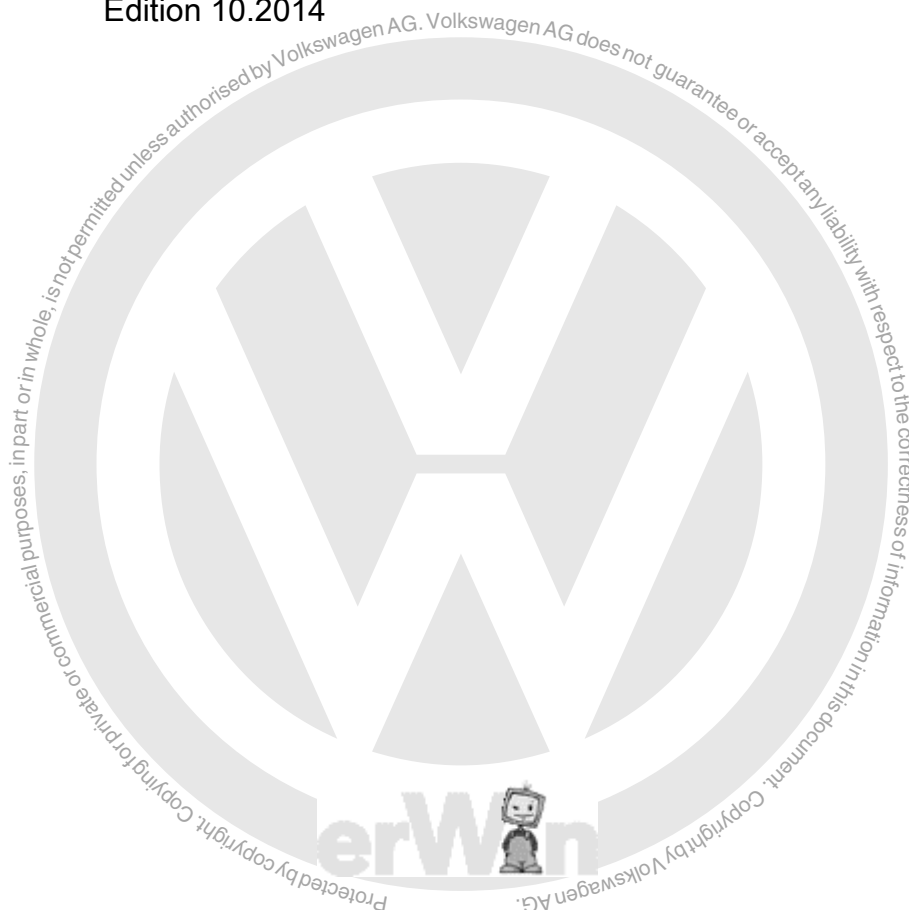




Repair Manual Golf 2013 ➤ Golf Variant 2014 ➤

Heating, Ventilation and Air Conditioning

Edition 10.2014





List of Workshop Manual Repair Groups

Repair Group

00 - General, Technical Data

80 - Heating, Ventilation

87 - Air Conditioning



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



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00 – General, Technical Data

1 Safety Precautions

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⇒ [“1.1 Handling Refrigerant Safety Precautions”, page 1](#)

⇒ [“1.2 Start/Stop System Safety Precautions”, page 1](#)

⇒ [“1.3 High Voltage System Safety Precautions”, page 1](#)

⇒ [“1.4 Safety Precautions near High Voltage Components”, page 2](#)

⇒ [“1.5 Cooling System Safety Precautions”, page 2](#)

⇒ [“1.6 Parking/Auxiliary Heater Safety Precautions”, page 2](#)

1.1 Handling Refrigerant Safety Precautions

There Is A Risk of Frostbite Through Refrigerant.

When working on the Air Conditioning (A/C) system refrigerant can come out under pressure. Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.

Risk of Destroying the Refrigerant Lines.

Destroying the refrigerant lines by ripping in the inner foil is possible.

- Never bend the refrigerant lines to a radius smaller than $r = 100 \text{ mm}$.

1.2 Start/Stop System Safety Precautions

There Is A Risk of Injury From the Engine Starting Unexpectedly.

The engine can start unexpectedly on vehicles with an activated Start/Stop System. A visible message appears in the instrument cluster indicating whether the Start/Stop System is activated.

- Deactivate the Start/Stop System: Turn off the ignition.

1.3 High Voltage System Safety Precautions

Extremely Dangerous Due to High Voltage.

The high voltage system is under high voltage. Death or serious bodily injury by electric shock.

- Individuals with electronic/medical life- and health sustaining machines in or on their person cannot perform any work on high voltage systems. Life- and health sustaining machines are for example pain killer pumps, implanted defibrillators, pacemakers, insulin pumps, and hearing aids.



- Have the high voltage system de-energized by a qualified person.

There Is A Risk of Injury From the Engine Starting Unexpectedly.

On electric - hybrid vehicles an active ready mode is difficult to identify. Parts of the body can be clamped or pulled.

- Turn off the ignition.
- Place the ignition key outside of the vehicle interior.

Risk of Damaging the High Voltage Cables.

Misuse can damage the insulation of high voltage cables or high voltage connectors.

- Never support objects on the high voltage cables and the high voltage connectors.
- Never support tools on the high voltage cables and the high voltage connectors.
- Never sharply bend or kink the high voltage cables.
- When connecting pay attention to the coding of the high voltage connectors.

1.4 Safety Precautions near High Voltage Components

Extremely Dangerous Due to High Voltage.

The high voltage system is under high voltage. Electrocution can cause death or very serious personal injury from damages high voltage components and high voltage cables.

- Perform a visual inspection of the high voltage components and the high voltage cables.
- Never use tools that are for cutting, deformed, or sharp edged.
- Never use welding, soldering, thermal adhesive or hot air.

1.5 Cooling System Safety Precautions

There Is A Risk of Burning from Hot Coolant

The cooling system is under pressure when the engine is warm. There is a risk of scalding from hot steam and coolant.

- Wear protective gloves.
- Wear protective eyewear.
- Reduce the pressure: cover the coolant reservoir cap with a cloth and carefully open.

1.6 Parking/Auxiliary Heater Safety Precautions

There Is A Risk of Fire and Explosion By the Parking/Auxiliary Heater

In areas that are subject to fire and explosion, a spark or the high temperature of the parking/auxiliary heater can ignite a fire or cause an explosion. It is possible to be burned.

- In areas that are subject to fire and explosion, switch off the parking/auxiliary heater.

Risk of Poisoning from the Exhaust Fumes

The parking/auxiliary heater produces poisonous exhaust fumes. Respiratory system injury and poisoning are possible.



- Only switch on the parking/auxiliary heater in closed areas with an exhaust extracting system.
- Switch off the parking/auxiliary heater in closed areas with no exhaust extracting system.

Risk of Damage By Engine Start

It is possible to damage the parking/auxiliary heater when fuel system components are removed or opened (for example, the metering pump, fuel line, fuel level sensor).

- Never start the engine when fuel system components are removed or opened.

Malfunctions Due to Air In the Fuel Supply

After working on the fuel tank or the fuel delivery unit, the metering pump draws in air and sends the air to the parking/auxiliary heater. Parking/auxiliary heater malfunctions due to air in the parking/auxiliary heater fuel supply are possible.

- Fill the fuel extraction tube with fuel.

Risk of Accident and Injury By the Activated Parking/Auxiliary Heater Timer

For vehicles with an activated timer for the parking/auxiliary heater, the parking/auxiliary heater can turn on unintentionally. Poisoning by exhaust fumes and burns from hot parking/auxiliary heater components are possible, as well as the risk of fire and explosion due to high temperatures.

- Deactivate the timer for the parking/auxiliary heater.



2 Identification

⇒ **"2.1 Heater and A/C Unit Identification", page 4**

2.1 Heater and A/C Unit Identification

⇒ **"2.1.1 Heater and A/C Unit Identification, Valeo", page 4**

⇒ **"2.1.2 Heater and A/C Unit Identification, Denso", page 4**

2.1.1 Heater and A/C Unit Identification, Valeo

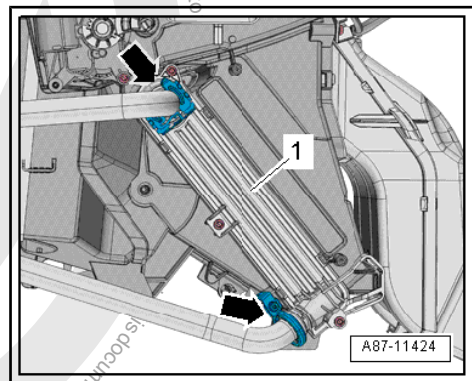


Note

Correct allocation must be observed when replacing components. Interchanging components from different manufacturers is not permitted. Refer to the Parts Catalog.

- Remove the left footwell center console trim. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console.

If the layout of the coolant pipe on the heater core looks like the one shown in the illustration, then the heater and Air Conditioning (A/C) unit is from the manufacturer Valeo.



2.1.2 Heater and A/C Unit Identification, Denso



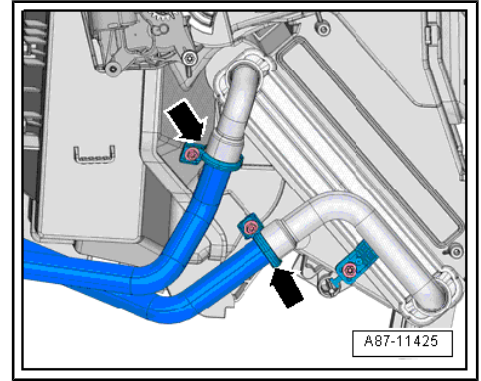
Note

Correct allocation must be observed when replacing components. Interchanging components from different manufacturers is not permitted. Refer to the Parts Catalog.

- Remove the left footwell center console trim. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console.



If the layout of the coolant pipe on the heater core looks like the one shown in the illustration, then the heater and Air Conditioning (A/C) unit is from the manufacturer Denso.





3 General Information

⇒ **"3.1 Odors in Vehicles with A/C System", page 6**

⇒ **"3.2 Vehicles with Start/Stop System General Information", page 6**

⇒ **"3.3 Type Label", page 7**

3.1 Odors in Vehicles with A/C System

- ◆ If there are unpleasant odors coming from the evaporator, clean the evaporator.
- ◆ For cleaning the evaporator, Volkswagen has tested and approved the Ultrasound A/C Cleaner - VAS6189B- as well as the Suction Feed Spray Gun - VAG1538- with a suitable spray nozzle.
- ◆ Instructions for cleaning the evaporator are provided with the tools.
- ◆ As soon as Volkswagen approves new procedures, the relevant notes are to be found in the repair manual. Refer to ⇒ Refrigerant R134a Servicing; Rep. Gr. 00 ; Concerns .

3.2 Vehicles with Start/Stop System General Information

Read safety precautions when working on vehicles with start/stop system. Refer to

⇒ **"1.2 Start/Stop System Safety Precautions", page 1** .

If the vehicle has a start-stop system, perform the following termination conditions to deactivate the start-stop function:

- ◆ Use the Start/Stop button to switch off the Start/Stop System.
- ◆ The battery state of charge does not make it possible to start the engine again (start voltage prediction).
- ◆ The defrost function is active.
- ◆ The heated front windshield is active.
- ◆ The selected temperature deviates more than 8 °C (46.4 °F) from the actual temperature inside the vehicle.
- ◆ The engine RPM exceeds 1,200 RPM.
- ◆ The Generator - C- is faulty, for example, the ribbed belt is torn.
- ◆ The coolant temperature is not in the specified range of 25 °C to 100 °C (77 to 212 °F).
- ◆ Increasing the blower speed by more than 4 steps.

Further information

- ◆ For more information, refer to Self Study Program, Start/Stop System 2009.



3.3 Type Label

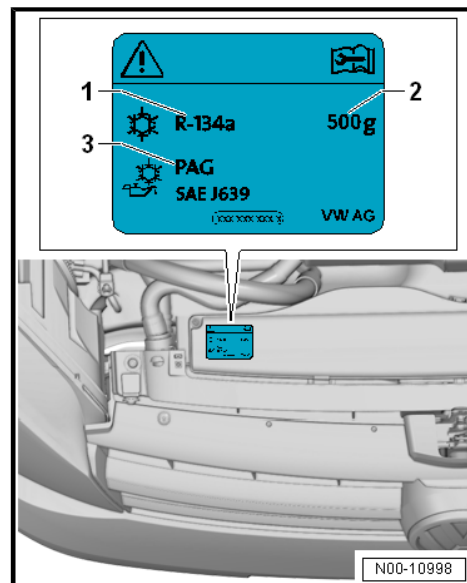
Type Label for the Refrigerant R134a and Refrigerant Oil Capacities.

- 1 - Refrigerant name
- 2 - Refrigerant capacity
- 3 - Refrigerant oil name



Note

- ◆ A filling tolerance of 500 ± 15 grams may deviate from the type label.
- ◆ Refrigerant R134a and refrigerant oil capacities. Refer to ⇒ "5 Technical Data", page 62.





4 Repair Information

⇒ [“4.1 Working on the Refrigerant Circuit”, page 8](#)

⇒ [“4.2 Refrigerant Circuit Seals”, page 8](#)

⇒ [“4.3 Heating Output, Checking”, page 9](#)

⇒ [“4.4 Cooling Output, Checking”, page 31](#)

4.1 Working on the Refrigerant Circuit

Work performed that requires the circuit to be opened must only be performed by trained personnel.

ELSA contains all information regarding performing repairs on vehicles with air conditioning and working with refrigerant. Refer to ⇒ Refrigerant R134a Servicing; Rep. Gr. 00 ; A/C System, General Information; A/C System and Refrigerant R134a Safety Precautions .

Information on tools for repairs in vehicles with climate control system can be found in ELSA. Refer to ⇒ Refrigerant R134a Servicing; Rep. Gr. 00 ; Special Tools .

ELSA contains usage information for the A/C Service Station when working on vehicles with an A/C system. Refer to ⇒ Refrigerant R134a Servicing; Rep. Gr. 00 ; A/C Service Station, Working with .

Under certain conditions, the dryer bag should no longer be replaced each time the refrigerant circuit is opened. Refer to ⇒ Refrigerant R134a Servicing; Rep. Gr. 00 ; Components, Replacing in ELSA.

The operation and procedure for flushing with refrigerant is described in ELSA . Refer to ⇒ Refrigerant R134a Servicing; Rep. Gr. 00 ; Refrigerant Circuit, Removing Contaminants; Refrigerant Circuit, Flushing (Cleaning) with Refrigerant R134a .

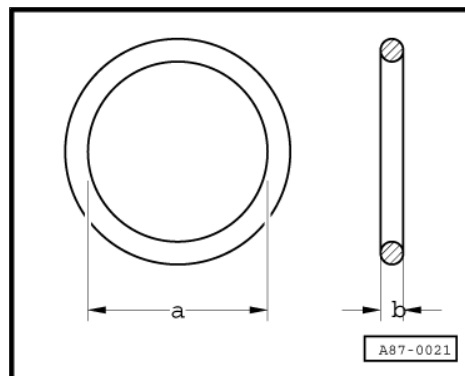
4.2 Refrigerant Circuit Seals

- ◆ Replace the seals.
- ◆ Coat the seals with refrigerant oil before installing.
- ◆ Make sure seals are seated properly on pipe or in groove.
- ◆ Perform the work under clean conditions (even the smallest deposit such as a hair may cause a leak).



Note

- ◆ Only install seals that are resistant to refrigerant R134a and corresponding refrigerant oil. These seals are color-coded to avoid mistakes (currently “red”, “light purple” or “dark purple”). Refer to the Parts Catalog.
- ◆ The dimensions -a and b- are different depending on the component location of the seal. Refer to the Parts Catalog.
- ◆ In addition to the color-coded seals, black seals are also installed during production for certain connections.





4.3 Heating Output, Checking

⇒ [“4.3.1 Information on Checking Heat Output and Tools Required”, page 9](#)

⇒ [“4.3.2 Heating Output and Temperature Door Actuation, Checking, Vehicles without A/C System”, page 11](#)

⇒ [“4.3.3 Heating Output and Temperature Door Actuation, Checking, Vehicles with Manual Climate Control System”, page 14](#)

⇒ [“4.3.4 Heating Output and Temperature Door Actuation, Checking, Vehicles with Automatic Climate Control System \(Without High Voltage System\)”, page 18](#)

⇒ [“4.3.5 Heating Output and Temperature Door Actuation, Checking, Vehicles with High Voltage System and Automatic Climate Control System”, page 23](#)

4.3.1 Information on Checking Heat Output and Tools Required



Note

This repair manual only outlines the checking procedure. Perform the detailed function test for the heating as described in the Guided Fault Finding using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester
- ◆ A standard thermometer (for temperature measurements, if necessary a thermometer with two measuring probes for simultaneous measurement, for example, for temperature on the right and left)



Note

If the coolant system is not bled completely after being filled, then air can get into the heater core for the heater. This will reduce the heating output and noises may result or the customer may complain there are different air temperatures coming out of the vents.

Corrective action for poor heating output or noises from coolant circuit:

- For vehicles without a high voltage system, perform a test drive at high engine speed (at least 10 minutes, engine speed above 2500 RPM), while selecting a low gear to prevent excessive vehicle speed.
- If the customer complains of poor heating output at certain engine speeds, check the incorporation of the heater core for the heater in the engine coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).
- If the customer complains of poor heating output on a vehicle with a high voltage system, check the incorporation of the heater core for the heater in the coolant circuit as well as the activation and the function of the different shut-off valves, coolant pumps and the High Voltage Heater (PTC) - Z115- before performing the heating output test using the Vehicle Diagnostic Tester in the “Guided Fault Finding” (for the Air Conditioning (A/C) system and the engine control module). Refer to



⇒ ["7.1 High Voltage Heater \(PTC\) Z115, Incorporation in Coolant Circuit", page 283](#) and ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).



Note

- ◆ *For vehicles without an A/C system with a Start-Stop System, the stop function is prevented depending on the setting on the Heater Control Module - J65- control head (for example, the heater is on). As soon as there is a request for heating, the engine is started.*
- ◆ *In vehicles with a manually regulated A/C system and a Start-Stop System, the stop function is prevented depending on the setting on the A/C Control Module - J301- control head (for example, the heater is on). As soon as there is a request for heating, the engine is started. In cooling mode, the A/C Control Module - J301- does not limit the stop function.*
- ◆ *If the A/C Humidity Sensor - G260- is not installed on vehicles with a A/C Control Module - J301- , a permissible stop time is currently calculated by characteristic curves which are influenced by the measured outside air temperature, the "recirculated-air mode" function and operating status of the windshield wipers. The calculated time must be greater than 20 seconds so that the stop function is permitted by the A/C Control Module - J301- . The stop time can be shortened at a lower outside air temperature, when recirculated-air mode is active and/or when raining to prevent the front and door windows from fogging up. If the calculated time for the stop function is less than 20 seconds, this is prevented.*
- ◆ *In vehicles with an automatically regulated A/C system and a Start-Stop System, the stop function is prevented depending on the setting on the Climatronic Control Module - J255- control head. If, for example, "Defrost" is selected, the stop function is not possible or will be interrupted and the engine will start. The same applies in the case of heating and cooling. The difference between the set specified and actual temperature exceeds a certain value. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" Function.*
- ◆ *Depending on the different conditions, the coolant which flows through the heater core for the heater in the A/C unit is warmed either by the engine or by the High Voltage Heater (PTC) - Z115- on vehicles with a high voltage system. Refer to ⇒ ["7.1 High Voltage Heater \(PTC\) Z115, Incorporation in Coolant Circuit", page 283](#) , ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses) and use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function (for the A/C system and the engine control module).*
- ◆ *Depending on the engine version, an After-Run Coolant Pump - V51- may be installed in the coolant circuit to support the engine coolant pump on vehicles with a high voltage system. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses) and ⇒ Wiring diagrams, Troubleshooting & Component locations. The After-Run Coolant Pump - V51- can be actuated in "stop mode" (engine stopped) to maintain the coolant flow rate through the heater core for the heater on vehicles with a Start/Stop System.*
- ◆ *Depending on the engine version, a Coolant Shut-Off Valve - N82- may be installed in the coolant circuit on vehicles without a high voltage system. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses) and ⇒ Wiring diagrams, Troubleshooting & Component locations. The Coolant Shut-Off Valve - N82- is then activated by the Engine Control Module - J623- , for example, when heating output is not requested by the Heater Control Module - J65- /*



A/C Control Module - J301- / Climatronic Control Module - J255- and the engine is still cold. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function (for the engine control module). With an activated Coolant Shut-Off Valve - N82- , no warmed up coolant can flow the heater core for the heater.

- ◆ On vehicles with a high voltage system different shut-off valves, coolant pumps and a High Voltage Heater (PTC) - Z115- are installed in the refrigerant circuit. These components make sure that also in electric driving mode the vehicle interior (with the engine switched off) can be heated. Refer to ⇒ ["7.1 High Voltage Heater \(PTC\) Z115 , Incorporation in Coolant Circuit", page 283](#) .

4.3.2 Heating Output and Temperature Door Actuation, Checking, Vehicles without A/C System

⇒ ["4.3.1 Information on Checking Heat Output and Tools Required", page 9](#)

Test Requirements

- Coolant circuit bled according to specifications. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant .
- All air guides, covers and seal OK and properly installed
- Seal between engine compartment, hood and plenum chamber is OK and installed correctly. To check, refer to ⇒ Body Exterior; Rep. Gr. 50 ; Bulkhead ; (Overview - Plenum Chamber Cover).
- If installed: After-Run Coolant Pump - V51- and the Coolant Shut-Off Valve - N82- function is OK.
- The air flow through the dust and pollen filter is not affected by dirt in the filter. To check, refer to ⇒ ["5.11 Dust and Pollen Filter, Removing and Installing", page 234](#) .
- The air intake for the heater (in fresh-air and recirculated-air modes) is not affected by dirt or retrofitted components.
- The vehicle is not exposed to sunlight.
- Engine is warm; coolant temperature is greater than 80 °C (176 °F).
- The Diagnostic Trouble Code (DTC) memory for the Heater Control Module - J65- control head was checked and erased and the basic setting was performed using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- The coding and adaptation of the Heater Control Module - J65- control head was checked using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Vehicles with TDI engine: the actuation and function of the Auxiliary Heater Heating Element - Z35- is OK. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Vehicles with a gasoline engine and an Auxiliary Heater Heating Element - Z35- (introduction not yet finalized): the actuation and function of the Auxiliary Heater Heating Element - Z35- is OK. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Vehicles with a parking heater: the actuation and function of the parking heater is OK. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.



Checking

- Close the hood, doors, windows and sunroof.
- Open all instrument panel vents.
- Start the engine and adjust the following settings on the Heater Control Module - J65- control head.
 - Turn the temperature setting regulator -21- to the “cold” stop.
 - Set the air distribution regulator -4- to “instrument panel vent”.
 - Turn the fresh air blower regulator -16- to the maximum speed.
- Measure the ambient temperature.
- Measure the temperature of the air coming out of the left and right instrument panel vents with a thermometer.

Specified values:

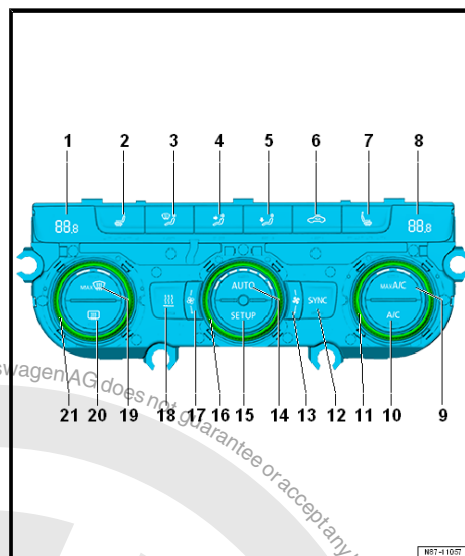
- After five minutes the measured values must be a maximum of 15 °C (59 °F) greater than the measured ambient temperature.
- The temperature deviation between the left and right side is less than 8 °C (46.4 °F).

If the target values are not reached, check the following:

- ◆ Check the seal between the engine compartment, engine hood and plenum chamber and repair if necessary. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Bulkhead ; (Plenum Chamber Cover Assembly Overview)
- ◆ Repeat the test while measuring the temperature of air drawn in via the fresh air intake for the heater in the plenum chamber with one of the two temperature sensors with the engine hood closed. The permissible increase of air temperature in the heater (between the air inlet in the fresh air intake and the air outlet from the instrument panel vents) is a maximum of 10 °C (50 °F).

If the temperature in the heater increases more than 10 °C (50 °F), check the following:

- ◆ Actuation and function of the Temperature Regulator Door Motor - V68- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- ◆ Function of the temperature door in the heater. Refer to ⇒ [“5.7 Air Distribution Housing, Removing and Installing”, page 230](#) .
- ◆ Foam seal on the heater core for the heater. Refer to ⇒ [“5.15 Heater Core, Removing and Installing”, page 244](#) .





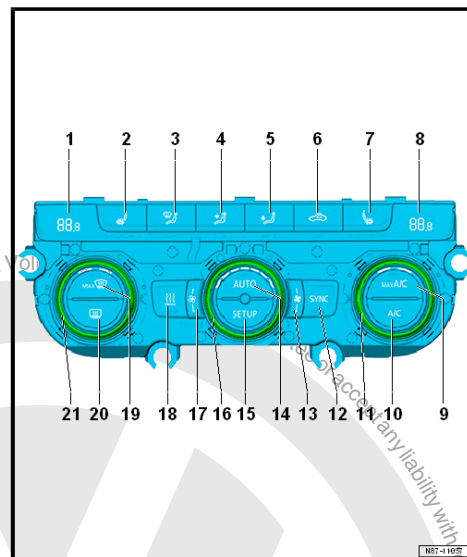
- Set the highest possible temperature.
- Turn the temperature setting regulator -21- to the “warm” stop.
- Measure the temperature of the air coming out of the left and right instrument panel vents with a thermometer.

Target values with an engine temperature of about 90 °C (194 ° F):

- The temperature of the air from the instrument panel vents goes above 55 °C (131 °F).
- The temperature deviation between the left and right side is less than 8 °C (46.4 °F).

If the target values are not reached, check the following:

- ◆ Coolant circuit bleeding. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant .
- ◆ Incorporation of the heater core for the heater into coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).
- ◆ Foam seal on the heater core for the heater. Refer to ⇒ [“5.15 Heater Core, Removing and Installing”, page 244](#) .
- ◆ Actuation and function of the Temperature Regulator Door Motor - V68- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- ◆ Function of the temperature door in the heater. Refer to ⇒ [“5.7 Air Distribution Housing, Removing and Installing”, page 230](#) .
- ◆ Engine coolant thermostat. The engine coolant may not heat properly if the coolant thermostat is malfunctioning. Refer to ⇒ Rep. Gr. 19 ; Coolant Pump/Thermostat .
- ◆ Engine coolant pump. Refer to ⇒ Rep. Gr. 19 ; Coolant Pump/Thermostat .
- ◆ If installed: check the function of the After-Run Coolant Pump - V51- and the Coolant Shut-Off Valve - N82- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.



Note

- ◆ *For vehicles without an After-Run Coolant Pump - V51- , set the engine speed to 2000 RPM and repeat the test if necessary. If the air temperature goes above 55 °C (131 °F) when repeating the test at a higher engine speed, this indicates that there is too little coolant flowing through the heater core for the heater. Cause: The delivery rate of the engine coolant pump is too low while idling or the incorporation of the heater core for the heater into the coolant circuit is not according to the specification. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).*
- ◆ *If too little warmed up coolant flows through the heater core for the heater, the required heat output is not reached.*



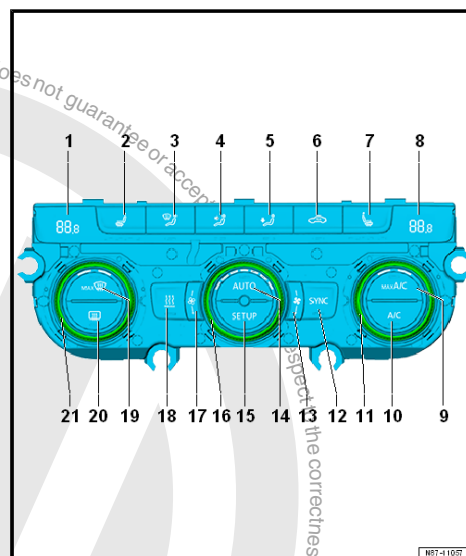
- Set the lowest possible temperature.
- Turn the temperature setting regulator -21- to the "cold" stop.
- Measure the temperature of the air coming out of the left and right instrument panel vents with a thermometer.

Specified values:

- After five minutes the measured values must be a maximum of 15 °C (59 °F) greater than the measured ambient temperature.
- The temperature deviation between the left and right side is less than 8 °C (46.4 °F).

If the target values are not reached, check the following:

- ◆ Actuation and function of the Temperature Regulator Door Motor - V68- using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- ◆ Function of the temperature door in the heater. Refer to [⇒ "5.7 Air Distribution Housing, Removing and Installing", page 230](#).
- ◆ Foam seal on the heater core for the heater. Refer to [⇒ "5.15 Heater Core, Removing and Installing", page 244](#).
- ◆ Measured value for the Evaporator Temperature Sensor - G308- using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.



4.3.3 Heating Output and Temperature Door Actuation, Checking Vehicles with Manual Climate Control System

Refer to

[⇒ "4.3.1 Information on Checking Heat Output and Tools Required", page 9](#)

Test Requirements

- Coolant circuit bled according to specifications. Refer to [⇒ Rep. Gr. 19 ; Coolant System/Coolant](#).
- All air guides, covers and seal OK and properly installed
- Seal between engine compartment, hood and plenum chamber is OK and installed correctly. To check, refer to [⇒ Body Exterior; Rep. Gr. 50 ; Bulkhead ; \(Overview - Plenum Chamber Cover\)](#).
- If installed: After-Run Coolant Pump - V51- and the Coolant Shut-Off Valve - N82- function is OK.
- The air flow through the dust and pollen filter is not affected by dirt in the filter. To check, refer to [⇒ "5.11 Dust and Pollen Filter, Removing and Installing", page 234](#).
- The air intake for the heater and Air Conditioning (A/C) Unit (in fresh air and recirculating air modes) is not affected by dirt or retrofitted components.
- The vehicle is not exposed to sunlight.
- The A/C system cooling output was checked and is OK. Refer to [⇒ "4.4.3 Cooling Output, Checking, Vehicles with Manual Climate Control System", page 36](#).
- Engine is warm; coolant temperature is greater than 80 °C (176 °F).



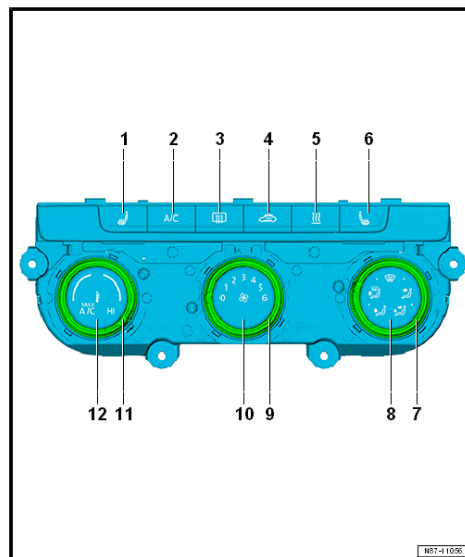
- The Diagnostic Trouble Code (DTC) memory for the A/C Control Module - J301- control head was checked and erased and the basic setting was performed in the "Guided Fault Finding" function on the Vehicle Diagnostic Tester .
- The coding and adaptation of the A/C Control Module - J301- control head was checked using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Vehicles with TDI engine: the actuation and function of the Auxiliary Heater Heating Element - Z35- is OK. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Vehicles with a gasoline engine and an Auxiliary Heater Heating Element - Z35- (introduction not yet finalized): the actuation and function of the Auxiliary Heater Heating Element - Z35- is OK. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Vehicles with a parking heater: the actuation and function of the parking heater is OK. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.





Checking

- Close the hood, doors, windows and sunroof.
- Open all instrument panel vents.
- Start the engine and adjust the following settings on the control head:
 - Turn the temperature setting regulator -11- to the “cold” stop.
 - Turn the air distribution regulator -7- to the “instrument panel vent” stop.
 - Turn the fresh air blower regulator -9- to the maximum speed.
 - A/C compressor on: The indicator lamp in the **A/C** button -2- illuminates.
- Let the A/C system run for several minutes at maximum cooling output while the engine is running.
- Measure the temperature of the air coming out of the left and right instrument panel vents with a thermometer.
- Compare the measured values with the displayed measured value for the Evaporator Temperature Sensor - G308- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.



Specified values:

- The measured values for the air temperature from the left and right vents must not be lower than the measured value of the Evaporator Temperature Sensor - G308- and also not greater than the maximum of 7 °C (44.6 °F) after five minutes. Use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- The deviation of the measured air temperatures from the left and right vents is less than 8 °C (46.4 °F).

If the target values are not reached, check the following:

- ◆ Actuation and function of the Temperature Regulator Door Motor - V68- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- ◆ Function of the temperature door in the A/C unit. Refer to [“5.7 Air Distribution Housing, Removing and Installing”, page 230](#).
- ◆ Foam seal on the heater core for the heater. Refer to [“5.15 Heater Core, Removing and Installing”, page 244](#).



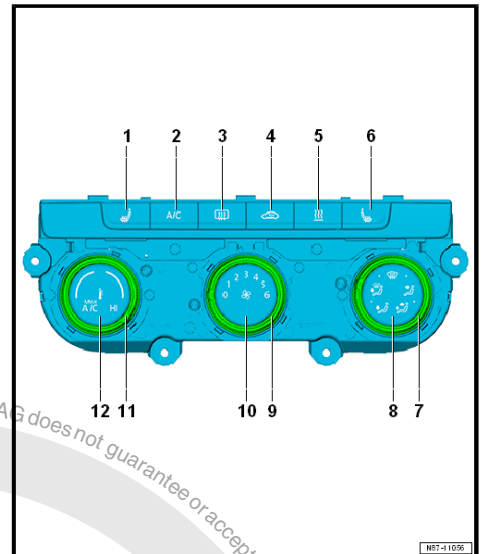
- Set the highest possible temperature.
- Turn the temperature setting regulator -11- to the “warm” stop.
- Measure the temperature of the air coming out of the left and right instrument panel vents with a thermometer.

Target values with an engine temperature of about 90 °C (194 ° F):

- The temperature of the air from the instrument panel vents goes above 55 °C (131 °F).
- The temperature deviation between the left and right side is less than 8 °C (46.4 °F).

If the target values are not reached, check the following:

- ◆ Coolant circuit bleeding. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant .
- ◆ Incorporation of the heater core for the heater into coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).
- ◆ Foam seal on the heater core for the heater. Refer to ⇒ [“5.15 Heater Core, Removing and Installing”, page 244](#) .
- ◆ Actuation and function of the Temperature Regulator Door Motor - V68- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- ◆ Function of the temperature door in the A/C unit. Refer to ⇒ [“5.7 Air Distribution Housing, Removing and Installing”, page 230](#) .
- ◆ Engine coolant thermostat. The engine coolant may not heat properly if the coolant thermostat is malfunctioning. Refer to ⇒ Rep. Gr. 19 ; Coolant Pump/Thermostat .
- ◆ Engine coolant pump. Refer to ⇒ Rep. Gr. 19 ; Coolant Pump/Thermostat .
- ◆ If installed: check the function of the After-Run Coolant Pump - V51- and the Coolant Shut-Off Valve - N82- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.



Note

- ◆ *For vehicles without an After-Run Coolant Pump - V51- , set the engine speed to 2000 RPM and repeat the test if necessary. If the air temperature goes above 55 °C (131 °F) when repeating the test at a higher engine speed, this indicates that there is too little coolant flowing through the heater core for the heater. Cause: The delivery rate of the engine coolant pump is too low while idling or the incorporation of the heater core for the heater into the coolant circuit is not according to the specification. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).*
- ◆ *If too little warmed up coolant flows through the heater core for the heater, the required heat output is not reached.*



- Set the lowest possible temperature.
- Turn the temperature setting regulator -11- to the “cold” stop.
- Measure the temperature of the air coming out of the left and right instrument panel vents with a thermometer.
- Compare the measured values with the displayed measured value for the Evaporator Temperature Sensor - G308- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

Specified values:

- The measured values must not be smaller than the measured value of the Evaporator Temperature Sensor - G308- and also not greater than maximum 7 °C (44.6 °F) after five minutes. Use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- The deviation of the measured air temperatures from the left and right vents is less than 8 °C (46.4 °F).

If the target values are not reached, check the following:

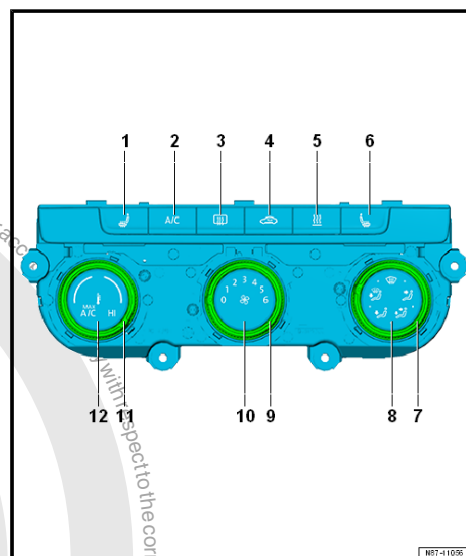
- ◆ Actuation and function of the Temperature Regulator Door Motor - V68- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- ◆ Function of the temperature door in the A/C unit. Refer to ⇒ [“5.7 Air Distribution Housing, Removing and Installing”, page 230](#).
- ◆ Foam seal on the heater core for the heater. Refer to ⇒ [“5.15 Heater Core, Removing and Installing”, page 244](#).

4.3.4 Heating Output and Temperature Door Actuation, Checking, Vehicles with Automatic Climate Control System (Without High Voltage System)

Refer to
⇒ [“4.3.1 Information on Checking Heat Output and Tools Required”, page 9](#)

Test Requirements

- Coolant circuit bled according to specifications. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant .
- All air guides, covers and seal OK and properly installed
- Seal between engine compartment, hood and plenum chamber is OK and installed correctly. To check, refer to ⇒ Body Exterior; Rep. Gr. 50 ; Bulkhead ; (Overview - Plenum Chamber Cover).
- The air flow through the dust and pollen filter is not affected by dirt in the filter. To check, refer to ⇒ [“5.11 Dust and Pollen Filter, Removing and Installing”, page 234](#).
- The air intake for the heater and Air Conditioning (A/C) Unit (in fresh air and recirculating air modes) is not affected by dirt or retrofitted components.
- If installed: After-Run Coolant Pump - V51- and the Coolant Shut-Off Valve - N82- function is OK.
- The vehicle is not exposed to sunlight.
- The A/C system cooling output was checked and is OK. Refer to ⇒ [“4.4.4 Cooling Output, Checking, Vehicles with Automatic](#)





Climate Control System (without High Voltage System)", page 41 .

- Engine is warm; coolant temperature is greater than 80 °C (176 °F).
- The Diagnostic Trouble Code (DTC) memory for the Climatronic Control Module - J255- control head was checked and erased and the basic setting was performed on the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- The coding and adaptation of the Climatronic Control Module - J255- control head was checked using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Vehicles with TDI engine: the actuation and function of the Auxiliary Heater Heating Element - Z35- is OK. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Vehicles with a gasoline engine and an Auxiliary Heater Heating Element - Z35- (introduction not yet finalized): the actuation and function of the Auxiliary Heater Heating Element - Z35- is OK. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Vehicles with a parking heater: the actuation and function of the parking heater is OK. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.

Checking

- Close the doors, hood, the windows, the sunroof and the rear lid.
- Open all instrument panel vents.
- Start the engine.



Note

If on a vehicle with the Start-Stop-function the engine does not start or was switched off via the "Start-Stop-function", for example, by changing the temperature setting on the Climatronic Control Module - J255- control head to "LOW" and activating the "A/C" function, start the engine.



- Motor starts (or starts after changing the settings):
- Set the temperature preset "cold" via the regulators -21 and 11-: "LO" for the driver and front passenger side in the display -1 and 8- of the Climatronic Control Module - J255- .
- Press the buttons -4 and 5- for the "instrument panel vents" and "footwell vents".
- Turn the fresh air blower regulator -16- to the maximum speed.
- A/C compressor on: The indicator lamp in the **A/C** button -10- illuminates.
- Let the A/C system run for several minutes at maximum cooling output while the engine is running.
- "Read measured values" for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- and the Evaporator Temperature Sensor - G308- using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Compare the measured values of the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- with the measured value of the Evaporator Temperature Sensor - G308- .

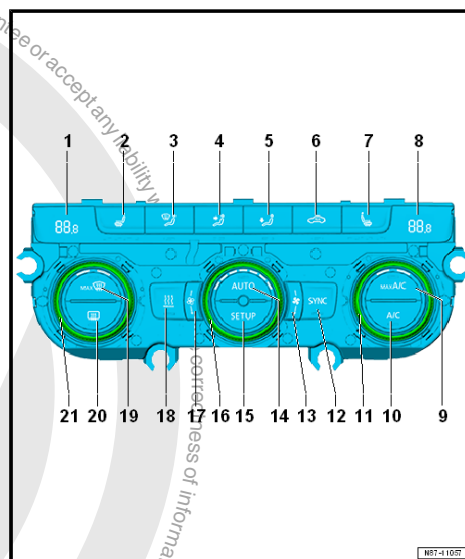
Specified values:

- The measured values for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- must not be smaller than the value for the Evaporator Temperature Sensor - G308- and also not greater than maximum 7 °C (44.6 °F) after five minutes. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- The deviation between the two measured values for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- must not be greater than 8 °C (46.4 °F).



Note

Using a hand, check if there is actually air coming out of the activated vents.





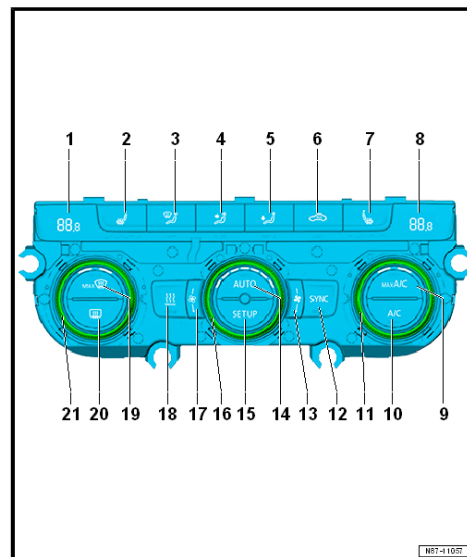
- Set the highest possible temperature for the driver side.
- Set the temperature preset “warm” via the regulator -21-: “HI” for the driver side in the display -1- for the Climatronic Control Module - J255- .
- “Read measured values” for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- .

Target values with an engine temperature of about 90 °C (194 ° F):

- The temperature increases to above 55 °C (131 °F) in the display field with the measured value for the Left Vent Temperature Sensor - G150- / Footwell Vent Temperature Sensor - G192- .
- The temperature increases less than 10 °C (50 °F) in the display field with the measured value for the Right Vent Temperature Sensor - G151- .

If the target values are not reached, check the following:

- ◆ Coolant circuit bleeding. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant .
- ◆ Incorporation of the heater core for the heater into coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).
- ◆ Foam seal on the heater core for the heater. Refer to ⇒ [“5.15 Heater Core, Removing and Installing”, page 244](#) .
- ◆ Actuation and function of the Left Temperature Door Motor - V158- and the Right Temperature Door Motor - V159- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- ◆ Measured values for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- ◆ Function of the temperature doors for the left and right side in the A/C unit. Refer to ⇒ [“5.7 Air Distribution Housing, Removing and Installing”, page 230](#) .
- ◆ Engine coolant thermostat. The engine coolant may not heat properly if the coolant thermostat is malfunctioning. Refer to ⇒ Rep. Gr. 19 ; Coolant Pump/Thermostat .
- ◆ Engine coolant pump. Refer to ⇒ Rep. Gr. 19 ; Coolant Pump/Thermostat .
- ◆ If installed: check the function of the After-Run Coolant Pump - V51- and the Coolant Shut-Off Valve - N82- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.





Note

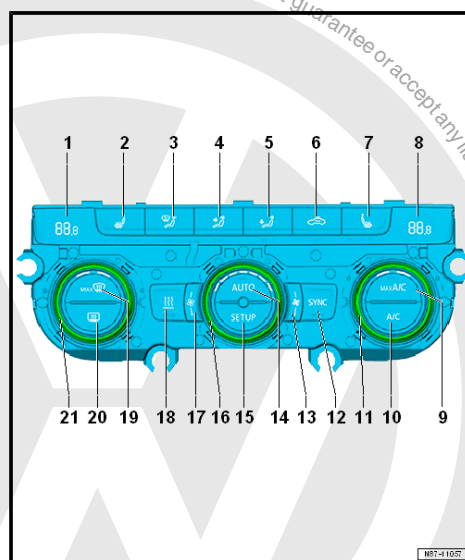
- ◆ For vehicles without an After-Run Coolant Pump - V51- , set the engine speed to 2000 RPM and repeat the test if necessary. If the air temperature goes above 55 °C (131 °F) when repeating the test at a higher engine speed, this indicates that there is too little coolant flowing through the heater core for the heater. Cause: The delivery rate of the engine coolant pump is too low while idling or the incorporation of the heater core for the heater into the coolant circuit is not according to the specification. Refer to ➤ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).
- ◆ If too little warmed up coolant flows through the heater core for the heater, the required heat output is not reached.

- Set the highest possible temperature for the front passenger side.
- Set the temperature preset “warm” via the regulator -11-: “HI” for the front passenger side in the display -8- for the Climatronic Control Module - J255- .
- “Read measured values” for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- .

Target values with an engine temperature of about 90 °C (194 °F):

- The temperature increases to above 55 °C (131 °F) in the display field with the measured value for the Right Vent Temperature Sensor - G151- .
- The deviation between the display fields for the measured values of the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- is less than 8 °C (46.4 °F).

If the target values are not reached, check the components as described above. Refer to ➤ [page 21](#) .





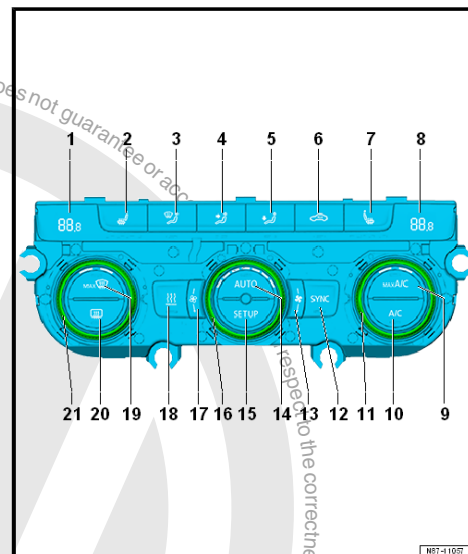
- Set the lowest possible temperature for the driver and front passenger side.
- Set the temperature preset “cold” via the regulators -21 and 11-: “LO” for the driver and front passenger side in the display -1 and 8- of the Climatronic Control Module - J255- .
- “Read measured values” for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- and Evaporator Temperature Sensor - G308- .
- Compare the measured values of the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- with the measured value of the Evaporator Temperature Sensor - G308- .

Specified values:

- The measured values for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- must not be smaller than the value for the Evaporator Temperature Sensor - G308- and also not greater than maximum 7 °C (44.6 °F) after five minutes. Use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- The deviation between the measured values for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- must not be greater than 8 °C (46.4 °F).

If the target values are not reached, check the following:

- ◆ Actuation and function of the Left Temperature Door Motor - V158- and the Right Temperature Door Motor - V159- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- ◆ Function of the temperature doors for the left and right side in the A/C unit. Refer to
⇒ [“5.7 Air Distribution Housing, Removing and Installing”, page 230](#) .
- ◆ Foam seal on the heater core for the heater. Refer to
⇒ [“5.15 Heater Core, Removing and Installing”, page 244](#) .
- ◆ Check the measured values for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- and Evaporator Temperature Sensor - G308- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.



4.3.5 Heating Output and Temperature Door Actuation, Checking, Vehicles with High Voltage System and Automatic Climate Control System

- Note safety precautions. Refer to
⇒ [“1.1 Handling Refrigerant Safety Precautions”, page 1](#) .
- See notes. Refer to
⇒ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .
- Observe safety precautions when working on the high voltage system. Refer to
⇒ [“1.3 High Voltage System Safety Precautions”, page 1](#) .
- Pay attention to safety precautions for working near high voltage components. Refer to



⇒ [“1.4 Safety Precautions near High Voltage Components”, page 2](#).

- Pay attention to the high voltage system danger classification. Refer to ⇒ Rep. Gr. 00 ; High Voltage System Danger Classification .

Working on A High Voltage System when Activated or with the Ignition Turned On

- Charge the vehicle batteries, for example, using the Battery Charger - VAS5904- in the battery support mode to minimize the number of automatic engine starts during the test- and measuring procedures while the ready mode is active. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Charging .
- Move the selector level into position “P”, activate the parking brake and arrange the necessary tools for testing and measuring procedures that require the ready mode to be active or that require the ignition to be on, so that they cannot come into contact with the turning components of the engine and so that they are not in the vicinity of the turning components of a running engine.



Note

- ◆ *Also move the selector lever into position “P” and activate the parking brake for testing and measuring procedures which require the ignition to be on, but do not require the ready mode to be active.*
- ◆ *Ready mode is displayed in the Instrument Cluster Control Module - J285- . Refer to the Owner's Manual.*
- ◆ *Activate and deactivate the ready mode. Refer to the Owner's Manual (consult the display in the Instrument Cluster Control Module - J285-).*

Refer to

⇒ [“4.3.1 Information on Checking Heat Output and Tools Required”, page 9](#)

Test Requirements

- Coolant circuit bled according to specifications. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant .
- All air guides, covers and seal OK and properly installed
- Seal between engine compartment, hood and plenum chamber is OK and installed correctly. To check, refer to ⇒ Body Exterior; Rep. Gr. 50 ; Bulkhead ; (Overview - Plenum Chamber Cover).
- The air flow through the dust and pollen filter is not affected by dirt in the filter. To check, refer to ⇒ [“5.11 Dust and Pollen Filter, Removing and Installing”, page 234](#) .
- The air intake for the heater and Air Conditioning (A/C) Unit (in fresh air and recirculating air modes) is not affected by dirt or retrofitted components.
- The function of the different shut-off valves, coolant pumps and the High Voltage Heater (PTC) - Z115- is OK. Refer to ⇒ [“7.1 High Voltage Heater \(PTC\) Z115 , Incorporation in Coolant Circuit”, page 283](#) and use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function (for the A/C system and the engine control module).
- The vehicle is not exposed to sunlight.



- The A/C system cooling output was checked and is OK. Refer to
⇒ [“4.4.4 Cooling Output, Checking, Vehicles with Automatic Climate Control System \(without High Voltage System\)”, page 41](#).
- Engine is warm; coolant temperature is greater than 80 °C (176 °F).



Note

- ◆ *The engine will not always start with a sufficiently charged High Voltage Battery 1 - AX2-. If the coolant in the engine is colder than approximately 70 °C (158 °F), the coolant which flows through the heater core for the heater is warmed by the High Voltage Heater (PTC) - Z115- and is delivered by the High Temperature Circuit Coolant Pump - V467-. So that the coolant flows properly through the heater core, not only do the High Temperature Circuit Coolant Pump - V467-, the Coolant Change-Over Valve 2 - N633- and the Transmission Coolant Valve - N488- have to be activated correctly, the check valves in the coolant circuit must be installed correctly and their function must be OK. Refer to
⇒ [“7.1 High Voltage Heater \(PTC\) Z115, Incorporation in Coolant Circuit”, page 283](#) and ⇒ Rep. Gr. 19; Coolant System/Coolant (Connection Diagram for Coolant Hoses).*
- ◆ *If the coolant temperature in the engine is greater than 75 °C (167 °F), the High Voltage Heater (PTC) - Z115- is no longer activated. So that the coolant flows through the heater core for the heater, the High Temperature Circuit Coolant Pump - V467- is activated when the engine is off. So that the coolant flows properly through the heater core, not only do the High Temperature Circuit Coolant Pump - V467-, the Coolant Change-Over Valve 2 - N633- and the Transmission Coolant Valve - N488- have to be activated correctly, the check valves in the coolant circuit must be installed correctly and their function must be OK. Refer to
⇒ [“7.1 High Voltage Heater \(PTC\) Z115, Incorporation in Coolant Circuit”, page 283](#) and ⇒ Rep. Gr. 19; Coolant System/Coolant (Connection Diagram for Coolant Hoses).*
- The Diagnostic Trouble Code (DTC) memory for the Climatronic Control Module - J255- control head and the Engine Control Module (ECM) (for example, the Engine Control Module - J623-) was checked and erased and the basic setting was performed on the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- The coding and adaptation of the Climatronic Control Module - J255- control head was checked using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Vehicles with a parking heater: the actuation and function of the parking heater is OK. Use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

Checking

- Close the doors, hood, the windows, the sunroof and the rear lid.
- Open all instrument panel vents.
- Turn on the ignition.
- Move the selector lever into position P.
- Activate the parking brake.
- Turn off the ignition.



- Open the hood.
- Connect the charger, for example Battery Charger - VAS5095A- to the jump start point for the 12V vehicle electrical system
- Turn on the ignition.
- Activate the ready mode (the engine does not need to start at first).



Note

With the ready mode active and the temperature preset "warm" on the Climatronic Control Module - J255- A/C control head ("HI" in the display), the coolant flow through the heater and A/C unit heater core is maintained with the engine off via the High Temperature Circuit Coolant Pump - V467- . Refer to ⇒ "7.1 High Voltage Heater (PTC) Z115, Incorporation in Coolant Circuit", page 283 and ⇒ Rep. Gr. 19 ; Coolant Pump/Thermostat .

- ◆ Motor starts (or starts after changing the settings):



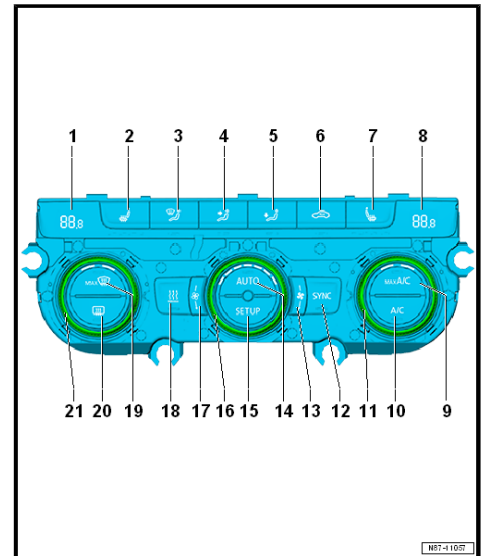
Note

For vehicles with a high voltage system, the engine can run or be switched off depending on the setting on the Climatronic Control Module - J255- control head, the coolant temperature, the charge level of the High Voltage Battery 1 - AX2- etc.





- Set the temperature preset "cold" via the regulators -21 and 11-: "LO" for the driver and front passenger side in the display -1 and 8- of the Climatronic Control Module - J255- .
- Press the buttons -4 and 5- for the "instrument panel vents" and "footwell vents".
- Turn the fresh air blower regulator -16- to the maximum speed.
- A/C compressor on: The indicator lamp in the **A/C** button -10- illuminates.
- "Eco" mode not activated: nothing appears in the display -3- of the Climatronic Control Module - J255- .
- Let the A/C system run for several minutes at maximum cooling output while the ready mode is active.
- "Read measured values" for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- and the Evaporator Temperature Sensor - G308- using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Compare the measured values of the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- with the measured value of the Evaporator Temperature Sensor - G308- .



Specified values:

- The measured values for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- must not be smaller than the value for the Evaporator Temperature Sensor - G308- and also not greater than maximum 7 °C (44.6 °F) after five minutes. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- The deviation between the two measured values for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- must not be greater than 8 °C (46.4 °F).



Note

Using a hand, check if there is actually air coming out of the activated vents.



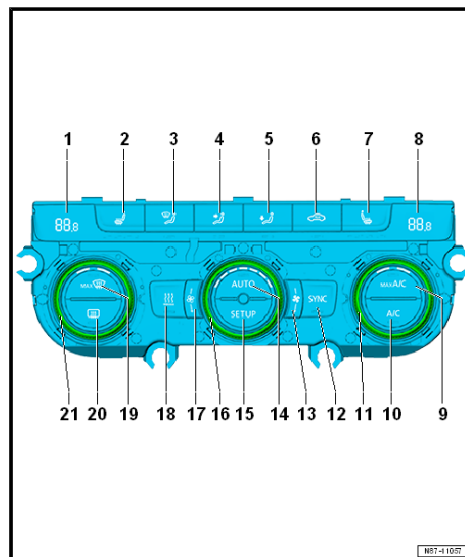
- Set the highest possible temperature for the driver side.
- Set the temperature preset “warm” via the regulator -21-: “HI” for the driver side in the display -1- for the Climatronic Control Module - J255- .
- “Read measured values” for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- .

Specified values with an engine temperature of about 90 °C (194 °F):

- The temperature increases to above 55 °C (131 °F) in the display field with the measured value for the Left Vent Temperature Sensor - G150- / Footwell Vent Temperature Sensor - G192- .
- The temperature increases less than 10 °C (50 °F) in the display field with the measured value for the Right Vent Temperature Sensor - G151- .

If the target values are not reached, check the following:

- ◆ Coolant circuit bleeding. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant .
- ◆ Incorporation of the heater core for the heater into coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).
- ◆ Foam seal on the heater core for the heater. Refer to ⇒ [“5.15 Heater Core, Removing and Installing”, page 244](#) .
- ◆ Actuation and function of the Left Temperature Door Motor - V158- and the Right Temperature Door Motor - V159- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- ◆ Measured values for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- ◆ Function of the temperature doors for the left and right side in the A/C unit. Refer to ⇒ [“5.7 Air Distribution Housing, Removing and Installing”, page 230](#) .
- ◆ Engine coolant thermostat. The engine coolant may not heat properly if the coolant thermostat is malfunctioning. Refer to ⇒ Rep. Gr. 19 ; Coolant Pump/Thermostat .
- ◆ The activation and function of the High Voltage Heater (PTC) - Z115- , the High Temperature Circuit Coolant Pump - V467- etc. (refer to ⇒ [“7.1 High Voltage Heater \(PTC\) Z115 , Incorporation in Coolant Circuit”, page 283](#)) as well as the incorporation of these components in the refrigerant circuit. Use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).
- ◆ Engine coolant pump. Refer to ⇒ Rep. Gr. 19 ; Coolant Pump/Thermostat .





Note

- ◆ So that the warmed coolant from the High Voltage Heater (PTC) - Z115- or from the engine can flow through the heater and A/C unit heater core, the High Temperature Circuit Coolant Pump - V467- , the Coolant Change-Over Valve 2 - N633- and the Transmission Coolant Valve - N488- (by the respective ECM) must also be activated. So that the coolant flows in the correct direction, the check valves in the coolant circuit must be installed correctly and it must be OK. For more information, refer to ⇒ "7.1 High Voltage Heater (PTC) Z115, Incorporation in Coolant Circuit", page 283 , ⇒ Rep. Gr. 19 ; Coolant System/ Coolant (Connection Diagram for Coolant Hoses) and ⇒ Wiring diagrams, Troubleshooting & Component locations. Use the Vehicle Diagnostic Tester in "Guided Fault Finding".

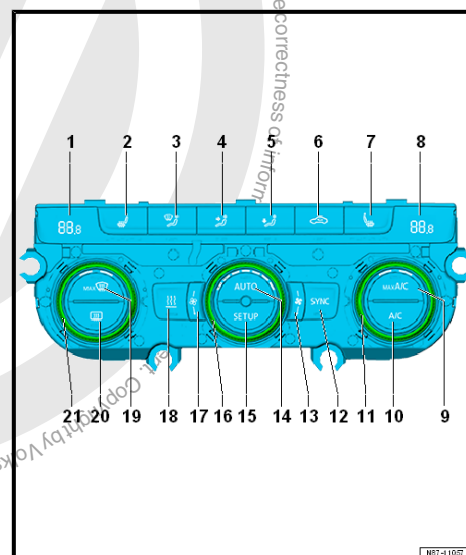
- ◆ If too little warmed up coolant flows through the heater core for the heater, the required heat output is not reached.

- Set the highest possible temperature for the front passenger side.
- Set the temperature preset "warm" via the regulator -11-: "HI" for the front passenger side in the display -8- for the Climatronic Control Module - J255- .
- "Read measured values" for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- .

Target values with an engine temperature of about 90 °C (194 ° F):

- The temperature increases to above 55 °C (131 °F) in the display field with the measured value for the Right Vent Temperature Sensor - G151- .
- The deviation between the display fields for the measured values of the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- is less than 8 °C (46.4 °F).

If the target values are not reached, check the components as described above. Refer to ⇒ page 28 .





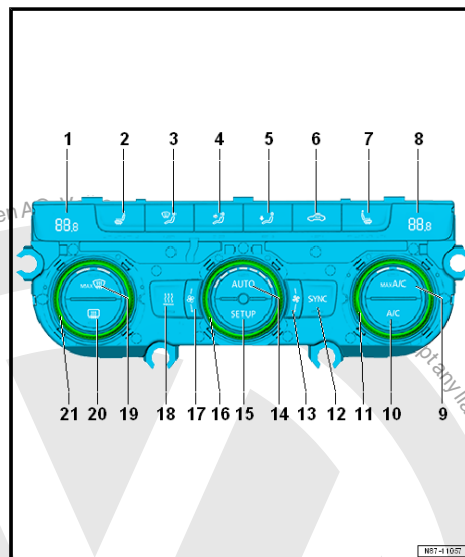
- Set the lowest possible temperature for the driver and front passenger side.
- Set the temperature preset “cold” via the regulators -21 and 11-: “LO” for the driver and front passenger side in the display -1 and 8- of the Climatronic Control Module - J255- .
- “Read measured values” for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- and Evaporator Temperature Sensor - G308- .
- Compare the measured values of the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- with the measured value of the Evaporator Temperature Sensor - G308- .

Specified values:

- The measured values for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- must not be smaller than the value for the Evaporator Temperature Sensor - G308- and also not greater than maximum 7 °C (44.6 °F) after five minutes. Use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- The deviation between the measured values for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- must not be greater than 8 °C (46.4 °F).

If the target values are not reached, check the following:

- ◆ Actuation and function of the Left Temperature Door Motor - V158- and the Right Temperature Door Motor - V159- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- ◆ Function of the temperature doors for the left and right side in the A/C unit. Refer to
⇒ [“5.7 Air Distribution Housing, Removing and Installing”, page 230](#) .
- ◆ Foam seal on the heater core for the heater. Refer to
⇒ [“5.15 Heater Core, Removing and Installing”, page 244](#) .
- ◆ Check the measured values for the Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- / Footwell Vent Temperature Sensor - G192- and Evaporator Temperature Sensor - G308- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.





4.4 Cooling Output, Checking

⇒ [“4.4.1 Information on Checking Cooling Output and Tools Required”, page 31](#)

⇒ [“4.4.2 Test Requirements”, page 32](#)

⇒ [“4.4.3 Cooling Output, Checking, Vehicles with Manual Climate Control System”, page 36](#)

⇒ [“4.4.4 Cooling Output, Checking, Vehicles with Automatic Climate Control System \(without High Voltage System\)”, page 41](#)

⇒ [“4.4.5 Cooling Output, Checking, Vehicles with Automatic Climate Control System \(with High Voltage System\)”, page 46](#)

⇒ [“4.4.6 Determining Malfunction if Deviation from Specified Value”, page 57](#)

⇒ [“4.4.7 Determining Malfunction of Temperature Increase Downstream from Evaporator”, page 58](#)

⇒ [“4.4.8 Ice Formation on Evaporator, Localizing Malfunction”, page 59](#)

4.4.1 Information on Checking Cooling Output and Tools Required



Note

This repair manual only outlines the checking procedure. Perform the detailed function test for the heating as described in the Guided Fault Finding using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester
- ◆ A standard thermometer (for temperature measurements, if necessary a thermometer with two measuring probes for simultaneous measurement, for example, for temperature on the right and left)



Note

- ◆ *With the Start/Stop System, the stop function is disabled depending on the setting on the A/C Control Module - J301- (for example, the heater is on). As soon as there is a request for heating, the engine is started. In cooling mode, the A/C Control Module - J301- does not limit the stop function. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.*
- ◆ *If the A/C Humidity Sensor - G260- is not installed on vehicles with a A/C Control Module - J301- , a permissible stop time is currently calculated by characteristic curves which are influenced by the measured outside air temperature, the "recirculated-air mode" function and operating status of the windshield wipers. The calculated time must be greater than 20 seconds so that the stop function is permitted by the A/C Control Module - J301- . The stop time can be shortened at a lower outside air temperature, when recirculated-air mode is active and/or when raining to prevent the front and door windows from fogging up. If the calculated time for the stop function is less than 20 seconds, this is prevented.*
- ◆ *With the Start/Stop Function, the stop function is disabled depending on the setting on the Climatronic Control Module - J255- control head. If, for example, "Defrost" is selected, the stop function is not possible or will be interrupted and the engine will start. The same applies in the case of heating and cooling. The difference between the set specified and actual temperature exceeds a certain value. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" Function.*

4.4.2 Test Requirements

- Ambient temperature greater than 15 °C (59 °F).
- Radiator and condenser are clean (if necessary clean).
- The ribbed belt, which drives the Air Conditioning (A/C) compressor, is OK and tensioned correctly. The belt pulley is actually driving the A/C compressor (vehicles without a high voltage system).
- All air guides, covers and seal OK and properly installed.
- Seal between engine compartment, engine hood and plenum chamber is OK and installed correctly. To check, refer to ⇒ Body Exterior; Rep. Gr. 50 ; Bulkhead ; (Plenum Chamber Cover Assembly Overview).
- The air flow through the dust and pollen filter is not affected by dirt in the filter. To check, refer to ⇒ ["5.11 Dust and Pollen Filter, Removing and Installing", page 234](#) .
- The air intake for the heater and A/C Unit (in fresh air and recirculating air modes) is not affected by dirt or retrofitted components.
- Vehicles without glove compartment cooling: glove compartment cooling connection is sealed on the A/C unit.
- Vehicles with glove compartment cooling: glove compartment cooling connection is installed on the A/C unit according to the specification.
- The vehicle is not exposed to sunlight.
- Engine is warm; coolant temperature is greater than 80 °C (176 °F).
- The Diagnostic Trouble Code (DTC) memory for the A/C Control Module - J301- / Climatronic Control Module - J255- control



head was checked and erased, the basic setting performed and the A/C Control Module - J301- / Climatronic Control Module - J255- coding checked using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.

- A/C Control Module - J301- / Climatronic Control Module - J255- adaptation checked using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- All instrument panel vents and, if present, vents in the rear center console are opened.
- Check that the air outlet from the rear footwell vents (under the front seats) is not blocked by the floor mats or other objects.
- Engine hood closed.

On Vehicles with A High Voltage System (hybrid vehicles)

- ◆ The ignition is switched on and the ready mode is activated (note the display in the instrument cluster), the engine starts or only runs, for example, when the High Voltage Battery 1 - AX2- is not charged enough or the hood is unlocked. Refer to the Owner's Manual.
- ◆ With the ignition switched on and the temperature preset "warm" on the Climatronic Control Module - J255- A/C control head ("HI" in the display), the coolant flow through the heater and A/C unit heater core is maintained via the High Temperature Circuit Coolant Pump - V467- . Refer to [⇒ "7.1 High Voltage Heater \(PTC\) Z115, Incorporation in Coolant Circuit", page 283](#) and ⇒ Rep. Gr. 19 ; Coolant Pump/Thermostat .
- Turn on the ignition.
- Move the selector lever into position P.
- Activate the parking brake.
- Turn off the ignition.
- Open the hood.
- Connect the charger, for example Battery Charger - VAS5095A- to the jump start point for the 12V vehicle electrical system
- Turn on the ignition.
- Activate the ready mode (the engine does not need to start at first).

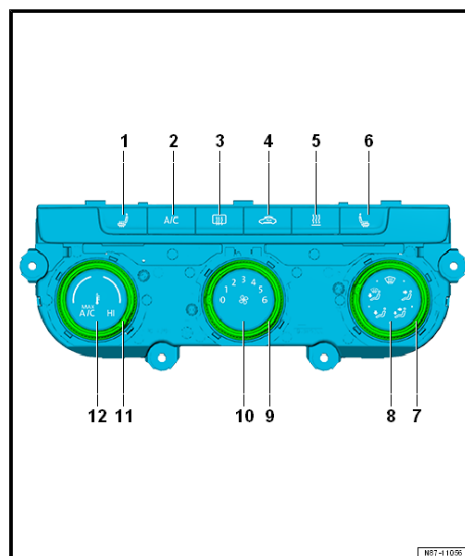
For Vehicles without A High Voltage System

- Start the engine.
- The engine runs (if necessary adjust the settings on the control head (the A/C Control Module - J301- or the Climatronic Control Module - J255-) in the direction "heat").



Vehicles with Manually Controlled A/C System

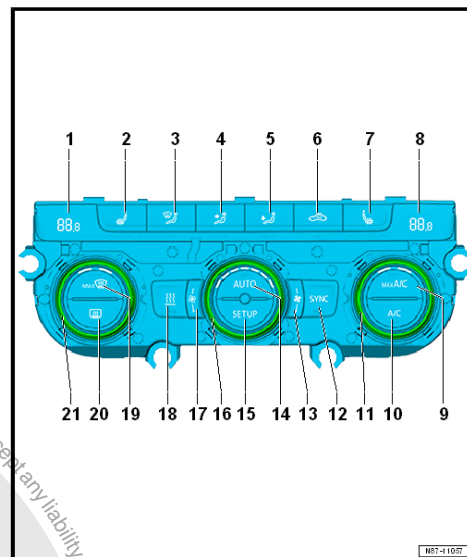
- Adjust the following settings on the A/C Control Module - J301-control head:
- Turn the temperature setting regulator -11- to the “cold” stop.
- A/C compressor on: The indicator lamp in the **A/C** button -2- illuminates.
- Recirculating air mode on: the indicator lamp in the **Recirculation** button -4- illuminates.
- Turn the air distribution regulator -7- to the “instrument panel vent” stop.
- Turn the fresh air blower regulator -9- to the maximum speed.





Vehicles with Automatic Climate Control System (with and without a High Voltage System):

- Adjust the following settings on the Climatronic Control Module - J255- control head:
- “Auto” mode: the indicator lamp in the **AUTO** button -14- illuminates.
- Set the temperature preset “cold” via the regulators -21 and 11-: “LO” for the driver and front passenger side in the display -1 and 8- of the Climatronic Control Module - J255- .
- Air Conditioning (A/C) compressor on: The indicator lamp in the **A/C** button -10- illuminates.
- Turn the fresh air blower regulator -16- to the maximum speed.



Note

The indicator lamp in the **AUTO** button turns off when the fresh air blower speed is changed manually.

For All Vehicles



Note

The maximum possible fresh air blower speed depends on several conditions (vehicle voltage, etc.)

Function with the engine running (on vehicles without a high voltage system):

Function with ready mode active (on vehicles with a high voltage system):

- Run the coolant fan(s) -V7- / -V177-. The actuation and speed depend on the pressure in the refrigerant circuit and the engine temperature.



Note

- ◆ The coolant fan(s) -V7- / -V177- are only switched from a certain pressure in the refrigerant circuit (from a pressure of 9 bar (130 psi) at this time) depending on the A/C Control Module - J301- / Climatronic Control Module - J255- control head version. The coolant fan actuation is displayed in the “Read measured values” function using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- ◆ Depending on the Engine Control Module (ECM), the specified and the actual speed of the Coolant Fans -V7- and -V177- can vary from one another. Use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

- The fresh air blower runs at maximum speed.



Note

The maximum possible fresh air blower speed depends on several conditions (vehicle voltage, etc.)



- The A/C system goes into recirculated-air mode. Approximately one minute after starting the engine (activating the ready mode), the back pressure/fresh air door is closed and the recirculation door is opened. The fresh air blower extracts the air from passenger compartment below instrument panel / behind the glove compartment.

If one of these prerequisites is not met:

- Check the Diagnostic Trouble Code (DTC) memory, perform an output diagnostic test and read the measured values using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

Continuation

Refer to

⇒ [“4.4.3 Cooling Output, Checking, Vehicles with Manual Climate Control System”, page 36](#)

Refer to

⇒ [“4.4.4 Cooling Output, Checking, Vehicles with Automatic Climate Control System \(without High Voltage System\)”, page 41](#)

Refer to

⇒ [“4.4.5 Cooling Output, Checking, Vehicles with Automatic Climate Control System \(with High Voltage System\)”, page 46](#)

4.4.3 Cooling Output, Checking, Vehicles with Manual Climate Control System

Refer to

⇒ [“4.4.1 Information on Checking Cooling Output and Tools Required”, page 31](#)



Note

This repair manual only outlines the checking procedure. Perform the detailed function test for the heating as described in the Guided Fault Finding using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

Procedure

- The requirements for testing the cooling capacity are fulfilled. Refer to ⇒ [“4.4.2 Test Requirements”, page 32](#) .
- Measure the ambient temperature: it must be warmer than 15 °C (59 °F).
- Close the doors, hood, the windows, the sunroof and the rear lid.
- Open all instrument panel vents.
- Start the engine.

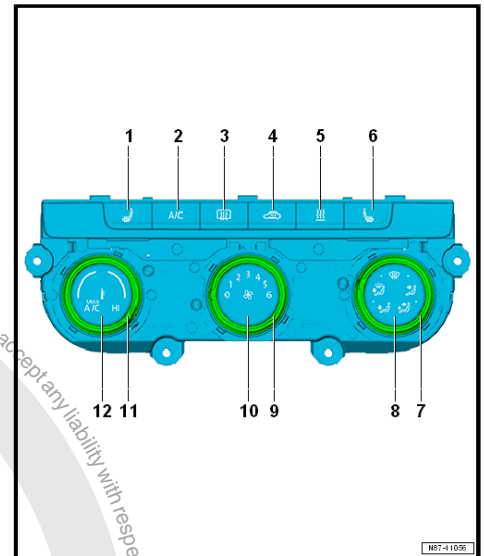


- Switch off the Air Conditioning (A/C) compressor on the A/C Control Module - J301- control head: the indicator lamp in the **A/C** button -2- does not illuminate.
- “Read measured values” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

Checking

- Read the actuation of the A/C Compressor Regulator Valve - N280- .
- The actuation of the A/C compressor (by the A/C Compressor Regulator Valve - N280-) is switched off: 0 A (amps) or 0% is displayed.
- Read the measured value for the Refrigerant Circuit Pressure Sensor - G805- .
- The pressure in the refrigerant circuit is same as the measured outside temperature or greater than the value in the chart.

Ambient Temperature in °C	Pressure Display (pressure in bar)
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0



Note

- ◆ *At absolute pressure, 0 bar corresponds to absolute vacuum. Normal ambient pressure equals approximately 1 bar (14.5 psi) absolute pressure and 0 bar pressure. On the scales of most pressure gauges, 0 bar pressure corresponds to an absolute pressure of one bar (can be seen from -1 mark below 0).*
- ◆ *Pressure in refrigerant circuit is governed by ambient temperature. On account of heat given off by components (for example, the radiator), pressure displayed with a warm engine will be slightly higher than that given for the respective ambient temperature.*

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

- Check the Refrigerant Circuit Pressure Sensor - G805- signal using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

If no fault is determined at the Refrigerant Circuit Pressure Sensor - G805- , there is insufficient refrigerant in the circuit.



If the displayed pressure in the refrigerant circuit is OK:

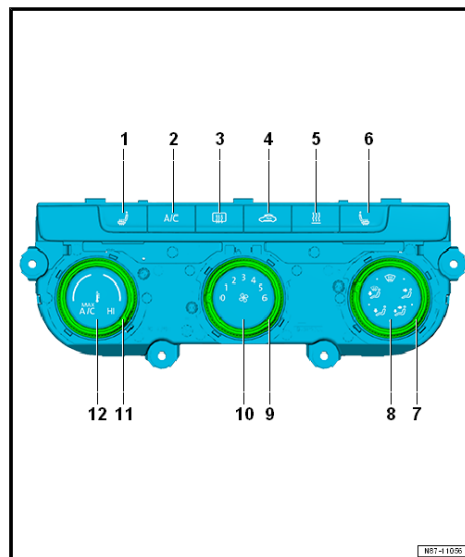
- Adjust the following settings on the A/C Control Module - J301- control head:
 - ◆ Turn the temperature setting regulator -11- to the “cold” stop.
 - ◆ Turn the air distribution regulator -7- to the “instrument panel vent” stop.
 - ◆ A/C compressor on: The indicator lamp in the **A/C** button -2- illuminates.
 - ◆ Recirculating air mode on: the indicator lamp in the **Recirculation** button -4- illuminates.
 - ◆ Turn the fresh air blower regulator -9- to the maximum speed.
- “Read measured values” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the display in the display fields:
 - The current calculated by the A/C Control Module - J301- , which flows via the A/C Compressor Regulator Valve - N280- , is greater than 0.3 Amps (30%). The A/C compressor is switched on.
 - The displayed pressure increases above the value when the compressor is switched off.

If the displayed pressure does not change and the actuation of the A/C compressor is OK:

- Check once more if the calculated current actually flows via the A/C Compressor Regulator Valve - N280- and the A/C compressor is actually being driven.

If the current is actually flowing via the A/C Compressor Regulator Valve - N280- and the A/C compressor is being driven, then the fault is in the refrigerant circuit. It is possible that the A/C compressor regulation is not OK.

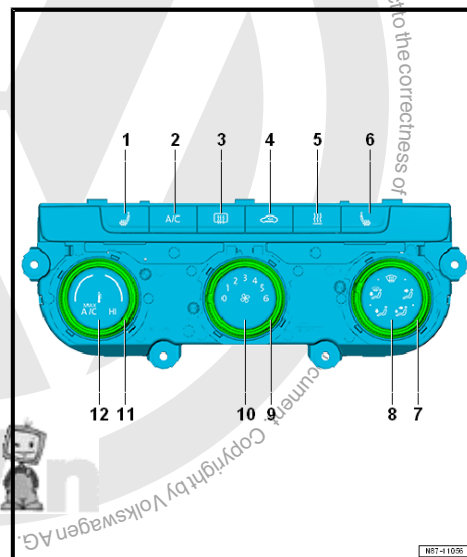
- The necessary work may only be performed by qualified personnel. If this is not possible, transfer the vehicle to a shop that has the necessary tools and equipment and where the work can be performed by qualified personnel. Refer to [⇒ “4.1 Working on the Refrigerant Circuit”, page 8](#) . Bring the detected problems to the attention of the workshop.





Note

- ◆ The A/C Control Module - J301- actuates the A/C Compressor Regulator Valve - N280- so that the air temperature reaches the specified value downstream of the evaporator (about 2 to 6 °C (35.6 to 42.8 °F)).
 - ◆ After vehicle start, a value greater than 0.55 A (75%) is displayed for the activation of the A/C Compressor Regulator Valve - N280- depending on the measured temperature, the engine speed and the electrical system voltage. As soon as the temperature measured by the Evaporator Temperature Sensor - G308- nears the specified value, the activation, and thus the compressor output, is reduced.
 - ◆ Under certain operating conditions, moisture in the refrigerant circuit can lead to ice build-up on the A/C Compressor Regulator Valve - N280- and on the expansion valve. A/C compressor regulation is reduced by this ice build-up. The evaporator is cooled too intensely and freezes. The ice on the evaporator may cause various customer concerns. Refer to [⇒ "4.4.8 Ice Formation on Evaporator, Localizing Malfunction", page 59](#).
 - ◆ If little or no current is displayed in the measured values for the A/C Compressor Regulator Valve - N280- activation, check the actuation of the A/C Compressor Regulator Valve - N280- using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Press the **Recirculation** button -4- on the A/C Control Module - J301- control head.
 - The indicator lamp in the button for the "recirculating air mode" illuminates.
 - Set engine speed of 2000 rpm (start of time measurement).
 - "Read measured values" using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.





- Compare the displayed measured value for the Evaporator Temperature Sensor - G308- with the values in the diagram.

A - Air temperature measured by the Evaporator Temperature Sensor - G308-

B - Ambient Temperature

C - Permissible Tolerance Range

- Depending on the ambient temperature, the measured air temperature should be after 5 minutes within the shown tolerance range.

If the required values are not reached:

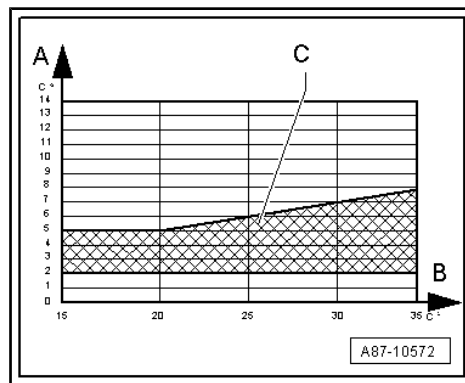
- Measure the temperature of the air coming out of the left and right instrument panel vents with a thermometer.
- Compare the measured value with the displayed measured value for the Evaporator Temperature Sensor - G308- .

If the measured values only slightly deviate from each other:

- Perform the procedure for identifying malfunctions if the target values are not reached. Refer to
⇒ [“4.4.6 Determining Malfunction if Deviation from Specified Value”, page 57](#) .

If the measured value for the Evaporator Temperature Sensor - G308- is greater than the determined measured value:

- Make sure the Evaporator Temperature Sensor - G308- is installed correctly (refer to
⇒ [“5.17 Evaporator Temperature Sensor G308 , Removing and Installing”, page 262](#)) and perform an electrical test for this sensor using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.



Note

The A/C system function can be recognized, for example, by the refrigerant pipe on the low pressure side (thick line from the inner heat exchanger to the A/C compressor) cooling off.

If the measured value for the Evaporator Temperature Sensor - G308- and the A/C system cooling output is OK:

- Measure the temperature of the air coming out of the left and right instrument panel vents with a thermometer.
- Compare the measured values on the thermometer and for the Evaporator Temperature Sensor - G308- .
- The determined measured values must not be smaller than the value for the Evaporator Temperature Sensor - G308- and not greater than maximum 7 °C (44.6 °F) after five minutes.

If the determined measured values are smaller:

- Make sure the Evaporator Temperature Sensor - G308- is installed correctly and check the electrical connections for contact resistance. Replace the faulty sensor. Use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

If the required values are not reached:



- Check the actuation and function of the temperature door. To do so, determine the malfunction with the temperature increase downstream of the evaporator (refer to ⇒ [“4.4.7 Determining Malfunction of Temperature Increase Downstream from Evaporator”, page 58](#)) and use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

4.4.4 Cooling Output, Checking, Vehicles with Automatic Climate Control System (without High Voltage System)

Refer to
⇒ [“4.4.1 Information on Checking Cooling Output and Tools Required”, page 31](#)



Note

This repair manual only outlines the checking procedure. Perform the detailed function test for the heating as described in the Guided Fault Finding using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

Procedure

- ◆ The requirements for testing the cooling capacity are fulfilled. Refer to ⇒ [“4.4.2 Test Requirements”, page 32](#) .
- Measure the ambient temperature: it must be warmer than 15 °C (59 °F).
- Close the doors, hood, the windows, the sunroof and the rear lid.
- Open all instrument panel vents and, if present, the vents in the rear center console.
- Start the engine.





