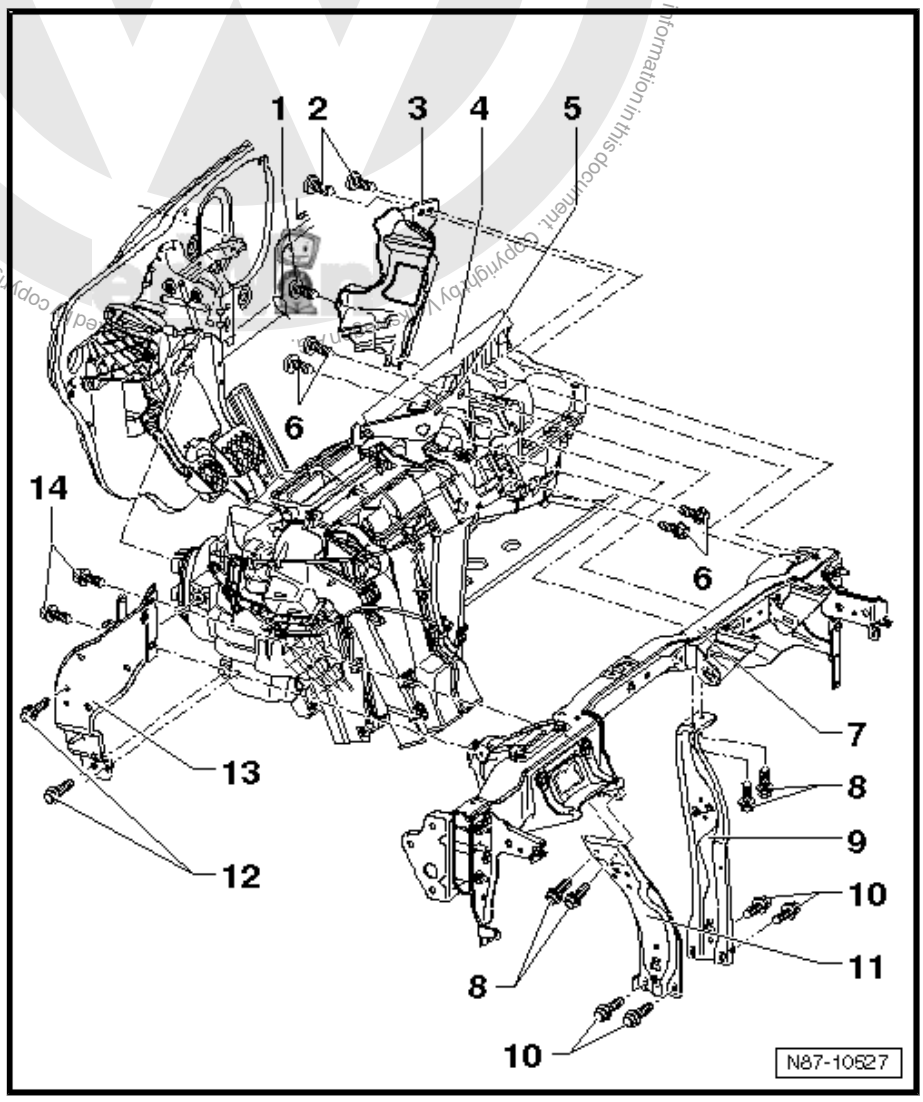
4 - Heater unit

Removing:

– Separate connectors from heater unit.

Note

– Remove both securing nuts from convenience system central control unit -J393- and hang central control unit to side ⇒ Rep. Gr. 97 .
– Unscrew bolts -6- and remove bracket -5-.
– Unscrew bolts -8- and -10- and remove supports -9- and -11-.
– Unscrew bolts -12- and -14- and remove retainer -13-.
– Remove bolts -2- and -1- from cable retainer -3-.



Note

– Remove heater unit.

Installing:

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

First tighten bolts -8- when installing supports -9- and -11-.

Note

- Have second mechanic guide both coolant pipes to heat exchanger through seal during installation of heater unit ⇒ page 22 .
- Fill with coolant ⇒ Rep. Gr. 19 .

5 - Bracket

6 - Bolts

- ❑ 8 ± 1 Nm

7 - Mounting plate

8 - Bolts

- ❑ 9 ± 1.3 Nm

9 - Right support

10 - Bolts

- ❑ 20 ± 3 Nm

11 - Left support

12 - Bolts

- ❑ 9 ± 1.3 Nm

13 - Bracket

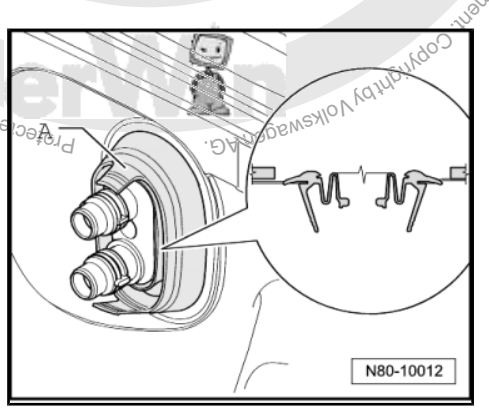
14 - Bolts

- ❑ 9 ± 1.3 Nm

Seal between heater unit and engine compartment

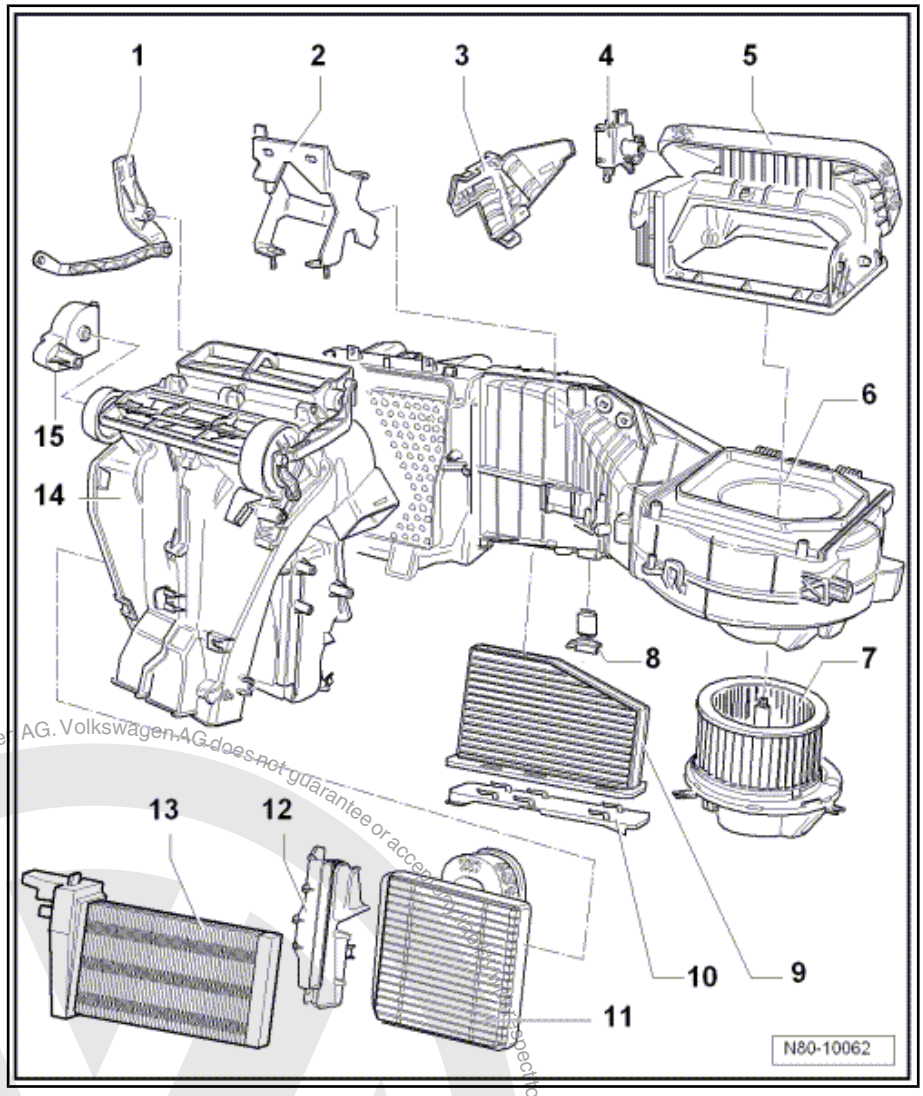
Note

Observe position of seal -A- during installation.



2 Dismantling and assembling heater unit

2.1 Assembly overview – heater unit



1 - Temperature flap actuator

- ❑ Removing and installing ⇒ page 26

2 - Bracket

3 - Cover

4 - Fresh air and air recirculation flap control motor -V154-

- ❑ Checking: vehicle diagnosis, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 11
- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system - VAS 5051- or successor model ⇒ page 42

5 - Air intake housing

- ❑ With air recirculation flap

6 - Heater unit

7 - Fresh air blower -V2-

- ❑ Removing and installing ⇒ page 3

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

- ❑ Removing and installing ⇒ page 3

9 - Dust and pollen filter

- ❑ Removing and installing ⇒ page 4

10 - Cover

- ❑ For dust and pollen filter.

11 - Heat exchanger

- ❑ Removing and installing ⇒ page 12

12 - Heat exchanger trim

13 - Auxiliary air heater element -Z35-

Vehicles up to 1K-7P015628 and 1K-7B084800

- ❑ With auxiliary air heater control unit -J604- .
- ❑ Checking: with vehicle diagnostic, testing and information system -VAS 5051- (or later model), under Heating, ventilation, air conditioning; Systems capable of self-diagnosis; Auxiliary heating; Electrical components.
- ❑ Removing and installing ⇒ page 15

Vehicles from 1K-7P015629 and 1K-7B084801

- ❑ A three-level auxiliary air heater element -Z35- is fitted here; it is controlled by the respective engine control unit via relays.
- ❑ Installed only in vehicles with diesel engines without supplementary heater.
- ❑ Removing and installing ⇒ page 16

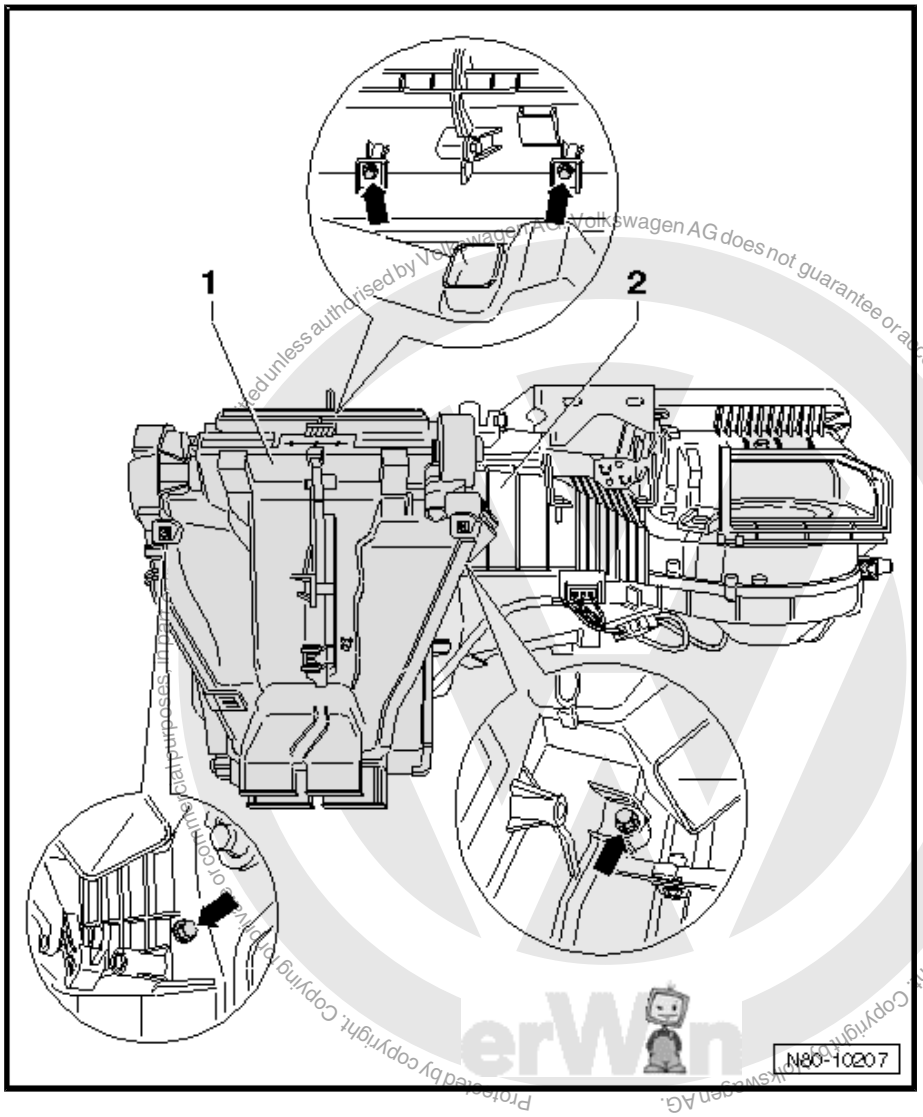
14 - Air distribution housing

15 - Air distribution flap actuator

- ❑ Removing and installing ⇒ page 26

2.2 Removing and installing air distribution housing

2.2.1 Removing



– Remove heater unit ⇒ page 19 .

– Separate all available connectors from air distribution housing.

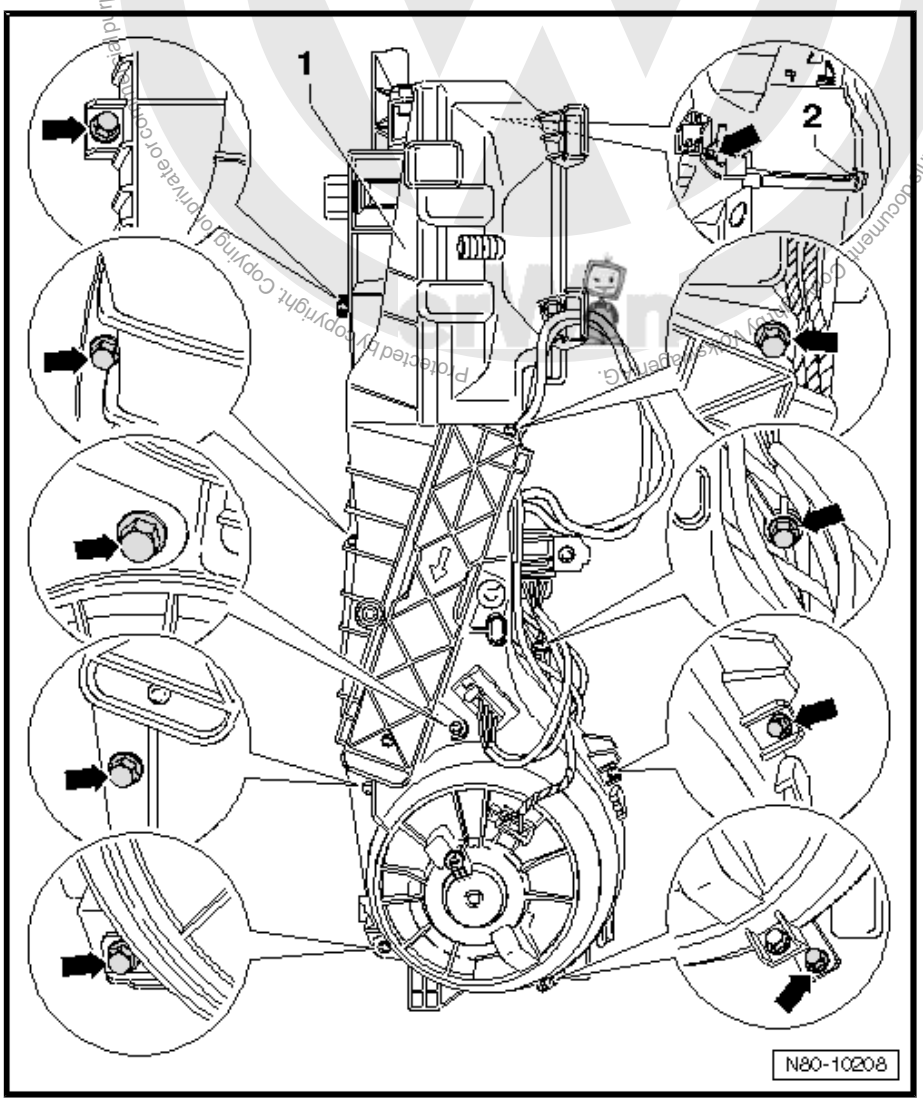
– Remove heat exchanger together with coolant pipes ⇒ page 12 .
– Remove bolts -arrows- (1.4 Nm).
– Remove air distribution housing -1- from heater unit -2-.

2.2.2 Installing

Install in reverse order.

2.3 Dismantling and assembling heater unit

2.3.1 Dismantling



– Remove heater unit ⇒ page 19 .
– Remove air distribution housing ⇒ page 24 .
– Remove clip -2- and bolts -arrows- from heater unit.
– Unfold heater unit.

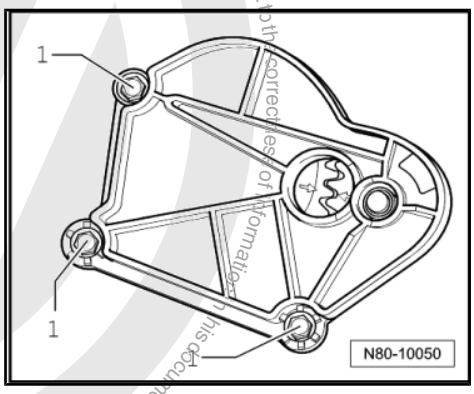
2.3.2 Assembling

Assemble in reverse order.

2.4 Removing and installing air distribution flap actuator

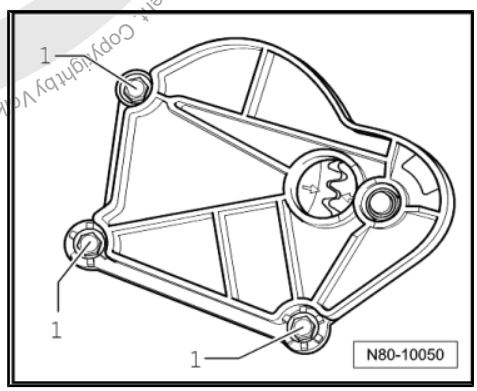
2.4.1 Removing

– Remove dash panel ⇒ Rep. Gr. 70 .
– Unclip flexible shaft from adapter for controls ⇒ page 9 .
– Remove bolts -1- and remove air distribution flap actuator.



2.4.2 Installing

– Arrows on gears must align.
– Position air distribution flap actuator and tighten bolts -1-.



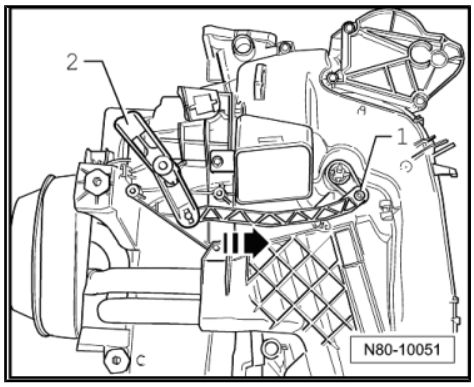
Note

After installation, check operation of air distribution flap ⇒ page 9 .

2.5 Removing and installing temperature flap actuator

2.5.1 Removing

– Remove driver side footwell trim ⇒ Rep. Gr. 68 .
– Remove left footwell vent ⇒ page 7 .
– Unclip cable on temperature flap actuator -2-.
– Release catch -1- and press temperature flap actuator in -direction of arrow- to stop.
– Pull off temperature flap actuator.



2.5.2 Installing

Install in reverse order.

Note

After installation, check operation of temperature flap. Temperature knob of control for heated and fresh air must move freely and without jerking from “cold” position to “warm” position.

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 Heating, ventilation, air conditioning system; 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.*

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

2 Air conditioning system with manual controls “Climatic”

2.1 Air conditioning and heating - passenger compartment

Note

- *Disconnect battery before removing components marked ** ⇒ Rep. Gr. 27 .*
- *A label on the lock carrier indicates the type and quantity of refrigerant used.*

1 - Dash panel**

2 - Centre vents

- ❑ Removing and installing ⇒ page 5

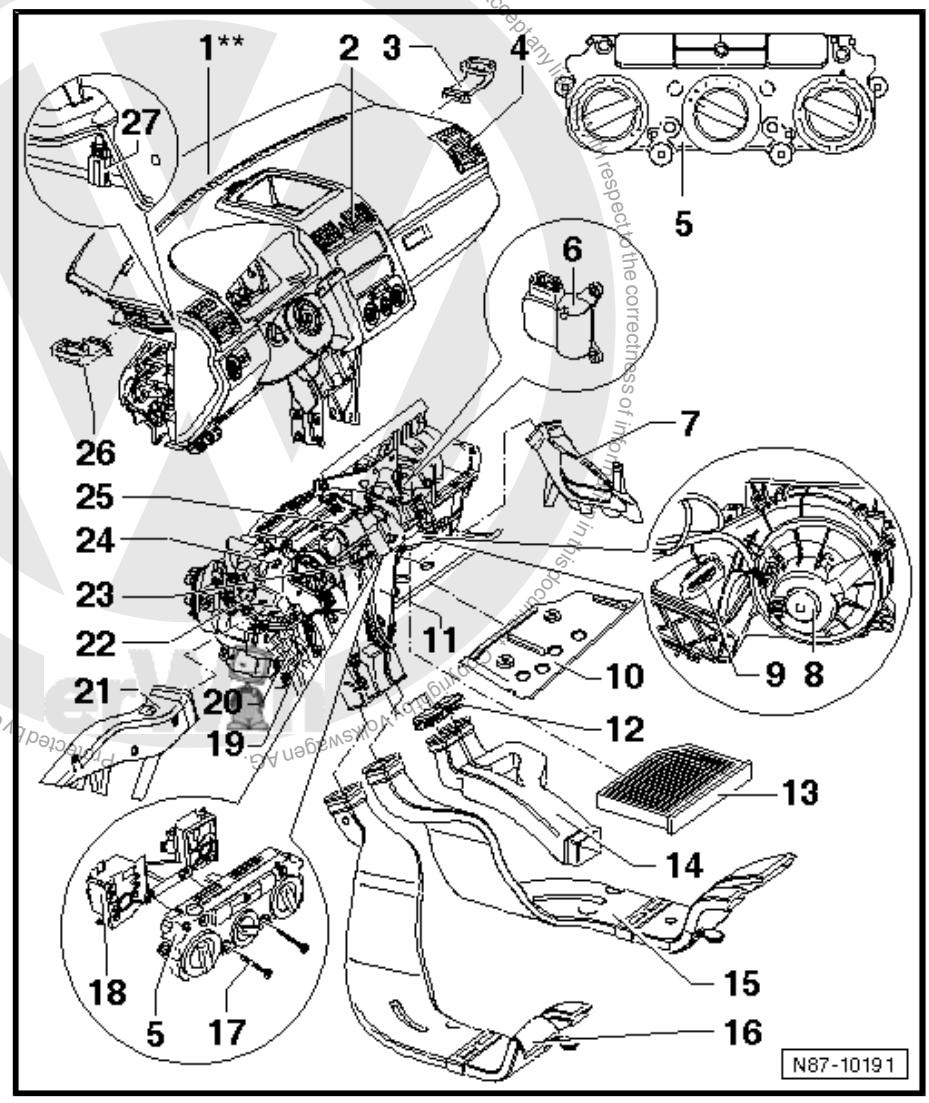
3 - Right side vent

4 - Right vent

- ❑ Removing and installing ⇒ page 5

5 - “Climatic” heating and air conditioning controls with air conditioning system control unit -J301-

- ❑ With dash panel temperature sensor -G56-
- ❑ With fresh air and air recirculation flap switch -E159- .
- ❑ With heated rear window button -E230- .
- ❑ With fresh air blower switch -E9-
- ❑ With air conditioning system control unit -J301- .
- ❑ With heated driver seat regulator -E94- and heated front passenger seat regulator -E95-
- ❑ For vehicles with supplementary heating having instant heating button -E537- .
- ❑ Removing and installing ⇒ page 33



6 - Air recirculation flap control motor -V113-

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 60
- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system -VAS 5051- or successor model ⇒ page 42

7 - Right footwell vent

- ❑ Removing and installing ⇒ page 7

8 - Fresh air blower -V2-

- ❑ Removing and installing ⇒ page 3

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

- ❑ Removing and installing ⇒ page 3

10 - Baffle plate for heater unit

- ❑ Removing ⇒ page 2

11 - Evaporator temperature sensor -G308- or evaporator output temperature sender -G263-

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)

Note

- ❑ Removing and installing ⇒ page 55

12 - Sealing cap

- ❑ Fitted only in vehicles without air duct to vent in rear centre console.

13 - Dust and pollen filter

- ❑ With activated charcoal filter
- ❑ Removing and installing ⇒ page 4

14 - Connecting piece

- ❑ For centre console air duct.
- ❑ To remove, centre console must be removed ⇒ Rep. Gr. 68 .

15 - Air duct for right rear footwell

- ❑ Removing and installing ⇒ page 6

16 - Air duct for left rear footwell

- ❑ Removing and installing ⇒ page 6

17 - Securing bolt

- ❑ Qty. 8

18 - Adapter for controls

19 - Auxiliary air heater element -Z35-

- ❑ Installed only in vehicles with diesel engines without supplementary heater.
- ❑ Removing and installing ⇒ page 15

Vehicles up to 1K-7P015628 and 1K-7B084800

- ❑ With auxiliary air heater control unit -J604- .
- ❑ Checking: with vehicle diagnostic, testing and information system -VAS 5051- (or later model), under Heating, ventilation, air conditioning; Systems capable of self-diagnosis; Auxiliary heating; Electrical components.

Vehicles from 1K-7P015629 and 1K-7B084801

- ❑ A three-level auxiliary air heater element -Z35- is fitted here; it is controlled by the respective engine control unit via relays.

20 - Heat exchanger

- ❑ Removing and installing ⇒ page 12

21 - Left footwell vent

- ❑ Removing and installing ⇒ page 7

22 - Temperature flap control motor -V68-

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 36

- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system -VAS 5051- or successor model ⇒ page 42

23 - Flexible shaft

- ❑ Removing and installing ⇒ page 9

24 - Footwell vent temperature sender -G192-

- ❑ Removing and installing ⇒ page 38

25 - Heater and air conditioning unit

- ❑ Removing and installing ⇒ page 84
- ❑ Dismantling and assembling ⇒ page 31

26 - Left side vent

27 - Centre vent temperature sender -G191-

- ❑ Removing and installing ⇒ page 39

2.2 Dismantling and assembling heater and air conditioner unit “Climatic”

1 - Temperature flap control motor -V68-

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 36
- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system - VAS 5051- or successor model ⇒ page 42

2 - Bracket

3 - Bolts

- ❑ Bolts must be removed to separate air distribution housing from evaporator housing.

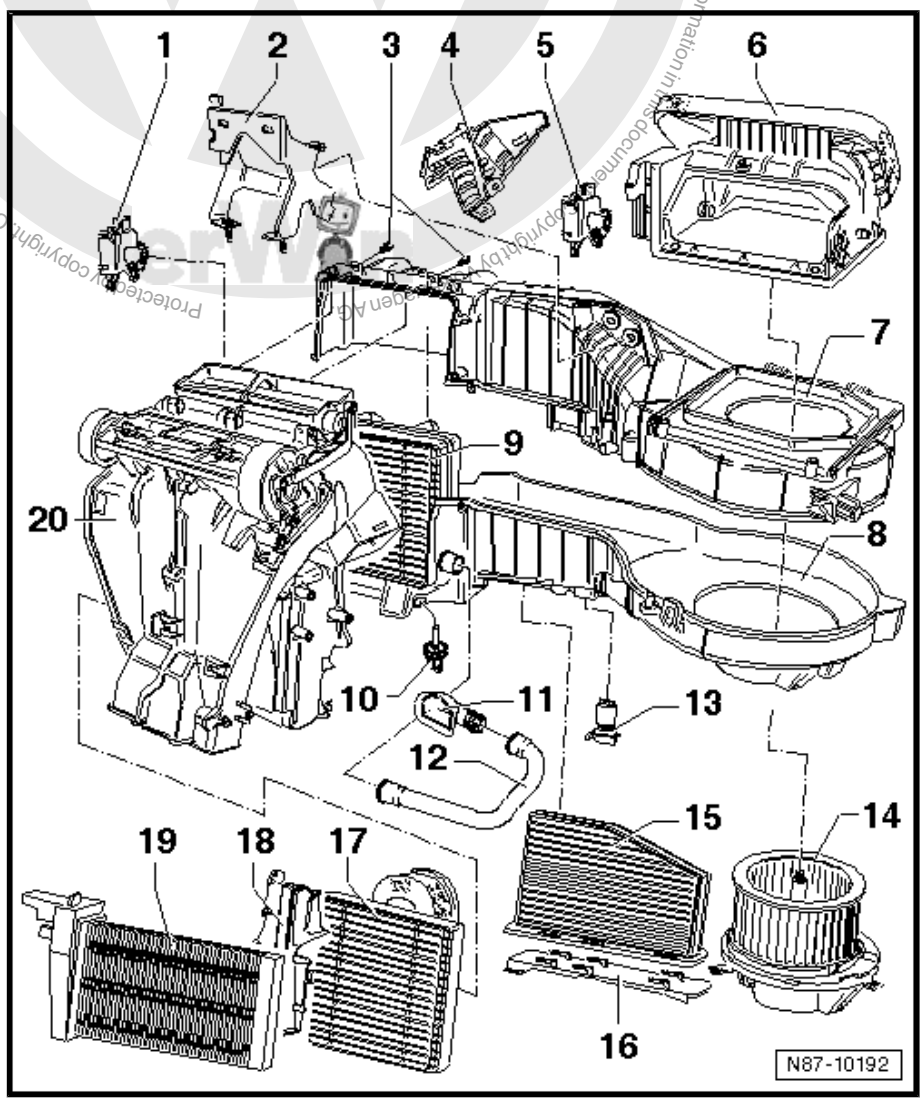
4 - Cover

5 - Air recirculation flap control motor -V113-

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 36
- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system - VAS 5051- or successor model ⇒ page 42

6 - Air intake housing

- ❑ With air recirculation flap



7 - Upper part of evaporator housing

- ❑ Dismantling and assembling evaporator housing ⇒ page 52

8 - Lower part of evaporator housing

- ❑ Dismantling and assembling evaporator housing ⇒ page 52

9 - Evaporator

- ❑ Removing and installing ⇒ page 103

10 - Evaporator temperature sensor -G308- or evaporator output temperature sender -G263-

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)

Note

- ❑ Removing and installing ⇒ page 55

11 - Connections for glove box cooling

- ❑ To dismantle, remove glove compartment ⇒ Rep. Gr. 68
- ❑ Installation position of connections for glove compartment cooling ⇒ page 32

12 - Refrigerant hose for glove compartment cooling

- ❑ To dismantle, remove glove compartment ⇒ Rep. Gr. 68

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

- ❑ Removing and installing ⇒ page 3

14 - Fresh air blower -V2-

- ❑ Removing and installing ⇒ page 3

15 - Dust and pollen filter

- ❑ With activated charcoal filter
- ❑ Removing and installing ⇒ page 4

16 - Cover

- ❑ For dust and pollen filter.

17 - Heat exchanger

- ❑ Removing and installing ⇒ page 12

18 - Heat exchanger trim

19 - Auxiliary air heater element -Z35-

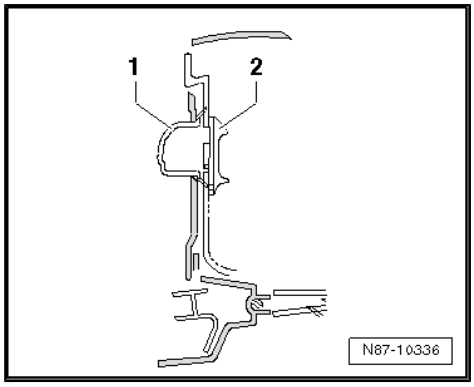
- ❑ Only in vehicles with diesel engines without supplementary heater.
- ❑ Checking: with vehicle diagnostic, testing and information system -VAS 5051- (or later model), under Heating, ventilation, air conditioning; Systems capable of self-diagnosis; Auxiliary heating; Electrical components.
- ❑ Removing and installing ⇒ page 15

20 - Air distribution housing

Installation position of connections for glove compartment cooling

1 - Connecting piece

2 - Valve



2.3 Removing and installing heating and air conditioning controls, “Climatic” with air conditioning system control unit -J301-

2.3.1 Removing

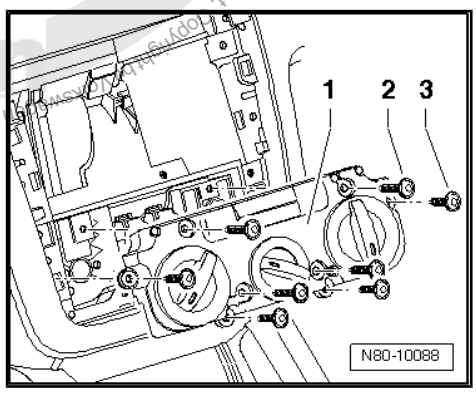
Note

- *The control consists of two separable housings. Before removing controls, set rotary knobs to the following positions:*
- *Heater control to “cold”*
- *Blower to “0”*
- *Vent direction to “footwell”*

– Remove radio ⇒ Rep. Gr. 91 .

– For vehicles without radio, remove centre dash panel trim. ⇒ Rep. Gr. 68 .

– Remove bolts -2- (4.2 x 45) and -3- (4.2 x 16) and remove the controls -1- from centre console.

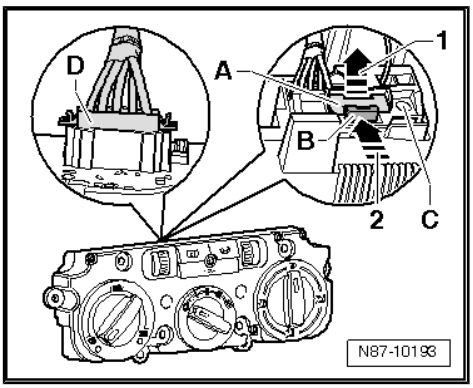


Specified torque for bolts -2- and -3-: 1.5 ± 0.2 Nm.

– Release connector catch -A- by pulling in direction of arrow -1-.

– Push connector catch -B- to connector -arrow 2- and remove connector -C-.

– Release connector catch -D- and remove connector -D-.



2.3.2 Installing

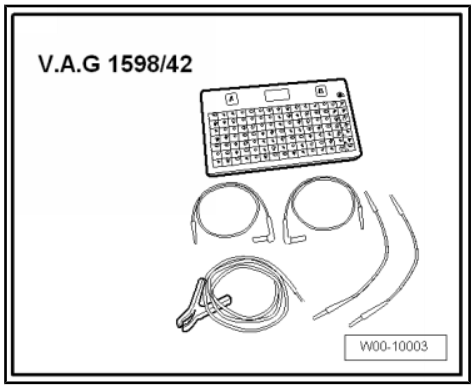
Installation is performed in the reverse order. Ensure that rotary knobs are in the same positions as when removed.

2.4 Connectors on controls for heating and air conditioning “Climatic”

2.4.1 Pin assignment for multi-pin connectors on back of controls for heating and air conditioning “Climatic”

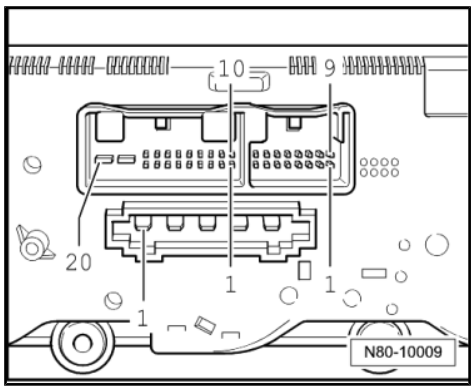
Special tools and workshop equipment required

- Test box -V.A.G 1598/42-
- Adapter cable -V.A.G 1598/47-



- Template -1598/47-2-

20-pin connector, T20c in current flow diagram



3 - Centre vent temperature sender -G191-

5 - High-pressure sender -G65-

7 - CAN, low

8 - CAN, high

12 - Right seat heating (optional)

13 - Left seat heating (optional)

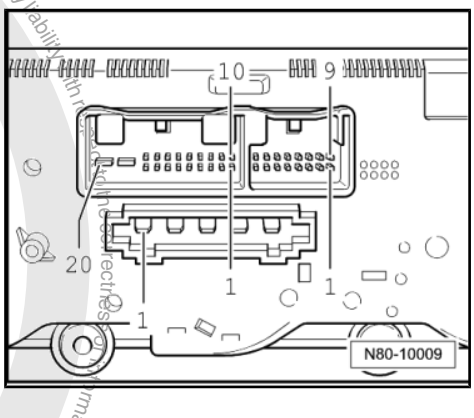
15 - Terminal 75, seat heating (optional)

16 - Air conditioning system compressor regulating valve -N280-

19 - Terminal 30A

20 - Terminal 31

16-pin connector, T16e in current flow diagram



1 - Temperature flap control motor -V68- , warm

2 - Evaporator temperature sensor -G308- or evaporator output temperature sender -G263-

4 - Footwell vent temperature sender -G192-

5 - Temperature flap control motor potentiometer -G92-

7 - + 5 V for temperature flap control motor potentiometer -G92-

8 - Earth for potentiometer for temperature flap control motor -G92- , centre vent temperature sender -G191- , footwell vent temperature sender -G192- and evaporator temperature sensor -G308- or evaporator output temperature sender -G263-

9 - Air recirculation flap control motor -V113- , open

10 - Air recirculation flap control motor -V113- , closed

11 - Temperature flap control motor -V68- , cold

5-pin connector, T5 in current flow diagram

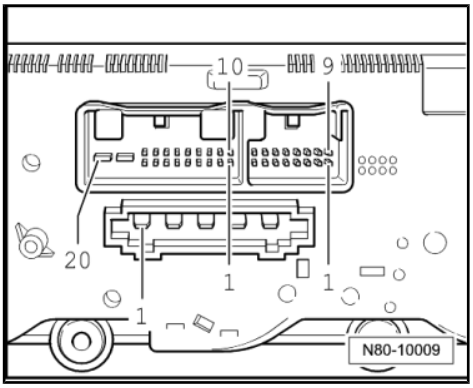
1 - 3rd blower speed

2 - 2nd blower speed

3 - 1st blower speed

4 - 4th blower speed

5 - X terminal



2.5 Removing and installing flexible shaft for air distribution

2.5.1 Removing

– Remove radio ⇒ Rep. Gr. 91 .

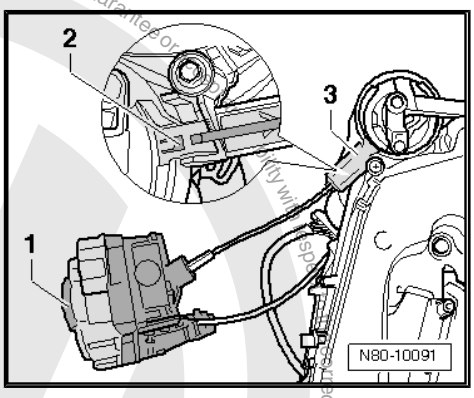
– For vehicles without radio, remove centre dash panel trim ⇒ Rep. Gr. 68 .

– Move flexible shaft to following position:

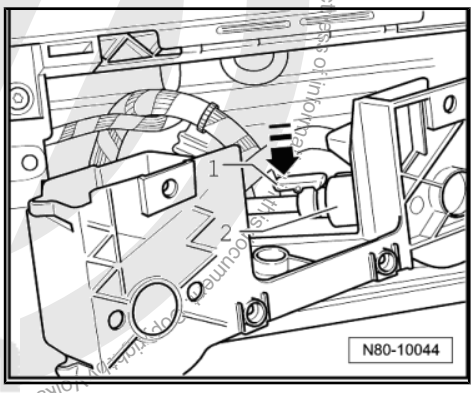
– Turn rotary switch for air distribution -1- until catch in shaft -2- is visible in gears -3-.

– Remove heating and air conditioning controls, Climatic ⇒ page 33 .

– Carefully pull out adapter for controls.



– Press in locking lug -arrow- of flexible shaft and pull out flexible shaft.



Note

When the flexible shaft is installed, the adapter and the rotary knob of the Climatic heating and air conditioning controls must be aligned in a specific position to one another or the system will malfunction.

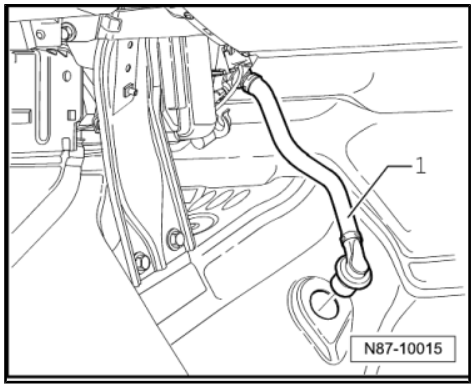
2.5.2 Checking

Flexible shaft for air distribution flap actuator:

– Run fresh air blower at highest speed. If air flows out of defroster jet in the “defrost” position, and no air flows out of footwell vent, then the flexible shaft is correctly installed. Otherwise, remove flexible shaft from adapter. Position controls for Climatic heating and air conditioning on adapter and turn rotary knob for air distribution $^{1}/_{2}$ turn (180°). Then reconnect flexible shaft. Repeat check.

2.6 Checking condensation water drainage hose on heater and air conditioner unit

– Remove footwell trim on front passenger side.



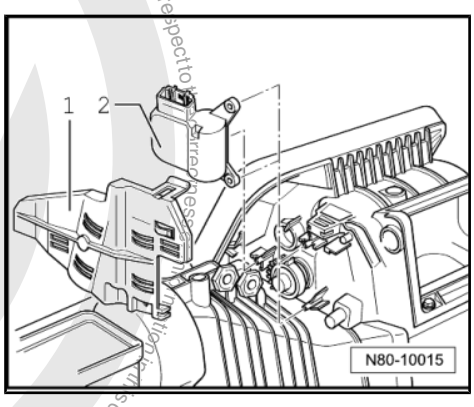
Note

- *It must be possible to push condensation drain hose -1- onto heater and air conditioner unit connection without tension.*
- *The condensation drain hose must be fitted securely to the connection for condensation drainage of the heater and air conditioner unit.*

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

2.7.1 Removing

– Remove glove compartment ⇒ Rep. Gr. 68 .
– Remove cover -1- for control motor.
– Separate connector from recirculated air flap control motor -V113- -2-.
– Pull off air recirculation flap control motor -V113- -2-.



2.7.2 Installing

Install in reverse order.

Note

- *After installation, check operation of air recirculation flap.*
- *Initiate "basic settings" function using vehicle diagnosis, testing and information system -VAS 5051- or successor model* ⇒ page 42 .

2.8 Removing and installing temperature flap control motor -V68-

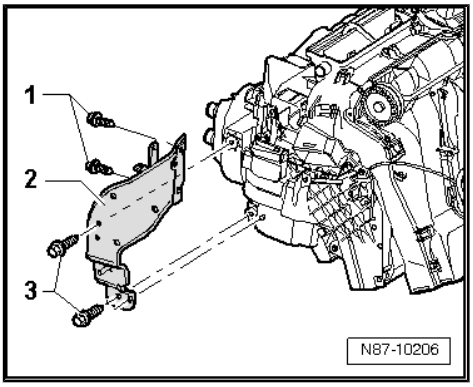
2.8.1 Removing

– Remove left footwell vent ⇒ page 7 .
– Remove left footwell trim ⇒ Rep. Gr. 68 .

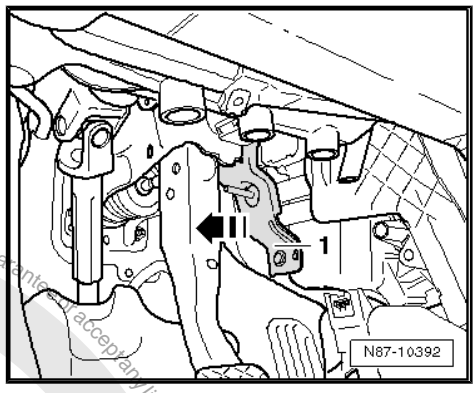
– Remove data bus diagnostic interface -J533- from ⇒ Rep. Gr. 97 .
– Remove bolts -3- (9 Nm ±1.3 Nm).

Do not remove bolts -1-.

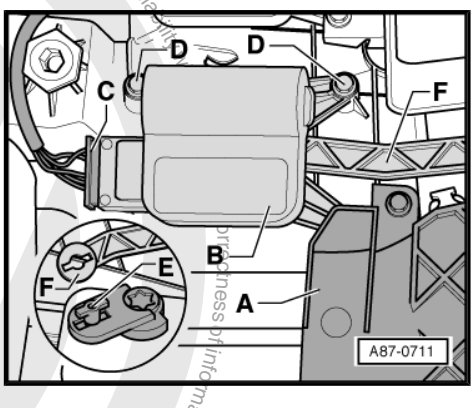
– Do not remove bracket -2-.



– Press bracket -1- in direction of brake pedal -arrow- and secure it on brake pedal with a cable tie.



– Mark connector -C- to control motor (danger of interchanging with other connectors of same construction).
– Separate connector -C- on temperature flap control motor -V68- .
– Remove cover -A-.
– Remove securing bolts -D- (1.4 Nm) and remove temperature flap control motor -V68- -B-.
– Remove lever -E- of control motor from connecting rod -F-.



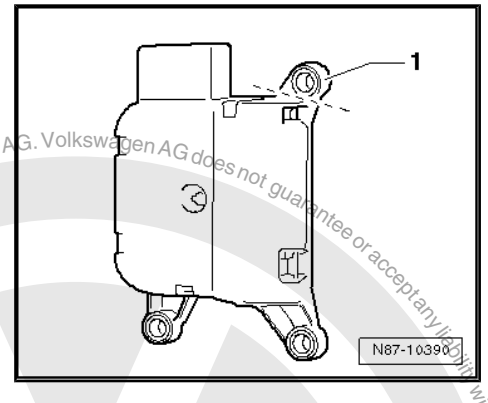
2.8.2 Installing

Note

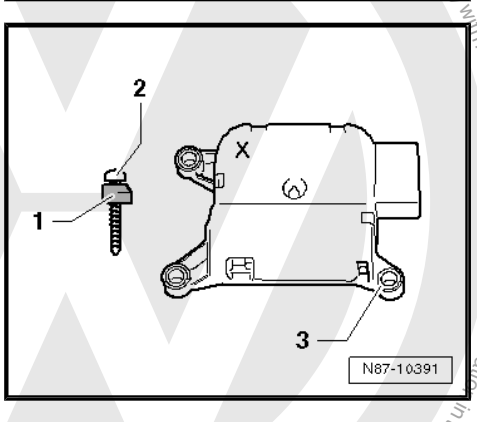
Optimised control motors are marked with an "X".

To ease assembly, use an approx. 2 mm shorter oval-head screw -N 103 254 01- .

– Cut off bracket -1- from old temperature flap control motor -V68- , e.g. using side cutting pliers.



– Position new temperature flap control motor -V68- marked with an “X” with shortened oval-head screw -2- and cut-off bracket -1- on bracket -3- on blower box.



Note

- *After installation, check operation of left temperature flap.*
- *Initiate “basic settings” function using vehicle diagnosis, testing and information system -VAS 5051- or successor model* *⇒ page 42* .

2.9 Removing and installing footwell vent temperature sender -G192-

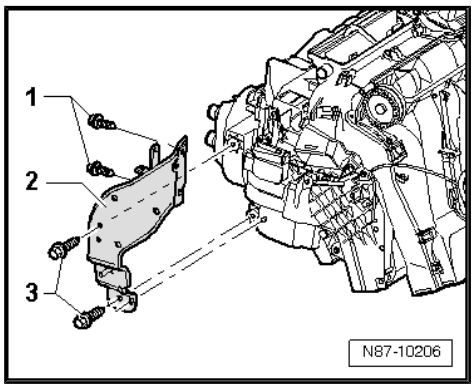
2.9.1 Removing

– Remove dash panel ⇒ Rep. Gr. 70 .

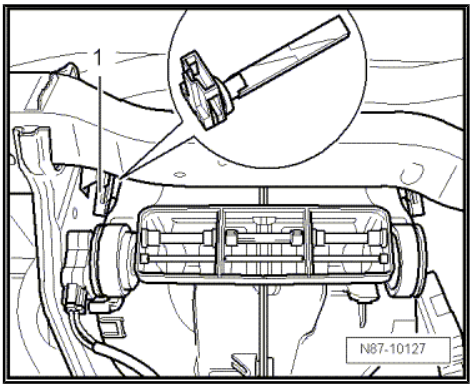
– Remove data bus diagnostic interface -J533- from ⇒ Rep. Gr. 97 .

– Remove left footwell vent ⇒ page 7 .

– Remove bolts -1- and -3- (9 ± 1.3 Nm).



– Remove bracket -2-.
– Pull connector off footwell vent temperature sender -G192- -1-.
– Turn footwell vent temperature sender -G192- 90° and remove it from housing.



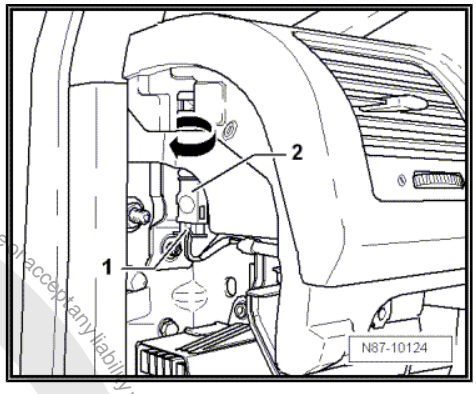
2.9.2 Installing

Install in reverse order.

2.10 Removing and installing centre vent temperature sender -G191-

2.10.1 Removing

– Remove left dash panel cover ⇒ Rep. Gr. 70 .
– Pull connector off centre vent temperature sender -G191- -1-.
– Turn centre vent temperature sender -G191- -2- 90° in -direction of arrow- and remove from dash panel.



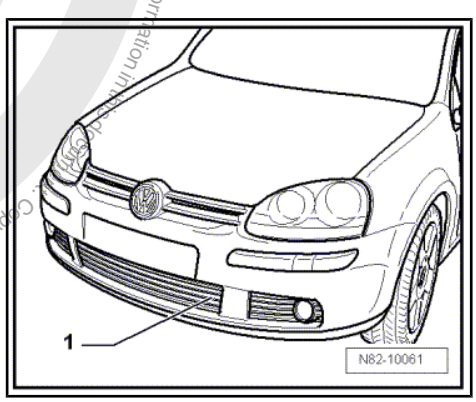
2.10.2 Installing

Install in reverse order.

2.11 Ambient temperature sensor -G17-

2.11.1 Removing

– Pull centre grille out of fasteners in front bumper cover ⇒ Rep. Gr. 63.
– Unclip ambient temperature sensor -G17- -1- from retainer and separate electrical connector.



2.11.2 Installing

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

Note

Ensure proper seating of electrical connection to prevent intrusion of splashed water.

3 Air conditioning system with automatic regulation “Climatronic”

Note

- *Switch from °C to °F and vice versa. Press and hold AUTO button and then press ECON or AC button.*
- *Pressing the AUTO button will cancel all settings which deviate from automatic operation.*
- *Deviations from automatic operation ⇒ appropriate operating instructions.*
- *Vehicles up to calendar week 21/2007: if ECON button is activated, the air conditioner compressor will be switched to almost zero delivery. Depending on vehicle equipment, the auxiliary air heater element -Z35- or the auxiliary heater (in supplementary heater function) will be switched off. If the auxiliary heater is activated by the driver, it will remain on. The respective surrounding conditions have to be fulfilled or the activation signals must have been delivered. The heating and ventilation operations continue to be controlled electronically.*
- *ECON button deactivated, air conditioner compressor switched on. Depending on vehicle equipment, the auxiliary air heater element -Z35- or the auxiliary heater (in supplementary heater function) will be switched on. If the auxiliary heater is activated by the driver, it will remain on. The respective surrounding conditions have to be fulfilled or the activation signals must have been delivered. The heating and ventilation operations continue to be controlled electronically.*
- *ON/OFF button activated, Climatronic in operation.*
- *ON/OFF button deactivated, Climatronic out of operation. There is no heating and ventilation.*
- *Vehicles from calendar week 22/2007: the ECON button was discontinued. Replaced by AC button. ON/OFF button was discontinued. Replaced by OFF button.*
- *AC button activated, air conditioner compressor switched on. Depending on vehicle equipment, the auxiliary air heater element -Z35- or the auxiliary heater (in supplementary heater function) will be switched on. If the auxiliary heater is activated by the driver, it will remain on. The respective surrounding conditions have to be fulfilled or the activation signals must have been delivered. The heating and ventilation operations continue to be controlled electronically.*
- *AC button deactivated, air conditioner compressor will be switched to almost zero delivery. Depending on vehicle equipment, the auxiliary air heater element -Z35- or the auxiliary heater (in supplementary heater function) will remain on. If the auxiliary heater is activated by the driver, it will remain on. The respective surrounding conditions have to be fulfilled or the activation signals must have been delivered. The heating and ventilation operations continue to be controlled electronically.*
- *OFF button is activated. Climatronic is out of operation. There is no heating and ventilation.*
- *OFF button is deactivated. Climatronic is in operation.*

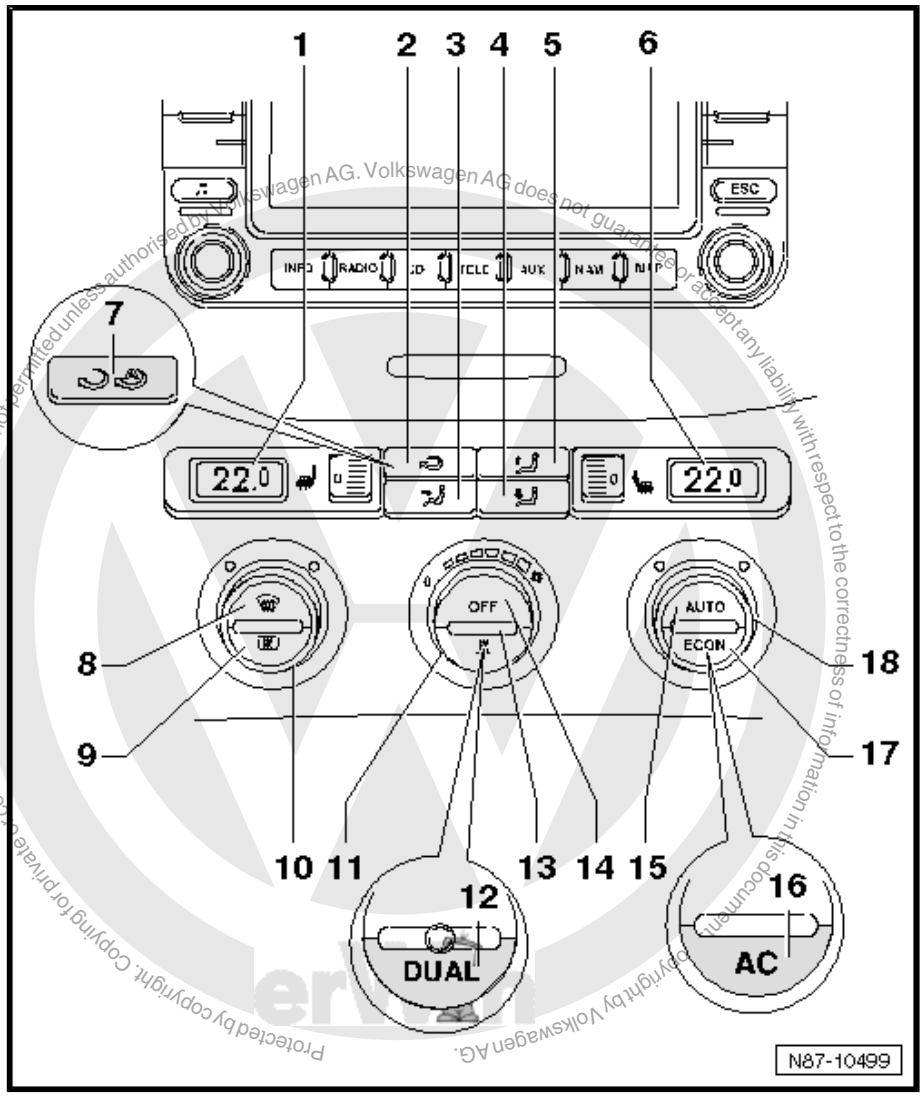
3.1 Procedure for checking and adjusting components

Select “guided fault finding” function in the vehicle diagnostic, testing and information system -VAS 5051- (or later model).

After all control units have been read:

– Press “GoTo” button.
– Select “Function/component selection”.
– Select “Body”.
– “Heating, ventilation, air conditioning (Repair group 01; 80… 87)”.
– Select “01-On Board Diagnostic (OBD) capable systems”.
– Select “Climatronic” or “Climatic”.
– Select “Functions”.
– “Basic settings”
– “Checking cooling output”.
– “Read data block”.

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



1 - Display for selected left interior temperature

Switch from °C to °F and vice versa. Press and hold AUTO button and then press ECON or AC button.

2 - Air recirculation button

- ❑ Pressing air recirculation button prevents polluted air from entering interior.

3 - Centre air distribution button

4 - Lower air distribution button

5 - Upper air distribution button

6 - Display for selected right interior temperature

Switch from °C to °F and vice versa. Press and hold AUTO button and then press ECON or AC button.

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

- ❑ Pressing the air recirculation button switches to the air recirculation mode and prevents polluted air from entering the interior.
- ❑ Vehicles from calendar week 22/2007. Pressing the air recirculation button again activates the automatic recirculation mode.

Note

8 - Windscreen defroster button

9 - Rear window heating button

10 - Rotary regulator for interior temperature, left

11 - Rotary blower regulator

- ❑ Turn to change blower speed.

12 - Dual button or instant heating button -E537-

- ❑ If the lamp in the button is on, the left and right temperatures may be adjusted independently.
- ❑ If the Dual button is pressed, the warning lamp goes out and the passenger side will assume the temperature setting for the driver side.

Note

13 - Dash panel temperature sensor -G56-

14 - Button for air conditioning system OFF or ON/OFF

15 - 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.

16 - AC button

- ❑ Observe notes on vehicles up to calendar week 21/2007 and from calendar week 22/2007 ⇒ page 41 .
- ❑ Deactivating the AC button sets the compressor to near-zero delivery. The heating and ventilation operations continue to be controlled electronically.