- Switch off the Air Conditioning (A/C) compressor on the Climatronic Control Module - J255- control head: the indicator lamp in the **A/C** button -10- does not illuminate.
- “Read measured values” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

Checking

- Read the actuation of the A/C Compressor Regulator Valve - N280- .
- The actuation of the A/C compressor (by the A/C Compressor Regulator Valve - N280-) is switched off: 0 A (amps) or 0% will be displayed.
- Read the measured value for the Refrigerant Circuit Pressure Sensor - G805- .
- The pressure in the refrigerant circuit is same as the measured outside temperature or greater than the value in the chart.

Ambient Temperature in °C	Pressure Display (pressure in bar)
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0



Note

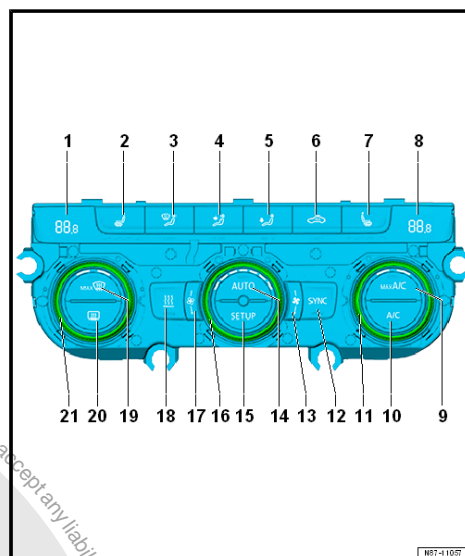
- ♦ *At absolute pressure, 0 bar corresponds to absolute vacuum. Normal ambient pressure equals approximately 1 bar (14.5 psi) absolute pressure and 0 bar pressure. On the scales of most pressure gauges, 0 bar pressure corresponds to an absolute pressure of one bar (can be seen from -1 mark below 0).*
- ♦ *Pressure in refrigerant circuit is governed by ambient temperature. On account of heat given off by components (for example, the radiator), pressure displayed with a warm engine will be slightly higher than that given for the respective ambient temperature.*

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

- Check the Refrigerant Circuit Pressure Sensor - G805- signal using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

If no fault is determined at the Refrigerant Circuit Pressure Sensor - G805- , there is insufficient refrigerant in the circuit.

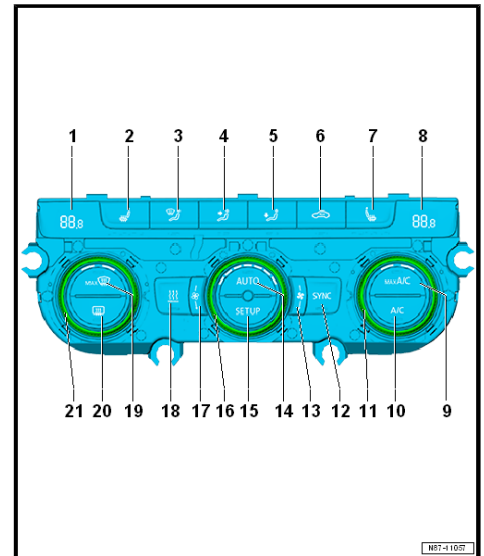
- See notes. Refer to
⇒ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .
- The necessary work may only be performed by qualified personnel. If this is not possible, transfer the vehicle to a workshop that has the necessary tools and equipment and where the work can be performed by qualified personnel. Refer to
⇒ [“4.1 Working on the Refrigerant Circuit”, page 8](#) . Bring the detected problems to the attention of the workshop.





If the displayed pressure in the refrigerant circuit is OK:

- Adjust the following settings on the Climatronic Control Module - J255- control head:
 - “Auto” mode: the indicator lamp in the **AUTO** button -14- illuminates.
 - Set the temperature preset “cold” via the regulators -21 and 11-: “LO” for the driver and front passenger side in the display -1 and 8- of the Climatronic Control Module - J255- .
 - A/C compressor on: The indicator lamp in the **A/C** button -10- illuminates.
 - Turn the fresh air blower regulator -16- to the maximum speed.
- “Read measured values” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the display in the display fields:
 - If a displayed current that is flowing via the A/C Compressor Regulator Valve - N280- is greater than 0.3 amps (30%): the A/C compressor is switched on.
 - The displayed pressure increases above the value when the compressor is switched off.



If the displayed pressure does not change and the actuation of the A/C compressor is OK:

- Check once more if the A/C compressor is actually being driven and the A/C Compressor Regulator Valve - N280- is being activated.

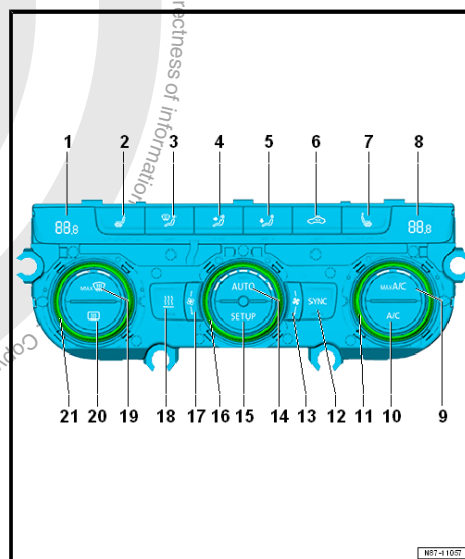
If the current is actually flowing via the A/C Compressor Regulator Valve - N280- and the A/C compressor is being driven, then the fault is in the refrigerant circuit. It is possible that the A/C compressor regulation is not OK.

- The necessary work may only be performed by qualified personnel. If this is not possible, transfer the vehicle to a workshop that has the necessary tools and equipment and where the work can be performed by qualified personnel. Refer to **⇒ “4.1 Working on the Refrigerant Circuit”, page 8** . Bring the detected problems to the attention of the workshop.



Note

- ◆ The Climatronic Control Module - J255- actuates the A/C Compressor Regulator Valve - N280- so that the air temperature reaches the specified value downstream of the evaporator (about 2 to 6 °C (35.6 to 42.8 °F)).
 - ◆ After vehicle start, a value greater than 0.55 A is displayed for the activation of the A/C Compressor Regulator Valve - N280- depending on the measured temperature, the engine speed and the vehicle voltage. As soon as the temperature measured by the Evaporator Temperature Sensor - G308- nears the specified value, the activation, and thus the A/C compressor output, is reduced.
 - ◆ Under certain operating conditions, moisture in the refrigerant circuit can lead to ice build-up on the A/C Compressor Regulator Valve - N280- and on the expansion valve. A/C compressor regulation is reduced by this ice build-up. The evaporator is cooled too intensely and freezes. The ice on the evaporator may cause various customer concerns. Refer to [⇒ "4.4.8 Ice Formation on Evaporator, Localizing Malfunction", page 59](#).
 - ◆ If no or very little current is displayed in the measured values for the A/C Compressor Regulator Valve - N280- actuation, check the actuation of the A/C Compressor Regulator Valve - N280- using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Press the **Recirculation** button -6- on the Climatronic Control Module - J255- control head.
 - The indicator lamp in the button for the "recirculating air mode" illuminates.
 - Set engine speed of 2000 rpm (start of time measurement).
 - "Read measured values" using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.





- Compare the displayed measured value for the Evaporator Temperature Sensor - G308- with the values in the diagram.

A - Air temperature measured by the Evaporator Temperature Sensor - G308-

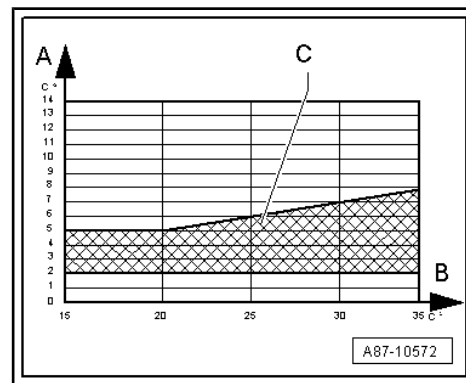
B - Ambient Temperature

C - Permissible Tolerance Range

- Depending on the ambient temperature, the measured air temperature should be after 5 minutes within the shown tolerance range.

If the required values are not reached:

- Compare the measured values for the Left Vent Temperature Sensor - G150- and the Right Vent Temperature Sensor - G151- with the displayed measured value for the Evaporator Temperature Sensor - G308- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.



Note

The temperature of the air coming out of the left and right instrument panel vents can also be measured with a thermometer.

If the measured values of the Evaporator Temperature Sensor - G308- and Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- only deviate from each other slightly:

- Perform the procedure for identifying malfunctions if the target values are not reached. Refer to [⇒ “4.4.6 Determining Malfunction if Deviation from Specified Value”, page 57](#).

If the measured value for the Evaporator Temperature Sensor - G308- is greater than the measured value for the Left Vent Temperature Sensor - G150- or Right Vent Temperature Sensor - G151- :

- Make sure the Evaporator Temperature Sensor - G308- is installed correctly (refer to [⇒ “5.17 Evaporator Temperature Sensor G308, Removing and Installing”, page 262](#)) and perform an electrical test for this sensor using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.



Note

The A/C system function is recognizable, for example, when the refrigerant pipe on the low pressure side (thick line) cools off.

If the measured value for the Evaporator Temperature Sensor - G308- and the A/C system cooling output is OK and there are no complaints, the cooling output test ends.

If the measured value for the Evaporator Temperature Sensor - G308- (and the A/C system cooling output) is not OK:

- Perform the procedure for identifying malfunctions if the target values are not reached (required cooling output not reached). Refer to [⇒ “4.4.6 Determining Malfunction if Deviation from Specified Value”, page 57](#).



If the measured value for the Evaporator Temperature Sensor - G308- (and the A/C system cooling output) is OK and there is a complaint due to excessive or different vent temperatures for the A/C system:

- Check the actuation of the temperature doors in the A/C unit (refer to [⇒ “5.7 Air Distribution Housing, Removing and Installing”, page 230](#)) and use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

4.4.5 Cooling Output, Checking, Vehicles with Automatic Climate Control System (with High Voltage System)

Refer to

[⇒ “4.4.1 Information on Checking Cooling Output and Tools Required”, page 31](#)

- Note safety precautions. Refer to [⇒ “1.1 Handling Refrigerant Safety Precautions”, page 1](#) .
- See notes. Refer to [⇒ “4.1 Working on the Refrigerant Circuit”, page 8](#) .
- Observe safety precautions when working on the high voltage system. Refer to [⇒ “1.3 High Voltage System Safety Precautions”, page 1](#) .
- Pay attention to safety precautions for working near high voltage components. Refer to [⇒ “1.4 Safety Precautions near High Voltage Components”, page 2](#) .
- Pay attention to the high voltage system danger classification. Refer to [⇒ Rep. Gr. 00 ; High Voltage System Danger Classification](#) .

Working On A High Voltage System when Activated or with the Ignition Turned On

- Charge the vehicle batteries, for example, using the Battery Charger - VAS5904- in the battery support mode to minimize the number of automatic engine starts during the test- and measuring procedures while the ready mode is active. Refer to [⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Charging](#) .
- Move the selector level into position “P”, activate the parking brake and arrange the necessary tools for testing and measuring procedures that require the ready mode to be active or that require the ignition to be on, so that they cannot come into contact with the turning components in the engine and so that they are not in the vicinity of the turning components of a running engine.



Note

- ♦ *Also move the selector lever into position “P” and activate the parking brake for testing and measuring procedures which require the ignition to be on, but do not require the ready mode to be active.*
- ♦ *Ready mode is displayed in the Instrument Cluster Control Module - J285- . Refer to the Owner's Manual.*
- ♦ *Activate and deactivate the ready mode. Refer to Owner's Manual (consult the display in the Instrument Cluster Control Module - J285-).*



Procedure

- ◆ The requirements for testing the cooling capacity are fulfilled. Refer to ➤ [“4.4.2 Test Requirements”, page 32](#) .
- Measure the ambient temperature: it must be warmer than 15 °C (59 °F).
- Close the doors, hood, the windows, the sunroof and the rear lid.
- Open all instrument panel vents and, if present, the vents in the rear center console.



Note

- ◆ *Ready mode is displayed in the Instrument Cluster Control Module - J285- .*
- ◆ *Activate the ready mode (and observe the display in the Instrument Cluster Control Module - J285-). Refer to the Owner's Manual.*
- ◆ *Also move the selector lever into position “P” and activate the parking brake for testing and measuring procedures which require the ignition to be on, but do not require the ready mode to be active.*
- The ignition is turned on and ready mode is active, the engine starts or only runs when, for example, the High Voltage Battery 1 - AX2- has not been charged enough.



Note

To check the cooling output on a vehicle with a high voltage system the engine must not be running (Electrical A/C Compressor - V470-).



- Switch off the Air Conditioning (A/C) compressor on the Climatronic Control Module - J255- control head: the indicator lamp in the **A/C** button -10- does not illuminate.
- “Read measured values” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

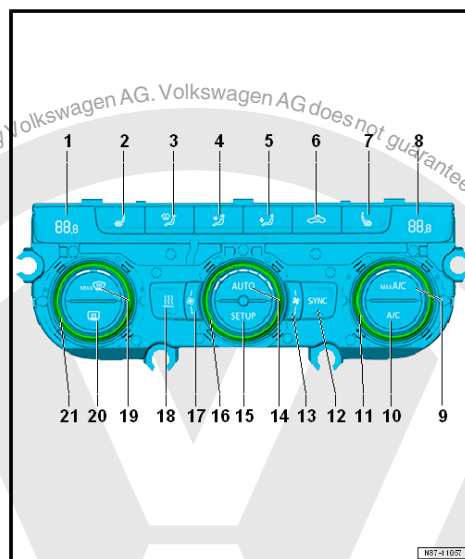
Checking

- ◆ Read out the activation of the Electrical A/C Compressor - V470- (compressor shut-off conditions and compressor speed).
- ◆ Read the measured value of the Refrigerant Circuit Pressure Sensor - G805- (the A/C Pressure/Temperature Sensor - G395- , depending on the vehicle version).



Note

- ◆ For the following test, various measured values can be selected in Guided Fault Finding and displayed in a table on the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- ◆ The Electrical A/C Compressor - V470- is supplied with electric energy via a fuse installed in the Electric Drive Power and Control Electronics - JX1- . Refer to
⇒ “3.5 A/C Compressor Fuse S355, Removing and Installing”, page 165 , ⇒ Rep. Gr. 93 ; Electric Drive Power and Control Electronics and ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ◆ The A/C compressor is turned off and there is no compressor speed displayed.
- ◆ The pressure in the refrigerant circuit is same as the measured outside temperature or greater than the value in the chart.
- The pressure in the refrigerant circuit is same as the measured outside temperature or greater than the value in the chart.



Ambient Temperature in °C	Pressure Display (pressure in bar)
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0



Note

- ◆ *At absolute pressure, 0 bar corresponds to absolute vacuum. Normal ambient pressure equals approximately 1 bar (14.5 psi) absolute pressure and 0 bar pressure. On the scales of most pressure gauges, 0 bar pressure corresponds to an absolute pressure of one bar (can be seen from -1 mark below 0).*
- ◆ *Depending on version of the Climatronic Control Module - J255- A/C control head, only integer values may be displayed as a measured value, if the pressure measured lies between two values the display switches back and forth.*
- ◆ *The displays for the activation of the A/C compressor are different. For a mechanically driven A/C compressor, the target and actual current for the activation of the A/C Compressor Regulator Valve - N280- are displayed. On an Electrical A/C Compressor - V470- , the target speed, which is calculated by the Climatronic Control Module - J255- and transmitted to the A/C Compressor Control Module - J842- , and the actual speed of the Electrical A/C Compressor - V470- , which is determined by the A/C Compressor Control Module - J842- , are shown in a measured value on the Vehicle Diagnostic Tester in the "Guided Fault Finding" function (for the A/C system).*
- ◆ *Pressure in refrigerant circuit is governed by ambient temperature. On account of heat given off by components (for example, the radiator), pressure displayed with a warm engine will be slightly higher than that given for the respective ambient temperature.*

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

Check the signal of the Refrigerant Circuit Pressure Sensor - G805- (the A/C Pressure/Temperature Sensor - G395- depending on the vehicle version) using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.

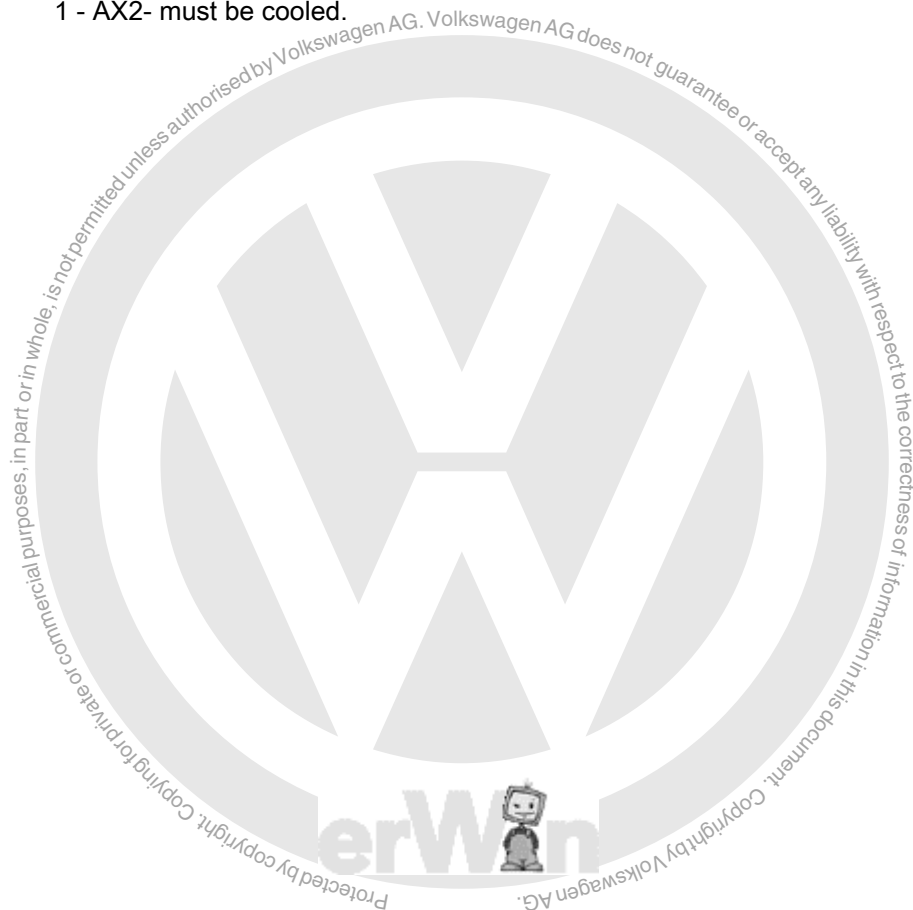
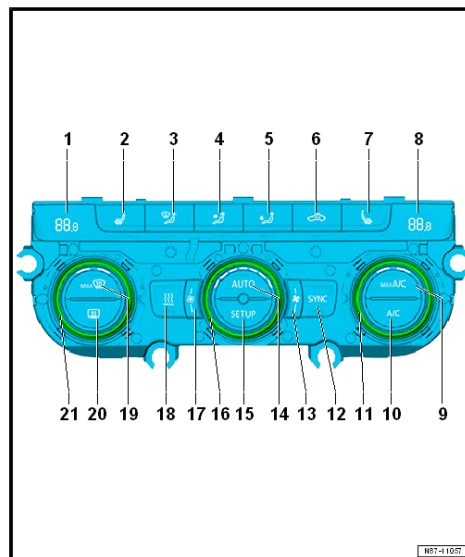
When no fault can be identified on the Refrigerant Circuit Pressure Sensor - G805- (the A/C Pressure/Temperature Sensor - G395- depending on the version of the vehicle) there is too little refrigerant in the circuit.

- The necessary work may only be performed by qualified personnel. If this is not possible, transfer the vehicle to a workshop that has the necessary tools and equipment and where the work can be performed by qualified personnel. Refer to [⇒ "4.1 Working on the Refrigerant Circuit", page 8](#) . Bring the detected problems to the attention of the workshop.



If the displayed pressure in the refrigerant circuit is OK:

- Adjust the following settings on the Climatronic Control Module - J255- control head:
 - “Auto” mode: the indicator lamp in the **AUTO** button -14- illuminates.
 - Set the temperature preset “cold” via the regulators -21 and 11-: “LO” for the driver and front passenger side in the display -1 and 8- of the Climatronic Control Module - J255- .
 - A/C compressor on: The indicator lamp in the **A/C** button -10- illuminates.
 - Turn the fresh air blower regulator -16- to the maximum speed.
- “Read measured values” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the display in the display fields:
 - The activation of the Electrical A/C Compressor - V470- (compressor shut-off conditions and compressor speed). The Electrical A/C Compressor - V470- is activated via the A/C Compressor Control Module - J842- by request from the - J255- so that the RPM is greater than 800.
 - Check the measured value of the Refrigerant Circuit Pressure Sensor - G805- (the A/C Pressure/Temperature Sensor - G395-) (refrigerant pressure). The displayed pressure increases above the value when the compressor is switched off.
 - Read the activation of the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- and the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- . The Heater and A/C Unit Refrigerant Cut-Off Valve - N541- is not activated, the activation of the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- depends on if the High Voltage Battery 1 - AX2- must be cooled.

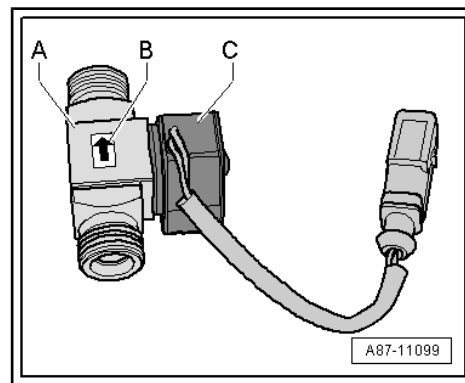




Note

- ◆ The target speed for the Electrical A/C Compressor - V470- is calculated by the Climatronic Control Module - J255- A/C control head. The request is sent via the data bus to the A/C Compressor Control Module - J842-. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" Function.
- ◆ The A/C compressor operates in the driving mode with a speed of 800 to 8600 revolutions/minute.
- ◆ The A/C compressor is not actuated at the maximum specified speed (of approximately 8500/min) on a stopped or slow moving vehicle (until the vehicle reaches a speed of about 45km/h) (the A/C compressor speed is limited to approximately 5000/min).
- ◆ The Electrical A/C Compressor - V470- is supplied with electric energy via a fuse installed in the Electric Drive Power and Control Electronics - JX1- . Refer to [⇒ "3.5 A/C Compressor Fuse S355, Removing and Installing", page 165](#) , ⇒ Rep. Gr. 93 ; Electric Drive Power and Control Electronics and ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ◆ The A/C compressor output (the delivery volume) is not always sufficient with a A/C compressor speed of 5000/min, a very high exterior temperature (more than 35 °C (95 °F)) and a high fresh air blower speed (inefficient environmental controls) at lowering the air temperature to the target value downstream of the evaporator. To check the regulation of the A/C compressor under these conditions, for example, activate the fresh air blower only with approximately 40% of the maximum voltage and check the temperature at a reduced fresh air blower speed using the Vehicle Diagnostic Tester in the "Guided Fault Finding" Function (for the A/C system).
- ◆ If little or no speed is displayed as a measured value (although the required air temperature downstream of the evaporator is not yet achieved; the speed is less than 4000 /min), check the activation of the Electrical A/C Compressor - V470- by the A/C Compressor Control Module - J842- using the Vehicle Diagnostic Tester in "Guided Fault Finding" function.
- ◆ The Heater and A/C Unit Refrigerant Cut-Off Valve - N541- and the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- are open without current.
- ◆ The Heater and A/C Unit Refrigerant Cut-Off Valve - N541- is activated for example, when no cooling output is needed by the A/C system, but the High Voltage Battery 1 - AX2- (the Electric Drive Power and Control Electronics - JX1-) must be cooled.
- ◆ The High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- is activated for example, when cooling output is needed by the A/C system, but the Hybrid Battery Unit - AX1- and / or the Electric Drive Power and Control Electronics - JX1- do not need to be cooled.
- In the "read measured values" function, read out the refrigerant circuit pressure measured by the Refrigerant Circuit Pressure Sensor - G805- (by the A/C Pressure/Temperature Sensor - G395-). The displayed pressure goes over the value when the A/C compressor is switched off. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" Function.

If the displayed pressure does not change and the actuation of the A/C compressor is OK:





- Check the activation and the function of the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- ; the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- must not be activated. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Check the installation position of the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- ; it must be installed on the proper side (arrow shows the refrigerant flow direction from the condenser to the expansion valve). Refer to [⇒ "2.4 Expansion Valve, Removing and Installing", page 110](#).

When the A/C compressor is being driven and the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- is not activated (and is installed correctly), there is a fault in the refrigerant circuit. There may be too little refrigerant in the refrigerant circuit or the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- is closed.

- The necessary work may only be performed by qualified personnel. If this is not possible, transfer the vehicle to a shop that has the necessary tools and equipment and where the work can be performed by qualified personnel. Refer to [⇒ "4.1 Working on the Refrigerant Circuit", page 8](#) . Bring the detected problems to the attention of the workshop.

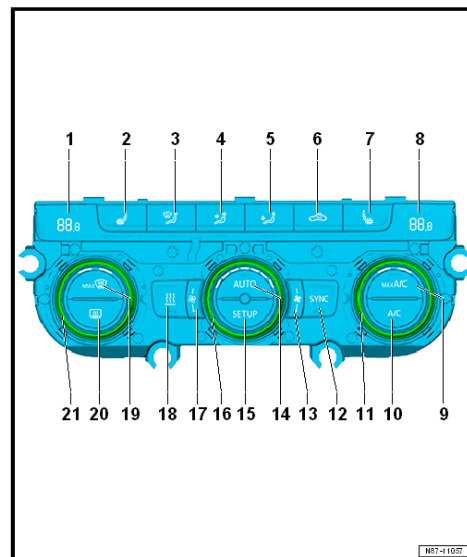


Note

- ◆ *The Electrical A/C Compressor - V470- is activated by the A/C Compressor Control Module - J842- (at the request of the Climatronic Control Module - J255- A/C control head), so that the air temperature reaches the specified value downstream of the evaporator (approximately 2 to 6 °C (35.6 to 42.8 °F)).*
- ◆ *After the vehicle starts, the engine speed and the A/C compressor electrical system voltage are activated with a speed greater than 3000 /min depending on the measured temperature. As soon as the temperature measured by the Evaporator Temperature Sensor - G308- nears the specified value, the activation, and thus the compressor output, is reduced.*
- ◆ *Under certain operating conditions, residual moisture in the refrigerant circuit can lead to ice build-up on the evaporator expansion valve in the A/C system. The A/C compressor/ expansion valve regulation is reduced by this ice build-up. The evaporator is either cooled too little or too intensely and potentially freezes. The ice on the evaporator may cause various customer concerns. Refer to [⇒ "4.4.8 Ice Formation on Evaporator, Localizing Malfunction", page 59](#) .*



- Press the **Recirculation** button -6- on the Climatronic Control Module - J255- control head.
- The indicator lamp in the button for the “recirculating air mode” illuminates.
- “Read measured values” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.





- Compare the displayed measured value for the Evaporator Temperature Sensor - G308- with the values in the diagram.

A - Air temperature measured by the Evaporator Temperature Sensor - G308-

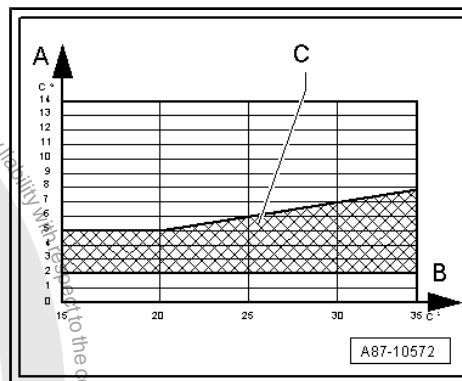
B - Ambient Temperature

C - Permissible Tolerance Range

- Depending on the ambient temperature, the measured air temperature should be after 5 minutes within the shown tolerance range.

If the required values are not reached:

Compare the measured values for the Left Vent Temperature Sensor - G150- and the Right Vent Temperature Sensor - G151- with the displayed measured value for the Evaporator Temperature Sensor - G308- using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.



Note

- ♦ The temperature of the air coming out of the left and right instrument panel vents can also be measured with a thermometer.
- ♦ The A/C system function is recognizable, for example, when the refrigerant pipe on the low pressure side (thick line) cools off.
- ♦ The A/C compressor is not actuated at the maximum specified speed (of approximately 8500/min) on a stopped or slow moving vehicle (until the vehicle reaches a speed of about 45km/h) (the A/C compressor speed is limited to approximately 5000/min).
- ♦ The A/C compressor output (the delivery volume) is not always sufficient with an A/C compressor speed of 5000/min, a high exterior temperature (more than 30 °C (86 °F)) and a high fresh air blower speed (inefficient environmental controls) at lowering the air temperature to the target value downstream of the evaporator. To check the regulation of the A/C compressor under these conditions, for example, activate the fresh air blower only with approximately 40% of the maximum voltage and check the temperature at a reduced fresh air blower speed using the Vehicle Diagnostic Tester in the "Guided Fault Finding" Function for the A/C system.

If the measured values of the Evaporator Temperature Sensor - G308- and Left Vent Temperature Sensor - G150- / Right Vent Temperature Sensor - G151- only deviate from each other slightly:

- Perform the procedure for identifying malfunctions if the target values are not reached. Refer to
⇒ ["4.4.6 Determining Malfunction if Deviation from Specified Value", page 57](#) .

If the measured value for the Evaporator Temperature Sensor - G308- is greater than the measured value for the Left Vent Temperature Sensor - G150- or Right Vent Temperature Sensor - G151- :

- Make sure the Evaporator Temperature Sensor - G308- is installed correctly (refer to
⇒ ["5.17 Evaporator Temperature Sensor G308 , Removing and Installing", page 262](#)) and perform an electrical test for this sensor using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.



If the measured value for the Evaporator Temperature Sensor - G308- and the A/C system cooling output is OK and there are no complaints, the cooling output test ends.

If the measured value for the Evaporator Temperature Sensor - G308- (and the A/C system cooling output) is not OK:

- Perform the procedure for identifying malfunctions if the target values are not reached (required cooling output not reached). Refer to
⇒ [“4.4.6 Determining Malfunction if Deviation from Specified Value”, page 57](#) .

If the measured value for the Evaporator Temperature Sensor - G308- (and the A/C system cooling output) is OK and there is a complaint due to excessive or different vent temperatures for the A/C system:

- Check the actuation of the temperature doors in the A/C unit (refer to
⇒ [“5.7 Air Distribution Housing, Removing and Installing”, page 230](#)) and use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

If the measured value of the Evaporator Temperature Sensor - G308- (and thus the A/C system cooling output) is OK, and if there is a complaint due to a lack of cooling output for the high voltage system components

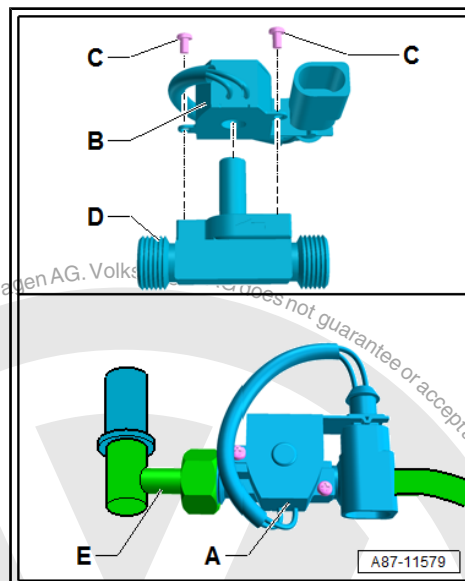
- Check the activation and function of the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- ; the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- must not be activated, when the cooling output for the cooling of the high voltage system components is requested. Refer to
⇒ [“7.2 High Voltage Battery Heat Exchanger Incorporation in the High Voltage System Coolant Circuit”, page 288](#) and use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the installation position of the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- ; it must be installed on the proper side (arrow shows the refrigerant flow direction from the condenser to the high voltage battery heat exchanger). Refer to
⇒ [“2.11 High Voltage Battery Heater Core Refrigerant Cut-Off Valve N542, Removing and Installing”, page 131](#) .
- Check the incorporation of the high voltage battery heat exchanger in high voltage system coolant circuit. Refer to
⇒ [“7.2 High Voltage Battery Heat Exchanger Incorporation in the High Voltage System Coolant Circuit”, page 288](#) and ⇒ Rep. Gr. 19 ; Coolant System/Coolant .
- Check the function and activation of the High Voltage Battery Coolant Pump - V590- and the High Voltage Battery Coolant Valve - N688- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” (for hybrid battery management system). Refer to
⇒ [“7.2 High Voltage Battery Heat Exchanger Incorporation in the High Voltage System Coolant Circuit”, page 288](#) and ⇒ Rep. Gr. 19 ; Coolant System/Coolant .

If the A/C compressor is being driven, the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- is not activated (and is installed correctly) and no fault can be determined in the high voltage system coolant circuit, then there is a fault in the refrigerant circuit. The constriction (restrictor) in the refrigerant line between the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- and the high voltage battery heat exchanger or the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- may be closed. Refer to
⇒ [“2.14 Refrigerant Line with Restrictor”, page 141](#) .



Note

- ◆ *The High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- is closed in the A/C system regulated mode; it is activated by the Climatronic Control Module - J255- A/C control head. Only when the coolant output via the high voltage battery heat exchanger is required from the High Voltage Battery 1 - AX2- and / or the Electric Drive Power and Control Electronics - JX1- the Climatronic Control Module - J255- switches off the activation for the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- and the refrigerant can flow via the restrictor in the refrigerant line into the high voltage battery heat exchanger and cool it. The High Voltage Battery 1 - AX2- is only cooled, however, when the High Voltage Battery Coolant Pump - V590- is also activated correctly. For cooling the Electric Drive Power and Control Electronics - JX1- and the High Voltage Battery Charger Control Module - J1050- , the High Voltage Battery Coolant Valve - N688- and the Coolant Pump in front of Electric Drive Power and Control Electronics - V508- must also be activated correctly. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function (for hybrid battery management system). Refer to ➔ ["7.2 High Voltage Battery Heat Exchanger Incorporation in the High Voltage System Coolant Circuit", page 288](#) and ➔ Rep. Gr. 19 ; Coolant System/Coolant .*
- ◆ *The Climatronic Control Module - J255- A/C control head detects a fault in the connection between the Climatronic Control Module - J255- and the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- . Depending on its version, the Climatronic Control Module - J255- switches off the Electrical A/C Compressor - V470- activation when there is a fault and there is no more coolant output.*
- ◆ *Depending on the version of the Climatronic Control Module - J255- A/C control head, the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- is not activated if the Electrical A/C Compressor - V470- output diagnostic test mode is being performed, so that the cooling function of the high voltage battery heat exchanger can be checked using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.*
- ◆ *The High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- -A- is open without current, which means that the high voltage battery heat exchanger is being cooled as long as the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- is not activated when A/C system is in operation. If, with the ignition switched off, another shut-off valve is connected (with the same electrical values as the installed High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- -A-) or if a coil -B- is removed from the shut-off valve -D- (if the connector to the coil -B- must be disconnected to remove it, it must be reconnected), the cooling function of the high voltage battery heat exchanger can be checked, without a fault being detected in the Climatronic Control Module - J255- . Refer to ➔ ["2.12 High Voltage Battery Heat Exchanger, Removing and Installing", page 133](#) .*
- ◆ *To remove the coil -B-, remove the bolts -C- (do not disconnect the connector with the ignition switched on, or reconnect before switching the ignition on after removing).*





- ◆ If the cooling output of the vehicle is OK and the high voltage battery heat exchanger is cooled correctly with the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- not activated, check the activation of the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- as well as the incorporation of the high voltage battery heat exchanger in the low temperature coolant circuit, and also the activation and function of the related components when there is a complaint. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function for the hybrid battery management system). Refer to
 ⇒ "7.2 High Voltage Battery Heat Exchanger Incorporation in the High Voltage System Coolant Circuit", page 288 and ⇒ Rep. Gr. 19 ; Coolant System/Coolant .
- ◆ If the cooling output of the vehicle is OK and the high voltage battery heat exchanger is not being cooled with an unactuated High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- (or a removed coil -B-), it could be due to a closed restrictor in the refrigerant line -E-. Refer to
 ⇒ "2.14 Refrigerant Line with Restrictor", page 141 .
- If there is a fault in the refrigerant circuit the necessary work may only be performed by qualified personnel. If this is not possible, transfer the vehicle to a workshop that has the necessary tools and equipment and where the work can be performed by qualified personnel. Refer to
 ⇒ "4.1 Working on the Refrigerant Circuit", page 8 . Bring the detected problems to the attention of the workshop.

4.4.6 Determining Malfunction if Deviation from Specified Value

The required cooling output is not attained. Refer to
 ⇒ "4.4.3 Cooling Output, Checking, Vehicles with Manual Climate Control System", page 36 ,
 ⇒ "4.4.4 Cooling Output, Checking, Vehicles with Automatic Climate Control System (without High Voltage System)", page 41
 and
 ⇒ "4.4.5 Cooling Output, Checking, Vehicles with Automatic Climate Control System (with High Voltage System)", page 46 .



Note

This repair manual only outlines the checking procedure. Perform the detailed function test for the heating as described in the Guided Fault Finding using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.

If a target value is not reached, this can be caused by various things:

- Determine the cause using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.

Possible causes for the deviation of the target value:

- ◆ Dirty radiator or Air Conditioning (A/C) system condenser.
- ◆ Retrofitted components at or in the front end.
- ◆ Fault in the activation or function of the Coolant Fans -V7- / -V177- .
- ◆ Fault in the coolant circuit, the coolant gets too hot.



- ◆ Fault in the activation of the A/C Compressor Regulator Valve - N280- by the A/C Control Module - J301- / Climatronic Control Module - J255- (vehicles without a high voltage system).
- ◆ Requests transmitted by one of the other control modules to the A/C Control Module - J301- / Climatronic Control Module - J255- to switch off the A/C Compressor Regulator Valve - N280- actuation (vehicles without a high voltage system).
- ◆ Fault in the A/C Compressor Regulator Valve - N280- function (vehicles without a high voltage system).
- ◆ Fault in the refrigerant circuit or A/C compressor.
- ◆ Fault in the activation or the function of the Battery Regulation Control Module - J840- , the Electrical A/C Compressor - V470- , the A/C Compressor Control Module - J842- or the Heater and A/C Unit Refrigerant Cut-Off Valve - N541-

If a fault was detected in the refrigerant circuit by the "Guided Fault Finding":

- If there is a fault in the refrigerant circuit the necessary work may only be performed by qualified personnel. If this is not possible, transfer the vehicle to a workshop that has the necessary tools and equipment and where the work can be performed by qualified personnel. Refer to
⇒ ["4.1 Working on the Refrigerant Circuit", page 8](#) . Bring the detected problems to the attention of the workshop.

4.4.7 Determining Malfunction of Temperature Increase Downstream from Evaporator

The temperature increase in the Air Conditioning (A/C) unit is too great. Refer to

⇒ ["4.4.3 Cooling Output, Checking, Vehicles with Manual Climate Control System", page 36](#) ,

⇒ ["4.4.4 Cooling Output, Checking, Vehicles with Automatic Climate Control System \(without High Voltage System\)", page 41](#) and

⇒ ["4.4.5 Cooling Output, Checking, Vehicles with Automatic Climate Control System \(with High Voltage System\)", page 46](#) .



Note

This repair manual only outlines the checking procedure. Perform the detailed function test for the heating as described in the Guided Fault Finding using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.

If a target value is not reached due to a temperature increase downstream from the evaporator, this can be caused by various things:

- Determine the cause using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.

Possible causes for the deviation of the target value:

- ◆ Due to a fault in the activation, the temperature doors do not reach the end stops correctly in the A/C unit.
- ◆ One or several measured values of the temperature sensors are faulty.
- ◆ Warmed up air flows by the temperature doors set in the "cold" position.



Note

This fault can be determined as follows: Clamp off both coolant hoses from the engine to the heater and A/C unit heater core using, for example, the Hose Clamps - Up To 40mm - 3093- and then repeat the cooling output test. If the measured values are then OK, this indicates a fault near the temperature doors.

4.4.8 Ice Formation on Evaporator, Localizing Malfunction

Vehicles without A High Voltage System

- ◆ The A/C Control Module - J301- / Climatronic Control Module - J255- control head actuates the A/C Compressor Regulator Valve - N280- so that the air temperature reaches the specified value downstream of the evaporator (about 2 to 6 °C (35.6 to 42.8 °F)).
- ◆ Depending on the measured temperature, engine speed and electrical system voltage in "Read measured values" of the A/C Control Module - J301- / Climatronic Control Module - J255- control head for the actuation of the A/C Compressor Regulator Valve - N280- , a value greater than 0.55 A (75%) is displayed after vehicle start. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function. As soon as the temperature measured by the Evaporator Temperature Sensor - G308- nears the specified value, the activation, and thus the compressor output, is reduced.
- ◆ Ice build-up can occur on the evaporator under extreme circumstances for particularly unfavorable Air Conditioning (A/C) system settings (for example, airflow direction is set to the instrument panel vents and these vents are closed, set to MAX AC for a minimal fresh air blower speed). At this setting, air is no longer flowing through the evaporator and is making the temperature at the Evaporator Temperature Sensor - G308- higher than the actual evaporator temperature. It can be assumed for the A/C system regulation, that the measured value of the Evaporator Temperature Sensor - G308- corresponds to the actual evaporator temperature and continues to activate the A/C Compressor Regulator Valve - N280- and the evaporator cools too much.
- ◆ Under certain operating conditions, moisture in the refrigerant circuit can lead to ice build-up on the A/C compressor regulator valve and on the expansion valve. A/C compressor regulation is reduced by this ice build-up. The evaporator is cooled too intensely and freezes. The freeze-up of the evaporator can be the cause for the following customer complaints. Refer to [⇒ page 60](#) .

Vehicles with A High Voltage System

- ◆ The Electrical A/C Compressor - V470- is activated via the A/C Compressor Control Module - J842- by the Climatronic Control Module - J255- A/C control head, so that the air temperature reaches the specified value downstream of the evaporator (approximately 2 to 6 °C (35.6 to 42.8 °F)).
- ◆ The Electrical A/C Compressor - V470- is supplied with electric energy via a fuse installed in the Electric Drive Power and Control Electronics - JX1- . Refer to [⇒ "3.5 A/C Compressor Fuse S355, Removing and Installing", page 165](#) , ⇒ Rep. Gr. 93 ; Electric Drive Power and Control Electronics and ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ◆ After the turning on the ignition and depending on the speed of the vehicle, the measured temperature and the electrical



system voltage, a value for the A/C compressor RPM greater than 3000 /min is displayed. As soon as the temperature measured by the Evaporator Temperature Sensor - G308- nears the specified value, the activation, and thus the compressor output, is reduced.

- ◆ Ice build-up can occur on the evaporator under extreme circumstances for particularly unfavorable A/C system settings (for example, airflow direction is set to the instrument panel vents and these vents are closed, set to MAX AC for a minimal fresh air blower speed). At this setting, air is no longer flowing through the evaporator and is making the temperature at the Evaporator Temperature Sensor - G308- higher than the actual evaporator temperature. It can be assumed for the A/C system regulation, that the measured value for the Evaporator Temperature Sensor - G308- corresponds to the actual evaporator temperature and continues to activate the Electrical A/C Compressor - V470- at a higher speed and the evaporator cools too much.
- ◆ If the A/C system is switched off and coolant output is required via the high voltage battery heat exchanger by the Battery Regulation Control Module - J840- (for the High Voltage Battery 1 - AX2-) or by the Electric Drive Power and Control Electronics - JX1- , it can also lead to evaporator ice-up under unfavorable conditions if the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- function is not OK. The Climatronic Control Module - J255- A/C control head activates the Electrical A/C Compressor - V470- and the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- . If the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- does not close, the evaporator cools so much that the condensation water on the evaporator slats freezes, because there is no regulation of the evaporator temperature. Check the function of the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- using the Vehicle Diagnostic Tester in the "Guided Fault Finding" (for the A/C system).
- ◆ Under certain operating conditions, moisture in the refrigerant circuit can lead to ice build-up on the expansion valve. A/C compressor regulation is reduced by this ice build-up. The evaporator is cooled too intensely and freezes. The freeze-up of the evaporator can be the cause for the following customer complaints. Refer to ➔ [page 60](#) .

Possible Customer Complaints (all vehicles with and without a high voltage system):

- ◆ After a long drive, A/C system repeatedly or sporadically fails (no cooling or heating performance), after switching off the vehicle or A/C system and after a short time, the A/C function is OK again.
- ◆ Vehicles with automatically regulated A/C system: after a long drive, windows fog up from inside, windows are also not cleared by then pressing the "Defrost" button, after switching off vehicle and after a short time, A/C function is OK again.

Corrective measure:

- Check the measured value for the Evaporator Temperature Sensor - G308- using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.

If the measured value of the sensor is too high under the operating conditions reported by the customer, even though the A/C system is operating without difficulty at greater than, for example, 10 °C (50 °F), depending on ambient temperature:

- Check the Evaporator Temperature Sensor - G308- . The evaporator can ice up due to an incorrect measured value.



If the measured value of the sensor is too low under the operating conditions reported by the customer, (at an ambient temperature above 0 °C (32 °F), longer when it is lower than 0 °C (32 °F)):

- Check the refrigerant line from the connection location on the right longitudinal member (from the inner heat exchanger or from the evaporator) to the A/C compressor (thick pipe, low pressure side) with the engine running. If this line is thickly iced-up when complaint occurs (a thin layer of ice is permitted), this indicates that the temperature in the evaporator is too low.
- There is a fault in the refrigerant circuit the A/C compressor control could not be OK.
- Check the pressures in the refrigerant circuit. Refer to ⇒ Refrigerant R134a Servicing; Rep. Gr. 00 ; Pressures, Checking .
- The necessary work may only be performed by qualified personnel. If this is not possible, transfer the vehicle to a shop that has the necessary tools and equipment and where the work can be performed by qualified personnel. Refer to ⇒ **“4.1 Working on the Refrigerant Circuit”, page 8** . Bring the detected problems to the attention of the workshop.



5 Technical Data

⇒ **"5.1 Refrigerant R134a Capacities", page 62**

⇒ **"5.2 Refrigerant Oil", page 62**

⇒ **"5.3 Oil Distribution", page 62**

5.1 Refrigerant R134a Capacities

For complete R134a refrigerant capacity. Refer to ⇒ Maintenance ; Booklet 36.1

5.2 Refrigerant Oil

Do not use refrigerant oil that was stored for long periods of time in open containers.

Refrigerant oil attracts moisture. Close any opened containers immediately after use to prevent moisture from entering.

Refrigerant Oil Can Be Obtained Using Following Part Number; for:	
6SES14C; Denso	G 052 300 A2
11PXE14; Sanden	G 052 154 A2
6CVC140; Delphi	G 052 154 A2 / G 052 300 A2
Hybrid; Visteon	G 052 535 M2

For complete refrigerant oil capacity. Refer to ⇒ Maintenance ; Booklet 36.1

5.3 Oil Distribution

The oil, which is located in the sump of the Air Conditioning (A/C) compressor before initially switching on the air conditioner system, is distributed through the refrigerant circuit as follows:

- ◆ A/C compressor approximately 50%
- ◆ Condenser approximately 10%
- ◆ Suction hose approximately 10%
- ◆ Evaporator approximately 20%
- ◆ Receiver/dryer approximately 10%



80 – Heating, Ventilation

1 Component Location Overview - Heating

⇒ [“1.1 Component Location Overview - Components Outside of Passenger Compartment”, page 63](#)

⇒ [“1.2 Component Location Overview - Components Inside Front Passenger Compartment”, page 67](#)

1.1 Component Location Overview - Components Outside of Passenger Compartment

⇒ [“1.1.1 Component Location Overview - Components Outside of Passenger Compartment”, page 63](#)

⇒ [“1.1.3 Component Location Overview - Components Outside of Passenger Compartment, Wagon”, page 65](#)

1.1.1 Component Location Overview - Components Outside of Passenger Compartment

1 - Vehicle Interior Forced Air Extraction

- ☐ Checking. Refer to
⇒ [“6.9 Passenger Compartment Forced Air Extraction, Checking”, page 280](#) .
- ☐ Removing and installing. Refer to
⇒ [“6.10 Passenger Compartment Forced Air Extraction, Removing and Installing”, page 281](#) .

2 - Outside Air Temperature Sensor - G17-

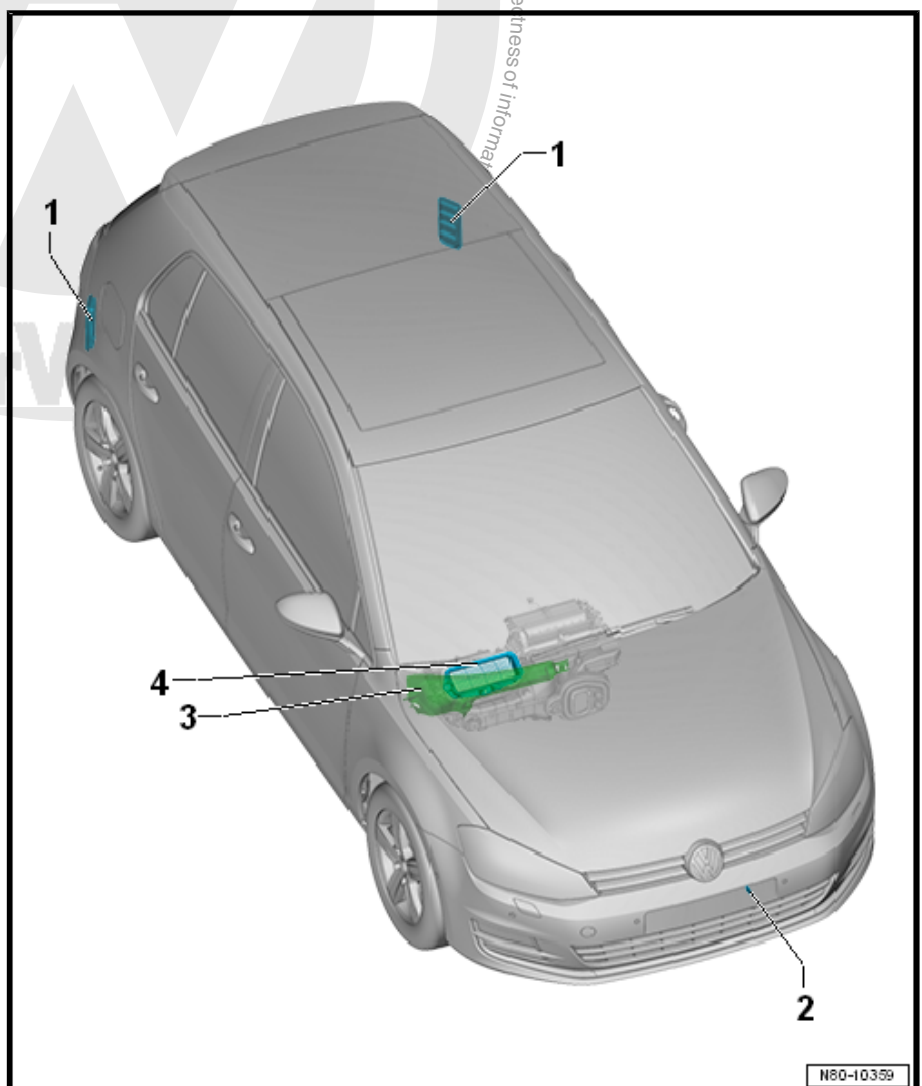
- ☐ Removing and installing. Refer to
⇒ [“9.4 Outside Air Temperature Sensor G17, Removing and Installing”, page 307](#) .

3 - Fresh Air Intake Cover

- ☐ Removing and installing. Refer to
⇒ [“6.3 Fresh Air Intake Cover, Removing and Installing”, page 274](#) .

4 - Fresh Air Intake

- ☐ Removing and installing. Refer to
⇒ [“6.2 Fresh Air Intake, Removing and Installing”, page 273](#) .





1.1.2 Component Location Overview - Components Outside of Passenger Compartment, Golf RHD

1 - Vehicle interior forced air extraction

- ❑ Checking. Refer to
⇒ ["6.9 Passenger Compartment Forced Air Extraction, Checking"](#), page 280 .
- ❑ Removing and installing. Refer to
⇒ ["6.10 Passenger Compartment Forced Air Extraction, Removing and Installing"](#), page 281 .

2 - Fresh air intake

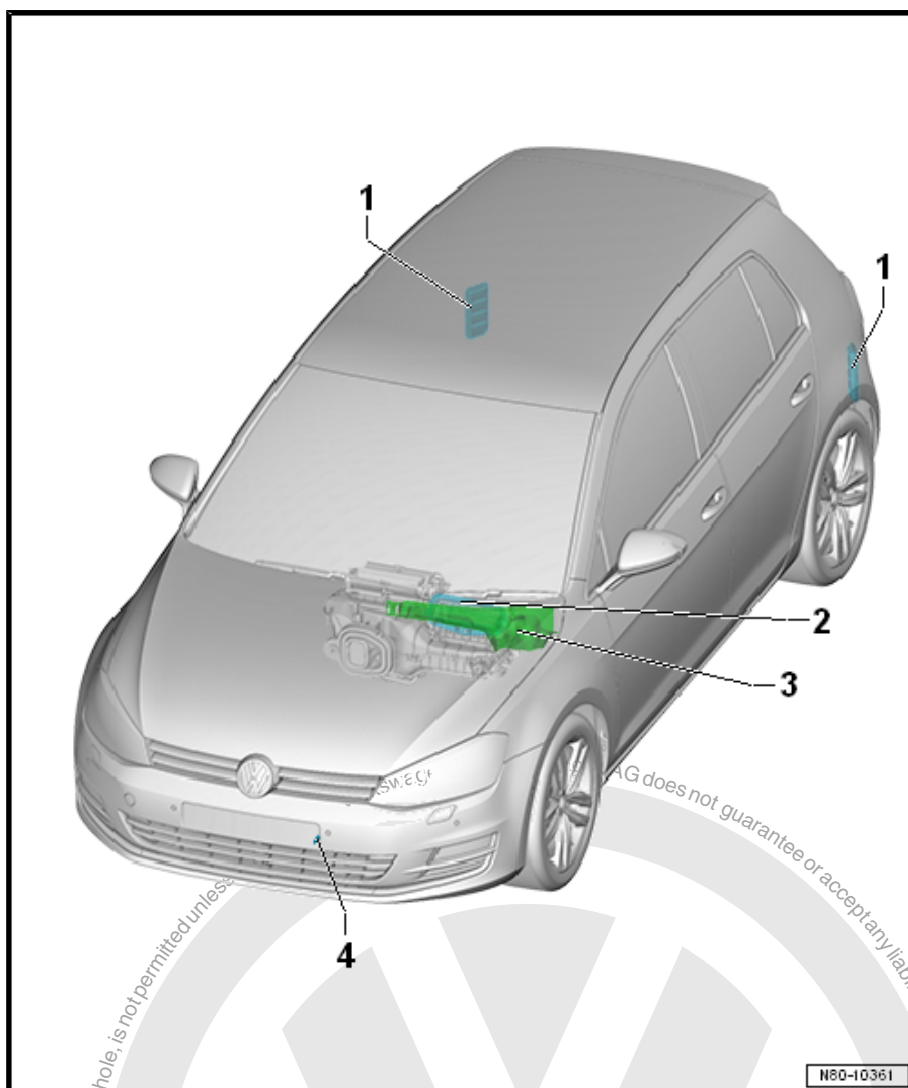
- ❑ Removing and installing. Refer to
⇒ ["6.2.2 Fresh Air Intake, Removing and Installing, RHD"](#), page 273 .

3 - Fresh air intake cover

- ❑ Removing and installing. Refer to
⇒ ["6.3.2 Fresh Air Intake Cover, Removing and Installing, RHD"](#), page 275 .

4 - Outside Air Temperature Sensor - G17-

- ❑ Removing and installing. Refer to
⇒ ["9.4 Outside Air Temperature Sensor G17, Removing and Installing"](#), page 307 .





1.1.3 Component Location Overview - Components Outside of Passenger Compartment, Wagon

1 - Vehicle Interior Forced Air Extraction

- ❑ Checking. Refer to
⇒ [“6.9 Passenger Compartment Forced Air Extraction, Checking”](#), page 280 .
- ❑ Removing and installing. Refer to
⇒ [“6.10.2 Passenger Compartment Forced Air Extraction, Removing and Installing, Golf Wagon”](#), page 281 .

2 - Outside Air Temperature Sensor - G17-

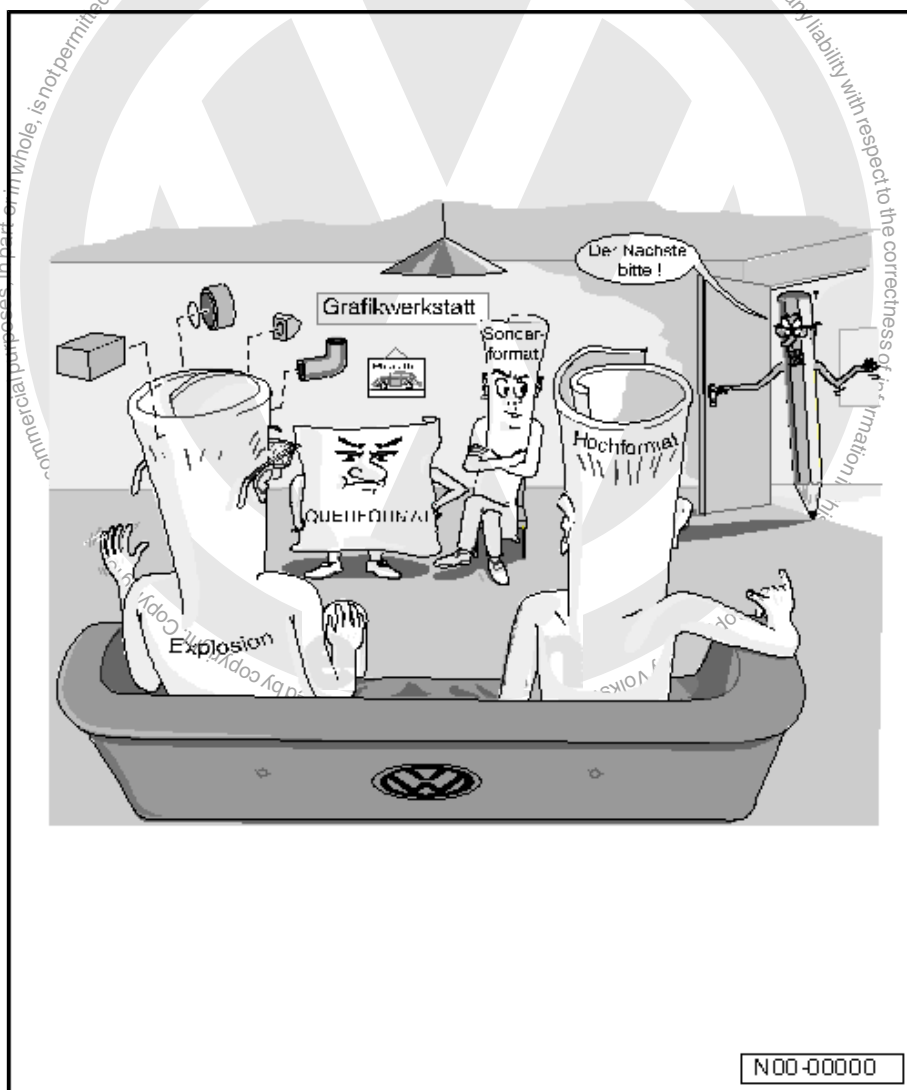
- ❑ Removing and installing. Refer to
⇒ [“9.4 Outside Air Temperature Sensor G17, Removing and Installing”](#), page 307 .

3 - Fresh Air Intake Cover

- ❑ Removing and installing. Refer to
⇒ [“6.3 Fresh Air Intake Cover, Removing and Installing”](#), page 274 .

4 - Fresh Air Intake

- ❑ Removing and installing. Refer to
⇒ [“6.2 Fresh Air Intake, Removing and Installing”](#), page 273 .





1.1.4 Component Location Overview - Components Outside of Passenger Compartment, Golf Wagon RHD

1 - Vehicle interior forced air extraction

- ❑ Checking. Refer to
⇒ [“6.9 Passenger Compartment Forced Air Extraction, Checking”, page 280](#) .
- ❑ Removing and installing. Refer to
⇒ [“6.10.2 Passenger Compartment Forced Air Extraction, Removing and Installing, Golf Wagon”, page 281](#) .

2 - Fresh air intake

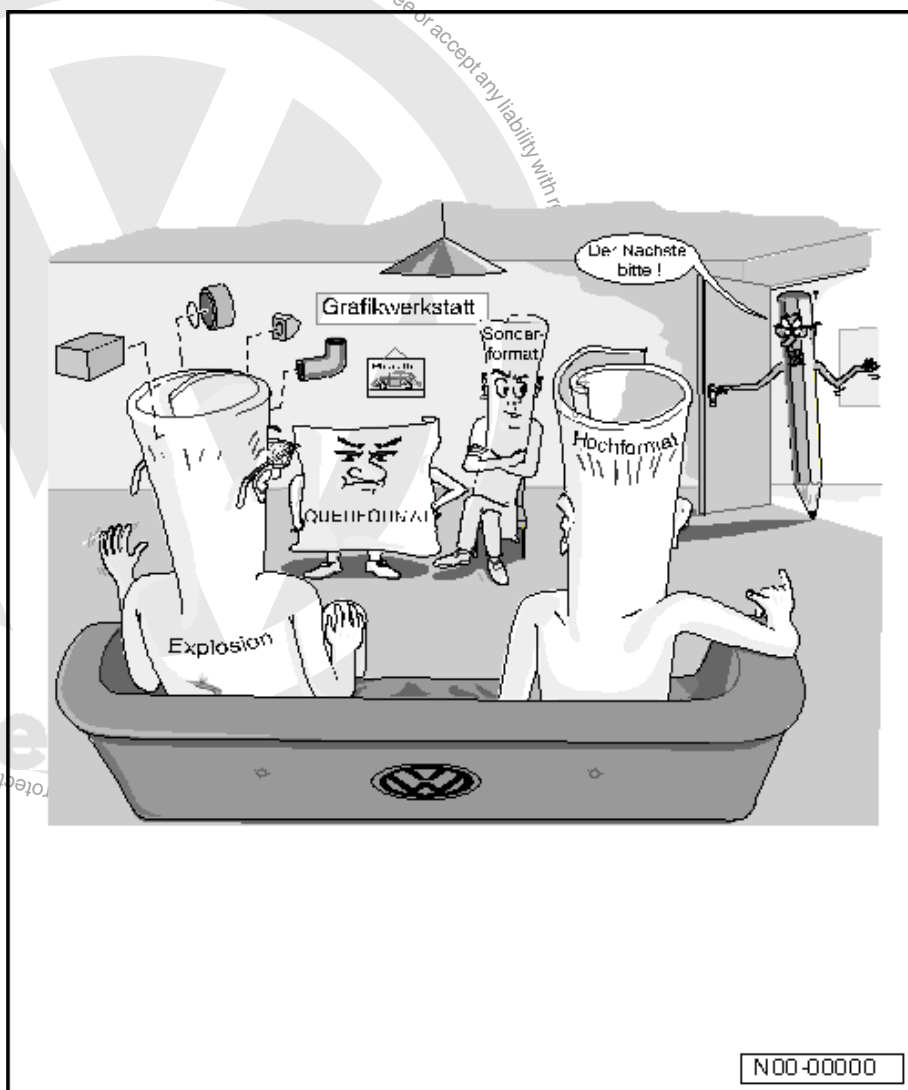
- ❑ Removing and installing. Refer to
⇒ [“6.2.2 Fresh Air Intake, Removing and Installing, RHD”, page 273](#) .

3 - Fresh air intake cover

- ❑ Removing and installing. Refer to
⇒ [“6.3.2 Fresh Air Intake Cover, Removing and Installing, RHD”, page 275](#) .

4 - Outside Air Temperature Sensor - G17-

- ❑ Removing and installing. Refer to
⇒ [“9.4 Outside Air Temperature Sensor G17, Removing and Installing”, page 307](#) .





1.2 Component Location Overview - Components Inside Front Passenger Compartment

⇒ [“1.2.1 Component Location Overview - Components Inside Front Passenger Compartment”, page 67](#)

1.2.1 Component Location Overview - Components Inside Front Passenger Compartment

1 - Driver Side Footwell Vent

- ☐ Removing and installing. Refer to
⇒ [“6.5 Driver Side Footwell Vent, Removing and Installing”, page 276](#) .
- ☐ Overview. Refer to
⇒ [“6.1 Overview - Air Routing and Air Distribution in Passenger Compartment”, page 271](#) .

2 - Temperature Regulator Door Motor - V68-

- ☐ Removing and installing. Refer to
⇒ [“4.5 Left Temperature Door Motor V158 with Left Temperature Door Potentiometer/Actuator G220, Removing and Installing”, page 187](#) .

3 - Air Distribution Door Motor - V428-

- ☐ Removing and installing. Refer to
⇒ [“4.8 Front Air Distribution Door Motor V426 with Air Distribution Door Motor Position Sensor G642, Removing and Installing”, page 199](#) .

4 - Dust and Pollen Filter

- ☐ Removing and installing. Refer to
⇒ [“5.11 Dust and Pollen Filter, Removing and Installing”, page 234](#) .

5 - Recirculation Door Motor - V113-

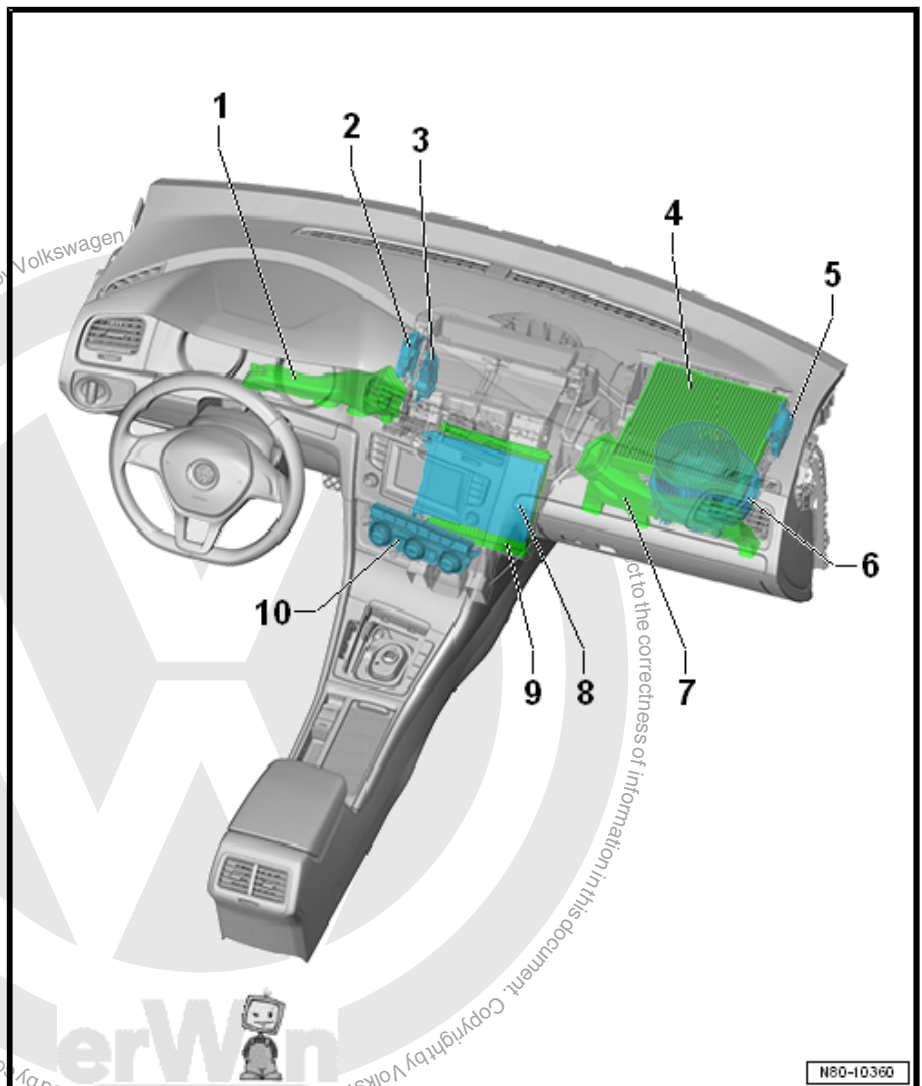
- ☐ Removing and installing. Refer to
⇒ [“4.4 Recirculation Door Motor V113, Removing and Installing”, page 183](#) .

6 - Fresh Air Blower - V2-

- ☐ Removing and installing. Refer to ⇒ [“5.12 Fresh Air Blower V2, Removing and Installing”, page 238](#) .

7 - Front Passenger Side Footwell Vent

- ☐ Removing and installing. Refer to
⇒ [“6.6 Front Passenger Side Footwell Vent, Removing and Installing”, page 277](#) .
- ☐ Overview. Refer to
⇒ [“6.1 Overview - Air Routing and Air Distribution in Passenger Compartment”, page 271](#) .





8 - Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604-

- ❑ Checking. Refer to
⇒ ["5.13 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Checking", page 240](#) .
- ❑ Removing and installing. Refer to
⇒ ["5.14 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Removing and Installing", page 242](#) .

9 - Heater Core

- ❑ Removing and installing. Refer to ⇒ ["5.15 Heater Core, Removing and Installing", page 244](#)

10 - Display and Control Head

Removing and installing. Refer to ⇒ ["8.2 Display and Control Head, Removing and Installing", page 301](#) .

1.2.2 Component Location Overview - Components Inside Front Passenger Compartment, RHD

1 - Recirculation Door Motor - V113-

- ❑ Removing and installing. Refer to
⇒ ["4.4.2 Recirculation Door Motor V113 , Removing and Installing, RHD", page 184](#) .

2 - Dust and Pollen Filter

- ❑ Removing and installing. Refer to
⇒ ["5.11.2 Dust and Pollen Filter, Removing and Installing, RHD", page 236](#) .

3 - Temperature Regulator Door Motor - V68-

- ❑ Removing and installing. Refer to
⇒ ["4.2.2 Temperature Regulator Door Motor V68 , Removing and Installing, RHD", page 177](#) .

4 - Air Distribution Door Motor - V428-

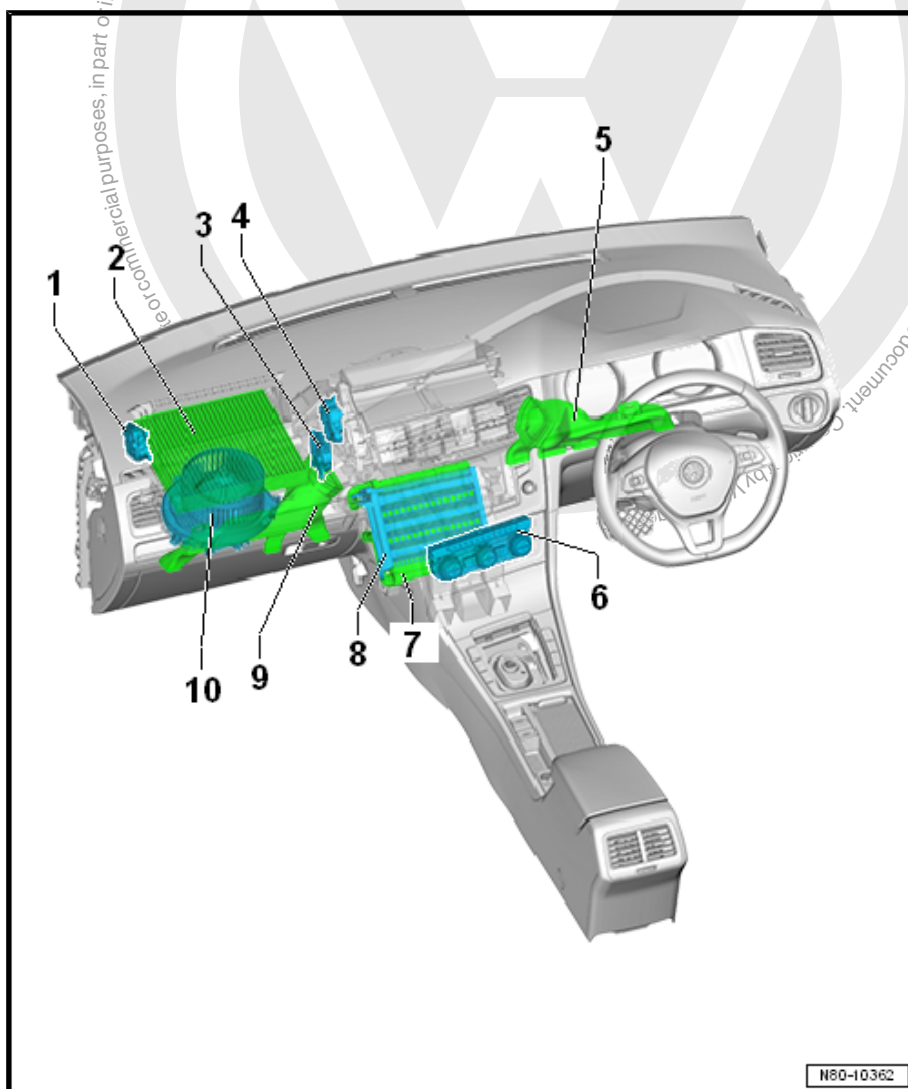
- ❑ Removing and installing. Refer to
⇒ ["4.9.2 Air Distribution Door Motor V428 , Removing and Installing, RHD", page 204](#) .

5 - Driver side footwell vent

- ❑ Removing and installing. Refer to
⇒ ["6.5.2 Driver Side Footwell Vent, Removing and Installing, RHD", page 277](#) .
- ❑ Overview. Refer to
⇒ ["6.1 Overview - Air Routing and Air Distribution in Passenger Compartment", page 271](#) .

6 - Display and Control Head

Removing and installing. Refer to ⇒ ["8.2 Display and Control Head, Removing and Installing", page 301](#) .





7 - Heater core

- ❑ Removing and installing. Refer to ⇒ [“5.15 Heater Core, Removing and Installing”, page 244](#) .

8 - Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604-

- ❑ Checking. Refer to
⇒ [“5.13 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Checking”, page 240](#) .
- ❑ Removing and installing. Refer to
⇒ [“5.14.2 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Removing and Installing, RHD”, page 243](#) .

9 - Fresh Air Blower - V2-

- ❑ Removing and installing. Refer to
⇒ [“5.12.2 Fresh Air Blower V2 , Removing and Installing, RHD”, page 239](#) .

10 - Front passenger side footwell vent

- ❑ Removing and installing. Refer to
⇒ [“6.6.2 Front Passenger Side Footwell Vent, Removing and Installing, RHD”, page 278](#) .
- ❑ Overview. Refer to
⇒ [“6.1 Overview - Air Routing and Air Distribution in Passenger Compartment”, page 271](#) .





2 Actuators

⇒ [“2.1 Component Location Overview - Front Actuators”, page 70](#)

⇒ [“2.2 Temperature Regulator Door Motor V68 with Temperature Regulator Door Motor Position Sensor G92 , Removing and Installing”, page 72](#)

⇒ [“2.3 Recirculation Door Motor V113 , Removing and Installing”, page 72](#)

⇒ [“2.4 Air Distribution Door Motor V428 with Position Sensor Air Distribution Door Motor Position Sensor G645 , Removing and Installing”, page 73](#)

2.1 Component Location Overview - Front Actuators

⇒ [“2.1.1 Component Location Overview - Front Actuators”, page 70](#)

2.1.1 Component Location Overview - Front Actuators

1 - Temperature Regulator Door Motor - V68-

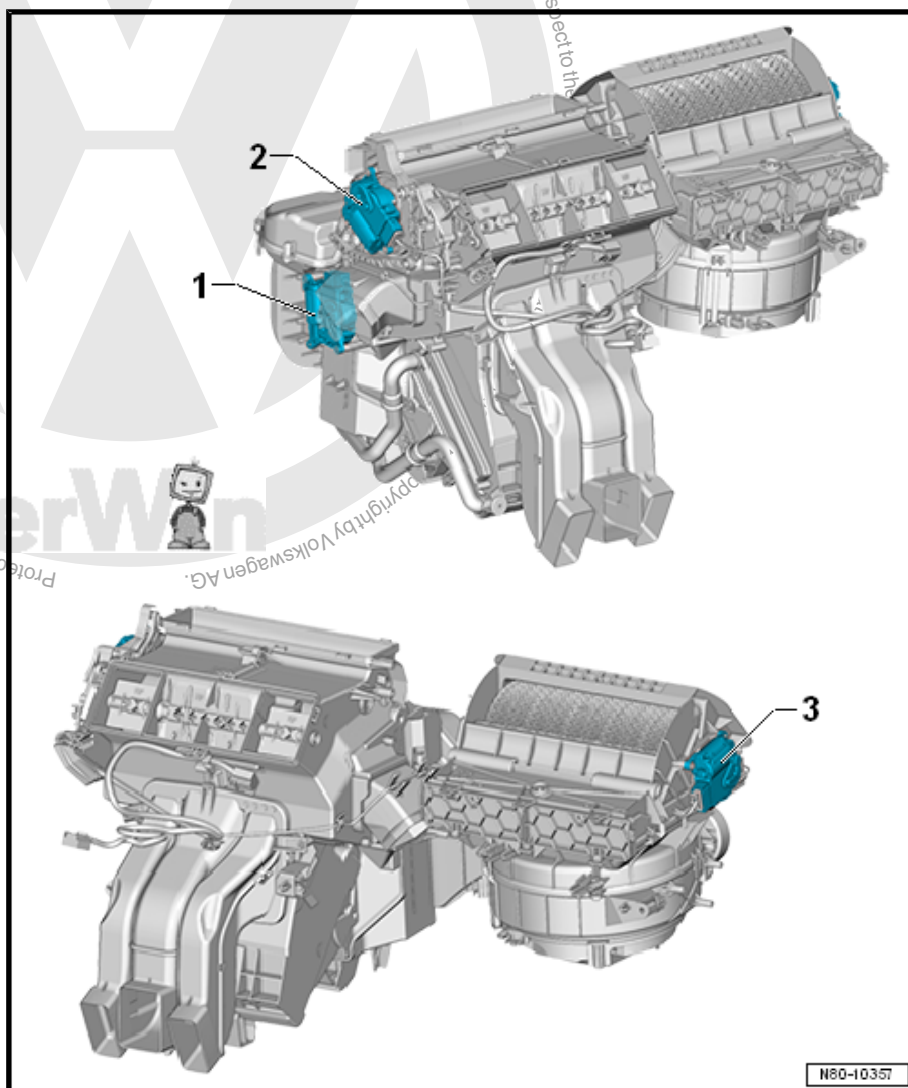
- ☐ Check using the Vehicle Diagnostic Tester
- ☐ Removing and installing. Refer to
⇒ [“4.2 Temperature Regulator Door Motor V68 with Temperature Regulator Door Motor Position Sensor G92 , Removing and Installing”, page 176](#) .
- ☐ Replacing: initiate basic setting using the Vehicle Diagnostic Tester .

2 - Air Distribution Door Motor - V428-

- ☐ Check using the Vehicle Diagnostic Tester
- ☐ Removing and installing. Refer to
⇒ [“4.9 Air Distribution Door Motor V428 with Position Sensor Air Distribution Door Motor Position Sensor G645 , Removing and Installing”, page 202](#) .
- ☐ Replacing: initiate basic setting using the Vehicle Diagnostic Tester .

3 - Recirculation Door Motor - V113-

- ☐ Check using the Vehicle Diagnostic Tester
- ☐ Removing and installing. Refer to ⇒ [“4.4 Recirculation Door Motor V113 , Removing and Installing”, page 183](#) .





- ☐ Replacing: initiate basic setting using the Vehicle Diagnostic Tester .

2.1.2 Component Location Overview - Front Actuators, RHD

1 - Recirculation Door Motor - V113-

- ☐ Check using the Vehicle Diagnostic Tester
- ☐ Removing and installing. Refer to
⇒ ["4.4 Recirculation Door Motor V113 , Removing and Installing", page 183](#) .
- ☐ Replacing: initiate basic setting using the Vehicle Diagnostic Tester .

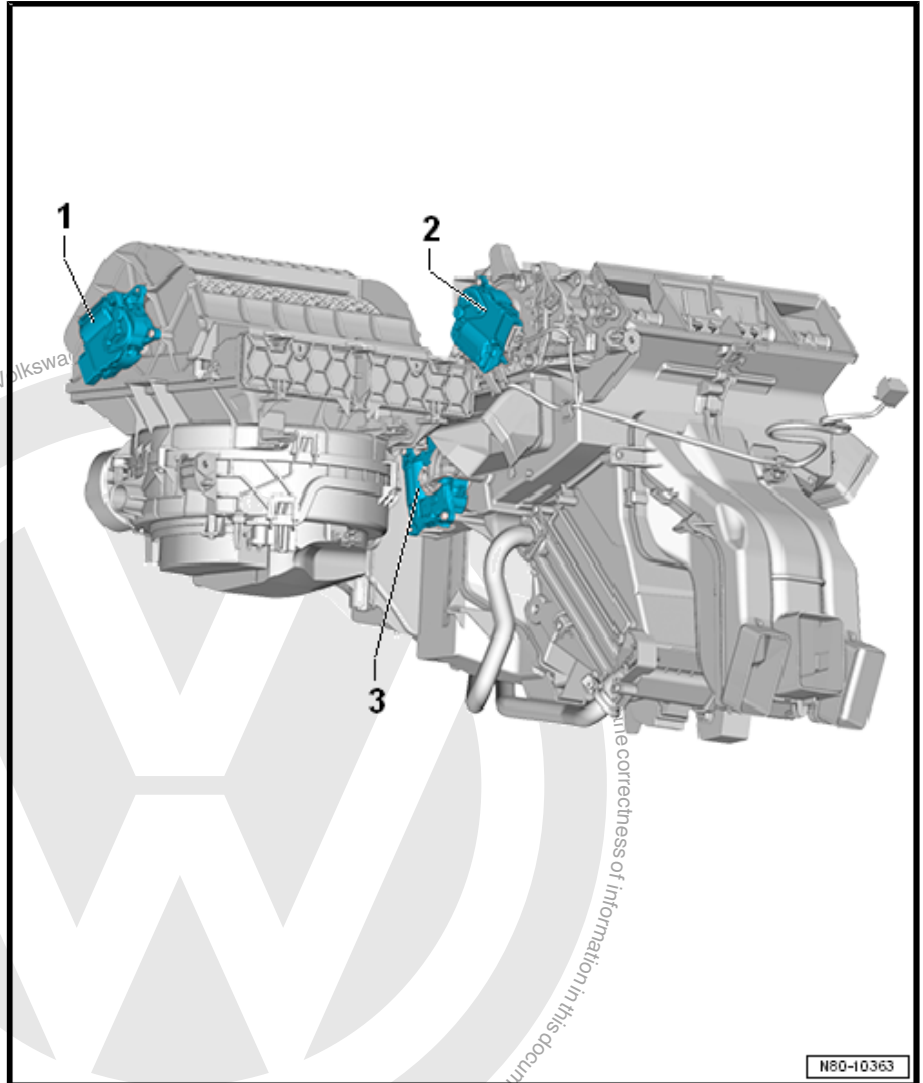
2 - Air Distribution Door Motor - V428-

- ☐ Check using the Vehicle Diagnostic Tester
- ☐ Removing and installing. Refer to
⇒ ["4.9.2 Air Distribution Door Motor V428 , Removing and Installing, RHD", page 204](#) .
- ☐ Replacing: initiate basic setting using the Vehicle Diagnostic Tester .

3 - Temperature Regulator Door Motor - V68-

- ☐ Check using the Vehicle Diagnostic Tester
- ☐ Removing and installing. Refer to
⇒ ["4.2.2 Temperature Regulator Door Motor V68 , Removing and Installing, RHD", page 177](#) .

- ☐ Replacing: initiate basic setting using the Vehicle Diagnostic Tester .





2.2 Temperature Regulator Door Motor - V68- with Temperature Regulator Door Motor Position Sensor - G92- , Removing and Installing

⇒ [“2.2.1 Temperature Regulator Door Motor V68 with Temperature Regulator Door Motor Position Sensor G92 , Removing and Installing”, page 72](#)

2.2.1 Temperature Regulator Door Motor - V68- with Temperature Regulator Door Motor Position Sensor - G92- , Removing and Installing

The removal and installation is identical to vehicles with an A/C system. Refer to

⇒ [“4.2 Temperature Regulator Door Motor V68 with Temperature Regulator Door Motor Position Sensor G92 , Removing and Installing”, page 176](#) .

2.2.2 Temperature Regulator Door Motor - V68- with Temperature Regulator Door Motor Position Sensor - G92- , Removing and Installing, RHD

The removal and installation is identical to vehicles with an A/C system. Refer to

⇒ [“4.2 Temperature Regulator Door Motor V68 with Temperature Regulator Door Motor Position Sensor G92 , Removing and Installing”, page 176](#) .

2.3 Recirculation Door Motor - V113- , Removing and Installing

⇒ [“2.3.1 Recirculation Door Motor V113 , Removing and Installing”, page 72](#)

2.3.1 Recirculation Door Motor - V113- , Removing and Installing

The removal and installation is identical to vehicles with an A/C system. Refer to

⇒ [“4.4 Recirculation Door Motor V113 , Removing and Installing”, page 183](#) .

2.3.2 Recirculation Door Motor - V113- , Removing and Installing, RHD

The removal and installation is identical to vehicles with an A/C system. Refer to

⇒ [“4.4 Recirculation Door Motor V113 , Removing and Installing”, page 183](#) .



2.4 Air Distribution Door Motor - V428- with Position Sensor Air Distribution Door Motor Position Sensor - G645- , Removing and Installing

⇒ [“2.4.1 Air Distribution Door Motor V428 with Position Sensor Air Distribution Door Motor Position Sensor G645 , Removing and Installing”, page 73](#)

2.4.1 Air Distribution Door Motor - V428- with Position Sensor Air Distribution Door Motor Position Sensor - G645- , Removing and Installing

The removal and installation is identical to vehicles with an A/C system. Refer to

⇒ [“4.9 Air Distribution Door Motor V428 with Position Sensor Air Distribution Door Motor Position Sensor G645 , Removing and Installing”, page 202](#) .

2.4.2 Air Distribution Door Motor - V428- with Position Sensor Air Distribution Door Motor Position Sensor - G645- , Removing and Installing, RHD



The removal and installation is identical to vehicles with an A/C system. Refer to

⇒ [“4.9 Air Distribution Door Motor V428 with Position Sensor Air Distribution Door Motor Position Sensor G645 , Removing and Installing”, page 202](#) .



3 Heater

⇒ [“3.1 Overview - Heater”, page 74](#)

⇒ [“3.2 Fresh Air Blower V2 , Removing and Installing”, page 79](#)

⇒ [“3.3 Fresh Air Blower Control Module J126 , Removing and Installing”, page 79](#)

⇒ [“3.4 Dust and Pollen Filter, Removing and Installing”, page 79](#)

⇒ [“3.5 Heater, Removing and Installing”, page 79](#)

⇒ [“3.6 Heater, Disassembling and Assembling”, page 79](#)

⇒ [“3.7 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Checking”, page 79](#)

⇒ [“3.8 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Removing and Installing”, page 80](#)

⇒ [“3.9 Heater Core, Removing and Installing”, page 80](#)

⇒ [“3.10 Partition, Removing and Installing”, page 80](#)

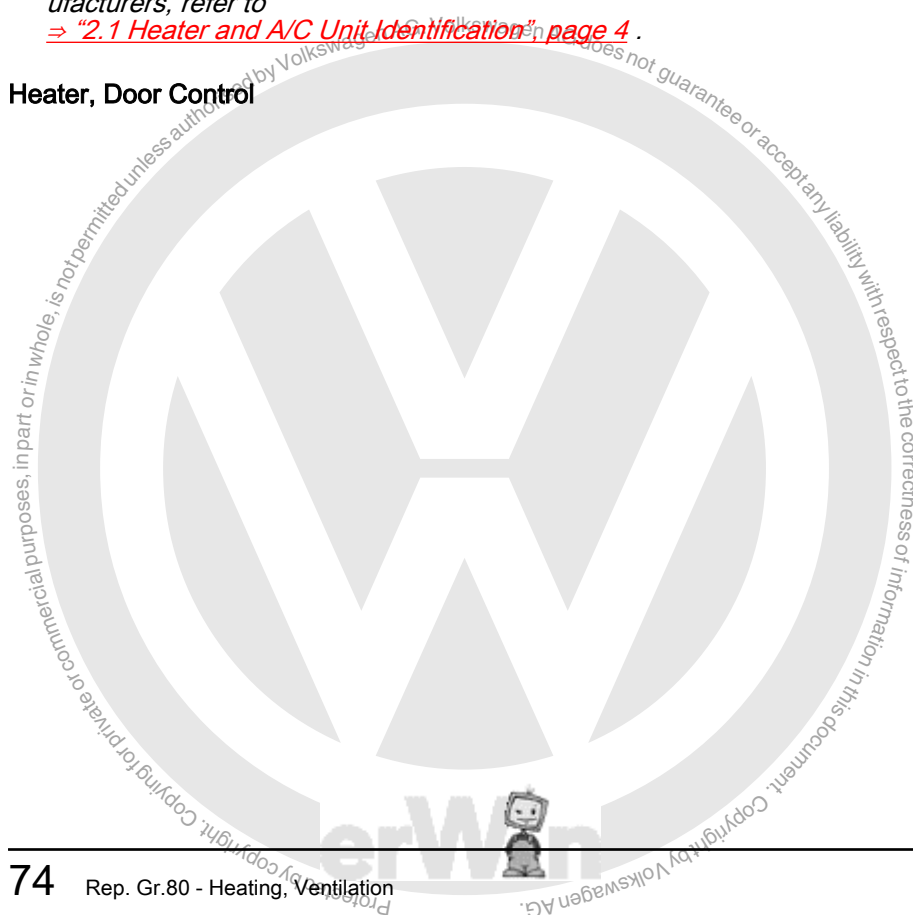
3.1 Overview - Heater



Note

- ◆ *There are different versions and manufacturers of the heater. Individual components of the different heaters are similar but not the same. Interchanging components from different manufacturers is not permitted. Refer to the Parts Catalog.*
- ◆ *A heater manufactured by “Valeo” is shown in the following illustrations. For distinguishing characteristics between manufacturers, refer to*
⇒ [“2.1 Heater and A/C Unit Identification”, page 4](#).

Heater, Door Control





1 - Operating Lever

- ☐ For operating the defroster and air distribution door

2 - Air Distribution Door Motor - V428-

- ☐ With the Air Distribution Door Motor Position Sensor - G645-
- ☐ To check, use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function and refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to ⇒ ["4.9 Air Distribution Door Motor V428 with Position Sensor Air Distribution Door Motor Position Sensor G645, Removing and Installing", page 202](#) .

3 - Screw

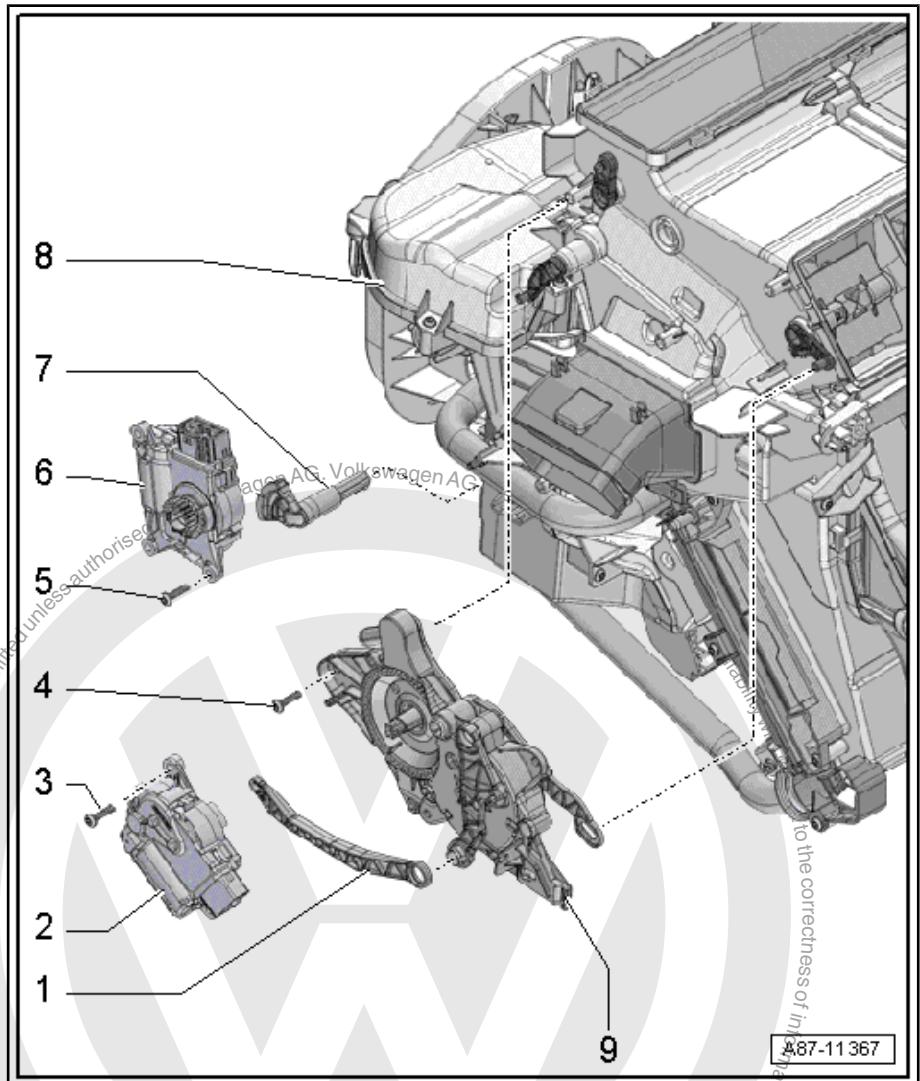
- ☐ 1 Nm
- ☐ Quantity: 2

4 - Screw

- ☐ 1 Nm
- ☐ Quantity: 3

5 - Screw

- ☐ 1 Nm
- ☐ Quantity: 2



6 - Temperature Regulator Door Motor - V68-

- ☐ With the Temperature Regulator Door Motor Position Sensor - G92-
- ☐ To check, use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function and refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to ⇒ ["4.2 Temperature Regulator Door Motor V68 with Temperature Regulator Door Motor Position Sensor G92, Removing and Installing", page 176](#) .

7 - Operating Lever

- ☐ For the operating of the warm air door

8 - Heater

- ☐ There are different versions. Refer to ⇒ ["2.1 Heater and A/C Unit Identification", page 4](#) .
- ☐ Interchanging components is not permitted.
- ☐ The following illustrations show the heater manufactured by "Valeo"
- ☐ The design is largely the same as the heater and Air Conditioning (A/C) unit design.
- ☐ The expansion valve, condensation water drain, evaporator, etc. are not present.
- ☐ (only on vehicles without an A/C system) instead of the evaporator an airflow limiter is installed.
- ☐ The seal for the plenum chamber rear wall does not have an opening for the expansion valve or it is sealed with a foam body.
- ☐ Removing and installing. Refer to ⇒ ["5.5 Heater and A/C Unit, Removing and Installing", page 224](#) .



9 - Defroster- and Air Distribution Door Actuator

- ❑ Removing and installing. Refer to
⇒ ["4.10 Air Distribution Door Adjuster, Removing and Installing", page 207](#).

Heater, Heater Core, Auxiliary Heater Heating Element

1 - Screw

- ❑ 2 Nm

2 - Coolant Pipe for The Heater Core

- ❑ There are different versions. Refer to the Parts Catalog.
- ❑ Coolant Supply from Engine
- ❑ Removing and installing. Refer to
⇒ ["5.16 Heater Core Coolant Pipes, Removing and Installing", page 260](#).

3 - Clamp

4 - Coolant pipe for the Heater Core

- ❑ There are different versions. Refer to the Parts Catalog.
- ❑ Coolant Return to Engine
- ❑ Removing and installing. Refer to
⇒ ["5.16 Heater Core Coolant Pipes, Removing and Installing", page 260](#).

5 - Seal

- ❑ There are different versions. Refer to the Parts Catalog.
- ❑ Replacing

6 - Cover

- ❑ For the heater core

7 - Screw

- ❑ 1 Nm

8 - Foam Spacer

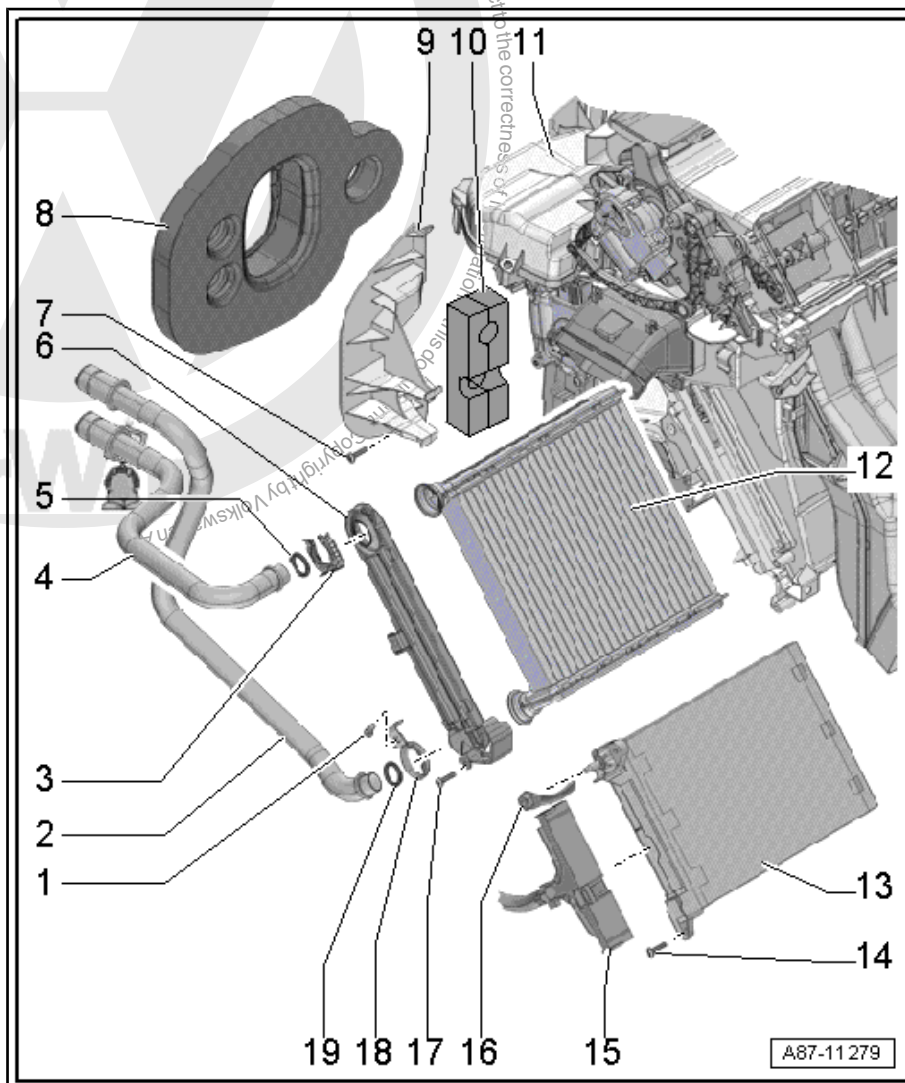
- ❑ For sealing/insulating
- ❑ For vehicles without an A/C system, without opening for the expansion valve. Refer to the Parts Catalog.
- ❑ Observe installed position

9 - Bracket

- ❑ for the coolant pipes

10 - Foam Piece

- ❑ For insulating
- ❑ Observe installed position





11 - Heater

- ☐ For vehicles without an Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604- , the opening for the auxiliary heater is closed.
- ☐ Removing and installing. Refer to ⇒ ["5.5 Heater and A/C Unit, Removing and Installing", page 224](#) .

12 - Heater Core

- ☐ There are different versions. Refer to the Parts Catalog.
- ☐ Removing and installing. Refer to ⇒ ["5.15 Heater Core, Removing and Installing", page 244](#) .

13 - Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604-

- ☐ Checking. Refer to
⇒ ["5.13 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Checking", page 240](#) .
- ☐ Removing and installing. Refer to
⇒ ["5.14 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Removing and Installing", page 242](#) .

14 - Screw

- ☐ 2 Nm
- ☐ Quantity: 2

15 - Wire

- ☐ For the Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604-

16 - Ground Cable for the Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604-

- ☐ Nut 9 ± 1 Nm
- ☐ For the auxiliary heater

17 - Screw

- ☐ 2 Nm
- ☐ Quantity: 3

18 - Hose Clamp

19 - Seal

- ☐ There are different versions. Refer to the Parts Catalog.
- ☐ Replacing

Air Intake Duct, Dust and Pollen Filter, Fresh Air Blower, Door Control



1 - Plastic Screw or Plug (depending on version)

- ☐ 0.3 Nm
- ☐ Quantity: 2

2 - Partition

- ☐ Removing and installing. Refer to ➤ ["5.20 Partition, Removing and Installing", page 269](#).

3 - Fresh Air Blower Housing and Dust and Pollen Filter

4 - Screw

- ☐ 1 Nm
- ☐ Quantity: 2

5 - Air Intake Duct

- ☐ Do not dismantle
- ☐ With fresh- and air recirculation door
- ☐ There are different versions. Refer to the Parts Catalog.
- ☐ Removing and installing. Refer to ➤ ["6.4 Air Intake Duct, Removing and Installing", page 276](#).

6 - Not installed

Only for vehicles with Climatronic.

7 - Not installed

Only for vehicles with Climatronic.

8 - Recirculation Door Motor - V113-

- ☐ Without position sensor with end switches in the end stops. Refer to ➤ Wiring diagrams, Troubleshooting & Component locations.
- ☐ To check, use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function and refer to ➤ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to ➤ ["4.4 Recirculation Door Motor V113, Removing and Installing", page 183](#).

9 - Screw

- ☐ 1 Nm
- ☐ Quantity: 2

10 - Dust and Pollen Filter

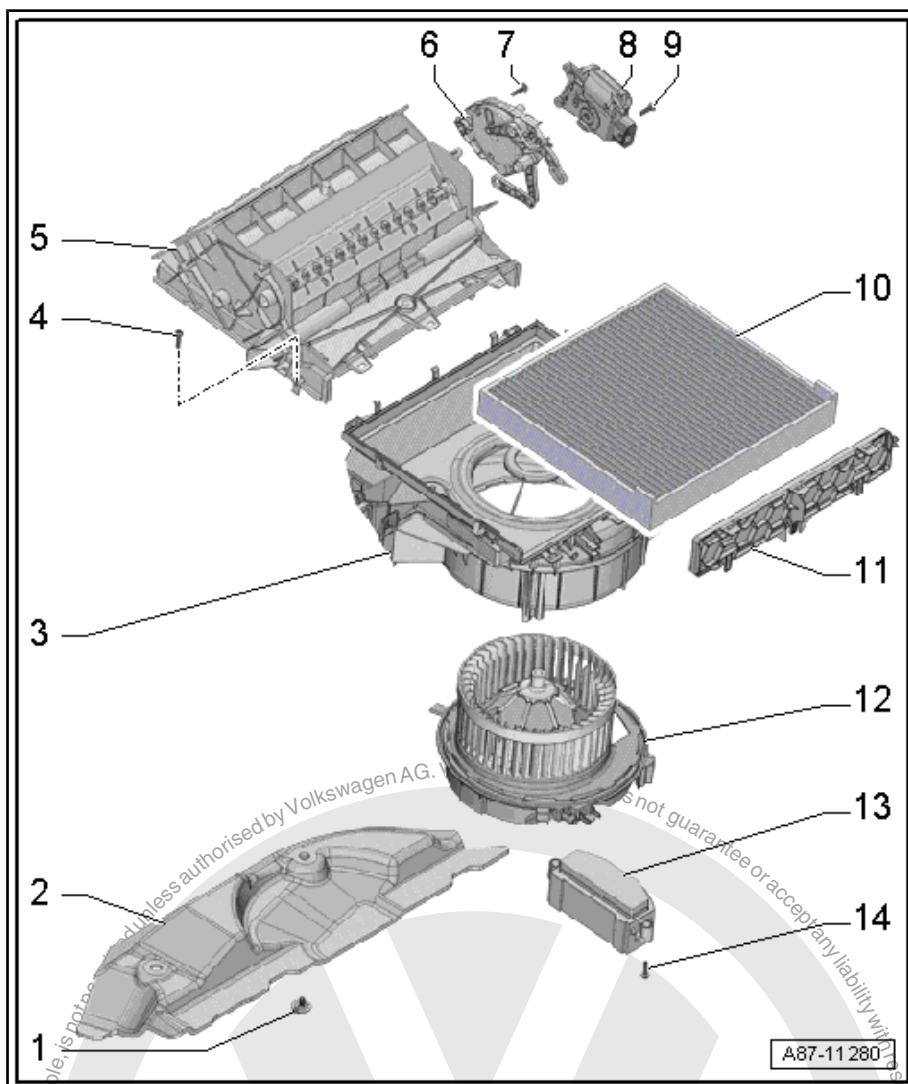
- ☐ There are different versions. Refer to the Parts Catalog.
- ☐ Replacement interval. Refer to ➤ Maintenance, Booklet 36.1.
- ☐ Removing and installing. Refer to ➤ ["5.11 Dust and Pollen Filter, Removing and Installing", page 234](#).

11 - Cover

- ☐ For dust and pollen filter

12 - Fresh Air Blower - V2-

- ☐ To check, use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function and refer to ➤ Wiring diagrams, Troubleshooting & Component locations.





- ❑ Removing and installing. Refer to ⇒ [“5.12 Fresh Air Blower V2 , Removing and Installing”](#), page 238 .

13 - Fresh Air Blower Control Module - J126-

- ❑ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ❑ Removing and installing. Refer to
⇒ [“5.10 Fresh Air Blower Control Module J126 , Removing and Installing”](#), page 233 .

14 - Screw

- ❑ 1 Nm
- ❑ Quantity: 2

3.2 Fresh Air Blower - V2- , Removing and Installing

The removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to
⇒ [“5.12 Fresh Air Blower V2 , Removing and Installing”](#),
page 238 .

3.3 Fresh Air Blower Control Module - J126- , Removing and Installing

The removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to
⇒ [“5.10 Fresh Air Blower Control Module J126 , Removing and Installing”](#), page 233 .

3.4 Dust and Pollen Filter, Removing and Installing

The removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to
⇒ [“5.11 Dust and Pollen Filter, Removing and Installing”](#),
page 234 .

3.5 Heater, Removing and Installing

It is not necessary to extract the refrigerant and remove the expansion valve. The further removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to
⇒ [“5.5 Heater and A/C Unit, Removing and Installing”](#),
page 224 .

3.6 Heater, Disassembling and Assembling

It is not necessary to extract the refrigerant and remove the expansion valve and the evaporator or to disassemble. The further procedure is identical to vehicles with an Air Conditioning (A/C) system. Refer to
⇒ [“5.6 Heater and A/C Unit, Disassembling and Assembling”](#),
page 228 .

3.7 Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604- , Checking

Checking is identical to vehicles with an Air Conditioning (A/C) system. Refer to
⇒ [“5.13 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Checking”](#), page 240 .



3.8 Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604- , Removing and Installing

The removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to
⇒ ["5.14 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Removing and Installing"](#),
[page 242](#) .

3.9 Heater Core, Removing and Installing

The removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to
⇒ ["5.15 Heater Core, Removing and Installing"](#), [page 244](#) .

3.10 Partition, Removing and Installing

The removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to
⇒ ["5.20 Partition, Removing and Installing"](#), [page 269](#) .





4 Air Routing

⇒ [“4.1 Overview - Air Routing and Air Distribution in Passenger Compartment”, page 81](#)

⇒ [“4.2 Driver Side Footwell Vent, Removing and Installing”, page 81](#)

⇒ [“4.3 Front Passenger Side Footwell Vent, Removing and Installing”, page 81](#)

⇒ [“4.4 Rear Footwell Vent, Removing and Installing”, page 81](#)

⇒ [“4.5 Fresh Air Intake, Removing and Installing”, page 82](#)

⇒ [“4.6 Fresh Air Intake Cover, Removing and Installing”, page 82](#)

⇒ [“4.7 Air Intake Duct, Removing and Installing”, page 82](#)

⇒ [“4.8 Passenger Compartment Forced Air Extraction, Checking”, page 82](#)

⇒ [“4.9 Passenger Compartment Forced Air Extraction, Removing and Installing”, page 82](#)

⇒ [“4.10 Air Guide for Defrost Air Vent, Removing and Installing”, page 82](#)

⇒ [“4.11 Center Instrument Panel Vent Air Guide, Removing and Installing”, page 82](#)

4.1 Overview - Air Routing and Air Distribution in Passenger Compartment

The assembly overview of the air ducts and air distribution in passenger compartment is identical to a vehicle with an Air Conditioning (A/C) system. Refer to

⇒ [“6.1 Overview - Air Routing and Air Distribution in Passenger Compartment”, page 271](#) .

4.2 Driver Side Footwell Vent, Removing and Installing

The removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to

⇒ [“6.5.1 Driver Side Footwell Vent, Removing and Installing”, page 276](#) .

4.3 Front Passenger Side Footwell Vent, Removing and Installing

The removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to

⇒ [“6.6.1 Front Passenger Side Footwell Vent, Removing and Installing”, page 277](#) .

4.4 Rear Footwell Vent, Removing and Installing

The removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to

⇒ [“6.7 Rear Footwell Vent, Removing and Installing”, page 279](#) .



4.5 Fresh Air Intake, Removing and Installing

The removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to
⇒ [“6.2 Fresh Air Intake, Removing and Installing”, page 273](#) .

4.6 Fresh Air Intake Cover, Removing and Installing

The removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to
⇒ [“6.3 Fresh Air Intake Cover, Removing and Installing”, page 274](#) .

4.7 Air Intake Duct, Removing and Installing

The removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to
⇒ [“6.4 Air Intake Duct, Removing and Installing”, page 276](#) .

4.8 Passenger Compartment Forced Air Extraction, Checking

The test is identical to a vehicle with an Air Conditioning (A/C) system. Refer to
⇒ [“6.9 Passenger Compartment Forced Air Extraction, Checking”, page 280](#) .

4.9 Passenger Compartment Forced Air Extraction, Removing and Installing

The removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to
⇒ [“6.10 Passenger Compartment Forced Air Extraction, Removing and Installing”, page 281](#) .

4.10 Air Guide for Defrost Air Vent, Removing and Installing

The removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to
⇒ [“6.11 Air Guide for Defrost Air Vent, Removing and Installing”, page 282](#) .

4.11 Center Instrument Panel Vent Air Guide, Removing and Installing

The removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to
⇒ [“6.12 Center Instrument Panel Vent Air Guide, Removing and Installing”, page 282](#) .



5 Display and Control Head

⇒ ["5.1 Overview - Display and Control Head", page 83](#)

⇒ ["5.2 Display and Control Head, Removing and Installing", page 84](#)

5.1 Overview - Display and Control Head

1 - Heated Driver Seat Adjuster

- ☐ Optional
- ☐ The seat heating as 3 settings. An LED indicates which setting is selected.
- ☐ If no LED is illuminated, the seat heater is switched off.

2 - Rear Window Defogger Button

- ☐ Rear window defroster remains on for 4 to 20 minutes, depending on exterior temperature.

3 - Recirculating Air Mode Button



Note

- ◆ The recirculating air mode is switched off during ignition and returns to fresh air mode.
- ◆ On vehicles for Japan "recirculating air mode" stays on after ignition.

4 - Heated Front Passenger Seat Adjuster

- ☐ Optional
- ☐ The seat heating as 3 settings. An LED indicates which setting is selected.
- ☐ If no LED is illuminated, the seat heater is switched off.

5 - Air Distribution Control Knob

6 - Air Distribution Display

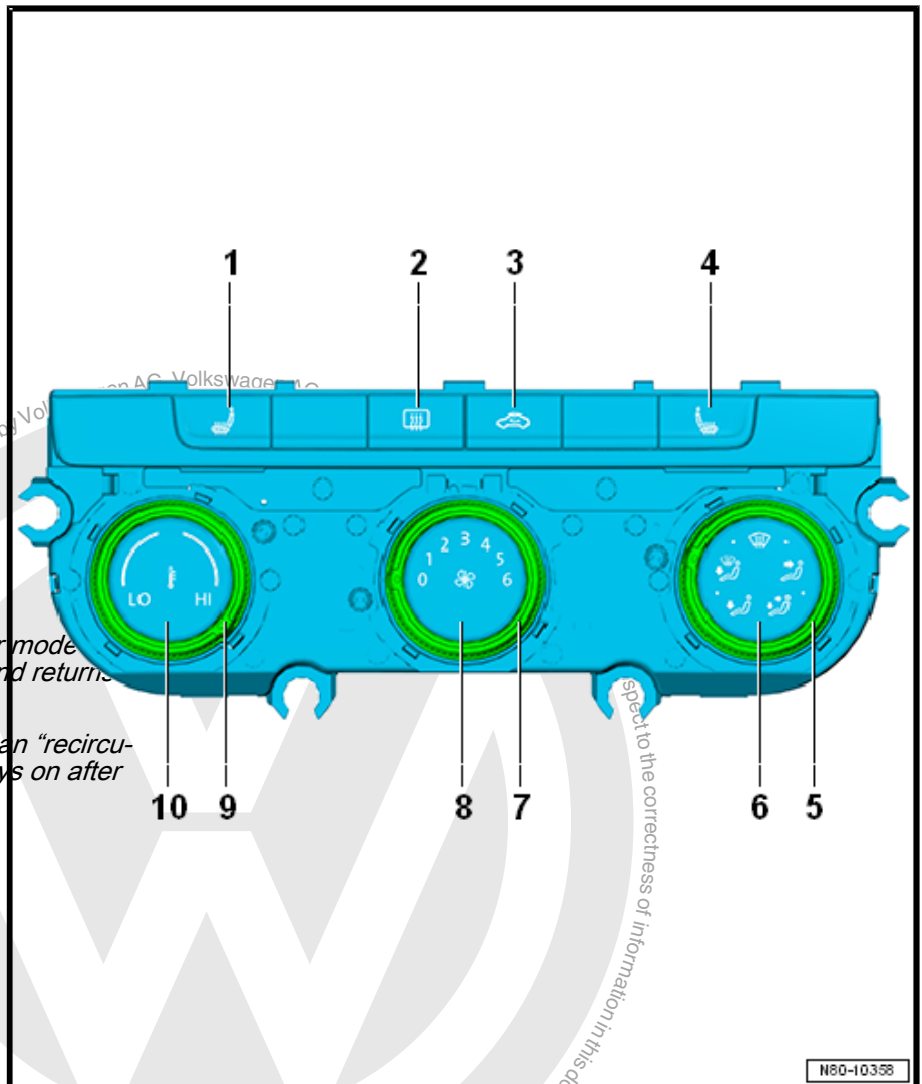
7 - Blower Speed Control Knob

- ☐ To the left: decreases the blower speed
- ☐ To the right: increases the blower speed

8 - Blower Speed Display

9 - Temperature Control Knob

- ☐ To the left: lower the temperature
- ☐ To the right: increases the temperature





10 - Temperature Setting Display

5.2 Display and Control Head, Removing and Installing

The removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to
⇒ [“8.2 Display and Control Head, Removing and Installing”, page 301](#).





6 Additional Components for Control and Regulation

⇒ [“6.1 Outside Air Temperature Sensor G17 , Removing and Installing”, page 85](#)

6.1 Outside Air Temperature Sensor - G17- , Removing and Installing

The removal and installation is identical to vehicles with an Air Conditioning (A/C) system. Refer to

⇒ [“9.4 Outside Air Temperature Sensor G17 , Removing and Installing”, page 307](#) .





87 – Air Conditioning

1 Component Location Overview - A/C System

⇒ [“1.1 Component Location Overview - Components Outside of Passenger Compartment”, page 86](#)

⇒ [“1.2 Component Location Overview - Components Inside Front Passenger Compartment”, page 94](#)

1.1 Component Location Overview - Components Outside of Passenger Compartment

⇒ [“1.1.1 Component Location Overview - Components Outside of Passenger Compartment, Golf and Golf GTE”, page 86](#)

⇒ [“1.1.3 Component Location Overview - Components Outside of Passenger Compartment, Golf Wagon”, page 90](#)

1.1.1 Component Location Overview - Components Outside of Passenger Compartment, Golf and Golf GTE

1 - Vehicle Interior Forced Air Extraction

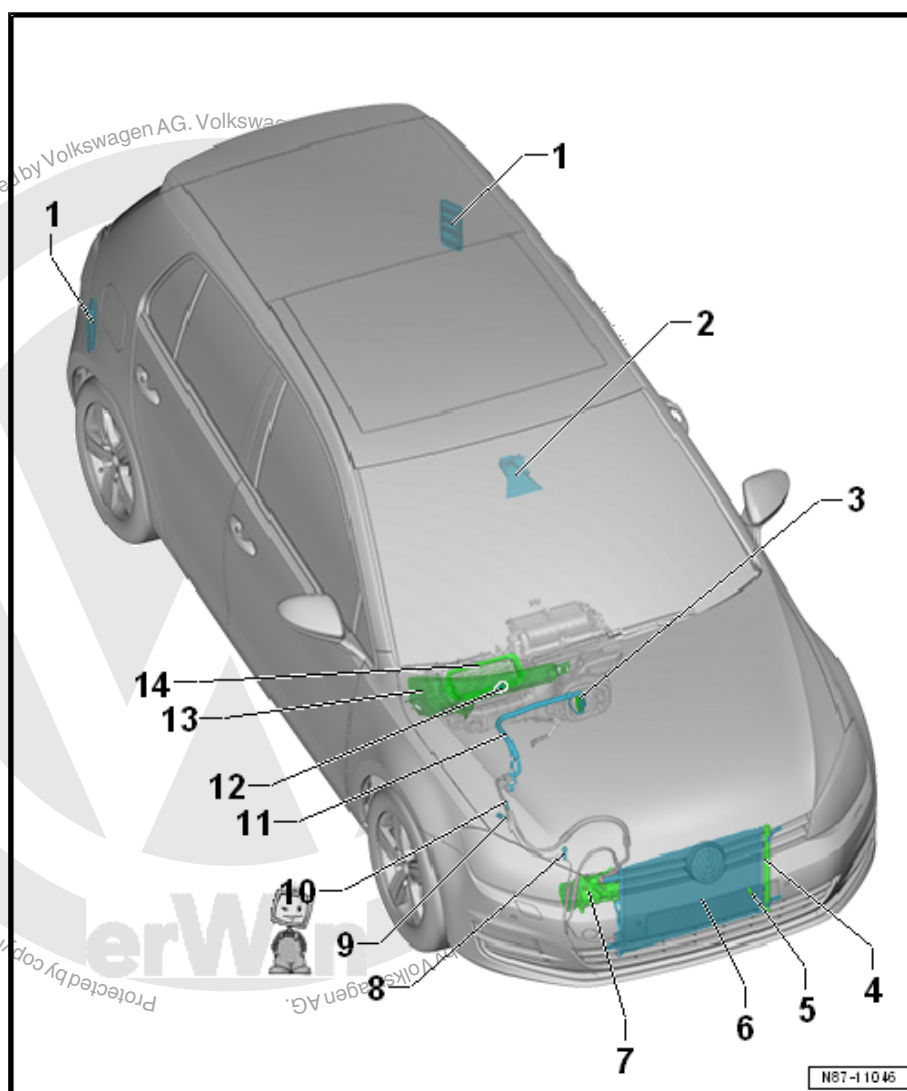
- ☐ Checking. Refer to
⇒ [“6.9 Passenger Compartment Forced Air Extraction, Checking”, page 280](#).
- ☐ Removing and installing. Refer to
⇒ [“6.10 Passenger Compartment Forced Air Extraction, Removing and Installing”, page 281](#).

2 - A/C Humidity Sensor - G260-

- ☐ Check via the Vehicle Electrical System Control Module - J519- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function. Refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to
⇒ [“9.5 A/C Humidity Sensor G260- Removing and Installing”, page 307](#).

3 - Expansion Valve

- ☐ Removing and installing. Refer to
⇒ [“2.4 Expansion Valve, Removing and Installing”, page 110](#).





- ❑ Tightening specifications. Refer to ➤ [“2.1 System Overview - Refrigerant Circuit”, page 100](#) .

4 - Dryer Bag

- ❑ Removing and installing. Refer to ➤ [“2.6 Dryer Bag/Dryer Cartridge, Removing and Installing”, page 118](#) .
- ❑ Overview. Refer to ➤ [“2.2 Overview - Condenser”, page 108](#) .

5 - Outside Air Temperature Sensor - G17-

- ❑ Check via the Vehicle Electrical System Control Module - J519- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function. Refer to ➤ Wiring diagrams, Troubleshooting & Component locations.
- ❑ Removing and installing. Refer to ➤ [“9.4 Outside Air Temperature Sensor G17 , Removing and Installing”, page 307](#) .

6 - Condenser

- ❑ With integrated receiver/dryer
- ❑ Overview. Refer to ➤ [“2.2 Overview - Condenser”, page 108](#) .
- ❑ Removing and installing. Refer to ➤ [“2.5 Condenser, Removing and Installing”, page 116](#) .



Note

Under certain conditions, the receiver/dryer and the dryer bag does not need to be replaced each time the refrigerant circuit is opened. Refer to ➤ Refrigerant R134a Servicing; Rep. Gr. 00; Components, Replacing .

7 - A/C Compressor

- ❑ Overview. Refer to ➤ [“3.1 Overview - A/C Compressor Power Unit”, page 149](#) .
- ❑ Removing and installing. Refer to ➤ [“3.4 A/C Compressor, Removing and Installing”, page 159](#) .
- ❑ Removing from and attaching to the bracket. Refer to ➤ [“3.3 A/C Compressor, Removing and Installing on Bracket”, page 155](#) .

8 - Evacuating and Charging Valve, High Pressure Side

- ❑ Removing and installing. Refer to ➤ [“2.8 Evacuating and Charging Valve, Removing and Installing, Low and High Pressure Side”, page 127](#) .

9 - Refrigerant Circuit Pressure Sensor - G805-

- ❑ 8 Nm
- ❑ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function. Refer to ➤ Wiring diagrams, Troubleshooting & Component locations.
- ❑ Removing and installing. Refer to ➤ [“2.3 Refrigerant Circuit Pressure Sensor G805 , Removing and Installing”, page 109](#) .

10 - Evacuating and Charging Valve, Low Pressure Side

- ❑ Removing and installing. Refer to ➤ [“2.8 Evacuating and Charging Valve, Removing and Installing, Low and High Pressure Side”, page 127](#) .

11 - Refrigerant Line with Inner Heat Exchanger

- ❑ From the condenser and Air Conditioning (A/C) compressor
- ❑ Removing and installing. Refer to ➤ [“2.13 Refrigerant Lines with Inner Heat Exchanger, Removing and Installing”, page 136](#) .

12 - Air Quality Sensor - G238-

- ❑ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function. Refer to ➤ Wiring diagrams, Troubleshooting & Component locations.
- ❑ Removing and installing. Refer to ➤ [“9.2 Air Quality Sensor G238 , Removing and Installing”, page 304](#) .
- ❑ Function mode. Refer to ➤ [“9.3 Function of Air Quality Sensor G238 ”, page 305](#) .
- ❑ Only for vehicles with Climatronic.



13 - Fresh Air Intake Cover

- ❑ Removing and installing. Refer to ➤ [“6.3 Fresh Air Intake Cover, Removing and Installing”, page 274](#) .

14 - Fresh Air Intake

- ❑ Removing and installing. Refer to ➤ [“6.2 Fresh Air Intake, Removing and Installing”, page 273](#) .

1.1.2 Component Location Overview - Components Outside of Passenger Compartment, Golf and Golf GTE, RHD

1 - Vehicle interior forced air extraction

- ❑ Checking. Refer to ➤ [“6.9 Passenger Compartment Forced Air Extraction, Checking”, page 280](#) .
- ❑ Removing and installing. Refer to ➤ [“6.10 Passenger Compartment Forced Air Extraction, Removing and Installing”, page 281](#) .

2 - A/C Humidity Sensor - G260-

- ❑ Check via the Vehicle Electrical System Control Module - J519- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ➤ Wiring diagrams, Troubleshooting & Component locations.
- ❑ Removing and installing. Refer to ➤ [“9.5 A/C Humidity Sensor G260, Removing and Installing”, page 307](#) .

3 - Fresh air intake

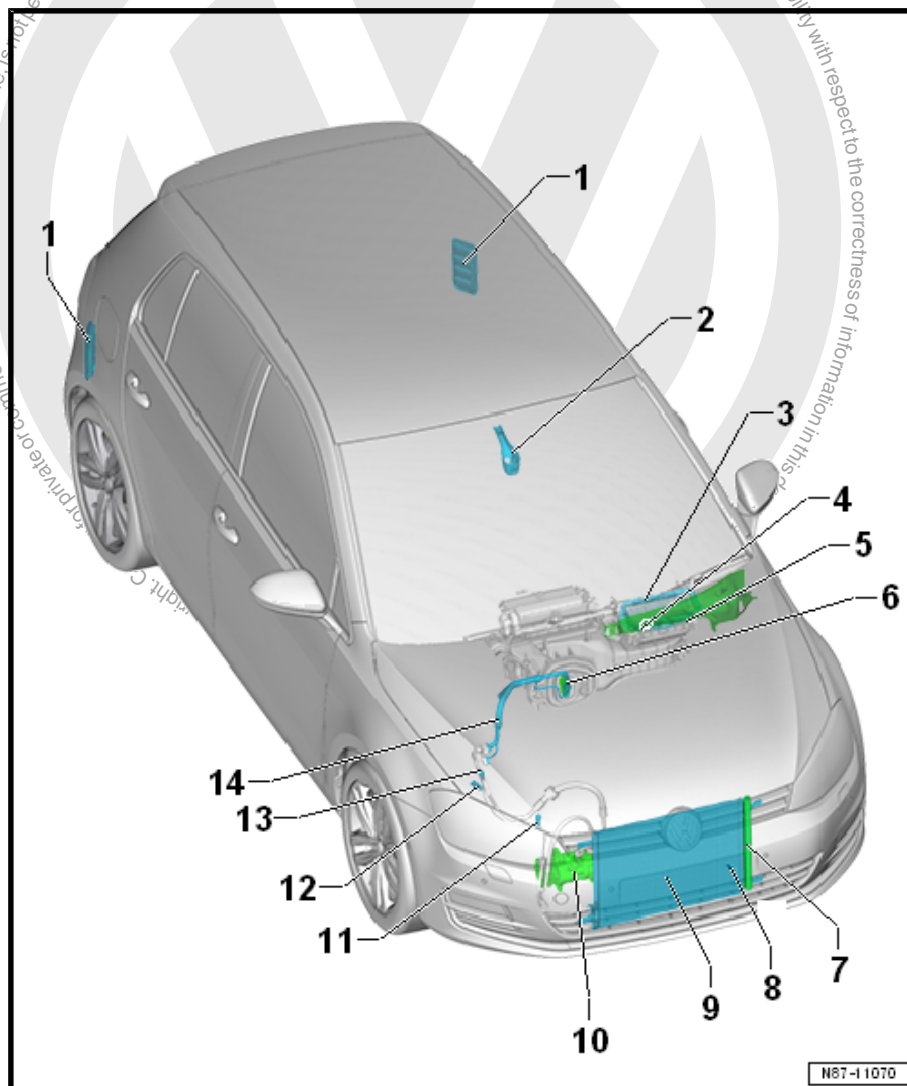
- ❑ Removing and installing. Refer to ➤ [“6.2.2 Fresh Air Intake, Removing and Installing, RHD”, page 273](#) .

4 - Fresh air intake cover

- ❑ Removing and installing. Refer to ➤ [“6.3.2 Fresh Air Intake Cover, Removing and Installing, RHD”, page 275](#) .

5 - Air Quality Sensor - G238-

- ❑ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ➤ Wiring diagrams, Troubleshooting & Component locations.
- ❑ Removing and installing. Refer to ➤ [“9.2 Air Quality Sensor G238, Removing and Installing”, page 304](#) .
- ❑ Function mode. Refer to ➤ [“9.3 Function of Air Quality Sensor G238”, page 305](#) .
- ❑ Only for vehicles with Climatronic.





6 - Expansion Valve

- ☐ Removing and installing. Refer to ⇒ [“2.4 Expansion Valve, Removing and Installing”, page 110](#).
- ☐ Tightening specifications. Refer to ⇒ [“2.1 System Overview - Refrigerant Circuit”, page 100](#).

7 - Dryer bag

- ☐ Removing and installing. Refer to ⇒ [“2.6 Dryer Bag/Dryer Cartridge, Removing and Installing”, page 118](#).
- ☐ Overview. Refer to ⇒ [“2.2 Overview - Condenser”, page 108](#).

8 - Outside Air Temperature Sensor - G17-

- ☐ Check via the Vehicle Electrical System Control Module - J519- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to ⇒ [“9.4 Outside Air Temperature Sensor G17, Removing and Installing”, page 307](#).

9 - Condenser

- ☐ With integrated receiver/dryer
- ☐ Overview. Refer to ⇒ [“2.2 Overview - Condenser”, page 108](#).
- ☐ Removing and installing. Refer to ⇒ [“2.5 Condenser, Removing and Installing”, page 116](#).



Note

Under certain conditions, the receiver/dryer and the dryer bag does not need to be replaced each time the refrigerant circuit is opened. Refer to in ELSA under Heating, Ventilation and Air Conditioning; Refrigerant R134a Servicing ⇒ Refrigerant R134a Servicing; Rep. Gr. 00; Components, Replacing.



10 - A/C Compressor

- ☐ Overview. Refer to ⇒ [“3.1 Overview - A/C Compressor Power Unit”, page 149](#).
- ☐ Removing and installing. Refer to ⇒ [“3.4 A/C Compressor, Removing and Installing”, page 159](#).
- ☐ Removing from and attaching to the bracket. Refer to ⇒ [“3.3 A/C Compressor, Removing and Installing on Bracket”, page 155](#).

11 - Evacuating and Charging Valve, High Pressure Side

- ☐ Removing and installing. Refer to ⇒ [“2.8 Evacuating and Charging Valve, Removing and Installing, Low and High Pressure Side”, page 127](#).

12 - Refrigerant Circuit Pressure Sensor - G805-

- ☐ 8 Nm
- ☐ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to ⇒ [“2.3 Refrigerant Circuit Pressure Sensor G805, Removing and Installing”, page 109](#).

13 - Evacuating and Charging Valve, Low Pressure Side

- ☐ Removing and installing. Refer to ⇒ [“2.8 Evacuating and Charging Valve, Removing and Installing, Low and High Pressure Side”, page 127](#).

14 - Refrigerant line with inner heat exchanger

- ☐ From the condenser and A/C compressor
- ☐ Removing and installing. Refer to ⇒ [“2.13 Refrigerant Lines with Inner Heat Exchanger, Removing and Installing”, page 136](#).



1.1.3 Component Location Overview - Components Outside of Passenger Compartment, Golf Wagon

1 - Vehicle Interior Forced Air Extraction

- ☐ Checking. Refer to ➤ [“6.9 Passenger Compartment Forced Air Extraction, Checking”, page 280](#) .
- ☐ Removing and installing. Refer to ➤ [“6.10.2 Passenger Compartment Forced Air Extraction, Removing and Installing, Golf Wagon”, page 281](#) .

2 - A/C Humidity Sensor - G260-

- ☐ Check via the Vehicle Electrical System Control Module - J519- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function. Refer to ➤ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to ➤ [“9.5 A/C Humidity Sensor G260, Removing and Installing”, page 307](#) .

3 - Expansion Valve

- ☐ Removing and installing. Refer to ➤ [“2.4 Expansion Valve, Removing and Installing”, page 110](#) .
- ☐ Tightening specifications. Refer to ➤ [“2.1 System Overview - Refrigerant Circuit”, page 100](#) .

4 - Dryer Bag

- ☐ Removing and installing. Refer to ➤ [“2.6 Dryer Bag/Dryer Cartridge, Removing and Installing”, page 118](#) .
- ☐ Overview. Refer to ➤ [“2.2 Overview - Condenser”, page 108](#) .

5 - Outside Air Temperature Sensor - G17-

- ☐ Check via the Vehicle Electrical System Control Module - J519- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ➤ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to ➤ [“9.4 Outside Air Temperature Sensor G17, Removing and Installing”, page 307](#) .

6 - Condenser

- ☐ With integrated receiver/dryer
- ☐ Overview. Refer to ➤ [“2.2 Overview - Condenser”, page 108](#) .
- ☐ Removing and installing. Refer to ➤ [“2.5 Condenser, Removing and Installing”, page 116](#) .





Note

Under certain conditions, the receiver/dryer and the dryer bag does not need to be replaced each time the refrigerant circuit is opened. Refer to ➤ Refrigerant R134a Servicing; Rep. Gr. 00 ; Components, Replacing.

7 - A/C Compressor

- ☐ Overview. Refer to ➤ [“3.1 Overview - A/C Compressor Power Unit”, page 149](#) .
- ☐ Removing and installing. Refer to ➤ [“3.4 A/C Compressor, Removing and Installing”, page 159](#) .
- ☐ Removing from and attaching to the bracket. Refer to ➤ [“3.3 A/C Compressor, Removing and Installing on Bracket”, page 155](#) .

8 - Evacuating and Charging Valve, High Pressure Side

- ☐ Removing and installing. Refer to ➤ [“2.8 Evacuating and Charging Valve, Removing and Installing, Low and High Pressure Side”, page 127](#) .

9 - Refrigerant Circuit Pressure Sensor - G805-

- ☐ 8 Nm
- ☐ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ➤ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to ➤ [“2.3 Refrigerant Circuit Pressure Sensor G805, Removing and Installing”, page 109](#) .

10 - Evacuating and Charging Valve, Low Pressure Side

- ☐ Removing and installing. Refer to ➤ [“2.8 Evacuating and Charging Valve, Removing and Installing, Low and High Pressure Side”, page 127](#) .

11 - Refrigerant Line with Inner Heat Exchanger

- ☐ From the condenser and Air Conditioning (A/C) compressor
- ☐ Removing and installing. Refer to ➤ [“2.13 Refrigerant Lines with Inner Heat Exchanger, Removing and Installing”, page 136](#) .

12 - Air Quality Sensor - G238-

- ☐ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ➤ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to ➤ [“9.2 Air Quality Sensor G238, Removing and Installing”, page 304](#) .
- ☐ Function mode. Refer to ➤ [“9.3 Function of Air Quality Sensor G238”, page 305](#) .
- ☐ Only for vehicles with Climatronic.

13 - Fresh Air Intake Cover

- ☐ Removing and installing. Refer to ➤ [“6.3 Fresh Air Intake Cover, Removing and Installing”, page 274](#) .

14 - Fresh Air Intake

- ☐ Removing and installing. Refer to ➤ [“6.2 Fresh Air Intake, Removing and Installing”, page 273](#) .



1.1.4 Component Location Overview - Components Outside of Passenger Compartment, Golf Wagon RHD

1 - Vehicle interior forced air extraction

- ❑ Checking. Refer to ➤ [“6.9 Passenger Compartment Forced Air Extraction, Checking”, page 280](#) .
- ❑ Removing and installing. Refer to ➤ [“6.10.2 Passenger Compartment Forced Air Extraction, Removing and Installing, Golf Wagon”, page 281](#) .

2 - A/C Humidity Sensor - G260-

- ❑ Check via the Vehicle Electrical System Control Module - J519- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ➤ Wiring diagrams, Troubleshooting & Component locations.
- ❑ Removing and installing. Refer to ➤ [“9.5 A/C Humidity Sensor G260, Removing and Installing”, page 307](#) .

3 - Fresh air intake

- ❑ Removing and installing. Refer to ➤ [“6.2.2 Fresh Air Intake, Removing and Installing, RHD”, page 273](#) .

4 - Air Quality Sensor - G238-

- ❑ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ➤ Wiring diagrams, Troubleshooting & Component locations.
- ❑ Removing and installing. Refer to ➤ [“9.2 Air Quality Sensor G238, Removing and Installing”, page 304](#) .
- ❑ Function mode. Refer to ➤ [“9.3 Function of Air Quality Sensor G238”, page 305](#) .
- ❑ Only for vehicles with Climatronic.

5 - Fresh air intake cover

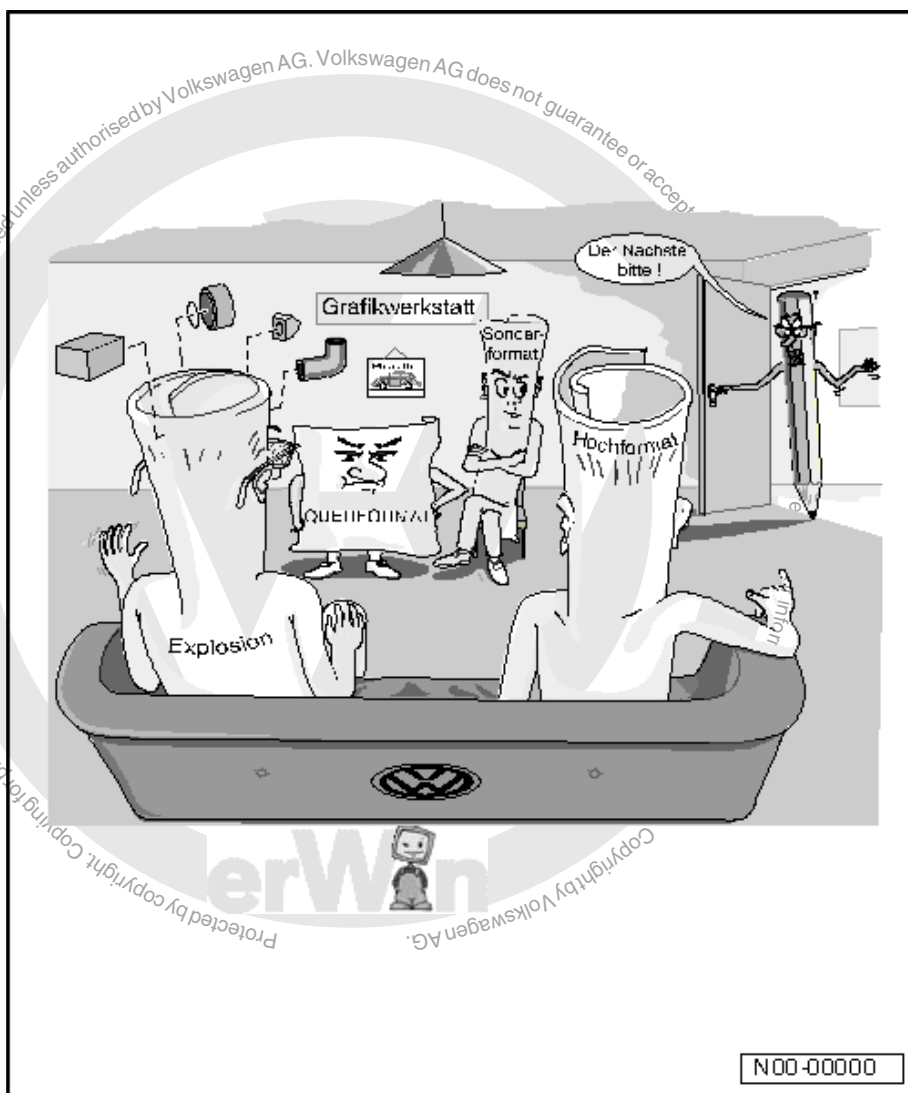
- ❑ Removing and installing. Refer to ➤ [“6.3.2 Fresh Air Intake Cover, Removing and Installing, RHD”, page 275](#) .

6 - Expansion Valve

- ❑ Removing and installing. Refer to ➤ [“2.4 Expansion Valve, Removing and Installing”, page 110](#) .
- ❑ Tightening specifications. Refer to ➤ [“2.1 System Overview - Refrigerant Circuit”, page 100](#) .

7 - Dryer bag

- ❑ Removing and installing. Refer to ➤ [“2.6 Dryer Bag/Dryer Cartridge, Removing and Installing”, page 118](#) .





- ☐ Overview. Refer to ➤ [“2.2 Overview - Condenser”, page 108](#) .

8 - Outside Air Temperature Sensor - G17-

- ☐ Check via the Vehicle Electrical System Control Module - J519- using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ➤ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to ➤ [“9.4 Outside Air Temperature Sensor G17 , Removing and Installing”, page 307](#) .

9 - Condenser

- ☐ With integrated receiver/dryer
- ☐ Overview. Refer to ➤ [“2.2 Overview - Condenser”, page 108](#) .
- ☐ Removing and installing. Refer to ➤ [“2.5 Condenser, Removing and Installing”, page 116](#) .



Note

Under certain conditions, the receiver/dryer and the dryer bag does not need to be replaced each time the refrigerant circuit is opened. Refer to in ELSA under Heating, Ventilation and Air Conditioning; Refrigerant R134a Servicing ➤ Refrigerant R134a Servicing; Rep. Gr. 00; Components, Replacing .

10 - A/C Compressor

- ☐ Overview. Refer to ➤ [“3.1 Overview - A/C Compressor Power Unit”, page 149](#)
- ☐ Removing and installing. Refer to ➤ [“3.4 A/C Compressor, Removing and Installing”, page 159](#) .
- ☐ Removing from and attaching to the bracket. Refer to ➤ [“3.3 A/C Compressor, Removing and Installing on Bracket”, page 155](#)

11 - Evacuating and Charging Valve, High Pressure Side

- ☐ Removing and installing. Refer to ➤ [“2.8 Evacuating and Charging Valve, Removing and Installing, Low and High Pressure Side”, page 127](#) .

12 - Refrigerant Circuit Pressure Sensor - G805-

- ☐ 8 Nm
- ☐ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ➤ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to ➤ [“2.3 Refrigerant Circuit Pressure Sensor G805 , Removing and Installing”, page 109](#) .

13 - Evacuating and Charging Valve, Low Pressure Side

- ☐ Removing and installing. Refer to ➤ [“2.8 Evacuating and Charging Valve, Removing and Installing, Low and High Pressure Side”, page 127](#) .

14 - Refrigerant line with inner heat exchanger

- ☐ From the condenser and A/C compressor
- ☐ Removing and installing. Refer to ➤ [“2.13 Refrigerant Lines with Inner Heat Exchanger, Removing and Installing”, page 136](#) .



1.2 Component Location Overview - Components Inside Front Passenger Compartment

⇒ [“1.2.1 Component Location Overview - Components Inside Front Passenger Compartment”, page 94](#)

1.2.1 Component Location Overview - Components Inside Front Passenger Compartment

1 - Left Vent Temperature Sensor - G150-

- ❑ Only for vehicles with Climatronic.
- ❑ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function. Refer to ⇒ [Wiring diagrams, Troubleshooting & Component locations](#).
- ❑ An incorrectly installed vent temperature sensor causes flow-generated noise
- ❑ Removing and installing. Refer to ⇒ [“9.6 Left Vent Temperature Sensor G150, Removing and Installing”, page 307](#).

2 - Driver Side Footwell Vent

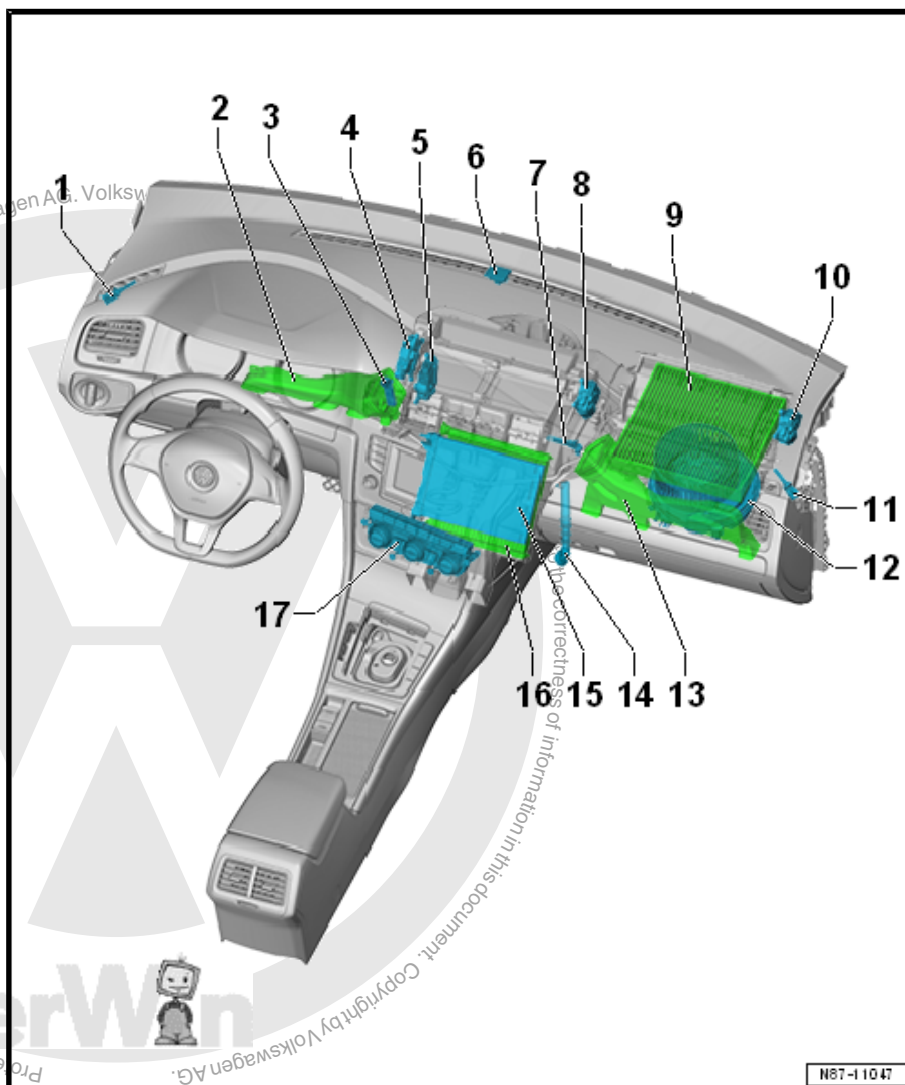
- ❑ Removing and installing. Refer to ⇒ [“6.5 Driver Side Footwell Vent, Removing and Installing”, page 276](#).
- ❑ Overview. Refer to ⇒ [“6.1 Overview - Air Routing and Air Distribution in Passenger Compartment”, page 271](#).

3 - Footwell Vent Temperature Sensor - G192-

- ❑ Only for vehicles with Climatronic.
- ❑ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function. Refer to ⇒ [Wiring diagrams, Troubleshooting & Component locations](#).
- ❑ Removing and installing. Refer to ⇒ [“9.8 Footwell Vent Temperature Sensor G192, Removing and Installing”, page 309](#).

4 - Front Air Distribution Door Motor - V426- or Air Distribution Door Motor - V428-

- ❑ Removing and installing. Refer to ⇒ [“4.8 Front Air Distribution Door Motor V426 with Air Distribution Door Motor Position Sensor G642, Removing and Installing”, page 199](#).
- ❑ Component Location Overview. Refer to ⇒ [“4.1 Component Location Overview - Front Actuators”, page 171](#).





5 - Left Temperature Door Motor - V158- or Temperature Regulator Door Motor - V68-

- ☐ Removing and installing. Refer to
⇒ [“4.5 Left Temperature Door Motor V158 with Left Temperature Door Potentiometer/Actuator G220 , Removing and Installing”, page 187](#) .
- ☐ Component Location Overview. Refer to
⇒ [“4.1 Component Location Overview - Front Actuators”, page 171](#) .

6 - Evaporator

- ☐ Only for vehicles with an Air Conditioning (A/C) system.
- ☐ Removing and installing. Refer to ⇒ [“5.9 Evaporator, Removing and Installing”, page 231](#) .

7 - Sunlight Photo Sensor - G107-

- ☐ Only for vehicles with Climatronic.
- ☐ Removing and installing. Refer to
⇒ [“9.1 Sunlight Photo Sensor G107 , Removing and Installing”, page 303](#) .

8 - Evaporator Temperature Sensor - G308-

- ☐ Only for vehicles with an A/C system.
- ☐ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function. Refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to
⇒ [“5.17 Evaporator Temperature Sensor G308 , Removing and Installing”, page 262](#) .

9 - Defroster Door Motor - V107-

- ☐ Only for vehicles with Climatronic.
- ☐ Removing and installing. Refer to
⇒ [“4.3 Defroster Door Motor V107 with Defroster Door Motor Position Sensor G135 , Removing and Installing”, page 179](#) .
- ☐ Component Location Overview. Refer to
⇒ [“4.1 Component Location Overview - Front Actuators”, page 171](#) .

10 - Right Temperature Door Motor - V159-

- ☐ Only for vehicles with Climatronic.
- ☐ Removing and installing. Refer to
⇒ [“4.6 Right Temperature Door Motor V159 with Right Temperature Door Potentiometer/Actuator G221 , Removing and Installing”, page 190](#) .
- ☐ Component Location Overview. Refer to
⇒ [“4.1 Component Location Overview - Front Actuators”, page 171](#) .

11 - Dust and Pollen Filter

- ☐ Removing and installing. Refer to ⇒ [“5.11 Dust and Pollen Filter, Removing and Installing”, page 234](#) .

12 - Recirculation Door Motor - V113- or Fresh Air/Recirculating Air/Back Pressure Door Motor - V425-

- ☐ Recirculation Door Motor - V113- , Removing and Installing. Refer to
⇒ [“4.4 Recirculation Door Motor V113 , Removing and Installing”, page 183](#) .
- ☐ Fresh Air/Recirculating Air/Back Pressure Door Motor - V425- , Removing and Installing. Refer to
⇒ [“4.7 Fresh Air/Recirculating Air/Back Pressure Door Motor V425 with Fresh Air/Recirculating Air/Back Pressure Door Motor Position Sensor G644 , Removing and Installing”, page 195](#) .
- ☐ Component Location Overview. Refer to
⇒ [“4.1 Component Location Overview - Front Actuators”, page 171](#) .

13 - Right Vent Temperature Sensor - G151-

- ☐ Only for vehicles with Climatronic.
- ☐ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to
⇒ [“9.7 Right Vent Temperature Sensor G151 , Removing and Installing”, page 308](#) .
- ☐ An incorrectly installed vent temperature sensor causes flow-generated noise

14 - Fresh Air Blower - V2-

- ☐ Removing and installing. Refer to ⇒ [“5.12 Fresh Air Blower V2 , Removing and Installing”, page 238](#) .



15 - Front Passenger Side Footwell Vent

- ☐ Removing and installing. Refer to
⇒ [“6.6 Front Passenger Side Footwell Vent, Removing and Installing”, page 277](#) .
- ☐ Overview. Refer to
⇒ [“6.1 Overview - Air Routing and Air Distribution in Passenger Compartment”, page 271](#) .

16 - Condensation Water Drain Hose

- ☐ Only for vehicles with an A/C system.
- ☐ Checking. Refer to ⇒ [“5.18 Condensation Water Drain, Checking”, page 264](#) .
- ☐ Removing and installing. Refer to
⇒ [“5.19 Condensation Water Drain, Removing and Installing”, page 265](#) .

17 - Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604-

- ☐ Checking. Refer to
⇒ [“5.13 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Checking”, page 240](#) .
- ☐ Removing and installing. Refer to
⇒ [“5.14 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Removing and Installing”, page 242](#) .

18 - Heater Core

- ☐ Removing and installing. Refer to ⇒ [“5.15 Heater Core, Removing and Installing”, page 244](#) .

19 - Display and Control Head

Removing and installing. Refer to ⇒ [“8.2 Display and Control Head, Removing and Installing”, page 301](#) .





1.2.2 Component Location Overview - Components Inside Front Passenger Compartment, RHD

1 - Recirculation Door Motor - V113- or Fresh Air/Recirculating Air/Back Pressure Door Motor - V425-

- ☐ Recirculation Door Motor - V113- , Removing and Installing. Refer to ➔ [“4.4.2 Recirculation Door Motor V113 , Removing and Installing, RHD”](#), page 184 .
- ☐ Fresh Air/Recirculating Air/Back Pressure Door Motor - V425- , Removing and Installing. Refer to ➔ [“4.7.2 Fresh Air/Recirculating Air/Back Pressure Door Motor V425 , Removing and Installing, RHD”](#), page 196 .
- ☐ Component Location Overview. Refer to ➔ [“4.1 Component Location Overview - Front Actuators”](#), page 171 .

2 - Dust and Pollen Filter

- ☐ Removing and installing. Refer to ➔ [“5.11.2 Dust and Pollen Filter, Removing and Installing, RHD”](#), page 236 .

3 - Left Temperature Door Motor - V158- or Temperature Regulator Door Motor - V68-

- ☐ Removing and installing. Refer to ➔ [“4.5.2 Left Temperature Door Motor V158 , Removing and Installing, RHD”](#), page 188 .
- ☐ Component Location Overview. Refer to ➔ [“4.1 Component Location Overview - Front Actuators”](#), page 171 .

4 - Front Air Distribution Door Motor - V426- or Air Distribution Door Motor - V428-

- ☐ Removing and installing. Refer to ➔ [“4.8.2 Air Distribution Door Motor V426 , Removing and Installing, RHD”](#), page 201 .
- ☐ Component Location Overview. Refer to ➔ [“4.1 Component Location Overview - Front Actuators”](#), page 171 .

5 - Heater core

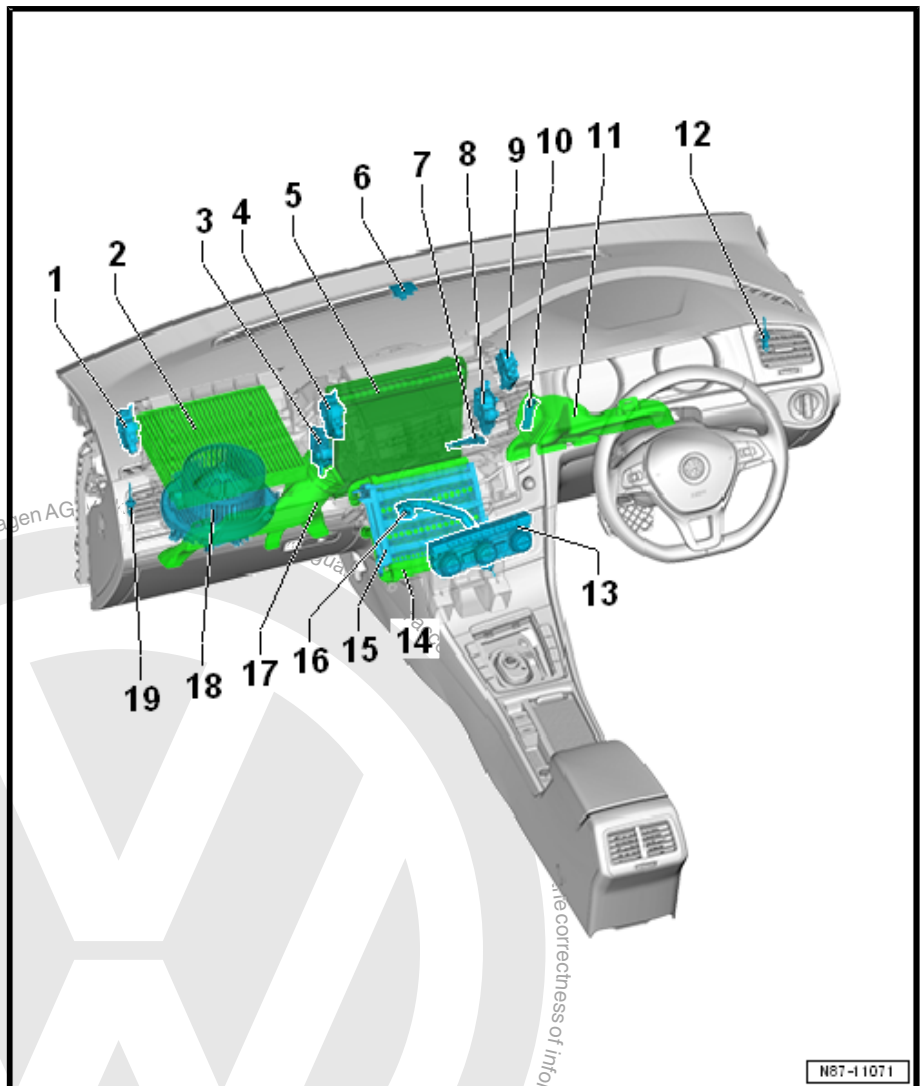
- ☐ Removing and installing. Refer to ➔ [“5.15 Heater Core, Removing and Installing”](#), page 244 .

6 - Sunlight Photo Sensor - G107-

- ☐ Only for vehicles with Climatronic.
- ☐ Removing and installing. Refer to ➔ [“9.1 Sunlight Photo Sensor G107 , Removing and Installing”](#), page 303 .

7 - Evaporator Temperature Sensor - G308-

- ☐ Only for vehicles with an A/C system.





- ❑ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ❑ Removing and installing. Refer to
⇒ [“5.17.2 Evaporator Temperature Sensor G308 , Removing and Installing, RHD”, page 263](#) .

8 - Right Temperature Door Motor - V159-

- ❑ Only for vehicles with Climatronic.
- ❑ Removing and installing. Refer to
⇒ [“4.6.2 Right Temperature Door Motor V159 , Removing and Installing, RHD”, page 192](#) .
- ❑ Component Location Overview. Refer to
⇒ [“4.1 Component Location Overview - Front Actuators”, page 171](#) .

9 - Defroster Door Motor - V107-

- ❑ Only for vehicles with Climatronic.
- ❑ Removing and installing. Refer to
⇒ [“4.3 Defroster Door Motor V107 with Defroster Door Motor Position Sensor G135 , Removing and Installing”, page 179](#) .
- ❑ Component Location Overview. Refer to
⇒ [“4.1 Component Location Overview - Front Actuators”, page 171](#) .

10 - Footwell Vent Temperature Sensor - G192-

- ❑ Only for vehicles with Climatronic.
- ❑ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ❑ Removing and installing. Refer to
⇒ [“9.8 Footwell Vent Temperature Sensor G192 , Removing and Installing” page 309](#) .

11 - Driver side footwell vent

- ❑ Removing and installing. Refer to
⇒ [“6.5.2 Driver Side Footwell Vent, Removing and Installing, RHD”, page 277](#) .
- ❑ Overview. Refer to
⇒ [“6.1 Overview - Air Routing and Air Distribution in Passenger Compartment”, page 271](#) .

12 - Right Vent Temperature Sensor - G151-

- ❑ Only for vehicles with Climatronic.
- ❑ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ❑ Removing and installing. Refer to
⇒ [“9.7 Right Vent Temperature Sensor G151 , Removing and Installing”, page 308](#) .
- ❑ An incorrectly installed vent temperature sensor causes flow-generated noise

13 - Display and Control Head

Removing and installing. Refer to ⇒ [“8.2 Display and Control Head, Removing and Installing”, page 301](#) .

14 - Evaporator

- ❑ Only for vehicles with an A/C system.
- ❑ Removing and installing. Refer to ⇒ [“5.9 Evaporator, Removing and Installing”, page 231](#) .

15 - Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604-

- ❑ Checking. Refer to
⇒ [“5.13 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Checking”, page 240](#) .
- ❑ Removing and installing. Refer to
⇒ [“5.14.2 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Removing and Installing, RHD”, page 243](#) .

16 - Condensation water drain hose

- ❑ Only for vehicles with an A/C system.
- ❑ Checking. Refer to ⇒ [“5.18 Condensation Water Drain, Checking”, page 264](#) .
- ❑ Removing and installing. Refer to
⇒ [“5.19.2 Condensation Water Drain, Removing and Installing, RHD”, page 267](#) .



17 - Front passenger side footwell vent

- ☐ Removing and installing. Refer to
⇒ [“6.6.2 Front Passenger Side Footwell Vent, Removing and Installing, RHD”, page 278](#) .
- ☐ Overview. Refer to
⇒ [“6.1 Overview - Air Routing and Air Distribution in Passenger Compartment”, page 271](#) .

18 - Fresh Air Blower - V2-

- ☐ Removing and installing. Refer to
⇒ [“5.12.2 Fresh Air Blower V2 , Removing and Installing, RHD”, page 239](#) .

19 - Left Vent Temperature Sensor - G150-

- ☐ Only for vehicles with Climatronic.
- ☐ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ☐ An incorrectly installed vent temperature sensor causes flow-generated noise
- ☐ Removing and installing. Refer to
⇒ [“9.6 Left Vent Temperature Sensor G150 , Removing and Installing”, page 307](#) .





2 Refrigerant Circuit

- ⇒ [“2.1 System Overview - Refrigerant Circuit”, page 100](#)
- ⇒ [“2.2 Overview - Condenser”, page 108](#)
- ⇒ [“2.3 Refrigerant Circuit Pressure Sensor G805 , Removing and Installing”, page 109](#)
- ⇒ [“2.4 Expansion Valve, Removing and Installing”, page 110](#)
- ⇒ [“2.5 Condenser, Removing and Installing”, page 116](#)
- ⇒ [“2.6 Dryer Bag/Dryer Cartridge, Removing and Installing”, page 118](#)
- ⇒ [“2.7 Low Pressure Side Refrigerant Line Balance Weight, Removing and Installing”, page 126](#)
- ⇒ [“2.8 Evacuating and Charging Valve, Removing and Installing, Low and High Pressure Side”, page 127](#)
- ⇒ [“2.9 A/C Pressure/Temperature Sensor G395 , Removing and Installing”, page 128](#)
- ⇒ [“2.10 Heater and A/C Unit Refrigerant Cut-Off Valve N541 , Removing and Installing”, page 129](#)
- ⇒ [“2.11 High Voltage Battery Heater Core Refrigerant Cut-Off Valve N542 , Removing and Installing”, page 131](#)
- ⇒ [“2.12 High Voltage Battery Heat Exchanger, Removing and Installing”, page 133](#)
- ⇒ [“2.13 Refrigerant Lines with Inner Heat Exchanger, Removing and Installing”, page 136](#)
- ⇒ [“2.14 Refrigerant Line with Restrictor”, page 141](#)
- ⇒ [“2.15 Condenser/Evaporator Refrigerant Line, Removing and Installing”, page 142](#)
- ⇒ [“2.16 Condenser/A/C Compressor Refrigerant Line, Removing and Installing”, page 144](#)
- ⇒ [“2.17 A/C Compressor/Evaporator Refrigerant Line, Removing and Installing”, page 146](#)

2.1 System Overview - Refrigerant Circuit

- ⇒ [“2.1.1 System Overview - Refrigerant Circuit”, page 100](#)
- ⇒ [“2.1.2 System Overview - Refrigerant Circuit, Golf GTE”, page 103](#)

2.1.1 System Overview - Refrigerant Circuit

- When working on the refrigerant circuit, note the information.
Refer to ⇒ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .



1 - Refrigerant Line - Low Pressure Side

- ❑ To the refrigerant line with the inner heat exchanger
- ❑ An additional balance weight may be present on this refrigerant line depending on the refrigerant line version and the production period. Refer to the Parts Catalog.
- ❑ Balance weight removing and installing. Refer to
⇒ ["2.7 Low Pressure Side Refrigerant Line Balance Weight, Removing and Installing", page 126](#).

2 - Refrigerant Line - High Pressure Side

- ❑ To the refrigerant line with the inner heat exchanger

3 - Refrigerant Line with Inner Heat Exchanger

- ❑ In the inner heat exchanger, the flowing fluid warm refrigerant on the high pressure side is delivered into the low pressure side as flowing, vapor, cold refrigerant to increase the efficiency of the A/C system

- ❑ From the condenser and A/C compressor

- ❑ Removing and installing. Refer to
⇒ ["2.13 Refrigerant Lines with Inner Heat Exchanger, Removing and Installing", page 136](#).

4 - Expansion Valve

- ❑ Function and removal and installation ⇒ ["2.4 Expansion Valve, Removing and Installing", page 110](#)

5 - A/C Compressor

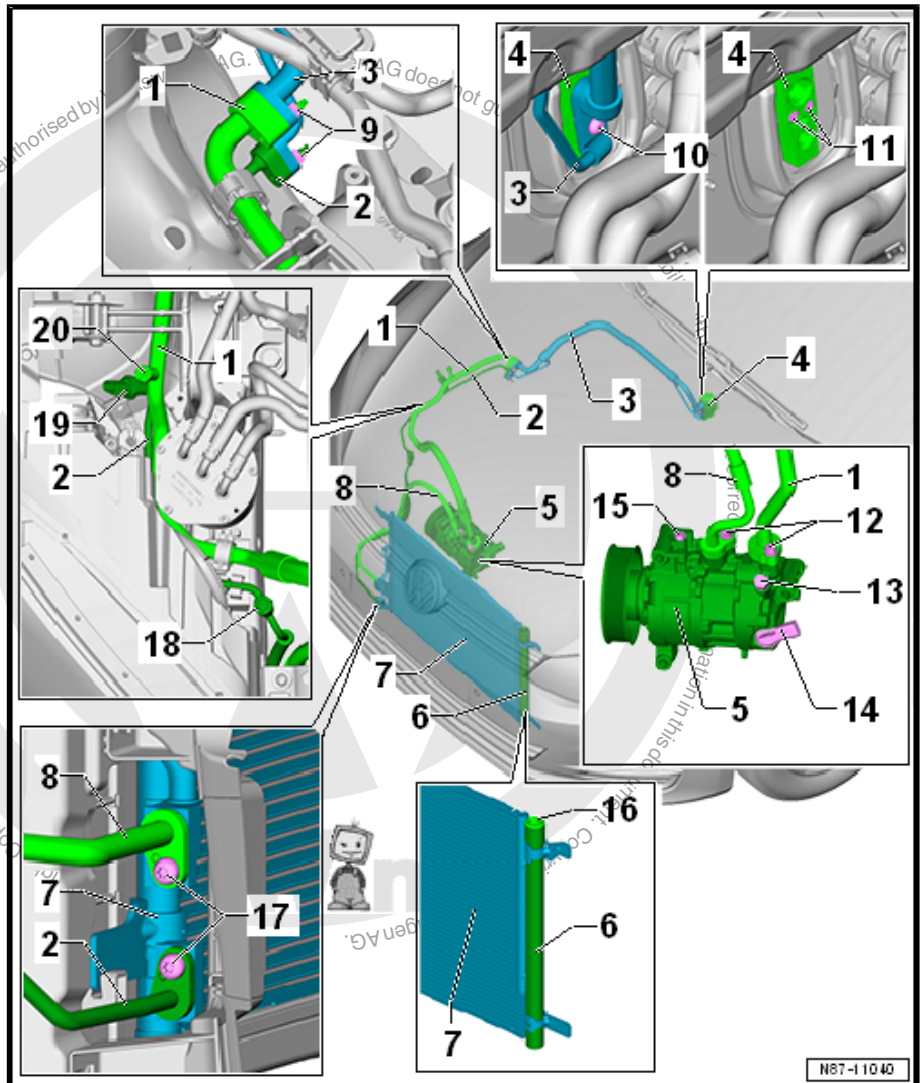
- ❑ Overview. Refer to ⇒ ["3.1 Overview - A/C Compressor Power Unit", page 149](#).
- ❑ Removing and installing. Refer to ⇒ ["3.4 A/C Compressor, Removing and Installing", page 159](#).
- ❑ Removing from and attaching to the bracket. Refer to
⇒ ["3.3 A/C Compressor, Removing and Installing on Bracket", page 155](#).