17 - ECON button

- ❑ Observe notes on vehicles up to calendar week 21/2007 and from calendar week 22/2007 ⇒ page 41 .
- ❑ Pressing the ECON button sets the air conditioner compressor to near-zero delivery. The heating and ventilation operations continue to be controlled electronically. The optional supplementary heater will likewise be switched off.

18 - Rotary regulator for interior temperature, right

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

Note

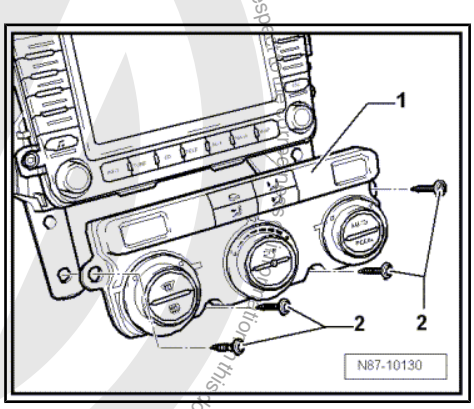
The Climatronic control unit -J255- and the operating and display unit for Climatronic air conditioning system -E87- are a single component which cannot be dismantled.

3.3.1 Removing

– Remove centre dash panel trim ⇒ Rep. Gr. 68 .

– Remove bolts -2- (1.5 ± 0.2 Nm) and remove operating and display unit for Climatronic air conditioning system -E87- -1- from dash panel.

– Separate connectors on operating and display unit for Climatronic air conditioning system -E87- .



3.3.2 Installing

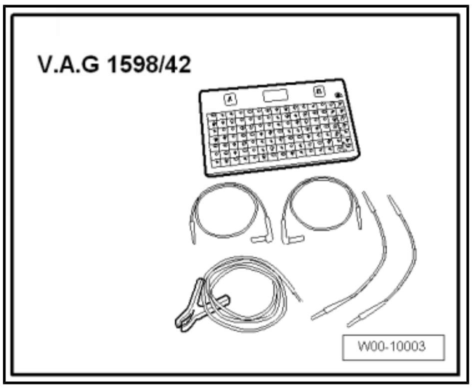
Install in reverse order.

3.4 Connectors on Climatronic control unit -J255-

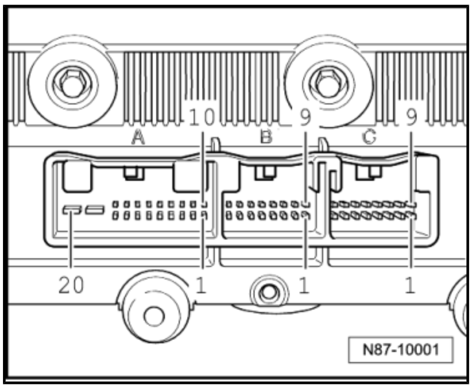
3.4.1 Pin assignment for multi-pin connectors A, B and C on back of Climatronic control unit -J255-

Special tools and workshop equipment required

- Test box -V.A.G 1598/42-
- Adapter cable -V.A.G 1598/47-



- Template -1598/47-2-



20-pin connector, T20c in current flow diagram -A-

1 - Sunlight penetration photosensor 2 -G134- or sunlight penetration photosensor -G107- , signal

2 - High-pressure sender -G65-

3 - Sunlight penetration photosensor 2 -G134- or sunlight penetration photosensor -G107- , signal

4 - From calendar week 45/2007: air quality sensor -G238- , signal

5 - CAN, high

6 - CAN, low

9 - + 5 V for sunlight penetration photosensor 2 -G134- or sunlight penetration photosensor -G107-

10 - Heated driver seat control unit -J131- (optional)

11 - Heated front passenger seat control unit -J132- (optional)

12 - Terminal 75 (optional)

13 - Left vent temperature sender -G150-

14 - Right vent temperature sender -G151-

16 - Positive connection (15a) or positive connection (30a) for vehicles with supplementary heating and air quality sensor -G238-

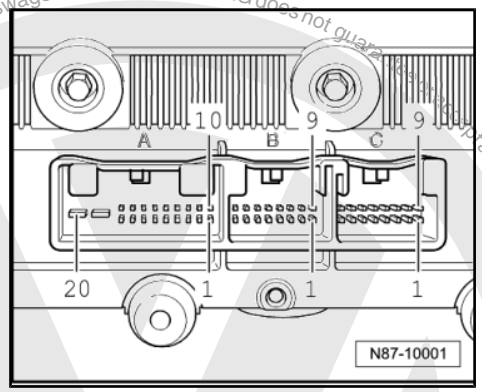
17 - Signal earth of senders

18 - Air conditioning system compressor regulating valve -N280-

19 - Terminal 31

20 - Positive connection (15a) or positive connection (30a) for vehicles with supplementary heating.

16-pin connector, T16c in current flow diagram -B-



1 - + 5V for control motor

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 centre flap control motor -G112-

6 - Vehicles up to calendar week 17/2007: potentiometer for air recirculation flap control motor -G143- . Vehicles from calendar week 18/2007: potentiometer for air recirculation flap control motor -G143- was discontinued.

7 - Vehicles up to calendar week 17/2007: potentiometer for air flow flap control motor -G113- . Vehicles from calendar week 18/2007: potentiometer for control motor for fresh air and air recirculation flap and air flow flap -G644- .

8 - Left footwell vent temperature sender -G261-

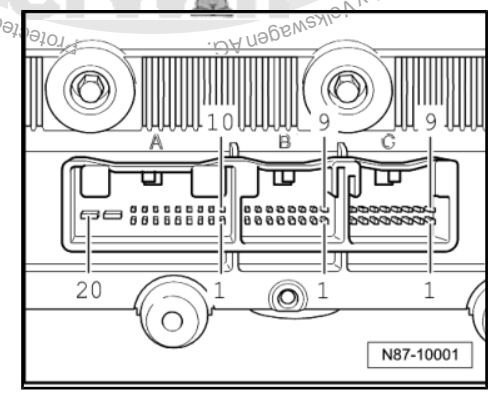
9 - Right footwell vent temperature sender -G262-

10 - Fresh air intake duct temperature sensor -G89- only installed up to December 2005

11 - Evaporator temperature sensor -G308- or evaporator output temperature sender -G263-

14 - Signal earth, potentiometer

16-pin connector, T16d 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 - Central flap control motor -V70- , chest

6 - Central flap control motor -V70- , footwell

7 - Vehicles up to calendar week 17/2007: air recirculation flap control motor -V113- , recirculation actuated. From calendar week 18/2007: air recirculation flap control motor -V113- was discontinued.

8 - Vehicles up to calendar week 17/2007: air recirculation flap control motor -V113- , fresh air actuated. From calendar week 18/2007: air recirculation flap control motor -V113- was discontinued.

9 - Vehicles up to calendar week 17/2007: air flow flap control motor -V71- open. From calendar week 18/2007: control motor for fresh air and air recirculation flap and air flow flap -V425- (air recirculation/partial air recirculation)

10 - Vehicles up to calendar week 17/2007: air flow flap control motor -V71- closed. From calendar week 18/2007: control motor for fresh air and air recirculation flap and air flow flap -V425- (air recirculation/increased flow)

11 - Right temperature flap control motor -V159- , cold

12 - Right temperature flap control motor -V159- , warm

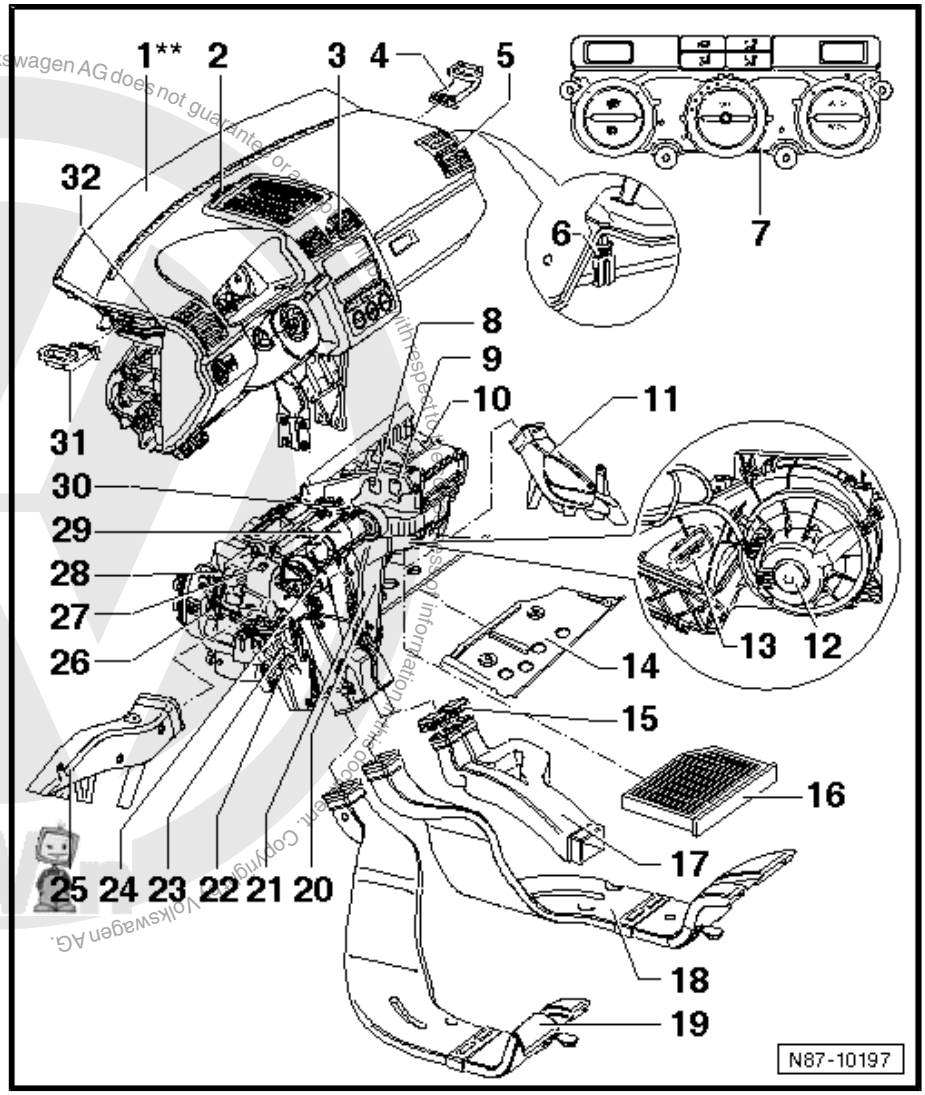
15 - Fresh air blower -V2- (PWM actuated)

16 - Fresh air blower -V2- , feedback signal

3.5 Climatronic - passenger compartment

Note

- *Disconnect battery before removing components marked ** ⇒ Rep. Gr. 27 .*
- *A label indicates the type and quantity of refrigerant used.*



1 - Dash panel**

- ❑ Removing and installing ⇒ Rep. Gr. 70

2 - Sunlight penetration photosensor -G107- or sunlight penetration photosensor 2 -G134-

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Function: controls temperature flap and fresh air blower depending on light intensity
- ❑ Emergency running in event of failure: Climatronic control unit -J255- assumes fixed value
- ❑ Removing and installing ⇒ page 59

3 - Centre vents

- ❑ Removing and installing ⇒ page 5

4 - Right side vent

5 - Vent

- ❑ Removing and installing ⇒ page 5

6 - Right vent temperature sender -G151-

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 58

7 - Climatronic control unit -J255-

- ❑ The Climatronic control unit -J255- and the operating and display unit for Climatronic air conditioning system -E87- are a single component which cannot be dismantled.
- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 44
- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system -VAS 5051- or successor model ⇒ page 42

8 - Vehicles up to calendar week 17/2007: air flow flap control motor -V71- ; from calendar week 18/2007: control motor for fresh air and air recirculation flap and air flow flap -V425-

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 60 for vehicles up to calendar week 17/2007

- ❑ Removing and installing ⇒ page 61 for vehicles up to calendar week 18/2007
- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system -VAS 5051- or successor model ⇒ page 42

9 - Vehicles up to calendar week 17/2007: air recirculation flap control motor -V113- ; from calendar week 18/2007: air recirculation flap control motor -V113- was discontinued

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 60
- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system -VAS 5051- or successor model ⇒ page 42

10 - Fresh air intake duct temperature sensor -G89-

- ❑ Only installed in vehicles up to 12.05
- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Function: temperature sensor controls temperature flap and fresh air blower, depending on temperature
- ❑ To dismantle, remove dash panel ⇒ Rep. Gr. 70

11 - Right footwell vent

- ❑ Removing and installing ⇒ page 7

12 - Fresh air blower -V2- with fresh air blower control unit -J126-

- ❑ Vehicles as of 11.05; fresh air blower control unit -J126- can be renew individually
- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing fresh air blower -V2- ⇒ page 3
- ❑ Removing and installing fresh air blower control unit -J126- ⇒ page 53

13 - Connector

14 - Baffle plate for heater unit

- ❑ Removing ⇒ page 2

15 - Sealing cap

- ❑ Fitted only in vehicles without air duct to vent in rear centre console.

16 - Dust and pollen filter

- ❑ With activated charcoal filter
- ❑ Removing and installing ⇒ page 4

17 - Connection for centre console air duct (optional)

- ❑ To remove, centre console must be removed ⇒ Rep. Gr. 68 .

18 - Air duct for right rear footwell

- ❑ Removing and installing ⇒ page 6

19 - Air duct for left rear footwell

- ❑ Removing and installing ⇒ page 6

20 - Evaporator temperature sensor -G308- or evaporator output temperature sender -G263-

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)

Note

- ❑ Removing and installing ⇒ page 55

21 - Right temperature flap control motor -V159-

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 65
- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system -VAS 5051- or successor model ⇒ page 42

22 - Auxiliary air heater element -Z35-

- ❑ Installed only in vehicles with diesel engines without auxiliary coolant heater.

- ❑ Checking: with vehicle diagnostic, testing and information system -VAS 5051- (or later model), under Heating, ventilation, air conditioning; Systems capable of self-diagnosis; Auxiliary heating; Electrical components.
- ❑ Removing and installing ⇒ page 15

23 - Heat exchanger
- ❑ Removing and installing ⇒ page 12

24 - Central flap control motor -V70-
- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 66
- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system -VAS 5051- or successor model ⇒ page 42

25 - Left footwell vent
- ❑ Removing and installing ⇒ page 7

26 - Left temperature flap control motor -V158-
- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 64
- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system -VAS 5051- or successor model ⇒ page 42

27 - Left footwell vent temperature sender -G261-
- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing ⇒ page 54

28 - Defroster flap control motor -V107-
- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 63
- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system -VAS 5051- or successor model ⇒ page 42

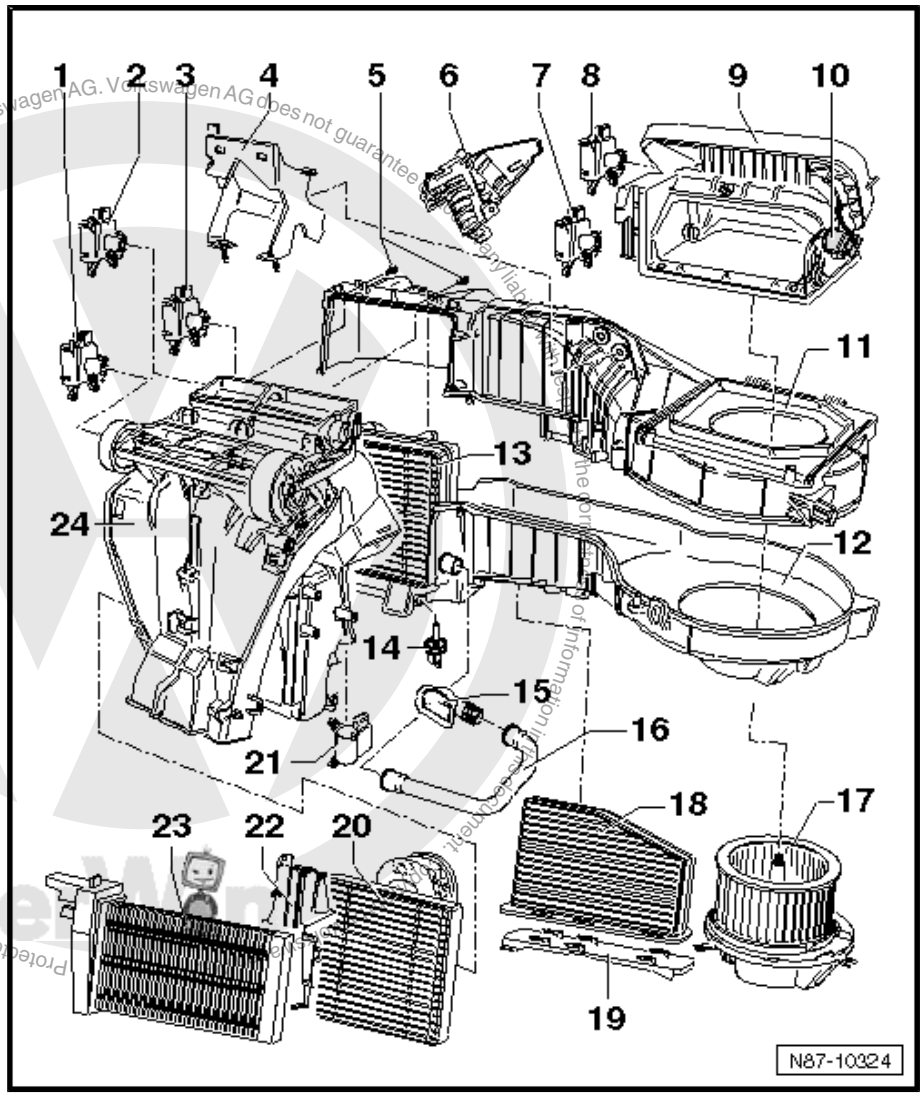
29 - Heater and air conditioning unit
- ❑ Removing and installing ⇒ page 84
- ❑ Dismantling and assembling ⇒ page 50

30 - Right footwell vent temperature sender -G262-
- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing ⇒ page 54

31 - Left side vent

32 - Left vent temperature sender -G150-
- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 58

3.6 Dismantling and assembling heater and air conditioner unit “Climatronic”



1 - Central flap control motor -V70-

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 66
- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system -VAS 5051- or successor model ⇒ page 42

2 - Left temperature flap control motor -V158-

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 64
- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system -VAS 5051- or successor model ⇒ page 42

3 - Defroster flap control motor -V107-

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 63
- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system -VAS 5051- or successor model ⇒ page 42

4 - Bracket

5 - Bolts

- ❑ Bolts must be removed to separate air distribution housing from evaporator housing.

6 - Cover

7 - Vehicles up to calendar week 17/2007: air recirculation flap control motor -V113- ; from calendar week 18/2007: air recirculation flap control motor -V113- was discontinued

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 60
- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system -VAS 5051- or successor model ⇒ page 42

8 - Vehicles up to calendar week 17/2007: air flow flap control motor -V71- ; from calendar week 18/2007: control motor for fresh air and air recirculation flap and air flow flap -V425-

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 60 for vehicles up to calendar week 17/2007
- ❑ Removing and installing ⇒ page 61 for vehicles up to calendar week 18/2007

- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system -VAS 5051- or successor model ⇒ page 42

9 - Air intake housing

- ❑ With air recirculation flap
- ❑ With air flow flap (Climatronic).

10 - Fresh air intake duct temperature sensor -G89-

- ❑ Only installed in vehicles up to 12.05
- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Function: temperature sensor controls temperature flap and fresh air blower, depending on temperature
- ❑ To dismantle, remove dash panel ⇒ Rep. Gr. 70

11 - Upper part of evaporator housing

- ❑ Dismantling and assembling evaporator housing ⇒ page 52

12 - Lower part of evaporator housing

- ❑ Dismantling and assembling evaporator housing ⇒ page 52

13 - Evaporator

- ❑ Removing and installing ⇒ page 103

14 - Evaporator temperature sensor -G308- or evaporator output temperature sender -G263-

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)

Note

- ❑ Removing and installing ⇒ page 55

15 - Connections for glove box cooling

- ❑ To dismantle, remove glove compartment ⇒ Rep. Gr. 68

16 - Refrigerant hose for glove compartment cooling

- ❑ To dismantle, remove glove compartment ⇒ Rep. Gr. 68
- ❑ Installation position of connections for glove compartment cooling ⇒ page 52

17 - Fresh air blower -V2- with fresh air blower control unit -J126-

- ❑ Vehicles as of 11.05; fresh air blower control unit -J126- can be renew individually
- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing fresh air blower -V2- ⇒ page 3
- ❑ Removing and installing fresh air blower control unit -J126- ⇒ page 53

18 - Dust and pollen filter

- ❑ With activated charcoal filter
- ❑ Removing and installing ⇒ page 4

19 - Cover

- ❑ For dust and pollen filter.

20 - Heat exchanger

- ❑ Removing and installing ⇒ page 12

21 - Right temperature flap control motor -V159-

- ❑ Checking: vehicle diagnostic, testing and information system -VAS 5051- (or later model)
- ❑ Removing and installing ⇒ page 65
- ❑ Renewing: initiate basic settings using vehicle diagnosis, testing and information system -VAS 5051- or successor model ⇒ page 42

22 - Heat exchanger trim

23 - Auxiliary air heater element -Z35-

- ❑ Installed only in vehicles with diesel engines with no supplementary heater

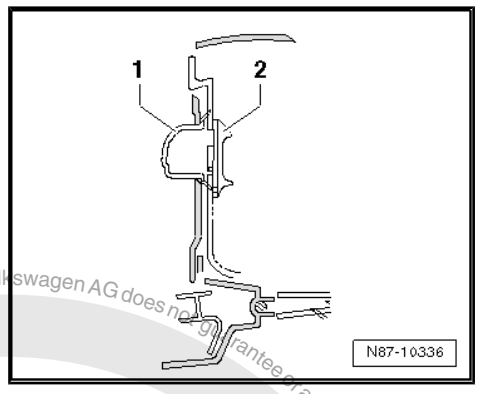
- ❑ Checking: with vehicle diagnostic, testing and information system -VAS 5051- (or later model), under Heating, ventilation, air conditioning; Systems capable of self-diagnosis; Auxiliary heating; Electrical components.
- ❑ Removing and installing ⇒ page 15 .

24 - Air distribution housing

Installation position of connections for glove compartment cooling

1 - Connecting piece

2 - Valve



3.7 Assembly overview - evaporator housing

– Remove heating and air conditioning unit ⇒ page 84 .

– Separate air distribution housing/evaporator housing from heater and air conditioning unit ⇒ page 24 .

1 - Lower part of evaporator housing

- ❑ Dismantling and assembling ⇒ page 25

2 - Evaporator

- ❑ Check insulation. It must be complete.
- ❑ Removing and installing ⇒ page 103

3 - Clip

4 - Upper part of evaporator housing

- ❑ Dismantling and assembling ⇒ page 25

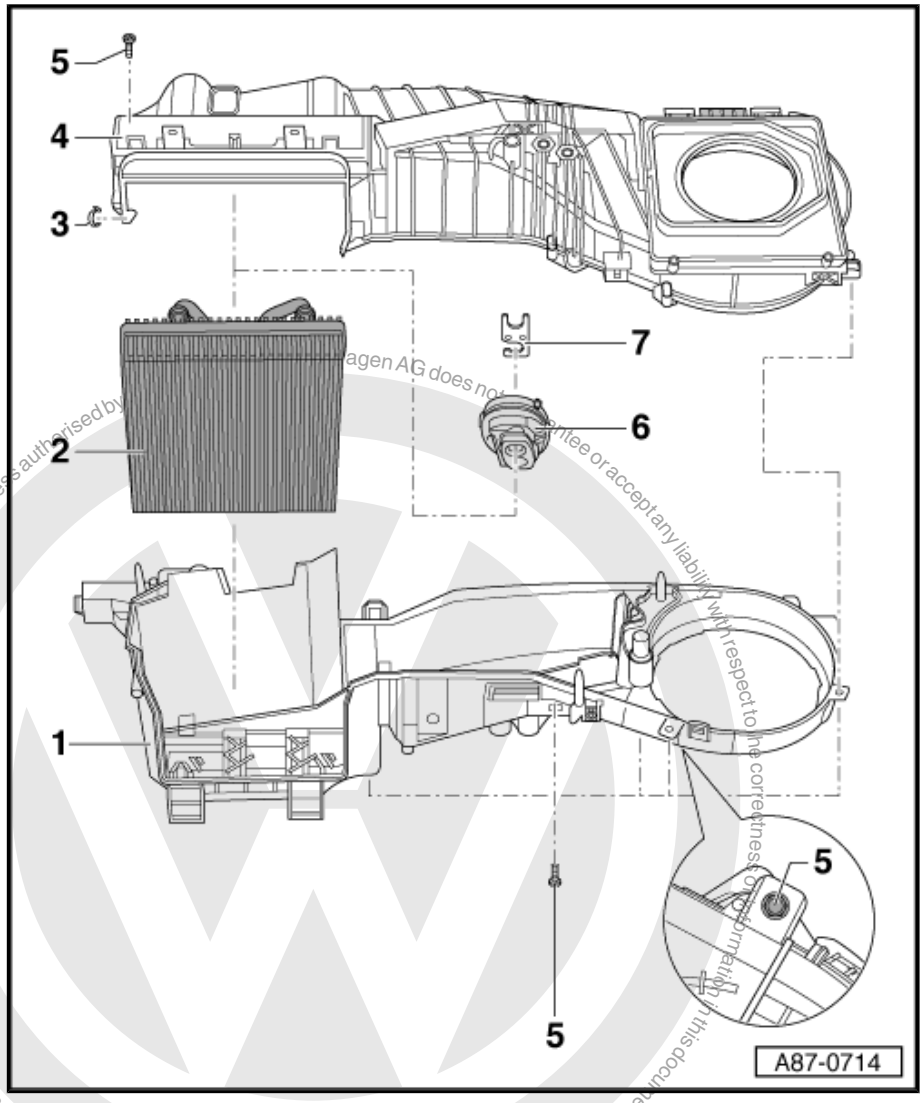
5 - Bolt

6 - Sealing and insulation

- ❑ Heat insulation for expansion valve.
- ❑ Removing and installing ⇒ page 103

7 - Bracket

- ❑ Removing and installing ⇒ page 103



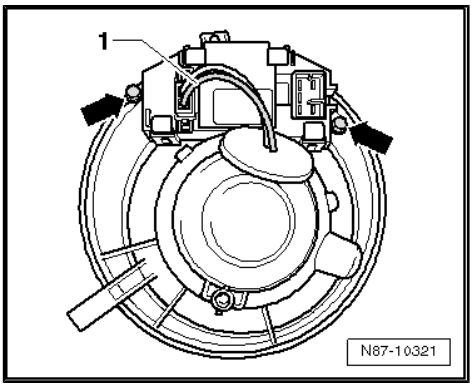
3.8 Removing and installing fresh air blower control unit -J126-

3.8.1 Removing

– Remove fresh air blower -V2- ⇒ page 3 .

– Disconnect connector -1- to fresh air blower -V2- .

– Remove bolts -arrows-.



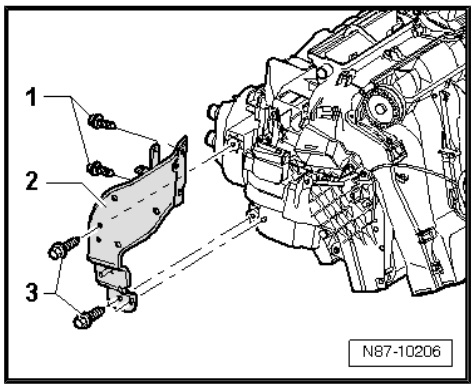
3.8.2 Installing

Install in reverse order.

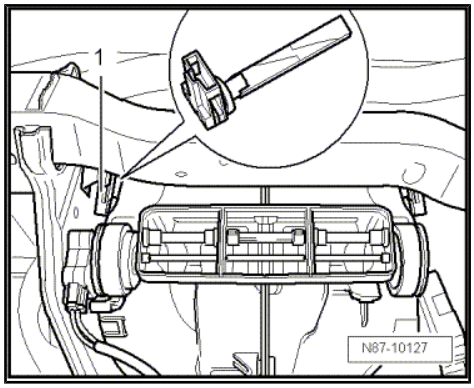
3.9 Removing and installing left footwell vent temperature sender -G261-

3.9.1 Removing

– Remove dash panel ⇒ Rep. Gr. 70 .
– Remove bolts -1- and -3- (9 ± 1.3 Nm).
– Remove retainer -2-.



– Pull connector off left footwell vent temperature sender -G261- -1-.
– Turn left footwell vent temperature sender -G261- -1- 90° and remove it from housing.



3.9.2 Installing

Install in reverse order.

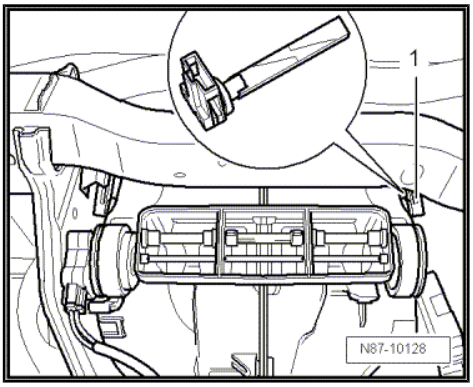
3.10 Removing and installing right footwell vent temperature sender -G262-

3.10.1 Removing

Note

For better illustration, right footwell vent temperature sender -G262- is shown with dash panel removed. The dash panel need not be removed.

– Remove glove compartment ⇒ Rep. Gr. 68 .
– Pull connector off right footwell vent temperature sender -G262- -1-.
– Turn right footwell vent temperature sender -G262- -1- 90° and remove it from housing.



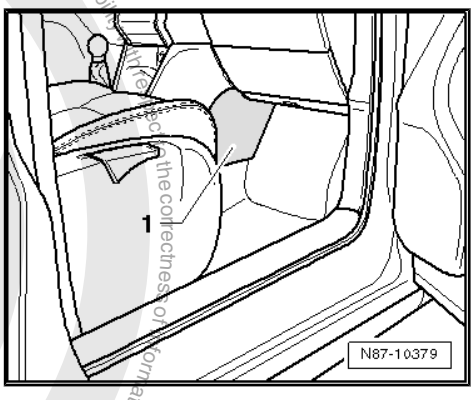
3.10.2 Installing

Install in reverse order.

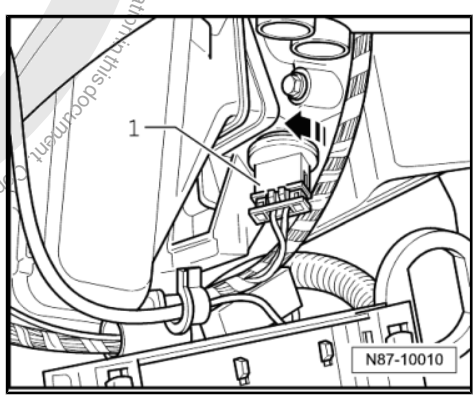
3.11 Removing and installing evaporator temperature sensor -G308- or evaporator output temperature sender -G263-

3.11.1 Removing

– Remove right footwell trim -1-.



– Pull connector off evaporator temperature sensor -G308- or evaporator output temperature sender -G263- -1-.
– Turn evaporator temperature sensor -G308- or evaporator output temperature sender -G263- in -direction of arrow- and pull it out.



3.11.2 Installing

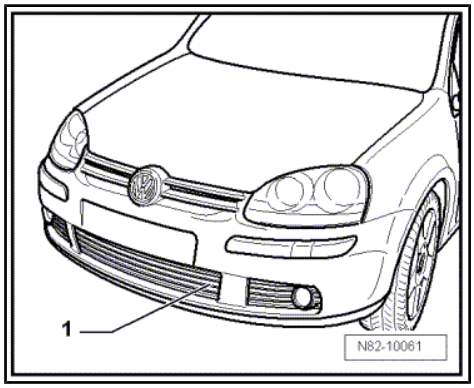
Install in reverse order.

3.12 Ambient temperature sensor -G17-

3.12.1 Removing

– Pull centre grille out of fasteners in front bumper cover ⇒ Rep. Gr. 63 .

– Unclip ambient temperature sensor -G17- from retainer and separate electrical connector.



3.12.2 Installing

Note

Ensure proper seating of electrical connection to prevent intrusion of splashed water.

3.13 Function of air quality sensor -G238-

- The air quality sensor detects noxious substances in the ambient air (primarily 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. +2° C, air recirculation is actuated even when there is a minimal increase in noxious substances in the ambient air.

At an ambient temperature between approx. +2° C and approx. -5° C, air recirculation is not actuated until there is a strong increase in noxious substances in the ambient air. The compressor is also switched on at the same time.

At an ambient temperature less than approx. -5° 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, and the compressor is not started. When the concentration decreases, the air conditioning system is switched back to fresh air mode.

- The “automatic air recirculation” function can be switched off at any time. If the function is active, the compressor will be switched on even at an ambient temperature below +2° C when “automatic air recirculation” is required. However, even with this function, it is not possible to operate the compressor at temperatures below -5° C.
- On vehicles with “automatic air recirculation”, the air conditioner compressor can also be switched on at temperatures down to approx. -5° C even if the recirculated air function has been activated manually.
- 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 sensitivity to the prevailing environmental pollution.
- If the level of noxious substances in the ambient air remains relatively high over a long period of time, the intelligent sensor starts to adapt to the change in environmental conditions so that, generally, the demand for recirculated air lasts less than 12 minutes in areas where the ambient air exhibits a constant

level of pollution. 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.
- To prevent too frequent operation of the recirculation/fresh air flap, the flap is not actuated immediately if there is a minimal increase in noxious substances in the ambient 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 the air recirculation/fresh air flap from switching too frequently, the sensor's request for “automatic air recirculation” continues for at least 25 seconds (minimum waiting period) even if the air pollutants decrease to a level that no longer requires air recirculation.
- 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 in the “defrost” mode.
- The air quality sensor -G238- requires approx. 30 seconds to become operational once the ignition has been switched on (warm-up time). During this time, the sensor can send no request for “automatic air recirculation” 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.

3.14 Removing and installing air quality sensor -G238-

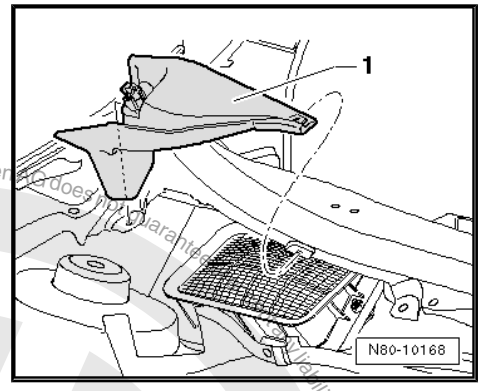
Note

- *The air quality sensor -G238- is installed on the air intake grille in the front right (from the driver's perspective) of the 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).*

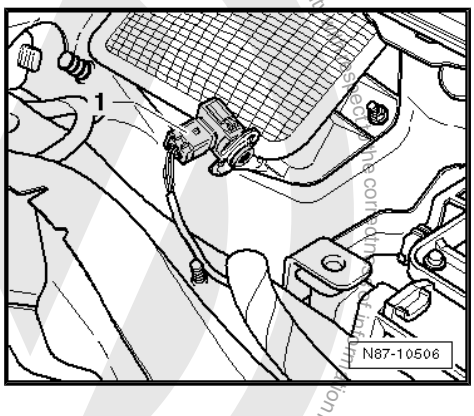
3.14.1 Removing

– Remove plenum chamber cover ⇒ Rep. Gr. 64 .

– Remove cover -1- from plenum chamber.



– Separate connector on air quality sensor -G238- .
– Release air quality sensor -G238- -1- and turn out of retainer on air intake grille.



3.14.2 Installing

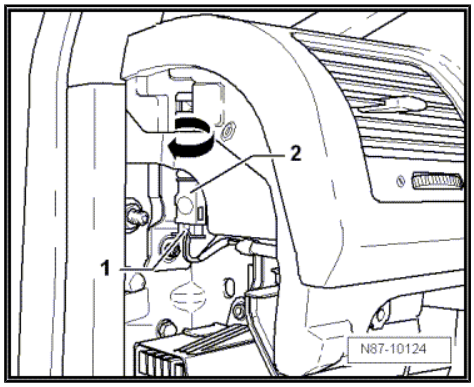
– Install in reverse order.

3.15 Removing left vent temperature sender -G150- and right vent temperature sender -G151-

Note

Removal of senders on both sides is identical, but one is a mirror image of the other.

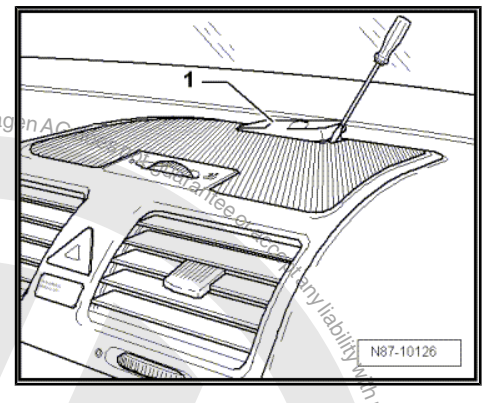
– Remove left or right dash panel cover ⇒ Rep. Gr. 70 .
– Pull connector -1- off vent temperature sender -2-.
– Turn vent temperature sender -2- 90° in -direction of arrow- and remove from dash panel.



3.16 Removing sunlight penetration photosensor -G107- or sunlight penetration photosensor 2 -G134-

– Unclip sunlight penetration photosensor -1- out of dash panel using an appropriate tool.

– Pull connector off sunlight penetration photosensor.

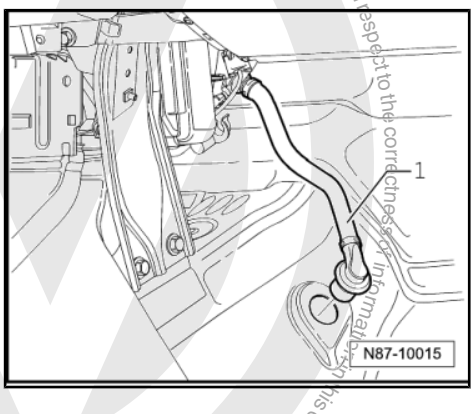


3.17 Checking condensation water drainage hose on air conditioner unit

– Remove footwell trim on front passenger side.

Note

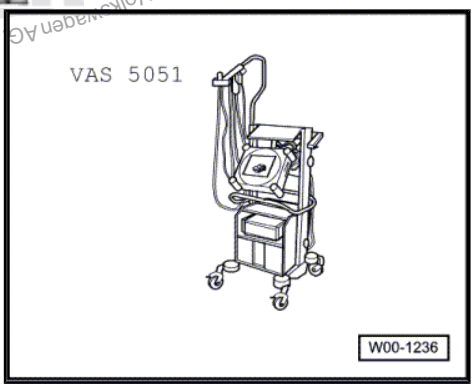
- *It must be possible to push condensation water drainage hose -1- onto air conditioner unit connection without tension.*
- *The condensation drain hose must be fitted securely to condensation drain connection on heater and air conditioning unit.*



3.18 Renewing control motors for air conditioning regulation

Special tools and workshop equipment required

- Vehicle diagnosis, testing and information system -VAS 5051- or successor models.



First carry out the following work:

– Switch off all electrical consumers.

– Switch off ignition.

– Pull out ignition key.

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

3.19.1 Removing

– Remove glove compartment ⇒ Rep. Gr. 68 .

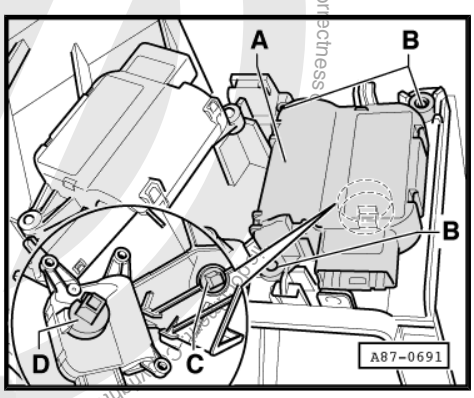
– Remove cover for control motors.

– If necessary, mark connector -A- (to prevent interchanging if several connectors are separated at the same time.)

– Separate connector -A-.

– Release catches -C- and -D- for retainer -B- on intake duct and remove retainer -B- (to rear).

– Remove control motor -A- from intake duct.



3.19.2 Installing

Install in reverse order.

Note

- *After installation, check operation of air recirculation flap.*
- *Initiate “basic settings” function using vehicle diagnosis, testing and information system -VAS 5051- or successor model* *⇒ page 42* .

3.20 Removing and installing air flow flap control motor -V71- for vehicles up to calendar week 17/2007

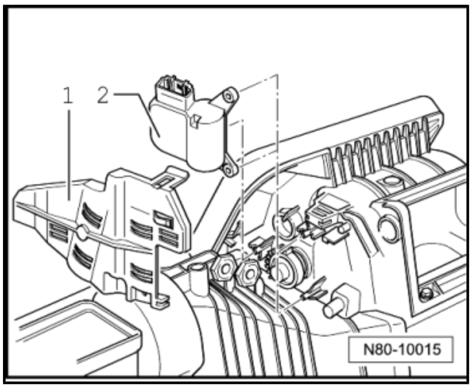
3.20.1 Removing

– Remove glove compartment ⇒ Rep. Gr. 68 .

Note

The position of the air flow flap must not be changed.

– Remove cover -1-.



– Remove air recirculation flap control motor -V113- ⇒ page 60 .
– Separate connector from air flow flap control motor -V71- -2-.
– Pull off air flow flap control motor -V71- -2-.

3.20.2 Installing

Install in reverse order.

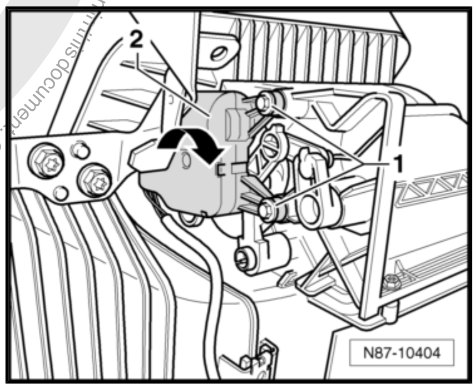
Note

♦ *After installation, check operation of air flow flap.*
♦ *Initiate "basic settings" function using vehicle diagnosis, testing and information system -VAS 5051- or successor model* *⇒ page 42* .

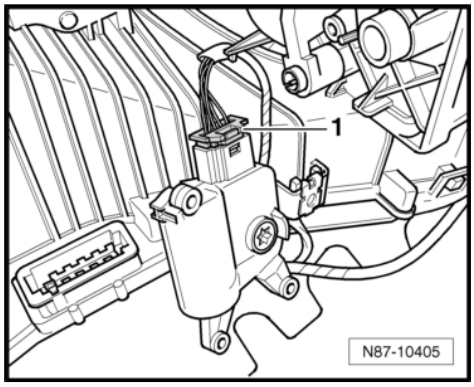
3.21 Removing and installing control motor for fresh air and air recirculation flap and air flow flap -V425- for vehicles from calendar week 18/2007

3.21.1 Removing

– Remove glove compartment ⇒ Rep. Gr. 68 .
– Remove bolts -1- (1.4 Nm).
– Turn control motor for fresh air and air recirculation flap and air flow flap -V425- -2- approx. 15° in direction of -arrow- and then pull off air intake housing.



– Disconnect connector -1- from control motor for fresh air and air recirculation flap and air flow flap -V425- .



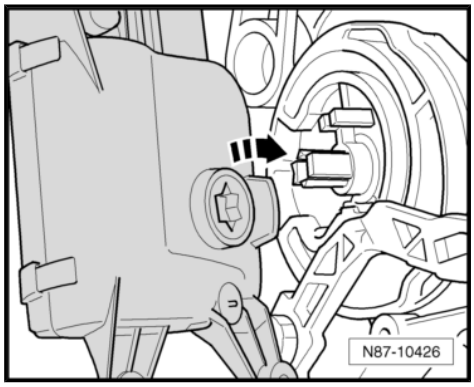
Note

The position of the air flow flap must not be changed.

3.21.2 Installing

Install in reverse order, noting the following:

The control motor for fresh air and air recirculation flap and air flow flap -V425- fits on the cable cam in one position only.



Note

- *After installation, check operation of air flow flap and air recirculation flap.*
- *Initiate "basic setting" function using vehicle diagnostic, testing and information system -VAS 5051- (or later model)* *⇒ page 42* .

3.22 Removing and installing setting unit for fresh air and air recirculation flap and air flow flap

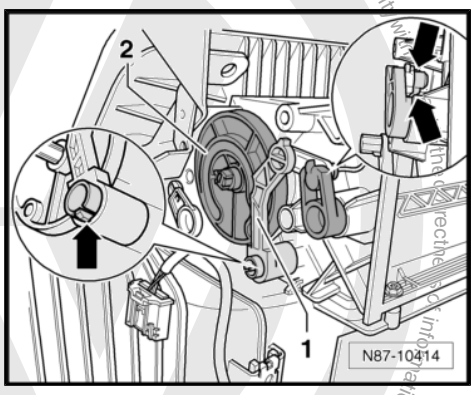
3.22.1 Removing

– Remove control motor for fresh air and air recirculation flap and air flow flap -V425- ⇒ page 61 .

– Release catches -arrows- from adjusting lever -1-.

– Remove adjusting levers from cable cam.

– Pull off cable cam -2- from air intake housing.

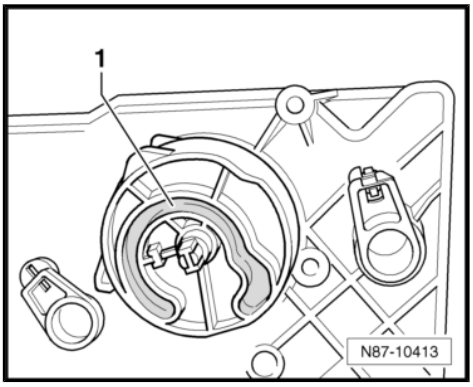


3.22.2 Installing

Note

When fitting the cable cam, ensure that the guide pin of the adjusting lever for the air flow flap sits in the groove.

– Push cable cam -1- onto air intake housing.



Note

When doing this, also ensure that the guide pin of the adjusting lever for the air flow flap sits in the groove.

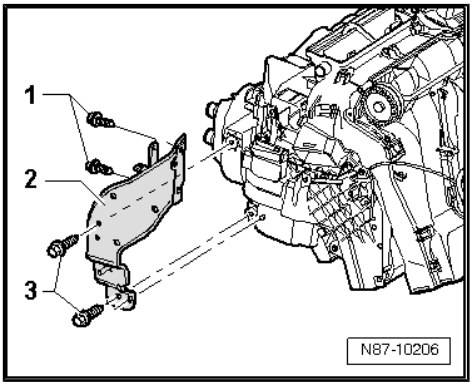
– Fit adjusting lever for air recirculation flap and lock.

3.23 Removing and installing defroster flap control motor -V107-

3.23.1 Removing

– Remove dash panel ⇒ Rep. Gr. 70 .

– Remove bolts -1- and -3- (9 ± 1.3 Nm).



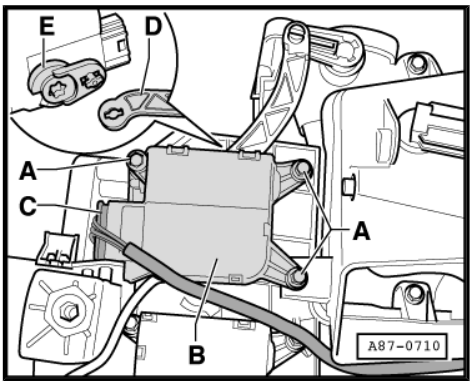
– Remove bracket -2-.

– Mark connector -C- to control motor (danger of interchanging with other connectors of same construction).

– Separate connector -C- on defroster flap control motor -V107- .

– Unscrew securing bolts -A- (1.4 Nm) and remove defroster flap control motor -V107- -B-.

– Remove lever -E- of control motor from connecting rod -D-.



3.23.2 Installing

Install in reverse order.

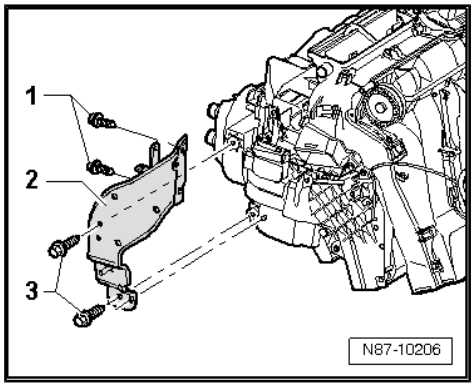
Note

- *After installation, check operation of defroster flap.*
- *Initiate “basic settings” function using vehicle diagnosis, testing and information system -VAS 5051- or successor model ⇒ page 42 .*

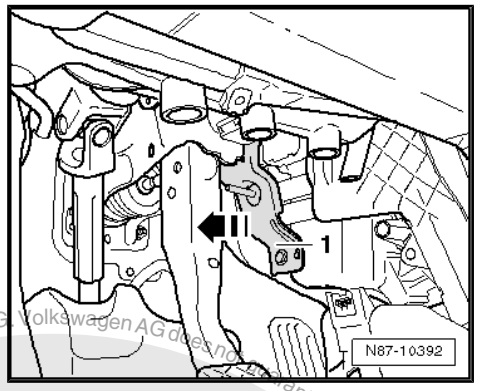
3.24 Removing and installing left temperature flap control motor -V158-

3.24.1 Removing

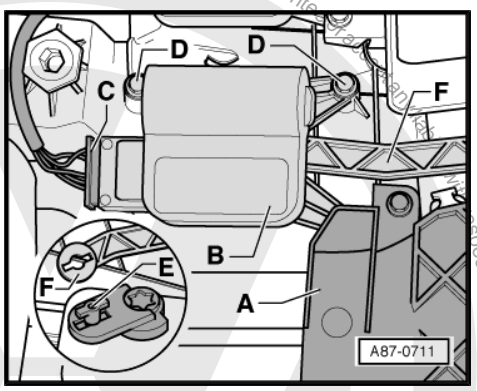
– Remove left footwell vent ⇒ page 7 .
– Remove centre console trim from left footwell.
– Remove data bus diagnostic interface -J533- from ⇒ Rep. Gr. 97 .
– Remove bolts -3- (9 Nm ±1.3 Nm).
– Do not remove bolts -1-.
– Do not remove bracket -2-.



– Press bracket in direction of brake pedal -arrow- and secure it on brake pedal with cable tie.



– Mark connector -C- to control motor (danger of interchanging with other connectors of same construction).
– Separate connector -C- on left temperature flap control motor -V158- .
– Remove cover -A-.
– Unscrew securing bolts -D- (1.4 Nm) and remove left temperature flap control motor -V158- -B-.
– Remove lever -E- of control motor from connecting rod -F-.



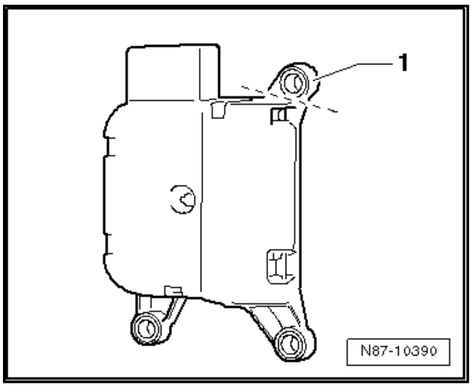
3.24.2 Installing

Note

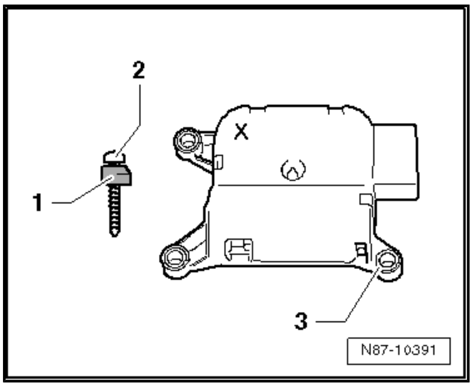
Optimised control motors are marked with an "X".

To ease assembly, use an approx. 2 mm shorter oval-head screw -N 103 254 01- .

– Cut off bracket -1- from old left temperature flap control motor -V158- , e.g. using side cutting pliers.



– Position new left temperature flap control motor -V158- marked with an “X” with shortened oval-head screw -2- and cut off bracket -1- on bracket -3- on blower box.



Note

- *After installation, check operation of left temperature flap.*
- *Initiate “basic settings” function using vehicle diagnosis, testing and information system -VAS 5051- or successor model* *⇒ page 42* .

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

3.25.1 Removing

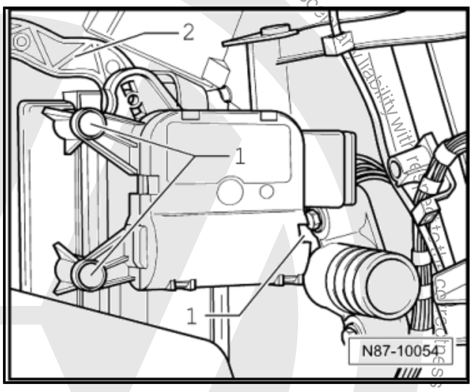
– Remove glove compartment ⇒ Rep. Gr. 68 .

– Remove right footwell vent ⇒ page 7 .

– Separate connector on right temperature flap control motor -V159- .

– Unscrew securing bolts -1- (1.4 Nm) and remove right temperature flap control motor -V159- .

– Unhook lever -2- from right temperature flap control motor -V159- .



3.25.2 Installing

Install in reverse order.

Note

- *After installation, check operation of right temperature flap.*
- *Initiate “basic settings” function using vehicle diagnosis, testing and information system -VAS 5051- or successor model* *⇒ page 42* .

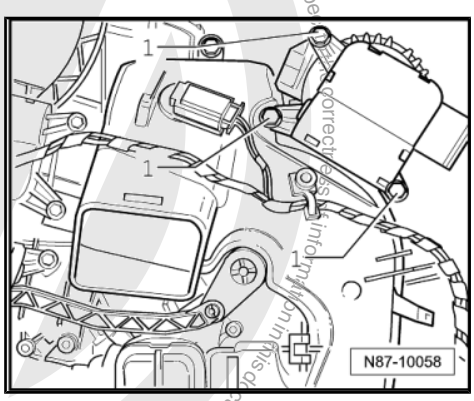
3.26 Removing and installing central flap control motor -V70-

3.26.1 Removing

– Remove dash panel ⇒ Rep. Gr. 70 .

– Separate connector on central flap control motor -V70- .

– Unscrew securing bolts -1- (1.4 Nm) and remove central flap control motor -V70- .



3.26.2 Installing

Install in reverse order.

Note

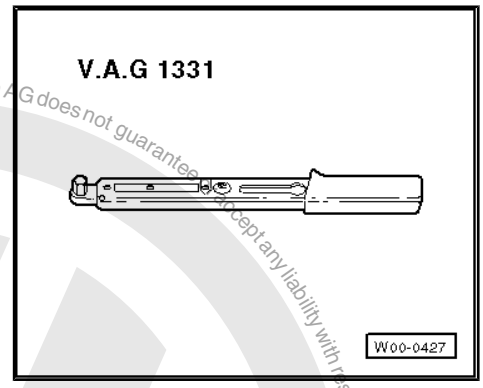
- *After installation, check operation of central flap.*
- *Initiate “basic settings” function using vehicle diagnosis, testing and information system -VAS 5051- or successor model* *⇒ page 42* .

4 Removing and installing ancillary bracket for air conditioner compressor

4.1 Engine codes: AZV, BDK, BJB, BKC, BKD, BLS, BMM, BMN, BRM, BRU, BVB, BXE, BXF and BXJ

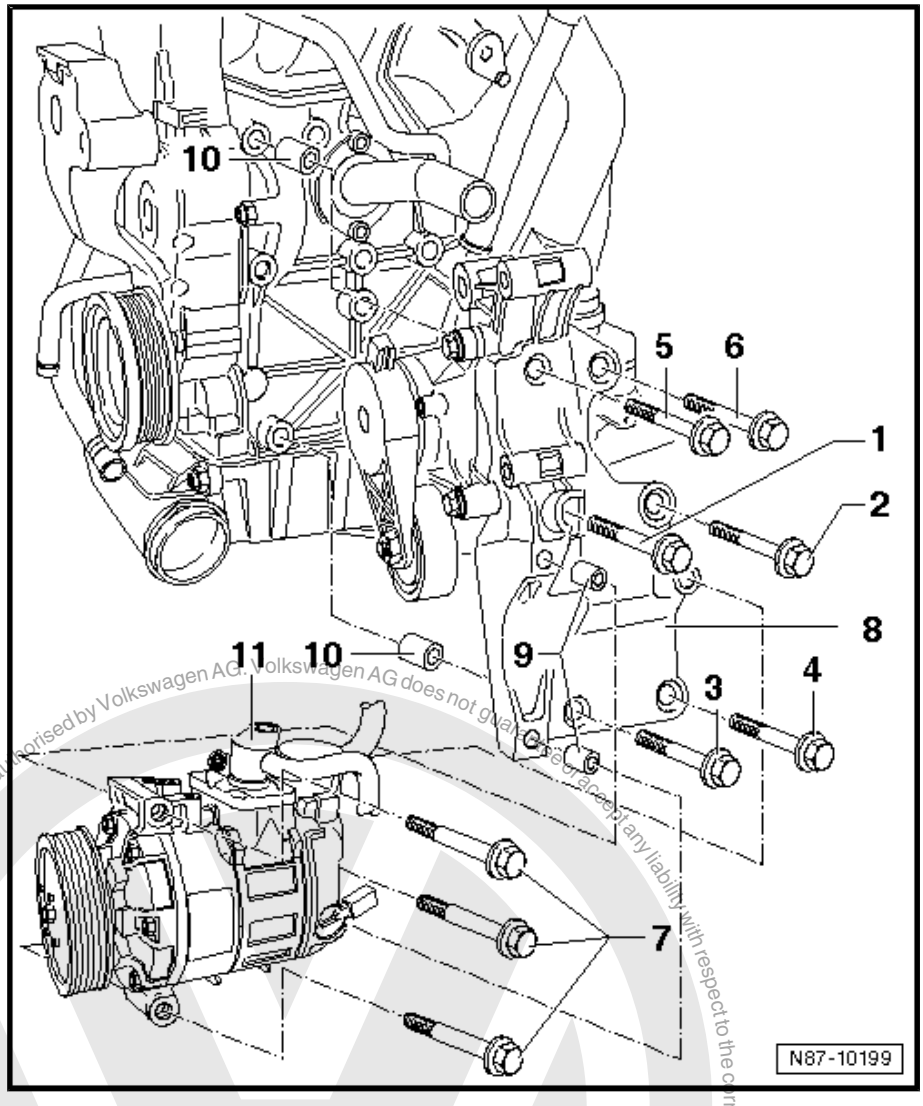
Special tools and workshop equipment required

- Torque wrench -V.A.G 1331/- (5…50 Nm)



Note

- *The ancillary bracket for air conditioner compressor and related components can be removed and installed without the refrigerant circuit being opened.*
- *To remove poly V-belt ⇒ Rep. Gr. 13 .*
- *Poly V-belt routing ⇒ page 69*



1 - Hexagon bolt M10×65

- ❑ 45 Nm

2 - Hexagon bolt M10×45

- ❑ 45 Nm

3 - Hexagon bolt M10×45

- ❑ 45 Nm

4 - Hexagon bolt M10x45

- ❑ 45 Nm

5 - Hexagon bolt M10×65

- ❑ 45 Nm

6 - Hexagon bolt M10×65

- ❑ 45 Nm

7 - Hexagon bolt M8x100

- ❑ Qty. 3
- ❑ 25 Nm

8 - Ancillary bracket for alternator and air conditioner compressor

- ♦ Number on ancillary unit bracket -03G 903 143 A-

Removing

- – Remove alternator ⇒ Rep. Gr. 27 .
- – Loosen air conditioner compressor and remove hexagon bolt -7-. Remove air conditioner compressor from ancillary bracket and secure to body with suitable material (e.g.welding wire) ⇒ page 69 .
- – Remove bolts -1- through -6- and remove ancillary bracket from cylinder block.