6 - Receiver/Dryer with Dryer Bag



Note

Under certain conditions, the receiver/dryer and the dryer bag does not need to be replaced each time the refrigerant circuit is opened. Refer to ⇒ Refrigerant R134a Servicing; Rep. Gr. 00; Components, Replacing.



N87-11040



- ☐ Denso condenser. Refer to
⇒ [“2.6.1 Dryer Bag, Removing and Installing, Denso Condenser”, page 118](#) .
- ☐ Modine condenser. Refer to
⇒ [“2.6.2 Dryer Bag, Removing and Installing, Modine Condenser”, page 120](#) .

7 - Condenser

- ☐ Overview. Refer to ⇒ [“2.2 Overview - Condenser”, page 108](#) .
- ☐ Removing and installing. Refer to ⇒ [“2.5 Condenser, Removing and Installing”, page 116](#) .
- ☐ There are different versions. Refer to the Parts Catalog.

8 - Refrigerant Line

- ☐ To the condenser

9 - Nut

- ☐ 8 Nm

10 - Bolt

- ☐ 8 Nm

11 - Bolt

- ☐ 10 Nm

12 - Bolt

- ☐ 22 Nm

13 - Relief Valve on A/C Compressor

- ☐ Checking. Refer to ⇒ [“3.6 Pressure Relieve Valve on A/C Compressor, Checking”, page 167](#) .

14 - Connector with A/C Compressor Regulator Valve - N280-

15 - Oil Drain Plug

- ◆ Denso A/C compressor - 30 Nm
- ◆ Sanden A/C compressor - 10 Nm
 - ☐ There are different versions. Refer to the Parts Catalog.
 - ☐ Tightening specification:

16 - Cap

- ☐ Modine: 5 Nm
- ☐ There are different versions. Refer to the Parts Catalog.

17 - Bolt

- ☐ 8 Nm

18 - High Pressure Side Service Connection

- ☐ Cap: 0.4 ± 0.1 Nm
- ☐ Valve: 2 ± 0.2 Nm
- ☐ Removing and installing. Refer to
⇒ [“2.8 Evacuating and Charging Valve, Removing and Installing, Low and High Pressure Side”, page 127](#) .

19 - Refrigerant Circuit Pressure Sensor - G805-

- ☐ 5 ± 1 Nm
- ☐ Removing and installing. Refer to
⇒ [“2.3 Refrigerant Circuit Pressure Sensor G805 , Removing and Installing”, page 109](#) .

20 - Low Pressure Side Service Connection

- ☐ Cap: 0.4 ± 0.1 Nm
- ☐ Valve: 2 ± 0.2 Nm
- ☐ Removing and installing. Refer to
⇒ [“2.8 Evacuating and Charging Valve, Removing and Installing, Low and High Pressure Side”, page 127](#) .



2.1.2 System Overview - Refrigerant Circuit, Golf GTE

Electrically-driven A/C compressor, refrigerant lines. Refer to ➔ [page 103](#)

High voltage battery heat exchanger, refrigerant cut-off valves and expansion valve. Refer to ➔ [page 106](#)

- When working on the refrigerant circuit, note the information. Refer to ➔ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .

Electrically-Driven A/C Compressor, Refrigerant Lines

1 - Electrical A/C Compressor - V470-

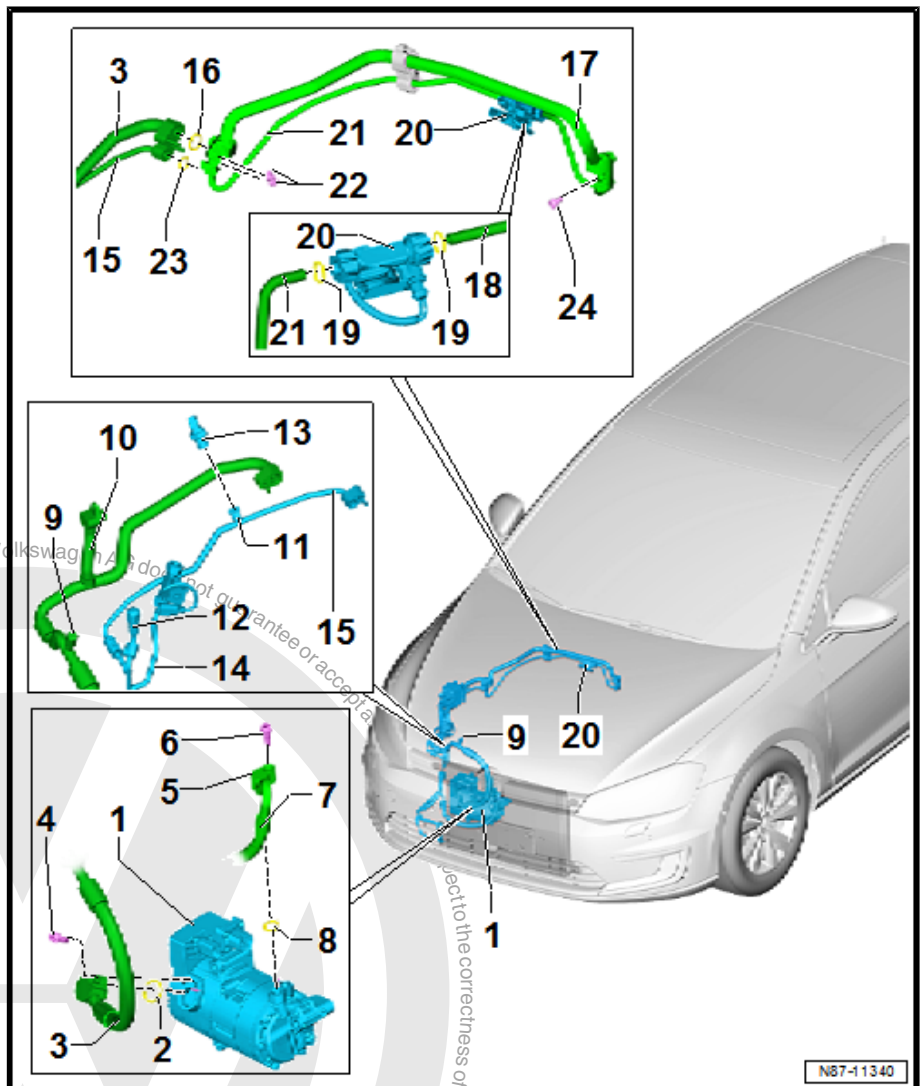
- ❑ Overview. Refer to ➔ [“3.1.2 Overview - A/C Compressor Power Unit, Golf GTE”, page 151](#) .
- ❑ With A/C Compressor Control Module - J842- and Electrical A/C Compressor - V470-
- ❑ Removing and installing. Refer to ➔ [“3.4.2 Electrical A/C Compressor V470, Removing and Installing, Golf GTE”, page 163](#) .

2 - Seal

- ❑ Replacing. For the correct version, refer to the Parts Catalog.
- ❑ Coat with refrigerant oil before installing. Refer to ➔ [“4.2 Refrigerant Circuit Seals”, page 8](#) .

3 - Refrigerant Line - Low Pressure Side

- ❑ From the connection point on the right longitudinal member to the Air Conditioning (A/C) compressor
- ❑ With outlet to the high voltage battery heat exchanger
- ❑ Additional weight on the refrigerant line. Refer to ➔ [“2.7 Low Pressure Side Refrigerant Line Balance Weight, Removing and Installing”, page 126](#) .





Note

An additional weight (balance weight in the refrigerant line to reduce noise) may be present on this refrigerant line depending on the refrigerant line version and the production period. Make sure that this component is not touching or can come in contact with other components during operation (noise). Refer to the Parts Catalog.

4 - Bolt

- ☐ 22 Nm

5 - Refrigerant Line

- ☐ To the condenser
- ☐ Different versions (with and without connection for the A/C Pressure/Temperature Sensor - G395-). Refer to Parts Catalog.

6 - Bolt

- ☐ 22 Nm

7 - Outlet of the Refrigerant Line - High Pressure Side

- ☐ To the high voltage battery heat exchanger

8 - Seal

- ☐ Replacing. For the correct version, refer to the Parts Catalog.
- ☐ Coat with refrigerant oil before installing. Refer to ⇒ ["4.2 Refrigerant Circuit Seals", page 8](#) .

9 - Low Pressure Side Service Connection

- ☐ Removing and installing. Refer to ⇒ ["2.8 Evacuating and Charging Valve, Removing and Installing, Low and High Pressure Side", page 127](#) .

10 - Outlet of the Refrigerant Line - Low Pressure Side

- ☐ To the high voltage battery heat exchanger

11 - Refrigerant Circuit Pressure Sensor - G805- connection

- ☐ Only installed on specific versions (not installed for example vehicles for North America). Refer to the Parts Catalog.

12 - High Pressure Side Service Connection

- ☐ Removing and installing. Refer to ⇒ ["2.8 Evacuating and Charging Valve, Removing and Installing, Low and High Pressure Side", page 127](#) .

13 - Refrigerant Circuit Pressure Sensor G805-

- ☐ 5 Nm
- ☐ To check, use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function and refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to ⇒ ["2.3 Refrigerant Circuit Pressure Sensor G805- Removing and Installing", page 109](#) .
- ☐ Only installed on specific versions (not installed for example vehicles for North America). Refer to the Parts Catalog.



Note

- ◆ *For vehicles with a Refrigerant Circuit Pressure Sensor - G805- or a A/C Pressure/Temperature Sensor - G395-, the Electrical A/C Compressor - V470- version (with the A/C Compressor Control Module - J842-) and A/C control head version (the Climatronic Control Module - J255-) is also different in addition to the pressure sensor . Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function and refer to the Parts Catalog.*
- ◆ *Depending on the version of the refrigerant line the Refrigerant Circuit Pressure Sensor - G805- can also be installed on vehicles with an A/C Pressure/Temperature Sensor - G395- to close the connection with valve securely. On this vehicle the Refrigerant Circuit Pressure Sensor - G805- is not connected to the vehicle electrical system.*

14 - Outlet of the Refrigerant Line - High Pressure Side

- ☐ To the high voltage battery heat exchanger

15 - Refrigerant Line - High Pressure Side

- ☐ From the condenser to the connection point on the right longitudinal member
- ☐ With outlet to the high voltage battery heat exchanger
- ☐ Different versions (with and without connection for the Refrigerant Circuit Pressure Sensor - G805-). Refer to Parts Catalog.

16 - Seal

- ☐ Replacing. For the correct version, refer to the Parts Catalog.
- ☐ Coat with refrigerant oil before installing. Refer to ➔ ["4.2 Refrigerant Circuit Seals", page 8](#) .

17 - Refrigerant Line - Low Pressure Side

- ☐ From the expansion valve to the connection point on the right longitudinal member
- ☐ Removing and installing. Refer to ➔ ["2.13 Refrigerant Lines with Inner Heat Exchanger, Removing and Installing", page 136](#) .

18 - Refrigerant Line - High Pressure Side

- ☐ From the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- to the expansion valve
- ☐ From the connection point on the right longitudinal member to the Heater and A/C Unit Refrigerant Cut-Off Valve - N541-
- ☐ Removing and Installing. Refer to ➔ ["2.4 Expansion Valve, Removing and Installing", page 110](#) and ➔ ["2.13 Refrigerant Lines with Inner Heat Exchanger, Removing and Installing", page 136](#) .

19 - Seal

- ☐ Replacing. For the correct version. refer to the Parts Catalog.
- ☐ Coat with refrigerant oil before installing. Refer to ➔ ["4.2 Refrigerant Circuit Seals", page 8](#) .

20 - Heater and A/C Unit Refrigerant Cut-Off Valve - N541-

- ☐ To check, use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function. Refer to ➔ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to ➔ ["2.10 Heater and A/C Unit Refrigerant Cut-Off Valve N541 , Removing and Installing", page 129](#) .



21 - Refrigerant Line - High Pressure Side

- ❑ From the connection point on the right longitudinal member to the Heater and A/C Unit Refrigerant Cut-Off Valve - N541-
- ❑ Removing and installing. Refer to
⇒ ["2.13.2 Refrigerant Lines with Inner Heat Exchanger, Removing and Installing, Golf GTE", page 139](#) .

22 - Nut

- ❑ 8 Nm

23 - Seal

- ❑ Replacing. For the correct version, refer to the Parts Catalog.
- ❑ Coat with refrigerant oil before installing. Refer to ⇒ ["4.2 Refrigerant Circuit Seals", page 8](#) .

24 - Bolt

- ❑ 8 Nm

High Voltage Battery Heat Exchanger, Refrigerant Cut-Off Valves and Expansion Valve

1 - Refrigerant Line - Low Pressure Side

- ❑ From the expansion valve to the connection point on the right longitudinal member
- ❑ Removing and installing. Refer to
⇒ ["4.2 Refrigerant Circuit Seals", page 8](#) .

2 - Seal

- ❑ Replacing, for the correct version, refer to the Parts Catalog.
- ❑ Coat with refrigerant oil before installing. Refer to
⇒ ["4.2 Refrigerant Circuit Seals", page 8](#) .

3 - Expansion Valve

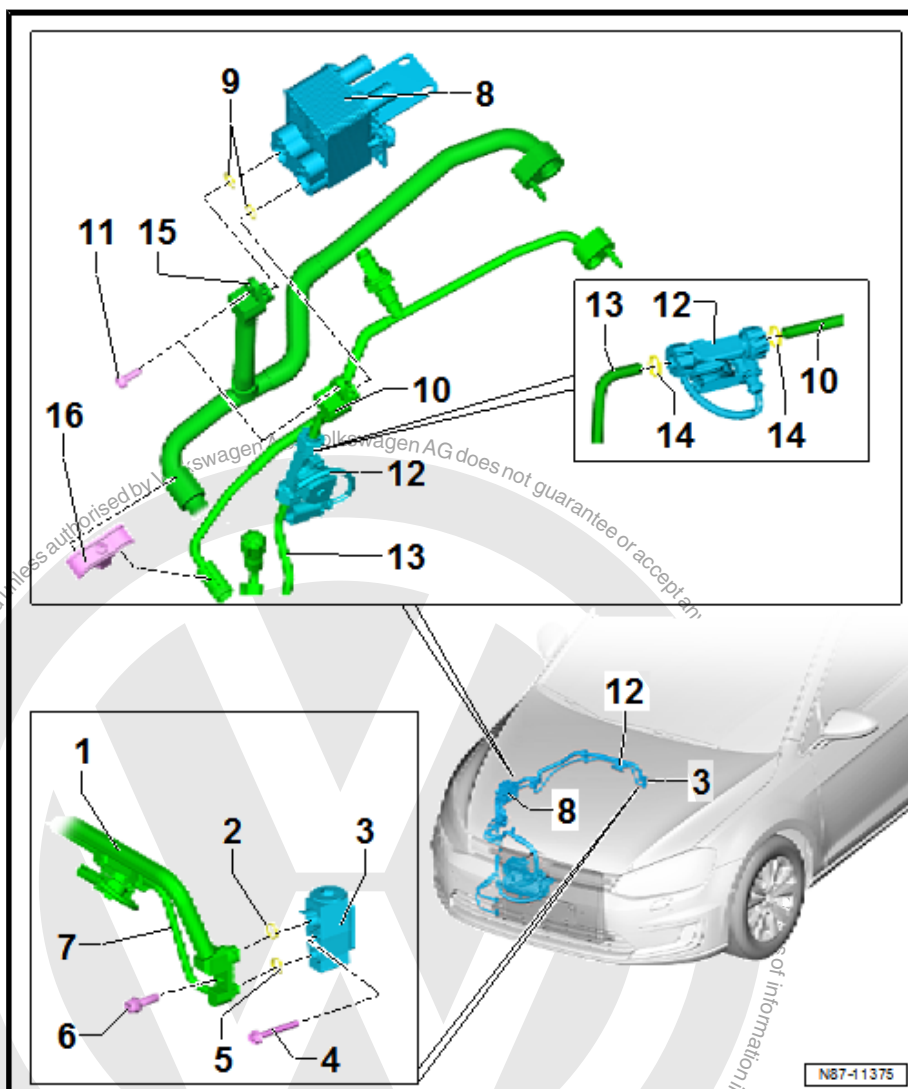
- ❑ There are different versions. Refer to the Parts Catalog.
- ❑ Removing and installing. Refer to
⇒ ["2.4 Expansion Valve, Removing and Installing", page 110](#) .

4 - Bolt

- ❑ 10 Nm
- ❑ Quantity: 2

5 - Seal

- ❑ Replacing. For the correct version, refer to the Parts Catalog.
- ❑ Coat with refrigerant oil before installing. Refer to ⇒ ["4.2 Refrigerant Circuit Seals", page 8](#) .





6 - Bolt

- ☐ 8 Nm

7 - Refrigerant Line - High Pressure Side

- ☐ From the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- to the expansion valve
- ☐ Refrigerant line from the connection point on the right longitudinal member to the Heater and A/C Unit Refrigerant Cut-Off Valve - N541-
- ☐ Removing and Installing. Refer to
⇒ [“2.10 Heater and A/C Unit Refrigerant Cut-Off Valve N541 , Removing and Installing”, page 129](#) and
⇒ [“2.13 Refrigerant Lines with Inner Heat Exchanger, Removing and Installing”, page 136](#) .

8 - Heat Exchanger for the High Voltage Battery

- ☐ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function. Refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to
⇒ [“2.12 High Voltage Battery Heat Exchanger, Removing and Installing”, page 133](#) .

9 - Seal

- ☐ Replacing. For the correct version, refer to the Parts Catalog.
- ☐ Coat with refrigerant oil before installing. Refer to ⇒ [“4.2 Refrigerant Circuit Seals”, page 8](#) .

10 - Refrigerant Line - High Pressure Side (with restrictor)

- ☐ From the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- to the high voltage battery heat exchanger
- ☐ A constriction (restrictor) is installed in this refrigerant line. Refer to
⇒ [“2.14 Refrigerant Line with Restrictor”, page 141](#) .
- ☐ To remove, remove the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- (refer to ⇒ [“2.11 High Voltage Battery Heater Core Refrigerant Cut-Off Valve N542 , Removing and Installing”, page 131](#)) and remove the refrigerant line from the High Voltage Battery Heat Exchanger. Refer to ⇒ [“2.12 High Voltage Battery Heat Exchanger, Removing and Installing”, page 133](#) .



Note

- ◆ The diameter of the restrictor hole is approximately 0.7 mm. Depending on the version of the refrigerant line this constriction is either installed fixed in the refrigerant line or only inserted. For the inserted version a strainer for flowing deposits may be installed, which can be blocked by the variable orifice.
- ◆ The restrictor limits the refrigerant flow to the high voltage battery heat exchanger with an open High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- (and with this its cooling output).

11 - Bolt

- ☐ 8 Nm

12 - High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542-

- ☐ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function and refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to
⇒ [“2.11 High Voltage Battery Heater Core Refrigerant Cut-Off Valve N542 , Removing and Installing”, page 131](#) .



13 - Refrigerant Line - High Pressure Side

- ❑ Refrigerant line to the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- from the refrigerant line outlet - high pressure side (from the condenser to the connection point on the right longitudinal member) -item 14- ➔ [Item 14 \(page 105\)](#) .

14 - Seal

- ❑ Replacing. For the correct version, refer to the Parts Catalog.
- ❑ Coat with refrigerant oil before installing. Refer to ➔ ["4.2 Refrigerant Circuit Seals", page 8](#) .

15 - Refrigerant Line - Low Pressure Side

- ❑ Refrigerant line from the high voltage battery heat exchanger to the outlet in the refrigerant line - low pressure side (from the connection point on the right longitudinal member to the A/C compressor) -item 10- ➔ [Item 10 \(page 104\)](#)

16 - Refrigerant Line Bracket

2.2 Overview - Condenser

Condenser, Receiver/Dryer



Note

The image shows a Modine condenser.

1 - Condenser

- ❑ There are different versions. Refer to the Parts Catalog.
- ❑ Removing and installing. Refer to ➔ ["2.5 Condenser, Removing and Installing", page 116](#).

2 - Seal

- ❑ Replacing. For the versions, refer to the Parts Catalog.
- ❑ Coat with refrigerant oil before installing

3 - Refrigerant Line

- ❑ To the inner heat exchanger

4 - Bolt

- ❑ 8 Nm

5 - Bolt

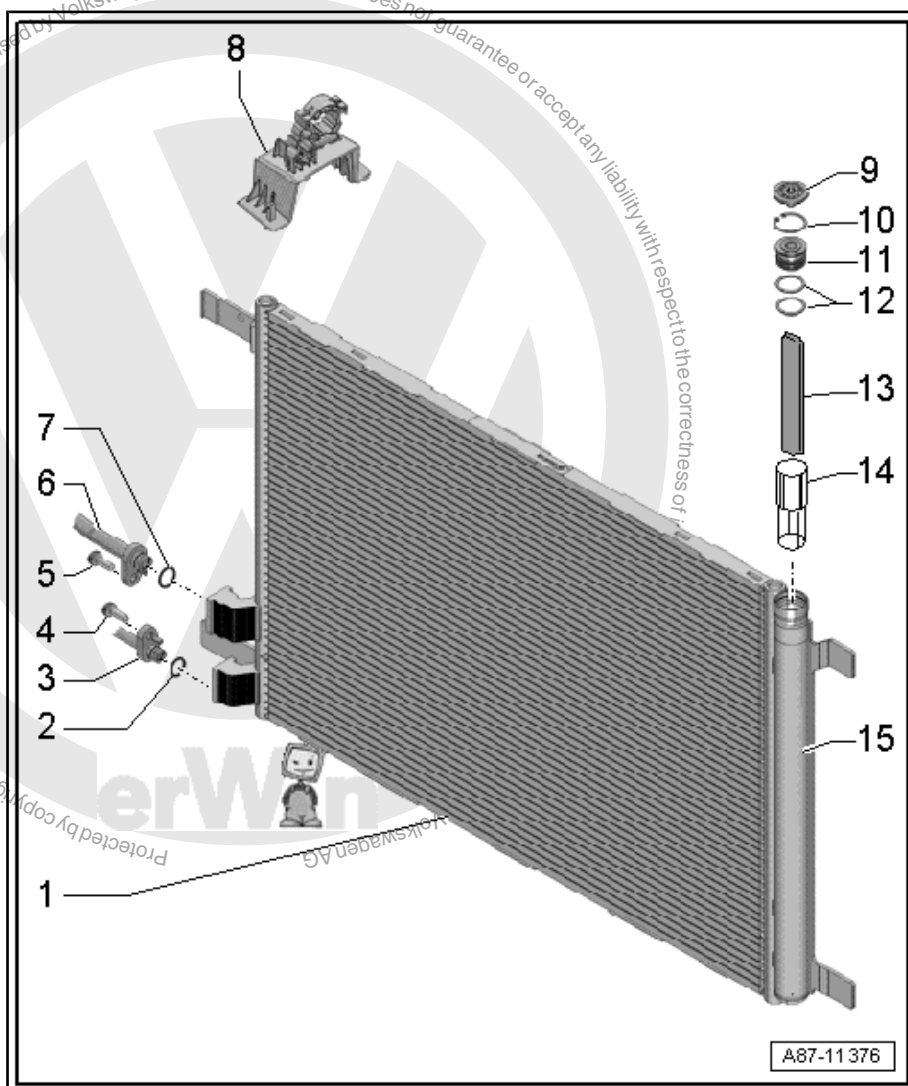
- ❑ 8 Nm

6 - Refrigerant Line

- ❑ From the Air Conditioning (A/C) compressor

7 - Seal

- ❑ Replacing. For the versions, refer to the Parts Catalog.
- ❑ Coat with refrigerant oil before installing





8 - Bracket

- ☐ For the refrigerant lines

9 - Cap

- ☐ Modine: 3 Nm
- ☐ There are different versions. Refer to the Parts Catalog.

10 - Snap Ring

11 - Cap

- ☐ There are different versions. Refer to the Parts Catalog.
- ☐ Replace if damaged

12 - Seal

- ☐ Replacing. For the versions, refer to the Parts Catalog.
- ☐ Coat with refrigerant oil before installing

13 - Dryer Bag

- ☐ There are different versions. Refer to the Parts Catalog.
- ☐ Removing and installing:
- ◆ Denso condenser. Refer to ⇒ ["2.6.1 Dryer Bag, Removing and Installing, Denso Condenser", page 118](#) .
- ◆ Modine condenser. Refer to ⇒ ["2.6.2 Dryer Bag, Removing and Installing, Modine Condenser", page 120](#) .
- ◆ Keihin condenser. Refer to ⇒ ["2.6.3 Dryer Bag, Removing and Installing, Keihin Condenser", page 123](#) .

14 - Strainer

- ☐ There are different versions. Refer to the Parts Catalog.
- ☐ Removal and installation
- ◆ Denso condenser. Refer to ⇒ ["2.6.1 Dryer Bag, Removing and Installing, Denso Condenser", page 118](#) .
- ◆ Modine condenser. Refer to ⇒ ["2.6.2 Dryer Bag, Removing and Installing, Modine Condenser", page 120](#) .
- ◆ Keihin condenser. Refer to ⇒ ["2.6.3 Dryer Bag, Removing and Installing, Keihin Condenser", page 123](#) .

15 - Receiver/Dryer

- ☐ There are different versions. Refer to the Parts Catalog.
- ☐ Is integrated on this version of the condenser



Note

Under certain conditions, the receiver/dryer and the dryer bag does not need to be replaced each time the refrigerant circuit is opened. Refer to ⇒ Refrigerant R134a Servicing; Rep. Gr. 00 ; Components, Replacing .

2.3 Refrigerant Circuit Pressure Sensor - G805- , Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench 1331 5-50Nm - VAG1331-
- ◆ Commercially available extra-long 12 edge socket, 1/2" 24-wrench size (Dimensions DxL 32x82 mm)

Removing

- Note safety precautions. Refer to ⇒ ["1.1 Handling Refrigerant Safety Precautions", page 1](#) .



- See notes. Refer to
⇒ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .
- Disconnect the connector -2-.

CAUTION

Danger or frostbite due to refrigerant coming out under pressure.

Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- If refrigerant flows out of the refrigerant line longer than 1 second when loosening the pressure sensor, tighten the pressure sensor and replace the faulty check valve.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.

- Counterhold the refrigerant line with a suitable tool.

CAUTION

Danger or frostbite due to refrigerant coming out under pressure. If work is performed improperly the connection can tear and refrigerant can flow out.

Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Counterhold the refrigerant line with a suitable tool.

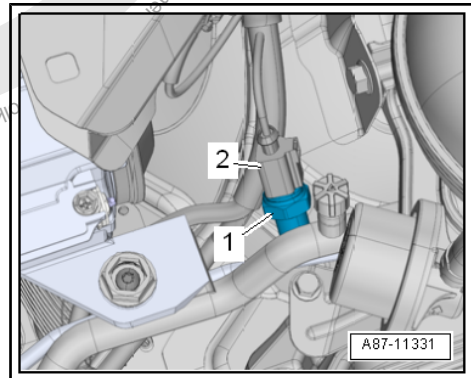
- Remove the pressure sensor -1- with a Commercially Available 12-Edge 1/2" Socket Long, 24mm .

Installing

Install in reverse order of removal.

Tightening Specifications

- ♦ Refer to Refrigerant Circuit Pressure Sensor - G805-
-item 19- ⇒ [Item 19 \(page 102\)](#) .



2.4 Expansion Valve, Removing and Installing

⇒ [“2.4.1 Expansion Valve, Removing and Installing, Golf and Golf Wagon”, page 110](#)

⇒ [“2.4.2 Expansion Valve, Removing and Installing, Golf GTE”, page 113](#)

2.4.1 Expansion Valve, Removing and Installing, Golf and Golf Wagon

Special tools and workshop equipment required

- ♦ Torque Wrench 1331 5-50Nm - VAG1331- (5 to 50 Nm)



- ◆ Engine Bung Set - VAS6122-
- ◆ A/C Service Station

Functions

- ◆ The expansion valve atomizes the streaming refrigerant and controls the flow quantity so that the vapor is gaseous only at the evaporator outlet, depending on the heat transmission.

Removing

- Note safety precautions. Refer to
⇒ ["1.1 Handling Refrigerant Safety Precautions", page 1](#) .
- See notes. Refer to
⇒ ["4.1 Working on the Refrigerant Circuit", page 8](#) .

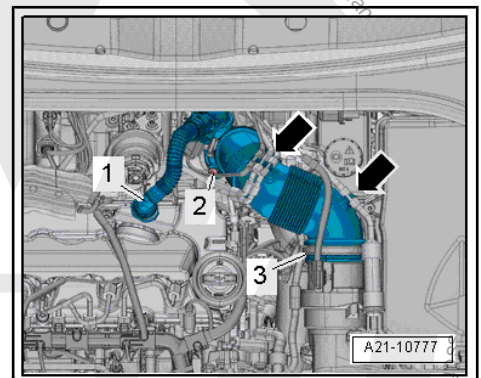


Note

- ◆ Extract the refrigerant using the A/C Service Station .
- ◆ The previously used service stations can still be used see shop equipment catalog.
- ◆ To prevent the ingress of dampness all components of the refrigerant circuit which have been opened must be sealed with suitable plugs.
- ◆ On some vehicles, connecting pipe from charge air cooler should be removed. Refer to ⇒ Rep. Gr. 21, Charge Air System; Overview - Charge Air System .

Vehicles with a TDI Engine

- Press the release buttons on the hose -1- for the crankcase ventilation and remove the hose from the cylinder head cover.
- Free up the vacuum hoses at the air guide pipe -arrows-.
- Loosen the hose clamp -3-.
- Pivot the air guide pipe with the connection rearward and remove from the turbocharger.





All Vehicles

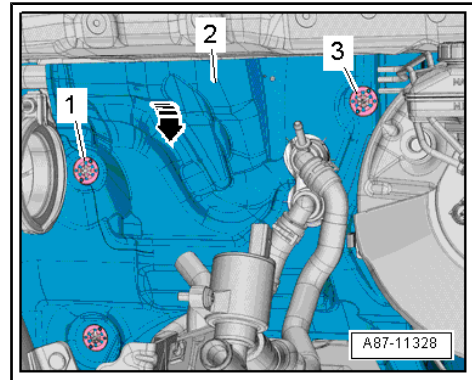
- Remove the sheet metal nuts -1 and 3-.
- Fold the heat shield -2- as far forward as possible -arrow-.

⚠ CAUTION

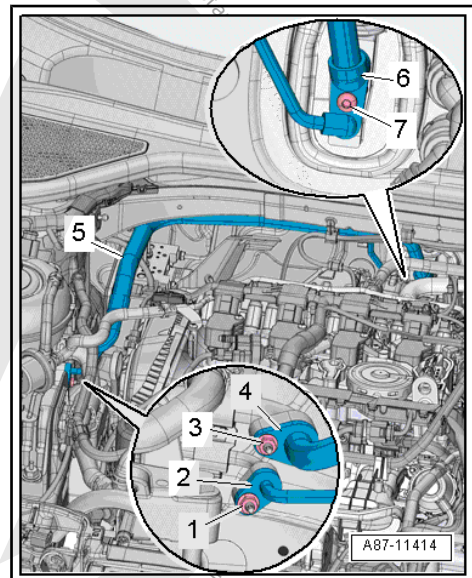
Danger or frostbite due to refrigerant coming out under pressure.

Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.

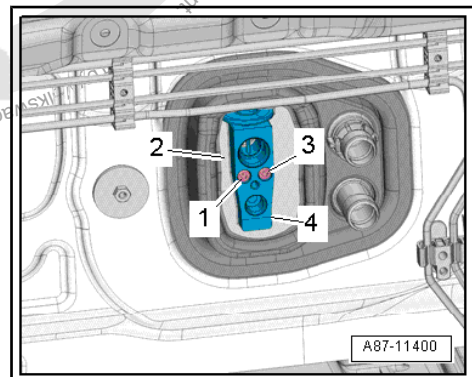


- Extract refrigerant.
- Remove the nuts -1 and 3- from the refrigerant line with the inner heat exchanger.
- Remove the bolt -7-.
- Disconnect the refrigerant line with the inner heat exchanger from the expansion valve.



- Remove the bolts -1 and 3-.
- Remove the expansion valve -4- from the heat shield insulation -2-.
- Seal the open lines and connections with clean plugs from the Engine Bung Set - VAS6122- .

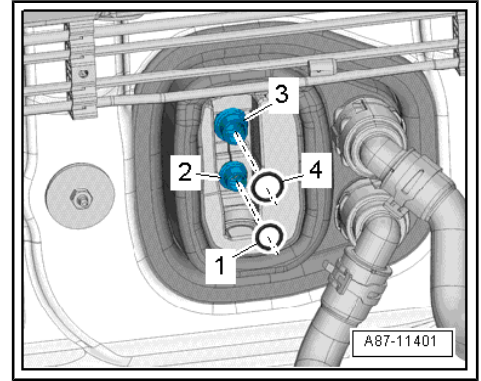
Installing



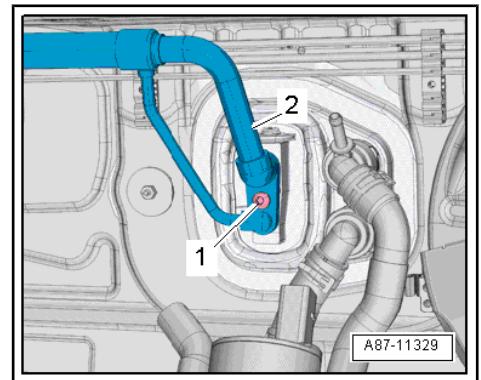


Install in reverse order of removal. Note the following:

- Replace the seals, version. Refer to the Parts Catalog.
- Replace the seals -1 and 4- on the connecting tubes -2 and 3- to the evaporator.

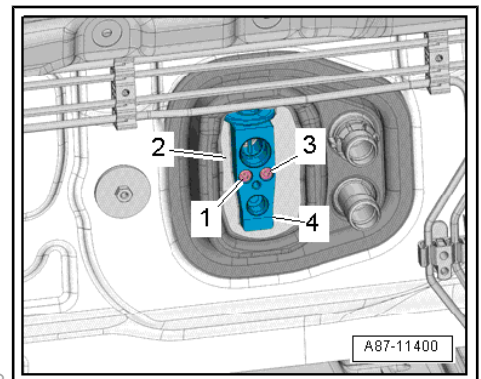


- Press in the refrigerant pipe -2- by hand on the expansion valve.
- Install the bolt -1- by hand and the tighten to the specified tightening specification.



Note

- ◆ The expansion valve is available in different versions (same housing but different control characteristic). Allocation. Refer to the Parts Catalog.
- ◆ Inspect the refrigerant pipes leading to the evaporator for debris and damage.
- ◆ Coat the seals with refrigerant oil before installing.
- ◆ Pay attention that the seal on the evaporator connecting tube is seated correctly.
- ◆ If the heat protection insulation -2- is missing or not installed correctly, it can cause reduced output of the Air Conditioning (A/C) system (change of the set control characteristic due to radiant heat).



Tightening Specifications

- ◆ Refer to
➤ ["2.1 System Overview - Refrigerant Circuit", page 100](#)

2.4.2 Expansion Valve, Removing and Installing, Golf GTE

Special tools and workshop equipment required

- ◆ Torque Wrench 1331 5-50Nm - VAG1331- (5 to 50 Nm)
- ◆ Engine Bung Set - VAS6122-
- ◆ A/C Service Station



Functions

- ♦ The expansion valve atomizes the streaming refrigerant and controls the flow quantity so that the vapor is gaseous only at the evaporator outlet, depending on the heat transmission.

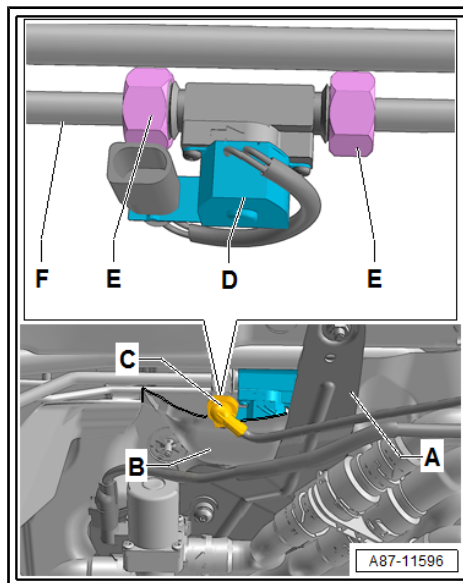
Removing

- Note safety precautions. Refer to
⇒ [“1.1 Handling Refrigerant Safety Precautions”, page 1](#) .
- See notes. Refer to
⇒ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .
- Observe safety precautions when working on the high voltage system. Refer to
⇒ [“1.3 High Voltage System Safety Precautions”, page 1](#) .
- Pay attention to safety precautions for working near high voltage components. Refer to
⇒ [“1.4 Safety Precautions near High Voltage Components”, page 2](#) .
- Pay attention to the high voltage system danger classification. Refer to ⇒ Rep. Gr. 00 ; High Voltage System Danger Classification .



Note

- ♦ *Extract the refrigerant using the A/C Service Station .*
 - ♦ *The previously used service stations can still be used see shop equipment catalog.*
 - ♦ *To prevent the ingress of dampness all components of the refrigerant circuit which have been opened must be sealed with suitable plugs.*
 - ♦ *On some vehicles, connecting pipe from charge air cooler should be removed. Refer to ⇒ Rep. Gr. 21 ; Charge Air System; Overview - Charge Air System .*
- Remove the air guide pipes in front of the expansion valve.
 - Loosen the bracket -A- for the High Voltage Battery Coolant Valve - N688- from the plenum chamber bulkhead.





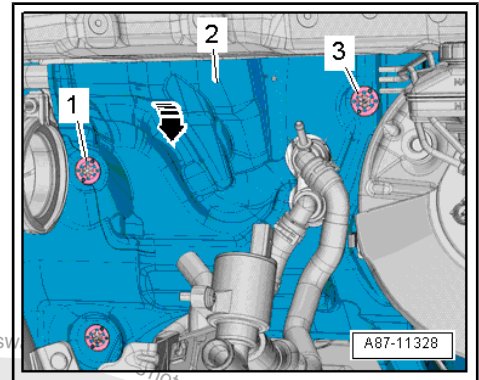
- Remove the sheet metal nuts -1 and 3-.
- Fold the heat shield -2- as far forward as possible -arrow-.

⚠ CAUTION

Danger or frostbite due to refrigerant coming out under pressure.

Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.



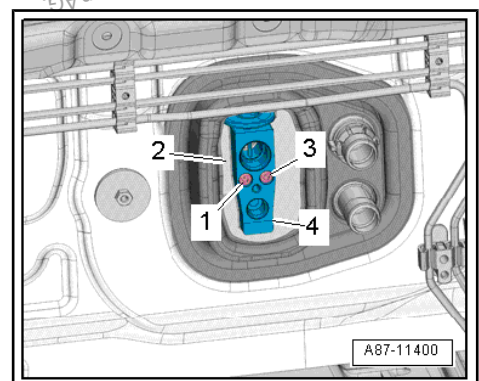
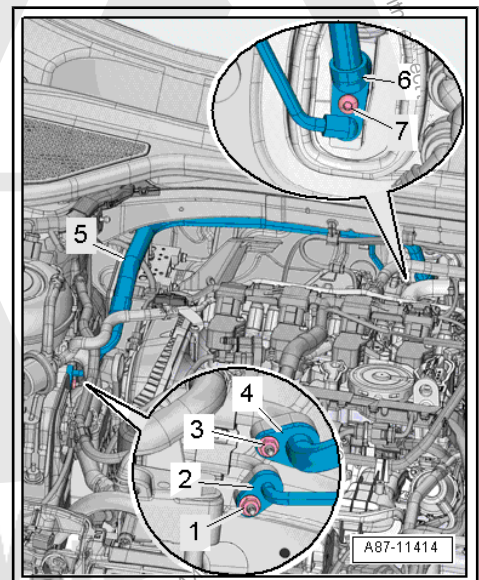
- Extract refrigerant.
- Remove the nuts -1 and 3- from the refrigerant line with the inner heat exchanger.

i Note

- ◆ This illustration shows the layout on a vehicle without a high voltage system.
- ◆ On a vehicle with a high voltage system the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- is installed in the refrigerant line- high pressure side. Refer to [⇒ "2.10 Heater and A/C Unit Refrigerant Cut-Off Valve N541, Removing and Installing", page 129](#).
- ◆ If necessary, disconnect the connector to the Heater and A/C Unit Refrigerant Cut-Off Valve - N541-.

- Remove the bolt -7-.
- Disconnect the refrigerant line with the inner heat exchanger from the expansion valve.
- Remove the bolts -1 and 3-.
- Remove the expansion valve -4- from the heat shield insulation -2-.
- Seal the open lines and connections with clean plugs from the Engine Bung Set - VAS6122-.

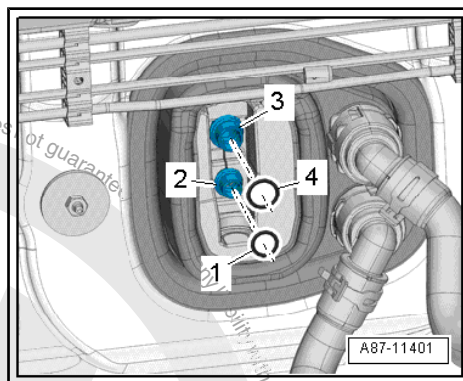
Installing



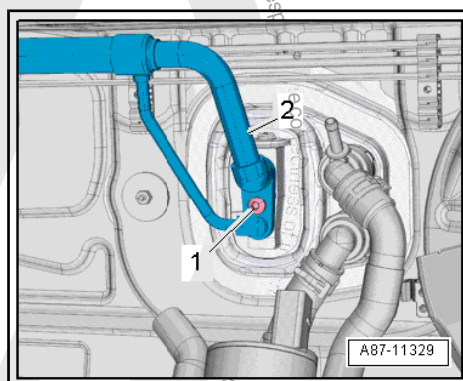


Install in reverse order of removal. Note the following:

- Replace the seals, version. Refer to the Parts Catalog.
- Replace the seals -1 and 4- on the connecting tubes -2 and 3- to the evaporator.

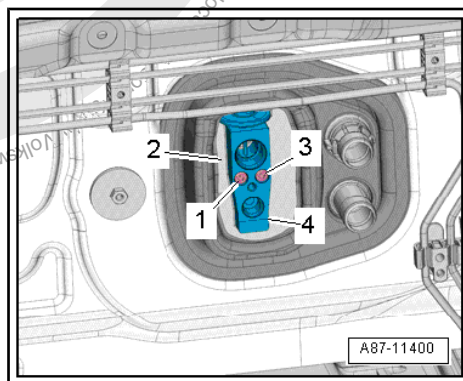


- Press in the refrigerant pipe -2- by hand on the expansion valve.
- Install the bolt -1- by hand and the tighten to the specified tightening specification.



Note

- ◆ The expansion valve is available in different versions (same housing but different control characteristic). Allocation. Refer to the Parts Catalog.
- ◆ Inspect the refrigerant pipes leading to the evaporator for debris and damage.
- ◆ Coat the seals with refrigerant oil before installing.
- ◆ Pay attention that the seal on the evaporator connecting tube is seated correctly.
- ◆ If the heat protection insulation -2- is missing or not installed correctly, it can cause reduced output of the A/C system (change of the set control characteristic due to radiant heat).



Tightening Specifications

- ◆ Refer to
⇒ ["2.1 System Overview - Refrigerant Circuit", page 100](#)

2.5 Condenser, Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench 1331 5-50Nm - VAG1331- (5 to 50 Nm)
- ◆ A/C Service Station



Note

- ◆ The previously used service stations can still be used see shop equipment catalog.
- ◆ To prevent the ingress of dampness all components of the refrigerant circuit which have been opened must be sealed with suitable plugs.

Perform the following work first:

- Turn off all electric consumers.
- Turn off the ignition.
- Remove the key.



Note

Environmentally hazardous draining of refrigerant is an offense punishable by law.

Removing

- Note safety precautions. Refer to ⇒ ["1.1 Handling Refrigerant Safety Precautions", page 1](#) .
- See notes. Refer to ⇒ ["4.1 Working on the Refrigerant Circuit", page 8](#) .
- Remove the front bumper cover. Refer to ⇒ Body Exterior; Rep. Gr. 63 ; Front Bumper; Bumper Cover, Removing and Installing .
- Release the air guide -2- from the mount -arrow- upward.
- Press the attachment -4- downward in direction of -arrow- and pull the air guide -2- forward.
- Remove the air guide downward.



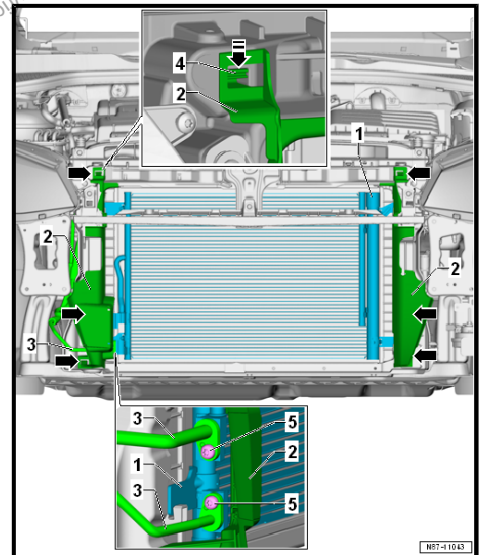
CAUTION

Danger or frostbite due to refrigerant coming out under pressure.

Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.

- Extract the refrigerant using the A/C Service Station .
- Remove the bolts -5-.
- Remove the refrigerant lines -3- from the connection on the condenser.
- Seal off the line connections.





- Have a second technician release the left and right tabs -1- in direction of -arrow A- and remove the condenser -3- upward out of the mounts in direction of -B arrows-.
- Remove the condenser -3- downward.

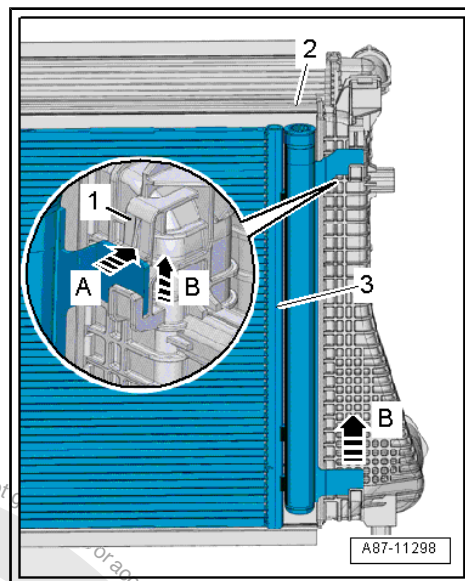
Installing

Install in reverse order of removal. Note the following:

- Replace the seals.

Tightening Specifications

- ◆ Refer to ⇒ [“2.2 Overview - Condenser”, page 108](#)
- ◆ Overview - Front Bumper. Refer to ⇒ Body Exterior; Rep. Gr. 63 ; Front Bumper; Overview - Bumper Cover ,



2.6 Dryer Bag/Dryer Cartridge, Removing and Installing

⇒ [“2.6.1 Dryer Bag, Removing and Installing, Denso Condenser”, page 118](#)

⇒ [“2.6.2 Dryer Bag, Removing and Installing, Modine Condenser”, page 120](#)

⇒ [“2.6.3 Dryer Bag, Removing and Installing, Keihin Condenser”, page 123](#)

2.6.1 Dryer Bag, Removing and Installing, Denso Condenser

Special tools and workshop equipment required

- ◆ Commercially available pick-up tool



Note

- ◆ See notes. Refer to ⇒ [“2.1 System Overview - Refrigerant Circuit”, page 100](#).
- ◆ Extract the refrigerant using the A/C Service Station .
- ◆ The previously used service stations can still be used see shop equipment catalog.
- ◆ To prevent the ingress of dampness all components of the refrigerant circuit which have been opened must be sealed with suitable plugs.

- Extract refrigerant using the A/C Service Station , only then open the refrigerant circuit.

Removing

- Note safety precautions. Refer to ⇒ [“1.1 Handling Refrigerant Safety Precautions”, page 1](#) .
- See notes. Refer to ⇒ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .
- Remove, depending on the charge air system engine components. Refer to ⇒ Rep. Gr. 21 ; Charge Air System; Overview - Charge Air System .



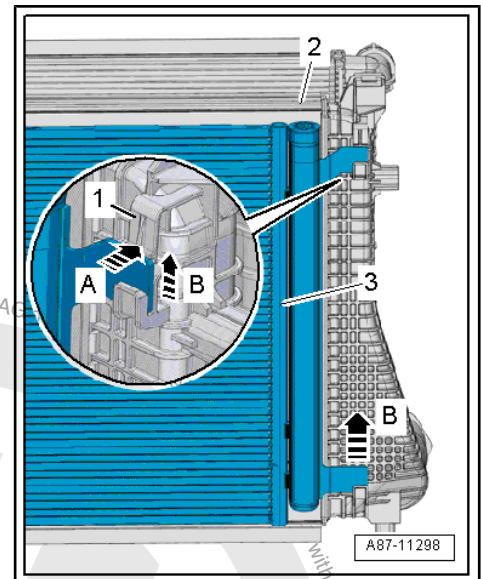
- Remove the radiator grille. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Radiator Grille/Front Trim; Radiator Grille, Removing and Installing .
- Have a second technician release the left and right tabs -1- in direction of -arrow A- and remove the condenser -3- upward out of the mounts in direction of -arrow B-.
- Move the condenser as far forward as possible.

⚠ CAUTION

Danger of frostbite due to refrigerant coming out under pressure.

Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.



- Remove the sealing plug -A-.
- Remove the dryer carrier -C- with the dryer bag -D- upward from the receiver/dryer.
- Remove the filter element -E- upward from the receiver/dryer using, for example, a pick-up tool.
- Seal the open receiver/dryer with the sealing plug -A- to prevent dirt and moisture from getting in.

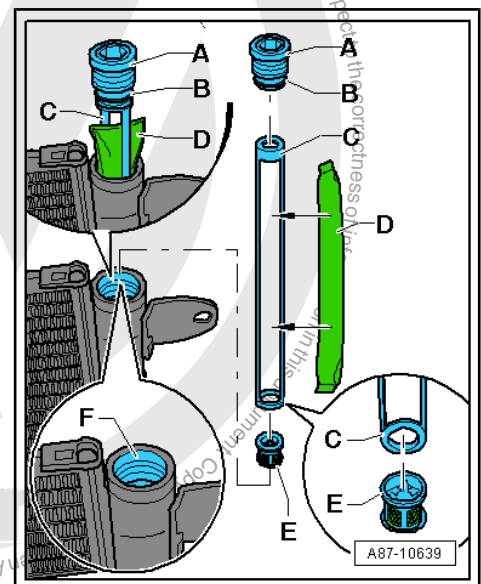
Installing

Install in reverse order of removal. Note the following:



Note

- ◆ Replace the sealing plug, seal and dryer bag after every opening of the receiver/dryer. Refer to Parts Catalog.
- ◆ Keep the dryer bag air-tight package closed as long as possible. Do not remove the dryer bag until just before replacing the dryer bag in the condenser. The dryer bag absorbs moisture in a very short time and become unusable.
- ◆ Coat the seals for the plug with refrigerant oil before installing.
- Using the opening, inspect the receiver/dryer on the condenser for dirt and damage on the threaded- and sealing surfaces.

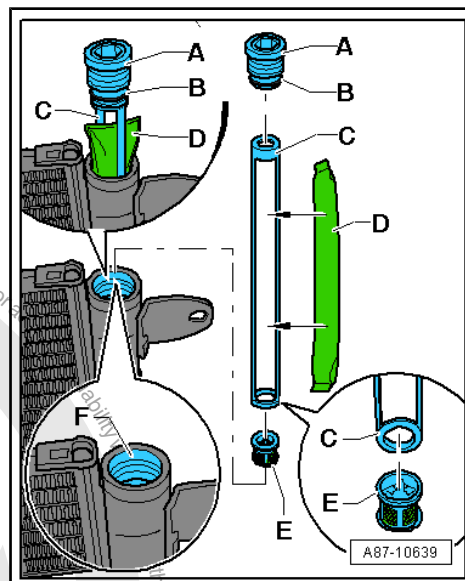




- Install the filter element -E- with the correct side into the condenser receiver/dryer.
- Remove the dryer bag -D- from the package and insert it into the dryer carrier -C-.
- Insert the dryer bag together with the dryer cartridge into the condenser receiver/dryer.
- Position and install the sealing plug -A-.

Tightening Specifications

- ◆ Refer to ⇒ [“2.2 Overview - Condenser”, page 108](#)
- ◆ Radiator Grille/Front Trim; Overview - Radiator Grille. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Radiator Grille/Front Trim; Overview - Radiator Grille .



2.6.2 Dryer Bag, Removing and Installing, Modine Condenser

Special tools and workshop equipment required

- ◆ T50 Socket



Note

- ◆ See notes. Refer to ⇒ [“2.1 System Overview - Refrigerant Circuit”, page 100](#) .
- ◆ Extract the refrigerant using the A/C Service Station .
- ◆ The previously used service stations can still be used see shop equipment catalog.
- ◆ To prevent the ingress of dampness all components of the refrigerant circuit which have been opened must be sealed with suitable plugs.

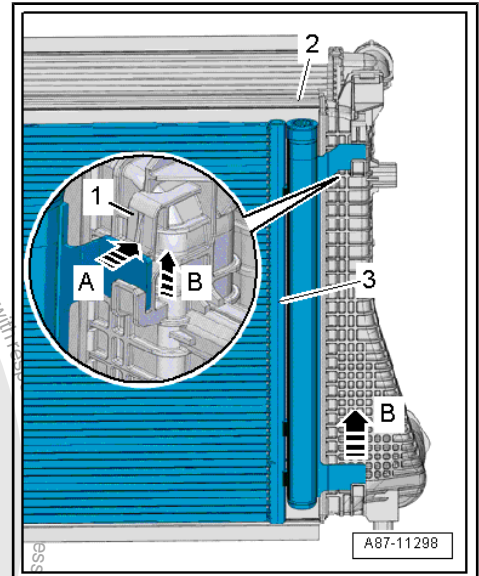
- Extract refrigerant using the A/C Service Station , only then open the refrigerant circuit.

Removing

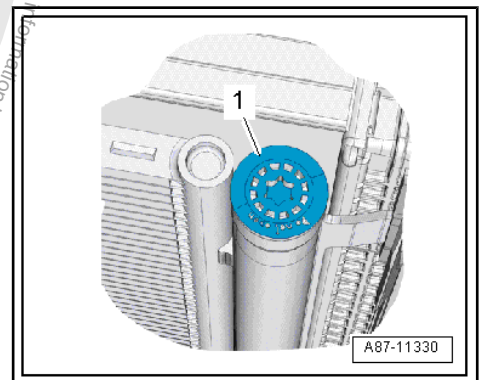
- Note safety precautions. Refer to ⇒ [“1.1 Handling Refrigerant Safety Precautions”, page 1](#) .
- See notes. Refer to ⇒ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .
- Remove, depending on the charge air system engine components. Refer to ⇒ Rep. Gr. 21 ; Charge Air System; Overview - Charge Air System .
- Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Radiator Grille/Front Trim; Radiator Grille, Removing and Installing .



- Have a second technician release the left and right tabs -1- in direction of -arrow A- and remove the condenser -3- upward out of the mounts in direction of -arrow B-.
- Move the condenser as far forward as possible.



- Remove the cap -1- using the T50 Socket .



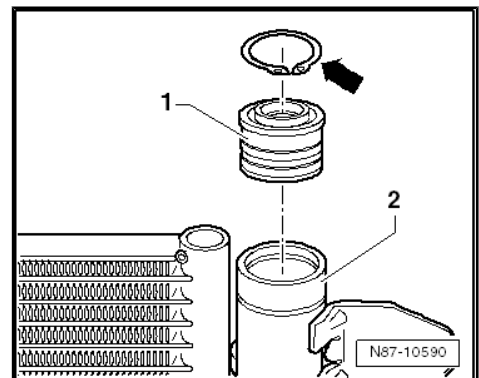
- Push in the cap -1- slightly.

⚠ CAUTION

Danger or frostbite due to refrigerant coming out under pressure.

Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.



- Remove the snap ring -arrow-.
- Install a M12 bolt in the cover and carefully pull it out of the receiver/dryer -2-.
- Remove the dryer bag with a commercially available pick-up tool from the receiver/dryer.

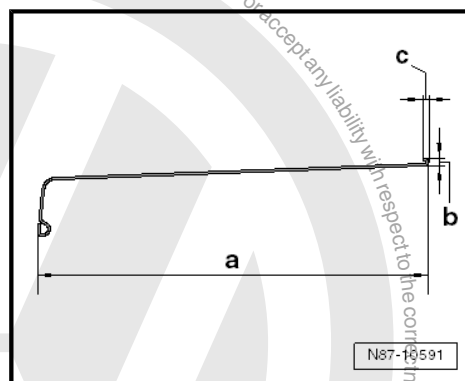


- Make a 2 mm diameter welding wire with the following dimensions.

a - 380 mm

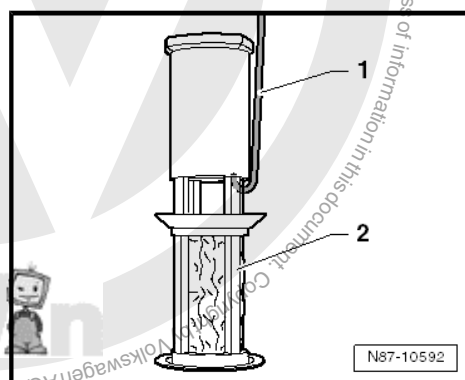
b - maximum 7 mm

c - maximum 6 mm



Hook the welding wire onto the strainer exactly as illustrated to prevent damage to the receiver/dryer

- Carefully remove the filter (strainer) -2- from the receiver/dryer with the welding wire -1-.



- If the work is not completed, close open receiver/dryer with the cap -1- to prevent dirt and moisture from entering.

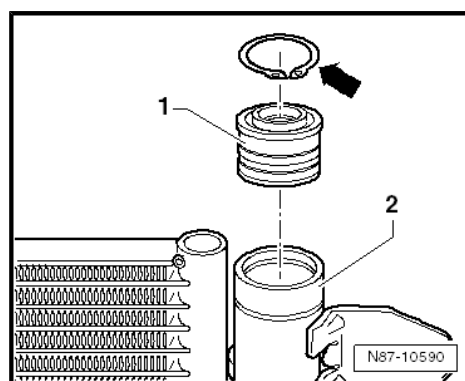
Installing

Install in reverse order of removal. Note the following:



Note

Replace the cap, seal and dryer bag after every opening of the receiver/dryer. Refer to Parts Catalog.

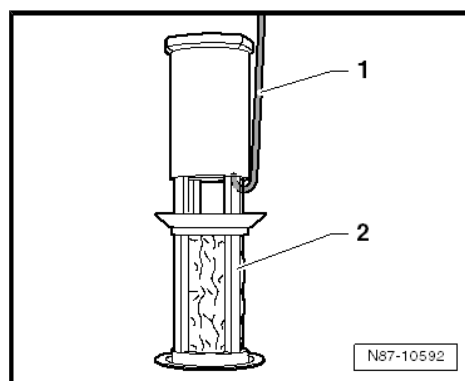


- Using the opening, inspect the receiver/dryer on the condenser for dirt and damage on the threaded- and sealing surfaces.
- Insert the filter element (with strainer) -2- with the correct side into the condenser receiver/dryer.
- The filter element must be pushed in until stop.



Note

Keep the dryer bag air-tight package closed as long as possible. Do not remove the dryer bag until just before replacing the dryer bag in the condenser. The dryer bag absorbs moisture in a very short time and become unusable.



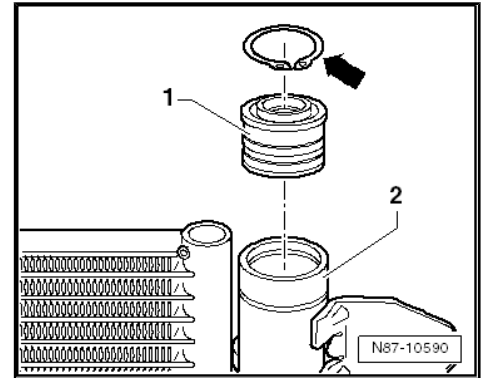
- Remove the dryer bag from the package and insert it into the condenser receiver/dryer.



- Insert the cap -1- and push it far enough downward so that the circlip -arrow- can engage in the groove.

i Note

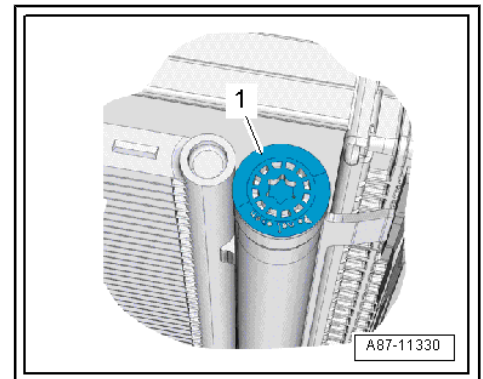
Coat the seal for the cap with refrigerant oil before installing.



- Install the cap -1- using the T50 Socket .

Tightening Specifications

- ◆ Refer to ➔ [“2.2 Overview - Condenser”, page 108](#)
- ◆ Radiator Grille/Front Trim: Overview - Radiator Grille. Refer to ➔ Body Exterior; Rep. Gr. 66 ; Radiator Grille/Front Trim; Overview - Radiator Grille .



2.6.3 Dryer Bag, Removing and Installing, Keihin Condenser

Special tools and workshop equipment required

- ◆ T50 Socket
- ◆ A/C Service Station

i Note

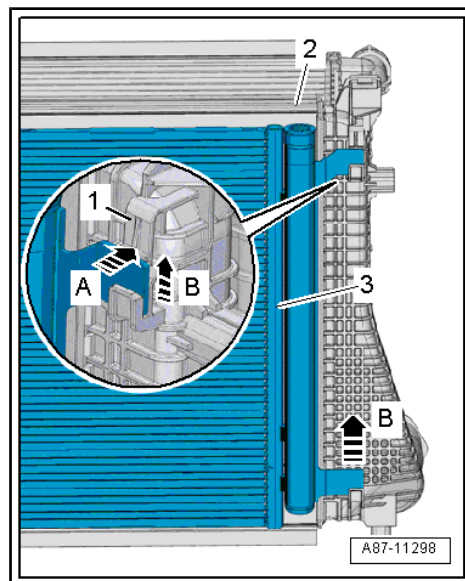
- ◆ See notes. Refer to ➔ [“2.1 System Overview - Refrigerant Circuit”, page 100](#) .
- ◆ Extract the refrigerant using the A/C Service Station .
- ◆ The previously used service stations can still be used see shop equipment catalog.
- ◆ To prevent the ingress of dampness all components of the refrigerant circuit which have been opened must be sealed with suitable plugs.
- Extract refrigerant using the A/C Service Station , only then open the refrigerant circuit.

Removing

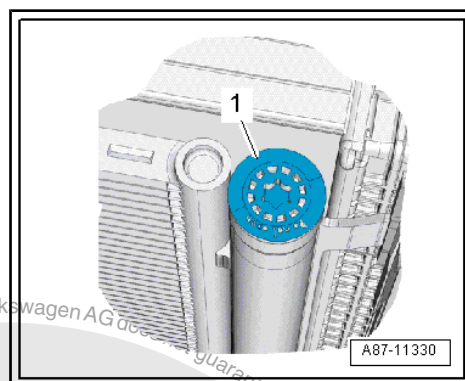
- Note safety precautions. Refer to ➔ [“1.1 Handling Refrigerant Safety Precautions”, page 1](#) .
- See notes. Refer to ➔ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .
- Remove, depending on the charge air system engine components. Refer to ➔ Rep. Gr. 21 ; Charge Air System; Overview - Charge Air System .
- Refer to ➔ Body Exterior; Rep. Gr. 66 ; Radiator Grille/Front Trim; Radiator Grille, Removing and Installing .



- Have a second technician release the left and right tabs -1- in direction of -arrow A- and remove the condenser -3- upward out of the mounts in direction of -arrow B-.
- Move the condenser as far forward as possible.



- Remove the cap -1- using the T50 Socket .



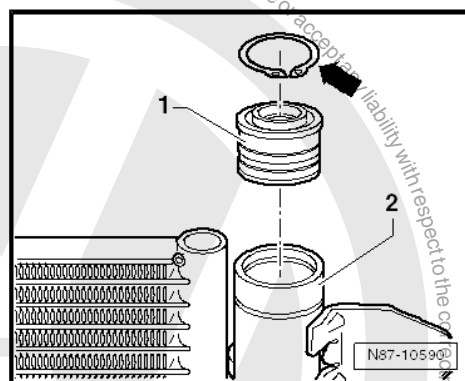
- Push in the cap -1- slightly.

⚠ CAUTION

Danger or frostbite due to refrigerant coming out under pressure.

Frostbite on the skin and other parts of the body is possible.

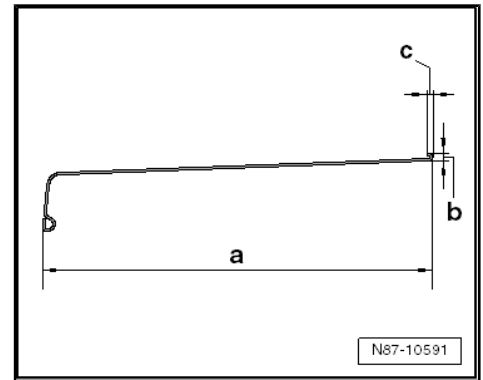
- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.



- Remove the snap ring -arrow-.
- Install a M12 bolt in the cover and carefully pull it out of the receiver/dryer -2-.
- Remove the dryer bag with a commercially available pick-up tool from the receiver/dryer.

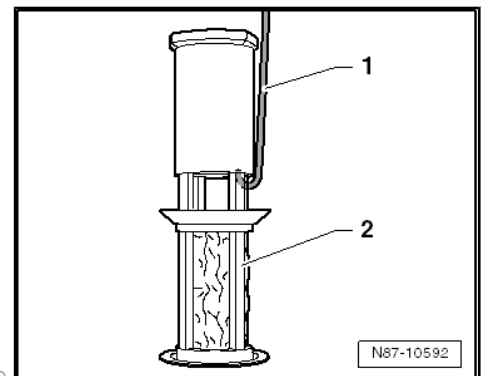


- Make a 2 mm diameter welding wire with the following dimensions.
- a - 380 mm
- b - maximum 7 mm
- c - maximum 6 mm



Hook the welding wire onto the strainer exactly as illustrated to prevent damage to the receiver/dryer

- Carefully remove the filter (strainer) -2- from the receiver/dryer with the welding wire -1-.



- If the work is not completed, close open receiver/dryer with the cap -1- to prevent dirt and moisture from entering.

Installing

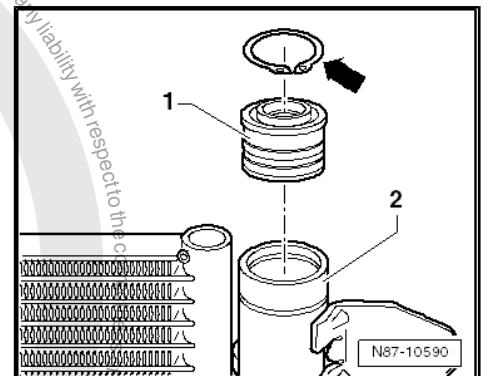
Install in reverse order of removal. Note the following:



Note

Replace the cap, seal and dryer bag after every opening of the receiver/dryer. Refer to Parts Catalog.

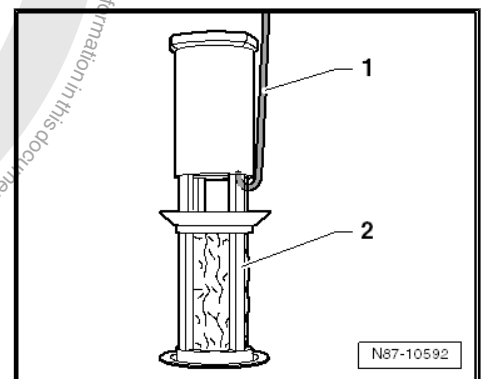
- Using the opening, inspect the receiver/dryer on the condenser for dirt and damage on the threaded- and sealing surfaces.
- Insert the filter element (with strainer) -2- with the correct side into the condenser receiver/dryer.
- The filter element must be pushed in until stop.



Note

Keep the dryer bag air-tight package closed as long as possible. Do not remove the dryer bag until just before replacing the dryer bag in the condenser. The dryer bag absorbs moisture in a very short time and become unusable.

- Remove the dryer bag from the package and insert it into the condenser receiver/dryer.



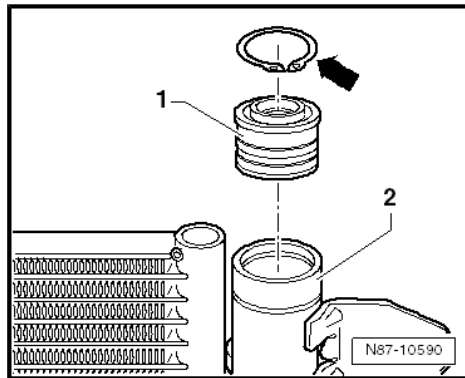


- Insert the cap -1- and push it far enough downward so that the circlip -arrow- can engage in the groove.



Note

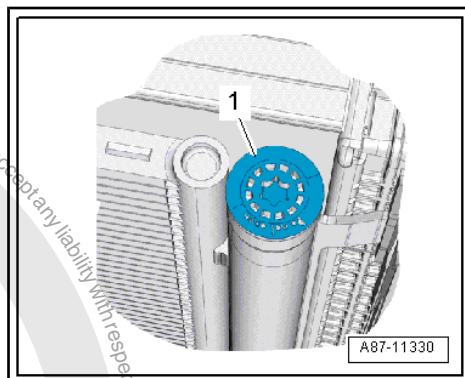
Coat the seal for the cap with refrigerant oil before installing.



- Install the cap -1- using the T50 Socket.

Tightening Specifications

- ♦ Refer to ⇒ [“2.2 Overview - Condenser”, page 108](#)
- ♦ Radiator Grille/Front Trim; Overview - Radiator Grille. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Radiator Grille/Front Trim; Overview - Radiator Grille .



2.7 Low Pressure Side Refrigerant Line Balance Weight, Removing and Installing

Special tools and workshop equipment required

- ♦ Torque Wrench 1331 5-50Nm - VAG1331- (5 to 50 Nm)

Removing

- Pay attention to safety precautions for working near high voltage components. Refer to ⇒ [“1.4 Safety Precautions near High Voltage Components”, page 2](#) .



Note

- ♦ *It is required to remove the refrigerant line to remove and install the balance weight.*
- ♦ *An additional balance -2- weight may be present on this refrigerant line -1- depending on the refrigerant line version and the production period. Refer to the Parts Catalog.*



- Remove the bolts -3-.
- Remove the balance weight -2- from the refrigerant line - low pressure side -1-.

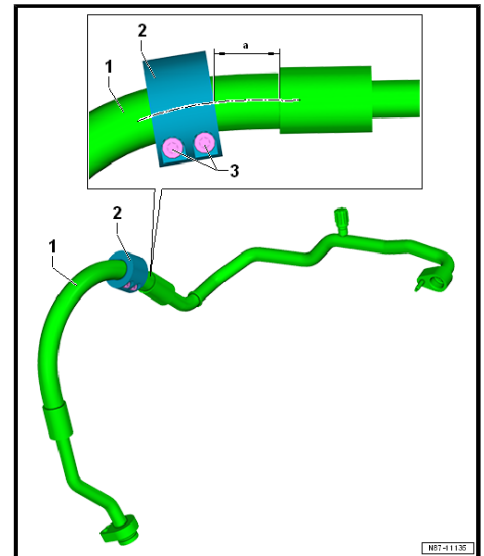
Installing

- Install the balance weight -2- to the specified dimension -a- 30 ± 5 mm on the refrigerant line-low pressure side -1-.
- Tighten the bolts -3-.



Note

- ◆ Pay attention, that the balance weight -2- is seated securely on the refrigerant line and does not touch or can come in contact with other components during operation.
- ◆ The refrigerant line-low pressure side -1- must not be crushed by the additional weight -B-.



Tightening Specification

Component	Tightening Specifications
Balance weight bolts	10 ± 1 Nm

2.8 Evacuating and Charging Valve, Removing and Installing, Low and High Pressure Side

Special tools and workshop equipment required

- ◆ Torque Wrench 1783 - 2-10Nm - VAG1783-
- ◆ Torque Wrench 1783 - 1/4" Drive Ratchet - VAS6234-
- ◆ Refrigerant Sockets - T10364-
- ◆ A/C Service Station



Note

- ◆ Environmentally hazardous draining of refrigerant is an offense punishable by law.
- ◆ To prevent the ingress of dampness, all components of the refrigerant circuit which have been opened must be sealed with suitable plugs.

Removing

- Note safety precautions. Refer to ["1.1 Handling Refrigerant Safety Precautions", page 1](#).
- See notes. Refer to ["4.1 Working on the Refrigerant Circuit", page 8](#).
- Pay attention to safety precautions for working near high voltage components. Refer to ["1.4 Safety Precautions near High Voltage Components", page 2](#).



- Remove the cap -3-.

⚠ CAUTION

Danger or frostbite due to refrigerant coming out under pressure.

Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.

- Extract from the refrigerant circuit using the A/C Service Station . Then immediately replace the valve -2-.
- Remove the valve insert -2- from the refrigerant line.

Installing

- Install in reverse order of removal.

Tightening Specifications

- ♦ Refer to
⇒ [“2.1 System Overview - Refrigerant Circuit”, page 100](#)

2.9 A/C Pressure/Temperature Sensor - G395- , Removing and Installing

Special tools and workshop equipment required

- ♦ Torque Wrench 1331 5-50Nm - VAG1331- (5 to 50 Nm)
- ♦ Engine Bung Set - VAS6122-
- ♦ A/C Service Station

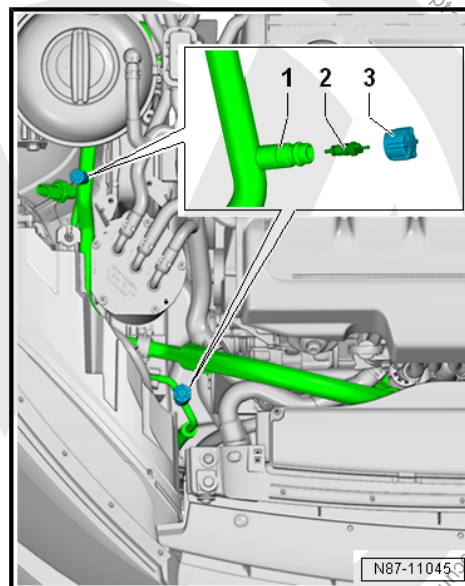


Note

Not installed in all vehicles and countries.

Removing

- Note safety precautions. Refer to
⇒ [“1.1 Handling Refrigerant Safety Precautions”, page 1](#) .
- See notes. Refer to
⇒ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .
- Pay attention to safety precautions for working near high voltage components. Refer to
⇒ [“1.4 Safety Precautions near High Voltage Components”, page 2](#) .
- Pay attention to the high voltage system danger classification. Refer to ⇒ Rep. Gr. 00 ; High Voltage System Danger Classification .
- Remove the front bumper cover. Refer to ⇒ Body Exterior; Rep. Gr. 63 ; Front Bumper .





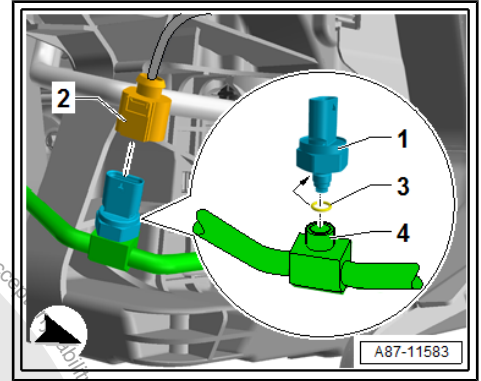
- Disconnect the connector -2-.
- Check the refrigerant line and connection -4- for contamination and if necessary clean.

⚠ CAUTION

Danger or frostbite due to refrigerant coming out under pressure.

Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.



- Loosen and remove the sensor -1-.
- Seal the open connection -4- with clean plugs from the Engine Bung Set - VAS6122- .

Installing

Install in reverse order of removal. Note the following:

- Check the connection -4- for contamination or damage if necessary clean or replace the refrigerant line.



Note

Replace the seal -3-. Refer to ["4.2 Refrigerant Circuit Seals", page 8](#) . Allocation. Refer to the Parts Catalog.

- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.

Tightening Specifications

Component	Tightening Specifications
A/C Pressure/Temperature Sensor - G395-	10 ± 1 Nm

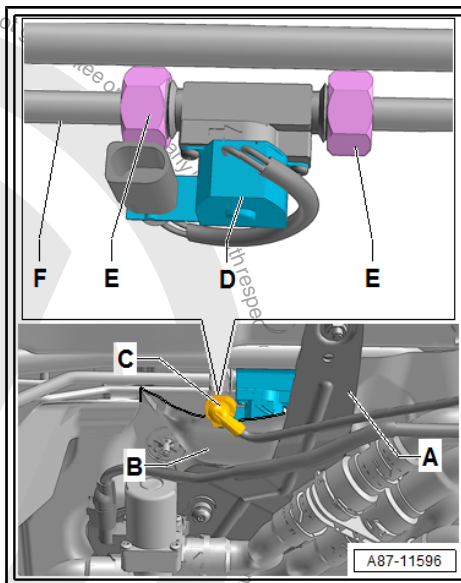
2.10 Heater and A/C Unit Refrigerant Cut-Off Valve - N541- , Removing and Installing

Removing

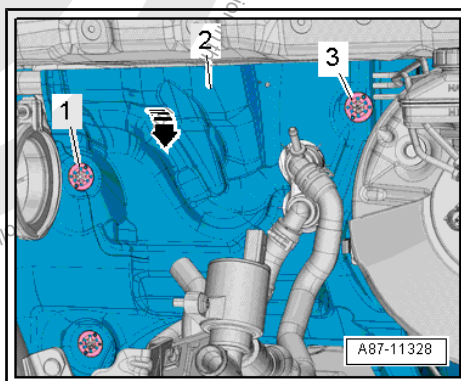
- Note safety precautions. Refer to ["1.1 Handling Refrigerant Safety Precautions", page 1](#) .
- See notes. Refer to ["4.1 Working on the Refrigerant Circuit", page 8](#) .
- Pay attention to safety precautions for working near high voltage components. Refer to ["1.4 Safety Precautions near High Voltage Components", page 2](#) .
- Pay attention to the high voltage system danger classification. Refer to ⇒ Rep. Gr. 00 ; High Voltage System Danger Classification .



- Turn off the ignition.
- Discharge the refrigerant circuit.
- Loosen the bracket -A- (for the Solenoid Valve 1 - N88-) from the plenum chamber bulkhead



- Loosen the heat shield -B- near the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- -D- and the refrigerant line -F- (to the coupling point on the right longitudinal member) from the plenum chamber bulkhead and carefully bend back.
- Remove the spring nuts -1- and 3-.
- Fold the heat shield -2- as far as necessary (and possible) forward -arrow-.



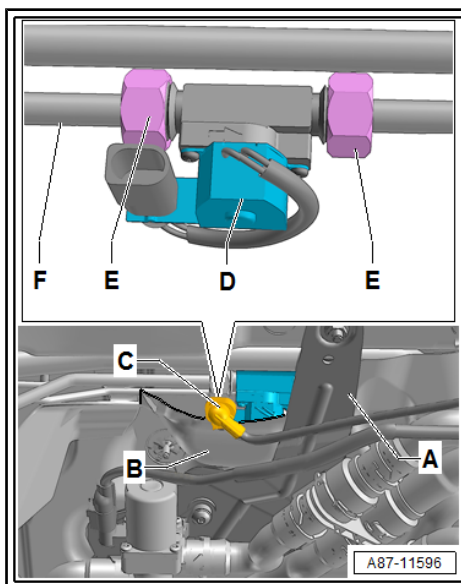
- Disconnect the connector -C- from the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- -D-.

CAUTION

Danger or frostbite due to refrigerant coming out under pressure.

Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.



- Loosen the union nut -E-, while doing this counterhold on the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- -D-.
- Loosen the refrigerant line -F- (to the coupling point on the right longitudinal member) from the bracket on the plenum chamber bulkhead.



- Remove the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- -D-.

Installing

Installation is carried out in the reverse order while observing the following.



Note

Check the routing of the refrigerant lines after attachment. They must be inserted into the provided brackets and must not come in contact with other components.

- Replace the seals -B-. Refer to ["4.2 Refrigerant Circuit Seals", page 8](#) . For the correct version, refer to the Parts Catalog.
- Tighten the union nuts -E- all the way by hand.
- Secure the refrigerant line -F- (to the coupling point on the right longitudinal member) in the bracket on the plenum chamber bulkhead.
- Tighten the union nuts -E- and while doing so, counterhold on the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- -D- and make sure that the routing of the refrigerant line is without tension.



Note

- ♦ *Make sure when tightening the union nuts that the refrigerant lines are not tensioned.*
- ♦ *Check the routing of the refrigerant lines after attachment. They must be inserted into the provided brackets and must not come in contact with other components.*

- Turn on the ignition.
- Check the Diagnostic Trouble Code (DTC) memory for the Climatronic Control Module - J255- control head and erase any displayed malfunctions, if necessary, using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.

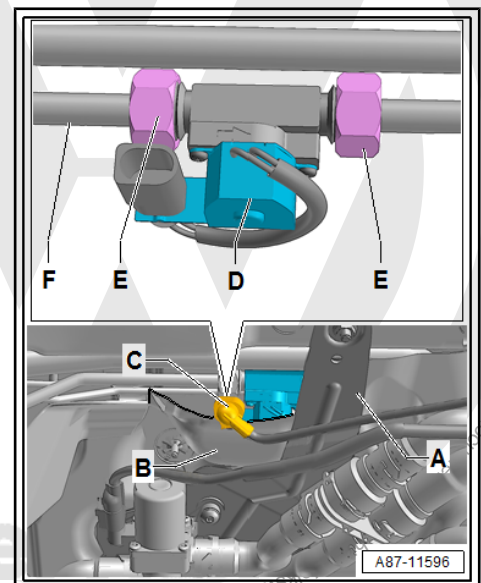
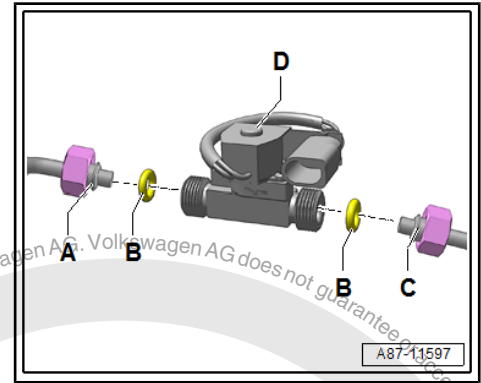
Tightening Specifications

Component	Tightening Specifications
Union nuts -E-	16.5 Nm

2.11 High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- , Removing and Installing

Removing

- Note safety precautions. Refer to ["1.1 Handling Refrigerant Safety Precautions", page 1](#) .
- See notes. Refer to ["4.1 Working on the Refrigerant Circuit", page 8](#) .
- Pay attention to safety precautions for working near high voltage components. Refer to ["1.4 Safety Precautions near High Voltage Components", page 2](#) .