♦ Strictly observe tightening sequence of securing bolts:

- – Tighten bolts (positions -1-…-6-) one after the other

9 - Dowel sleeves

- ❑ Qty. 2
- ❑ Ensure proper seating between ancillary unit bracket and air conditioner compressor

10 - Dowel sleeves

- ❑ Qty. 2
- ❑ Ensure proper seating between ancillary unit bracket and engine block.

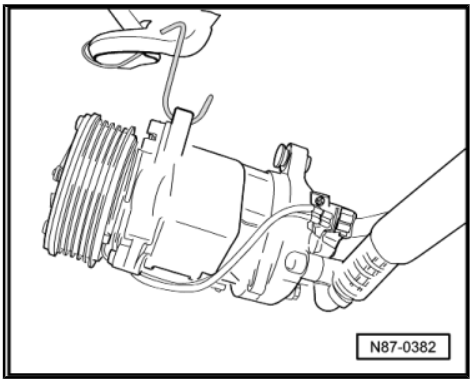
11 - Air conditioner compressor

- ❑ Removing and installing ⇒ page 94

Securing air conditioner compressor to body

If compressor is removed without opening refrigerant circuit, it should be secured to body using suitable material, for example, welding wire.

When doing this, ensure refrigerant hoses on air conditioner compressor are not stressed.



Note

- *When installing poly V-belt, ensure that it is correctly seated on poly V-belt pulley.*
- *Finally, place poly V-belt over pulley of air conditioner compressor.*

Poly V-belt routing

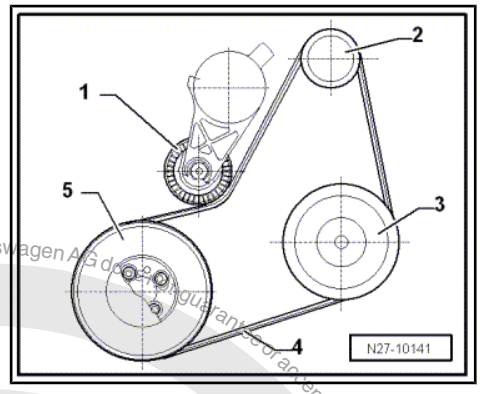
1 - Tensioning roller

2 - Poly V-belt pulley for alternator

3 - Poly V-belt pulley for air conditioner compressor

4 - Poly V-belt

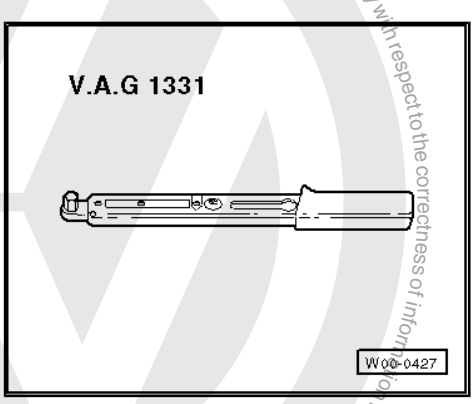
5 - Poly V-belt pulley for crankshaft



4.2 Engine codes: BCA, BUD

Special tools and workshop equipment required

- Torque wrench -V.A.G 1331/- (5…50 Nm)



Note

- *The ancillary bracket for air conditioner compressor and related components can be removed and installed without the refrigerant circuit being opened.*
- *To remove poly V-belt ⇒ Rep. Gr. 13 .*
- *Poly V-belt routing* ⇒ page 71

1 - Hexagon bolt M10×55

- ❑ 50 Nm
- ❑ Qty. 2

2 - Ancillary bracket for alternator and air conditioner compressor

- ♦ Number on ancillary unit bracket -036 260 885-

Removing

– Remove alternator ⇒ Rep. Gr. 27 .

– Loosen air conditioner compressor and remove hexagon bolt -4-. Remove air conditioner compressor from ancillary bracket and secure to body with suitable material (e.g.welding wire) ⇒ page 70 .

– Remove bolts -1- and -3- and remove ancillary bracket from cylinder block.

3 - Hexagon bolt M10×45

- ❑ 50 Nm
- ❑ Qty. 2

4 - Hexagon bolt M8x100

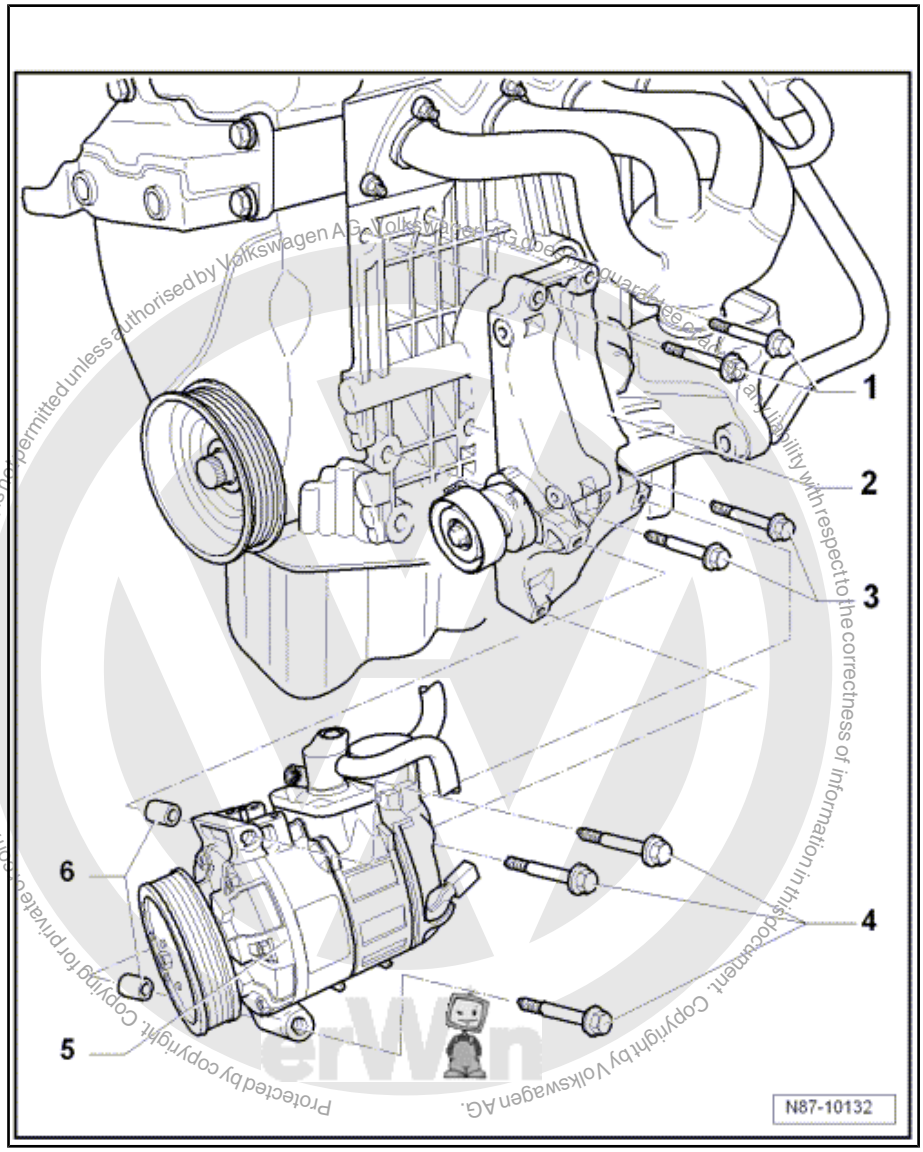
- ❑ 25 Nm

5 - Air conditioner compressor

- ❑ Removing and installing ⇒ page 94

6 - Dowel sleeves

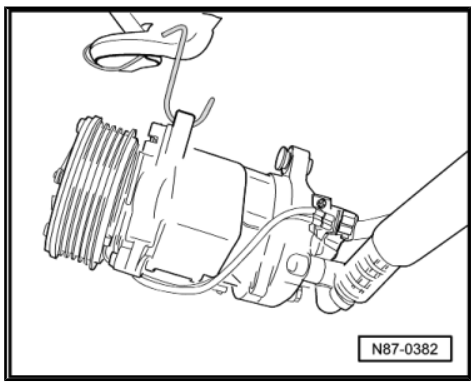
- ❑ Qty. 2
- ❑ Ensure proper seating between ancillary unit bracket and air conditioner compressor



Securing air conditioner compressor to body

If compressor is removed without opening refrigerant circuit, it should be secured to body using suitable material, for example, welding wire.

When doing this, ensure refrigerant hoses on air conditioner compressor are not stressed.



Note

- ♦ *When installing poly V-belt, ensure that it is correctly seated on poly V-belt pulley.*
- ♦ *Finally, place poly V-belt over pulley of air conditioner compressor.*

Poly V-belt routing

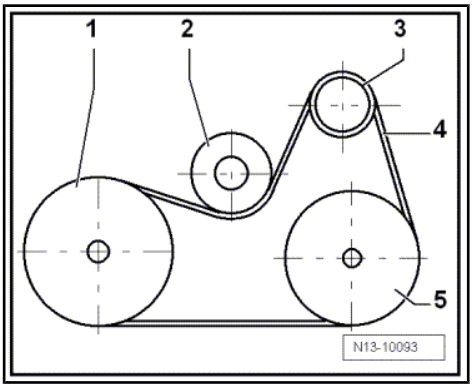
1 - Poly V-belt pulley for crankshaft

2 - Tensioning roller

3 - Poly V-belt pulley for alternator

4 - Poly V-belt

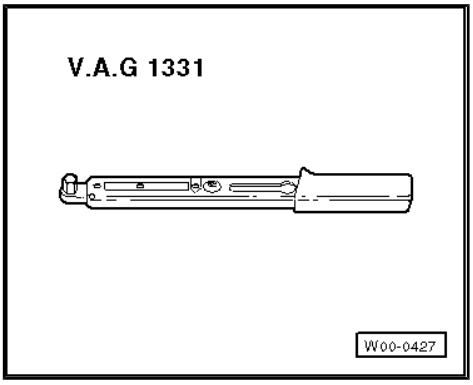
5 - Poly V-belt pulley for air conditioner compressor



4.3 Engine codes: BLG, BMY

Special tools and workshop equipment required

- Torque wrench -V.A.G 1331/- (5…50 Nm)



Note

- *The ancillary bracket for air conditioner compressor and related components can be removed and installed without the refrigerant circuit being opened.*
- *To remove poly V-belt ⇒ Rep. Gr. 13 .*
- *Poly V-belt routing ⇒ page 73*

1 - Air conditioner compressor

- ❑ Removing and installing ⇒ page 94

2 - Hexagon bolt M8x100

- ❑ 25 Nm

3 - Hexagon bolt M10×45

- ❑ 50 Nm

4 - Ancillary bracket for alternator and air conditioner compressor

- ◆ Number on ancillary unit bracket -03C 903 143 A-

Removing

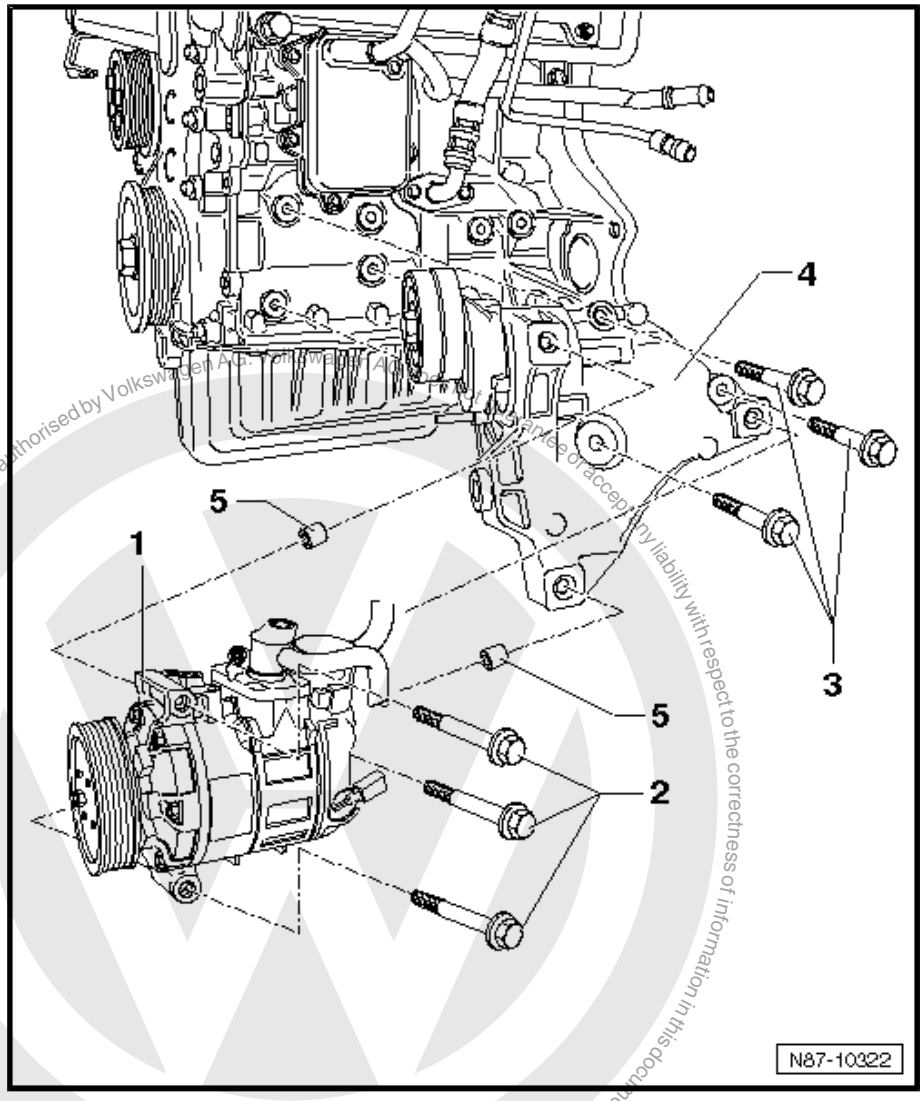
– Remove alternator ⇒ Rep. Gr. 27 .

– Loosen air conditioner compressor and remove hexagon bolt -2-. Remove air conditioner compressor from ancillary bracket and secure to body with suitable material (e.g.welding wire) ⇒ page 72 .

– Remove bolts -3- and remove ancillary bracket from cylinder block.

5 - Dowel sleeves

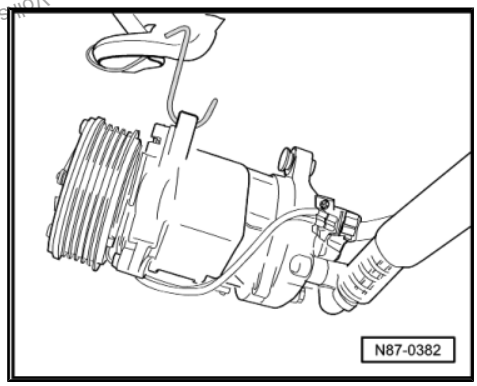
- ❑ Qty. 2
- ❑ Ensure proper seating between ancillary unit bracket and air conditioner compressor



Securing air conditioner compressor to body

If compressor is removed without opening refrigerant circuit, it should be secured to body using suitable material, for example, welding wire.

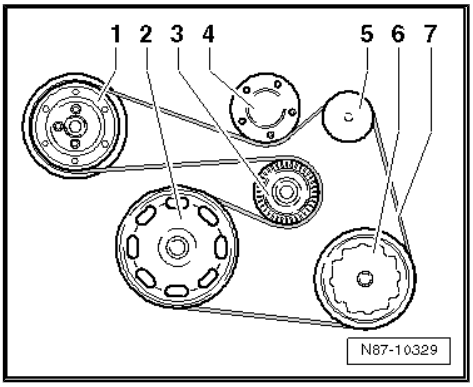
When doing this, ensure refrigerant hoses on air conditioner compressor are not stressed.



Note

- ◆ *When installing poly V-belt, ensure that it is correctly seated on poly V-belt pulley.*
- ◆ *Finally, place poly V-belt over pulley of air conditioner compressor.*

Poly V-belt routing



1 - Poly V-belt pulley for cooling system pump

2 - Poly V-belt pulley for crankshaft

3 - Lower tensioning roller

4 - Upper tensioning roller

5 - Poly V-belt pulley for alternator

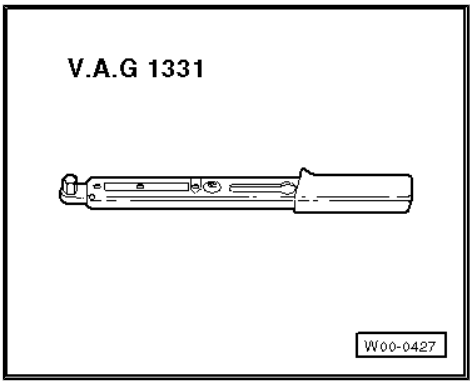
6 - Poly V-belt pulley for air conditioner compressor

7 - Poly V-belt

4.4 Engine codes: BAG, BKG, BLF, BLN, BLP and CAX

Special tools and workshop equipment required

- Torque wrench -V.A.G 1331/- (5…50 Nm)



Note

- *The ancillary bracket for air conditioner compressor and related components can be removed and installed without the refrigerant circuit being opened.*
- *To remove poly V-belt ⇒ Rep. Gr. 13 .*
- *Poly V-belt routing ⇒ page 75*

1 - Hexagon bolt M8×45

- ❑ Qty. 3
- ❑ 25 Nm

2 - Hexagon bolt M8x100

- ❑ Qty. 3
- ❑ 25 Nm

3 - Air conditioner compressor

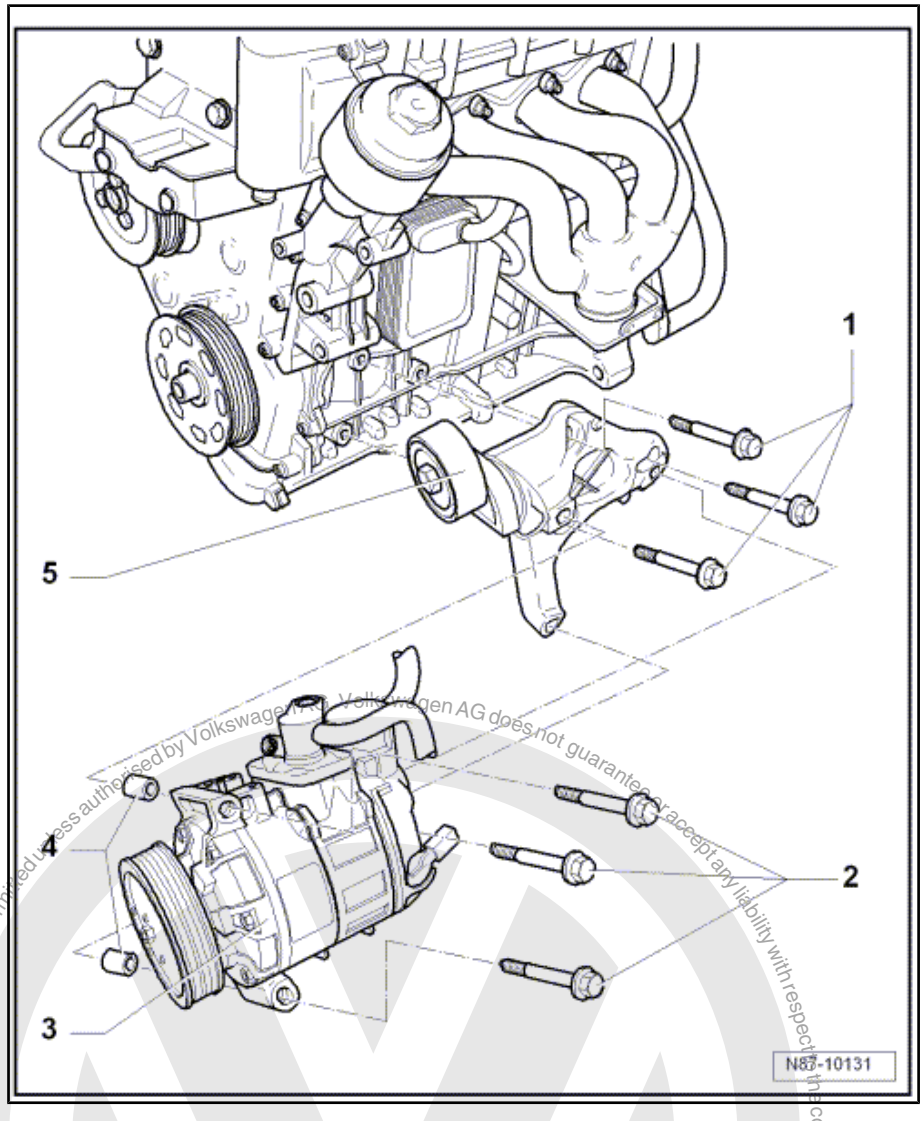
- ❑ Removing and installing ⇒ page 94

4 - Dowel sleeves

- ❑ Qty. 2
- ❑ Ensure proper seating between ancillary unit bracket and air conditioner compressor

5 - Ancillary bracket for air conditioner compressor

Number on ancillary unit bracket -1K0 260.885 B-



Removing

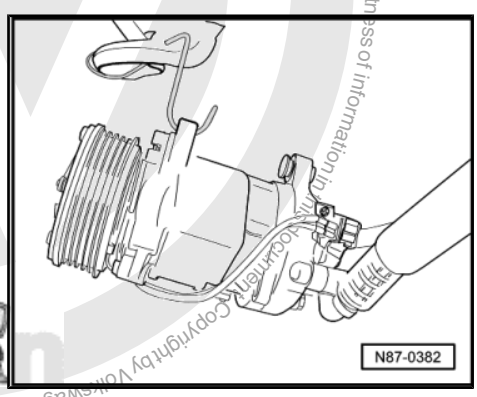
– Loosen air conditioner compressor and remove hexagon bolt -2-. Remove air conditioner compressor from ancillary bracket and secure to body with suitable material (e.g.welding wire) ⇒ page 74 .

– Remove bolts -1- and remove ancillary bracket -5- from cylinder block.

Securing air conditioner compressor to body

If compressor is removed without opening refrigerant circuit, it should be secured to body using suitable material, for example, welding wire.

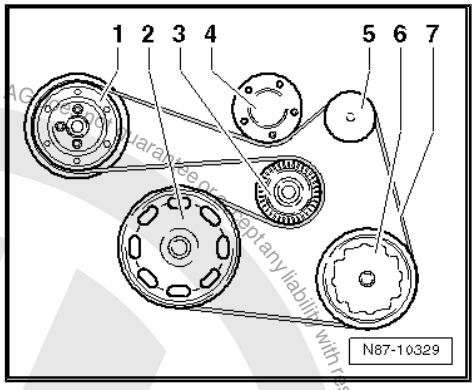
When doing this, ensure refrigerant hoses on air conditioner compressor are not stressed.



Note

- ♦ *When installing poly V-belt, ensure that it is correctly seated on poly V-belt pulley.*
- ♦ *Finally, place poly V-belt over pulley of air conditioner compressor.*

Poly V-belt routing

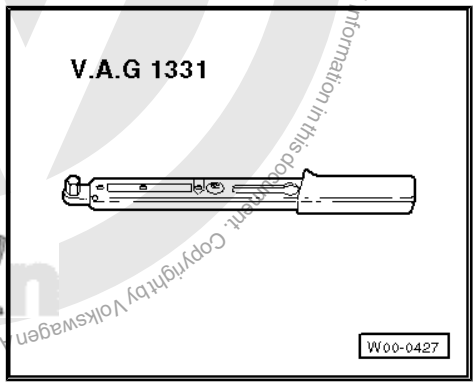


1 - Poly V-belt pulley for cooling system pump
2 - Poly V-belt pulley for crankshaft
3 - Lower tensioning roller
4 - Upper tensioning roller
5 - Poly V-belt pulley for alternator
6 - Poly V-belt pulley for air conditioner compressor
7 - Poly V-belt

4.5 Engine codes: AXW, AXX, BGU, BHY, BLR, BLX, BLY, BPY, BSE, BSF, BVX, BVY, BVZ, BWA, BYD, CAWB, CBFA and CCTA

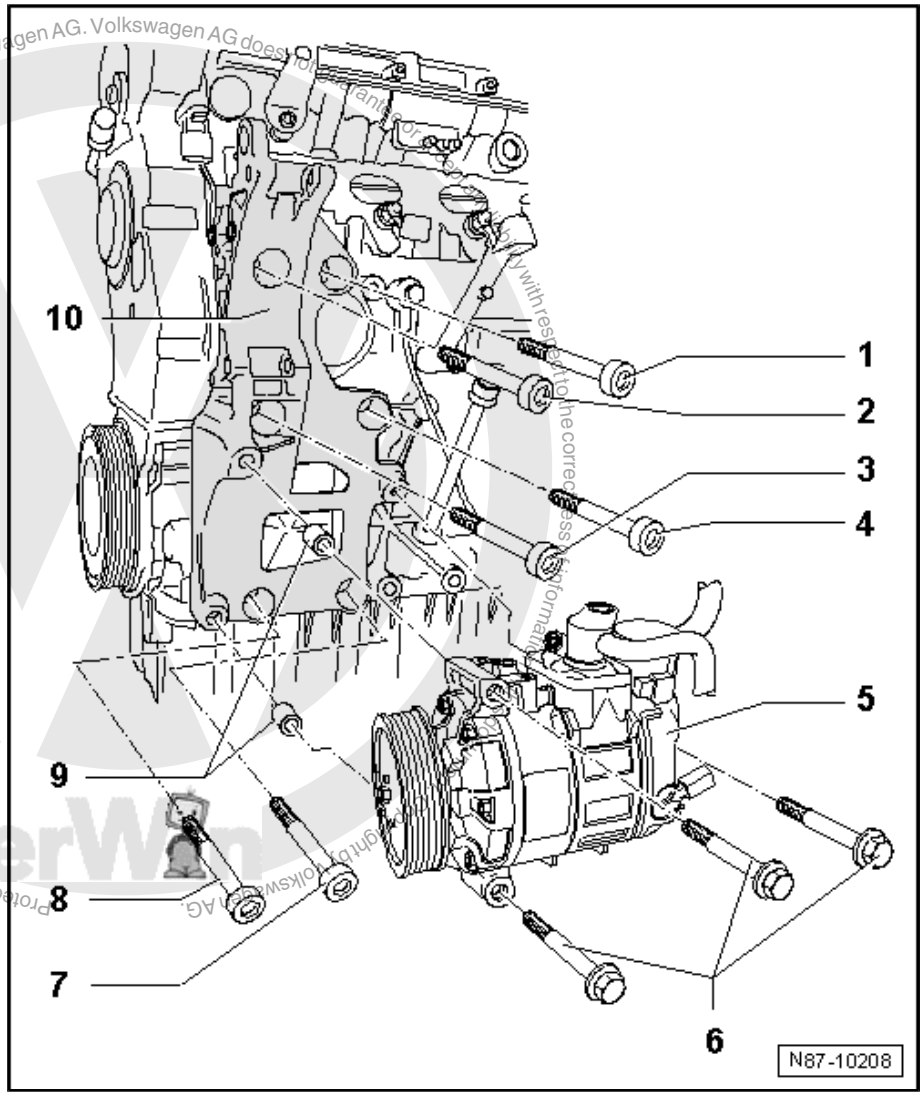
Special tools and workshop equipment required

- Torque wrench -V.A.G 1331- (5…50 Nm)



Note

- *The ancillary bracket for air conditioner compressor and related components can be removed and installed without the refrigerant circuit being opened.*
- *To remove poly V-belt ⇒ Rep. Gr. 13 .*
- *Poly V-belt routing ⇒ page 77*



1 - Socket head flange bolt M10×45

- ❑ Dowel hole
- ❑ Observe different torques:
- ❑ 1.6 l injection engine and 2.0 l FSI engine: 52 Nm
- ❑ 2.0 l turbo FSI engine: 40 Nm

2 - Socket head flange bolt M10×45

- ❑ Observe different torques:
- ❑ 1.6 l injection engine and 2.0 l FSI engine: 52 Nm
- ❑ 2.0 l turbo FSI engine: 40 Nm

3 - Socket head flange bolt M10×45

- ❑ Observe different torques:
- ❑ 1.6 l injection engine and 2.0 l FSI engine: 52 Nm
- ❑ 2.0 l turbo FSI engine: 40 Nm

4 - Socket head flange bolt M10×45

- ❑ Observe different torques:
- ❑ 1.6 l injection engine and 2.0 l FSI engine: 52 Nm
- ❑ 2.0 l turbo FSI engine: 40 Nm

5 - Air conditioner compressor

- ❑ Removing and installing ⇒ page 94

6 - Hexagon bolt M8x100

- ❑ Qty. 3
- ❑ 25 Nm

7 - Socket head flange bolt M10×45

- ❑ Dowel hole
- ❑ Observe different torques:
- ❑ 1.6 l injection engine and 2.0 l FSI engine: 52 Nm
- ❑ 2.0 l turbo FSI engine: 40 Nm

8 - Socket head flange bolt M10×45

- ❑ Observe different torques:
- ❑ 1.6 l injection engine and 2.0 l FSI engine: 52 Nm
- ❑ 2.0 l turbo FSI engine: 40 Nm

9 - Dowel sleeves

- ❑ Qty. 2
- ❑ Ensure proper seating between ancillary bracket and air conditioner compressor.

10 - Ancillary bracket for air conditioner compressor

Number on ancillary unit bracket -06F 903 143 E/F-

Removing

– Remove alternator ⇒ Rep. Gr. 27 .
– Loosen air conditioner compressor and remove hexagon bolt -6-. Remove air conditioner compressor from ancillary bracket and secure to body with suitable material (e.g.welding wire) ⇒ page 77 .
– Remove bolts -1- through -4-, -7- and -8- and remove ancillary bracket -10- from cylinder block.

Installing

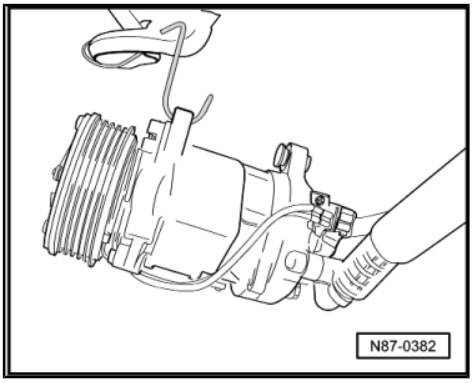
♦ Strictly observe tightening sequence of securing bolts:

– Tighten socket head flange bolts, positions -1- (dowel hole), -7- (dowel hole), -4-, -8-, -3- and -2- one after the other.

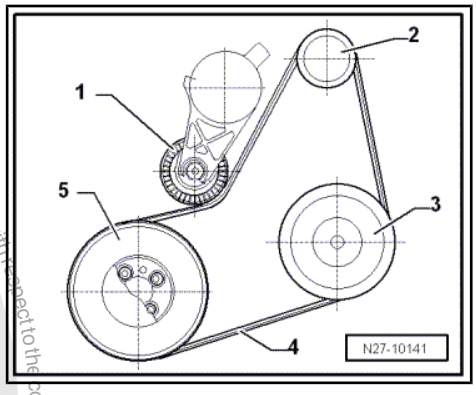
Securing air conditioner compressor to body

If compressor is removed without opening refrigerant circuit, it should be secured to body using suitable material, for example, welding wire.

When doing this, ensure refrigerant hoses on air conditioner compressor are not stressed.



Poly V-belt routing



1 - Tensioning roller
2 - Poly V-belt pulley for alternator
3 - Poly V-belt pulley for air conditioner compressor
4 - Poly V-belt
5 - Poly V-belt pulley for crankshaft

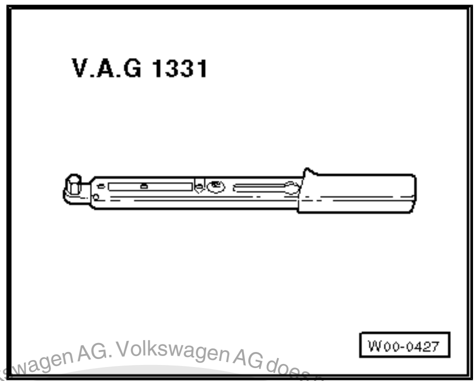
Note

♦ *When installing poly V-belt, ensure that it is correctly seated on poly V-belt pulley.*
♦ *Finally, place poly V-belt over pulley of air conditioner compressor.*

4.6 Engine codes: BGP, BGQ, BTK, CBTA and CBUA

Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1331/- (5…50 Nm)

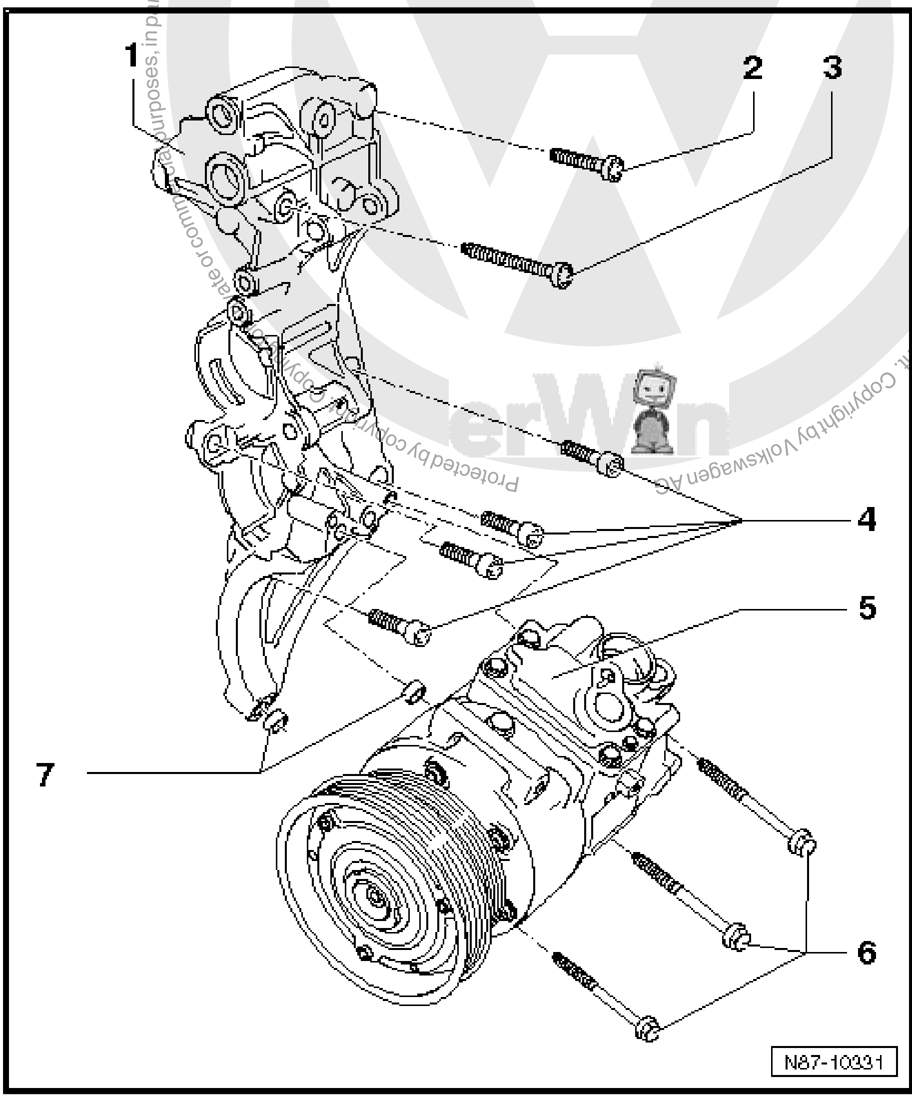


Note

♦ *The ancillary bracket for air conditioner compressor and related components can be removed and installed without the refrigerant circuit being opened.*

♦ *To remove poly V-belt ⇒ Rep. Gr. 13 .*

♦ *Poly V-belt routing* *⇒ page 79*



1 - Ancillary bracket for alternator and air conditioner compressor

♦ Number on ancillary unit bracket -07K 903 143 B-

Removing

– Loosen air conditioner compressor and remove hexagon bolt -6-. Remove air conditioner compressor from ancillary bracket and secure to body with suitable material (e.g.welding wire) ⇒ page 79 .

– Remove bolts from ancillary bracket.

2 - Multi-point socket head bolt M8X60

❑ 25 Nm

3 - Multi-point socket head bolt M8X110

❑ 25 Nm

4 - Hexagon socket head bolt M8X30

❑ 25 Nm

❑ Qty. 4

5 - Air conditioner compressor

❑ Removing and installing ⇒ page 94

6 - Hexagon bolts M8×85

❑ Qty. 3

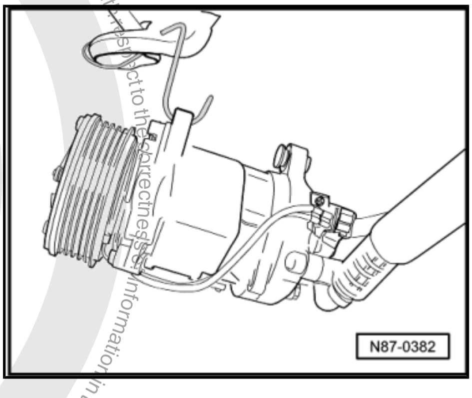
❑ 25 Nm

7 - Dowel sleeves
❑ Qty. 2
❑ Ensure proper seating between ancillary unit bracket and air conditioner compressor

Securing air conditioner compressor to body

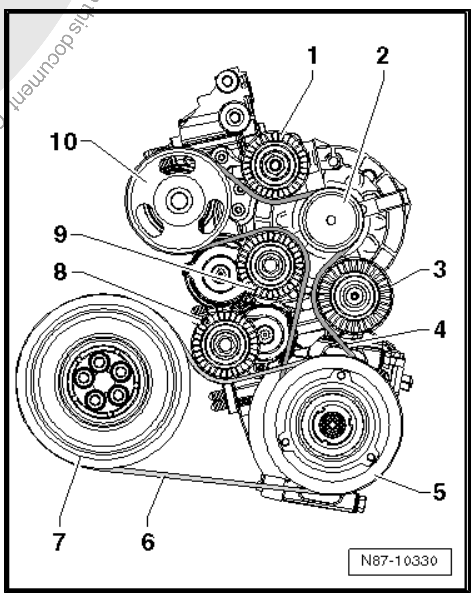
If compressor is removed without opening refrigerant circuit, it should be secured to body using suitable material, for example, welding wire.

When doing this, ensure that refrigerant hoses on air conditioner compressor are not strained.



Poly V-belt routing

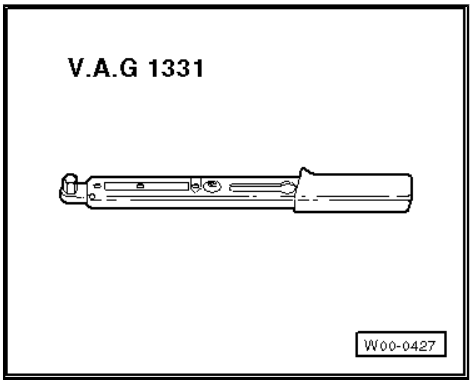
1 - Upper idler pulley
2 - Poly V-belt pulley for alternator
3 - Lower idler pulley
4 - Poly V-belt for alternator and air conditioner compressor
5 - Poly V-belt pulley for air conditioner compressor
6 - Poly V-belt for air conditioner compressor
7 - Poly V-belt pulley for crankshaft
8 - Tensioning roller for poly V-belt for air conditioner compressor
9 - Tensioning roller for poly V-belt for alternator and cooling system pump
10 - Poly V-belt pulley for cooling system pump



4.7 Engine codes: BUB, CBRA

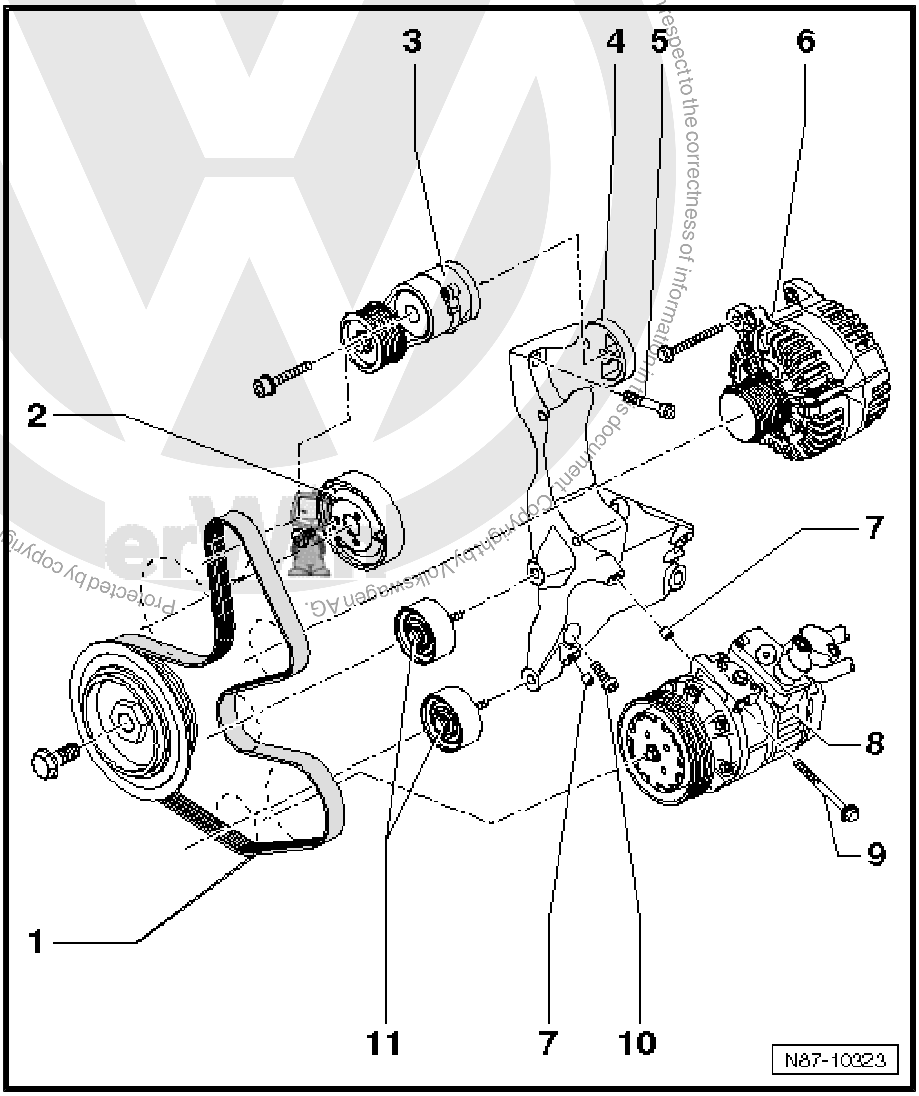
Special tools and workshop equipment required

♦ Torque wrench -V.A.G 1331/- (5…50 Nm)



Note

- *The ancillary bracket for air conditioner compressor and related components can be removed and installed without the refrigerant circuit being opened.*
- *To remove poly V-belt ⇒ Rep. Gr. 13 .*
- *Poly V-belt routing* *⇒ page 81*



1 - Poly V-belt

- ❑ Removing and installing ⇒ Rep. Gr. 13

2 - Poly V-belt pulley for cooling system pump

3 - Tensioning roller

4 - Ancillary bracket for alternator and air conditioner compressor

- Number on ancillary unit bracket -038 903 143 AF -

Removing

– Loosen air conditioner compressor and remove hexagon bolt -9-. Remove air conditioner compressor from ancillary bracket and secure to body with suitable material (e.g.welding wire) ⇒ page 81 .

– Remove bolts from ancillary bracket.

Note tightening sequence when installing ⇒ page 81 .

5 - Fit bolt

- ❑ 25 Nm

6 - Alternator

7 - Dowel sleeves

- ❑ Qty. 2
- ❑ Ensure proper seating between ancillary unit bracket and air conditioner compressor

8 - Air conditioner compressor

- ❑ Removing and installing ⇒ page 94

9 - Hexagon bolt M8x100

- ❑ Qty. 3
- ❑ 25 Nm

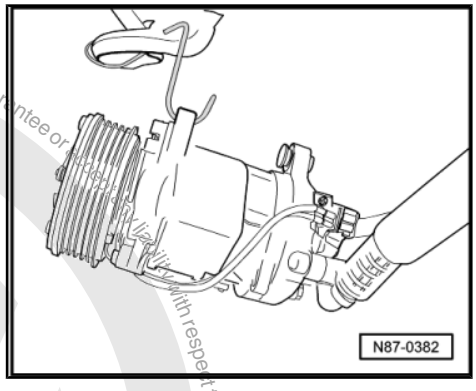
10 - Fitted bolt

- ❑ 25 Nm

Securing air conditioner compressor to body

If compressor is removed without opening refrigerant circuit, it should be secured to body using suitable material, for example, welding wire.

When doing this, ensure refrigerant hoses on air conditioner compressor are not stressed.



Note

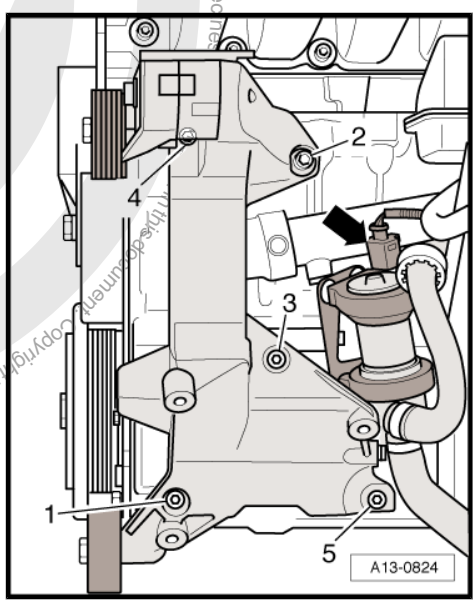
- *When installing poly V-belt, ensure that it is correctly seated on poly V-belt pulley.*
- *Finally, place poly V-belt over pulley of air conditioner compressor.*

Tightening sequence for ancillary bracket

Note

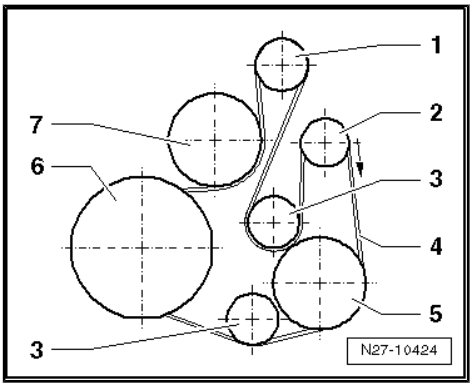
Bolts -1- and -2- are fit bolts.

– First tighten bolts in sequence 1...5 by hand.
– Then tighten bolts in sequence 1...5 to 25 Nm.



Poly V-belt routing

1 - Tensioning roller
2 - Poly V-belt pulley for alternator
3 - Idler rollers
4 - Poly V-belt
5 - Poly V-belt pulley for air conditioner compressor
6 - Poly V-belt pulley for crankshaft
7 - Poly V-belt pulley for cooling system pump



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

Note

- *Notes on repair work to vehicles with air conditioning and on handling refrigerant can be found in ELSA under Heating, ventilation, air conditioning system; 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.*

WARNING

Danger of freezing injuries.

If refrigerant circuit has not been evacuated, refrigerant will 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 coolant circuit due to re-evaporation. Extract refrigerant again.

Note

- *The refrigerant circuit must be purged with refrigerant R134a under the following circumstances:*
- *If dirt or other contamination is in the circuit.*
- *If during the evacuation of a leak-tight refrigerant circuit the vacuum is not maintained at the gauge (there is moisture in the refrigerant circuit and this generates vapour pressure).*
- *If the refrigerant circuit has been left open for longer than normally required for repairs (e.g. following an accident).*
- *When pressure and temperature measurements in the refrigerant circuit indicate that there is moisture in the refrigerant circuit.*
- *There is doubt about the amount of refrigerant oil in the refrigerant circuit.*
- *The air conditioner compressor has to be exchanged because of internal damage (e.g. noisy or lack of power).*

The procedure for purging with refrigerant R134a is described in ELSA under Heating, ventilation, air conditioning system; Air conditioning system with refrigerant R134a ⇒ Rep. Gr. 00 Technical data; Clearing refrigerant circuit of contaminants.

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

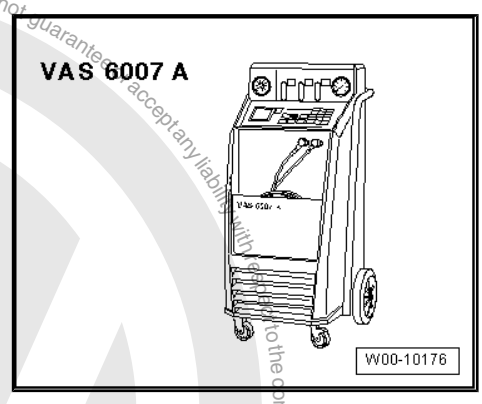
Notes on testing equipment and tools for repair work to vehicles with air conditioning can be found in ELSA under Heating, ventilation, air conditioning system; Air conditioning system with refrigerant R134a ⇒ Rep. Gr. 00 ; Technical data.

5.1 Testing equipment and tools

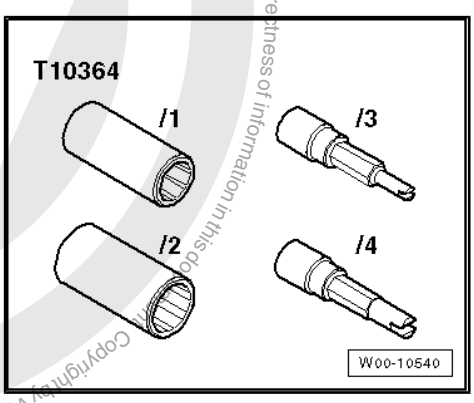
Notes on testing equipment and tools for repair work to vehicles with air conditioning can be found in ELSA under Heating, ventilation, air conditioning system; Air conditioning system with refrigerant R134a ⇒ Rep. Gr. 00 ; Technical data.

Special tools and workshop equipment required

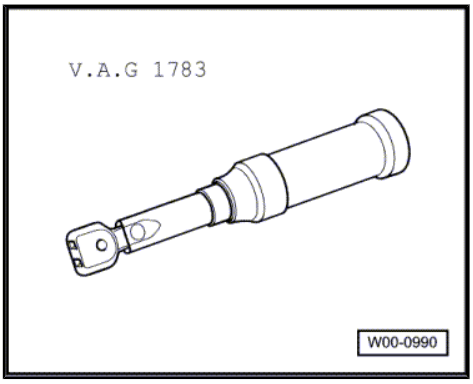
- E.g. air conditioner service station -VAS 6007A- (or later model)



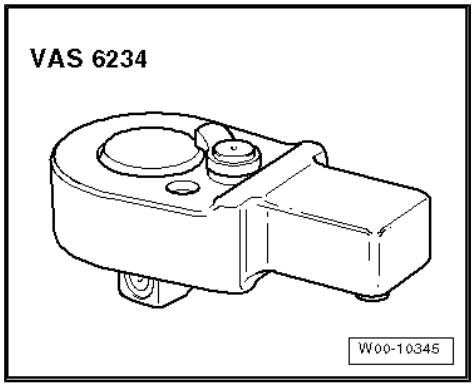
- Adapter set for service connections -T10364-



- Torque wrench -V.A.G 1783- (2…10 Nm) for adapter set for service connections -T10364-



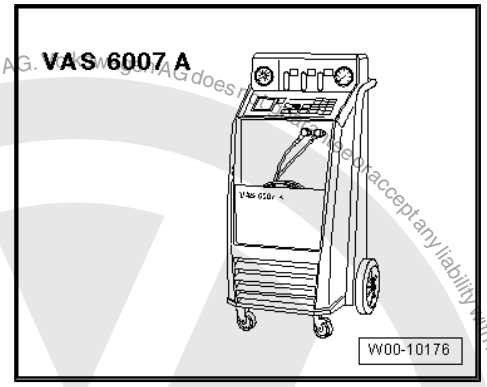
- Ratchet insert tool 1/4" -VAS 6234- for adapter set for service connections -T10364-



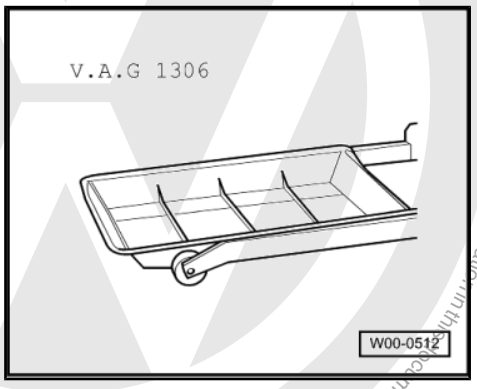
5.2 Removing and installing heater and air conditioning unit

Special tools and workshop equipment required

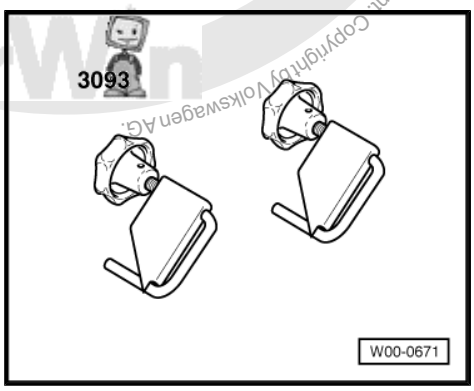
- Air conditioner service station -VAS 6007A- or later model.



- Drip tray -V.A.G 1306-



- Hose clamps up to 40 mm Ø -VAS 3093-



- Compressed air gun, commercially available

5.2.1 Removing

Note

To improve access, additional components must be removed depending on engine version e.g. engine cover ⇒ Rep. Gr. 10 .

– Extract refrigerant, e.g. with air conditioner service station -VAS 6007A- before opening refrigerant circuit. Observe notes ⇒ page 88 .

– Remove dash panel ⇒ Rep. Gr. 70

– Remove right and left rear footwell air ducts ⇒ page 6 .

– Place drip tray -V.A.G 1306- beneath engine.

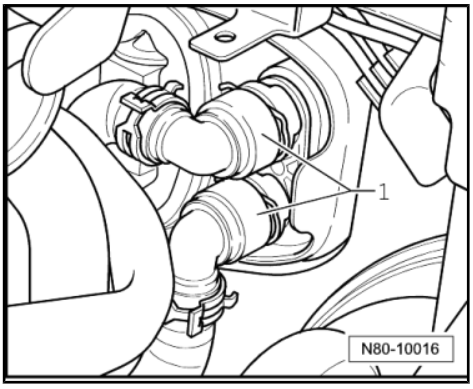
– Mark coolant hoses -1-

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, release pressure before carrying out repairs.

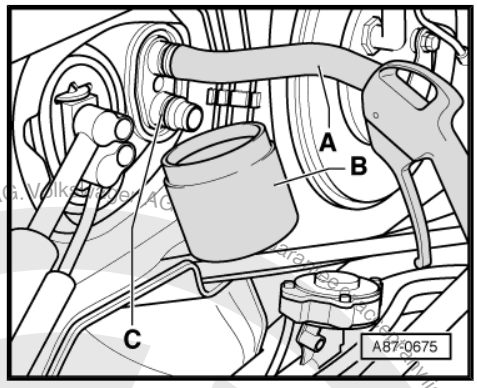


– Clamp off coolant hoses -1- using hose clamps up to 40 mm Ø -VAS 3093- and disconnect coolant hoses to heat exchanger.

– Push a piece of hose -A- onto upper connection.

– Hold a container -B- under lower connection -C-.

– Carefully blow remaining coolant out of heat exchanger using a compressed air pistol at heat exchanger connection.



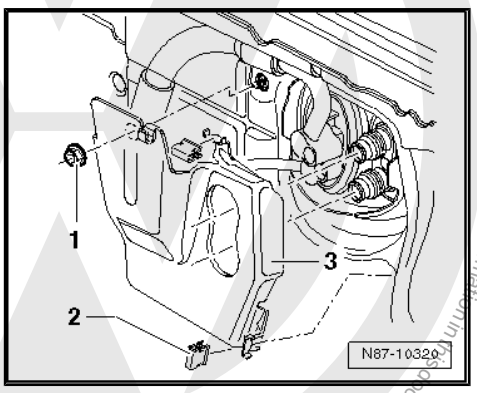
Applies only to vehicles with a protective plate before the expansion valve.

Note

On right-hand drive vehicles, lock washers are installed instead of a clip and a nut.

– Unscrew nut -1- (6 ± 0.9 Nm).

– Release clips -2- and remove protective plate -3-.



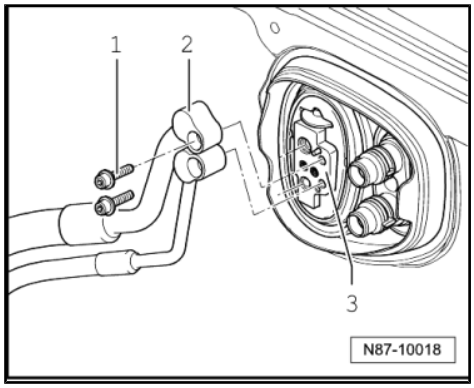
Continuation for all vehicles

WARNING

Danger of freezing injuries.

If refrigerant circuit has not been evacuated, refrigerant will 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 coolant circuit due to re-evaporation. Extract refrigerant again.



– With access from engine compartment, remove bolts (10 ± 1 Nm) -1- for refrigerant lines -2-.
– Remove refrigerant lines from expansion valve -3-.