- Pay attention to the high voltage system danger classification. Refer to ➤ Rep. Gr. 00 ; High Voltage System Danger Classification .
- Turn off the ignition.
- Discharge the refrigerant circuit.

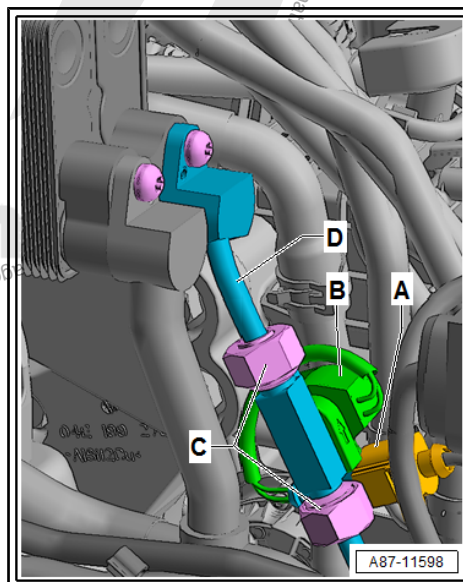
⚠ CAUTION

Danger or frostbite due to refrigerant coming out under pressure.

Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.

- Disconnect the connector -A- from the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- -B-.
- Loosen the union nuts -C- and while doing so counterhold on the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- -B-.
- Remove the refrigerant line -D- from the high voltage battery heat exchanger. Refer to
⇒ ["2.14 Refrigerant Line with Restrictor", page 141](#) .



- Remove the Heater and High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- -D-.

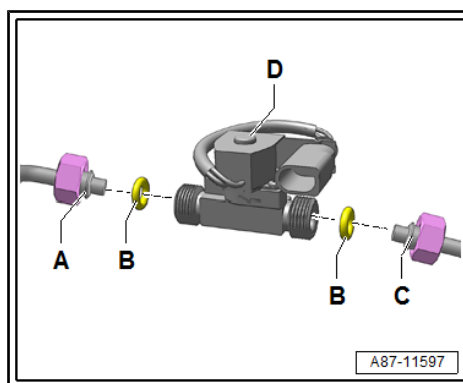
Installing

Installation is carried out in the reverse order while observing the following.



Note

- ◆ *Note the installation instructions for the seals -B-. Refer to ⇒ ["4.2 Refrigerant Circuit Seals", page 8](#) .*
- ◆ *Check the routing of the refrigerant lines after attachment. They must be inserted into the provided brackets and must not come in contact with other components.*
- Replace the seals -B-. For the correct version, refer to the Parts Catalog.



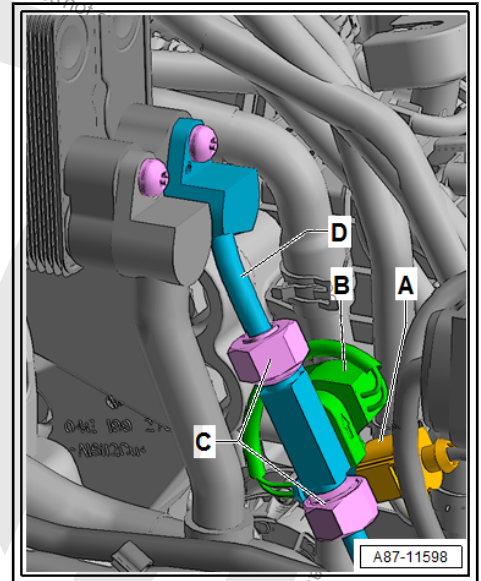


- Check the restrictor in the refrigerant line -D- (to the high voltage battery heat exchanger) for dirt. Refer to ➤ [“2.14 Refrigerant Line with Restrictor”, page 141](#) .
- Tighten the union nuts -C- all the way by hand.
- Install the refrigerant line -D- on the high voltage battery heat exchanger. Refer to ➤ [“2.14 Refrigerant Line with Restrictor”, page 141](#) .
- Tighten the union nuts -C-, and while doing so, counterhold on the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- -B- and make sure that the routing of the refrigerant lines is without tension.



Note

- ◆ *Make sure when tightening the union nuts that the refrigerant lines are not tensioned.*
- ◆ *Check the routing of the refrigerant lines after attachment. They must be inserted into the provided brackets and must not come in contact with other components.*
- ◆ *Pay attention to the notes for operating the Air Conditioning (A/C) system after charging. Refer to ➤ Refrigerant R134a Servicing; Rep. Gr. 00 ; A/C Service Station, Working with .*
- Evacuate and charge the refrigerant circuit. Refer to ➤ Refrigerant R134a Servicing; Rep. Gr. 00 ; A/C Service Station Working with .
- Turn on the ignition.
- Check the Diagnostic Trouble Code (DTC) memory for the Climatronic Control Module - J255- control head and erase any displayed malfunctions, if necessary, using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.



Tightening Specifications

Component	Tightening Specifications
Union nuts -C-	16.5 Nm

2.12 High Voltage Battery Heat Exchanger, Removing and Installing

Special tools and workshop equipment required

- ◆ Hose Clamps - Up To 25mm - 3094-
- ◆ Engine Bung Set - VAS6122-
- ◆ Spring Clip Pliers - VAS6499-
- ◆ Cooling System Tester - VAG1274B-

Removing

- Note safety precautions. Refer to ➤ [“1.1 Handling Refrigerant Safety Precautions”, page 1](#) .
- See notes. Refer to ➤ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .
- Note safety precautions. Refer to ➤ [“1.5 Cooling System Safety Precautions”, page 2](#) .
- Pay attention to safety precautions for working near high voltage components. Refer to



⇒ **"1.4 Safety Precautions near High Voltage Components",
page 2** .

- Pay attention to the high voltage system danger classification. Refer to ⇒ Rep. Gr. 00 ; High Voltage System Danger Classification .
- Extract refrigerant using the A/C Service Station , only then open the refrigerant circuit.



Note

To prevent the ingress of dampness all components of the refrigerant circuit which have been opened must be sealed with suitable plugs.

- Turn off the ignition.



CAUTION

The cooling system is under pressure when the engine is warm. There is a risk of scalding from hot steam and coolant.

Burns on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Reduce the pressure: cover the coolant reservoir cap with a cloth and carefully open.

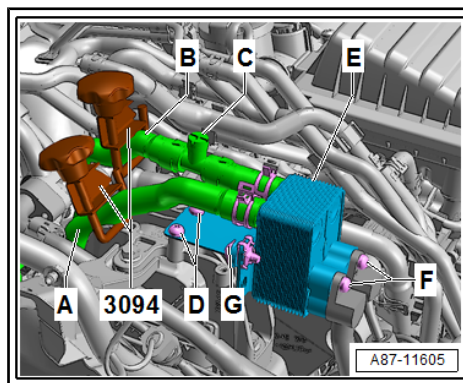
- Open the coolant reservoir cap for the high voltage system. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant .
- Loosen the coolant expansion tank for the engine coolant circuit from the vehicle and tilt slightly to the side. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant .
- Clamp the coolant hoses -A and B- with Hose Clamps - Up To 25mm - 3094- .



Note

The heater core is designed for a specific coolant flow direction. Therefore, coolant hoses must be connected on the correct sides.

- Cover the area beneath connections for coolant hoses on the heat exchanger -E- with absorbent paper.
- Remove coolant hoses -A and B- from connections on the heat exchanger -E-.
- Close the open connections for the coolant hoses on the heat exchanger -E- with clean plugs from the Engine Bung Set - VAS6122- .
- Remove the bolts -F- from the refrigerant line to the heat exchanger -E-.
- Remove the bolts -D-.





- Loosen the heat exchanger -E- from the refrigerant lines -B and C- and remove together with the bracket -F-.
- Seal the open connections for the coolant hoses on the heat exchanger -E- and on the refrigerant lines -B and C- with clean plugs from the Engine Bung Set - VAS6122- .



Note

The bracket -F- is secured with two bolts -G- on the heat exchanger -E-.

Installing

Install in reverse order of removal. Note the following:

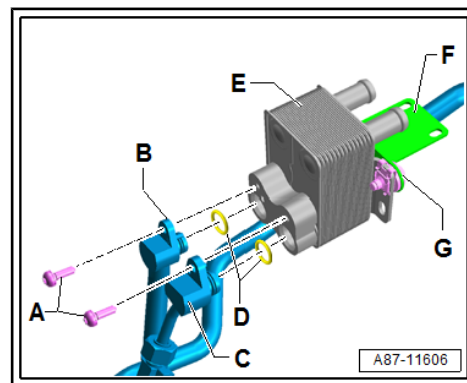
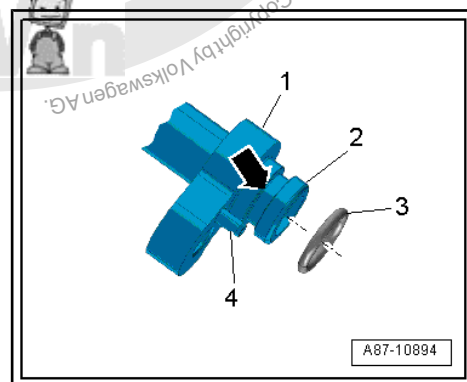
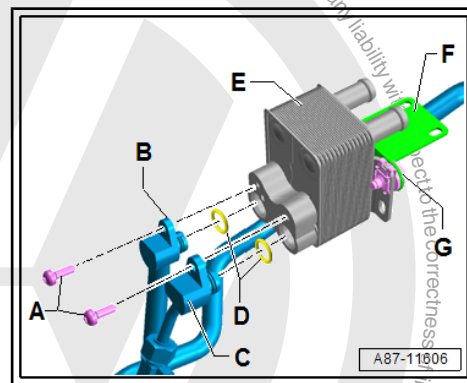
- Replace the seals -D-, For the correct version, refer to the Parts Catalog.
- Check the connection on the refrigerant line (-B- and -C-) and the heat exchanger -E- for debris and damage.
- Insert the seal -3- into the groove -arrow- on the refrigerant line connection -1-.



Note

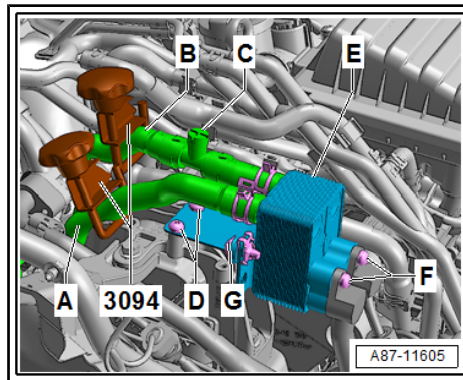
- ◆ If equipped, inspect the alignment pin -4- for damage and check that it is seated correctly.
- ◆ Coat the seals with refrigerant oil before installing. Refer to ["4.2 Refrigerant Circuit Seals", page 8](#) .
- ◆ Make sure the seals fit correctly inside the groove in the respective refrigerant line.

- The bracket -F- is secured with two bolts -G- on the heat exchanger -E-, if the bolts -G- are loosened replace them (but do not tighten them).
- Assemble the heat exchanger -E- with the refrigerant lines -B and C- and secured with the bolts -A- (Do not tighten the bolts -A-).





- Align the heat exchanger -E- free of tension and replace the bolts -D-.
- Tighten the bolts -G- (tightening specification: 8 Nm).
- Tighten the bolts -D- (tightening specification: 8 Nm).
- Tighten the bolts -F- (tightening specification: 8 Nm).
- Install the coolant hoses -A and B- on the connections on the heat exchanger -E-.
- Fill the coolant in the coolant expansion tank for the high voltage system. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant .
- Slightly raise the pressure in the coolant expansion tank for the high voltage system, for example with the Cooling System Tester - VAG1274B- . Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant
- Carefully open the bleeder screw -C-.
- Carefully open the Hose Clamps - Up To 25mm - 3094- on the coolant hose -A- and allow coolant to flow into the heat exchanger -E-.
- As soon as coolant flows out of the bleeder screw -C-, seal the bleeder screw -C- again.



Note

When the removal and installation of the high voltage battery heat exchanger -E- is performed as described above there should be no air in the high voltage system coolant circuit. If, for some other reason, there is still some air in the coolant circuit, bleed the coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant .

- If necessary, fill the coolant in the coolant expansion tank for the high voltage system. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant .
- Remove the Hose Clamps - Up To 25mm - 3094- and install all removed or loosened components.
- Perform remaining installation operations in reverse order of removal.
- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.

2.13 Refrigerant Lines with Inner Heat Exchanger, Removing and Installing

⇒ ["2.13.1 Refrigerant Lines with Inner Heat Exchanger, Removing and Installing, Golf and Golf Wagon", page 136](#)

⇒ ["2.13.2 Refrigerant Lines with Inner Heat Exchanger, Removing and Installing, Golf GTE", page 139](#)

2.13.1 Refrigerant Lines with Inner Heat Exchanger, Removing and Installing, Golf and Golf Wagon

Special tools and workshop equipment required

- ♦ Engine Bung Set - VAS6122-
- ♦ Torque Wrench 1331 5-50Nm - VAG1331- (5 to 50 Nm)



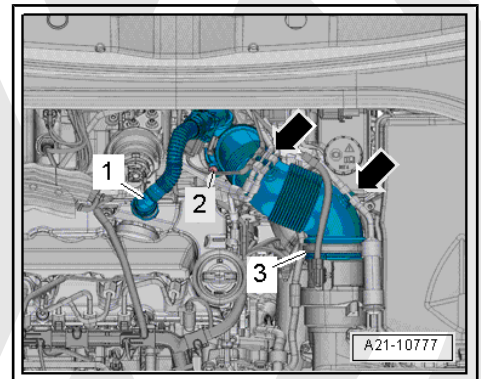
◆ A/C Service Station

Removing

- Note safety precautions. Refer to
⇒ ["1.1 Handling Refrigerant Safety Precautions", page 1](#).
- See notes. Refer to
⇒ ["4.1 Working on the Refrigerant Circuit", page 8](#).
- Extract refrigerant using the A/C Service Station , only then open the refrigerant circuit.

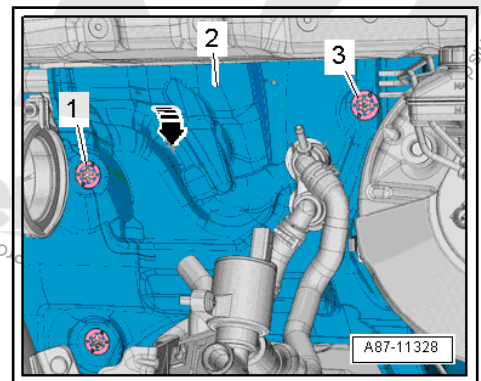
Vehicles with A TDI Engine

- Press the release buttons on the hose -1- for the crankcase ventilation and remove the hose from the cylinder head cover.
- Free up the vacuum hoses at the air guide pipe -arrows-.
- Loosen the hose clamp -3-.
- Remove the bolt -2- and tilt the air guide pipe with the connection downward and remove it from the turbocharger.



For All Vehicles

- Remove the sheet metal nuts -1 and 3-.
- Fold the heat shield -2- as far forward as possible -arrow-.



CAUTION

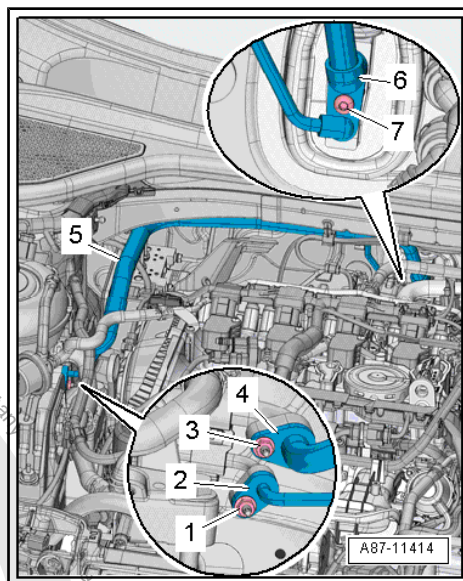
Danger or frostbite due to refrigerant coming out under pressure.

Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.



- Remove the bolt -7-.
- Disconnect the refrigerant line -6- with the inner heat exchanger from the expansion valve.
- Remove the nuts -1 and 3- and remove the refrigerant lines -2 and 4-.
- Remove the refrigerant line -5- with the inner heat exchanger.
- Seal the open lines and connections with clean plugs from the Engine Bung Set - VAS6122- .



Installing

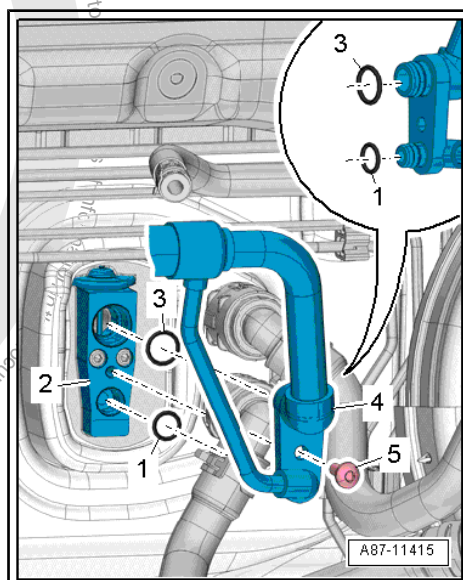
Install in reverse order of removal. Note the following:

- Refer to ➤ Rep. Gr. 21 ; Turbocharger; Overview - Turbocharger .
- Replace the seals. For the correct version, refer to the Parts Catalog.
- Clean the connections on the expansion valve -2- and on the inner heat exchanger -4- and inspect them for damage.
- Thoroughly clean the refrigerant lines around the connection area and check for damage.



Note

- ◆ Coat the seals with refrigerant oil before installing.
 - ◆ Make sure the seals fit correctly inside the groove on each refrigerant line.
- Insert the seals -1 and 3- into the groove on the inner heat exchanger connection.
 - Insert the inner heat exchanger on the expansion valve.

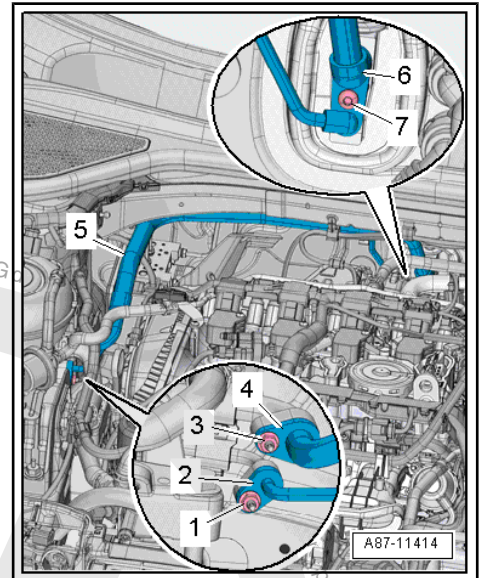




- Tighten the bolt -5-.
- Install the refrigerant lines -2 and 4- with the inner heat exchanger on the connections.
- Install and tighten the nuts -1 and 3-.

Tightening Specifications

- ◆ Refer to
⇒ [“2.1 System Overview - Refrigerant Circuit”, page 100](#).



2.13.2 Refrigerant Lines with Inner Heat Exchanger, Removing and Installing, Golf GTE

Special tools and workshop equipment required

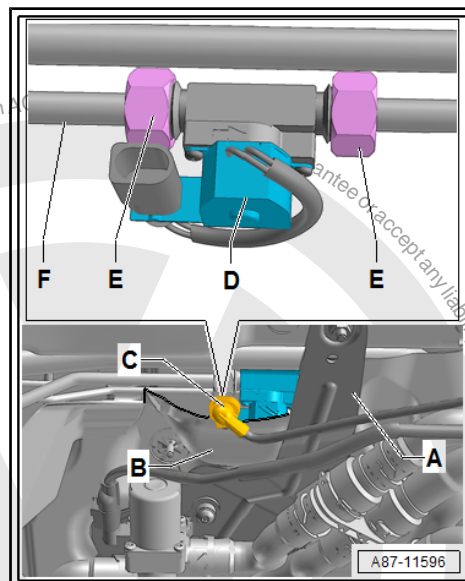
- ◆ Engine Bung Set - VAS6122-
- ◆ Torque Wrench 13315-50Nm - VAG1331- (5 to 50 Nm)
- ◆ A/C Service Station

Removing

- Note safety precautions. Refer to
⇒ [“1.1 Handling Refrigerant Safety Precautions”, page 1](#).
- See notes. Refer to
⇒ [“4.1 Working on the Refrigerant Circuit”, page 8](#).
- Observe safety precautions when working on the high voltage system. Refer to
⇒ [“1.3 High Voltage System Safety Precautions”, page 1](#).
- Pay attention to safety precautions for working near high voltage components. Refer to
⇒ [“1.4 Safety Precautions near High Voltage Components”, page 2](#).
- Pay attention to the high voltage system danger classification. Refer to ⇒ Rep. Gr. 00 ; High Voltage System Danger Classification.
- Extract refrigerant using the A/C Service Station , only then open the refrigerant circuit.



- Loosen the bracket -A- (for the Solenoid Valve 1 - N88-) from the plenum chamber bulkhead.
- Loosen the heat shield -B- near the Heater and A/C Unit Refrigerant Cut-Off Valve - N541- -D- and the refrigerant line -F- (to the coupling point on the right longitudinal member) from the plenum chamber bulkhead and carefully bend back.



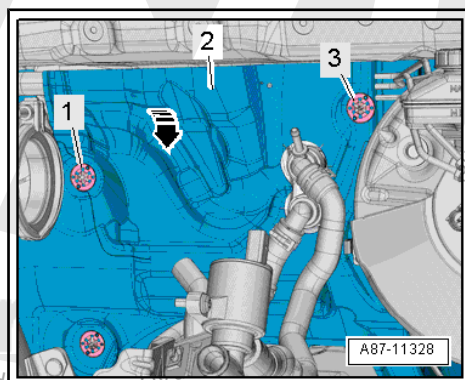
- Remove the sheet metal nuts -1 and 3-.
- Fold the heat shield -2- as far forward as possible -arrow-.

CAUTION

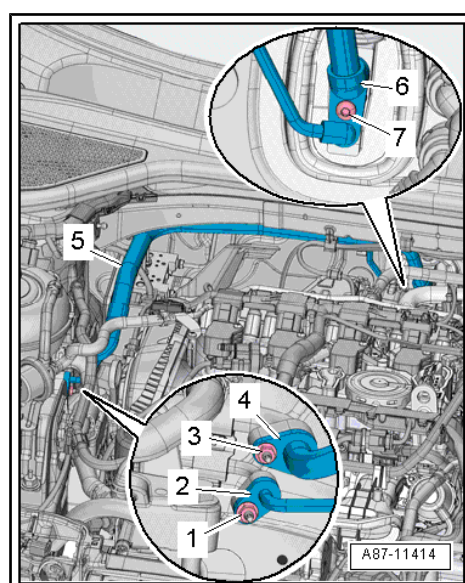
Danger or frostbite due to refrigerant coming out under pressure.

Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.



- Remove the bolt -7-.
- Disconnect the refrigerant line -6- with the inner heat exchanger from the expansion valve.
- Remove the nuts -1 and 3- and remove the refrigerant lines -2 and 4-.
- Remove the refrigerant line -5- with the inner heat exchanger.
- Seal the open lines and connections with clean plugs from the Engine Bung Set - VAS6122- .





Installing

Install in reverse order of removal. Note the following:

- Refer to ➤ Rep. Gr. 21 ; Turbocharger; Overview - Turbocharger .
- Replace the seals. For the correct version, refer to the Parts Catalog.
- Clean the connections on the expansion valve -2- and on the inner heat exchanger -4- and inspect them for damage.
- Thoroughly clean the refrigerant lines around the connection area and check for damage.

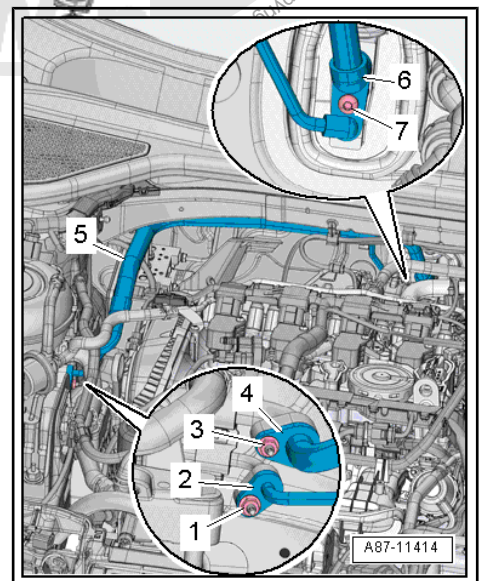
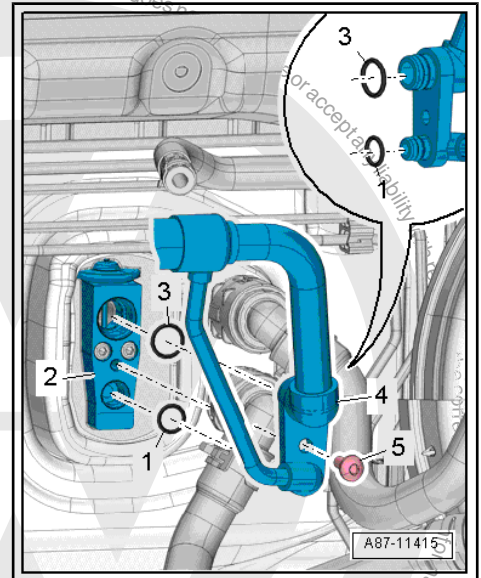


Note

- ◆ Coat the seals with refrigerant oil before installing. Refer to ➤ [“4.2 Refrigerant Circuit Seals”, page 8](#) .
- ◆ Make sure the seals fit correctly inside the groove on each refrigerant line.
- Insert the seals -1 and 3- into the groove on the inner heat exchanger connection.
- Insert the inner heat exchanger on the expansion valve.
- Tighten the bolt -5-.
- Install the refrigerant lines -2 and 4- with the inner heat exchanger on the connections.
- Install and tighten the nuts -1 and 3-.

Tightening Specifications

- ◆ Refer to ➤ [“2.1 System Overview - Refrigerant Circuit”, page 100](#) .



2.14 Refrigerant Line with Restrictor

- Note safety precautions. Refer to ➤ [“1.1 Handling Refrigerant Safety Precautions”, page 1](#) .
- See notes. Refer to ➤ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .
- Pay attention to safety precautions for working near high voltage components. Refer to ➤ [“1.4 Safety Precautions near High Voltage Components”, page 2](#) .

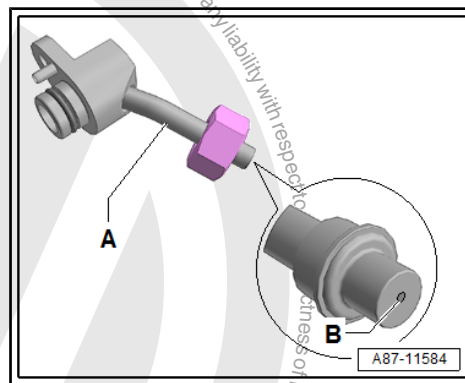


- Pay attention to the high voltage system danger classification. Refer to ⇒ Rep. Gr. 00 ; High Voltage System Danger Classification .



Note

- ◆ This illustration shows a refrigerant line -A- with a permanently installed restrictor -B- (without a strainer)
- ◆ To remove the refrigerant line, remove the High Voltage Battery Heater Core Refrigerant Cut-Off Valve - N542- (refer to ⇒ ["2.11 High Voltage Battery Heater Core Refrigerant Cut-Off Valve N542, Removing and Installing", page 131](#)) and remove the refrigerant line from the high voltage battery heat exchanger. Refer to ⇒ ["2.12 High Voltage Battery Heat Exchanger, Removing and Installing", page 133](#) .
- ◆ The diameter of the illustrated restrictor hole -B- is approximately 0.7 mm. Depending on the version of the refrigerant line this constriction is either installed fixed in the refrigerant line or only inserted. For the inserted version a strainer for flowing deposits may be installed, which can be blocked by the variable orifice.
- ◆ Before installing check the bore -B- for debris and if necessary clean or replace.
- ◆ There are different versions. Refer to the Parts Catalog.



2.15 Condenser/Evaporator Refrigerant Line, Removing and Installing

Special tools and workshop equipment required

- ◆ Engine Bung Set - VAS6122-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331- (5 to 50 Nm)
- ◆ A/C Service Station

Removing

- Note safety precautions. Refer to ⇒ ["1.1 Handling Refrigerant Safety Precautions", page 1](#) .
- See notes. Refer to ⇒ ["4.1 Working on the Refrigerant Circuit", page 8](#) .
- Extract refrigerant using the A/C Service Station , only then open the refrigerant circuit.
- Remove the front bumper cover. Refer to ⇒ Body Exterior; Rep. Gr. 63 ; Front Bumper; Bumper Cover, Removing and Installing .
- Remove the right engine mount. Refer to ⇒ Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .



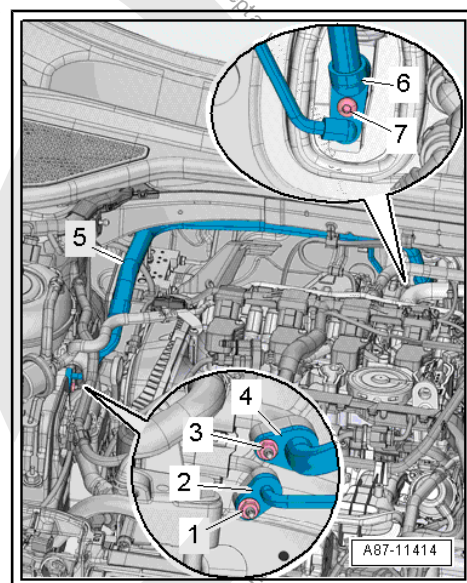
⚠ CAUTION

Danger or frostbite due to refrigerant coming out under pressure.

Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.

- Remove the nut -1-.
- Disconnect the refrigerant lines.





- Remove the bolt -5- of the lower refrigerant line -3-.
- Remove the refrigerant line -3- from the condenser -1-.
- Unclip and remove the refrigerant line -3- from the mountings.

Installing

Install in reverse order of removal. Note the following:

- Replace the seals. For the correct version, refer to the Parts Catalog.
- Coat the seals with refrigerant oil before installing. Refer to ➔ [“4.2 Refrigerant Circuit Seals”, page 8](#) .



Note

Make sure the seals fit correctly inside the groove on each refrigerant line.

Tightening Specifications

- ◆ Refer to ➔ [“2.1 System Overview - Refrigerant Circuit”, page 100](#) .
- ◆ Subframe Mount; Overview - Subframe Mount. Refer to ➔ Rep. Gr. 10 Subframe Mount; Overview - Subframe Mount .
- ◆ Front bumper cover. Refer to ➔ Body Exterior; Rep. Gr. 63 ; Front Bumper; Bumper Cover, Removing and Installing .

2.16 Condenser/A/C Compressor Refrigerant Line, Removing and Installing

Special tools and workshop equipment required

- ◆ Engine Bung Set - VAS6122-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331- (5 to 50 Nm)
- ◆ A/C Service Station

Removing

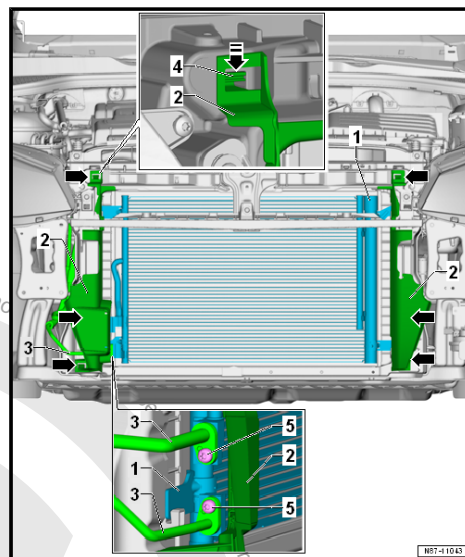
- Note safety precautions. Refer to ➔ [“1.1 Handling Refrigerant Safety Precautions”, page 1](#) .
- See notes. Refer to ➔ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .
- Extract refrigerant using the A/C Service Station , only then open the refrigerant circuit.

Depending on the engine, parts of the air filter are to be removed. Refer to ➔ Rep. Gr. 24 ; Air Filter; Overview - Air Filter Housing or ➔ Rep. Gr. 23 ; Air Filter; Overview - Air Filter Housing .

Depending on the engine, parts of the air routing are to be removed. Refer to ➔ Rep. Gr. 24 ; Intake Manifold; Overview - Intake Manifold or ➔ Rep. Gr. 23 ; Intake Manifold; Overview - Intake Manifold .

Depending on the engine, charge air system parts of the air routing are to be removed. Refer to ➔ Rep. Gr. 21 ; Charge Air System .

- Remove the front bumper cover. Refer to ➔ Body Exterior; Rep. Gr. 63 ; Front Bumper; Bumper Cover, Removing and Installing .
- Remove the noise insulation. Refer to ➔ Body Exterior; Rep. Gr. 66 ; Noise Insulation .





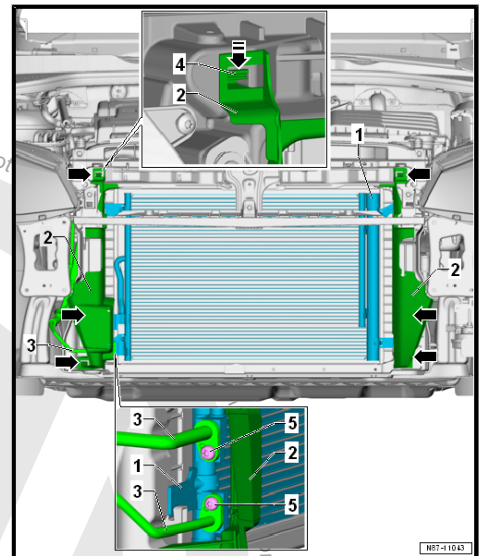
CAUTION

Danger or frostbite due to refrigerant coming out under pressure.

Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.

- Remove the bolt -5- of the upper refrigerant line -3-.
- Remove the refrigerant line -3- from the condenser -1-.





- Remove the bolt -3- for the refrigerant line -2-.
- Remove the refrigerant line.

Installing

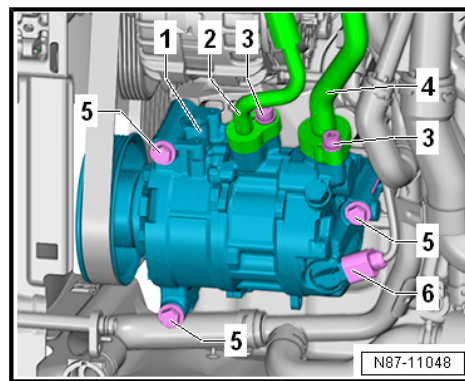
Install in reverse order of removal. Note the following:

- Replace the seals. For the correct version, refer to the Parts Catalog.
- Coat the seals with refrigerant oil before installing. Refer to ➔ [“4.2 Refrigerant Circuit Seals”, page 8](#) .



Note

Make sure the seals fit correctly inside the groove on each refrigerant line.



Tightening Specifications

- ◆ Refer to ➔ [“2.1 System Overview - Refrigerant Circuit”, page 100](#)
- ◆ Refer to ➔ [“3.1 Overview - A/C Compressor Power Unit”, page 149](#)
- ◆ Noise insulation. Refer to ➔ Body Exterior; Rep. Gr. 66 ; Noise Insulation .
- ◆ Front bumper cover. Refer to ➔ Body Exterior; Rep. Gr. 63 ; Front Bumper; Bumper Cover, Removing and Installing .

2.17 A/C Compressor/Evaporator Refrigerant Line, Removing and Installing

Special tools and workshop equipment required

- ◆ Engine Bung Set - VAS6122-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331- (5 to 50 Nm)
- ◆ A/C Service Station

Removing

- Note safety precautions. Refer to ➔ [“1.1 Handling Refrigerant Safety Precautions”, page 1](#) .
- See notes. Refer to ➔ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .
- Extract refrigerant using the A/C Service Station , only then open the refrigerant circuit.

Depending on the engine, parts of the air filter are to be removed. Refer to ➔ Rep. Gr. 24 ; Air Filter; Overview - Air Filter Housing or ➔ Rep. Gr. 23 ; Air Filter; Overview - Air Filter Housing .

Depending on the engine, parts of the air routing are to be removed. Refer to ➔ Rep. Gr. 24 ; Intake Manifold; Overview - Intake Manifold or ➔ Rep. Gr. 23 ; Intake Manifold; Overview - Intake Manifold .

Depending on the engine, charge air system parts of the air routing are to be removed. Refer to ➔ Rep. Gr. 21 ; Charge Air System .

- Remove the front bumper cover. Refer to ➔ Body Exterior; Rep. Gr. 63 ; Front Bumper; Bumper Cover, Removing and Installing .



- Remove the noise insulation from underneath the engine. Refer to ➔ Body Exterior; Rep. Gr. 66 ; Noise Insulation .

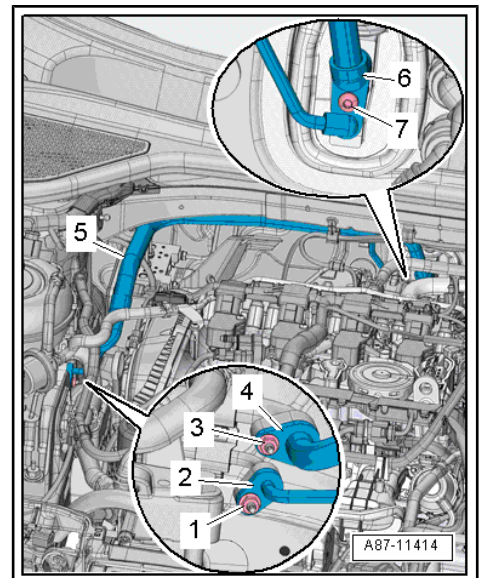
! CAUTION

Danger or frostbite due to refrigerant coming out under pressure.

Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.

- Detach the coolant expansion tank and move it to the side.
- Remove the nut -3-.
- Disconnect the refrigerant lines.





- Remove the bolt -3- for the refrigerant line -4-.
- Unclip and remove the refrigerant lines from the mountings.

Installing

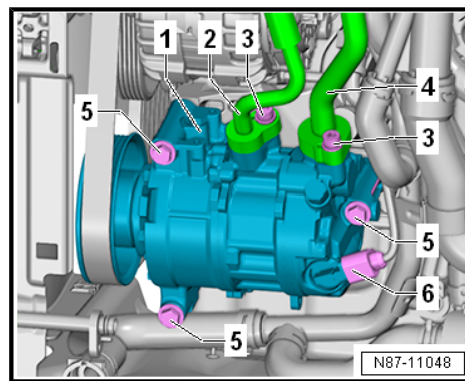
Install in reverse order of removal. Note the following:

- Replace the seals. For the correct version, refer to the Parts Catalog.
- Coat the seals with refrigerant oil before installing. Refer to [⇒ "4.2 Refrigerant Circuit Seals", page 8](#) .



Note

Make sure the seals fit correctly inside the groove on each refrigerant line.



Tightening Specifications

- ◆ Refer to [⇒ "2.1 System Overview - Refrigerant Circuit", page 100](#)
- ◆ Refer to [⇒ "3.1 Overview - A/C Compressor Power Unit", page 149](#)
- ◆ Noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation .





3 A/C Compressor

⇒ [“3.1 Overview - A/C Compressor Power Unit”, page 149](#)

⇒ [“3.2 Overview - Belt Pulley”, page 153](#)

⇒ [“3.3 A/C Compressor, Removing and Installing on Bracket”, page 155](#)

⇒ [“3.4 A/C Compressor, Removing and Installing”, page 159](#)

⇒ [“3.5 A/C Compressor Fuse S355 , Removing and Installing”, page 165](#)

⇒ [“3.6 Pressure Relieve Valve on A/C Compressor, Checking”, page 167](#)

⇒ [“3.7 Belt Pulley, Removing and Installing”, page 168](#)

3.1 Overview - A/C Compressor Power Unit

⇒ [“3.1.1 Overview - A/C Compressor Power Unit, Golf and Golf Wagon”, page 149](#)

⇒ [“3.1.2 Overview - A/C Compressor Power Unit, Golf GTE”, page 151](#)

3.1.1 Overview - A/C Compressor Power Unit, Golf and Golf Wagon



Note

The illustration shows one version.





1 - Ribbed Belt

- ❑ Removing and installing. Refer to ➤ Rep. Gr. 13 ; Cylinder Block, Belt Pulley Side; Ribbed Belt, Removing and Installing .
- ❑ Mark the rotation direction, install on correct side. Refer to ➤ Rep. Gr. 13 ; Cylinder Block, Belt Pulley Side; Ribbed Belt, Removing and Installing .

2 - Sub-Assembly Bracket

- ❑ Optional
- ❑ To remove and install, refer to ➤ Rep. Gr. 13 ; Cylinder Block, Belt Pulley Side; Sub-Assembly Bracket, Removing and Installing .

3 - Seal

- ❑ Replacing. For the correct version, refer to the Parts Catalog.
- ❑ Coat with refrigerant oil before installing

4 - Bolt

- ❑ 22 Nm

5 - High Pressure Side Refrigerant Line

6 - Low Pressure Side Refrigerant Line

7 - Bolt

- ❑ 22 Nm

8 - Seal

- ❑ Replacing. For the correct version, refer to the Parts Catalog.
- ❑ Coat with refrigerant oil before installing

9 - A/C Compressor Regulator Valve - N280-

- ❑ To check, use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function and refer to ➤ Wiring diagrams, Troubleshooting & Component locations.

10 - Air Conditioning (A/C) Compressor

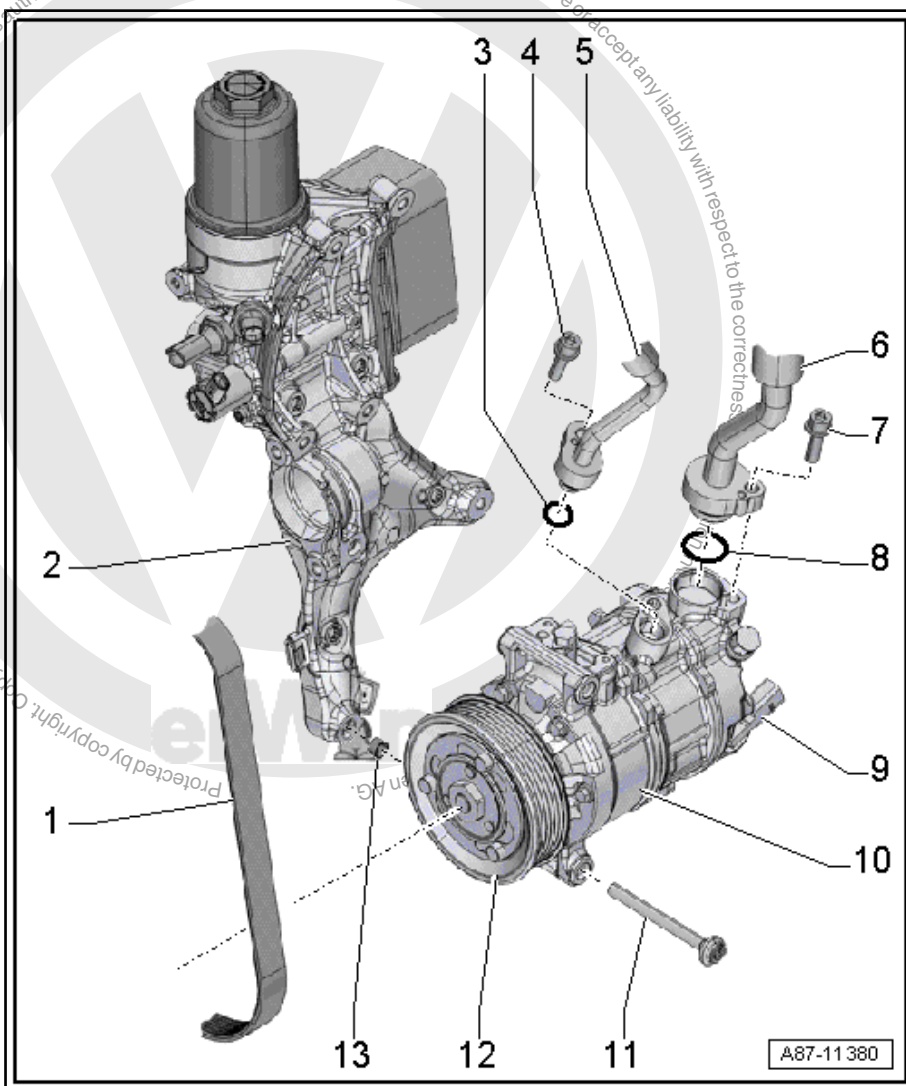
- ❑ There are different versions. Refer to the Parts Catalog.
- ❑ Removing and installing. Refer to ➤ ["3.4 A/C Compressor, Removing and Installing", page 159](#) .
- ❑ Removing from and attaching to the bracket. Refer to ➤ ["3.3 A/C Compressor, Removing and Installing on Bracket", page 155](#) .

11 - Bolt

- ❑ 25 Nm
- ❑ Quantity: 3

12 - Belt Pulley with Overload Protection

- ❑ There are different versions. Refer to the Parts Catalog.
- ❑ Overview. Refer to ➤ ["3.2 Overview - Belt Pulley", page 153](#) .





13 - Alignment Sleeve

- ☐ Quantity: 2

3.1.2 Overview - A/C Compressor Power Unit, Golf GTE

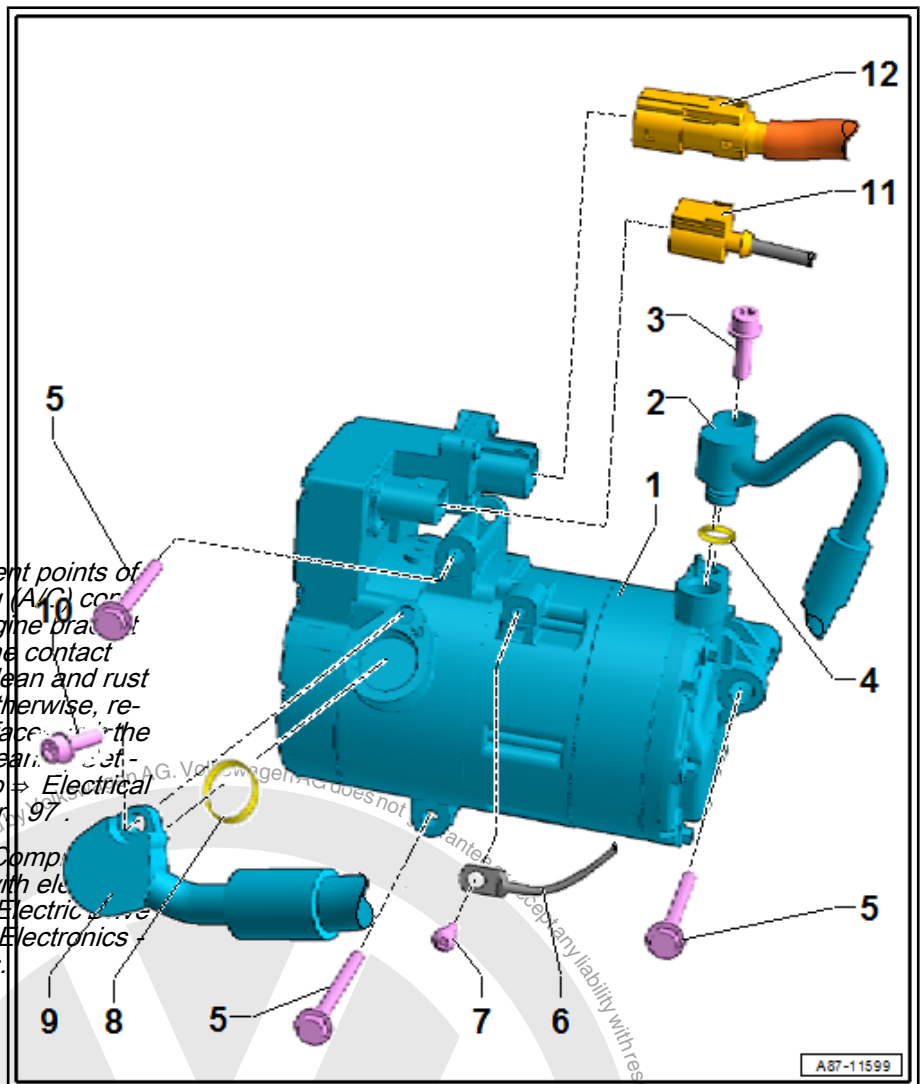
1 - Electrical A/C Compressor - V470-

- ☐ With A/C Compressor Control Module - J842- and Electrical A/C Compressor - V470-
- ☐ Removing and installing. Refer to ➔ ["3.3 A/C Compressor, Removing and Installing on Bracket", page 155](#)
- ☐ Removing and installing. Refer to ➔ ["3.4 A/C Compressor, Removing and Installing", page 159](#).



Note

- ◆ Check the attachment points of the Air Conditioning (A/C) compressor and the engine bracket before installing. The contact surfaces must be clean and rust and grease-free. Otherwise, repair the contact surface. [Contact Surface Cleaning Set - VAS6410-](#). Refer to ➔ [Electrical Equipment; Rep. Gr. 97](#).
- ◆ The Electrical A/C Compressor V470- is supplied with electricity through one of the Electrical Power and Control Electronics - JX1- installed fuses.



2 - High Pressure Side Refrigerant Line

3 - Bolt

- ☐ 25 Nm (with M 8 threads)
- ☐ 9 Nm (with M 6 threads)

4 - Seal

- ☐ To replace. Refer to ➔ ["4.2 Refrigerant Circuit Seals", page 8](#). For the correct version, refer to the Parts Catalog.
- ☐ Lubricate lightly with refrigerant oil before installing.

5 - Bolt

- ☐ 25 Nm
- ☐ There are different versions. Refer to the Parts Catalog.



Note

If the A/C compressor is secured with aluminum bolts (There are different versions. Refer to the Parts Catalog), use the aluminum bolts only once, then replace. Aluminum bolt tightening specification: 8 Nm + 180° turn.

6 - Ground (GND) Cable

- ☐ Check the contact surface before attaching and clean if necessary.



Note

The contact surfaces must be clean and rust and grease-free. Otherwise, repair the contact surfaces with the Contact Surface Cleaning Set - VAS6410-. Refer to ⇒ Electrical Equipment; Rep. Gr. 97.

7 - Bolt

- ☐ 9 Nm

8 - Seal

- ☐ To replace, refer to ⇒ ["4.2 Refrigerant Circuit Seals", page 8](#). For the correct version, refer to the Parts Catalog.
- ☐ Lubricate lightly with refrigerant oil before installing.

9 - Low Pressure Side Refrigerant Line

10 - Bolt

- ☐ 25 Nm (with M 8 threads)
- ☐ 9 Nm (with M 6 threads)

11 - 8-Pin Connector

- ☐ With the control wire from the Climatronic Control Module - J255- control head. Refer to ⇒ Wiring diagrams, Troubleshooting & Component locations

12 - High Voltage Cable to the Electric Drive Power and Control Electronics - JX1- (with High Voltage Battery Charger Control Module - J1050-)



3.2 Overview - Belt Pulley

⇒ ["3.2.1 Overview - Belt Pulley, Denso A/C Compressor", page 153](#)

⇒ ["3.2.2 Overview - Belt Pulley, Sanden A/C Compressor", page 154](#)

3.2.1 Overview - Belt Pulley, Denso A/C Compressor

1 - Screw

- ☐ 4.5 Nm
- ☐ Quantity: 3

2 - Cap

3 - Nut

- ☐ 25 Nm
- Hold the belt pulley securely with a commercially available oil filter band wrench to loosen and tighten the hex nut.

4 - Drive Plate

- ☐ The overload protection takes over when the torque is excessive (for example, if the Air Conditioning (A/C) compressor runs with resistance) and the belt pulley runs freely without driving the A/C compressor.

5 - Circlip

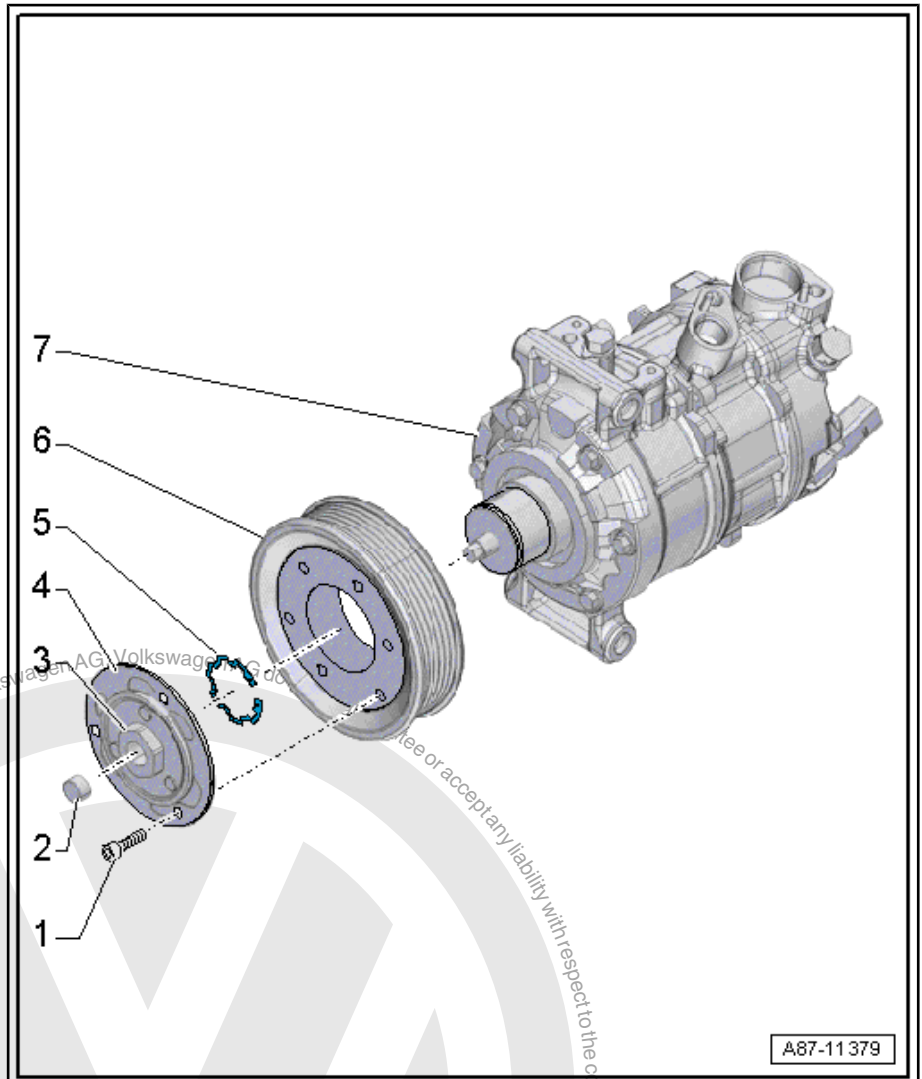
- ☐ Replacing
- ☐ Install on the proper side - the flat side faces A/C compressor

6 - Belt pulley

- ☐ There are different versions. Refer to the Parts Catalog.
- ☐ Is sensitive to impact, be careful when handling
- ☐ Removing and installing. Refer to ⇒ ["3.7 Belt Pulley, Removing and Installing", page 168](#) .

7 - A/C Compressor

- ☐ Clean the A/C compressor driveshaft before setting the belt pulley on it





3.2.2 Overview - Belt Pulley, Sanden A/C Compressor

1 - Nut

- 25 Nm



Note

The Air Conditioning (A/C) compressor input shaft may be covered with a plastic cap to protect the threads on it (the plastic cap is not illustrated).

- Hold the belt pulley securely with a commercially available oil filter band wrench to loosen and tighten the hex nut.
- The thread of the nut, which was screwed in with locking compound, must be cleaned (for example, using a thread tap). Otherwise, there is a danger that the input shaft breaks off during assembly.
- Clean the thread of the A/C compressor input shaft with a wire brush.
- Insert the nut with locking compound. For the locking compound, refer to the Parts Catalog.

2 - Bolt

- 12 Nm

- Hold the belt pulley securely with a commercially available oil filter band wrench to loosen and tighten the bolts.
- The threaded bolt holes, into which the self-locking bolts or bolts with locking compound are screwed, must be cleaned (for example with a thread tap). Otherwise, there is a danger that the bolts break off during assembly.
- Clean the thread of the bolts, which are screwed in with locking compound, with a wire brush. Then insert the bolts with locking compound. For the locking compound, refer to the Parts Catalog.

3 - Drive Plate

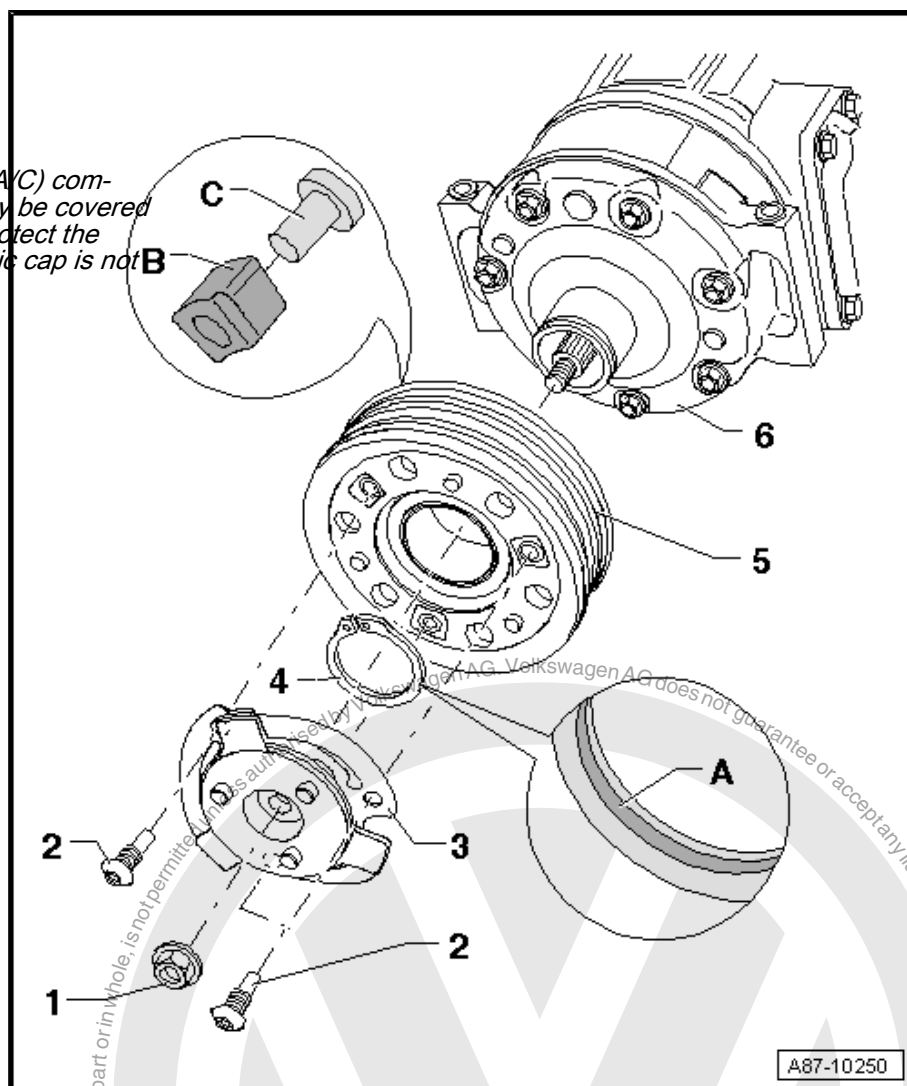
- The overload protection (securing spring elements), takes over when the torque is excessive (for example, if the A/C compressor runs with resistance) and the belt pulley runs freely without driving the A/C compressor.
- Drive plate spring elements dampen vibrations and noise

4 - Circlip

- Replacing
- Install on proper side, beveled insertion edge -A- faces away from A/C compressor - install flat side faces the A/C compressor

5 - Belt pulley

- With rubber elements -B- and threaded plates -C- for decoupling belt pulley from A/C compressor input shaft, dampens vibrations and noise





Note

- ◆ *The threaded plates can also be connected to each other by a ring, depending on the version.*
- ◆ *For "cold climate" vehicles (for example, central and north Europe), A/C compressors with a smaller stroke may be installed. On these A/C compressors, the belt pulley is slightly different from the one illustrated here (the rubber elements -B- are, for example, not present). Refer to Parts Catalog.*

6 - A/C Compressor

- Clean the A/C compressor driveshaft before setting the belt pulley on it

3.3 A/C Compressor, Removing and Installing on Bracket

⇒ ["3.3.1 A/C Compressor, Removing and Installing on Bracket, Golf and Golf Wagon", page 155](#)

⇒ ["3.3.2 A/C Compressor, Removing and Installing on Bracket, Golf GTE", page 157](#)

3.3.1 A/C Compressor, Removing and Installing on Bracket, Golf and Golf Wagon



Note

Pay attention to the turn off conditions for vehicles with the Start/Stop System. Refer to
⇒ ["3.2 Vehicles with Start/Stop System General Information", page 6](#).

Special tools and workshop equipment required

- ◆ Torque Wrench 1331 5-50Nm - VAG1331- (5 to 50 Nm)

ELSA contains all information regarding performing repairs on vehicles with air conditioning and working with refrigerant. Refer to ⇒ Refrigerant R134a Servicing; Rep. Gr. 00 ; A/C System, General Information; A/C System and Refrigerant R134a Safety Precautions .

Information on tools for repairs in vehicles with climate control system can be found in ELSA. Refer to ⇒ Refrigerant R134a Servicing; Rep. Gr. 00 ; Special Tools .

Removing

- Note safety precautions. Refer to ⇒ ["1 Safety Precautions", page 1](#) .
- See notes. Refer to ⇒ ["4.1 Working on the Refrigerant Circuit", page 8](#) .
- Remove the noise insulation under the engine. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .



Depending on the engine type, remove the right front wheel housing liner. Refer to ➤ Body Exterior; Rep. Gr. 66 ; Wheel Housing Liner; Front Wheel Housing Liner, Removing and Installing .

- Remove the ribbed belt. Refer to ➤ Rep. Gr. 13 ; Cylinder Block, Belt Pulley Side; Sub-Assembly Bracket, Removing and Installing .
- Disconnect the connector -6- from the Air Conditioning (A/C) compressor -1-.
- Remove the hex bolt -5- and then remove the A/C compressor -1-.



Note

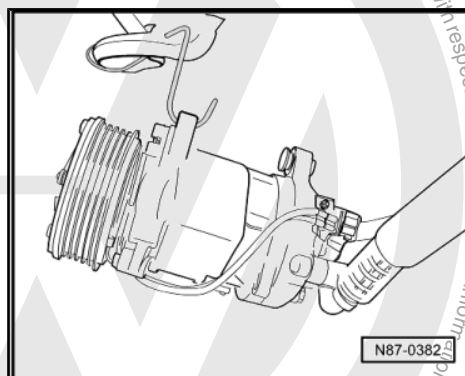
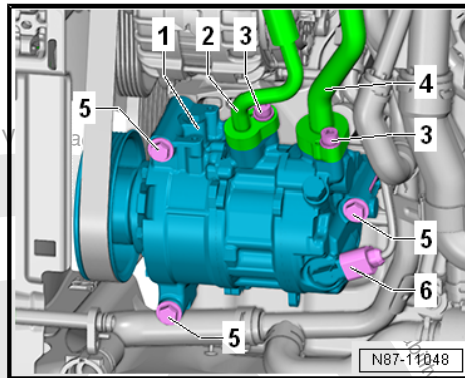
Do not loosen the refrigerant pipes on the A/C compressor if only the auxiliary components bracket is being removed.

- Attach the A/C compressor to the body with something suitable, for example, welding wire.

Installing

Install in reverse order of removal. Note the following:

- Thoroughly clean the contact surfaces on the A/C compressor and bracket.





- Insert the alignment sleeve -arrows- in the A/C compressor.



Note

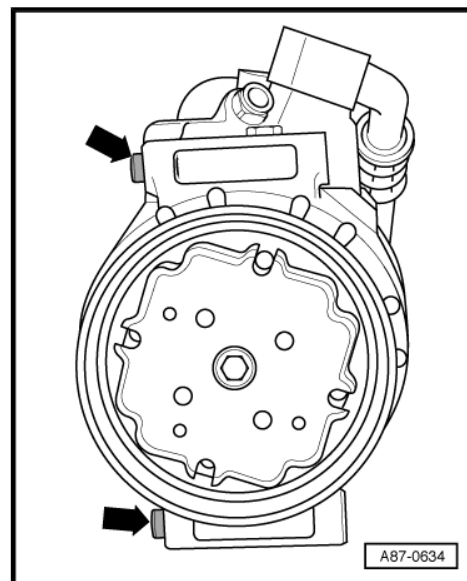
Make sure the alignment sleeves are seated correctly and the contact surfaces are clean. Alignment sleeves that are installed incorrectly and dirty or damaged contact surfaces can lead to alignment irregularities between the compressor and engine. Alignment irregularities over operating time cause damage to the A/C compressor.



NOTICE

Risk of damaging the A/C compressor. Refrigerant oil may accumulate in the compression chamber of the removed A/C compressor.

- After installing a new A/C compressor or filling with fresh refrigerant oil, turn the A/C compressor 10 times by hand before installing the ribbed belt.



Tightening Specifications

- ◆ Refer to
⇒ [“3.1 Overview - A/C Compressor Power Unit”, page 149](#)

Pay attention to the following when starting the engine for the first time after filling the refrigerant circuit:

- Follow the information on operating the A/C system after installing the A/C compressor. Refer to ⇒ Refrigerant R134a Servicing .

3.3.2 A/C Compressor, Removing and Installing on Bracket, Golf GTE

Special tools and workshop equipment required

- ◆ Torque Wrench 1331 5-50Nm - VAG1331- (5 to 50 Nm)

Removing

- Note safety precautions. Refer to
⇒ [“1.1 Handling Refrigerant Safety Precautions”, page 1](#) .
- See notes. Refer to
⇒ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .
- Observe safety precautions when working on the high voltage system. Refer to
⇒ [“1.3 High Voltage System Safety Precautions”, page 1](#) .
- Pay attention to safety precautions for working near high voltage components. Refer to
⇒ [“1.4 Safety Precautions near High Voltage Components”, page 2](#) .
- Pay attention to the high voltage system danger classification. Refer to ⇒ Rep. Gr. 00 ; High Voltage System Danger Classification .



DANGER

Danger to life due to high voltage.

Death or serious bodily injury by electric shock.

- Have the high voltage system de-energized by a qualified person.





- De-energize the high voltage system. Refer to ⇒ Rep. Gr. 93 ; High Voltage System, De-Energizing .
- Remove the noise insulation under the engine. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .

Removing the right front wheel housing liner. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Wheel Housing Liner; Front Wheel Housing Liner, Removing and Installing

- Push aside the Electrical A/C Compressor - V470- -5- noise insulation (if installed) or partially remove to ensure that the connectors and bolts are accessible.
- Disconnect the connector -2- from the Electrical A/C Compressor - V470- -5-.
- Disconnect the high voltage cable -3- from the Electrical A/C Compressor - V470- -5-.
- Disconnect the potential equalization cable -4- from the Electrical A/C Compressor - V470- -5-.
- Remove the bolts -7-.
- Remove the Electrical A/C Compressor - V470- -5-.

NOTICE

Risk of damaging the A/C compressor. Refrigerant oil may accumulate in the compression chamber of the removed A/C compressor.

- After installing a new A/C compressor or filling with fresh refrigerant oil, turn the A/C compressor 10 times by hand before installing the ribbed belt.

- Secure the Electrical A/C Compressor - V470- -2- to the body with a suitable equipment for example a welding wire -1-.

Installing

Install in reverse order of removal. Note the following:

- Start the vehicle only after assembling the refrigerant circuit.
- Only start the vehicle when the refrigerant circuit is filled.



Note

- ◆ *Inspect the attachment points for the Electrical A/C Compressor - V470- and engine prior to installing.*
- ◆ *The contact surfaces must be clean and rust and grease-free.*

WARNING

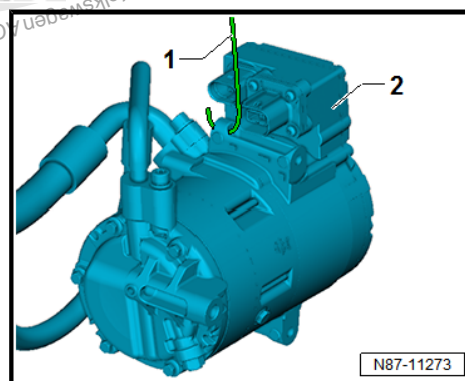
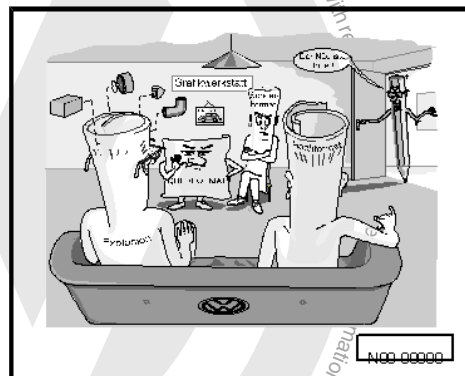
Danger to life due to high voltage.

Severe bodily injury or death by electrocution is possible.

- Have a qualified person put the high voltage system back into service.

Tightening Specifications

- ◆ Refer to
⇒ ["3.1 Overview - A/C Compressor Power Unit", page 149](#)





3.4 A/C Compressor, Removing and Installing

⇒ ["3.4.1 A/C Compressor, Removing and Installing, Golf and Golf Wagon", page 159](#)

⇒ ["3.4.2 Electrical A/C Compressor V470, Removing and Installing, Golf GTE", page 163](#)

3.4.1 A/C Compressor, Removing and Installing, Golf and Golf Wagon



Note

- ◆ Perform Guided Fault Finding "A/C compressor first start" whenever a new Air Conditioning (A/C) compressor is installed.
- ◆ Pay attention to the turn off conditions for vehicles with the Start/Stop System. Refer to ["3.2 Vehicles with Start/Stop System General Information", page 6](#).
- ◆ If the A/C compressor is sent in for a warranty claim, document the extracted refrigerant quantity and add in the claim.

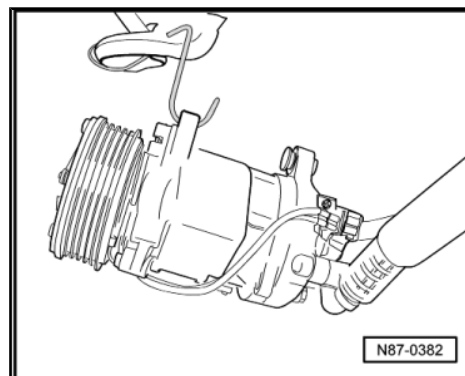
Special tools and workshop equipment required

- ◆ Torque Wrench 1331 5-50Nm - VAG1331- (5 to 50 Nm)
- ◆ A/C Service Station



Note

- ◆ *Flush the refrigerant circuit with R134a refrigerant under the following conditions:*
- ◆ *In the event of dirt or other contamination in the refrigerant circuit.*
- ◆ *If vacuum reading is not maintained on evacuating a leak-free refrigerant circuit (pressure build-up due to moisture in refrigerant circuit).*
- ◆ *If the refrigerant circuit has been left open for longer than normal (for example, following an accident).*
- ◆ *If pressure and temperature measurements in the refrigerant circuit indicate the likelihood of moisture*
- ◆ *In the event of doubt about the amount of refrigerant oil in the circuit.*
- ◆ *The A/C compressor must be replaced on account of internal damage (for example, noise or no output).*
- ◆ *If only the auxiliary component bracket is being removed, it is not necessary to loosen the refrigerant lines on the A/C compressor. Attach the A/C compressor to the body with wire.*



The procedure for flushing with refrigerant R134a is described in ELSA . Refer to ➤ Refrigerant R134a Servicing; Rep. Gr. 00 ; Refrigerant Circuit, Removing Contaminants; Refrigerant Circuit, Flushing (Cleaning) with Refrigerant R134a .

ELSA contains all information regarding performing repairs on vehicles with air conditioning and working with refrigerant. Refer to ➤ Refrigerant R134a Servicing; Rep. Gr. 00 ; A/C System, General Information; A/C System and Refrigerant R134a Safety Precautions .

Information on tools for repairs in vehicles with climate control system can be found in ELSA. Refer to ➤ Refrigerant R134a Servicing; Rep. Gr. 00 ; Special Tools .

Pay attention to the notes when operating. Refer to
⇒ [page 162](#)

Removing

- Note safety precautions. Refer to
⇒ ["1 Safety Precautions", page 1](#) .
- See notes. Refer to
⇒ ["4.1 Working on the Refrigerant Circuit", page 8](#) .
- When working on the refrigerant circuit, note the information. Refer to
⇒ ["2.1 System Overview - Refrigerant Circuit", page 100](#) .
- Extract refrigerant using the A/C Service Station , only then open the refrigerant circuit.
- Remove the noise insulation under the engine. Refer to ➤ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .

Depending on the engine type, remove the right front wheel housing liner. Refer to ➤ Body Exterior; Rep. Gr. 66 ; Wheel Housing Liner; Front Wheel Housing Liner, Removing and Installing .

Depending on the engine, parts of the air filter are to be removed. Refer to ➤ Rep. Gr. 24 ; Air Filter; Overview - Air Filter Housing or ➤ Rep. Gr. 23 ; Air Filter; Overview - Air Filter Housing .



Depending on the engine, parts of the air routing are to be removed. Refer to ➤ Rep. Gr. 24 ; Intake Manifold; Overview - Intake Manifold or ➤ Rep. Gr. 23 ; Intake Manifold; Overview - Intake Manifold .

Depending on the engine, charge air system parts of the air routing are to be removed. Refer to ➤ Rep. Gr. 21 ; Charge Air System .

- Remove the ribbed belt. Refer to ➤ Rep. Gr. 13 ; Cylinder Block, Belt Pulley Side; Sub-Assembly Bracket, Removing and Installing .

⚠ CAUTION

Danger or frostbite due to refrigerant coming out under pressure.

Frostbite on the skin and other parts of the body is possible.

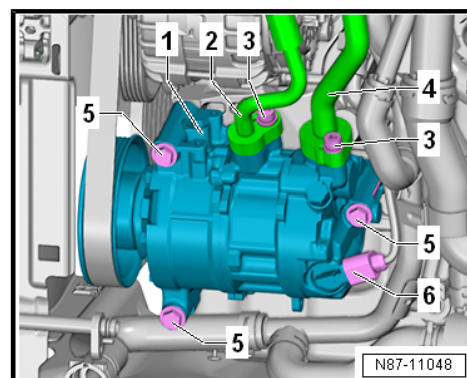
- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.

- Remove the bolts -3- and disconnect the refrigerant lines -2 and 4- from the A/C compressor -1-.
- Disconnect the connector -6- from the A/C compressor -1-.
- Remove the hex bolt -5- and then remove the A/C compressor -1-.

Installing

Install in reverse order of removal. Note the following:

- Perform Guided Fault Finding "A/C compressor first start" whenever a new A/C compressor is installed.
- Thoroughly clean the contact surfaces on the A/C compressor and bracket.





- Insert the alignment sleeve -arrows- in the A/C compressor.



Note

- ◆ *Make sure the alignment sleeves are seated correctly and the contact surfaces are clean. Alignment sleeves that are installed incorrectly and dirty or damaged contact surfaces can lead to alignment irregularities between the compressor and engine. Alignment irregularities over operating time cause damage to the A/C compressor.*
- ◆ *If the A/C compressor is replaced due to certain complaints (for example, internal damage), the refrigerant circuit must be cleaned. Refer to ⇒ A/C System - with Refrigerant R134a .*
- ◆ *There is an unspecified amount of refrigerant oil in the removed A/C compressor, so therefore pay attention to the information on replacing the A/C compressor. Refer to ⇒ Refrigerant R134a Servicing .*



NOTICE

Risk of damaging the A/C compressor. Refrigerant oil may accumulate in the compression chamber of the removed A/C compressor.

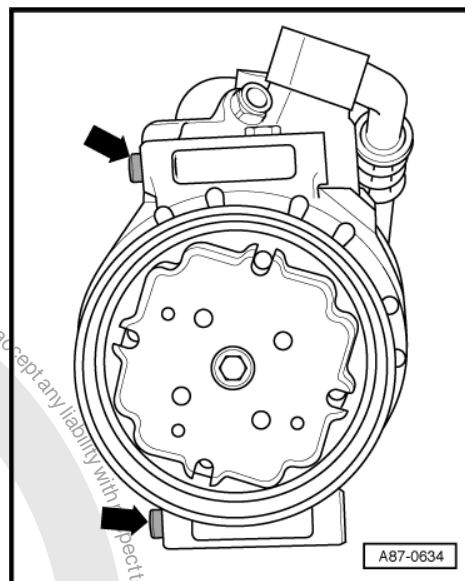
- After installing a new A/C compressor or filling with fresh refrigerant oil, turn the A/C compressor 10 times by hand before installing the ribbed belt.

Tightening Specifications

- ◆ Refer to
⇒ [“3.1 Overview - A/C Compressor Power Unit”, page 149](#)

Pay attention to the following when starting the engine for the first time after filling the refrigerant circuit:

- Follow the information on operating the A/C system after installing the A/C compressor. Refer to ⇒ Refrigerant R134a Servicing; Rep. Gr. 00 .
- After installing a new A/C compressor or fresh refrigerant oil has been filled into compressor (for example, after blowing through the A/C system), turn ribbed belt pulley of A/C compressor 10 rotations by hand before starting the engine. This prevents damage to the A/C compressor.
- Start the engine with the A/C compressor already turned off (indicator lamp button **A/C** is off) and wait until the idle RPM stabilizes.
- Open the instrument panel vents.
- Select for example the temperature preset “Lo” on the Heater and A/C Controls - EX21- .
- Turn on the A/C compressor (indicator lamp button **A/C** is lit) and let the engine idle for at least 5 minutes.





Note

- ◆ *The A/C compressor is always driven by the ribbed belt pulley (no A/C clutch).*
- ◆ *If the A/C compressor is blocked, the compressor shaft overload protection is activated. The blockage is mostly recognized by deformations/bumps on the ribbed belt pulley. In addition, the blockage can be recognized by the abraded rubber in the area of the ribbed belt pulley.*
- ◆ *The A/C compressor is equipped with a protected oil supply, this prevents A/C compressor damage in the event that the system is empty. This means that approximately 40 to 50 cm³ of refrigerant oil remains in the A/C compressor.*
- ◆ *Only start the engine when the refrigerant circuit is filled.*
- ◆ *The engine may only be started when the refrigerant circuit is installed correctly. For example; if the refrigerant lines are not connected to A/C compressor, when the engine is running the A/C compressor may heat up (via internal heat generation) so much that the A/C compressor will be damaged.*
- ◆ *A/C Compressor Regulator Valve - N280- is not activated when the refrigerant circuit is empty and the A/C compressor idles with the engine.*
- ◆ *If it is necessary to start the engine with a discharged refrigerant circuit:*
- ◆ *Refrigerant circuit must be fully assembled.*
- ◆ *At least a quarter of the prescribed refrigerant oil must be in the A/C compressor.*
- ◆ *Do not let the engine RPM go above 2,000.*
- ◆ *The engine should only run as long as is absolutely necessary, maximum 10 minutes.*

3.4.2 Electrical A/C Compressor - V470- , Removing and Installing, Golf GTE

Special tools and workshop equipment required

- ◆ Torque Wrench 1331 5-50Nm - VAG1331- (5 to 50 Nm)

V.A.G 1331




W00-11166

- ◆ A/C Service Station

Removing

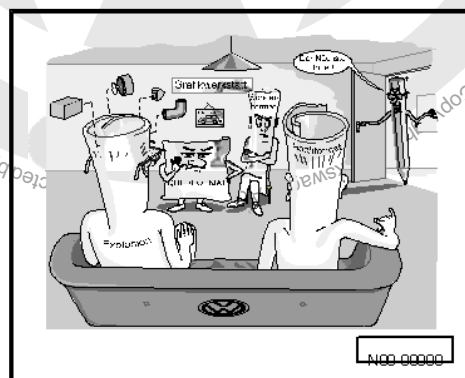
- Note safety precautions. Refer to
⇒ [“1.1 Handling Refrigerant Safety Precautions”, page 1](#) .



- ponents”.
- Classification.
Danger Class-
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accessible.
housing Liner;
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re that the
- A/C Com-
- Electrical A/C
- el A/C Com
- 

Death or serious bodily injury by electric shock:

- De-energize the high voltage system. Refer to ⇒ Rep. Gr. 93 ; High Voltage System, De-Energizing .
- Loosen the front section from the right front wheel housing liner, until the Electrical A/C Compressor - V470- is accessible. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Wheel Housing Liner; Overview - Front Wheel Housing Liner .
- Push aside the Electrical A/C Compressor - V470- -5- noise insulation (if installed) or partially remove to ensure that the connectors and bolts are accessible.
- Disconnect the connector -2- from the Electrical A/C Compressor - V470- -5-.
- Disconnect the high voltage cable -3- from the Electrical A/C Compressor - V470- -5-.
- Disconnect the ground cable -4- from the Electrical A/C Compressor - V470- -5-.
- Extract the refrigerant using the A/C Service Station . See notes. Refer to
⇒ "4.1 Working on the Refrigerant Circuit", page 8 .



Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Extract refrigerant and open the refrigerant circuit immediately.
- If the refrigerant was extracted more than 10 minutes in the past and the refrigerant circuit was not opened, extract the refrigerant again. The refrigerant circuit pressure comes from evaporation.

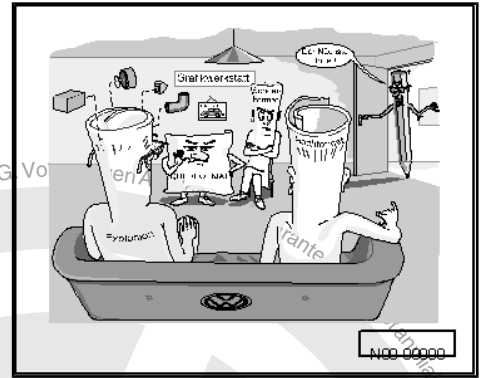


- Remove the refrigerant lines -1- and -6- from the Electrical A/C Compressor - V470- -5-.
- Remove the bolts -7-.
- Remove the Electrical A/C Compressor - V470- -5-.

Installing

Install in reverse order of removal. Note the following:

- Start the engine only after assembling the refrigerant circuit.
- Only start the engine when the refrigerant circuit is filled.



Note

- ◆ *Inspect the attachment points for the Electrical A/C Compressor - V470- and engine prior to installing.*
- ◆ *The contact surfaces must be clean and rust and grease-free.*



NOTICE

Risk of damaging the A/C compressor. Refrigerant oil may accumulate in the compression chamber of the removed A/C compressor.

- After installing a new A/C compressor or filling with fresh refrigerant oil, turn the A/C compressor 10 times by hand before installing the ribbed belt.



WARNING

Danger to life due to high voltage.

Severe bodily injury or death by electrocution is possible.

- Have a qualified person put the high voltage system back into service.