Note

- *Seal open connections for lines.*
- *To seal open connections of expansion valve, use, for example, sealing cap of a spare expansion valve.*

– Cover carpet in vehicle interior with waterproof foil and absorbent paper.

Note

During removal, note lengths and locations of bolts for later installation.

1 - Bolt

❑ 4,5 ± 0.7 Nm

❑ Lower right on cable retainer to heater and air conditioning unit, near bulkhead

2 - Bolts

❑ 4,5 ± 0.7 Nm

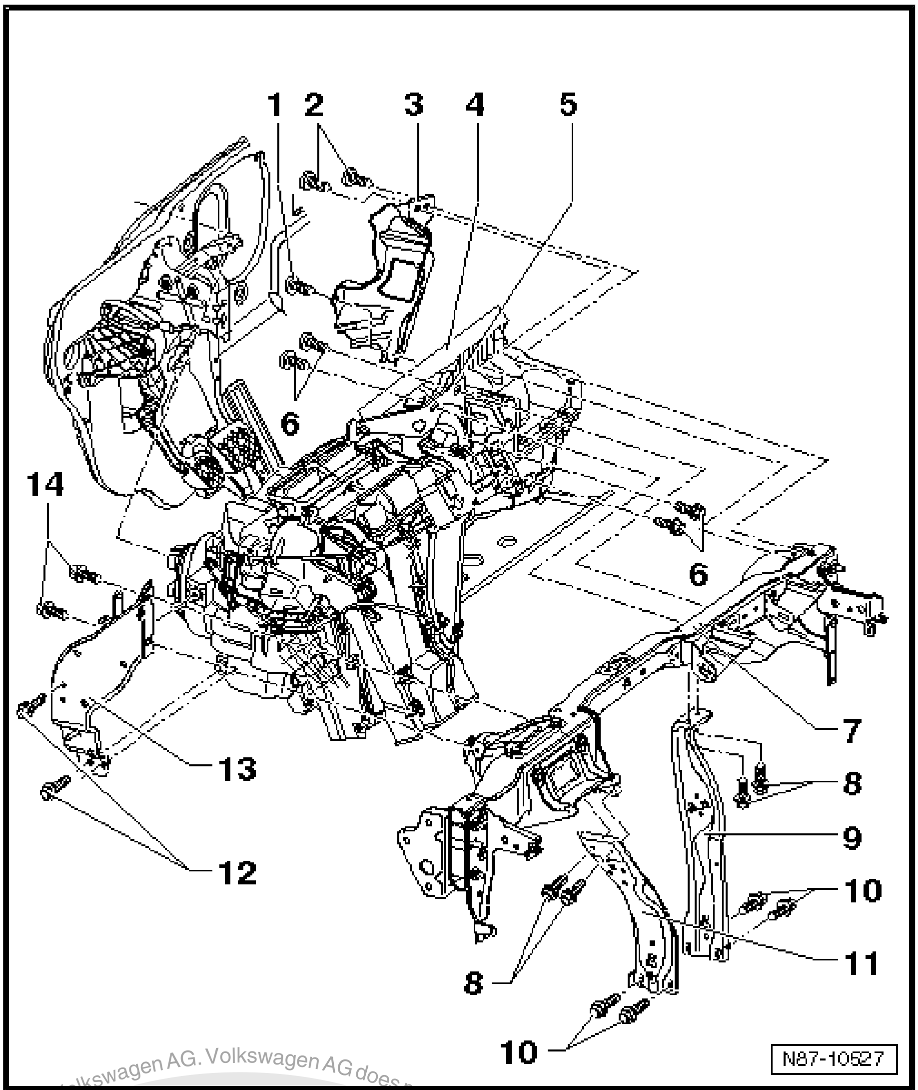
3 - Cable retainer

4 - Heater and air conditioning unit

❑ Removing:

– Remove condensation water drain hose from air conditioner unit ⇒ page 59 .

– Separate connectors on air conditioner unit.



Note

– Remove both securing nuts from convenience system central control unit -J393- and hang central control unit to side ⇒ Rep. Gr. 97 .

– Unscrew bolts -6- and remove bracket -5-.

– Unscrew bolts -8- and -10- and remove supports -9- and -11-.

– Unscrew bolts -12- and -14- and remove retainer -13-.

– Remove bolts -1- and -2- from cable retainer -3-.

Note

– Remove heater and air conditioner unit.

Installing:

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

Note

– Have second mechanic guide both coolant pipes to heat exchanger through seal during installation of heater unit ⇒ page 88 .

– During installation, ensure proper seating of condensation drain hose ⇒ page 59 .

– Fill with coolant ⇒ Rep. Gr. 19 .

– Refilling with refrigerant R134a and refrigerant oil ⇒ page 109 .

5 - Bracket

6 - Bolts

- ❑ 8 Nm

7 - Mounting plate

8 - Bolts

- ❑ 9 ± 1.3 Nm

9 - Right support

10 - Bolts

- ❑ 20 ± 3 Nm

11 - Left support

12 - Bolts

- ❑ 9 ± 1.3 Nm

13 - Bracket

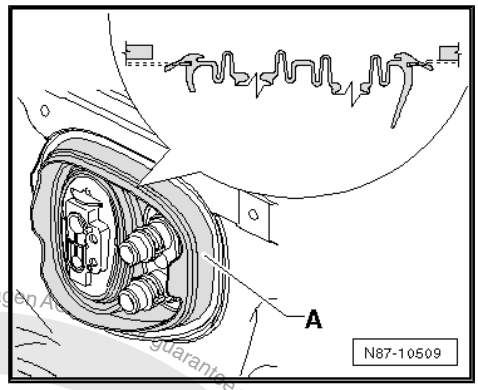
14 - Bolts

- ❑ 9 ± 1.3 Nm

Note

First tighten bolts -8- when installing supports -9- and -11-.

Heater and air conditioner unit/engine compartment seal



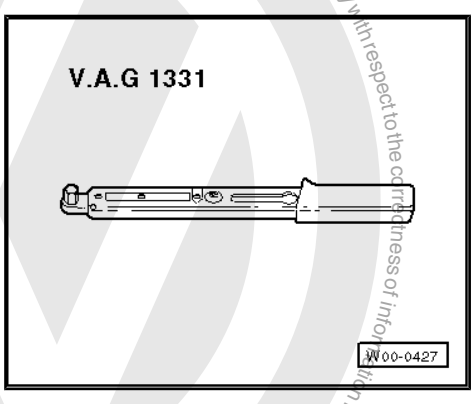
Note

Observe position of seal -A- during installation.

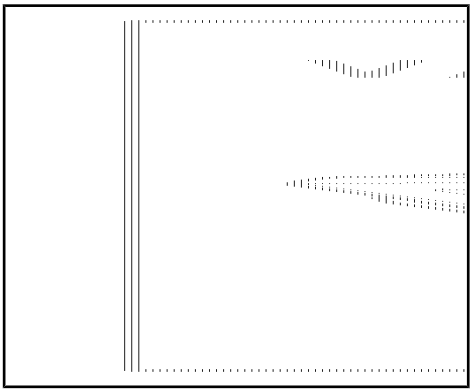
5.3 Renewing components of refrigerant circuit

Special tools and workshop equipment required

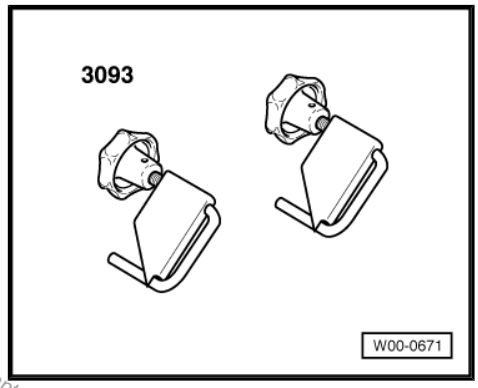
- ♦ Torque wrench -V.A.G 1331/- (5…50 Nm)



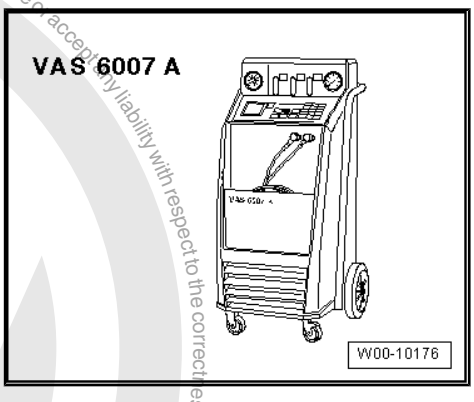
- Drip tray for workshop hoist -VAS 6208-



- Hose clamps up to 40 mm Ø -3093-



- Air conditioner service station -VAS 6007A- or later model.



Note

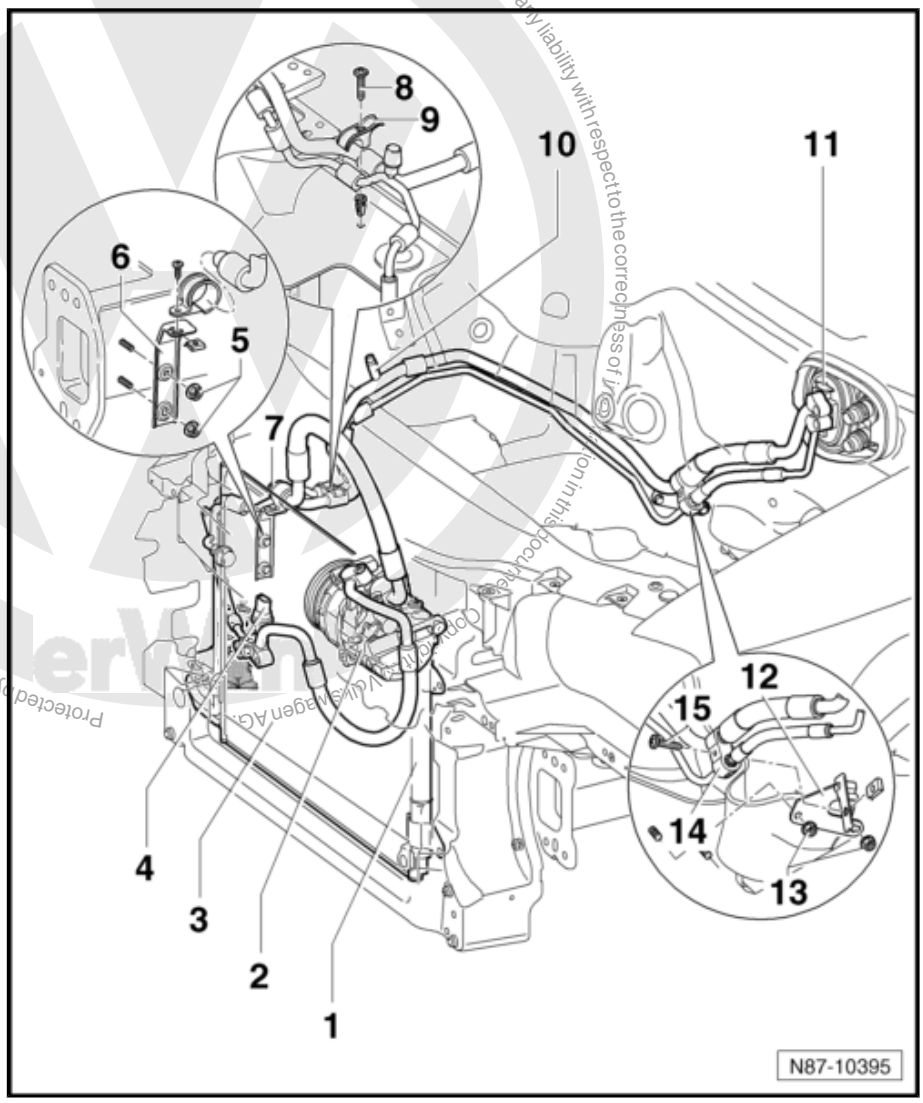
- *The refrigerant must be extracted beforehand, e.g. with air conditioner service station -VAS 6007A- .*
- *The previously used service stations can still be used ⇒ Volkswagen Workshop Equipment catalogue.*
- *All of the refrigerant circuit's components that have been opened must be sealed with suitable plugs to prevent the ingress of moisture.*
- *The colour coding of O-rings for R134a refrigerant circuits has been discontinued. Coloured and black O-rings are used.*
- *Under certain conditions, it is not necessary to renew the receiver with dryer every time that the refrigerant circuit is opened. Refer to ELSA under Heating, ventilation, air conditioning system; Air conditioning system with refrigerant R134a ⇒ Rep. Gr. 00 ; Technical data; Renewing components.*
- *Notes on repair work to vehicles with air conditioning and on handling refrigerant can be found in ELSA under Heating, ventilation, air conditioning system; Air conditioning system with refrigerant R134a ⇒ Rep. Gr. 00 ; Technical data.*
- *Notes on repair work to vehicles with air conditioning and on handling refrigerant can be found in ELSA under Heating, ventilation, air conditioning system; Air conditioning system with refrigerant R134a ⇒ Rep. Gr. 00 ; Technical data.*

WARNING

Danger of freezing injuries.

If refrigerant circuit has not been evacuated, refrigerant will 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 coolant circuit due to re-evaporation. Extract refrigerant again.



1 - Receiver with dryer

Note

- ❑ Removing and installing ⇒ page 92

2 - Air conditioner compressor

- ❑ Manufacturer: Denso, designation 7SEU17C
- ❑ Observe remarks on installation of air conditioner compressor ⇒ page 106 .
- ❑ Removing and installing ⇒ page 94

3 - Condenser

- ❑ Removing and installing ⇒ page 103

4 - High-pressure sender - G65-

Removing and installing ⇒ page 92

5 - Bracket

- ❑ Nuts, 6 Nm

6 - Evacuating and charging valve

- ❑ High-pressure side
- ❑ Releasing refrigerant into the environment is a punishable offence.
- ❑ Removing and installing ⇒ page 107
- ❑ Capacities ⇒ page 109

7 - Retainer

- ❑ Bolt 3.5 Nm

8 - Evacuating and charging valve

- ❑ Low-pressure side
- ❑ Releasing refrigerant into the environment is a punishable offence.
- ❑ Removing and installing ⇒ page 107
- ❑ Capacities ⇒ page 109

9 - Expansion valve

- ❑ Function and removal ⇒ page 100 .

10 - Hexagon nut

- ❑ 20 Nm

11 - Bracket

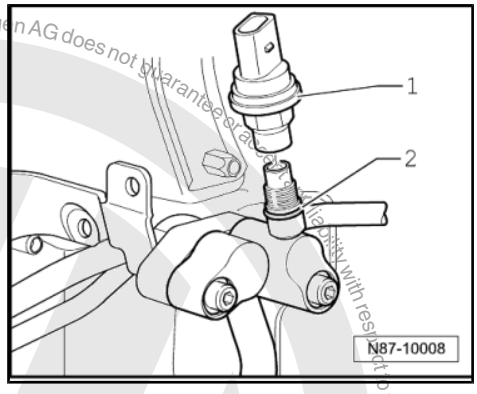
5.4 Removing and installing high-pressure sender -G65-

5.4.1 Removing

– Remove noise insulation tray from engine ⇒ Rep. Gr. 50 .

– Separate connector from high-pressure sender -1-.

– Unscrew high-pressure sender -G65- -1- from refrigerant line connection.



Note

- *Renew O-ring -2-.*
- *Depending on engine version, the high-pressure sender -G65- -1- may be installed in another location near the condenser.*

5.4.2 Installing

Install in reverse order.

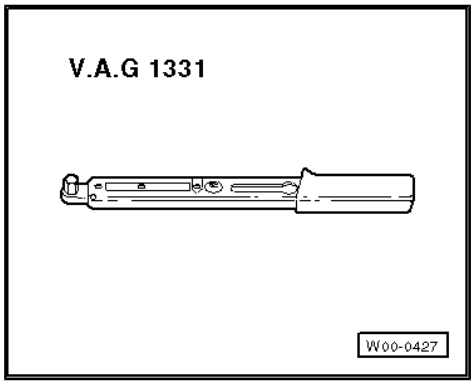
5.5 Removing and installing receiver with dryer

Note

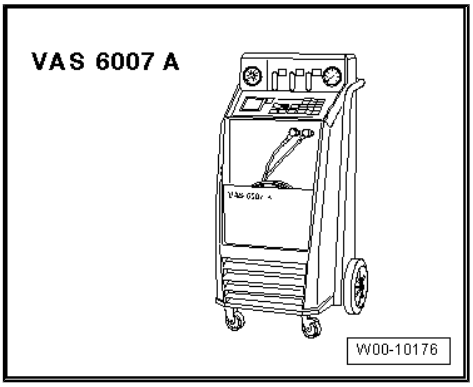
Under certain conditions, it is not necessary to renew the receiver with dryer every time that the refrigerant circuit is opened. Refer to ELSA under Heating, ventilation, air conditioning system; Air conditioning system with refrigerant R134a ⇒ Rep. Gr. 00 ; Technical data; Renewing components.

Special tools and workshop equipment required

- Torque wrench -V.A.G 1331/- (5…50 Nm)



- Air conditioner service station -VAS 6007A- or later model.



5.5.1 Removing

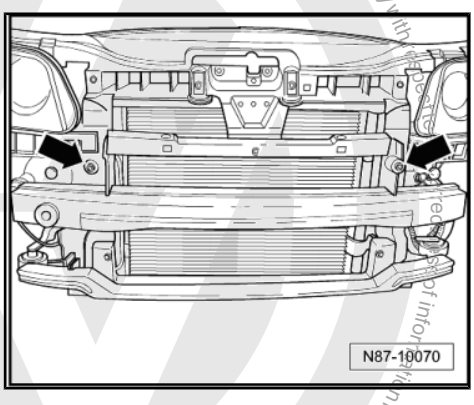
Note

- *Observe notes ⇒ page 88 .*
- *The refrigerant must be extracted beforehand, e.g. with air conditioner service station -VAS 6007A- .*
- *The previously used service stations can still be used ⇒ Volkswagen Workshop Equipment catalogue.*
- *All of the refrigerant circuit's components that have been opened must be sealed with suitable plugs to prevent the ingress of moisture.*

– Extract refrigerant, e.g. with air conditioner service station -VAS 6007A- before opening refrigerant circuit.

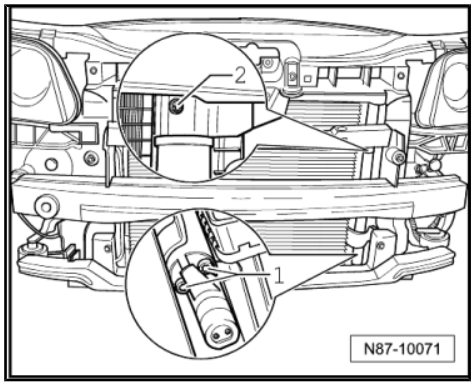
– Move lock carrier to service position ⇒ Rep. Gr. 50 .

– Remove radiator securing bolts -arrows- (7 Nm).



– Hang radiator on workshop hoist -V.A.G 1202/A- and lifting tackle -VAS 2024A- using workshop material (cable ties or uncoated wire) and unhook radiator from lock carrier. Coolant hoses and refrigerant lines remain connected.

– Remove securing bolt -2- and remove retaining clip.



WARNING

Danger of freezing injuries.

If refrigerant circuit has not been evacuated, refrigerant will 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 coolant circuit due to re-evaporation. Extract refrigerant again.

– Remove bolts -1- and pull out receiver with dryer upwards.

Note

Depending on condenser, only one bolt -1- may be present.

5.5.2 Installing

Install in reverse order.

Note

- *First tighten bolt(s) -1- to 4.2 Nm ± 0.7 Nm and then tighten securing bolt -2-.*
- *When installing radiator, ensure that sealing strips on radiator are properly seated.*

5.6 Removing and installing air conditioner compressor

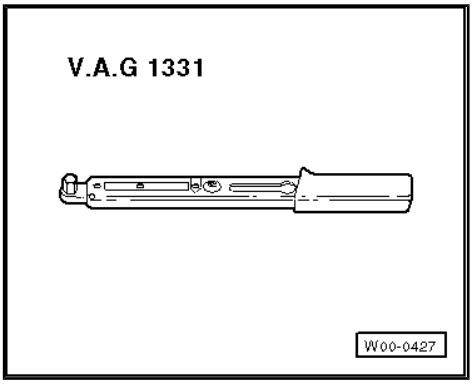
5.6.1 Removing

Note

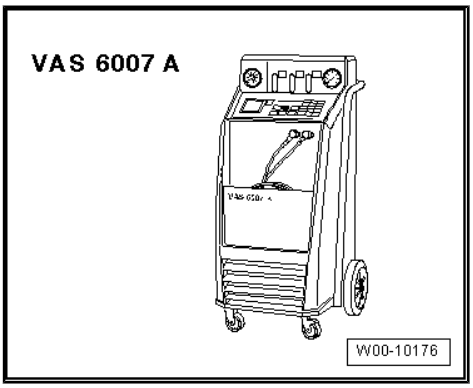
- *Zexel air conditioner compressors have to be replaced by Denso air conditioner compressors. Refer to technical solution (TPL) 2011410.*
- *A software update of the engine control unit is only required for the 1.6 l 75 kW engine with engine code BSE. These software versions are only available online via SVM (Software Versions Management) and can be flashed with the code for the repair measure.*

Special tools and workshop equipment required

- Torque wrench -V.A.G 1331/- (5…50 Nm)



- Air conditioner service station -VAS 6007A- or later model.



Note

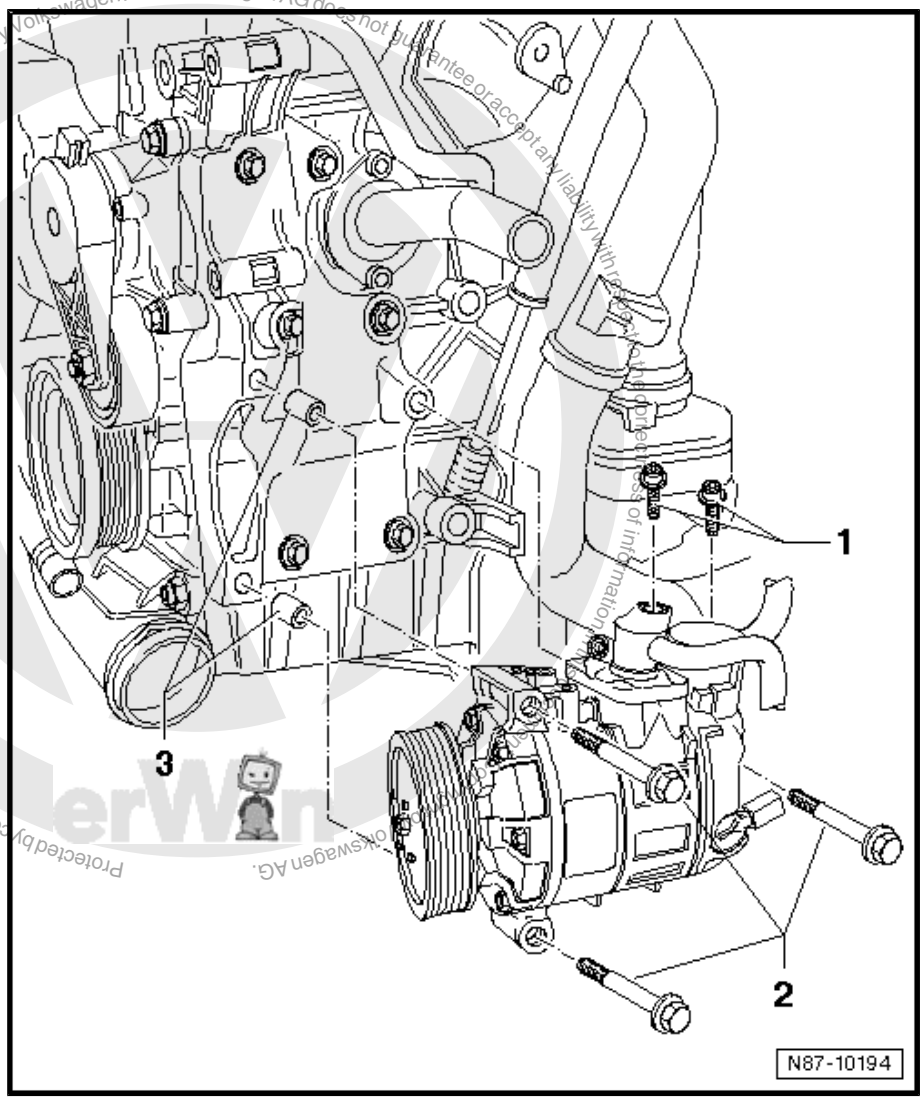
- *The refrigerant circuit must be purged with refrigerant R134a under the following circumstances:*
- *If dirt or other contamination is in the circuit.*
- *If during the evacuation of a leak-tight refrigerant circuit the vacuum is not maintained at the gauge (there is moisture in the refrigerant circuit and this generates vapour pressure).*
- *If the refrigerant circuit has been left open for longer than normally required for repairs (e.g. following an accident).*
- *When pressure and temperature measurements in the refrigerant circuit indicate that there is moisture in the refrigerant circuit.*
- *There is doubt about the amount of refrigerant oil in the refrigerant circuit.*
- *The air conditioner compressor has to be exchanged because of internal damage (e.g. noisy or lack of power).*

The procedure for purging with refrigerant R134a is described in ELSA under Heating, ventilation, air conditioning system; Air conditioning system with refrigerant R134a ⇒ Rep. Gr. 00 Technical data; Clearing refrigerant circuit of contaminants.

Notes on repair work to vehicles with air conditioning and on handling refrigerant can be found in ELSA under Heating, ventilation, air conditioning system; 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.

– Extract refrigerant, e.g. with air conditioner service station - VAS 6007A- before opening refrigerant circuit. Observe notes ⇒ page 88 .



– Remove noise insulation under engine ⇒ Rep. Gr. 50 .
– Remove front right wheel housing liner ⇒ Rep. Gr. 66 .
– Remove poly V-belt ⇒ Rep. Gr. 13 .

WARNING

Danger of freezing injuries.

If refrigerant circuit has not been evacuated, refrigerant will 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 coolant circuit due to re-evaporation. Extract refrigerant again.

– Remove bolts (22 Nm ± 1 Nm) -1- from air conditioner compressor and separate refrigerant lines from air conditioner compressor.

– Remove hexagon bolts (25 Nm) -2- and remove air conditioner compressor.

5.6.2 Installing

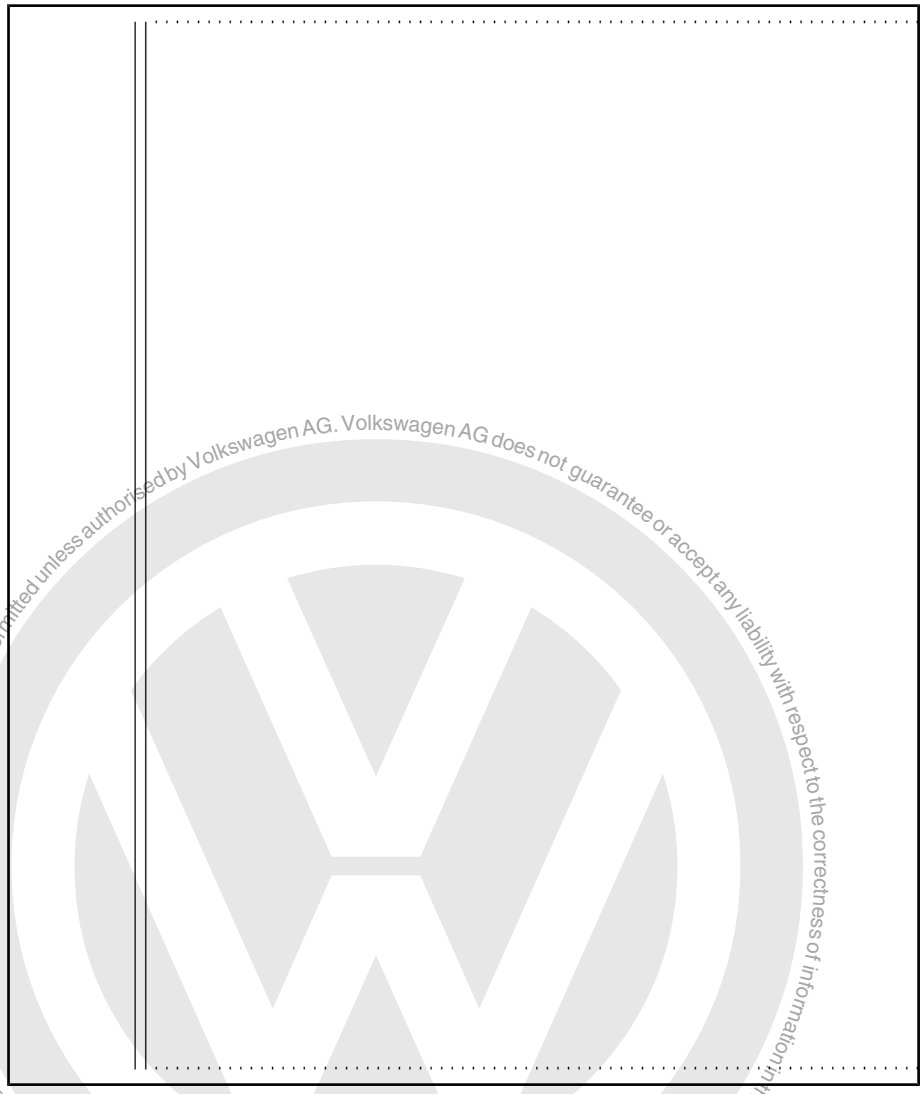
Note

- *Ensure that dowel sleeves -3- are properly seated.*
- *Observe remarks on installation of air conditioner compressor* ⇒ page 106 .