Tightening Specifications

- ◆ ➤ [“3.1 Overview - A/C Compressor Power Unit”, page 149](#)

3.5 A/C Compressor Fuse - S355- , Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench 1783 - 2-10Nm - VAG1783-
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-

Removing

- Note safety precautions. Refer to
➤ [“1.1 Handling Refrigerant Safety Precautions”, page 1](#) .
- See notes. Refer to
➤ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .
- Observe safety precautions when working on the high voltage system. Refer to
➤ [“1.3 High Voltage System Safety Precautions”, page 1](#) .
- Pay attention to safety precautions for working near high voltage components. Refer to
➤ [“1.4 Safety Precautions near High Voltage Components”, page 2](#) .



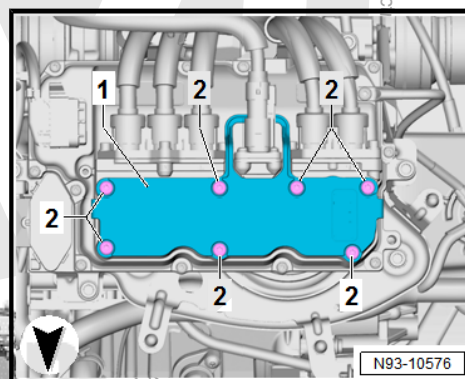
- Pay attention to the high voltage system danger classification. Refer to ➤ Rep. Gr. 00 ; High Voltage System Danger Classification .

⚠ DANGER

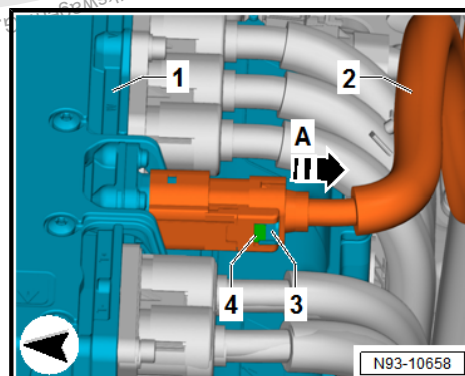
Danger to life due to high voltage.

Death or serious bodily injury by electric shock.

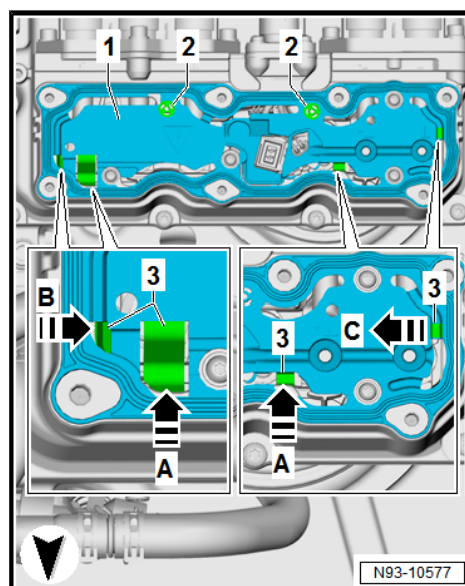
- Have the high voltage system de-energized by a qualified person.
- De-energize the high voltage system. Refer to ➤ Rep. Gr. 93 ; High Voltage System, De-Energizing .
- Remove the bolts -2- from the cover -1-.



- Remove the fuse -3- from the high voltage cable connector -2- for the High Voltage Battery Charger 1 - AX4- in direction of -arrow A-.
- Push the locking mechanism -4-.
- Remove the High Voltage Battery Charger 1 - AX4- high voltage cable -2- from the Electric Drive Power and Control Electronics - JX1- -1-.
- Remove the cover -1-.



- Release the retainers -3- in direction of arrows -A, B and C-.
- Unclip the retainers -2- upward.
- Remove the protection against contact -1-.





- Remove bolts -2-.
- Remove the A/C Compressor Fuse - S355- -1-.

Installing

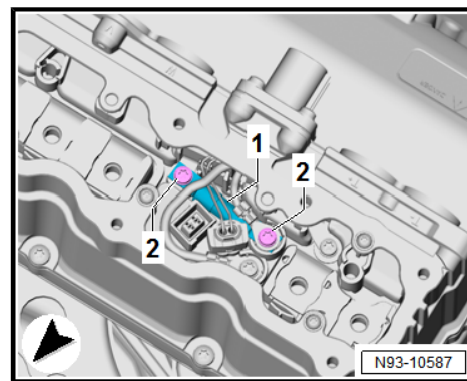
Install in reverse order of removal. Note the following:

NOTICE

The seal can be deformed if a contact protection is already installed.

If the seal is deformed, it can cause leaks. As a result, there may be moisture-related damage in the high voltage system.

- Replace the protection against contact for the Electric Drive Power and Control Electronics - JX1- after disassembling.



Replace the cover bolts for the Electric Drive Power and Control Electronics - JX1- after disassembling.

Cover Tightening Sequence

- Install the cover bolts.
- Tighten the bolts in the sequence -5, 6 and 1-. After that, the sequence can be in any order.

WARNING

Danger to life due to high voltage.

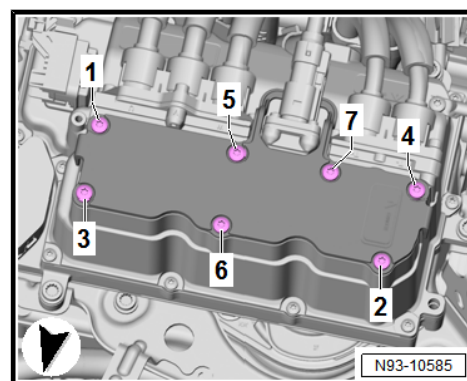
Severe bodily injury or death by electrocution is possible.

- Have a qualified person put the high voltage system back into service.

- Operate the high voltage system. Refer to ➔ Rep. Gr. 93 ; High Voltage System, De-Energizing .

Tightening Specifications

- ◆ Overview - Electric Drive Power and Control Electronics. Refer to ➔ Rep. Gr. 93 ; Electric Drive Power and Control Electronics .



3.6 Pressure Relieve Valve on A/C Compressor, Checking

Checking

- ◆ Function: Protects the refrigerant circuit against excessive pressure
- Note safety precautions. Refer to ➔ "1.1 Handling Refrigerant Safety Precautions", page 1 .



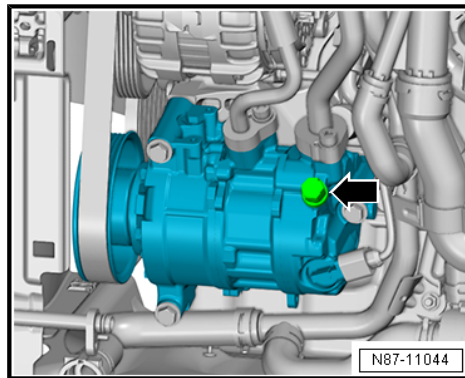
- See notes. Refer to
⇒ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .

CAUTION

There is a risk of frostbite through refrigerant. The pressure relief valve drains refrigerant when the engine is running and the refrigerant circuit pressure is too high.

Frostbite on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Turn the engine off.



Denso Air Conditioning (A/C) Compressor Relief Valve

- ◆ The pressure relief valve -arrow- has operated when refrigerant oil is found in the close vicinity.
- ◆ In this case, the vehicle must be taken to a specialized A/C repair facility. Refer to
⇒ [“4.1 Working on the Refrigerant Circuit”, page 8](#) .



Note

For other A/C compressor manufactures the relief valve is located in a similar place.

3.7 Belt Pulley, Removing and Installing

⇒ [“3.7.1 Belt Pulley, Removing and Installing, Denso”, page 168](#)

⇒ [“3.7.2 Belt Pulley, Removing and Installing, Sanden”, page 170](#)

3.7.1 Belt Pulley, Removing and Installing, Denso



Note

- ◆ *The belt pulley is sensitive to impact, for this reason handle it especially carefully.*
- ◆ *If the overload protection of the belt pulley is tripped, check the A/C compressor for ease of movement, before replacing the belt pulley. Replace an A/C compressor that is not operating smoothly.*
- ◆ *If the drive plate overload protection has activated, the belt pulley can be rotated using the outer part of the drive plate so that the Air Conditioning (A/C) compressor shaft and the hexagon head on the drive plate (inner part of the drive plate) do not rotate.*

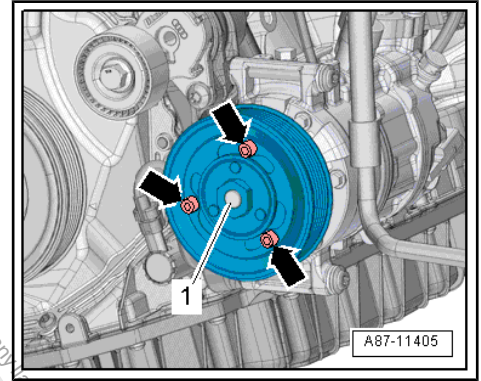
Special tools and workshop equipment required

- ◆ Commercially available oil filter band wrench

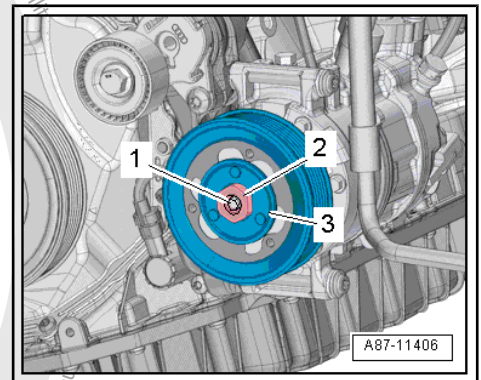


Removing

- Remove the ribbed belt. Refer to ➤ Rep. Gr. 13 ; Cylinder Block, Belt Pulley Side; Sub-Assembly Bracket, Removing and Installing .
- Remove the cap -1-.
- Remove the bolts -arrows- by counterholding the belt pulley with an oil filter band wrench.



- Remove the nut -2- by counterholding on the input shaft -1- of the A/C compressor.
- Remove the drive plate -3- with the nut.



Note

- ◆ The torque to drive the A/C compressor is transferred to the drive plate via the threaded connection.
- ◆ If, while the A/C compressor is working, the drive plate was attached to the A/C compressor shaft so tight, that it cannot be loosened (the 7 mm wrench cannot transmit the necessary torque) then the A/C compressor must be replaced.

- Remove the circlip -2-.
- Remove the belt pulley -1-.

Installing

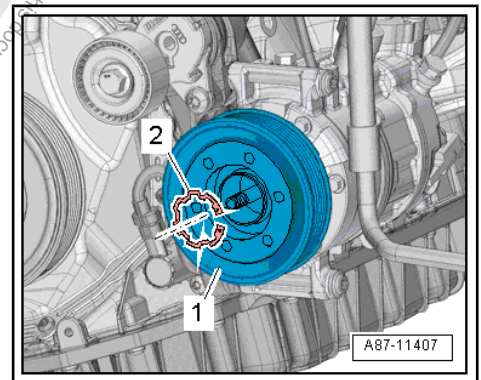
Install in reverse order of removal. Note the following:



Note

Replace the circlip.

- Clean the A/C compressor input shaft before setting the belt pulley on it.
- Place the belt pulley onto the A/C compressor input shaft.
 - The fitting must be possible without much force.
- Insert the circlip on the proper side.
 - Flat side faces the A/C compressor
- Clean the input shaft thread for the A/C compressor before removing the drive plate.



Note

The thread of the new drive plate has already been greased with a specific amount of grease by the manufacturer.

Tightening Specifications

- ◆ Refer to
➤ ["3.2.1 Overview - Belt Pulley, Denso A/C Compressor", page 153](#)



3.7.2 Belt Pulley, Removing and Installing, Sanden



Note

- ◆ *The belt pulley is sensitive to impact, for this reason handle it especially carefully.*
- ◆ *If the overload protection of the belt pulley is tripped, check the Air Conditioning (A/C) compressor for ease of movement, before replacing the belt pulley. Replace an A/C compressor that is not operating smoothly.*
- ◆ *If the drive plate overload protection has activated, the belt pulley can be rotated using the outer part of the drive plate so that the A/C compressor shaft and the hexagon head on the drive plate (inner part of the drive plate) do not rotate.*
- Remove the ribbed belt. Refer to ⇒ Rep. Gr. 13 ; Cylinder Block, Belt Pulley Side; Sub-Assembly Bracket, Removing and Installing .
- Remove and install the belt pulley. Refer to ⇒ ["3.2.2 Overview - Belt Pulley, Sanden A/C Compressor", page 154](#) .



4 Actuators

⇒ [“4.1 Component Location Overview - Front Actuators”, page 171](#)

⇒ [“4.2 Temperature Regulator Door Motor V68 with Temperature Regulator Door Motor Position Sensor G92 , Removing and Installing”, page 176](#)

⇒ [“4.3 Defroster Door Motor V107 with Defroster Door Motor Position Sensor G135 , Removing and Installing”, page 179](#)

⇒ [“4.4 Recirculation Door Motor V113 , Removing and Installing”, page 183](#)

⇒ [“4.5 Left Temperature Door Motor V158 with Left Temperature Door Potentiometer/Actuator G220 , Removing and Installing”, page 187](#)

⇒ [“4.6 Right Temperature Door Motor V159 with Right Temperature Door Potentiometer/Actuator G221 , Removing and Installing”, page 190](#)

⇒ [“4.7 Fresh Air/Recirculating Air/Back Pressure Door Motor V425 with Fresh Air/Recirculating Air/Back Pressure Door Motor Position Sensor G644 , Removing and Installing”, page 195](#)

⇒ [“4.8 Front Air Distribution Door Motor V426 with Air Distribution Door Motor Position Sensor G642 , Removing and Installing”, page 199](#)

⇒ [“4.9 Air Distribution Door Motor V428 with Position Sensor Air Distribution Door Motor Position Sensor G645 , Removing and Installing”, page 202](#)

⇒ [“4.10 Air Distribution Door Adjuster, Removing and Installing”, page 207](#)

4.1 Component Location Overview - Front Actuators

⇒ [“4.1.1 Component Location Overview - Front Actuators, Electric-Manual Climate Control System”, page 171](#)

⇒ [“4.1.3 Component Location Overview - Front Actuators, Climate Tronic”, page 173](#)

4.1.1 Component Location Overview - Front Actuators, Electric-Manual Climate Control System



1 - Temperature Regulator Door Motor - V68-

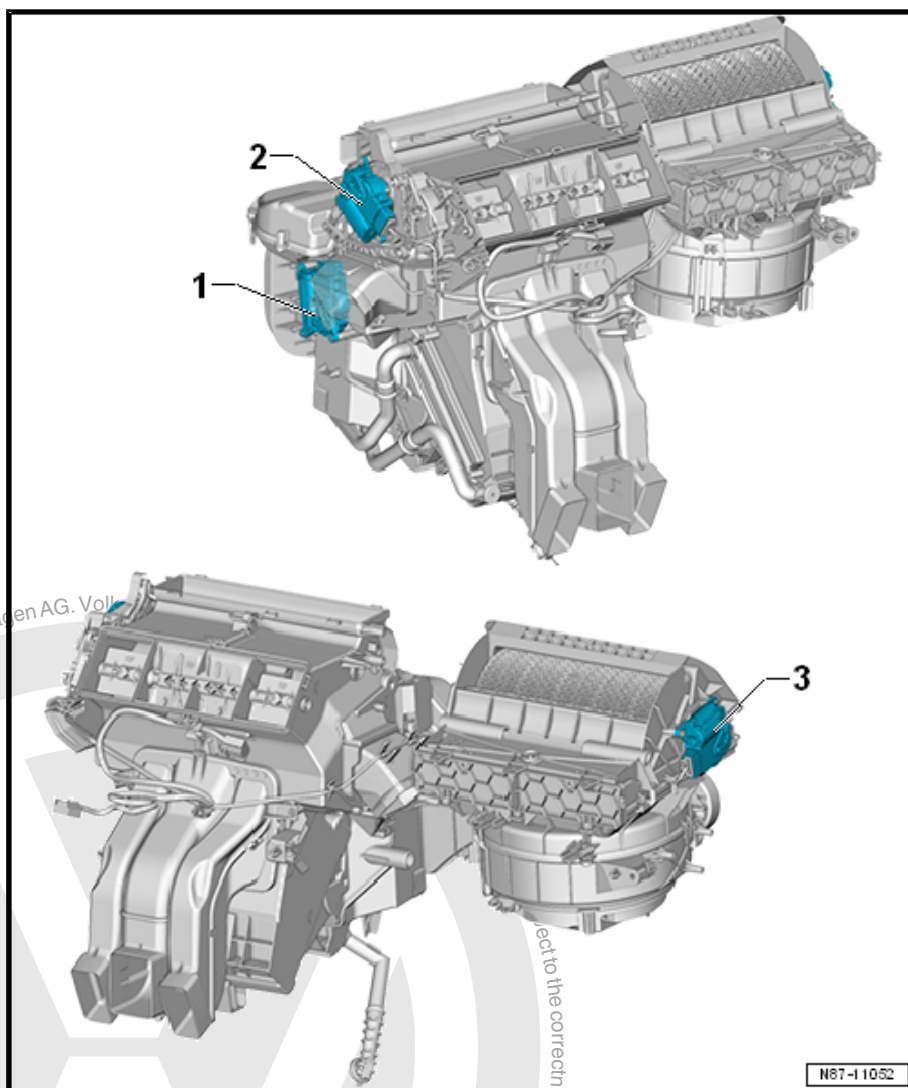
- ☐ With the Temperature Regulator Door Motor Position Sensor - G92-
- ☐ Check using the Vehicle Diagnostic Tester
- ☐ Removing and installing. Refer to
⇒ ["4.2 Temperature Regulator Door Motor V68 with Temperature Regulator Door Motor Position Sensor G92 , Removing and Installing", page 176](#) .
- ☐ Replacing: initiate basic setting using the Vehicle Diagnostic Tester .

2 - Air Distribution Door Motor - V428-

- ☐ With the Air Distribution Door Motor Position Sensor - G645-
- ☐ Check using the Vehicle Diagnostic Tester
- ☐ Removing and installing. Refer to
⇒ ["4.9 Air Distribution Door Motor V428 with Position Sensor Air Distribution Door Motor Position Sensor G645 , Removing and Installing", page 202](#) .
- ☐ Replacing: initiate basic setting using the Vehicle Diagnostic Tester .

3 - Recirculation Door Motor - V113-

- ☐ Check using the Vehicle Diagnostic Tester
- ☐ Removing and installing. Refer to
⇒ ["4.4 Recirculation Door Motor V113 , Removing and Installing", page 183](#) .
- ☐ Replacing: initiate basic setting using the Vehicle Diagnostic Tester .





4.1.2 Component Location Overview - Front Actuators, Electric-Manual Climate Control System, RHD

1 - Temperature Regulator Door Motor - V68-

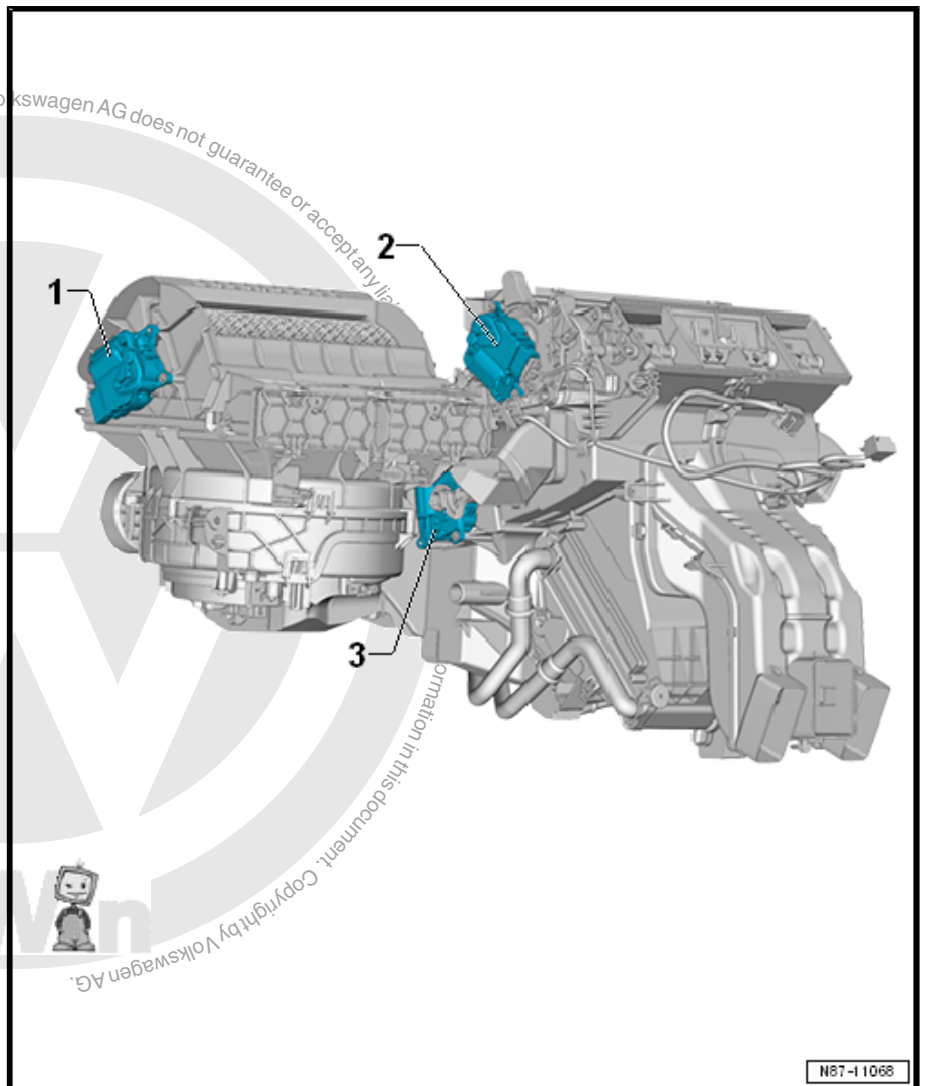
- ☐ Check using the Vehicle Diagnostic Tester
- ☐ Removing and installing. Refer to
⇒ ["4.2.2 Temperature Regulator Door Motor V68, Removing and Installing, RHD", page 177](#).
- ☐ Replacing: initiate basic setting using the Vehicle Diagnostic Tester.

2 - Air Distribution Door Motor - V428-

- ☐ Check using the Vehicle Diagnostic Tester
- ☐ Removing and installing. Refer to
⇒ ["4.9.2 Air Distribution Door Motor V428, Removing and Installing, RHD", page 204](#).
- ☐ Replacing: initiate basic setting using the Vehicle Diagnostic Tester.

3 - Recirculation Door Motor - V113-

- ☐ Check using the Vehicle Diagnostic Tester
- ☐ Removing and installing. Refer to
⇒ ["4.4 Recirculation Door Motor V113, Removing and Installing", page 183](#).
- ☐ Replacing: initiate basic setting using the Vehicle Diagnostic Tester.



N87-11068

4.1.3 Component Location Overview - Front Actuators, Climatronic

Pay attention to the turn off conditions for vehicles with the Start/Stop System. Refer to
⇒ ["3.2 Vehicles with Start/Stop System General Information", page 6](#).

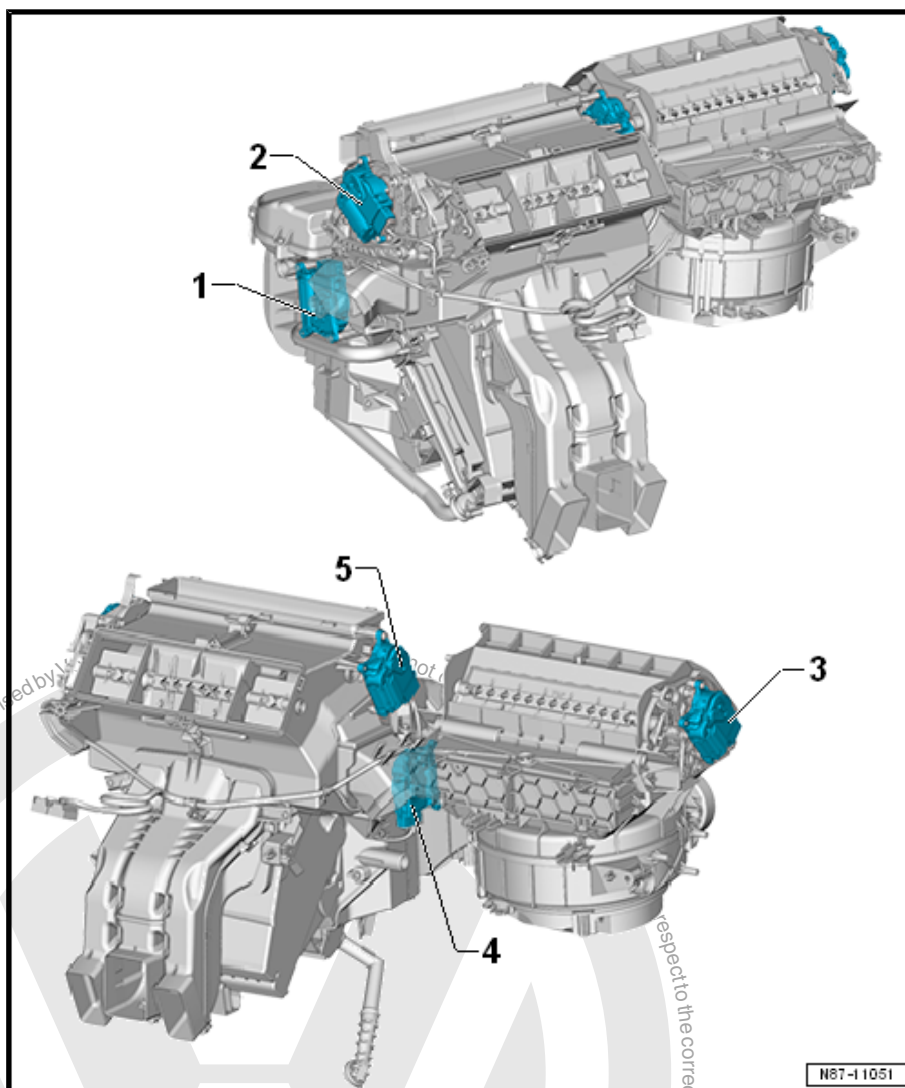


1 - Left Temperature Door Motor - V158-

- ❑ With Left Temperature Door Potentiometer/Actuator - G220-
- ❑ Check using the Vehicle Diagnostic Tester
- ❑ Removing and installing. Refer to
⇒ ["4.5.1 Left Temperature Door Motor V158, Removing and Installing", page 187](#) .
- ❑ Replacing: initiate basic setting using the Vehicle Diagnostic Tester .

2 - Front Air Distribution Door Motor - V426- with Front Air Distribution Door Motor Position Sensor - G642-

- ❑ With the Front Air Distribution Door Motor Position Sensor - G642-
- ❑ Check using the Vehicle Diagnostic Tester
- ❑ Removing and installing. Refer to
⇒ ["4.8 Front Air Distribution Door Motor V426 with Air Distribution Door Motor Position Sensor G642, Removing and Installing", page 199](#) .
- ❑ Replacing: Initiate the basic setting using the Vehicle Diagnostic Tester



3 - Fresh Air/Recirculating Air/Back Pressure Door Motor - V425-

- ❑ With Fresh Air/Recirculating Air/Back Pressure Door Motor Position Sensor - G644-
- ❑ Check using the Vehicle Diagnostic Tester
- ❑ Removing and installing. Refer to
⇒ ["4.7 Fresh Air/Recirculating Air/Back Pressure Door Motor V425 with Fresh Air/Recirculating Air/Back Pressure Door Motor Position Sensor G644, Removing and Installing", page 195](#) .
- ❑ Replacing: Initiate the basic setting using the Vehicle Diagnostic Tester

4 - Right Temperature Door Motor - V159-

- ❑ With Right Temperature Door Potentiometer/Actuator - G221-
- ❑ Check using the Vehicle Diagnostic Tester
- ❑ Removing and installing. Refer to
⇒ ["4.6.1 Right Temperature Door Motor V159, Removing and Installing", page 190](#) .
- ❑ Replacing: initiate basic setting using the Vehicle Diagnostic Tester .

5 - Defroster Door Motor - V107-

- ❑ With the Defroster Door Motor Position Sensor - G135-
- ❑ Check using the Vehicle Diagnostic Tester
- ❑ Removing and installing. Refer to
⇒ ["4.3 Defroster Door Motor V107 with Defroster Door Motor Position Sensor G135, Removing and Installing", page 179](#) .
- ❑ Replacing: initiate basic setting using the Vehicle Diagnostic Tester .

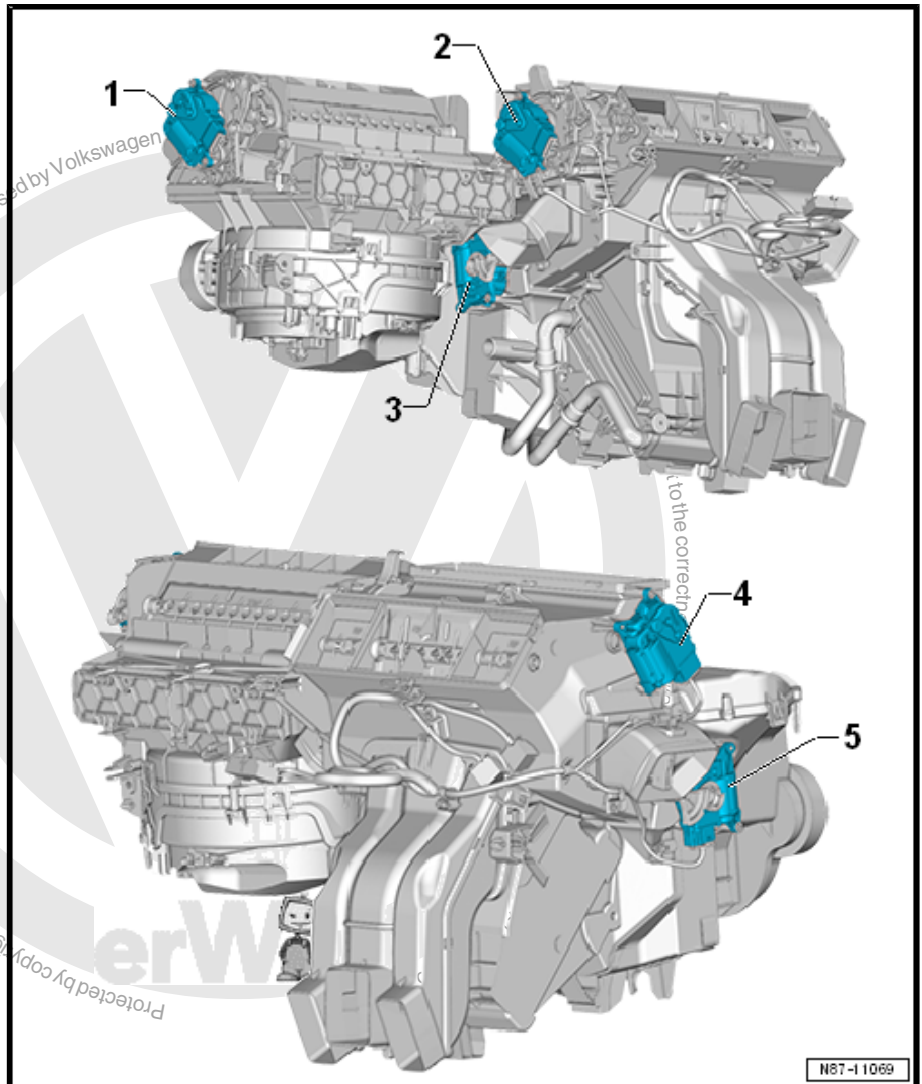
4.1.4 Component Location Overview - Front Actuators, Climatronic, RHD

1 - Fresh Air/Recirculating Air/Back Pressure Door Motor - V425-

- ☐ With Fresh Air/Recirculating Air/Back Pressure Door Motor Position Sensor - G644-
- ☐ Check using the Vehicle Diagnostic Tester
- ☐ Removing and installing. Refer to
⇒ ["4.7.2 Fresh Air/Recirculating Air/Back Pressure Door Motor V425 , Removing and Installing, RHD", page 196](#) .
- ☐ Replacing: Initiate the basic setting using the Vehicle Diagnostic Tester

2 - Front Air Distribution Door Motor - V426- with Front Air Distribution Door Motor Position Sensor - G642-

- ☐ with the Front Air Distribution Door Motor Position Sensor - G642-
- ☐ Check using the Vehicle Diagnostic Tester
- ☐ Removing and installing. Refer to
⇒ ["4.8.2 Air Distribution Door Motor V426 , Removing and Installing, RHD", page 201](#) .
- ☐ Replacing: Initiate the basic setting using the Vehicle Diagnostic Tester



3 - Left Temperature Door Motor - V158-

- ☐ with Left Temperature Door Potentiometer/Actuator - G220-
- ☐ Check using the Vehicle Diagnostic Tester
- ☐ Removing and installing. Refer to
⇒ ["4.5.2 Left Temperature Door Motor V158 , Removing and Installing, RHD", page 188](#) .
- ☐ Replacing: initiate basic setting using the Vehicle Diagnostic Tester .

4 - Defroster Door Motor - V107-

- ☐ With the Defroster Door Motor Position Sensor - G135-
- ☐ Check using the Vehicle Diagnostic Tester
- ☐ Removing and installing. Refer to
⇒ ["4.3.2 Defroster Door Motor V107 with Defroster Door Motor Position Sensor G135 , Removing and Installing, RHD", page 181](#) .
- ☐ Replacing: initiate basic setting using the Vehicle Diagnostic Tester .

5 - Right Temperature Door Motor - V159-

- ☐ with Right Temperature Door Potentiometer/Actuator - G221-
- ☐ Check using the Vehicle Diagnostic Tester
- ☐ Removing and installing. Refer to
⇒ ["4.6.2 Right Temperature Door Motor V159 , Removing and Installing, RHD", page 192](#) .



- ❑ Replacing: initiate basic setting using the Vehicle Diagnostic Tester .

4.2 Temperature Regulator Door Motor - V68- with Temperature Regulator Door Motor Position Sensor - G92- , Removing and Installing

⇒ [“4.2.1 Temperature Regulator Door Motor V68 , Removing and Installing”, page 176](#)

4.2.1 Temperature Regulator Door Motor - V68- , Removing and Installing

Heater and Electronic-Manually Regulated A/C System

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester

Removing

- Turn off the ignition.
- Equipment level with ignition lock: Remove the ignition key.

⚠ CAUTION

Pyrotechnic components can unintentionally deploy.

Risk of injury.

- Discharge static electricity: Briefly touch the door striker pin.

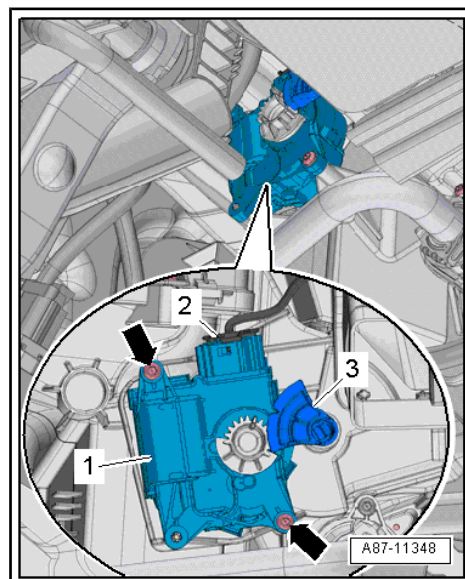
- Remove the driver footwell vent. Refer to
⇒ [“6.5 Driver Side Footwell Vent, Removing and Installing”, page 276](#) .
- Remove the operating lever -3- from the heater.



Note

The upper bolt is accessible with a commercially available small bit-ratchet.

- Remove the bolts -arrows-.
- Disconnect the connector -2-.
- Remove the Temperature Regulator Door Motor - V68- -1-.



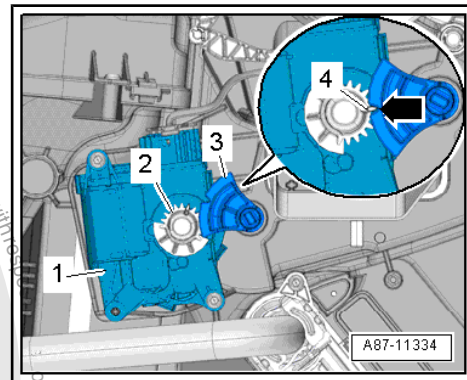
Installing

Install in reverse order of removal. Note the following:



Note

- ◆ Check the function of the doors and linkage before installing.
- ◆ Check if the lever and shafts are seated correctly in the mounts.
- Mount the actuator -1- onto the air distribution housing. When doing this, the toothed gear -2- on the actuator must engage into the toothed gear -3- on the operating lever.
- The long tooth -4- must engage into the recess -arrow- on the operating lever.



Note

- ◆ If the toothed gear on the actuator and the toothed gear on the temperature door lever do not face each other, turn the mount in the actuator.
- ◆ If the bolts cannot be installed, the actuator does not sit completely on the housing.
- Switch on the ignition, connect the affected actuator to the vehicle wiring harness and select the setting for the desired actuator position on the display control head (for example, the center position). Wait until the actuator reaches the desired position and switch the ignition off.
- Install the wiring harness so that it cannot come in contact with any moving parts (for example, the lever on the actuator).
- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries, then perform the “basic setting” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

- ◆ Refer to ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)

4.2.2 Temperature Regulator Door Motor - V68- , Removing and Installing, RHD

Heater and electronic-manually regulated A/C system:

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester

Removing

- Turn off the ignition.
- Remove the partition. Refer to ⇒ [“5.20.2 Partition, Removing and Installing, RHD”, page 270](#).
- Remove the footwell center console trim panel. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .



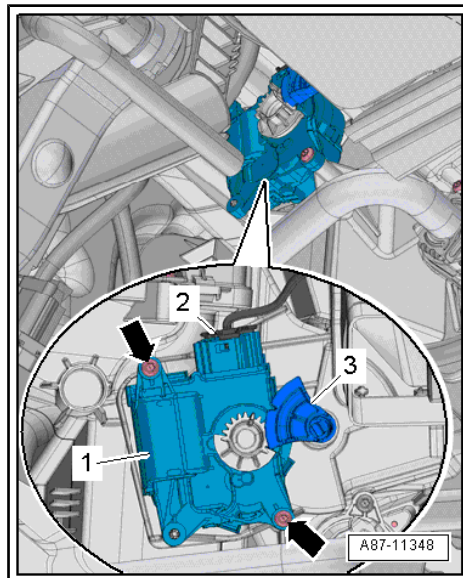
- Remove the operating lever -3- from the heater.



Note

The upper bolt is accessible with a commercially available small bit-ratchet.

- Remove the bolts -arrows-.
- Disconnect the connector -2-.
- Remove the Temperature Regulator Door Motor - V68- -1-.





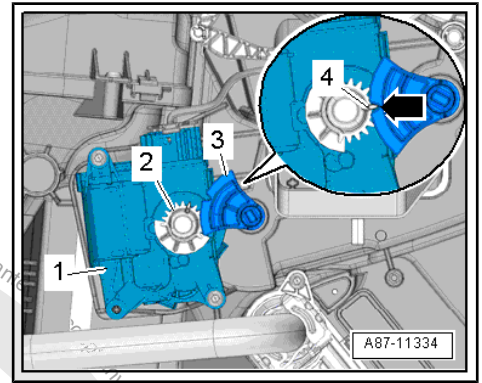
Installing

Install in reverse order of removal. Note the following:



Note

- ◆ Check the function of the doors and linkage before installing.
- ◆ Check if the lever and shafts are seated correctly in the mounts.
- Mount the actuator -1- onto the air distribution housing. When doing this, the toothed gear -2- on the actuator must engage into the toothed gear -3- on the operating lever.
- The long tooth -4- must engage into the recess -arrow- on the operating lever.



Note

- ◆ If the toothed gear on the actuator and the toothed gear on the temperature door lever do not face each other, turn the mount in the actuator.
- ◆ If the bolts cannot be installed, the actuator does not sit completely on the housing.
- Switch on the ignition, connect the affected actuator to the vehicle wiring harness and select the setting for the desired actuator position on the display control head (for example, the center position). Wait until the actuator reaches the desired position and switch the ignition off.
- Install the wiring harness so that it cannot come in contact with any moving parts (for example, the lever on the actuator).
- Check the DTC memory and erase any displayed entries, then perform the “basic setting” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

- ◆ ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)
- ◆ Footwell center console trim panel. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .

4.3 Defroster Door Motor - V107- with Defroster Door Motor Position Sensor - G135- , Removing and Installing

⇒ [“4.3.1 Defroster Door Motor V107 with Defroster Door Motor Position Sensor G135 , Removing and Installing”, page 179](#)

4.3.1 Defroster Door Motor - V107- with Defroster Door Motor Position Sensor - G135- , Removing and Installing

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester

Perform the following work first:

- Turn off all electric consumers.



- Turn off the ignition.
- Remove the key.

Removing

- Remove the glove compartment. Refer to ➔ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Glove Compartment, Removing and Installing .
- Remove the bolts -arrows-.
- Remove the Defroster Door Motor - V107- -1-.
- Disconnect the connector -2-.

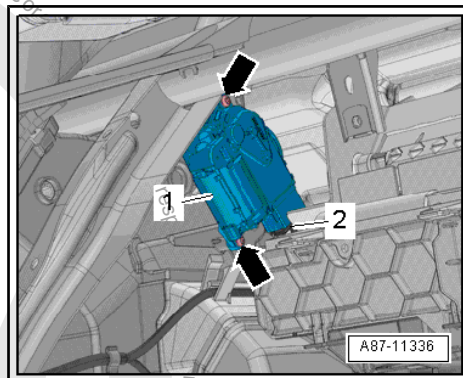
Installing

Install in reverse order of removal. Note the following:



Note

- ◆ Check the function of the doors and linkage before installing.
- ◆ Check if the lever and shafts are seated correctly in the mounts.



- The actuator mount -1- can only be installed in one position on the actuating arm -2-.
- The actuator mount must be opposite the actuating arm, as shown in the illustration.

**Note**

If the mount and the actuating arm are not opposite each other, turn the mount in the actuator.

- Switch on the ignition, connect the affected actuator to the vehicle wiring harness and select the setting for the desired actuator position on the display control head (for example, the center position). Wait until the actuator reaches the desired position and switch the ignition off.
- Mount the actuator on the air distribution housing so that the actuating arm reaches into the mount -1- -arrow-.
- There must not be any play in the connection between the actuator and the actuating arm.

**Note**

If the bolts cannot be installed, the actuator does not sit completely on the housing.

- Install the wiring harness so that it cannot come in contact with any moving parts (for example, the lever on the actuator).
- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries, then perform the “basic setting” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

- ◆ Refer to ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)
- ◆ Storage Compartments and Covers; Overview - Glove Compartment. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Overview - Glove Compartment .

4.3.2 Defroster Door Motor - V107- with Defroster Door Motor Position Sensor - G135- , Removing and Installing, RHD

Special tools and workshop equipment required

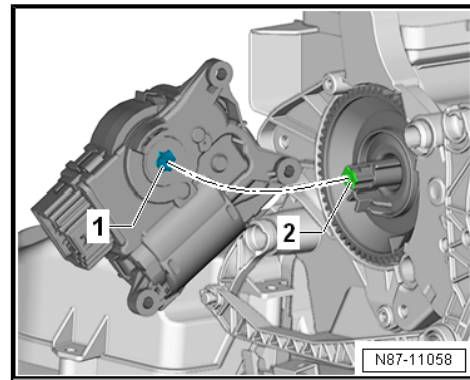
- ◆ Vehicle Diagnostic Tester

Perform the following work first:

- Turn off all electric consumers.
- Turn off the ignition.
- Remove the key.

Removing

- Remove the instrument panel. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel; Instrument Panel, Removing and Installing .





- Remove screws -2-.
- Remove the Defroster Door Motor - V107- -1-.
- Disconnect the connector -3-.

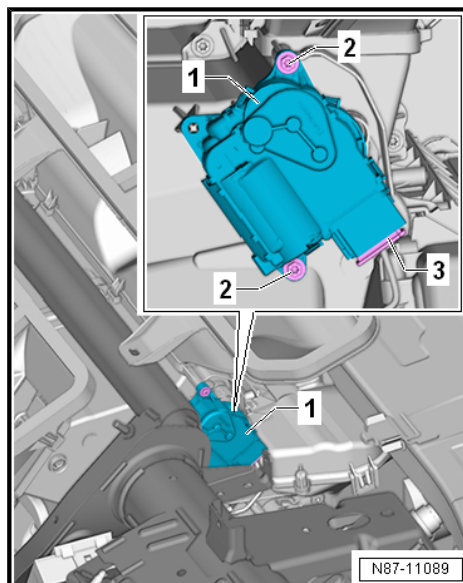
Installing

Install in reverse order of removal. Note the following:



Note

- ◆ Check the function of the doors and linkage before installing.
- ◆ Check if the lever and shafts are seated correctly in the mounts.
- ◆ The illustration shows a LHD.

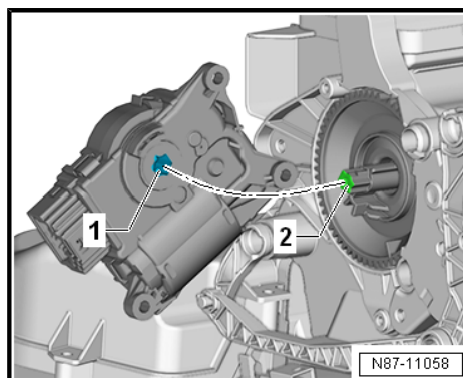


- The actuator mount -1- can only be installed in one position on the actuating arm -2-.
- The actuator mount must be opposite the actuating arm as shown in the illustration.



Note

If the mount and the actuating arm are not opposite each other, turn the mount in the actuator.



- Switch on the ignition, connect the affected actuator to the vehicle wiring harness and select the setting for the desired actuator position on the display control head (for example, the center position). Wait until the actuator reaches the desired position and switch the ignition off.
- Mount the actuator on the air distribution housing so that the actuating arm reaches into the mount -1- -arrow-.
- There must not be any play in the connection between the actuator and the actuating arm.



Note

If the bolts cannot be installed, the actuator does not sit completely on the housing.

- Install the wiring harness so that it cannot come in contact with any moving parts (for example, the lever on the actuator).
- Check the DTC memory and erase any displayed entries, then perform the “basic setting” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

- ◆ ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)
- ◆ Instrument panel. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel; Instrument Panel, Removing and Installing .



4.4 Recirculation Door Motor - V113- , Removing and Installing

⇒ ["4.4.1 Recirculation Door Motor V113 , Removing and Installing", page 183](#)

4.4.1 Recirculation Door Motor - V113- , Removing and Installing

Heater and Electronic-Manually Regulated A/C System

Special tools and workshop equipment required

◆ Vehicle Diagnostic Tester



Note

The actuator has end stops with integrated end switches instead of a position sensor.

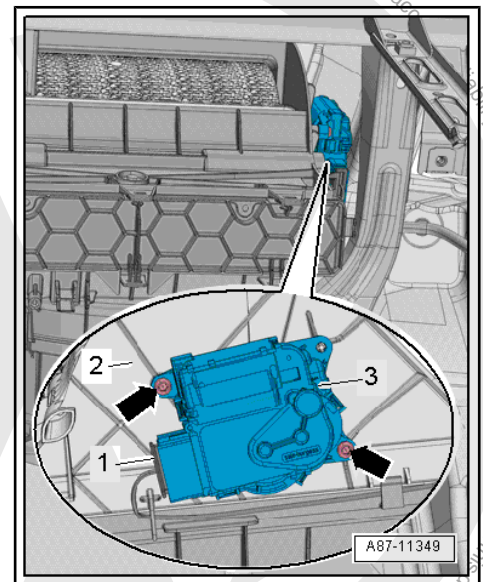
Perform the Following Work First

- Turn off all electric consumers.
- Turn off the ignition.
- Remove the key.

Removing

- Remove the glove compartment. Refer to ⇒ Body Interior, Rep. Gr. 68 ; Storage Compartments and Covers; Glove Compartment, Removing and Installing .
- Remove the bolts -arrows-.
- Remove the Recirculation Door Motor - V113- -3- from the air intake duct -2-.
- Disconnect the connector -1-.

Installing



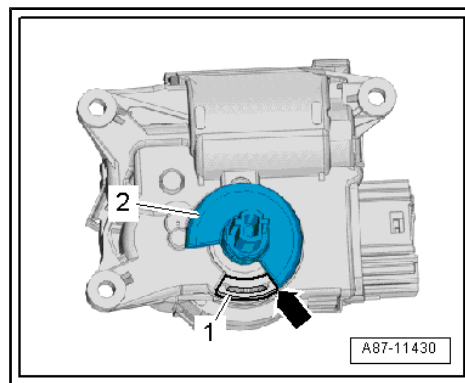


Install in reverse order of removal. Note the following:



Note

- ◆ Check the function of the doors and linkage before installing.
- ◆ Check if the lever and shafts are seated correctly in the mounts.
- The fresh air door must be in the “open” position so the fresh air comes into the vehicle.
- The actuating shaft -2- must contact the stop -1- -arrow- as illustrated.



Note

If the actuating shaft of the actuator is not set to “fresh-air mode” stop, turn the mount in the actuator.

- Switch on the ignition, connect the affected actuator to the vehicle wiring harness and select the setting for the desired actuator position on the display control head (for example, the center position). Wait until the actuator reaches the desired position and switch the ignition off.
- Mount the actuator to the air intake housing so that the actuating shaft engages into the mount.
- There must not be any play in the connection between the actuating shaft and the mount.



Note

If the bolts cannot be installed, the actuator does not sit completely on the housing.

- Install the wiring harness so that it cannot come in contact with any moving parts (for example, the lever on the actuator).
- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries, then perform the “basic setting” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

- ◆ Refer to ➔ [“5.1 Overview - Heater and A/C Unit”, page 213](#)
- ◆ Storage Compartments and Covers; Overview - Glove Compartment. Refer to ➔ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Overview - Glove Compartment .

4.4.2 Recirculation Door Motor - V113- , Removing and Installing, RHD

Heater and electronic-manually regulated A/C system:

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester



Note

The actuator has end stops with integrated end switches instead of a position sensor.

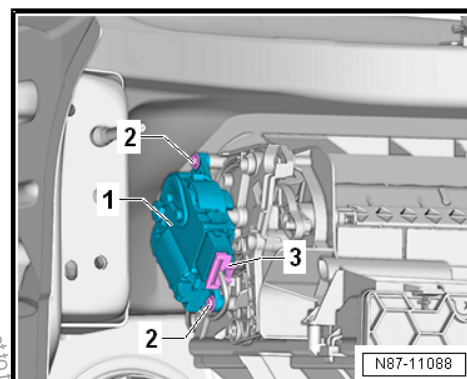
Perform the following work first:

- Turn off all electric consumers.
- Turn off the ignition.
- Remove the key.

Removing

- Remove the instrument panel central tube. Refer to ➤ Body Interior; Rep. Gr. 70 ; Instrument Panel Central Tube; Instrument Panel Central Tube, Removing and Installing .
- Remove screws -2-.
- Remove the Recirculation Door Motor - V113- -1- from the air intake duct.
- Disconnect the connector -3-.

Installing



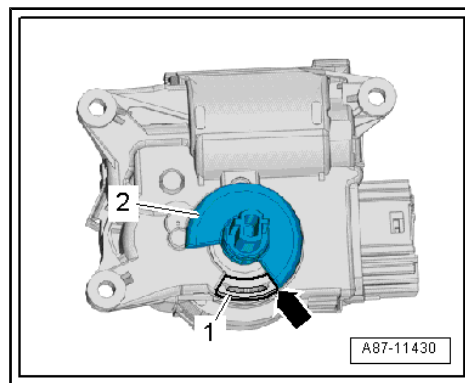


Install in reverse order of removal. Note the following:



Note

- ◆ Check the function of the doors and linkage before installing.
- ◆ Check if the lever and shafts are seated correctly in the mounts.
- The fresh air door must be in the “open” position so the fresh air comes into the vehicle.
- The actuating shaft -2- must contact the stop -1- -arrow- as illustrated.



Note

If the actuating shaft of the actuator is not set to “fresh-air mode” stop, turn the mount in the actuator.

- Switch on the ignition, connect the affected actuator to the vehicle wiring harness and select the setting for the desired actuator position on the display control head (for example, the center position). Wait until the actuator reaches the desired position and switch the ignition off.
- Mount the actuator to the air intake housing so that the actuating shaft engages into the mount.
- There must not be any play in the connection between the actuating shaft and the mount.



Note

If the bolts cannot be installed, the actuator does not sit completely on the housing.

- Install the wiring harness so that it cannot come in contact with any moving parts (for example, the lever on the actuator).
- Check the DTC memory and erase any displayed entries, then perform the “basic setting” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

- ◆ ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)
- ◆ Overview - Instrument Panel Central Tube, Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel Central Tube; Overview - Instrument Panel Central Tube .
- ◆ Overview - instrument panel. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel; Overview - Instrument Panel .



4.5 Left Temperature Door Motor - V158- with Left Temperature Door Potentiometer/Actuator - G220- , Removing and Installing

⇒ ["4.5.1 Left Temperature Door Motor V158 , Removing and Installing", page 187](#)

4.5.1 Left Temperature Door Motor - V158- , Removing and Installing

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester

Perform the following work first:

- Turn off all electric consumers.
- Turn off the ignition.
- Remove the key.

Removing

CAUTION

Pyrotechnic components can unintentionally deploy.
Risk of injury.

- Discharge static electricity: Briefly touch the door striker pin.

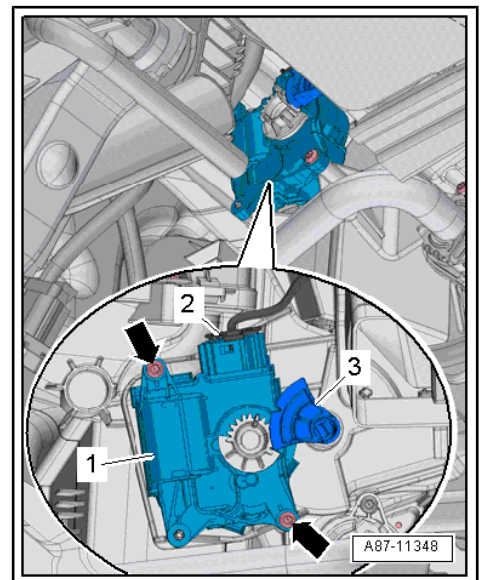
- Remove the driver footwell vent. Refer to
⇒ ["6.5 Driver Side Footwell Vent, Removing and Installing",
page 276](#) .
- Remove the operating lever -3- from the heater.



Note

The upper bolt is accessible with a commercially available small bit-ratchet.

- Remove the bolts -arrows-.
- Disconnect the connector -2-.
- Remove the Left Temperature Door Motor - V158- -1-.





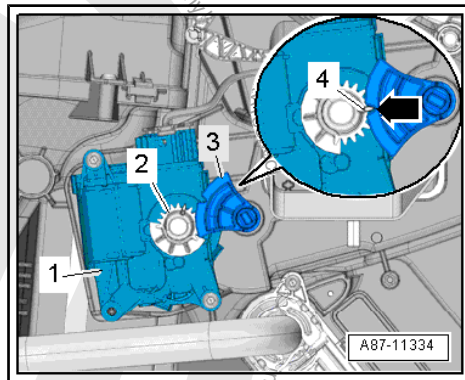
Installing

Install in reverse order of removal. Note the following:



Note

- ◆ Check the function of the doors and linkage before installing.
- ◆ Check if the lever and shafts are seated correctly in the mounts.
- Mount the actuator -1- onto the air distribution housing. When doing this, the toothed gear -2- on the actuator must engage into the toothed gear -3- on the temperature door lever.
- The long tooth -4- must engage into the recess -arrow- on the operating lever.



Note

- ◆ If the toothed gear on the actuator and the toothed gear on the temperature door lever do not face each other, turn the mount in the actuator.
- ◆ If the bolts cannot be installed, the actuator does not sit completely on the housing.
- ◆ Turn the actuator so far until it has reached a favorable position for installation. The direction of rotation can be reversed by switching the positive and negative.
- Switch on the ignition, connect the affected actuator to the vehicle wiring harness and select the setting for the desired actuator position on the display control head (for example, the center position). Wait until the actuator reaches the desired position and switch the ignition off.
- Install the wiring harness so that it cannot come in contact with any moving parts (for example, the lever on the actuator).
- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries, then perform the “basic setting” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

- ◆ Refer to ➔ [“5.1 Overview - Heater and A/C Unit”, page 213](#)

4.5.2 Left Temperature Door Motor - V158- , Removing and Installing, RHD

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester

Perform the following work first:

- Turn off all electric consumers.
- Turn off the ignition.
- Remove the key.



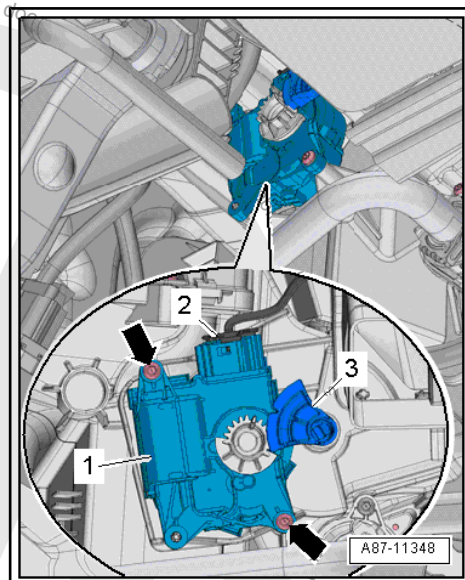
Removing

- Remove the partition. Refer to
⇒ [“5.20.2 Partition, Removing and Installing, RHD”](#),
[page 270](#) .
- Remove the footwell center console trim panel. Refer to ⇒
Body Interior; Rep. Gr. 68 ; Center Console; Overview - Cen-
ter Console .
- Remove the operating lever -3- from the heater.



Note

- ◆ *The upper bolt is accessible with a commercially available small bit-ratchet.*
- ◆ *The illustration shows LHD. The procedure is identical.*
- Remove the bolts -arrows-.
- Disconnect the connector -2-.
- Remove the Left Temperature Door Motor - V158- -1-.





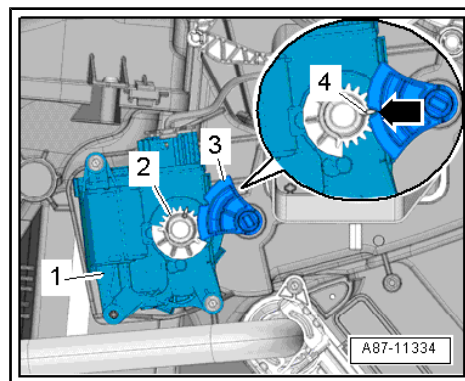
Installing

Install in reverse order of removal. Note the following:



Note

- ◆ Check the function of the doors and linkage before installing.
- ◆ Check if the lever and shafts are seated correctly in the mounts.
- Mount the actuator -1- onto the air distribution housing. When doing this, the toothed gear -2- on the actuator must engage into the toothed gear -3- on the temperature door lever.
- The long tooth -4- must engage into the recess -arrow- on the operating lever.



Note

- ◆ If the toothed gear on the actuator and the toothed gear on the temperature door lever do not face each other, turn the mount in the actuator.
- ◆ If the bolts cannot be installed, the actuator does not sit completely on the housing.
- ◆ Turn the actuator so far until it has reached a favorable position for installation. The direction of rotation can be reversed by switching the positive and negative.
- Switch on the ignition, connect the affected actuator to the vehicle wiring harness and select the setting for the desired actuator position on the display control head (for example, the center position). Wait until the actuator reaches the desired position and switch the ignition off.
- Install the wiring harness so that it cannot come in contact with any moving parts (for example, the lever on the actuator).
- Check the DTC memory and erase any displayed entries, then perform the “basic setting” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

- ◆ ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)
- ◆ Footwell center console trim panel. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .

4.6 Right Temperature Door Motor - V159- with Right Temperature Door Potentiometer/Actuator - G221- , Removing and Installing

⇒ [“4.6.1 Right Temperature Door Motor V159, Removing and Installing”, page 190](#)

4.6.1 Right Temperature Door Motor - V159- , Removing and Installing

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester

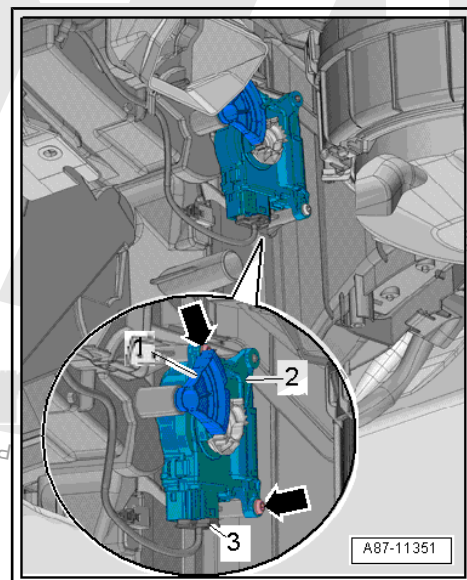


Perform the following work first:

- Turn off all electric consumers.
- Turn off the ignition.
- Remove the key.

Removing

- Remove the partition. Refer to [⇒ "5.20 Partition, Removing and Installing", page 269](#) .
- Remove the operating lever -1- for the temperature door.
- Remove the bolts -arrows-.
- Remove the Right Temperature Door Motor - V159- -2-.
- Disconnect the connector -3-.





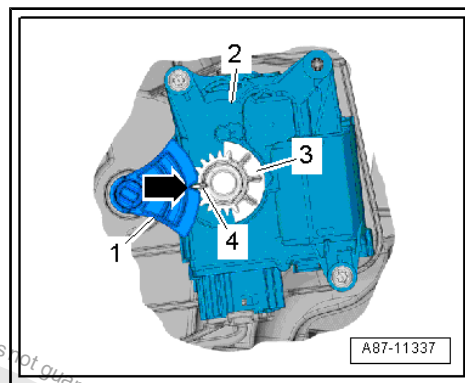
Installing

Install in reverse order of removal. Note the following:



Note

- ◆ Check the function of the doors and linkage before installing.
- ◆ Check if the lever and shafts are seated correctly in the mounts.
- Mount the actuator -2- onto the air distribution housing. When doing this, the toothed gear -3- on the actuator must engage into the toothed gear -1- on the temperature door lever.
- The long tooth -4- must engage into the recess -arrow- on the operating lever.



Note

- ◆ If the toothed gear on the actuator and the toothed gear on the temperature door lever do not face each other, turn the mount in the actuator.
- ◆ If the bolts cannot be installed, the actuator does not sit completely on the housing.
- Switch on the ignition, connect the affected actuator to the vehicle wiring harness and select the setting for the desired actuator position on the display control head (for example, the center position). Wait until the actuator reaches the desired position and switch the ignition off.
- Install the wiring harness so that it cannot come in contact with any moving parts (for example, the lever on the actuator).



Note

Turn the actuator so far until it has reached a favorable position for installation. The direction of rotation can be reversed by switching the positive and negative.

- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries, then perform the “basic setting” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

- ◆ Refer to ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)

4.6.2 Right Temperature Door Motor - V159- , Removing and Installing, RHD

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester
- ◆ Ratchet-Bit

Perform the following work first:

- Turn off all electric consumers.
- Turn off the ignition.



- Remove the key.

Removing



Note

- ◆ *The Right Temperature Door Motor - V159- is accessible from the footwell.*
- ◆ *The illustration shows LHD. The procedure is identical.*
- ◆ *The bolts are accessible with a commercially available small reversible ratchet-bit with bit holder.*



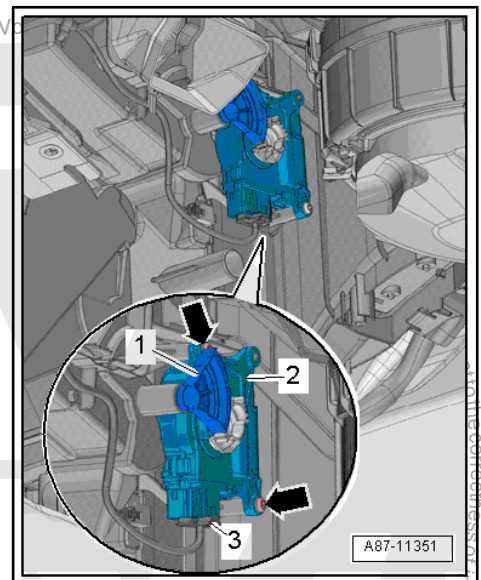
CAUTION

Pyrotechnic components can unintentionally deploy.

Risk of injury.

- Discharge static electricity: Briefly touch the door striker pin.

- Remove the operating lever -1- for the temperature door.
- Remove the bolts -arrows-.
- Remove the Right Temperature Door Motor -V159- -2-.
- Disconnect the connector -3-.





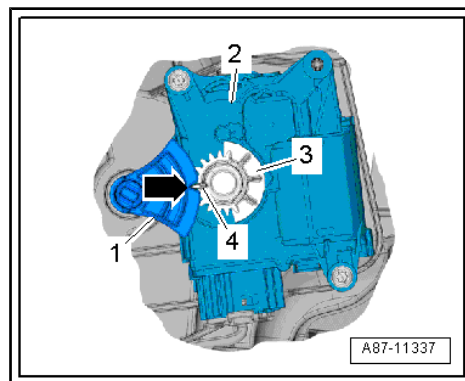
Installing

Install in reverse order of removal. Note the following:



Note

- ◆ Check the function of the doors and linkage before installing.
- ◆ Check if the lever and shafts are seated correctly in the mounts.
- Mount the actuator -2- onto the air distribution housing. When doing this, the toothed gear -3- on the actuator must engage into the toothed gear -1- on the temperature door lever.
- The long tooth -4- must engage into the recess -arrow- on the operating lever.



Note

- ◆ If the toothed gear on the actuator and the toothed gear on the temperature door lever do not face each other, turn the mount in the actuator.
- ◆ If the bolts cannot be installed, the actuator does not sit completely on the housing.
- Switch on the ignition, connect the affected actuator to the vehicle wiring harness and select the setting for the desired actuator position on the display control head (for example, the center position). Wait until the actuator reaches the desired position and switch the ignition off.
- Install the wiring harness so that it cannot come in contact with any moving parts (for example, the lever on the actuator).



Note

Turn the actuator so far until it has reached a favorable position for installation. The direction of rotation can be reversed by switching the positive and negative.

- Check the DTC memory and erase any displayed entries, then perform the “basic setting” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

- ◆ ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)



4.7 Fresh Air/Recirculating Air/Back Pressure Door Motor - V425- with Fresh Air/Recirculating Air/Back Pressure Door Motor Position Sensor - G644- , Removing and Installing

⇒ **"4.7.1 Fresh Air/Recirculating Air/Back Pressure Door Motor V425 , Removing and Installing", page 195**

4.7.1 Fresh Air/Recirculating Air/Back Pressure Door Motor - V425- , Removing and Installing

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester

Perform the following work first:

- Turn off all electric consumers.
- Turn off the ignition.
- Remove the key.

Removing

- Remove the glove compartment. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Glove Compartment, Removing and Installing .
- Unclip the wiring harness.
- Remove the bolts -arrows-.
- Remove the Fresh Air/Recirculating Air/Back Pressure Door Motor - V425- -1- from the air intake duct.
- Disconnect the connector -3-.

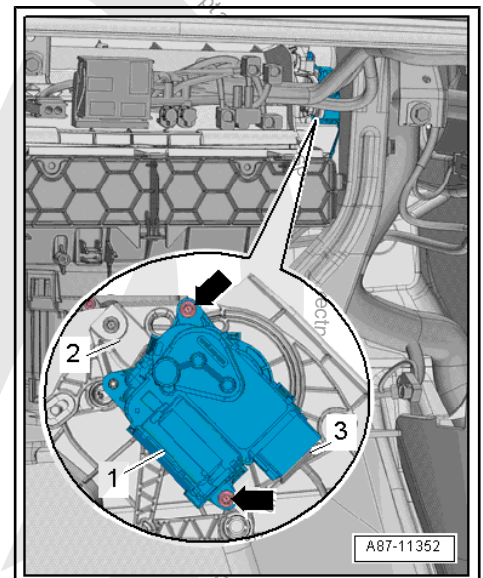
Installing

Install in reverse order of removal. Note the following:



Note

- ◆ Check the function of the doors and linkage before installing.
- ◆ Check if the lever and shafts are seated correctly in the mounts.



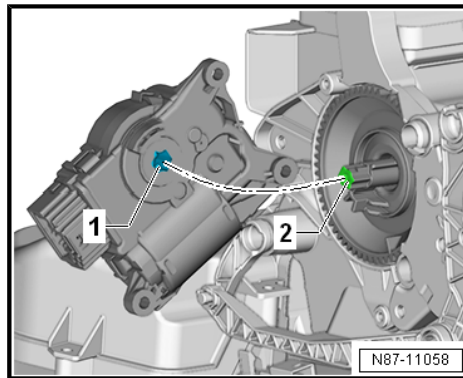


- The actuator mount -1- can only be installed in one position on the actuating arm -2-.
- The actuator mount must be opposite the actuating arm as shown in the illustration.



Note

If the mount and the actuating arm are not opposite each other, turn the mount in the actuator.



- Switch on the ignition, connect the affected actuator to the vehicle wiring harness and select the setting for the desired actuator position on the display control head (for example, the center position). Wait until the actuator reaches the desired position and switch the ignition off.
- Mount the actuator on the air distribution housing so that the actuating arm reaches into the mount -1- -arrow-.
- There must not be any play in the connection between the actuator and the actuating arm.



Note

If the bolts cannot be installed, the actuator does not sit completely on the housing.

- Install the wiring harness so that it cannot come in contact with any moving parts (for example, the lever on the actuator).



Note

Turn the actuator so far until it has reached a favorable position for installation. The direction of rotation can be reversed by switching the positive and negative.

- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries, then perform the “basic setting” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

- ◆ Refer to ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)
- ◆ Storage Compartments and Covers; Overview - Glove Compartment. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Overview - Glove Compartment .

4.7.2 Fresh Air/Recirculating Air/Back Pressure Door Motor - V425- , Removing and Installing, RHD

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester



Note

The actuator has end stops with integrated end switches instead of a position sensor.

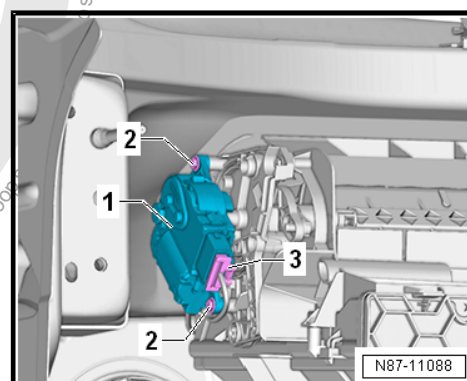
Perform the following work first:

- Turn off all electric consumers.
- Turn off the ignition.
- Remove the key.

Removing

- Remove the instrument panel central tube. Refer to ➔ Body Interior; Rep. Gr. 70 ; Instrument Panel Central Tube; Instrument Panel Central Tube, Removing and Installing .
- Remove screws -2-.
- Remove the Fresh Air/Recirculating Air/Back Pressure Door Motor - V425- -1- from the air intake duct.
- Disconnect the connector -3-.

Installing



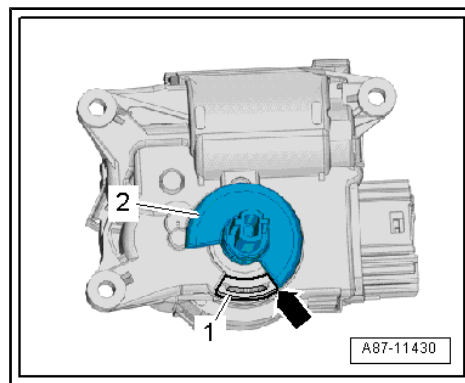


Install in reverse order of removal. Note the following:



Note

- ◆ Check the function of the doors and linkage before installing.
- ◆ Check if the lever and shafts are seated correctly in the mounts.
- The fresh air door must be in the “open” position so the fresh air comes into the vehicle.
- The actuating shaft -2- must contact the stop -1- -arrow- as illustrated.



Note

If the actuating shaft of the actuator is not set to “fresh-air mode” stop, turn the mount in the actuator.

- Switch on the ignition, connect the affected actuator to the vehicle wiring harness and select the setting for the desired actuator position on the display control head (for example, the center position). Wait until the actuator reaches the desired position and switch the ignition off.
- Mount the actuator to the air intake housing so that the actuating shaft engages into the mount.
- There must not be any play in the connection between the actuating shaft and the mount.



Note

If the bolts cannot be installed, the actuator does not sit completely on the housing.

- Install the wiring harness so that it cannot come in contact with any moving parts (for example, the lever on the actuator).
- Check the DTC memory and erase any displayed entries, then perform the “basic setting” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

- ◆ ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)
- ◆ Overview - Instrument Panel Central Tube. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel Central Tube; Overview - Instrument Panel Central Tube .
- ◆ Overview - instrument panel. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel; Overview - Instrument Panel .



4.8 Front Air Distribution Door Motor - V426- with Air Distribution Door Motor Position Sensor - G642- , Removing and Instal- ling

⇒ [“4.8.1 Air Distribution Door Motor V426 , Removing and Instal-
ling”, page 199](#)

4.8.1 Air Distribution Door Motor - V426- , Re- moving and Installing

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester

Perform the following work first:

- Turn off all electric consumers.
- Turn off the ignition.
- Remove the key.

Removing

- Remove the instrument panel. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel; Instrument Panel, Removing and Installing .
- If installed, remove the Access/Start System Interface - J965- . Refer to ⇒ Electrical Equipment; Rep. Gr. 94 ; Access/Start Authorization; Component Location Overview - Access/Start Authorization System .
- Remove the driver footwell vent. Refer to ⇒ [“6.5 Driver Side Footwell Vent, Removing and Installing”, page 276](#) .

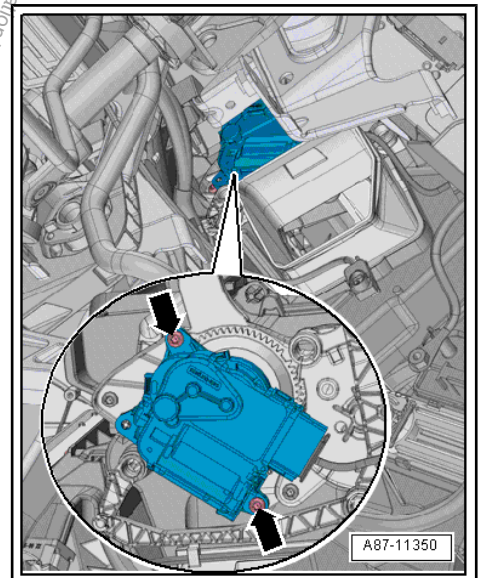
Remove the bolts -arrows-.



Note

- ◆ *The bolts are behind the central tube and can be reached from below.*
- ◆ *To remove the bolts use a magnetic screwdriver or have a second technician hold a magnet over the bolts. If a bolt falls, it goes into the tray for the cable duct and cannot be reached. The instrument panel must then be removed to remove the bolt.*
- Remove the Front Air Distribution Door Motor - V426- -4-.
- Disconnect the connector -1-.

Installing





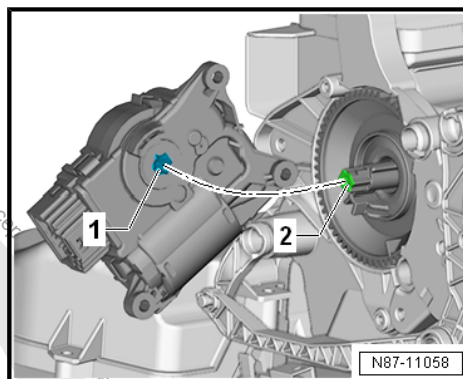
Install in reverse order of removal. Note the following:



Note

- ◆ Check the function of the doors and linkage before installing.
- ◆ Check if the lever and shafts are seated correctly in the mounts.

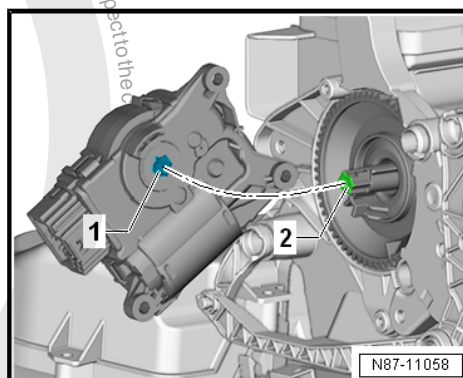
- The actuator mount -1- can only be installed in one position on the actuating arm -2-.
- The actuator mount must be opposite the actuating arm as shown in the illustration.



Note

If the mount and the actuating arm are not opposite each other, turn the mount in the actuator.

- Switch on the ignition, connect the affected actuator to the vehicle wiring harness and select the setting for the desired actuator position on the display control head (for example, the center position). Wait until the actuator reaches the desired position and switch the ignition off.
- Mount the actuator on the air distribution housing so that the actuating arm reaches into the mount -1- -arrow-.
- There must not be any play in the connection between the actuator and the actuating arm.



Note

If the bolts cannot be installed, the actuator does not sit completely on the housing.

- Install the wiring harness so that it cannot come in contact with any moving parts (for example, the lever on the actuator).



Note

Turn the actuator so far until it has reached a favorable position for installation. The direction of rotation can be reversed by switching the positive and negative.

- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries, then perform the “basic setting” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

- ◆ Refer to ➤ [“5.1 Overview - Heater and A/C Unit”, page 213](#)
- ◆ Overview - instrument panel. Refer to ➤ Body Interior; Rep. Gr. 70 ; Instrument Panel; Overview - Instrument Panel .



4.8.2 Air Distribution Door Motor - V426- , Removing and Installing, RHD

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester

Perform the following work first:

- Turn off all electric consumers.
- Turn off the ignition.
- Remove the key.

Removing

- Remove the glove compartment. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Glove Compartment, Removing and Installing .
- Remove screws -2-.
- Remove the Front Air Distribution Door Motor - V426- -1-.
- Disconnect the connector -3-.

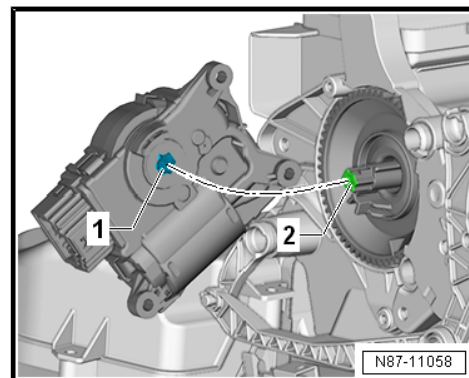
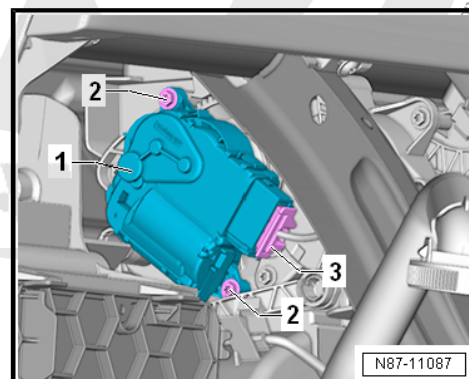
Installing

Install in reverse order of removal. Note the following:



Note

- ◆ Check the function of the doors and linkage before installing.
- ◆ Check if the lever and shafts are seated correctly in the mounts.





- The actuator mount -1- can only be installed in one position on the actuating arm -2-.
- The actuator mount must be opposite the actuating arm as shown in the illustration.



Note

If the mount and the actuating arm are not opposite each other, turn the mount in the actuator.

- Switch on the ignition, connect the affected actuator to the vehicle wiring harness and select the setting for the desired actuator position on the display control head (for example, the center position). Wait until the actuator reaches the desired position and switch the ignition off.
- Mount the actuator on the air distribution housing so that the actuating arm reaches into the mount -1- -arrow-.
- There must not be any play in the connection between the actuator and the actuating arm.



Note

If the bolts cannot be installed, the actuator does not sit completely on the housing.

- Install the wiring harness so that it cannot come in contact with any moving parts (for example, the lever on the actuator).



Note

Turn the actuator so far until it has reached a favorable position for installation. The direction of rotation can be reversed by switching the positive and negative.

- Check the DTC memory and erase any displayed entries, then perform the “basic setting” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

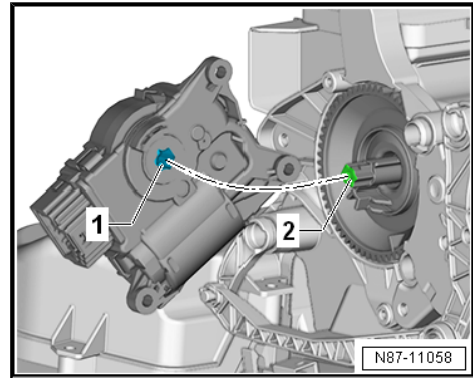
- ♦ ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)
- ♦ Storage Compartments and Covers; Overview - Glove Compartment. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Overview - Glove Compartment .

4.9 Air Distribution Door Motor - V428- with Position Sensor Air Distribution Door Motor Position Sensor - G645- , Removing and Installing

⇒ [“4.9.1 Air Distribution Door Motor V428 , Removing and Installing”, page 202](#)

4.9.1 Air Distribution Door Motor - V428- , Removing and Installing

Special tools and workshop equipment required





◆ Vehicle Diagnostic Tester

Removing

- Remove the instrument panel. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel; Instrument Panel, Removing and Installing .
- If installed, remove the Access/Start System Interface - J965- . Refer to ⇒ Electrical Equipment; Rep. Gr. 94 ; Access/Start Authorization; Component Location Overview - Access/Start Authorization System .
- Remove the driver footwell vent. Refer to ⇒ ["6.5 Driver Side Footwell Vent, Removing and Installing"](#), page 276 .
- Remove the bolts -arrows-.



Note

- ◆ *The bolts are behind the central tube and can be reached from below.*
- ◆ *To remove the bolts use a magnetic screwdriver or have a second technician hold a magnet over the bolts. If a bolt falls, it goes into the tray for the cable duct and cannot be reached.*
- Remove the Air Distribution Door Motor - V428- -4-.
- Disconnect the connector -1-.

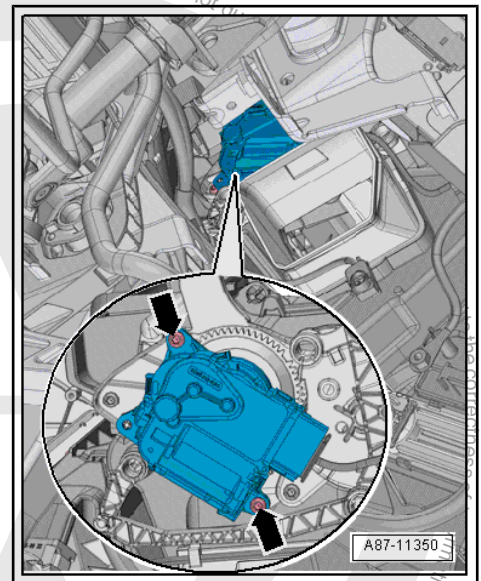
Installing

Install in reverse order of removal. Note the following:



Note

- ◆ *Check the function of the doors and linkage before installing.*
- ◆ *Check if the lever and shafts are seated correctly in the mounts.*



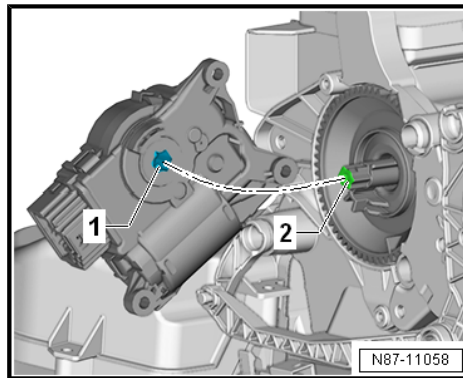


- The actuator mount -1- can only be installed in one position on the actuating arm -2-.
- The actuator mount must be opposite the actuating arm as shown in the illustration.



Note

If the mount and the actuating arm are not opposite each other, turn the mount in the actuator.



- Switch on the ignition, connect the affected actuator to the vehicle wiring harness and select the setting for the desired actuator position on the display control head (for example, the center position). Wait until the actuator reaches the desired position and switch the ignition off.
- Attach the adjustment motor to the air distribution housing so that the relay lever -2- reaches into the mount -1-.
- There must not be any play in the connection between the actuator and the actuating arm.



Note

If the bolts cannot be installed, the actuator does not sit completely on the housing.

- Install the wiring harness so that it cannot come in contact with any moving parts (for example, the lever on the actuator).



Note

Turn the actuator so far until it has reached a favorable position for installation. The direction of rotation can be reversed by switching the positive and negative.

- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries, then perform the “basic setting” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and Air Conditioning (A/C) unit function.

Tightening Specifications

- ♦ Refer to ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)
- ♦ Overview - instrument panel. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel; Overview - Instrument Panel .

4.9.2 Air Distribution Door Motor - V428- , Removing and Installing, RHD

Special tools and workshop equipment required

- ♦ Vehicle Diagnostic Tester

Perform the following work first:

- Turn off all electric consumers.
- Turn off the ignition.
- Remove the key.



Removing

- Remove the glove compartment. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Glove Compartment, Removing and Installing .
- Remove screws -2-.
- Remove the Front Air Distribution Door Motor - V426- -1-.
- Disconnect the connector -3-.

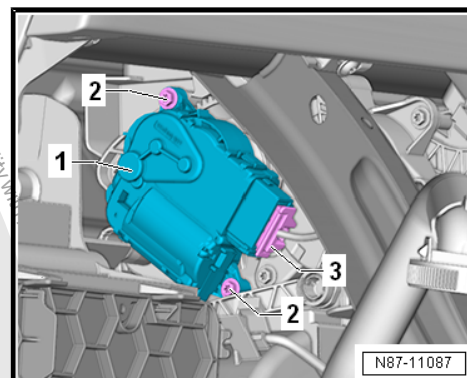
Installing

Install in reverse order of removal. Note the following:



Note

- ◆ Check the function of the doors and linkage before installing.
- ◆ Check if the lever and shafts are seated correctly in the mounts.



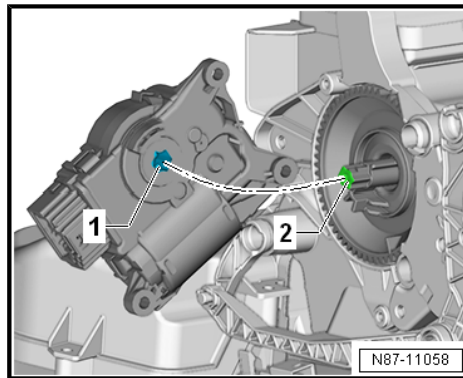


- The actuator mount -1- can only be installed in one position on the actuating arm -2-.
- The actuator mount must be opposite the actuating arm as shown in the illustration.



Note

If the mount and the actuating arm are not opposite each other, turn the mount in the actuator.



- Switch on the ignition, connect the affected actuator to the vehicle wiring harness and select the setting for the desired actuator position on the display control head (for example, the center position). Wait until the actuator reaches the desired position and switch the ignition off.
- Mount the actuator on the air distribution housing so that the actuating arm reaches into the mount -1- -arrow-.
- There must not be any play in the connection between the actuator and the actuating arm.



Note

If the bolts cannot be installed, the actuator does not sit completely on the housing.

- Install the wiring harness so that it cannot come in contact with any moving parts (for example, the lever on the actuator).



Note

Turn the actuator so far until it has reached a favorable position for installation. The direction of rotation can be reversed by switching the positive and negative.

- Check the DTC memory and erase any displayed entries, then perform the “basic setting” using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

- ♦ ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)
- ♦ Storage Compartments and Covers; Overview - Glove Compartment. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Overview - Glove Compartment .



4.10 Air Distribution Door Adjuster, Removing and Installing

⇒ ["4.10.1 Front Air Distribution Door Adjuster, Removing and Installing, Heater and Electric-Manual Climate Control System", page 207](#)

⇒ ["4.10.3 Front Air Distribution Door Adjuster, Removing and Installing, Climatronic", page 209](#)

4.10.1 Front Air Distribution Door Adjuster, Removing and Installing, Heater and Electric-Manual Climate Control System

Removing

- Remove the instrument panel. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel; Instrument Panel, Removing and Installing .
- Remove the defroster vent air guide. Refer to ⇒ ["6.11 Air Guide for Defrost Air Vent, Removing and Installing", page 282](#) .
- Remove the air distribution door motor. Refer to ⇒ ["4.9 Air Distribution Door Motor V428 with Position Sensor Air Distribution Door Motor Position Sensor G645 , Removing and Installing", page 202](#) .
- Carefully remove the operating lever -7- -arrow-.
- Carefully remove the operating lever -3- from the lever for the defroster door -2-.
- Remove the bolts -1, 4 and 8-.
- Remove the adjuster -9- upward.

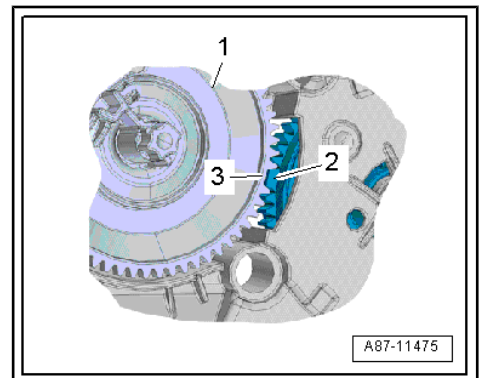
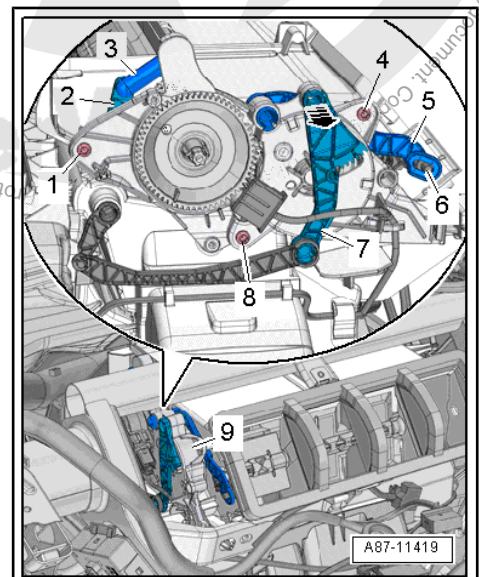
Installing

- Install in reverse order of removal. Note the following:



Note

- ◆ Check the function of the doors and linkage before installing.
 - ◆ Check if the lever and shafts are seated correctly in the mounts.
-
- Check if the gears correlate correctly with one another.
 - The square tooth -2- must engage into the gap -3- on the toothed gear -1-.

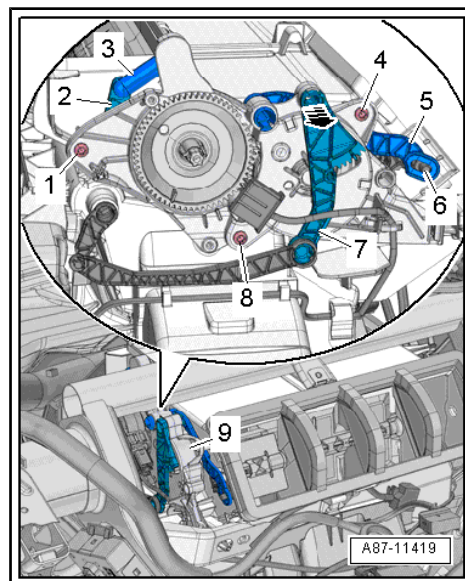




- When mounting the adjuster, the operating lever -5- must engage into the vent door lever -6- in the middle.

Tightening Specifications

- ◆ Refer to ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)
- ◆ Overview - instrument panel. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel; Overview - Instrument Panel .



4.10.2 Front Air Distribution Door Adjuster, Removing and Installing, Heater and Electric-Manual Climate Control System, RHD

Removing

- Remove the instrument panel central tube. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel Central Tube; Instrument Panel Central Tube, Removing and Installing .
- Remove the defroster vent air guide. Refer to ⇒ [“6.11 Air Guide for Defrost Air Vent, Removing and Installing”, page 282](#) .
- Remove the air distribution door motor. Refer to ⇒ [“4.9 Air Distribution Door Motor V428 with Position Sensor Air Distribution Door Motor Position Sensor G645 , Removing and Installing”, page 202](#) .
- Carefully remove the operating lever -7- arrow-.
- Carefully remove the operating lever -3- from the lever for the defroster door -2-.
- Remove the bolts -1-, -4- and -8-.
- Remove the adjuster -9- upward.

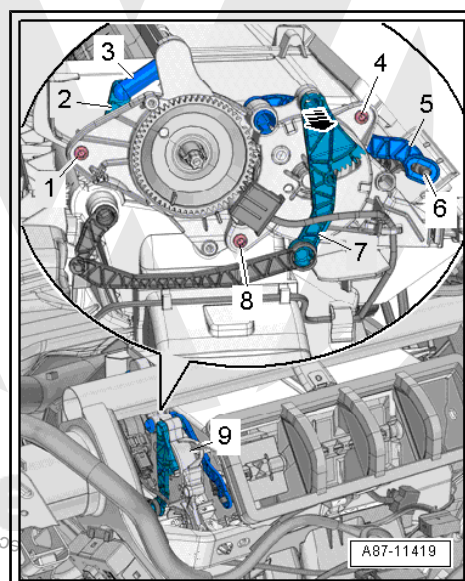
Installing

- Install in reverse order of removal. Note the following:



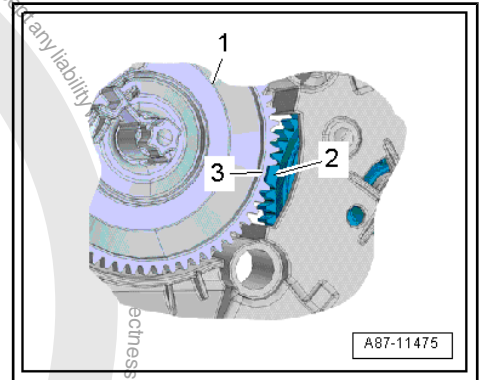
Note

- ◆ Check the function of the doors and linkage before installing.
- ◆ Check if the lever and shafts are seated correctly in the mounts.





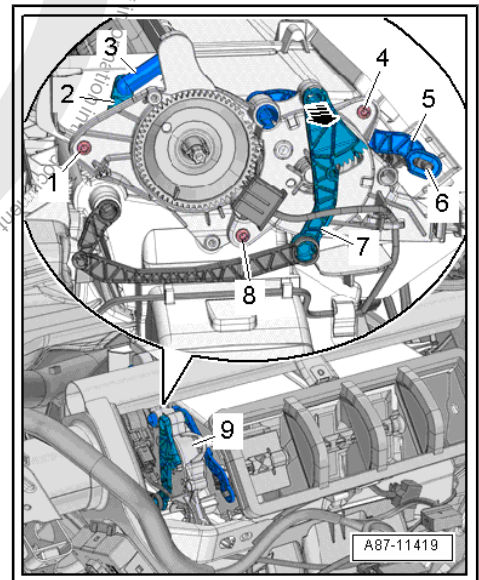
- Check if the gears correlate correctly with one another.
- The square tooth -2- must engage into the gap -3- on the toothed gear -1-.



- When mounting the adjuster, the operating lever -5- must engage into the vent door lever -6- in the middle.

Tightening Specifications

- ◆ ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)
- ◆ Overview - Instrument Panel Central Tube. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel Central Tube; Overview - Instrument Panel Central Tube .



4.10.3 Front Air Distribution Door Adjuster, Removing and Installing, Climatronic

Removing

- Remove the instrument panel. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel; Instrument Panel, Removing and Installing .
- Remove the defroster vent air guide. Refer to ⇒ [“6.11 Air Guide for Defrost Air Vent, Removing and Installing”, page 282](#) .
- Remove the air distribution door motor. Refer to ⇒ [“4.8 Front Air Distribution Door Motor V426 with Air Distribution Door Motor Position Sensor G642 , Removing and Installing”, page 199](#) .



- Carefully remove the operating lever -5- -arrow-.
- Remove the bolts -1, 2 and 6-.
- Remove the adjuster -7- upward.

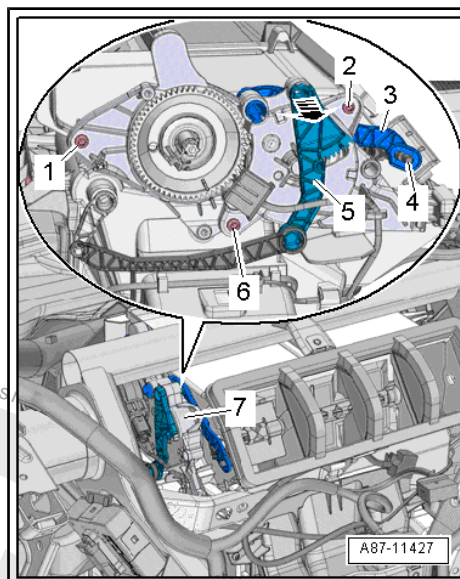
Installing

- Install in reverse order of removal. Note the following:

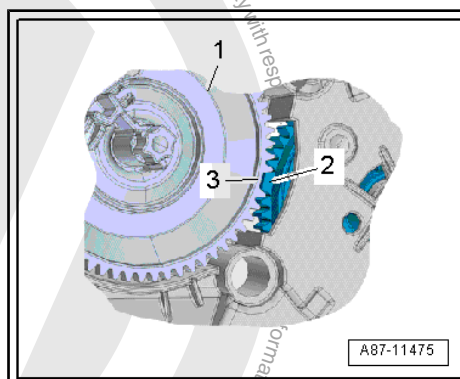


Note

- ♦ Check the function of the doors and linkage before installing.
- ♦ Check if the lever and shafts are seated correctly in the mounts.



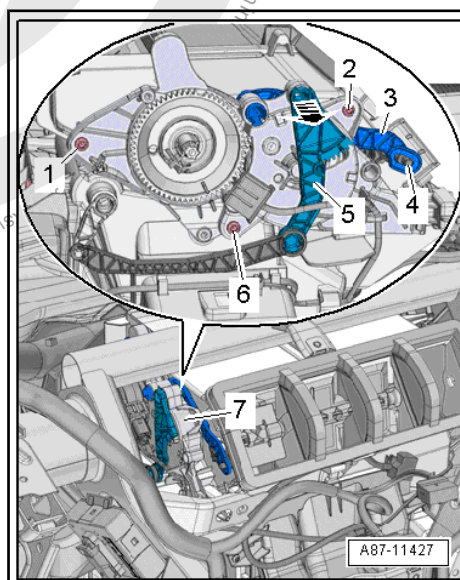
- Check if the gears correlate correctly with one another.
- The square tooth -2- must engage into the gap -3- on the toothed gear -1-.



- When mounting the adjuster, the operating lever -3- must engage into the vent door lever -4- in the middle.

Tightening Specifications

- ♦ Refer to ⇒ ["5.1 Overview - Heater and A/C Unit", page 213](#).
- ♦ Overview - instrument panel. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel; Overview - Instrument Panel .



4.10.4 Front Air Distribution Door Adjuster, Removing and Installing, Climatronic, RHD

Removing

- Remove the instrument panel central tube. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel Central Tube; Instrument Panel Central Tube, Removing and Installing .



- Remove the defroster vent air guide. Refer to
⇒ ["6.11 Air Guide for Defrost Air Vent, Removing and Installing", page 282](#) .
- Remove the air distribution door motor. Refer to
⇒ ["4.8 Front Air Distribution Door Motor V426 with Air Distribution Door Motor Position Sensor G642 , Removing and Installing", page 199](#) .
- Carefully remove the operating lever -5- -arrow-.
- Remove the bolts -1-, -2- and -6-.
- Remove the adjuster -7- upward.

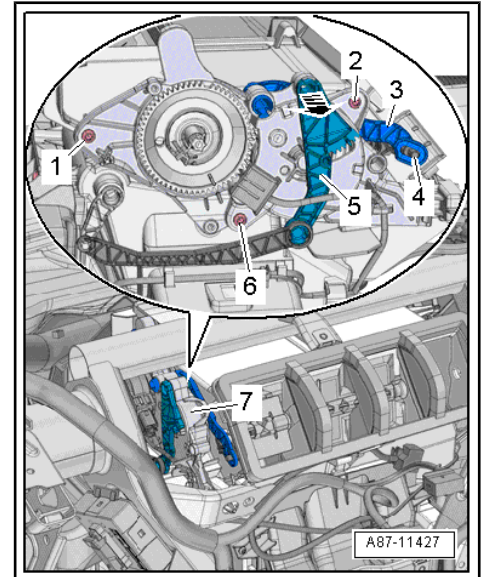
Installing

- Install in reverse order of removal. Note the following:

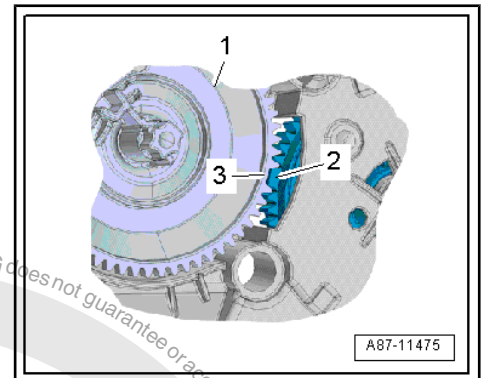


Note

- ◆ Check the function of the doors and linkage before installing.
- ◆ Check if the lever and shafts are seated correctly in the mounts.



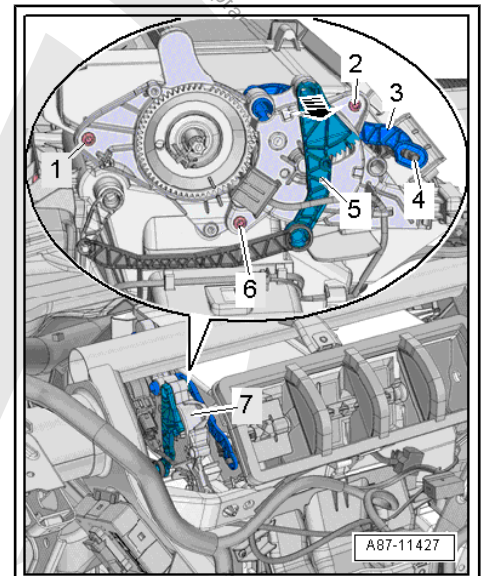
- Check if the gears correlate correctly with one another.
- The square tooth -2- must engage into the gap -3- on the toothed gear -1-.

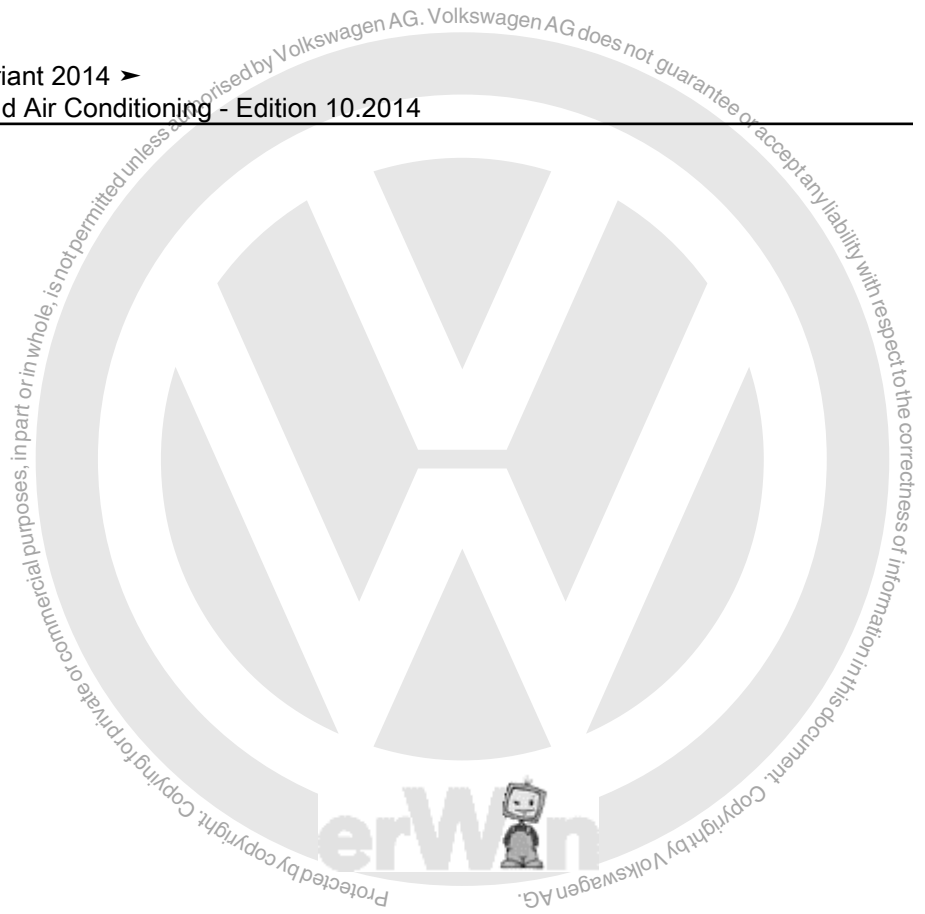


- When mounting the adjuster, the operating lever -3- must engage into the vent door lever -4- in the middle.

Tightening Specifications

- ◆ ⇒ ["5.1 Overview - Heater and A/C Unit", page 213](#)
- ◆ Overview - Instrument Panel Central Tube. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel Central Tube; Overview - Instrument Panel Central Tube .







5 Front Heater and A/C Unit

- ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)
- ⇒ [“5.2 Overview - Attachments for Heater and A/C Unit and Air Intake Housing”, page 218](#)
- ⇒ [“5.3 Overview - Evaporator Housing”, page 220](#)
- ⇒ [“5.4 Overview - Air Distribution Housing Doors and Partitions”, page 222](#)
- ⇒ [“5.5 Heater and A/C Unit, Removing and Installing”, page 224](#)
- ⇒ [“5.6 Heater and A/C Unit, Disassembling and Assembling”, page 228](#)
- ⇒ [“5.7 Air Distribution Housing, Removing and Installing”, page 230](#)
- ⇒ [“5.8 Heater and A/C Unit Bracket, Removing and Installing”, page 230](#)
- ⇒ [“5.9 Evaporator, Removing and Installing”, page 231](#)
- ⇒ [“5.10 Fresh Air Blower Control Module J126 , Removing and Installing”, page 233](#)
- ⇒ [“5.11 Dust and Pollen Filter, Removing and Installing”, page 234](#)
- ⇒ [“5.12 Fresh Air Blower V2 , Removing and Installing”, page 238](#)
- ⇒ [“5.13 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Checking”, page 240](#)
- ⇒ [“5.14 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Removing and Installing”, page 242](#)
- ⇒ [“5.15 Heater Core, Removing and Installing”, page 244](#)
- ⇒ [“5.16 Heater Core Coolant Pipes, Removing and Installing”, page 260](#)
- ⇒ [“5.17 Evaporator Temperature Sensor G308 , Removing and Installing”, page 262](#)
- ⇒ [“5.18 Condensation Water Drain, Checking”, page 264](#)
- ⇒ [“5.19 Condensation Water Drain, Removing and Installing”, page 265](#)
- ⇒ [“5.20 Partition, Removing and Installing”, page 269](#)

5.1 Overview - Heater and A/C Unit

- ⇒ [“5.1.1 Overview - Heater and A/C Unit, Climatronic”, page 213](#)

5.1.1 Overview - Heater and A/C Unit, Climatronic



Note

- ◆ *There are different versions and various manufacturers of the heater and A/C units. Individual components of the different heater and A/C units are similar but not the same. Interchanging components from different manufacturers is not permitted. Refer to the Parts Catalog.*



- ♦ A heater and A/C unit manufactured by "Valeo" is shown in the following illustrations. Distinguishing characteristics between manufacturers. Refer to ➔ ["2 Identification", page 4](#) .

Overview - Heater and A/C Unit, Left Side Door Control

1 - Operating Lever

- ❑ For operating the defroster and air distribution door

2 - Air Distribution Door Motor

- ❑ To check, use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function. Refer to ➔ Wiring diagrams, Troubleshooting & Component locations.

Heater and electric-manual climate control system:

Air Distribution Door Motor - V428- with Air Distribution Door Motor Position Sensor - G645-

- ❑ Removing and installing. Refer to ➔ ["4.9 Air Distribution Door Motor V428 with Position Sensor Air Distribution Door Motor Position Sensor G645, Removing and Installing", page 202](#) .

Climatronic:

- ❑ Front Air Distribution Door Motor - V426- with Front Air Distribution Door Motor Position Sensor - G642-
- ❑ Removing and installing. Refer to ➔ ["4.8 Front Air Distribution Door Motor V426 with Air Distribution Door Motor Position Sensor G642, Removing and Installing", page 199](#) .

3 - Screw

- ❑ 1 Nm
- ❑ Quantity: 2

4 - Screw

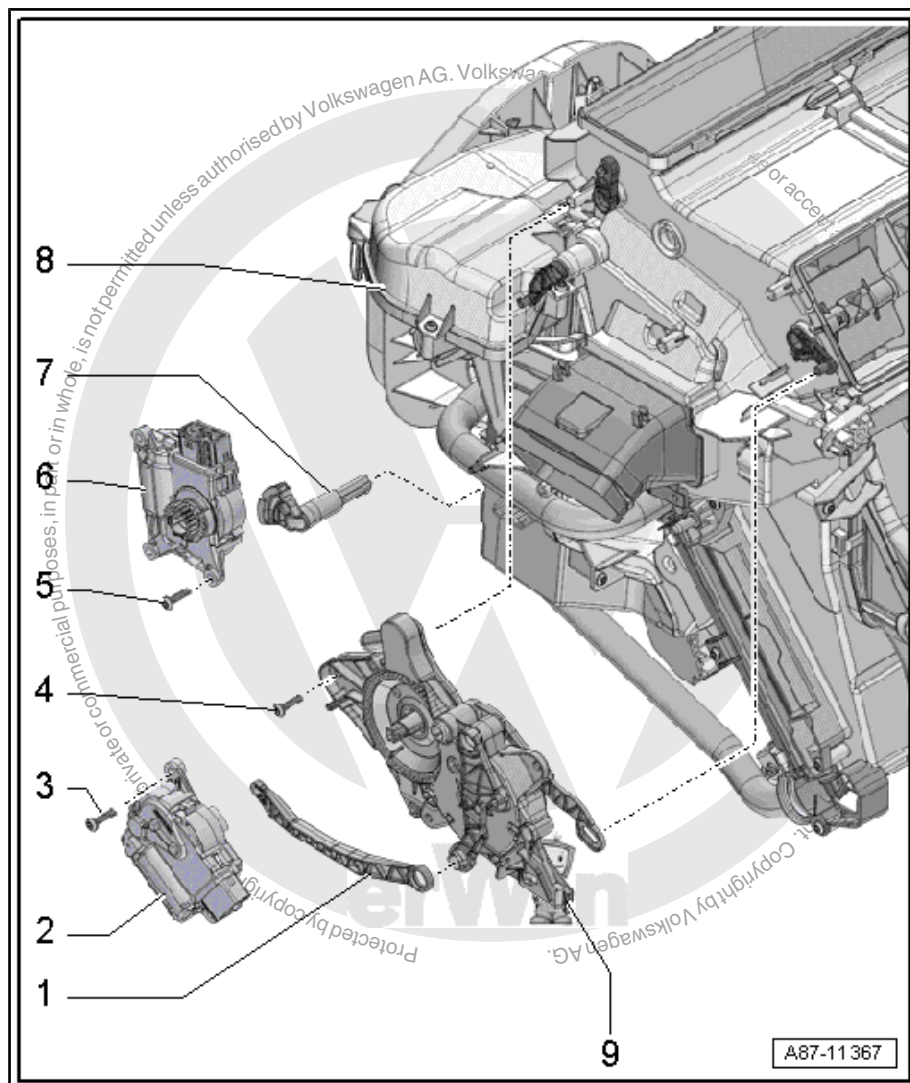
- ❑ 1 Nm
- ❑ Quantity: 3

5 - Screw

- ❑ 1 Nm
- ❑ Quantity: 2

6 - Temperature Regulator Door Motor

- ❑ To check, use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function. Refer to ➔ Wiring diagrams, Troubleshooting & Component locations.





Heater and electric-manual climate control system:

- ☐ Temperature Regulator Door Motor - V68- with Temperature Regulator Door Motor Position Sensor - G92-
- ☐ Removing and installing. Refer to
⇒ [“4.2 Temperature Regulator Door Motor V68 with Temperature Regulator Door Motor Position Sensor G92 , Removing and Installing”, page 176](#) .

Climatronic:

- ☐ Left Temperature Door Motor - V158- with Left Temperature Door Potentiometer/Actuator - G220-
- ☐ Removing and installing. Refer to
⇒ [“4.5 Left Temperature Door Motor V158 with Left Temperature Door Potentiometer/Actuator G220 , Removing and Installing”, page 187](#) .

7 - Operating Lever

- ☐ For warm-air door

8 - Heater and Air Conditioning (A/C) Unit

- ☐ The heater and the heater and A/C unit have many components that are the same
- ☐ There are different versions. Refer to ⇒ [“2 Identification”, page 4](#) .
- ☐ Interchanging components is not permitted.
- ☐ The following illustrations show the heater manufactured by “Valeo”
- ☐ Removing and installing. Refer to ⇒ [“5.5 Heater and A/C Unit, Removing and Installing”, page 224](#) .

9 - Defroster- and Air Distribution Door Actuator

- ☐ Only on vehicles with heating or electric-manual climate control system
- ☐ Removing and installing. Refer to
⇒ [“4.10 Air Distribution Door Adjuster, Removing and Installing”, page 207](#) .

Overview - Heater and A/C Unit, Right Side Door Control





1 - Heater and Air Conditioning (A/C) Unit

- ❑ Removing and installing. Refer to
⇒ [“5.5 Heater and A/C Unit, Removing and Installing”, page 224](#) .

2 - Operating Lever

- ❑ For defroster door

3 - Screw

- ❑ 1 Nm
- ❑ Quantity: 2

4 - Defroster Door Motor - V107-

- ❑ With the Defroster Door Motor Position Sensor - G135-
- ❑ Only for Climatronic
- ❑ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function. Refer to
⇒ Wiring diagrams, Troubleshooting & Component locations.
- ❑ Removing and installing. Refer to
⇒ [“4.3 Defroster Door Motor V107 with Defroster Door Motor Position Sensor G135, Removing and Installing”, page 179](#) .

5 - Right Temperature Door Motor - V159-

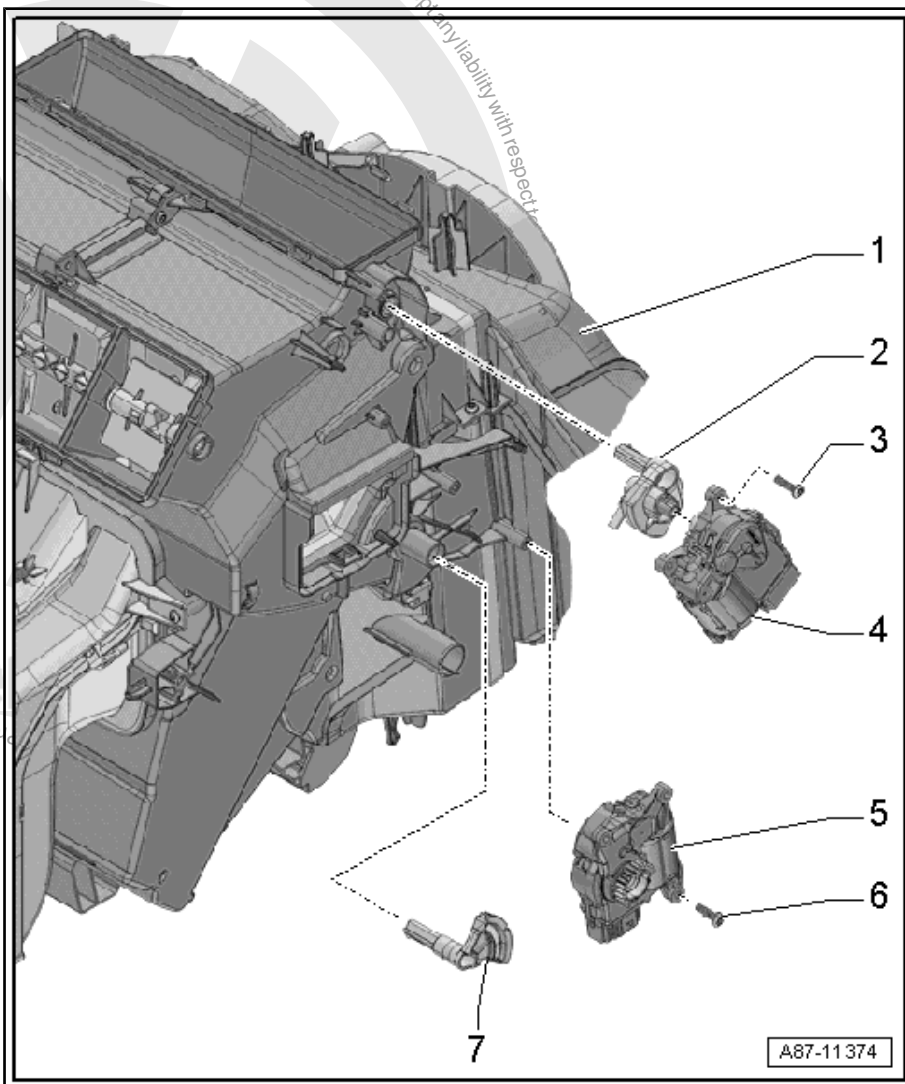
- ❑ With Right Temperature Door Potentiometer/Actuator - G221-
- ❑ Only for Climatronic
- ❑ To check, use the Vehicle Diagnostic Tester in the “Guided Fault Finding” function. Refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ❑ Removing and installing. Refer to
⇒ [“4.6 Right Temperature Door Motor V159 with Right Temperature Door Potentiometer/Actuator G221, Removing and Installing”, page 190](#) .

6 - Screw

- ❑ 1 Nm
- ❑ Quantity: 2

7 - Operating Lever

- ❑ For warm-air door



Overview - Heater and Air Conditioning (A/C) Unit, Heater Core, Auxiliary Heater Heating Element

The illustration shows Valeo heater.



1 - Bolt

- ☐ 6 Nm

2 - Coolant Pipe for Heater Core

- ☐ There are different versions. Refer to the Parts Catalog.
- ☐ Coolant Supply from Engine
- ☐ Removing and installing. Refer to ➔ ["5.15 Heater Core, Removing and Installing", page 244](#) .

3 - Clamp

4 - Coolant Pipe for Heater Core

- ☐ There are different versions. Refer to the Parts Catalog.
- ☐ Coolant return to engine
- ☐ Removing and installing. Refer to ➔ ["5.15 Heater Core, Removing and Installing", page 244](#) .

5 - Seal

- ☐ There are different versions. Refer to the Parts Catalog.
- ☐ Replacing

6 - Cover

- ☐ For the heater core

7 - Screw

- ☐ 2 Nm

8 - Foam Spacer

- ☐ For sealing/insulating
- ☐ Observe installed position

9 - Bracket

- ☐ For the coolant pipes

10 - Foam Piece

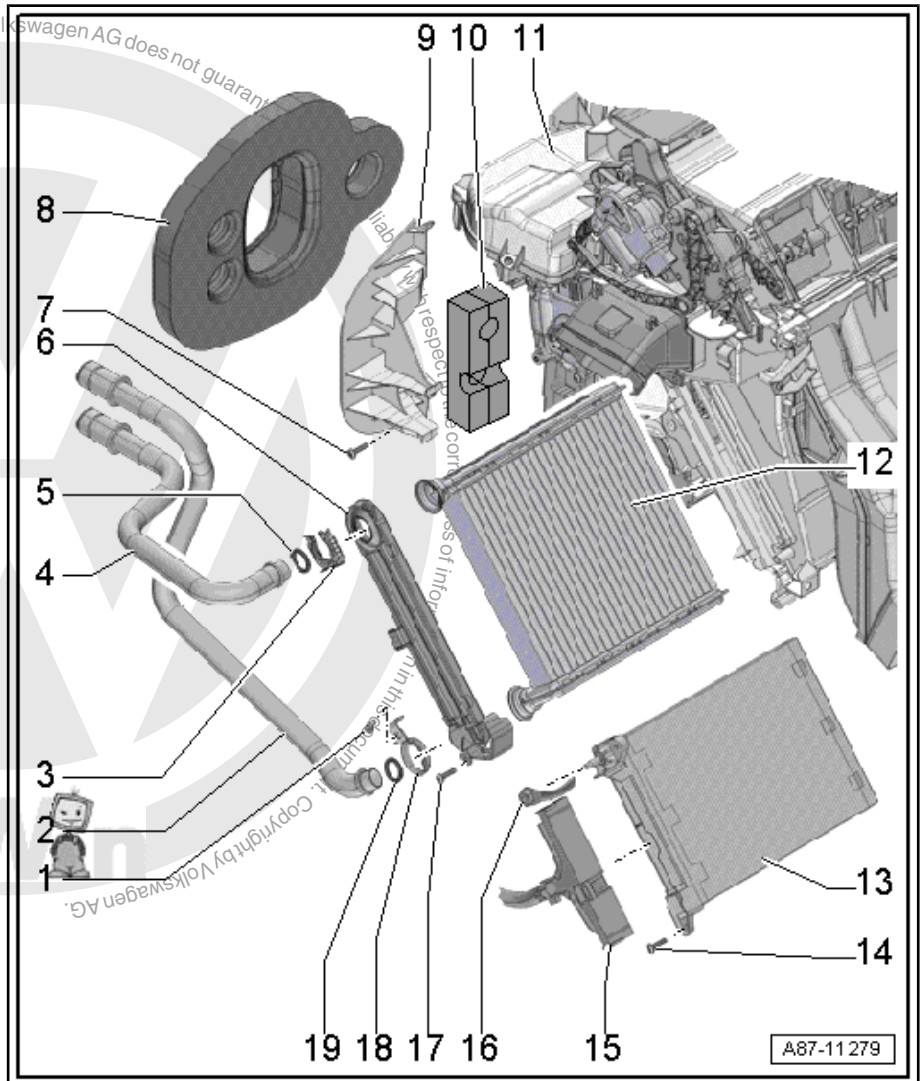
- ☐ For insulating
- ☐ Observe installed position

11 - Heater and A/C Unit

- ☐ For vehicles without an Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604- the opening for the Auxiliary Heater Heating Element - Z35- is closed.
- ☐ Removing and Installing. Refer to ➔ ["5.5 Heater and A/C Unit, Removing and Installing", page 224](#) .
- ☐ Disassembling and assembling. Refer to ➔ ["5.6 Heater and A/C Unit, Disassembling and Assembling", page 228](#) .

12 - Heater Core

- ☐ There are different versions. Refer to the Parts Catalog.
- ☐ Removing and installing. Refer to ➔ ["5.15 Heater Core, Removing and Installing", page 244](#) .





13 - Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604-

- ☐ Activation, checking. Refer to
⇒ ["5.13 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Checking", page 240](#) .
- ☐ Removing and installing. Refer to
⇒ ["5.14 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Removing and Installing", page 242](#) .

14 - Screw

- ☐ 2 Nm
- ☐ Quantity: 2

15 - Wire

- ☐ For the Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604-

16 - Ground (GND) Cable

- ☐ Nut 9 ± 1 Nm
- ☐ For the auxiliary heater

17 - Screw

- ☐ 2 Nm
- ☐ Quantity: 3

18 - Screw Clamp

19 - Seal

- ☐ There are different versions. Refer to the Parts Catalog.

5.2 Overview - Attachments for Heater and A/C Unit and Air Intake Housing



Note

- ◆ *There are different versions and various manufacturers of the heater and A/C units. Individual components of the different heater and A/C units are similar but not the same. Interchanging components from different manufacturers is not permitted. Refer to the Parts Catalog.*
- ◆ *A "Valeo" air intake housing is shown in the following illustration. Refer to ⇒ ["2 Identification", page 4](#) for the different manufacturers' distinguishing characteristics of the heater and A/C units.*



1 - Plastic Screw or Plug (depending on version)

- ☐ 0.3 Nm
- ☐ Quantity: 2

2 - Partition

- ☐ Removing and installing. Refer to ➔ ["5.20 Partition, Removing and Installing", page 269](#).

3 - Fresh Air Blower Housing Upper Section

4 - Screw

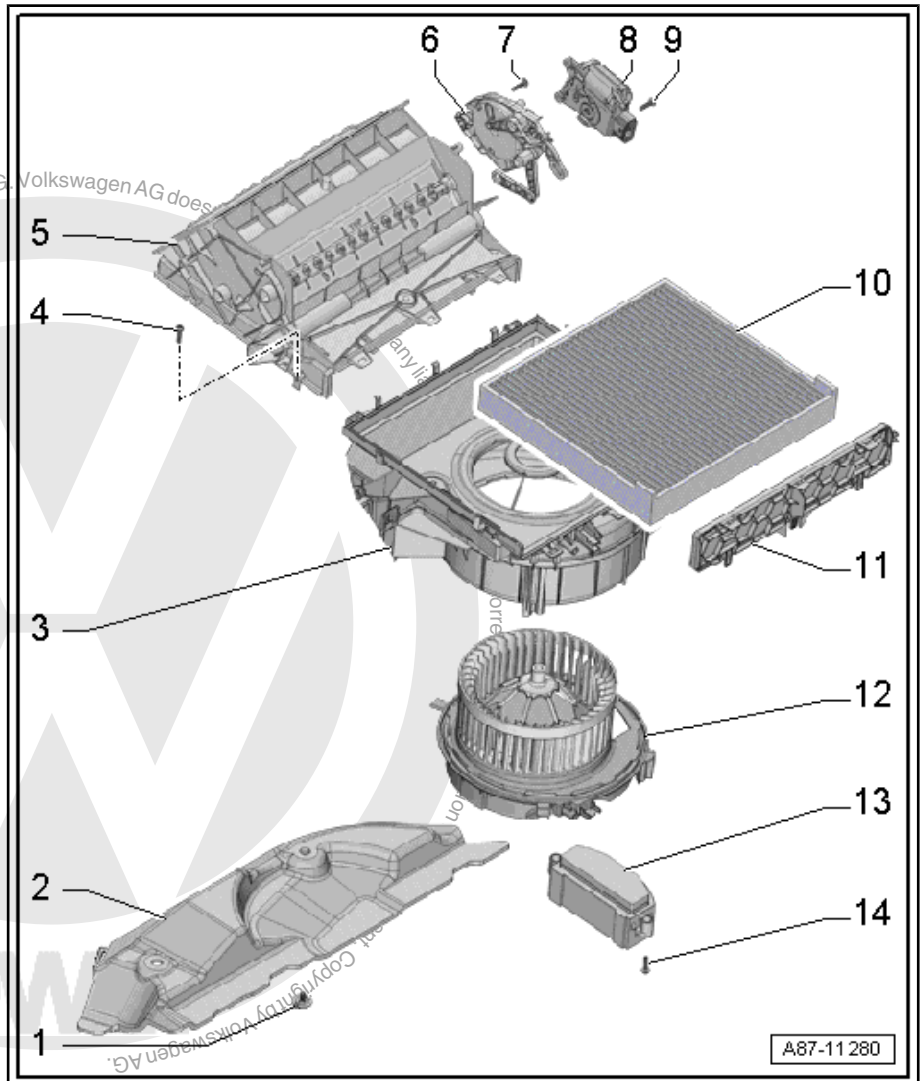
- ☐ 1 Nm
- ☐ Quantity: 2

5 - Air Intake Duct

- ☐ With fresh- and air recirculation door
- ☐ There are different versions. Refer to the Parts Catalog.
- ☐ Removing and installing. Refer to ➔ ["6.4 Air Intake Duct, Removing and Installing", page 276](#).
- ☐ Do not dismantle

6 - Dust, Fresh and Air Recirculation Door Adjuster

- ☐ Only for Climatronic
- ☐ Removing and installing. Refer to ➔ ["4.10 Air Distribution Door Adjuster, Removing and Installing", page 207](#).



7 - Screw

- ☐ 1 Nm
- ☐ Only for Climatronic
- ☐ Quantity: 2

8 - Actuator

- ☐ To check, use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function. Refer to ➔ Wiring diagrams, Troubleshooting & Component locations.

Heater and electric-manual climate control system:

- ☐ Recirculation Door Motor - V113- without position sensor; with end switches in the end stops. Refer to ➔ Wiring diagrams, Troubleshooting & Component locations.
- ☐ Removing and installing. Refer to ➔ ["4.4 Recirculation Door Motor V113, Removing and Installing", page 183](#).

Climatronic:

- ☐ Fresh Air/Recirculating Air/Back Pressure Door Motor - V425- with Fresh Air/Recirculating Air/Back Pressure Door Motor Position Sensor - G644-
- ☐ Removing and installing. Refer to ➔ ["4.7 Fresh Air/Recirculating Air/Back Pressure Door Motor V425 with Fresh Air/Recirculating Air/Back Pressure Door Motor Position Sensor G644, Removing and Installing", page 195](#).

9 - Screw

- ☐ 1 Nm



- ❑ Quantity: 2

10 - Dust and Pollen Filter

- ❑ There are different versions. Refer to the Parts Catalog.
- ❑ Replacement interval. Refer to ⇒ Maintenance ; Booklet 36.1 .
- ❑ Removing and installing. Refer to ⇒ ["5.11 Dust and Pollen Filter, Removing and Installing", page 234](#) .

11 - Cover

- ❑ For dust and pollen filter

12 - Fresh Air Blower - V2-

- ❑ To check, use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function and refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ❑ Removing and installing. Refer to ⇒ ["5.12 Fresh Air Blower V2 , Removing and Installing ", page 238](#) .

13 - Fresh Air Blower Control Module - J126-

- ❑ To check, use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function. Refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ❑ Removing and installing. Refer to ⇒ ["5.10 Fresh Air Blower Control Module J126 , Removing and Installing", page 233](#)

14 - Screw

- ❑ 1 Nm
- ❑ Quantity: 2

5.3 Overview - Evaporator Housing



Note

- ◆ *There are different versions and various manufacturers of the heater and A/C units. Individual components of the different heater and A/C units are similar but not the same. Interchanging components from different manufacturers is not permitted. Refer to the Parts Catalog.*
- ◆ *A "Valeo" evaporator housing is shown in the following illustration. Refer to ⇒ ["2 Identification", page 4](#) for the different manufacturers' distinguishing characteristics of the heater and A/C units.*



1 - Evaporator Housing Lower Section

2 - Evaporator

- ☐ Only with Air Conditioning (A/C) system
- ☐ Check the foam seals for damage and that they are correctly bonded
- ☐ Removing and installing. Refer to ➔ ["5.9 Evaporator, Removing and Installing", page 231](#) .

3 - Seal

- ☐ Only for vehicles with an A/C system.
- ☐ Replacing. For the correct version, refer to the Parts Catalog.
- ☐ Coat with refrigerant oil before installing

4 - Retaining Plate

- ☐ Only with A/C system
- ☐ To secure the refrigerant line and secure the expansion valve

5 - Expansion Valve

- ☐ Only with A/C system
- ☐ Removing and installing. Refer to ➔ ["2.4 Expansion Valve, Removing and Installing", page 110](#) .

6 - Bolt

- ☐ 10 Nm
- ☐ Only with A/C system
- ☐ Quantity: 2

7 - Seal/Insulation

- ☐ Heat insulation for expansion valve
- ☐ The seal for the plenum chamber rear wall does not have an opening for the expansion valve or it is sealed with a foam body on vehicles without an A/C system.

8 - Seal

- ☐ Only for vehicles with an A/C system.
- ☐ Replacing. For the correct version, refer to the Parts Catalog.
- ☐ Coat with refrigerant oil before installing

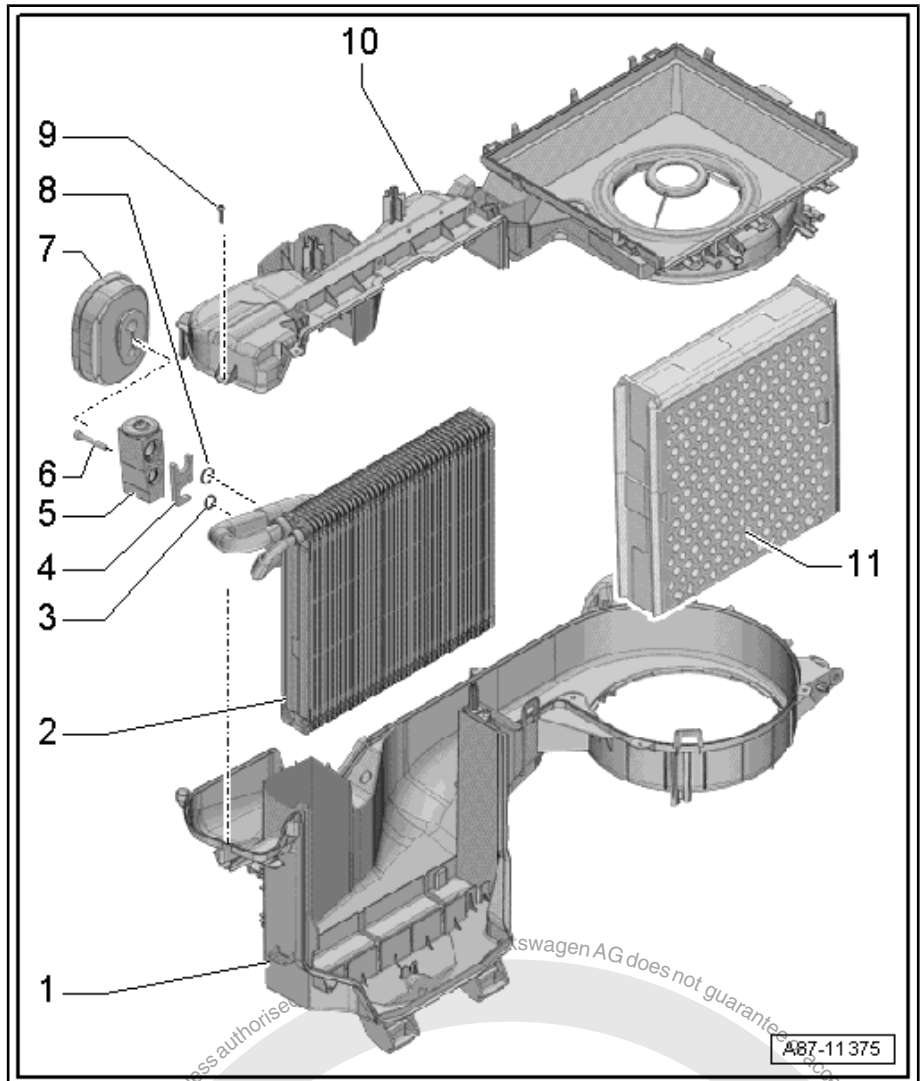
9 - Screw

- ☐ 1.5 Nm
- ☐ Quantity: 8

10 - Evaporator Housing Upper Section

11 - Airflow Regulator

- ☐ Only installed in vehicles without an A/C system.





5.4 Overview - Air Distribution Housing Doors and Partitions

View from the Front



Note

- ◆ -Arrow- = direction of travel
- ◆ Refer to ➤ ["5.1 Overview - Heater and A/C Unit", page 213](#).

1 - Right Door for Warm Air

- ☐ From the heater core
- ☐ Activated via the right door for cold air

2 - Operating Lever

- ☐ For door control

3 - Right Door for Cold Air

- ☐ From the evaporator
- ☐ Different versions

Heater and electric-manual climate control system

- ☐ Activated collectively via the left door shaft for cold air and left operating lever by the Temperature Regulator Door Motor - V68-

Climatronic:

- ☐ Activated by the Right Temperature Door Motor - V159- via the right operating lever.

4 - Right Operating Lever for Thermostat Door

- ☐ Equipment version
- ☐ Only Climatronic
- ☐ Activated by the Right Temperature Door Motor - V159-

5 - "Defrost" Door Operating Lever

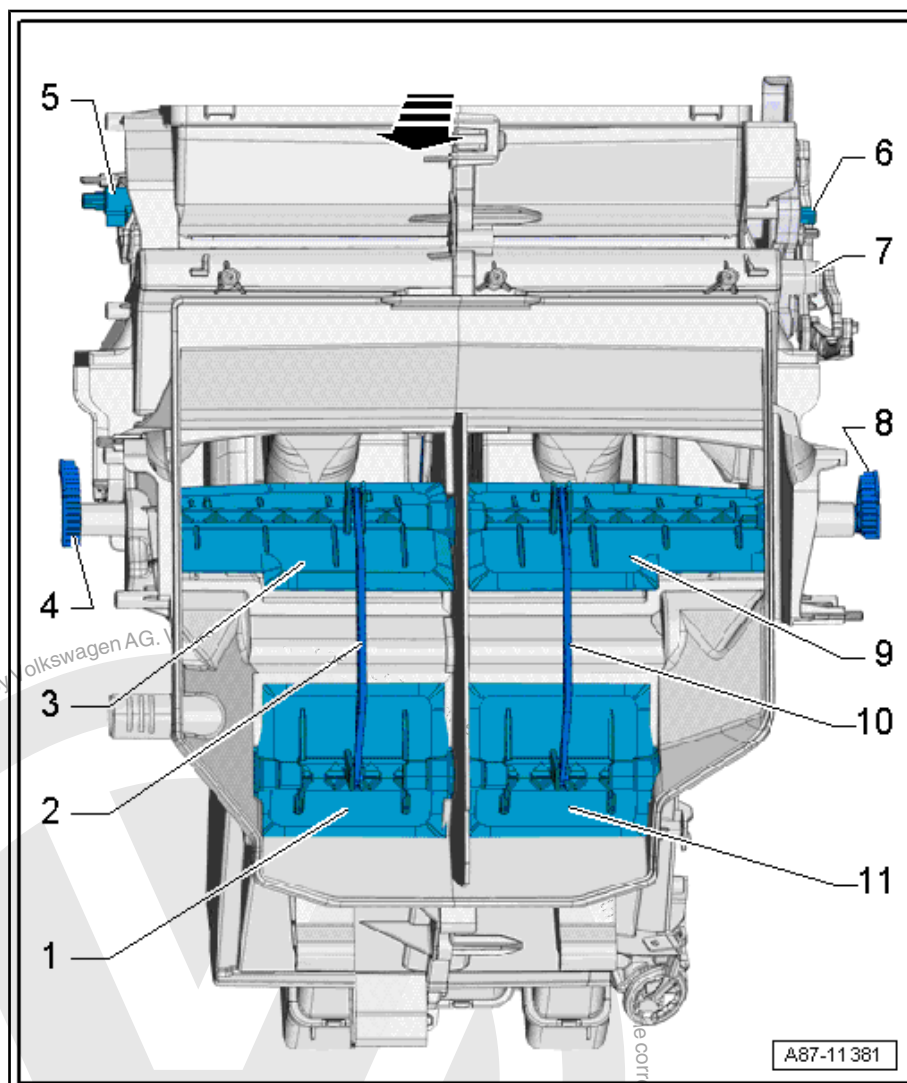
- ☐ For the windshield and door windows
- ☐ Equipment version
- ☐ Only Climatronic
- ☐ Activated by the Defroster Door Motor - V107-

6 - "Defrost" Door Operating Lever

- ☐ For the windshield and door windows
- ☐ Equipment version
- ☐ Only heater and electric-manual climate control system
- ☐ Activated by the Air Distribution Door Motor - V428- via the defrost and air distribution adjuster

7 - Air Distribution Door Operating Lever

Heater and electric-manual climate control system





- ☐ Activated by the Air Distribution Door Motor - V428- via the defrost and air distribution adjuster

Climatronic:

- ☐ Activated by the Front Air Distribution Door Motor - V426- via the defrost and air distribution adjuster

8 - Left Operating Lever

Heater and electric-manual climate control system

- ☐ Activated by the Temperature Regulator Door Motor - V68-

Climatronic:

- ☐ Activated by the Left Temperature Door Motor - V158-

9 - Left Door for Cold Air

- ☐ From the evaporator
- ☐ Different versions

Heater and electric-manual climate control system

- ☐ Activated by the Temperature Regulator Door Motor - V68- via the left operating lever.

Climatronic:

- ☐ Activated by the Left Temperature Door Motor - V158- via the left operating lever.

10 - Operating Lever

- ☐ For door control

11 - Left Door for Warm Air

- ☐ From the heater core
- ☐ Activated via the left door for cold air

View from Behind



Note

- ◆ -Arrow-= direction of travel
- ◆ Refer to ⇒ "5.1 Overview - Heater and A/C Unit", page 213.



1 - Rear Air Guide Channel Door

- ☐ Equipment version

Heater and electric-manual climate control system

- ☐ The air guide channel is sealed with a sealing plug
- ☐ Depending on the manufacturer, not always present with the heater and electric-manual climate control system (not necessary, since the air guide channel is sealed)

Climatronic (vehicle-specific)

- ☐ For the rear vent in the inside the center console

2 - Operating Lever

- ☐ For door control
- ☐ Equipment levels with Climatronic
- ☐ Not always present with the heater and electronic-manually regulated A/C system -1-

3 - Left Door for the Left Instrument Panel Vent

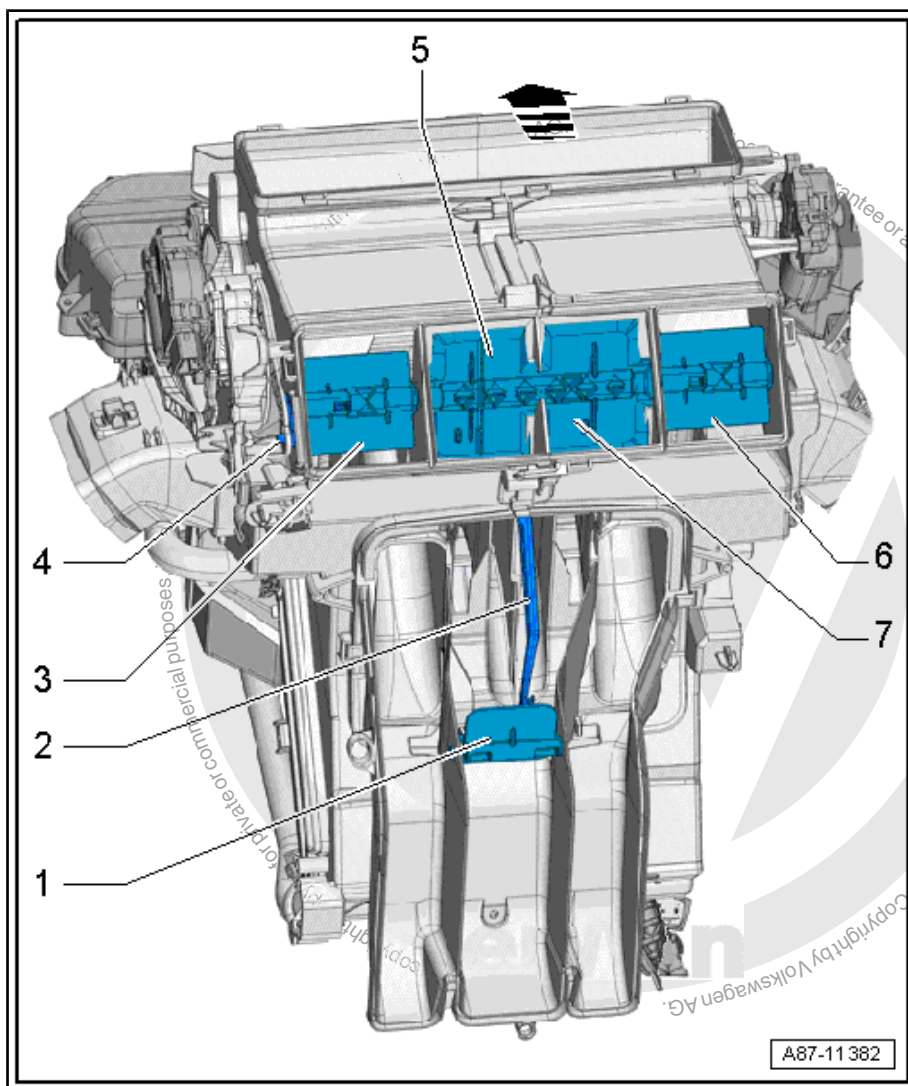
4 - Operating Lever

- ☐ For operating the vent doors
- ☐ Activated via the adjuster -item 9- ➔ [Item 9 \(page 215\)](#)

5 - Left Door for the Center Instrument Panel Vent

6 - Right Door for the Right Instrument Panel Vent

7 - Right Door for the Center Instrument Panel Vent



5.5 Heater and A/C Unit, Removing and Installing

Special tools and workshop equipment required

- ◆ Torque Wrench 1331 5-50Nm - VAG1331- (5 to 50 Nm)
- ◆ Hose Clamps - Up To 25mm - 3094-
- ◆ Shop Crane - Drip Tray - VAS6208-
- ◆ Engine Bung Set - VAS6122-
- ◆ A/C Service Station
- ◆ Commercially available compressed-air gun



Removing



Note

*To improve accessibility, additional components for example engine cover must be removed (depending on engine version).
Refer to ➔ Rep. Gr. 10 ; Engine Cover; Engine Cover, Removing and Installing or ➔ Rep. Gr. 23 ; Engine Cover; Overview - Air Filter Housing .*

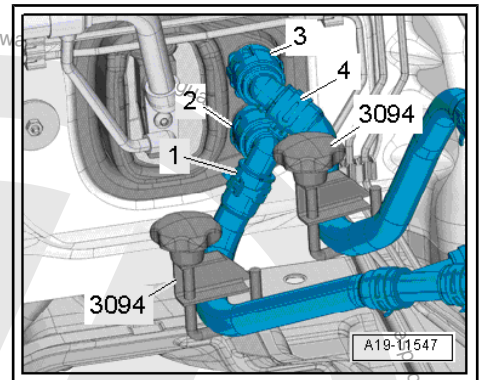
- Observe the safety instructions. Refer to
➔ [“1 Safety Precautions”, page 1](#) .
- Vehicles with Air Conditioning (A/C) system: Extract the refrigerant using the A/C Service Station , only then open the refrigerant circuit. See notes. Refer to
➔ [“2.1 System Overview - Refrigerant Circuit”, page 100](#) .
- Vehicles with an A/C system: Remove the refrigerant line with the inner heat exchanger from the expansion valve. Refer to
➔ [“2.13 Refrigerant Lines with Inner Heat Exchanger, Removing and Installing”, page 136](#) .
- Place the Shop Crane - Drip Tray - VAS6208- under the engine.
- Mark the coolant hoses -1 and 4-.



Note

*The heater core is designed for a specific coolant flow direction.
Therefore, coolant hoses must be connected on the correct sides.*

- Clamp off the coolant hoses -1 and 4- using Hose Clamps - Up To 25mm - 3094- .



CAUTION

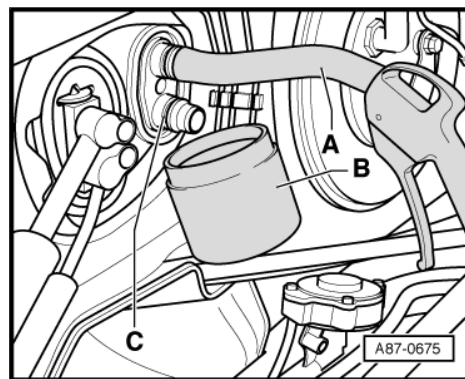
The cooling system is under pressure when the engine is warm.
There is a risk of scalding from hot steam and coolant.

Burns on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Reduce the pressure: cover the coolant reservoir cap with a cloth and carefully open.



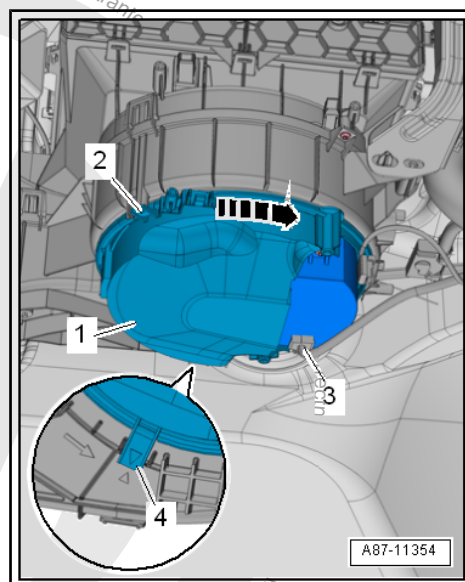
- Lift the clips -2 and 3-.
- Remove the coolant hoses -1 and 4- from the heater core for the heater.
- Connect a section of hose -A- to the upper connection.
- Insert the compressed-air gun into the end of the hose.
- Hold a container -B- under the lower connection -C- and carefully blow the coolant out of the heater core using the compressed-air gun.
- Seal the open lines and connections with clean plugs from the Engine Bung Set - VAS6122- .



Note

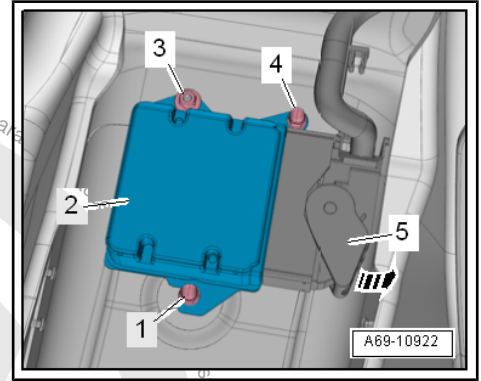
To seal off all open connections on expansion valve, sealing caps from a replacement expansion valve can be used (preventing dirt and moisture from entering the system).

- Remove the instrument panel central tube. Refer to ➤ Body Interior; Rep. Gr. 70 ; Instrument Panel Central Tube; Instrument Panel Central Tube, Removing and Installing .
- Remove the air guide channel to the rear vent (vehicle-specific). Refer to ➤ ["6.8 Rear Center Console Vent Air Guide Channel, Removing and Installing", page 279](#) .
- Lift the rear footwell vent underneath the front seat and pull rearward to facilitate removing the footwell vent from the heater and A/C Unit.
- Remove the rear footwell vent from the heater and A/C unit.
- Disconnect the connector -3- from the Fresh Air Blower Control Module - J126- .
- Remove the connector -5- from the Airbag Control Module - J234- (on the tunnel) -2-.

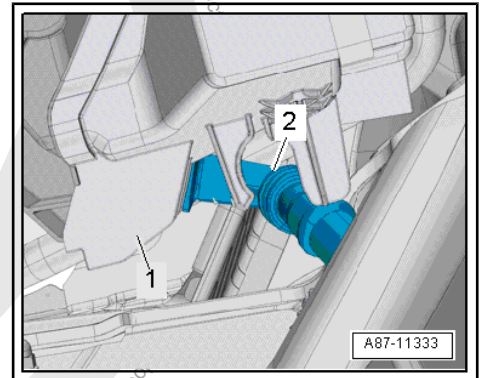




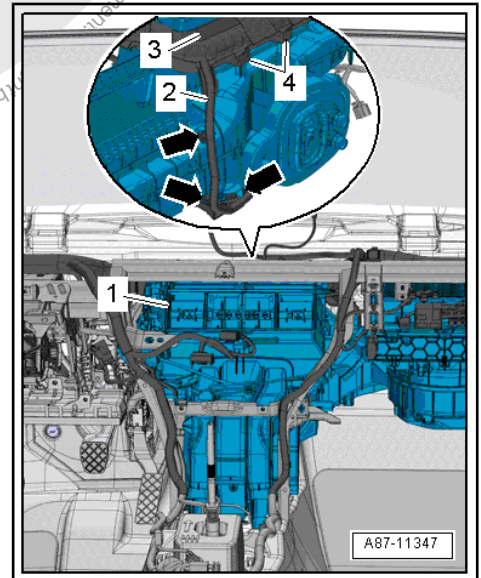
- Cover the carpet and Airbag Control Module - J234- in the vehicle interior with a waterproof foil and water absorbing paper.



- Remove the condensation water drain hose -2- carefully from the heater and A/C unit -1-.



- Remove the heater and A/C unit -1- from the bracket on the plenum chamber bulkhead.
- Free up the cable channel -3-.
- Free up the wiring harness -2- at the mounts -4- -arrows-.
- Remove the heater and A/C unit to the side.



Installing

Install in reverse order of removal. Note the following:



Note

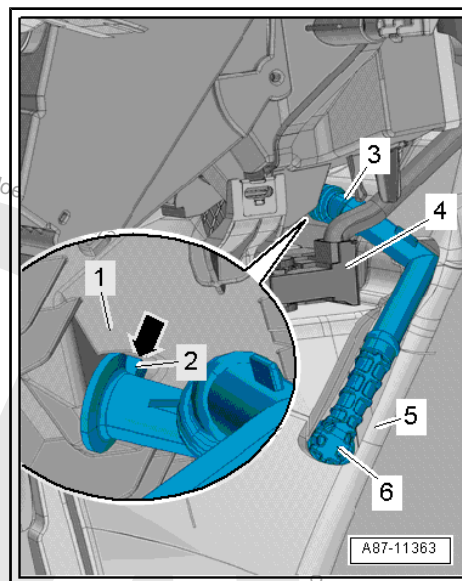
The assistance of a second technician is necessary to install the heater and A/C unit.



- Make sure the condensation water hose -3- is seated correctly.
- The coding -2- and -arrow- must line up with the heater and A/C unit -1-.
- If a commercially available cable tie was used to secure the condensation water drain -3-, replace it.
- The condensation water drain hose must be routed as shown in the illustration from underneath the wiring harness of the Airbag Control Module - J234- -4-.
- Fill with coolant. Refer to ➔ Rep. Gr. 19 ; Coolant System/ Coolant .
- Fill with R134a refrigerant and refrigerant oil. Refer to ➔ ["5.1 Refrigerant R134a Capacities", page 62](#) .
- Check the heater and A/C unit function.

Tightening Specifications

- ◆ Refer to ➔ ["5.1 Overview - Heater and A/C Unit", page 213](#)
- ◆ Refer to ➔ ["2.1 System Overview - Refrigerant Circuit", page 100](#)
- ◆ Overview - Instrument Panel Central Tube. Refer to ➔ Body Interior; Rep. Gr. 70 ; Instrument Panel Central Tube; Overview - Instrument Panel Central Tube .
- ◆ Engine cover. Refer to ➔ Rep. Gr. 10 ; Engine Cover; Engine Cover, Removing and Installing .
- ◆ Air filter housing. Refer to ➔ Rep. Gr. 23 ; Air Filter; Engine Cover; Overview - Air Filter Housing .



5.6 Heater and A/C Unit, Disassembling and Assembling



Note

- ◆ *There are different versions and various manufacturers of the heater and Air Conditioning (A/C) units. Individual components of the different heater and A/C units are similar but not the same. Interchanging components from different manufacturers is not permitted. Refer to the Parts Catalog.*
- ◆ *A heater and A/C unit manufactured by "Valeo" is shown in the following illustrations. For distinguishing characteristics between manufacturers, refer to ➔ ["2 Identification", page 4](#) .*



1 - Air Distribution Housing

- ☐ Different versions
- ☐ Interchanging components is not permitted.
- ☐ The following illustrations show the heater manufactured by "Valeo"
- ☐ Depending on vehicle equipment level with or without the Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604-
- ☐ Manufacturer differences. Refer to ["2 Identification", page 4](#).

2 - Wiring Harness

- ☐ There are different versions. Refer to the Parts Catalog.

3 - Evaporator Housing



Note

For vehicles without an A/C system an airflow regulator is installed in place of the evaporator.

4 - Screw

- ☐ 1 Nm
- ☐ Quantity: 3

5 - Left Bracket

- ☐ For heater and A/C unit
- ☐ Removing and installing. Refer to ["5.8 Heater and A/C Unit Bracket, Removing and Installing", page 230](#).

6 - Nut

- ☐ 4.5 Nm

7 - Nut

- ☐ 4.5 Nm

8 - Right Bracket

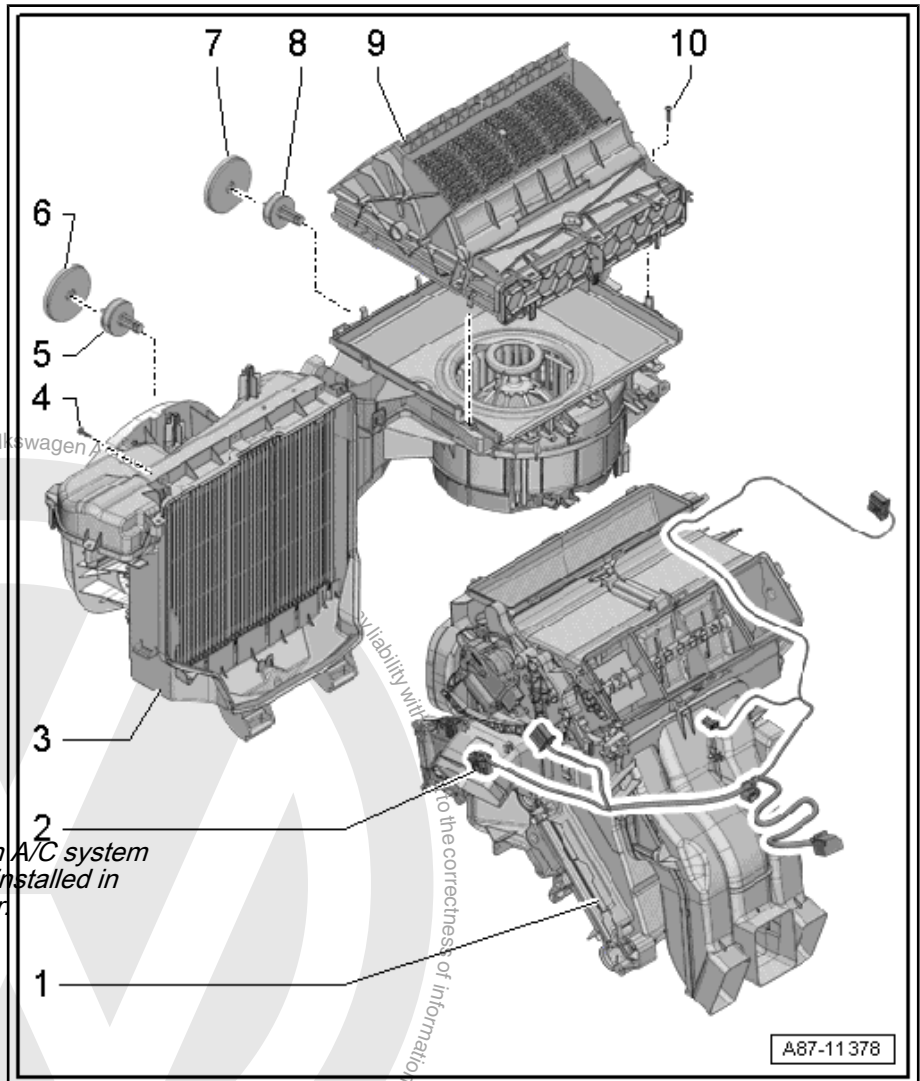
- ☐ For heater and A/C unit
- ☐ Removing and installing. Refer to ["5.8 Heater and A/C Unit Bracket, Removing and Installing", page 230](#).

9 - Air Intake Housing

- ☐ There are different versions. Refer to the Parts Catalog.

10 - Screw

- ☐ 1 Nm
- ☐ Quantity: 2

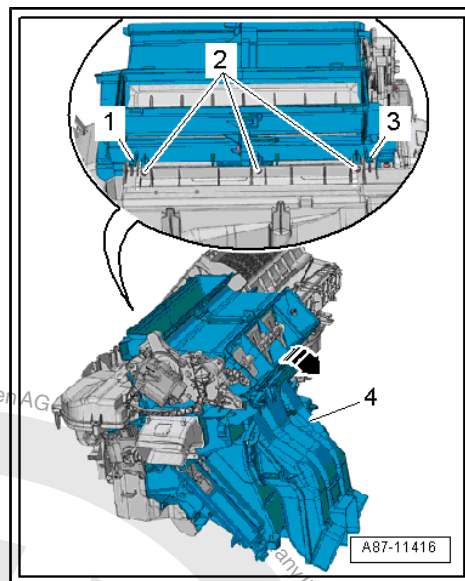




5.7 Air Distribution Housing, Removing and Installing

Removing

- Remove the heater and A/C unit. Refer to
⇒ [“5.5 Heater and A/C Unit, Removing and Installing”,
page 224](#) .
- Remove the coolant pipes from the heater core. Refer to
⇒ [“5.16 Heater Core Coolant Pipes, Removing and Installing”,
page 260](#) .
- Disconnect the connector from the fresh/recirculated air door motor and free up the wiring harness.
- Remove screws -2-.
- Release the mounting tabs -1 and 3-.
- Tilt the air distribution housing -4- toward the rear -arrow- and disengage.



Installing

Install in reverse order of removal. Note the following:

Tightening Specifications

- ♦ Refer to
⇒ [“5.6 Heater and A/C Unit, Disassembling and Assembling”,
page 228](#)



Note

The smallest leaks at the tongue and groove joint between the air distribution housing and the evaporator housing can lead to whistling noises due to escaping air. Coat the connecting surfaces lightly with, for example, silicone grease. Refer to the Parts Catalog.

5.8 Heater and A/C Unit Bracket, Removing and Installing



Note

The brackets remain installed in the vehicle when removing the heater and Air Conditioning (A/C) unit.





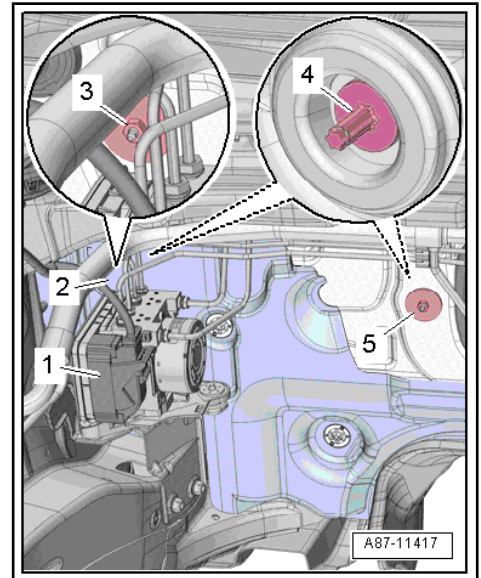
Removing

- Remove the heater and A/C unit. Refer to [⇒ “5.5 Heater and A/C Unit, Removing and Installing”, page 224](#).
- Disconnect the connector -1-.
- Fold the heat shield -2- behind the ABS unit to the side.
- Remove the nuts -3 and 5-.
- Remove the bracket -4- in the interior.



Note

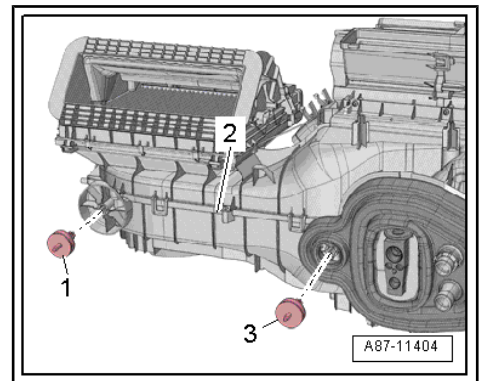
If the nut above the ABS unit is not accessible as described, the refrigerant pipe with the inner heat exchanger must be removed. Refer to [⇒ “2.13 Refrigerant Lines with Inner Heat Exchanger, Removing and Installing”, page 136](#).



Installing

Install in reverse order of removal. Note the following:

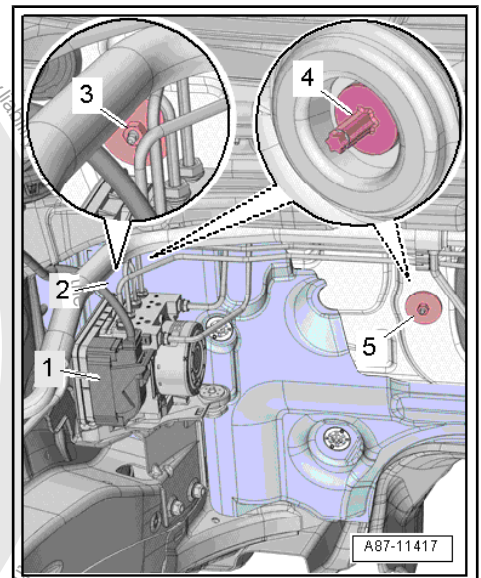
- Insert the bracket -1 and 3- into the mounts on the heater and A/C unit -2- and bring the A/C unit into the installation position.
- Install the heater and A/C unit. Refer to [⇒ “5.5 Heater and A/C Unit, Removing and Installing”, page 224](#).



- Tighten the nuts -3 and 5- on the brackets.
- Install the remaining components.
- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

Component	Tightening Specifications
Nut	4.5 Nm



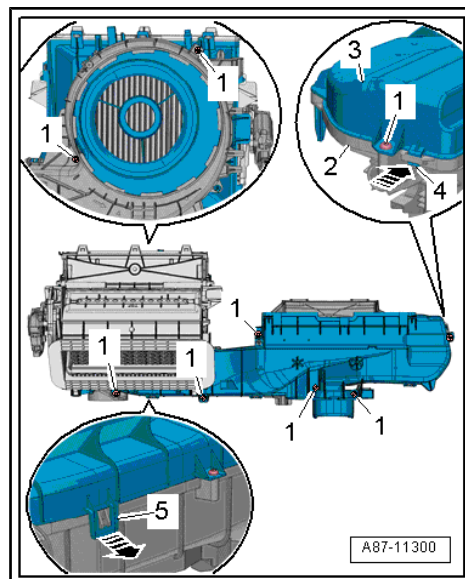
5.9 Evaporator, Removing and Installing

Removing

- When working on the refrigerant circuit, note the information. Refer to [⇒ “4.1 Working on the Refrigerant Circuit”, page 8](#).



- Remove the heater and Air Conditioning (A/C) unit. Refer to [⇒ "5.5 Heater and A/C Unit, Removing and Installing", page 224](#).
- Remove bolts -1-.
- Release the mounting tabs -4 and 5- -arrows-.
- Remove the evaporator housing upper section -3- from the lower section -2-.

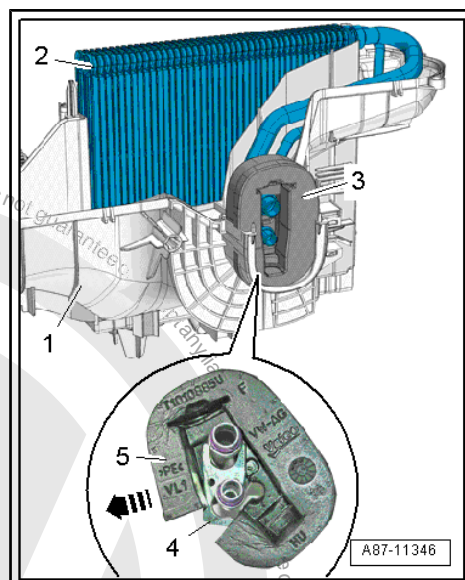


- Remove the evaporator -2- from the evaporator housing lower section -1-.
- Remove the expansion valve. Refer to [⇒ "2.4 Expansion Valve, Removing and Installing", page 110](#).
- Remove the seal/insulation -3- by pulling the moving part -5- to the side -arrow-.
- Remove the retaining plate -4- for the refrigerant lines.