5.7 Assembly overview - poly V-belt pulley (air conditioner compressor from “Denso”)

Note

- *This type of poly V-belt pulley is installed on “7SEU17C” air conditioner compressors.*
- *Various types of poly V-belt pulley are installed depending on design of air conditioner compressor and type of engine ⇒ Parts catalogue .*
- *Removing and installing poly V-belt pulley* ⇒ page 99 .



1 - Cover

2 - Retaining ring

- ❑ Remove carefully using a small screwdriver or long-nose pliers (be especially careful with the poly V-belt pulley)

3 - Guide cage

4 - Retaining ring

- ❑ Always renew
- ❑ Install correctly (flat side faces air conditioner compressor)

5 - Shim

6 - Poly V-belt pulley

- ❑ The poly V-belt pulley is constructed in plastic and is especially sensitive to impact, be especially careful when handling the poly V-belt pulley
- ❑ Various versions ⇒ Parts catalogue

7 - Air conditioner compressor

- ❑ Various types of poly V-belt pulley are installed depending on type of engine and country version ⇒ Parts catalogue
- ❑ Clean air conditioner compressor flange before fitting poly V-belt pulley

8 - Rubber element

- ❑ Qty. 6
- ❑ Flexible coupling between poly V-belt pulley and air compressor drive shaft, dampens vibrations and noise
- ❑ Lightly moisten rubber elements with, for example, tyre assembly paste or soapy solution (used as a lubricant) when installing.

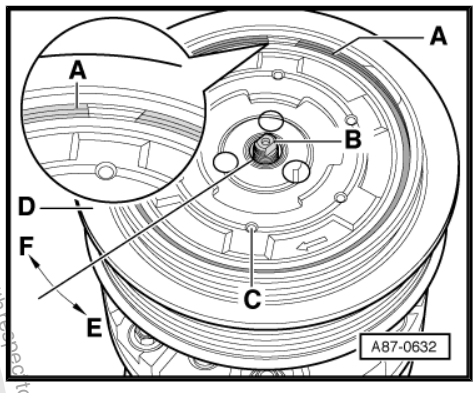
5.8 Removing and installing poly V-belt pulley (air conditioner compressor from “Denso”)

5.8.1 Removing

– Carefully remove circlip -A- using a small screwdriver or long-nose pliers (pay particular attention not to damage the poly V-belt pulley).

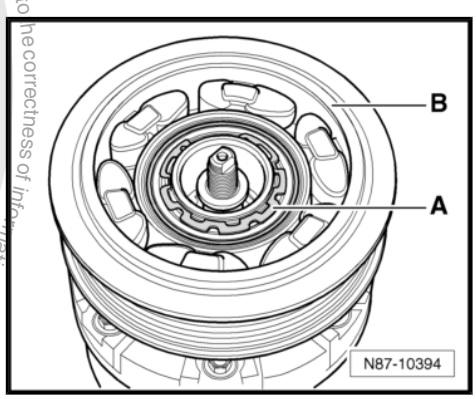
– Counterhold drive shaft of air conditioner compressor -B- using an open-jaw spanner or socket from Shock absorber set - T10001- (depending on design of air conditioner compressor) and turn drive disc -C- along with poly V-belt pulley -D- in direction of arrow -E- (specified torque 35 Nm).

– Remove drive plate -C-.



– Remove circlip -A-.

– Pull off belt poly V-belt pulley -B-.



5.8.2 Installing

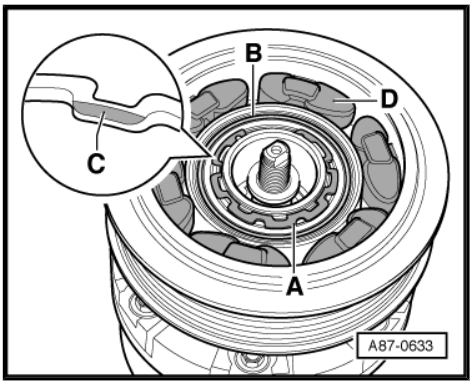
Note

- *Renew circlip -A-.*
- *Clean air conditioner compressor flange before fitting poly V-belt pulley.*
- *When installing, ensure the circlip -A- is deformed as little as possible.*

– Install belt poly V-belt pulley -B-.

– Install circlip -A- correctly, chamfer -C- faces away from air conditioner compressor (flat side towards air conditioner compressor).

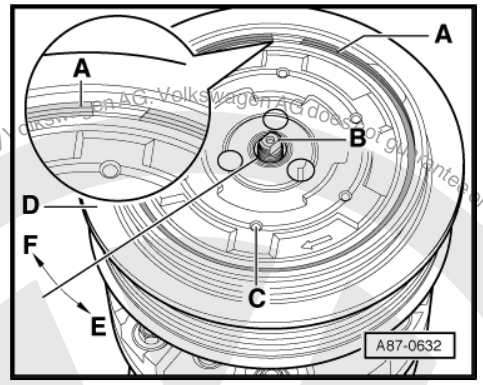
– Insert rubber elements -D- into poly V-belt pulley -B-, as shown in figure.



Note

When installing rubber elements -D- moisten lightly with, for example, tyre assembly paste or soapy solution (used as a lubricant)

– Insert drive plate -C- into rubber elements -D- until it contacts drive shaft of air conditioner compressor -B-.
– Screw drive plate -C- onto compressor shaft -B- by turning in direction of arrow -F-.
– Install circlip -A-.



5.9 Removing and installing poly V-belt pulley, “Sanden” air conditioner compressor

5.9.1 Removing

5.9.2 Installing

5.10 Checking high-pressure safety valve on air conditioner compressor

♦ Function: protects refrigerant circuit against excessive pressure.

WARNING

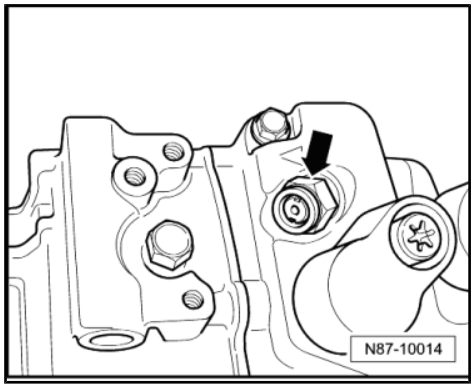
Danger of freezing injuries.

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.

Checking high-pressure safety valve on air conditioner compressor (manufacturer Denso)

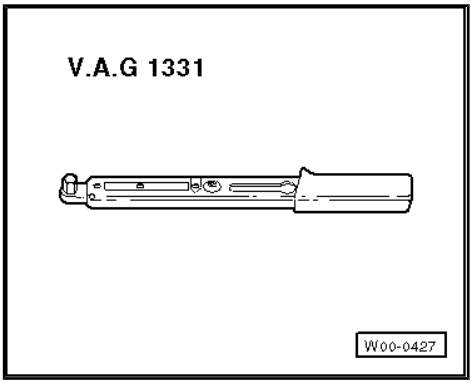
♦ The high-pressure safety valve -arrow- has operated when refrigerant oil is found in the immediate vicinity.
♦ In this case, hand over vehicle to a suitable workshop ⇒ page 82 .



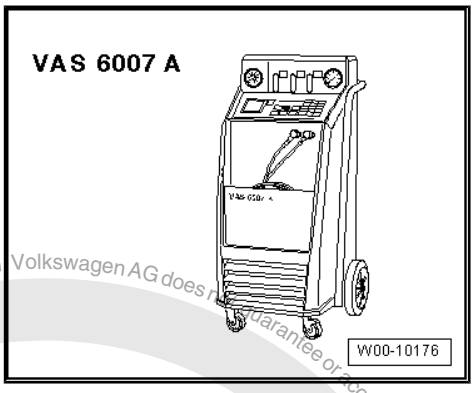
5.11 Expansion valve, function and removing

Special tools and workshop equipment required

- Torque wrench -V.A.G 1331/- (5…50 Nm)



- Air conditioner service station -VAS 6007A- or later model.



Note

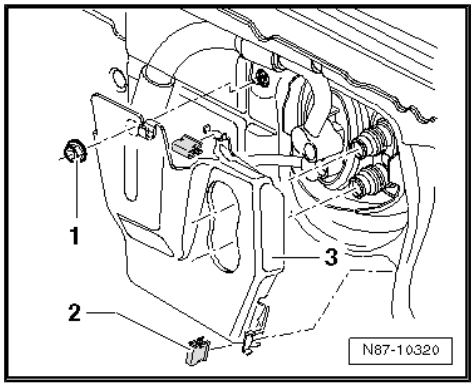
- *The refrigerant must be extracted beforehand, e.g. with air conditioner service station -VAS 6007A- .*
- *The previously used service stations can still be used ⇒ Volkswagen Workshop Equipment catalogue.*
- *All of the refrigerant circuit's components that have been opened must be sealed with suitable plugs to prevent the ingress of moisture.*
- *Connecting pipe from charge air cooler must be removed on some vehicles ⇒ Rep. Gr. 21*

Applies only to vehicles with a protective plate before the expansion valve.

Note

On right-hand drive vehicles, lock washers are installed instead of a clip and a nut.

– Unscrew nut -1- (6 ± 0.9 Nm).
– Release clips -2- and remove protective plate -3-.



Continuation for all vehicles

1 - Bolts

- ❑ 10 ± 1 Nm
- ❑ Qty. 2

2 - Refrigerant lines on expansion valve

3 - O-ring

- ❑ 13.7 mm; 2.5 mm

4 - Expansion valve

- ❑ Removing:

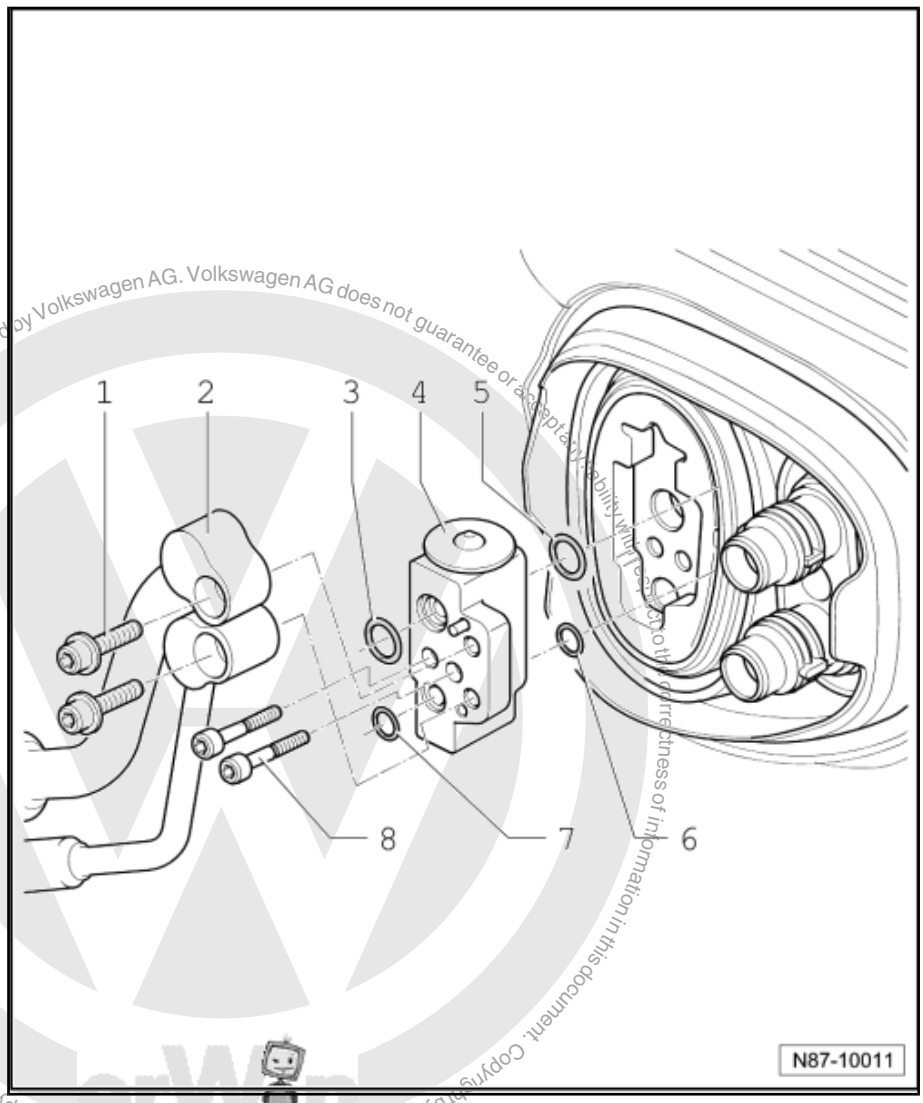
– Extract refrigerant, e.g. with air conditioner service station -VAS 6007A- .

WARNING

Danger of freezing injuries.

If refrigerant circuit has not been evacuated, refrigerant will 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 coolant circuit due to re-evaporation. Extract refrigerant again.



– Remove bolts -1- and pull refrigerant lines -2- out of expansion valve.
– Remove screws -8- and remove expansion valve -4-.

5 - O-ring

- ❑ 14 mm; 1.82 mm
- ❑ Moisten with refrigerant oil when installing.

6 - O-ring

- ❑ 10.8 mm; 1.82 mm

❑ Moisten with refrigerant oil when installing.

7 - O-ring

❑ 9.5 mm; 2.5 mm

8 - Socket head combi-bolt

❑ 5 Nm

5.11.1 Function

♦ The expansion valve atomises incoming refrigerant and regulates the flow so that, depending on the heat transport, the vapour does not become a gas until it reaches the outlet of the evaporator.

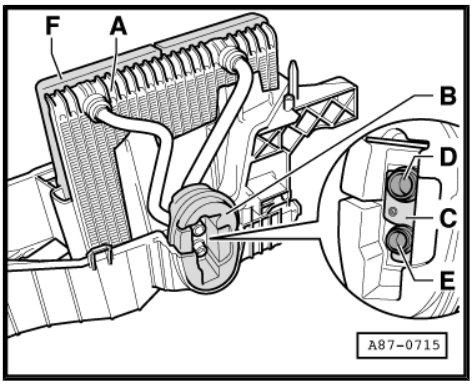
5.12 Removing and installing evaporator

– Remove heater and air conditioning unit ⇒ page 84 .

– Dismantle heater and air conditioning unit: vehicles with Climatronic ⇒ page 50 , vehicles with Climatic ⇒ page 31 .

– Dismantle evaporator housing ⇒ page 52 .

– Pull evaporator -A- out from lower part of evaporator housing.



Note

♦ *Before inserting evaporator, check condensed water drain and clean if necessary.*

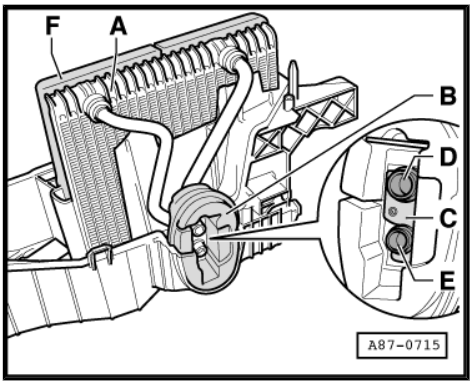
♦ *Clean evaporator housing and, if necessary, evaporator, before inserting.*

– When inserting evaporator -A- in lower part of evaporator housing and assembling the two parts of housing, ensure that seal -F- is not damaged.

– Before inserting evaporator, examine seal -F- (it must be bonded all around).

– Set bracket -C- and combined seal and insulation -B- on connection pipes of evaporator -D- and -E-.

– Insert evaporator -A- in lower part of evaporator housing as shown in figure.



Note

♦ *After assembling parts of evaporator housing, check for proper seating of combined seal and insulation -B- at opening for both refrigerant lines -D- and -E-.*

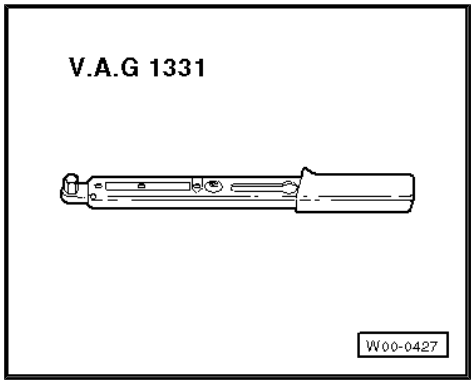
♦ *Check seating of retainer -C- on both refrigerant lines -D- and -E- for proper seating.*

♦ *If heat insulation -B- is missing or improperly installed, it may lead to reduced performance of the air conditioning system (due to changes in the set mapped values of the expansion valve through heat radiation).*

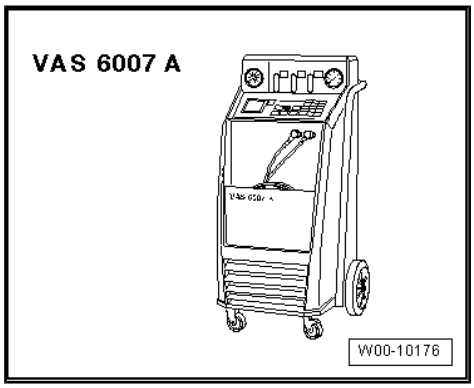
5.13 Removing and installing condenser

Special tools and workshop equipment required

- Torque wrench -V.A.G 1331/- (5…50 Nm)



- Air conditioner service station -VAS 6007A- or later model.



Note

- *The refrigerant must be extracted beforehand, e.g. with air conditioner service station -VAS 6007A- .*
- *The previously used service stations can still be used ⇒ Volkswagen Workshop Equipment catalogue.*
- *All of the refrigerant circuit's components that have been opened must be sealed with suitable plugs to prevent the ingress of moisture.*

First carry out the following work:

– Switch off all electrical consumers.
– Switch off ignition.
– Pull out ignition key.
– Extract refrigerant, e.g. with air conditioner service station -VAS 6007A- .

Note

Releasing refrigerant into the environment is a punishable offence.

– Remove front bumper ⇒ Rep. Gr. 63 .
– Remove lock carrier ⇒ Rep. Gr. 50 .

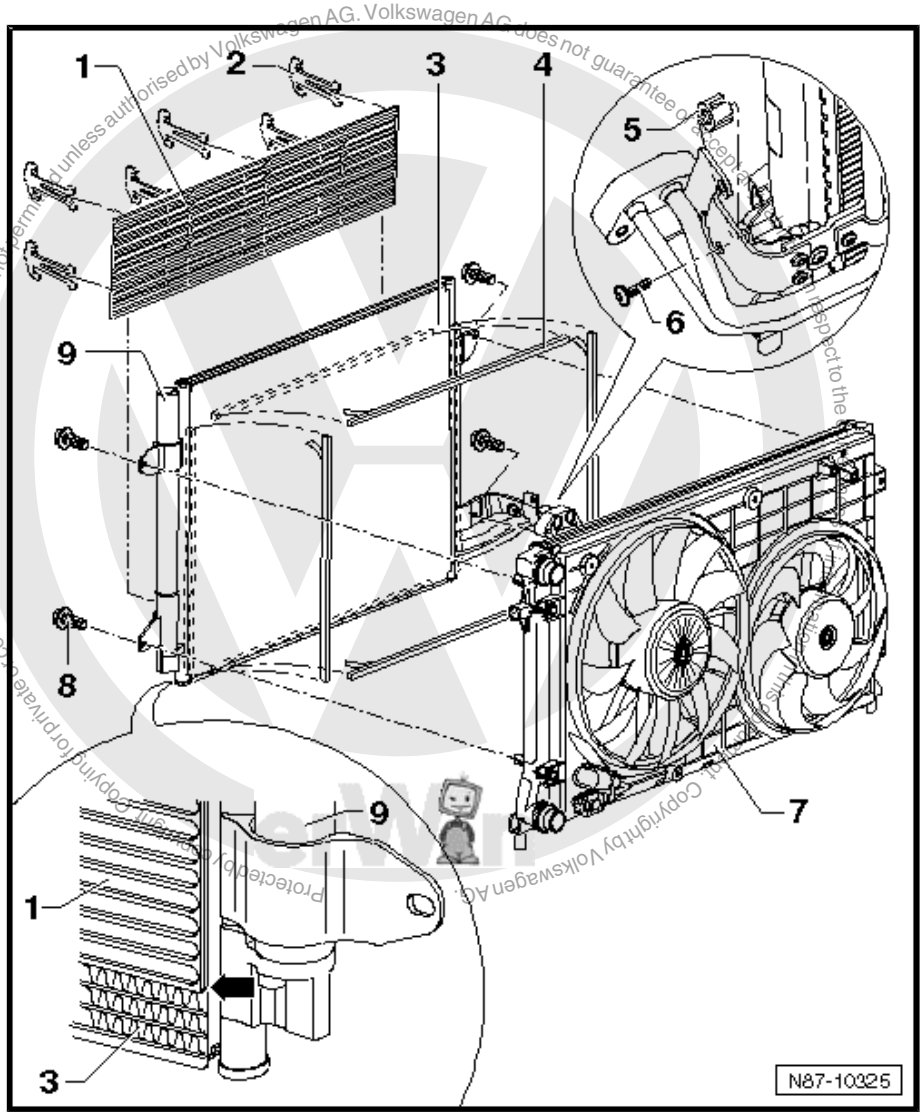
WARNING

Danger of freezing injuries.

If refrigerant circuit has not been evacuated, refrigerant will 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 coolant circuit due to re-evaporation. Extract refrigerant again.

– Remove refrigerant lines on condenser and seal.



1 - Protective screen

- ❑ Only on vehicles with heavy-duty equipment.
- ❑ Only in vehicles with condensers from manufacturer “Showa”.
- ❑ Position protective screen on 3rd rib from the bottom -arrow-

2 - Securing clip

- ❑ Qty. 8

3 - Condenser

- ❑ Secured with 4 bolts to radiator

4 - Sealing strip

- ❑ Glue top sealing strip to 6th fin row from top of condenser before installing
- ❑ Glue bottom sealing strip to 1st fin row from bottom of condenser before installing
- ❑ Glue side sealing strips to outer edge of condenser before installing

5 - Spacer

Note

6 - Bolt

- ❑ 5 ± 0.5 Nm

7 - Radiator

8 - Bolts

- ❑ Qty. 4
- ❑ 5 ± 0.5 Nm

Note

9 - Receiver with dryer

Under certain conditions, it is not necessary to renew the receiver with dryer every time that the refrigerant circuit is opened. Refer to ELSA under Heating, ventilation, air conditioning system; Air conditioning system with refrigerant R134a ⇒ Rep. Gr. 00 ; Technical data; Renewing components.

❑ Removing and installing ⇒ page 92

5.14 Notes on installing air conditioner compressor

5.14.1 Installing

– Do not start engine until after reconnecting refrigerant circuit.

– After installing a new air conditioner compressor or filling with fresh refrigerant oil (e.g. after blowing out refrigerant circuit), turn compressor pulley 10 revolutions by hand before starting engine. This will prevent damage to the air conditioner compressor.

– If possible, start engine only with refrigerant circuit charged.

Note

♦ *The air conditioner compressor is driven permanently by the poly V-belt pulley (not fitted with a magnetic clutch).*

♦ *If an air conditioner compressor seizes, the overload protection separates from the air conditioner compressor shaft. The seizure can normally be detected by the bulges in the poly V-belt pulley. Another indication of a seizure is abraded rubber material around the poly V-belt pulley.*

♦ *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 cm^3 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.*

♦ *Air conditioning system compressor regulating valve -N280- is not activated when the refrigerant circuit is empty and 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 2000 rpm.*

♦ *Run engine only as long as absolutely necessary, max. 10 min.*

Note

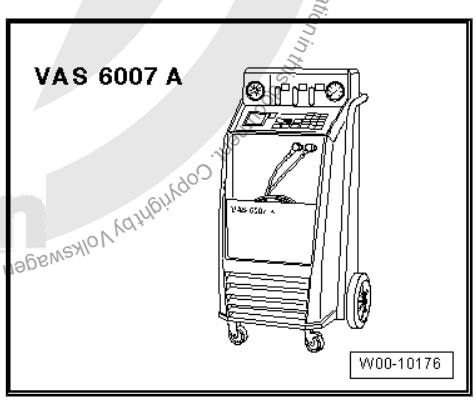
Note the following when starting engine for first time after filling refrigerant circuit:

- Start engine with air conditioner compressor switched off (“Econ” mode) and wait until the idling speed stabilizes.
- Open dash panel vents.
- Set temperature to “Lo” on the operating and display unit for Climatronic air conditioning system -E87- .
- Now switch air conditioner compressor on (“Auto” mode) and allow engine to run for at least 5 minutes at idling speed.

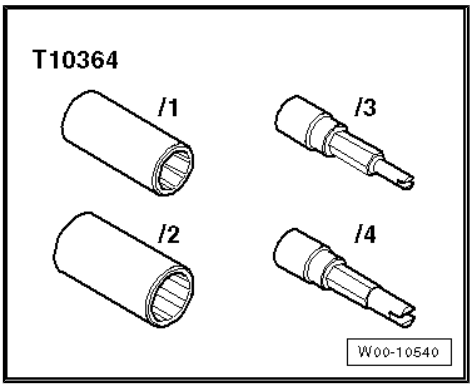
5.14.2 Removing evacuating and charging valve, low-pressure side and high-pressure side

Special tools and workshop equipment required

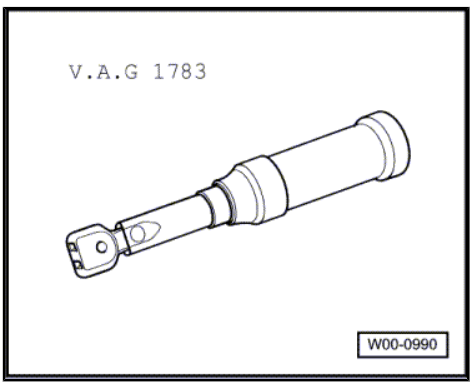
- E.g. air conditioner service station -VAS 6007A- (or later model)



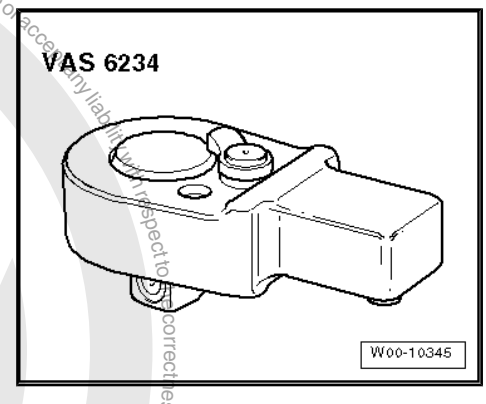
- Adapter set for service connections -T10364-



- Torque wrench -V.A.G 1783-



- Ratchet insert tool 1/4" -VAS 6234-



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.*

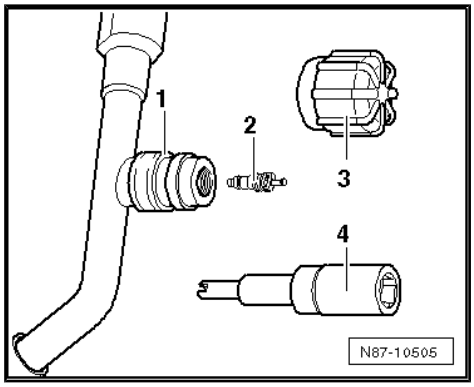
– Remove cap -3-.

WARNING

Danger of freezing injuries.

If refrigerant circuit has not been evacuated, refrigerant and refrigerant oil will 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 coolant circuit due to re-evaporation. Extract refrigerant again.



– Evacuate refrigerant circuit, e.g. with air conditioner service station -VAS 6007A- (or later model) before renewing valve -2-.

– Unscrew valve core -2- (2.4 ± 0.2 Nm) out of refrigerant line using suitable adapter -4-. When doing this, carefully hold valve support -1- with a suitable tool.

6 Capacities

6.1 Refrigerant R134a

Air conditioner compressor	Manufacturer	Total capacity
7SEU16C	Denso	525±25 grammes
7SEU17C	Denso	525±25 grammes
PXE16	Sanden	525±25 grammes
DSC17E	Zexel	525±25 grammes

6.2 Refrigerant oil

Note

- *The special refrigerant oil (for use with refrigerant circuits R134a only) can no longer be obtained on the refrigerant/machine oil market.*
- *Refrigerant oils from containers which have been open for a longer period of time are unusable.*

Refrigerant oil can be obtained using following part No. for	
Denso 7SEU16C	G 052 300 A2
Denso 7SEU17C	G 052 300 A2
Sanden PXE16	G 052 154 A2
Zexel / Valeo DSC17E	G 052 154 A2

Type	Production period	Total capacity[1)]
Denso 1K0 820 803 E	from 07.03	140 cm^3 ±10 cm^3
Sanden 1K0 820 803 G	from 07.03	110 cm^3 ±10 cm^3
Sanden 1K0 820 859 G	from 06.2005	110 cm^3 ±10 cm^3
Zexel / Valeo 1K0 820 803 H	from 07.03	120 cm^3 + 15 cm^3
Denso 1K0 820 803 F	From 11.2006	180 cm^3 ±10 cm^3

1) This quantity of refrigerant oil is contained in a replacement air conditioner compressor and corresponds to the total capacity.

Important information:

Because refrigerant oil is very hygroscopic, opened containers must be immediately closed airtight after use to stop intrusion of moisture.

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%