Installing

Install in reverse order of removal. Note the following:

- If a new expansion valve is not installed on the evaporator, transfer it from the old evaporator. Refer to [⇒ "2.4 Expansion Valve, Removing and Installing", page 110](#).
- Replace the seals.



Note

- ♦ *The smallest leaks at the tongue and groove joint between the upper and lower sections of the evaporator housing can lead to whistling noises due to escaping air. Coat the connecting surfaces lightly with, for example, silicone grease. Refer to the Parts Catalog.*
- ♦ *Before inserting the evaporator, check condensation water drain and clean drain if necessary.*
- ♦ *Before inserting evaporator, clean evaporator housing and the evaporator, if necessary.*

Tightening Specifications

- ♦ Refer to [⇒ "5.3 Overview - Evaporator Housing", page 220](#)



5.10 Fresh Air Blower Control Module - J126- , Removing and Installing

⇒ [“5.10.1 Fresh Air Blower Control Module J126 , Removing and Installing”, page 233](#)

5.10.1 Fresh Air Blower Control Module - J126- , Removing and Installing

Removing

- Remove the partition. Refer to
⇒ [“5.20.1 Partition, Removing and Installing”, page 269](#) .
- Disconnect the connectors -1 and 3-.
- Remove the bolts -arrows-.

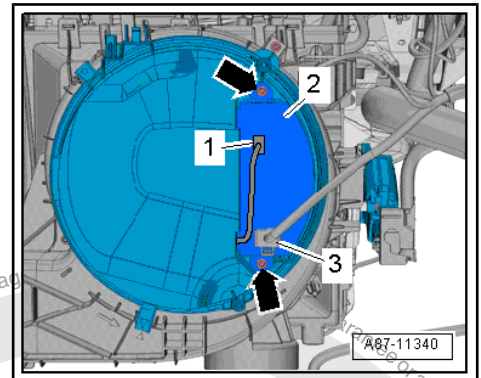
CAUTION

There is a risk of burns from the hot radiating surface of the fresh air blower control module.

It is possible to burn hands.

- Wear protective gloves.

- Remove the control module -2- from the Fresh Air Blower - V2- .



Installing

Install in reverse order of removal. Note the following:

- Check the Fresh Air Blower - V2- function.

Tightening Specifications

- ◆ Refer to
⇒ [“5.2 Overview - Attachments for Heater and A/C Unit and Air Intake Housing”, page 218](#)

5.10.2 Fresh Air Blower Control Module - J126- , Removing and Installing, RHD

Removing

- Remove the partition. Refer to
⇒ [“5.20.2 Partition, Removing and Installing, RHD”, page 270](#) .



- Disconnect the connectors -1- and -4-.
- Remove screws -2-.

⚠ CAUTION

There is a risk of burns from the hot radiating surface of the fresh air blower control module.

It is possible to burn hands.

- Wear protective gloves.

- Remove the control module -3- from the Fresh Air Blower - V2- .

Installing

Install in reverse order of removal. Note the following:

- Check the Fresh Air Blower - V2- function.

Tightening Specifications

- ♦ ⇒ [“5.2 Overview - Attachments for Heater and A/C Unit and Air Intake Housing”, page 218](#)

5.11 Dust and Pollen Filter, Removing and Installing

- ♦ ⇒ [“5.11.1 Dust and Pollen Filter, Removing and Installing”, page 234](#)

5.11.1 Dust and Pollen Filter, Removing and Installing

Special tools and workshop equipment required

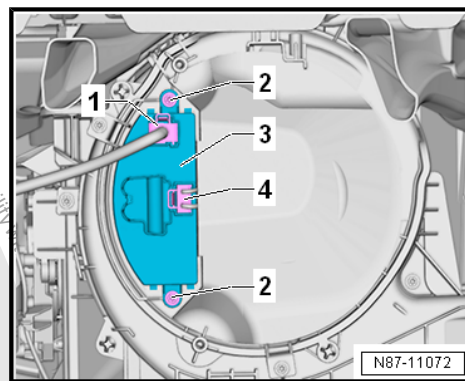
- ♦ Commercially Available Vacuum Cleaner
- ♦ Blower Motor Cover Plate - T10532-
- ♦ Trim Removal Wedge - 3409-

Removing



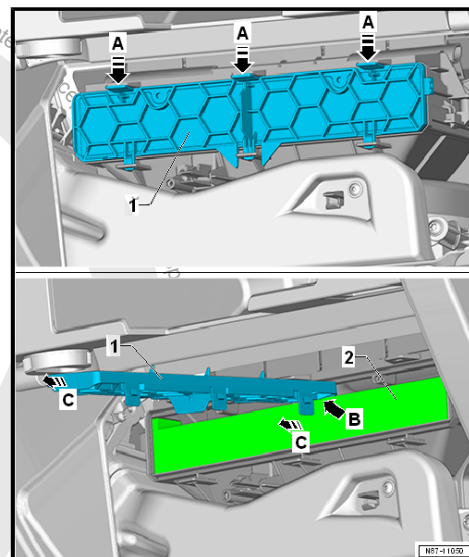
Note

- ♦ *Handle customer property in the glove compartment carefully.*
- ♦ *Store objects from the glove compartment in a sealable plastic bag.*
- Bring the glove compartment lid into the service position. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Glove Compartment Lid Service Position .

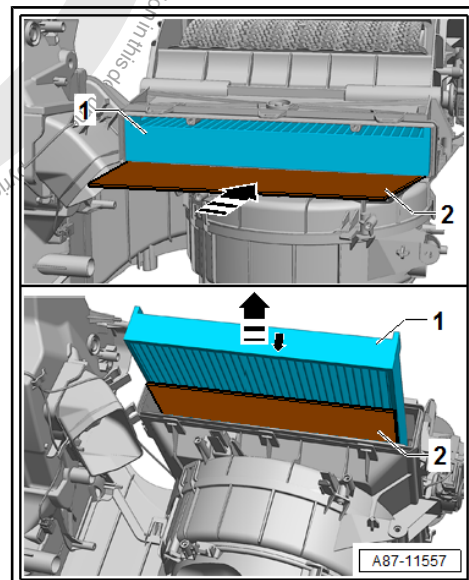




- Release the cover -1- in direction of -arrow- and remove.



- Push the Blower Motor Cover Plate - T10532- -2- under the pollen filter -1-.





- Engage the cover -1- in the dust and pollen filter -2- -arrow B-.

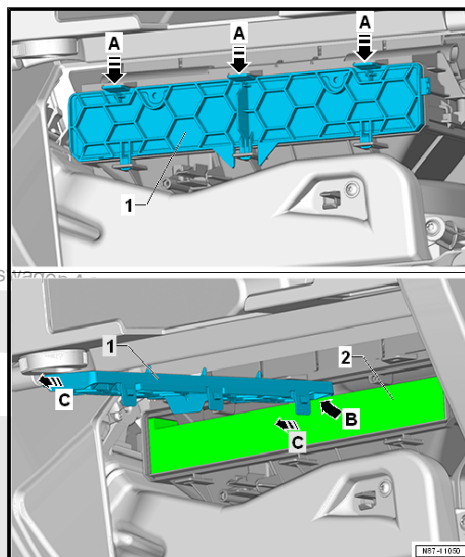
NOTICE

There is a risk of damaging the fresh air blower due to dirt falling out of the dust and pollen filter due to incorrect seating of the cover plate.

- Carefully remove the dust and pollen filter.
- Counterhold the cover plate.
- Remove the cover -1- in direction of -arrow C-.
- Make sure that the Blower Motor Cover Plate - T10532- is not removed with it.
- Remove dirt and leaves from the Blower Motor Cover Plate - T10532- with a commercially available vacuum cleaner.

Installing

- Install in reverse order of removal. When doing this, note the following:
- Note installation position of the dust and pollen filter during assembly.



5.11.2 Dust and Pollen Filter, Removing and Installing, RHD

Special tools and workshop equipment required

- ◆ Commercially Available Vacuum Cleaner
- ◆ Blower Motor Cover Plate - T10532-
- ◆ Trim Removal Wedge - 3409-



Removing

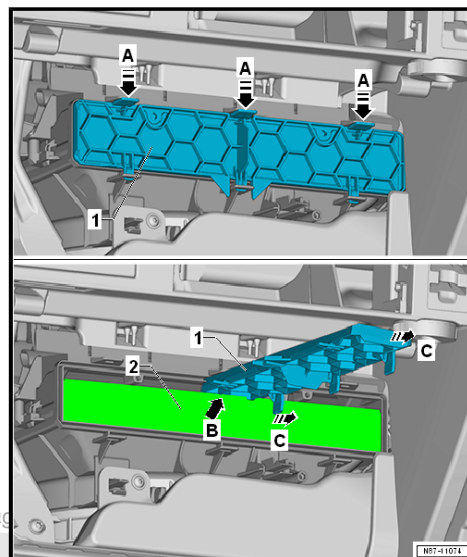


Note

- ◆ Handle customer property in the glove compartment carefully.
- ◆ Store objects from the glove compartment in a sealable plastic bag.
- Bring the glove compartment lid into the service position. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Glove Compartment Lid Service Position .



- Release the cover -1- in the -direction of the arrow A- and re-move.

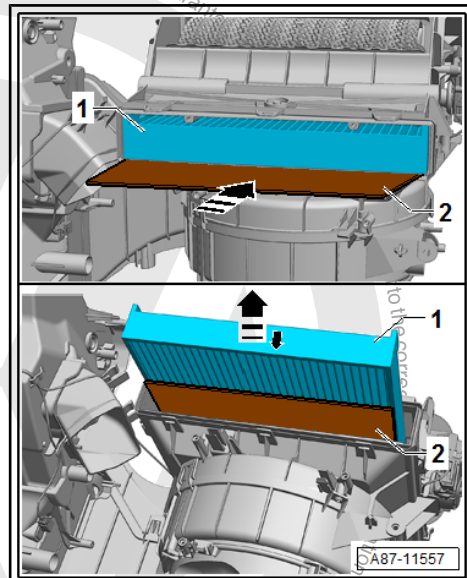


- Push the Blower Motor Cover Plate - T10532- -2- under the pollen filter -1-.



Note

The illustration shows a LHD.





- Engage the cover -1- in the dust and pollen filter -2- -arrow B-.

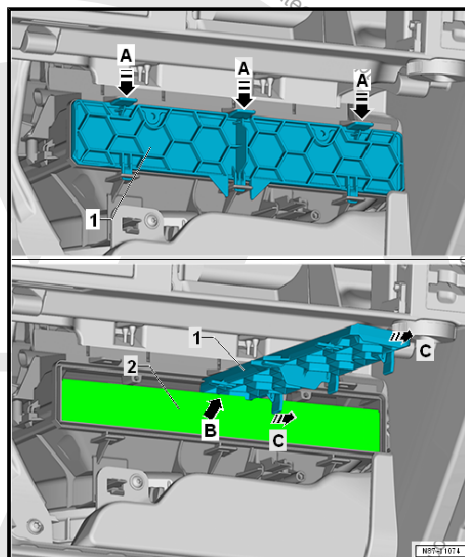
NOTICE

There is a risk of damaging the fresh air blower due to dirt falling out of the dust and pollen filter due to incorrect seating of the cover plate.

- Carefully remove the dust and pollen filter.
- Counterhold the cover plate.
- Remove the cover -1- in the -direction of the arrow C-.
- Make sure that the Blower Motor Cover Plate - T10532- is not removed with it.
- Remove dirt and leaves from the Blower Motor Cover Plate - T10532- with a commercially available vacuum cleaner.

Installing

- Install in reverse order of removal. When doing this, note the following:
- Note installation position of the dust and pollen filter during assembly.



5.12 Fresh Air Blower - V2- , Removing and Installing

⇒ [“5.12.1 Fresh Air Blower V2 , Removing and Installing”](#), page 238

5.12.1 Fresh Air Blower - V2- , Removing and Installing



Note

If only the Fresh Air Blower - V2- is faulty, Fresh Air Blower Control Module - J126- removing and installing. Refer to ⇒ [“5.10 Fresh Air Blower Control Module J126 , Removing and Installing”](#), page 233 .

Removing

The Fresh Air Blower - V2- is accessible from footwell on front passenger side.

- Remove the partition. Refer to ⇒ [“5.20.1 Partition, Removing and Installing”](#), page 269 .



- Disconnect the connector -3-.
- Remove the bolt -2-, if equipped.
- Lift the securing tab -4- and turn the fresh air blower -1- clockwise -arrow-.
- Remove the fresh air blower from the evaporator housing lower section.

! NOTICE

Risk of damaging the fresh air blower if operated incorrectly. Imbalance and problems during operation is possible.

- **Avoid using force on the fan wheel.**
- **Never move the balancing weight on the fan wheel.**

Installing

Install in reverse order of removal.

- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Then check the Fresh Air Blower - V2- function.

Tightening Specifications

- ◆ Refer to
⇒ ["5.2 Overview - Attachments for Heater and A/C Unit and Air Intake Housing", page 218](#)

5.12.2 Fresh Air Blower - V2- , Removing and Installing, RHD

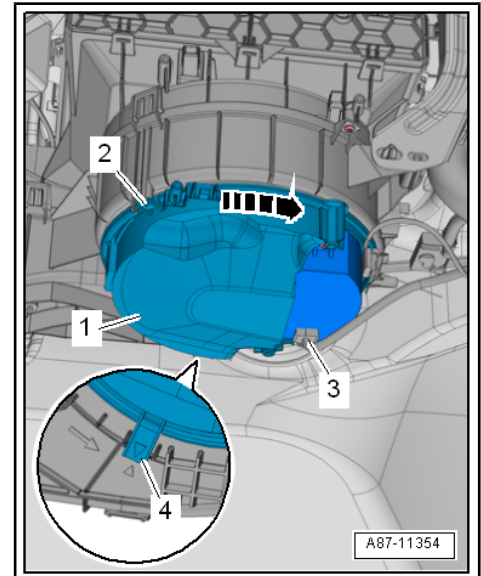


Note

If only the Fresh Air Blower - V2- is faulty, Fresh Air Blower Control Module - J126- removing and installing. Refer to ⇒ ["5.10, Fresh Air Blower Control Module J126 , Removing and Installing", page 233](#) .

Removing

- Remove the partition. Refer to ⇒ ["5.20.2 Partition, Removing and Installing, RHD", page 270](#) .
- Remove the glove compartment. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Glove Compartment, Removing and Installing .
- Remove the footwell vent on the front passenger side. Refer to ⇒ ["6.6.2 Front Passenger Side Footwell Vent, Removing and Installing, RHD", page 278](#) .





- Disconnect the connectors.
- Remove screws -2-.
- Unclip the securing tab -arrows-.
- Remove the Fresh Air Blower - V2- -1- downward in the -direction of the arrow-.

NOTICE

Risk of damaging the fresh air blower if operated incorrectly
Imbalance and problems during operation is possible.

- Avoid using force on the fan wheel.
- Never move the balancing weight on the fan wheel.

Installing

Install in reverse order of removal. Note the following:

- Push the Fresh Air Blower - V2- on the centering drift -3-.
- Check the DTC memory and erase any displayed entries using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Then check the Fresh Air Blower - V2- function.

Tightening Specifications

- ◆ ⇒ [5.2 Overview - Attachments for Heater and A/C Unit and Air Intake Housing](#), page 218

5.13 Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604- , Checking

⇒ ["5.13.1 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Checking"](#), page 240

5.13.1 Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604- , Checking

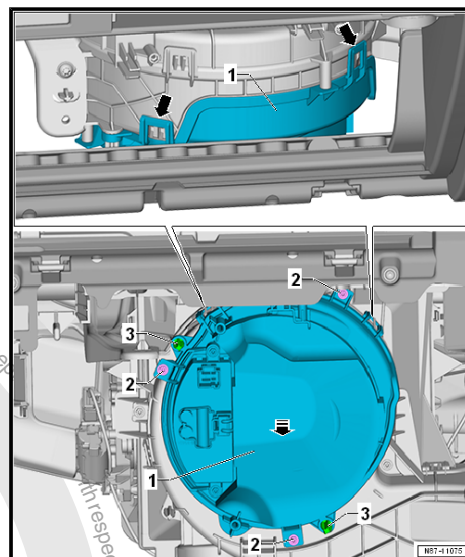
Checking

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester with Vehicle Diagnosis System - Trigger Clamp - 100A - VAS5051B/7-

Test Conditions

- The intake temperature is below 19 °C (66.2 °F)
- The coolant temperature is below 80 °C (176 °F)
- The passenger compartment temperature is approximately 20 °C (68 °F)
- Battery voltage greater than 11 V
- Alternator load not greater than 50% (terminal DF)
- Engine RPM higher than 450
- Turn the interior temperature control to maximum heating. (For vehicles with Climatronic select the high setting).





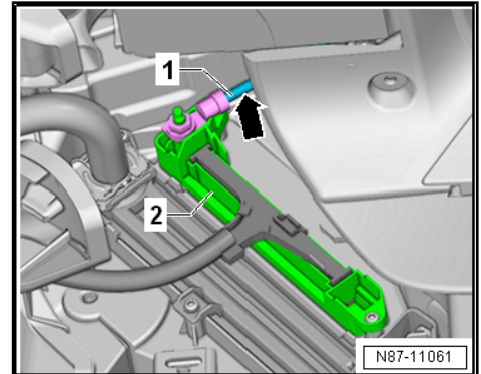
Test Sequence

- Remove the left footwell center console trim. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .
- Using the Vehicle Diagnostic Tester and the Vehicle Diagnosis System - Trigger Clamp - 100A - VAS5051B/7- measure the current draw -arrows- on the Ground (GND) cable -1- from Auxiliary Heater Heating Element - Z35- -2-.

Slight heating output ≈ 30A

Medium heating output ≈ 60A

Large heating output ≈ 80A



5.13.2 Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604- , Checking, RHD

Checking

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester with Vehicle Diagnosis System - Trigger Clamp - 100A - VAS5051B/7-

Test Conditions

- The intake temperature is below 19 °C
- The coolant temperature is below 80 °C
- The passenger compartment temperature is approximately 20 °C
- Battery voltage greater than 11 V
- Alternator load not greater than 50 % (terminal DF)
- Engine RPM higher than 450
- Turn the interior temperature control to maximum heating. (For vehicles with Climatronic select the high setting).

Test Sequence

- Remove the center console. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .
- Remove the glove compartment. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Glove Compartment, Removing and Installing .
- Loosen the instrument panel in the area of the glove compartment until the instrument panel can be pulled forward to remove the Auxiliary Heater Heating Element - Z35- .

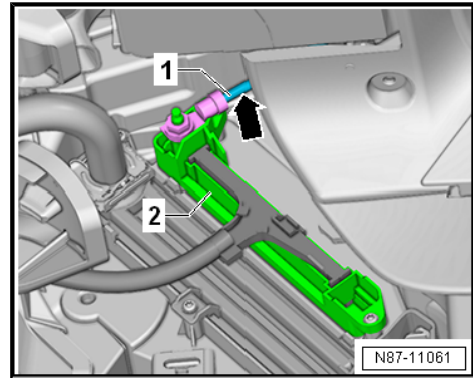


- Using the Vehicle Diagnostic Tester and the Vehicle Diagnosis System - Trigger Clamp - 100A - VAS5051B/7- measure the current draw -arrows- on the ground cable -1- from Auxiliary Heater Heating Element - Z35- -2-.

Slight heating output $\approx 30A$

Medium heating output $\approx 60A$

Large heating output $\approx 80A$



5.14 Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604- , Removing and Installing

⇒ **“5.14.1 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Removing and Installing”, page 242**

5.14.1 Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604- , Removing and Installing

Removing

- Remove the driver side knee airbag. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Knee Airbags; Overview - Knee Airbag .
- Remove the left footwell center console trim. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console.

CAUTION

Pyrotechnic components can unintentionally deploy.

Risk of injury.

- **Discharge static electricity:** Briefly touch the door striker pin.



- Loosen the nut -3- and then remove the Ground (GND) cable -4-.

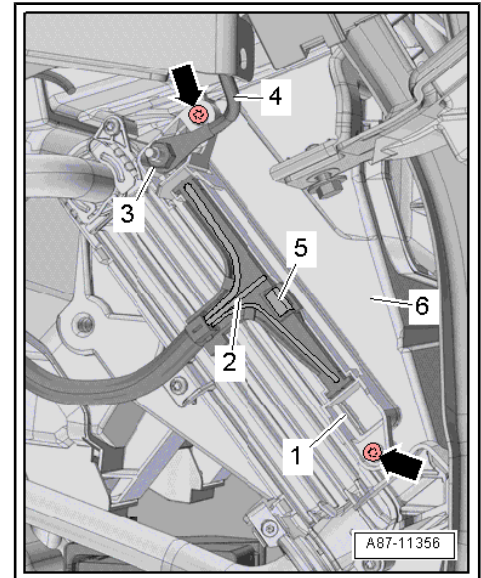
⚠ CAUTION

There is a risk of burns by the metal surfaces of the auxiliary heater heating element. Heating elements can be very hot.

It is possible for the skin to be burned.

- Wear protective gloves.
- Never touch the metal surfaces of the heating element.

- Disconnect the connector -2- by sliding the retainer -5- upward and pressing the release inward.
- Remove the bolts -arrows-.
- Remove the Auxiliary Heater Heating Element - Z35- with the Auxiliary Air Heater Control Module - J604- -1- left from the heater and Air Conditioning (A/C) unit -6-.



Installing



Note

Pay attention to the correct position and threaded connection of the Ground (GND) cable.

Install in reverse order of removal.

Tightening Specifications

- ◆ Refer to ➤ [“5.1 Overview - Heater and A/C Unit”, page 213](#)

5.14.2 Auxiliary Heater Heating Element - Z35- with Auxiliary Air Heater Control Module - J604- , Removing and Installing, RHD

Removing

- Remove the center console. Refer to ➤ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .
- Remove the glove compartment. Refer to ➤ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Glove Compartment, Removing and Installing .
- Loosen the instrument panel in the area of the glove compartment until the instrument panel can be pulled forward to remove the Auxiliary Heater Heating Element - Z35-.

⚠ CAUTION

Pyrotechnic components can unintentionally deploy.

Risk of injury.

- Discharge static electricity: Briefly touch the door striker pin.



- Loosen the nut -3- and then remove the ground cable -4-.

⚠ CAUTION

There is a risk of burns by the metal surfaces of the auxiliary heater heating element. Heating elements can be very hot.
It is possible for the skin to be burned.

- Wear protective gloves.
- Never touch the metal surfaces of the heating element.

- Disconnect the connector -2- by sliding the retainer -5- upward and pressing the release inward.
- Remove the bolts -arrows-.
- Remove the Auxiliary Heater Heating Element - Z35- with the Auxiliary Air Heater Control Module - J604- -1- left from the heater and A/C unit -6-.

Installing



Note

Pay attention to the correct position and threaded connection of the ground cable.

Install in reverse order of removal.

Tightening Specifications

- ♦ ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)
- ♦ Center Console; Overview - Center Console. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .
- ♦ Storage Compartments and Covers; Overview - Glove Compartment. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Overview - Glove Compartment .

5.15 Heater Core, Removing and Installing

⇒ [“5.15.1 Heater Core, Removing and Installing, Valeo”, page 244](#)

⇒ [“5.15.3 Heater Core, Removing and Installing, Denso”, page 252](#)

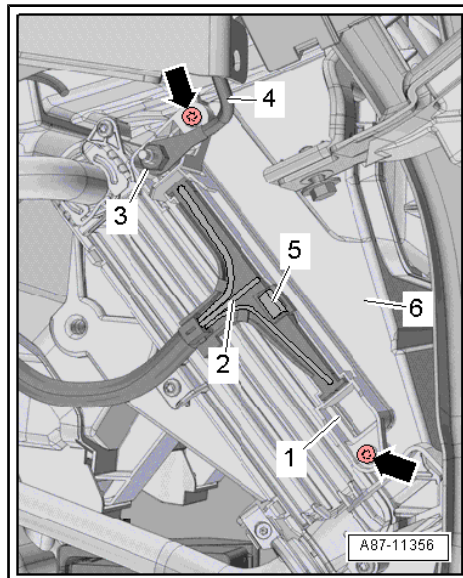
5.15.1 Heater Core, Removing and Installing, Valeo

Special tools and workshop equipment required

- ♦ Shop Crane - Drip Tray - VAS6208-
- ♦ Hose Clamps - Up To 25mm - 3094-
- ♦ Compressed air gun, commercially available
- ♦ Engine Bung Set - VAS6122-

Removing

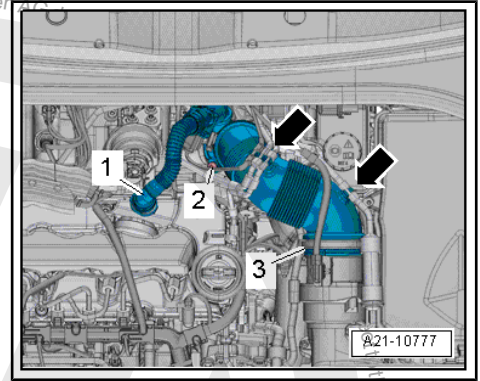
- Observe the safety instructions. Refer to ⇒ [“1 Safety Precautions”, page 1](#) .





Vehicles with a TDI Engine

- Press the release buttons on the hose -1- for the crankcase ventilation and remove the hose from the cylinder head cover.
- Free up the vacuum hoses at the air guide pipe -arrows-.
- Loosen the hose clamp -3-.
- Remove the bolt -2- and tilt the air guide pipe with the connection downward and remove it from the turbocharger.



For All Vehicles

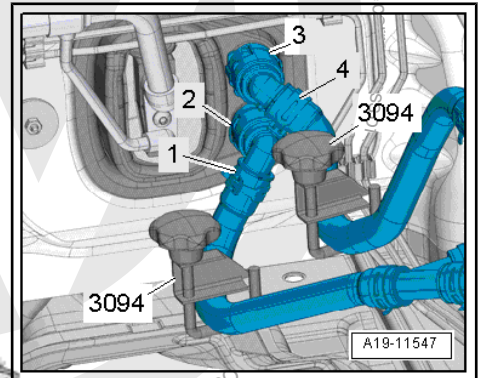
- Mark the installed position of the coolant hoses -1 and 4-.



Note

The heater core is designed for a specific coolant flow direction. Therefore, coolant hoses must be connected on the correct sides.

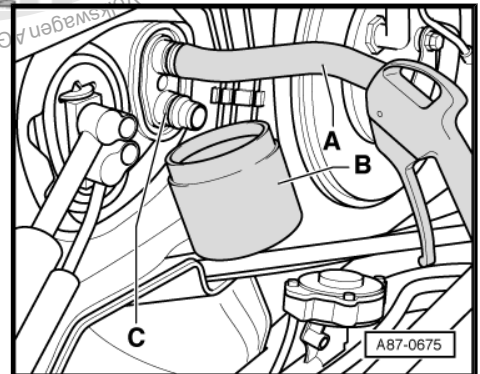
- Clamp off the coolant hoses -1 and 4- using Hose Clamps - Up To 25mm - 3094- .
- Lift the clips -2 and 3-.
- Remove the coolant hoses -1 and 4- from the heater core for the heater.



- Slide a section of hose -A- to the upper connection.

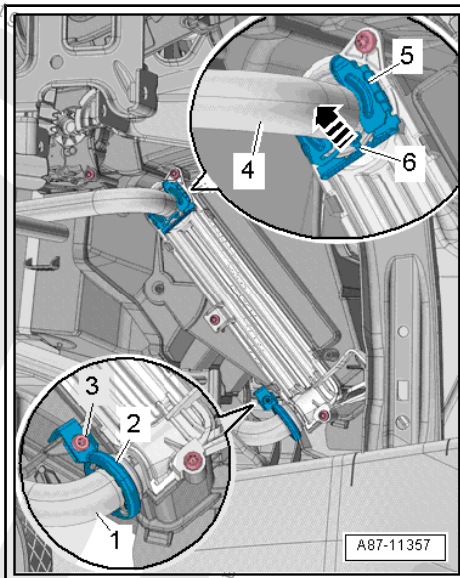
Insert the compressed-air gun into the end of the hose.

- Hold a container -B- under the lower connection -C- and carefully blow the coolant out of the heater core using the compressed-air gun.
- Seal the open lines and connections with clean plugs from the Engine Bung Set - VAS6122- .
- Remove the driver side knee airbag. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Knee Airbags; Overview - Knee Airbag .
- Remove the left footwell center console trim. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .
- Vehicles with an auxiliary air heater: remove the Auxiliary Heater Heating Element - Z35- with the Auxiliary Air Heater Control Module - J604- . Refer to ⇒ ["5.14 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Removing and Installing", page 242 .](#)
- Cover the area beneath the connections for the coolant hoses in the plenum chamber, for example, with waterproof foil and water absorbing paper.

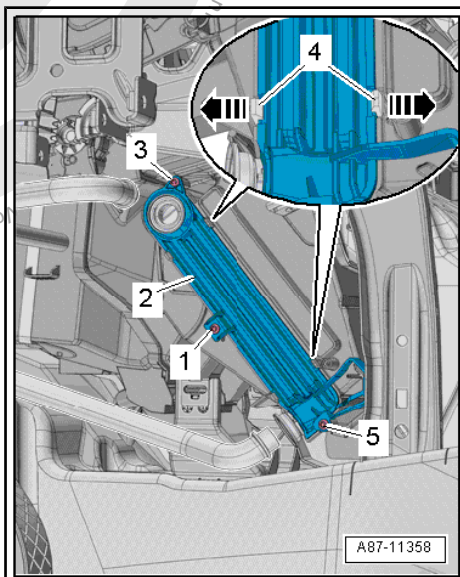




- Lift the retainer -6- and remove the clip -5-. Remove the coolant line -4- from the heater core.
- Remove the bolt -3-.
- Remove the screw clamp -2- and then remove the coolant line -1- from the heater core.
- Seal the open lines and connections with clean plugs from the Engine Bung Set - VAS6122- .



- Remove the bolts -1, 3 and 5-.
- Release the securing tabs -4- -arrows- and remove the cover -2-.



- If the noise insulation cannot be removed easily, open the cover tabs -arrows-.
- Remove the heater core to the left.

Installing

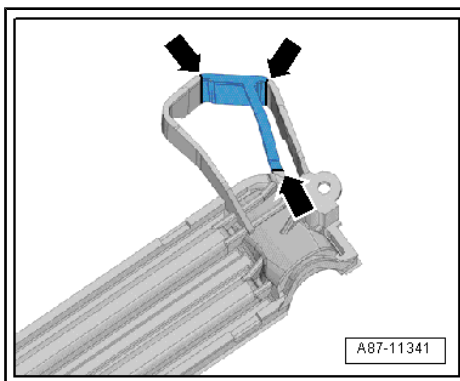
Install in reverse order of removal. Note the following:



Note

Replace the seals.

- With the heater core removed, check the heater shaft for debris.
- If necessary, remove any dirt or coolant residue.
- Vehicles with a TDI engine: Check the removed auxiliary heater heating element shaft for debris and clean if necessary.

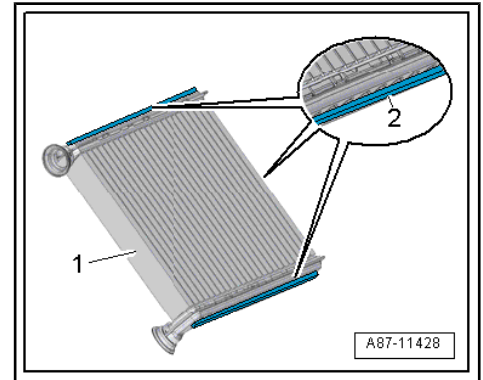




- Check the foam seals -2- attached to the heater core -1- for damage and replace if necessary.

i Note

- ◆ *If not bonded correctly, the foam seal may curl up during insertion.*
- ◆ *Cold air may flow past heater core if the foam seal is damaged or not properly installed.*



- Check the heater core connection -3- and the connection -2- for the coolant pipes for damage or debris.
- Clean the sealing surface for the seal and glaze it.
- Coat a new seal -4- with coolant (or lightly with silicone grease) and attach it to the coolant pipe -1-.
- Carefully slide the heater core all the way into the heater and A/C unit until stop.

i Note

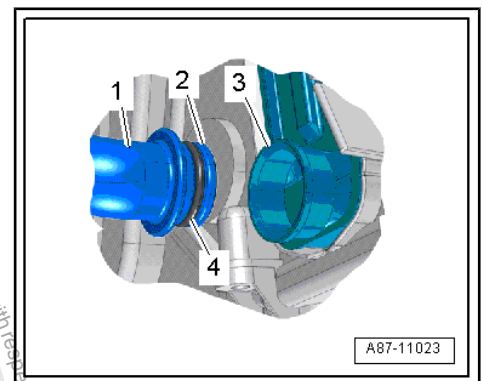
When inserting the heater core, make sure that the connections and the coolant pipes are not damaged.

- Slide the coolant pipes into the heater core until stop.

! NOTICE

There is a risk of heater core malfunctions due to faulty seals and leaks.

- **Never pinch the seal.**
- **Never tilt the coolant pipe.**
- **Slide the coolant pipes on completely.**





- Position a new clip -5- or screw clamp -2- on the coolant pipe/ heater core connection.
- Tighten the bolt -3-. Refer to
⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#) .
- Check the clamp and screw-type clamp for proper seating on the heater core and the coolant pipe connections. They must not be touching the air distribution housing or any other components.
- Fill with coolant. Refer to ⇒ Rep. Gr. 19 ; Coolant System/ Coolant .
- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

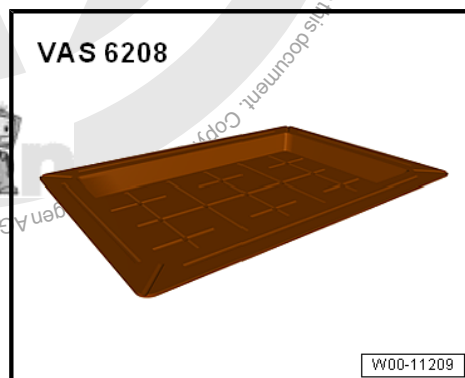
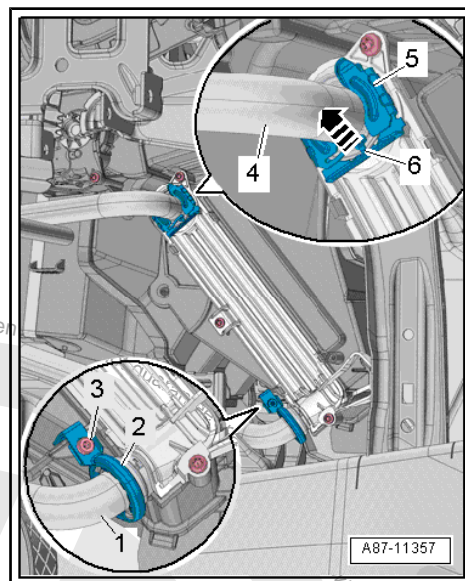
Tightening Specifications

- ◆ Refer to ⇒ [“5.1 Overview - Heater and A/C Unit”, page 213](#)
- ◆ Turbocharger; Overview - Turbocharger. Refer to ⇒ Rep. Gr. 21 ; Turbocharger; Overview - Turbocharger
- ◆ Center Console; Overview - Center Console. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .
- ◆ Knee Airbags; Overview - Knee Airbag. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Knee Airbags; Overview - Knee Airbag .

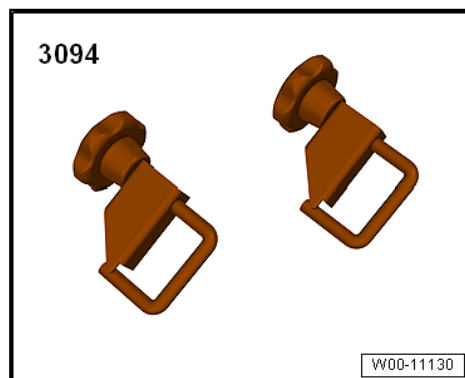
5.15.2 Heater Core, Removing and Installing, Valeo, RHD

Special tools and workshop equipment required

- ◆ Shop Crane - Drip Tray - VAS6208-



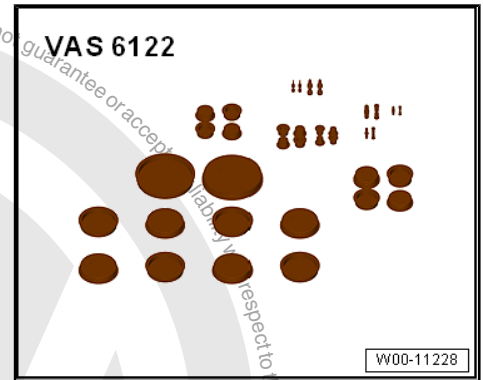
- ◆ Hose Clamps - Up To 25mm - 3094-



- ◆ Compressed air gun, commercially available



◆ Engine Bung Set - VAS6122-

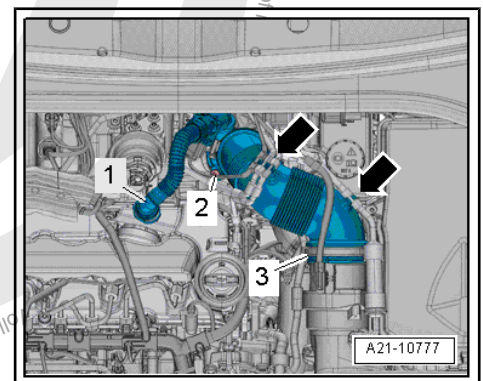


Removing

- Observe the safety instructions. Refer to
⇒ ["1 Safety Precautions", page 1](#).

Vehicles with a TDI engine:

- Press the release buttons on the hose -1- for the crankcase ventilation and remove the hose from the cylinder head cover.
- Free up the vacuum hoses at the air guide pipe -arrows-.
- Loosen the hose clamp -3-.
- Remove the bolt -2- and tilt the air guide pipe with the connection downward and remove it from the turbocharger.



For all vehicles:

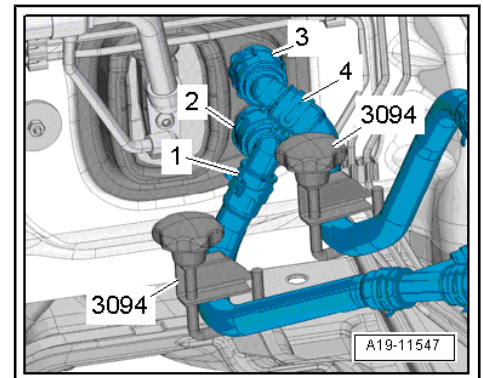
- Mark the installed position of the coolant hoses -1- and -4-.



Note

The heater core is designed for a specific coolant flow direction. Therefore, coolant hoses must be connected on the correct sides.

- Clamp off the coolant hoses -1- and -4- using Hose Clamps - Up To 25mm - 3094- .
- Lift the clips -2- and -3-.
- Remove the coolant hoses -1- and -4- from the heater core for the heater.

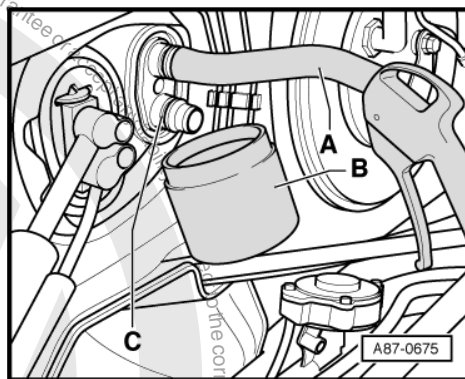




- Slide a section of hose -A- to the upper connection.

Insert the compressed-air gun into the end of the hose.

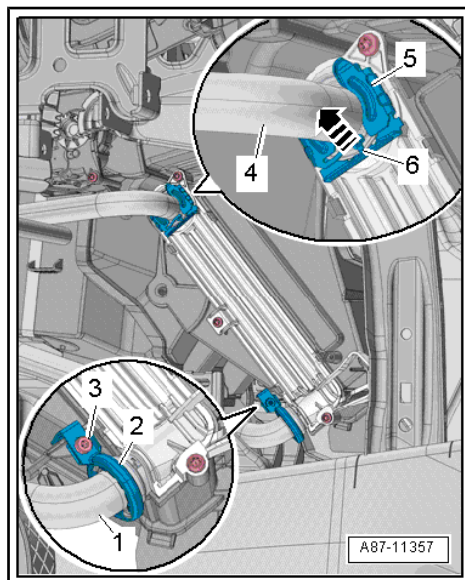
- Hold a container -B- under the lower connection -C- and carefully blow the coolant out of the heater core using the compressed-air gun.
- Seal the open lines and connections with clean plugs from the Engine Bung Set - VAS6122- .
- Remove the partition. Refer to
⇒ ["5.20 Partition, Removing and Installing", page 269](#) .
- Remove the glove compartment. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Glove Compartment, Removing and Installing .
- Remove the footwell vent on the front passenger side. Refer to
⇒ ["6.6.2 Front Passenger Side Footwell Vent, Removing and Installing, RHD", page 278](#) .
- Remove the footwell center console trim panel. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .
- Vehicles with an auxiliary air heater: remove the Auxiliary Heater Heating Element - Z35- with the Auxiliary Air Heater Control Module - J604-. Refer to
⇒ ["5.14 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604, Removing and Installing", page 242](#) .
- Cover the area beneath the connections for the coolant hoses in the plenum chamber, for example, with waterproof foil and water absorbing paper.
- Lift the retainer -6- and remove the clip -5-. Remove the coolant line -4- from the heater core.



Note

The illustration shows LHD.

- Remove the bolt -3-.
- Remove the screw clamp -2- and then remove the coolant line -1- from the heater core.
- Seal the open lines and connections with clean plugs from the Engine Bung Set - VAS6122- .





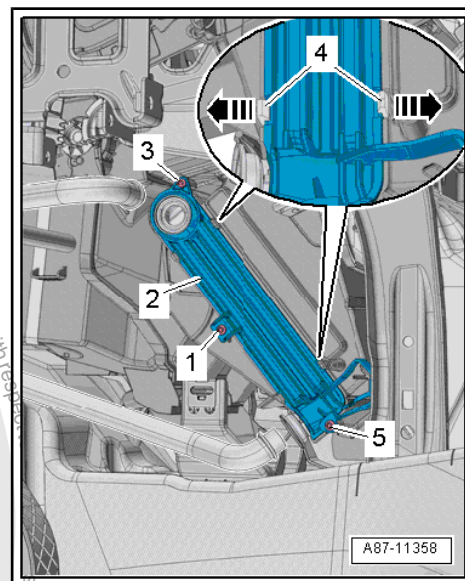
- Remove the bolts -1- -3- and -5-.



Note

The illustration shows LHD.

- Release the securing tabs -4- -arrows- and remove the cover -2-.



- If the noise insulation cannot be removed easily, open the cover tabs -arrows-.
- Remove the heater core to the left.

Installing

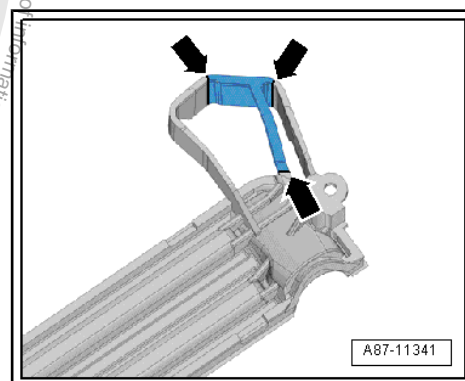
Install in reverse order of removal. Note the following:



Note

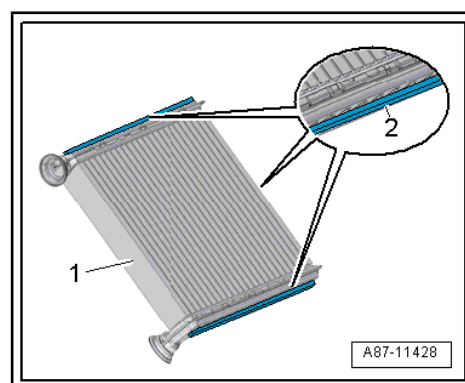
Replace the seals!

- With the heater core removed, check the heater shaft for debris.
- If necessary, remove any dirt or coolant residue.
- Vehicles with a TDI engine: Check the removed auxiliary heater heating element shaft for debris and clean if necessary.
- Check the foam seals -2- attached to the heater core -1- for damage and replace if necessary.



Note

- ♦ If not bonded correctly, the foam seal may curl up during insertion.
- ♦ Cold air may flow past heater core if the foam seal is damaged or not properly installed.





- Check the heater core connection -3- and the connection -2- for the coolant pipes for damage or debris.
- Clean the sealing surface for the seal and glaze it.
- Coat a new seal -4- with coolant (or lightly with silicone grease) and attach it to the coolant pipe -1-.
- Carefully slide the heater core all the way into the heater and A/C unit until stop.



Note

When inserting the heater core, make sure that the connections and the coolant pipes are not damaged.

- Slide the coolant pipes into the heater core until stop.



NOTICE

There is a risk of heater core malfunctions due to faulty seals and leaks.

- **Never pinch the seal.**
- **Never tilt the coolant pipe.**
- **Slide the coolant pipes on completely.**
- Position a new clip -5- or screw clamp -2- on the coolant pipe/heater core connection.
- Tighten the bolt -3-. Refer to ⇒ ["5.1 Overview - Heater and A/C Unit", page 213](#).
- Check the clamp and screw-type clamp for proper seating on the heater core and the coolant pipe connections. They must not be touching the air distribution housing or any other components.
- Fill with coolant. Refer to ⇒ Rep. Gr. 19 ; Coolant System/ Coolant .
- Check the DTC memory and erase any displayed entries using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Check the heater and A/C unit function.

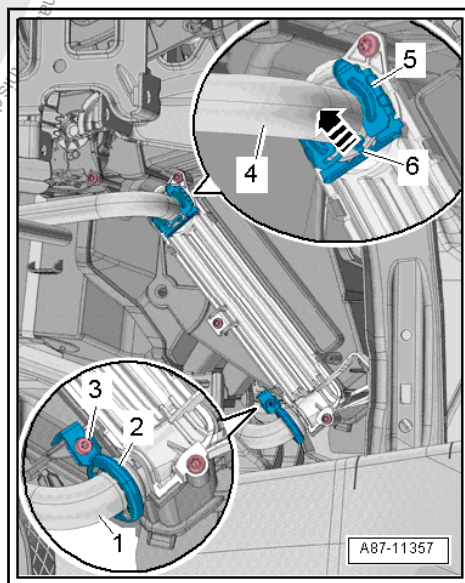
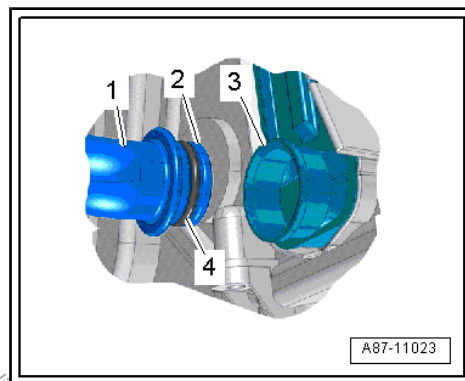
Tightening specifications:

- ♦ ⇒ ["5.1 Overview - Heater and A/C Unit", page 213](#)
- ♦ Turbocharger; Overview - Turbocharger. Refer to ⇒ Rep. Gr. 21 ; Turbocharger; Overview - Turbocharger
- ♦ Center Console; Overview - Center Console. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .
- ♦ Storage Compartments and Covers; Overview - Glove Compartment. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Overview - Glove Compartment .

5.15.3 Heater Core, Removing and Installing, Denso

Special tools and workshop equipment required

- ♦ Shop Crane - Drip Tray - VAS6208-
- ♦ Hose Clamps - Up To 25mm - 3094-





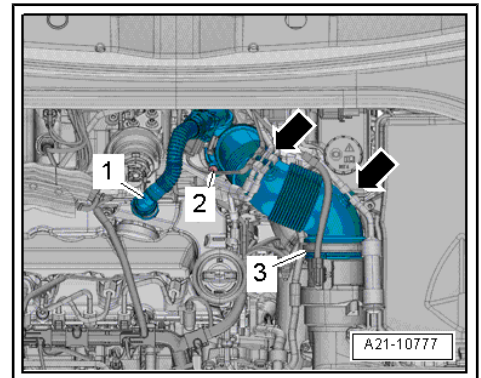
- ◆ Compressed air gun, commercially available
- ◆ Engine Bung Set - VAS6122-

Removing

- Observe the safety instructions. Refer to
⇒ [“1 Safety Precautions”, page 1](#) .

Vehicles with a TDI Engine

- Press the release buttons on the hose -1- for the crankcase ventilation and remove the hose from the cylinder head cover.
- Free up the vacuum hoses at the air guide pipe -arrows-.
- Loosen the hose clamp -3-.
- Remove the bolt -2- and tilt the air guide pipe with the connection downward and remove it from the turbocharger.



For All Vehicles

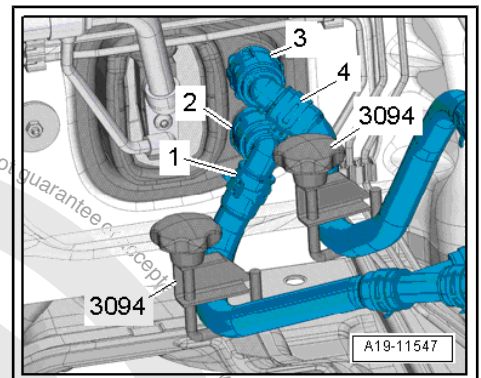
- Mark the installed position of the coolant hoses -1 and 4-.



Note

The heater core is designed for a specific coolant flow direction. Therefore, coolant hoses must be connected on the correct sides.

- Clamp off the coolant hoses -1 and 4- using Hose Clamps - Up To 25mm - 3094- .
- Lift the clips -2 and 3-.
- Remove the coolant hoses -1 and 4- from the heater core for the heater.



- Slide a section of hose -A- onto the upper connection.

Insert the compressed-air gun into the end of the hose.

- Hold a container -B- under the lower connection -C- and carefully blow the coolant out of the heater core using the compressed-air gun.

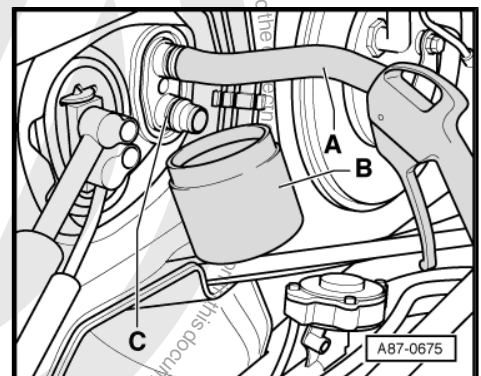
- Seal the open lines and connections with clean plugs from the Engine Bung Set - VAS6122- .

- Remove the driver side knee airbag. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Knee Airbags; Overview - Knee Airbag .

- Remove the left footwell center console trim. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .

- Vehicles with an auxiliary air heater: remove the Auxiliary Heater Heating Element - Z35- with the Auxiliary Air Heater Control Module - J604- . Refer to
⇒ [“5.14 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Removing and Installing”, page 242](#) .

- Cover the area beneath the connections for the coolant hoses in the plenum chamber and Airbag Control Module - J234- with for example a with waterproof foil and water absorbing paper.



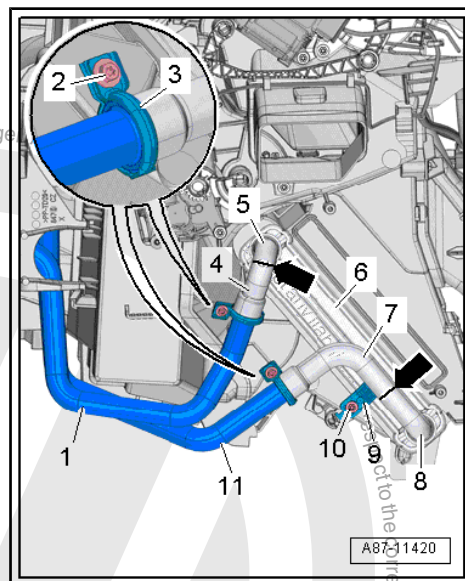


- Remove the bolts -2- and remove the screw clamps -3-.
- Disconnect the coolant pipes.



Note

- ♦ *If the coolant pipes cannot be disconnected due to stuck seals cut through the coolant pipes at the positions marked with -arrows- using the A/C Pipe Pliers - T40147- .*
- ♦ *Remove the severed coolant pipes -4 and 7- of the heater core from the coolant pipes -1 and 11- to the engine.*
- Remove the bolt -10- and then remove the bracket -9- for the heater core.
- Remove the heater core -6- to the left.
- Seal the open lines and connections with clean plugs from the Engine Bung Set - VAS6122- .



Installing

Install in reverse order of removal. Note the following:



Note

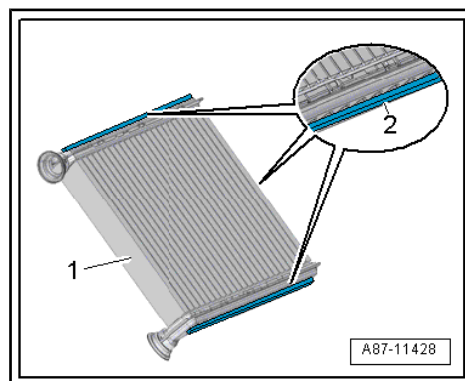
Replace the seals.

- With the heater core removed, check the heater shaft for debris.
- If necessary, remove any dirt or coolant residue.
- Vehicles with a TDI engine: Check the removed auxiliary heater heating element shaft for debris and clean if necessary.
- Check the foam seals -2- attached to the heater core -1- for damage and replace if necessary.



Note

- ♦ *If not bonded correctly, the foam seal may curl up during insertion.*
- ♦ *Cold air may flow past heater core if the foam seal is damaged or not properly installed.*
- ♦ *The heater core for a heater and A/C unit manufactured by "Valeo" is illustrated.*





- Check the heater core connection -3- and the coolant pipe connection -1- for damage or debris.
- Clean the sealing surface for the seal and glaze it.
- Coat a new seal -1- with coolant (or lightly with silicone grease) and attach it to the coolant pipe.
- Carefully slide the heater core all the way into the heater and A/C unit until stop.



Note

When inserting the heater core, make sure that the connections and the coolant pipes are not damaged.

- Slide the coolant pipes into the heater core until stop.



NOTICE

There is a risk of heater core malfunctions due to faulty seals and leaks.

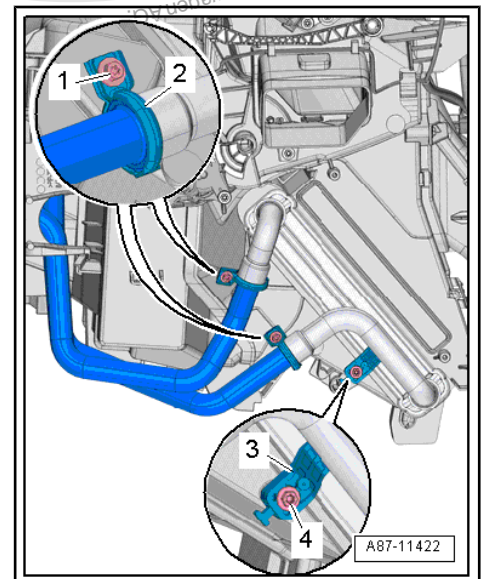
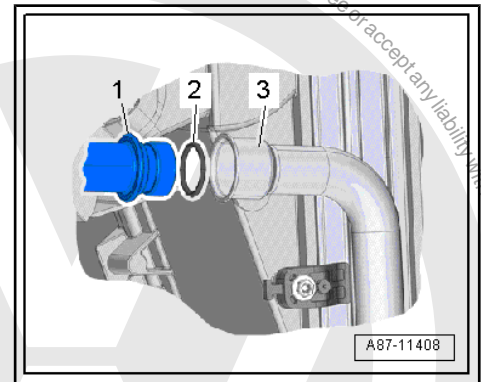
- **Never pinch the seal.**
- **Never tilt the coolant pipe.**
- **Slide the coolant pipes on completely.**
- Attach the bracket -3- for the heater core onto the air distribution housing and tighten the bolt -4- to specification.
- Attach the new clamp -2- to the coolant pipe/heater core connection.
- Tighten the bolt -1-. Refer to [⇒ "5.1 Overview - Heater and A/C Unit", page 213](#).
- Check the clamp and screw-type clamp for proper seating on the heater core and the coolant pipe connections. They must not be touching the air distribution housing or any other components.
- Fill with coolant. Refer to ⇒ Rep. Gr. 19 ; Coolant System/ Coolant .
- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Check the heater and A/C unit function.

Tightening Specifications

- ◆ Overview - Heater and A/C Unit. Refer to [⇒ "5.1 Overview - Heater and A/C Unit", page 213](#)
- ◆ Turbocharger; Overview - Turbocharger. Refer to ⇒ Rep. Gr. 21 ; Turbocharger; Overview - Turbocharger
- ◆ Center Console; Overview - Center Console. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .
- ◆ Knee Airbags; Overview - Knee Airbag. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Knee Airbags; Overview - Knee Airbag .

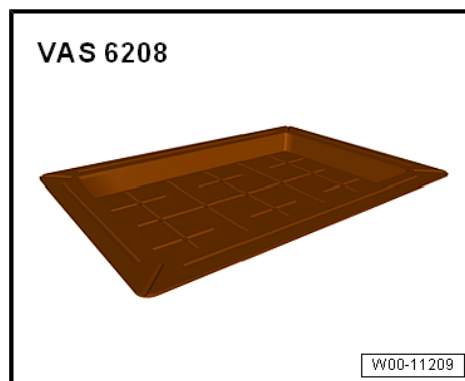
5.15.4 Heater Core, Removing and Installing, Denso, RHD

Special tools and workshop equipment required

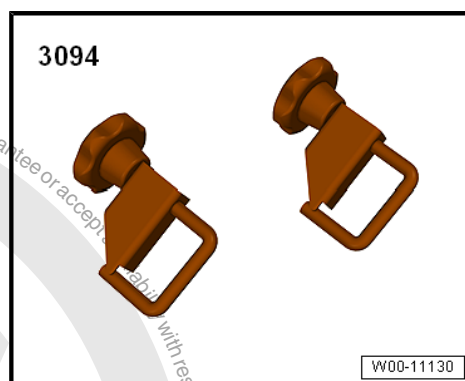




◆ Shop Crane - Drip Tray - VAS6208-

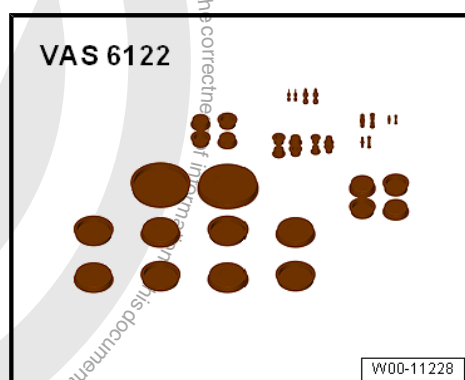


◆ Hose Clamps - Up To 25mm - 3094-



◆ Compressed air gun, commercially available

◆ Engine Bung Set - VAS6122-

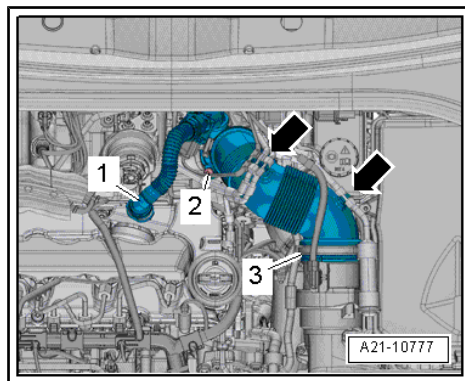


Removing

- Observe the safety instructions. Refer to [⇒ "1 Safety Precautions", page 1](#).

Vehicles with a TDI engine:

- Press the release buttons on the hose -1- for the crankcase ventilation and remove the hose from the cylinder head cover.
- Free up the vacuum hoses at the air guide pipe -arrows-.
- Loosen the hose clamp -3-.
- Remove the bolt -2- and tilt the air guide pipe with the connection downward and remove it from the turbocharger.





For all vehicles:

- Mark the installed position of the coolant hoses -1- and -4-.



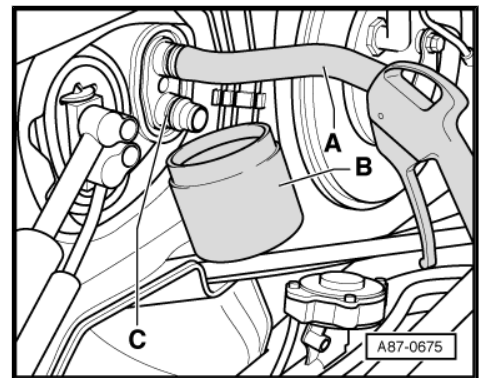
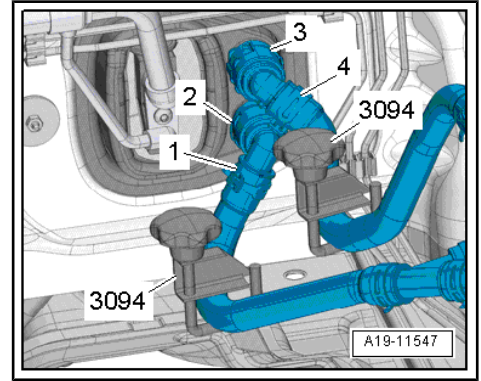
Note

The heater core is designed for a specific coolant flow direction. Therefore, coolant hoses must be connected on the correct sides.

- Clamp off the coolant hoses -1- and -4- using Hose Clamps - Up To 25mm - 3094- .
- Lift the clips -2- and -3-.
- Remove the coolant hoses -1- and -4- from the heater core for the heater.
- Slide a section of hose -A- onto the upper connection.

Insert the compressed-air gun into the end of the hose.

- Hold a container -B- under the lower connection -C- and carefully blow the coolant out of the heater core using the compressed-air gun.
- Seal the open lines and connections with clean plugs from the Engine Bung Set - VAS6122- .
- Remove the partition. Refer to [⇒ "5.20 Partition, Removing and Installing", page 269](#) .
- Remove the glove compartment. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Glove Compartment, Removing and Installing .
- Remove the footwell vent on the front passenger side. Refer to [⇒ "6.6.2 Front Passenger Side Footwell Vent, Removing and Installing, RHD", page 278](#) .
- Remove the footwell center console trim panel. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .
- Vehicles with an auxiliary air heater: remove the Auxiliary Heater Heating Element - Z35- with the Auxiliary Air Heater Control Module - J604- . Refer to [⇒ "5.14 Auxiliary Heater Heating Element Z35 with Auxiliary Air Heater Control Module J604 , Removing and Installing", page 242](#) .
- Cover the area beneath the connections for the coolant hoses in the plenum chamber and Airbag Control Module - J234- with for example a with waterproof foil and water absorbing paper



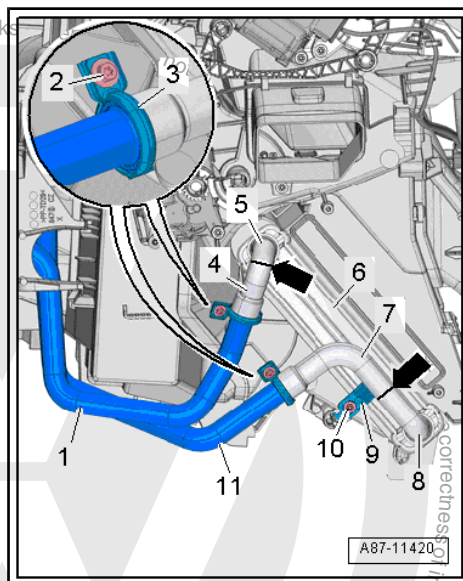


- Remove the bolts -2- and remove the screw clamps -3-.
- Disconnect the coolant pipes.



Note

- ♦ *If the coolant pipes cannot be disconnected due to stuck seals cut through the coolant pipes at the positions marked with -arrows- using the A/C Pipe Pliers - T40147- .*
- ♦ *Remove the severed coolant pipes -4 -and -7- of the heater core from the coolant pipes -1- and -11- to the engine.*
- Remove the bolt -10- and then remove the bracket -9- for the heater core.
- Remove the heater core -6- to the left.
- Seal the open lines and connections with clean plugs from the Engine Bung Set - VAS6122- .



Installing

Install in reverse order of removal. Note the following:



Note

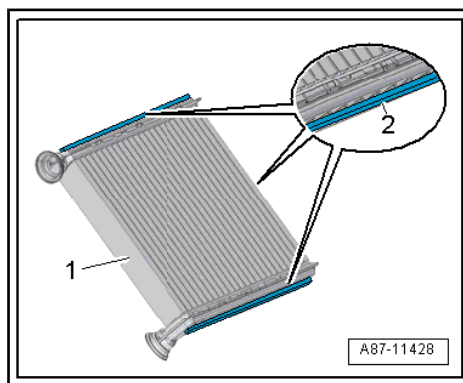
Replace the seals.

- With the heater core removed, check the heater shaft for debris.
- If necessary, remove any dirt or coolant residue.
- Vehicles with a TDI engine: Check the removed auxiliary heater heating element shaft for debris and clean if necessary.
- Check the foam seals -2- attached to the heater core -1- for damage and replace if necessary.



Note

- ♦ *If not bonded correctly, the foam seal may curl up during insertion.*
- ♦ *Cold air may flow past heater core if the foam seal is damaged or not properly installed.*
- ♦ *The heater core for a heater and A/C unit manufactured by "Valeo" is illustrated.*





- Check the heater core connection -3- and the coolant pipe connection -1- for damage or debris.
- Clean the sealing surface for the seal and glaze it.
- Coat a new seal -1- with coolant (or lightly with silicone grease) and attach it to the coolant pipe.
- Carefully slide the heater core all the way into the heater and A/C unit until stop.



Note

When inserting the heater core, make sure that the connections and the coolant pipes are not damaged.

- Slide the coolant pipes into the heater core until stop.



NOTICE

There is a risk of heater core malfunctions due to faulty seals and leaks.

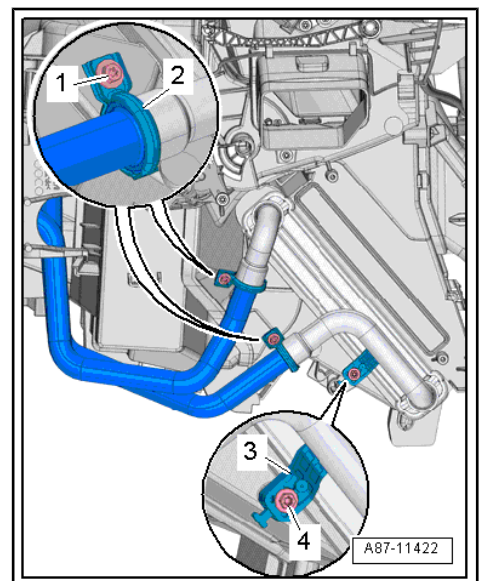
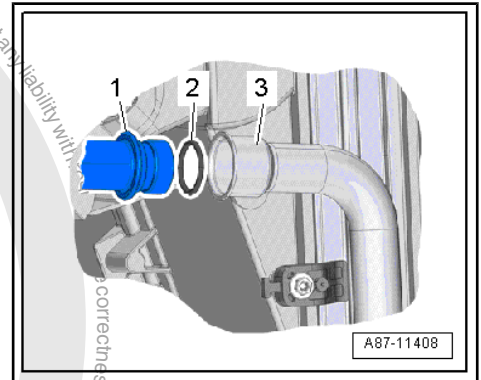
- **Never pinch the seal.**
- **Never tilt the coolant pipe.**
- **Slide the coolant pipes on completely.**



- Attach the bracket -3- for the heater core onto the air distribution housing and tighten the screw -4- to specification.
- Attach the new clamp -2- to the coolant pipe/heater core connection.
- Tighten the bolt -1-. Refer to [⇒ "5.1 Overview - Heater and A/C Unit", page 213](#).
- Check the clamp and screw-type clamp for proper seating on the heater core and the coolant pipe connections. They must not be touching the air distribution housing or any other components.
- Fill with coolant. Refer to ⇒ Rep. Gr. 19 ; Coolant System/ Coolant .
- Check the DTC memory and erase any displayed entries using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.
- Check the heater and A/C unit function.

Tightening specifications:

- ◆ [⇒ "5.1 Overview - Heater and A/C Unit", page 213](#)
- ◆ Turbocharger; Overview - Turbocharger. Refer to ⇒ Rep. Gr. 21 ; Turbocharger; Overview - Turbocharger
- ◆ Center Console; Overview - Center Console. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .
- ◆ Storage Compartments and Covers; Overview - Glove Compartment. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Overview - Glove Compartment .





5.16 Heater Core Coolant Pipes, Removing and Installing

⇒ ["5.16.1 Heater Core Coolant Pipes, Removing and Installing, Valeo", page 260](#)

⇒ ["5.16.2 Heater Core Coolant Pipes, Removing and Installing, Denso", page 261](#)

5.16.1 Heater Core Coolant Pipes, Removing and Installing, Valeo

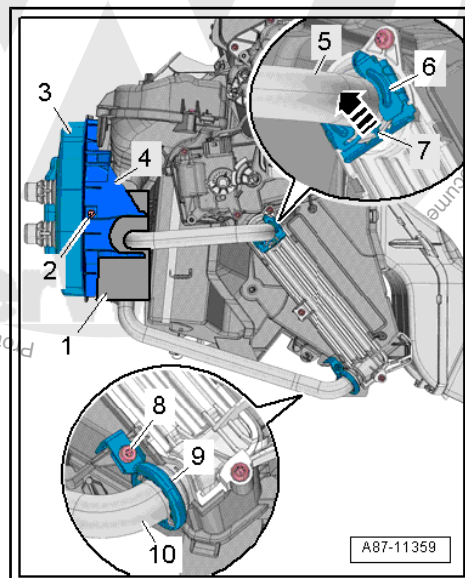


Note

There are different versions and various manufacturers of the heater and Air Conditioning (A/C) units. Individual components of the different heater and A/C units are similar but not the same (for distinguishing characteristics, refer to ⇒ ["2.1 Heater and A/C Unit Identification", page 4](#)). Interchanging components from different manufacturers is not permitted. Refer to the Parts Catalog.

Removing

- Remove the heater and A/C unit. Refer to ⇒ ["5.5 Heater and A/C Unit, Removing and Installing", page 224](#) .
- Remove the sealing boot -3- to the plenum chamber bulkhead.
- Remove the bolt -2-.
- Remove the bracket -4- for the coolant pipes to the left.
- Remove the foam piece -1-.
- Lift the catch -7- and remove the clamp -6-.
- Remove the coolant pipe -5- from the heater core.
- Remove the bolt -8-.
- Remove the screw clamp -9- and then remove the coolant pipe -10- from the heater core.
- Remove the coolant pipes.



Installing

Install in reverse order of removal. Note the following:

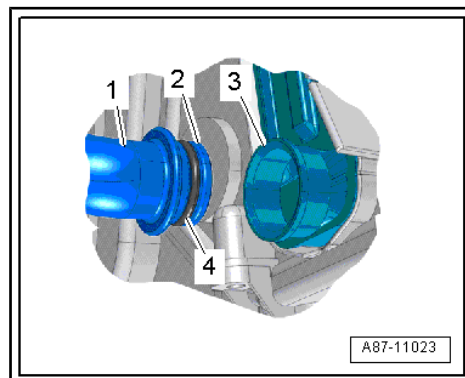
- Check the heater core connection -3- and the connection -2- for the coolant pipes for damage or debris.
- Clean the sealing surface for the seal and glaze it.
- Coat a new seal -4- with coolant (or lightly with silicone grease) and attach it to the coolant pipe -1-.
- Slide the coolant pipes into the heater core until stop.



NOTICE

There is a risk of heater core malfunctions due to faulty seals and leaks.

- Never pinch the seal.
- Never tilt the coolant pipe.
- Slide the coolant pipes on completely.

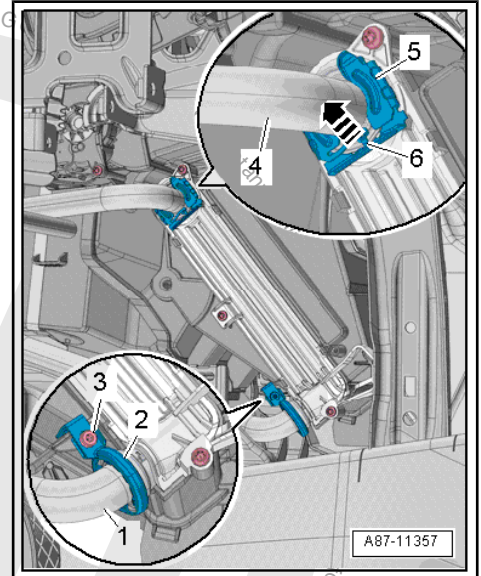




- Position a new clip -5- or screw clamp -2- on the coolant pipe/ heater core connection.
- Tighten the bolt -3-.
- Check the clamp and screw-type clamp for proper seating on the heater core and the coolant pipe connections. They must not be touching the air distribution housing or any other components.
- Install the heater and A/C unit. Refer to [⇒ “5.5 Heater and A/C Unit, Removing and Installing”, page 224](#).
- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

- ◆ Refer to [⇒ “5.1 Overview - Heater and A/C Unit”, page 213](#)



5.16.2 Heater Core Coolant Pipes, Removing and Installing, Denso

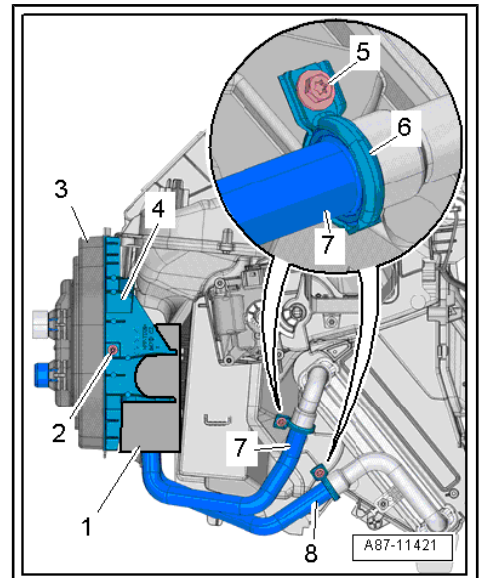


Note

There are different versions and various manufacturers of the heater and Air Conditioning (A/C) units. Individual components of the different heater and A/C units are similar but not the same (for distinguishing characteristics, refer to [⇒ “2.1 Heater and A/C Unit Identification”, page 4](#)). Interchanging components from different manufacturers is not permitted. Refer to the Parts Catalog.

Removing

- Remove the heater and A/C unit. Refer to [⇒ “5.5 Heater and A/C Unit, Removing and Installing”, page 224](#).
- Remove the sealing boot -3- to the plenum chamber bulkhead.
- Remove the bolt -2-.
- Remove the bracket -4- for the coolant pipes to the left.
- Remove the foam piece -1-.
- Remove the bolts -5- and remove the screw-type clamps -6-.
- Remove the coolant pipes -7 and 8- from the heater core.





Installing

Install in reverse order of removal. Note the following:

- Check the heater core connection -3- and the coolant pipe connection -1- for damage or debris.
- Clean the sealing surface for the seal and glaze it.
- Coat the new seals -2- with coolant (or lightly with silicone grease) and attach it to the coolant pipe -1-.
- Slide the coolant pipes into the heater core until stop.

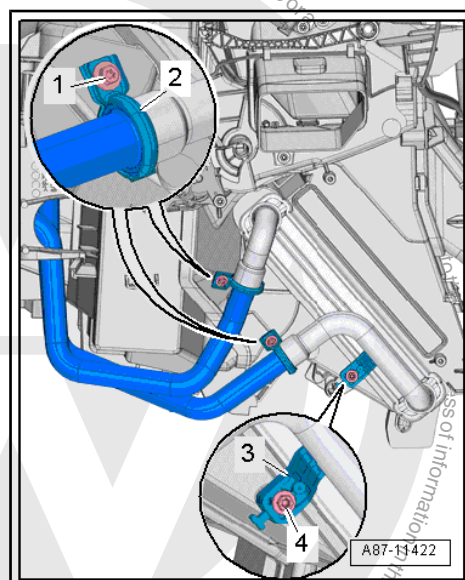
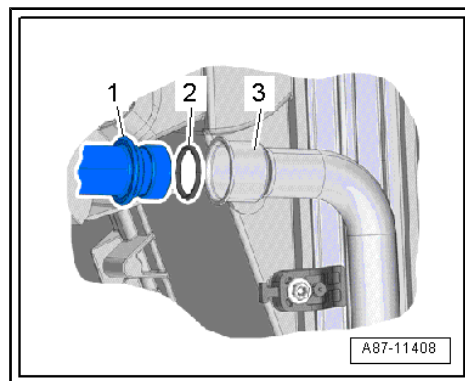
NOTICE

There is a risk of heater core malfunctions due to faulty seals and leaks.

- **Never pinch the seal.**
- **Never tilt the coolant pipe.**
- **Slide the coolant pipes on completely.**
- Attach the new screw clamps -2- to the coolant pipe/heater core connection.
- Tighten the bolt -1-.
- Check the screw clamps -2- for proper seating on the heater core and the coolant pipe connections. They must not be touching the air distribution housing or any other components.
- Install the heater and A/C unit. Refer to [⇒ “5.5 Heater and A/C Unit, Removing and Installing”, page 224](#).
- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.
- Check the heater and A/C unit function.

Tightening Specifications

- ◆ Refer to [⇒ “5.1 Overview - Heater and A/C Unit”, page 213](#)



5.17 Evaporator Temperature Sensor - G308- , Removing and Installing

[⇒ “5.17.1 Evaporator Temperature Sensor G308 , Removing and Installing”, page 262](#)

5.17.1 Evaporator Temperature Sensor - G308- , Removing and Installing

Special tools and workshop equipment required

- ◆ Trim Removal Wedge - 3409-



Note

Only with vehicles with an Air Conditioning (A/C) system. The opening in the heater is sealed on vehicles with a heater.



Removing

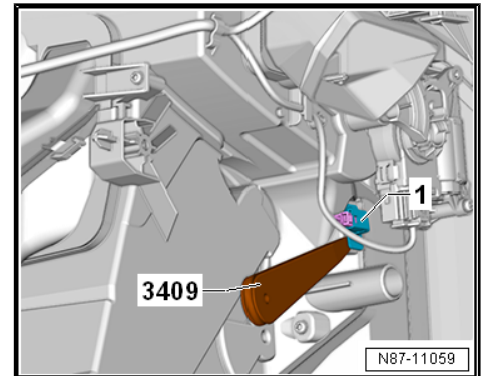
- Remove the glove compartment. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Glove Compartment, Removing and Installing .
- Release the Evaporator Temperature Sensor - G308- with a Trim Removal Wedge - 3409- .
- Remove the Evaporator Temperature Sensor - G308- -2- from the housing.
- Disconnect the connector -1-.

Installing

Install in reverse order of removal.

Tightening Specifications

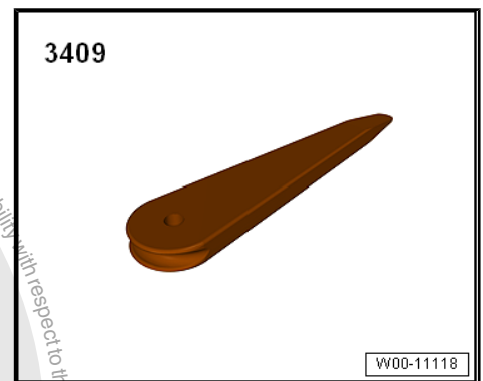
- ◆ Storage Compartments and Covers; Overview - Glove Compartment. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Overview - Glove Compartment .



5.17.2 Evaporator Temperature Sensor - G308- , Removing and Installing, RHD

Special tools and workshop equipment required

- ◆ Trim Removal Wedge - 3409-



Note

Only with vehicles with an A/C system. The opening in the heater is sealed on vehicles with a heater.

Removing



Note

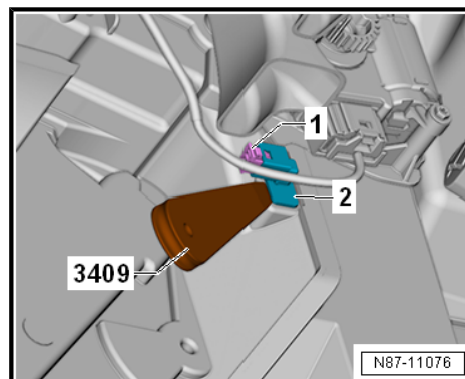
The Evaporator Temperature Sensor - G308- is accessible from the footwell.



- Release the Evaporator Temperature Sensor - G308- with a Trim Removal Wedge - 3409- .
- Remove the Evaporator Temperature Sensor - G308- -2- from the housing.
- Disconnect the connector -1-.

Installing

Install in reverse order of removal.

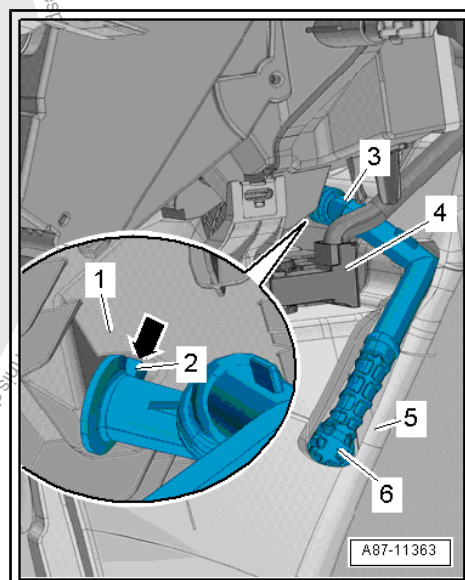


5.18 Condensation Water Drain, Checking

Checking

- Remove the right footwell center console trim panel. Refer to
⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview -
Center Console .
- Carefully fold back the carpet near the condensation water
drain hose far enough so that the condensation water drain
hose is visible.

The tab -arrow- on the connection must engage into the guide
-2-.





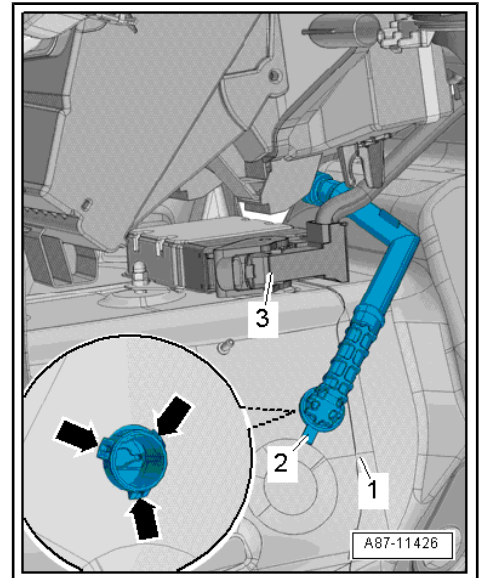
- Insert the condensation water drain hose -6- into the body opening until it audibly engages.

i Note

- ◆ *It must be possible to connect the condensation water drain hose -1- to the connection on the heater and Air Conditioning (A/C) unit without having any tension on it.*
- ◆ *The condensation water drain hose must fit securely to the condensation water drain connection on the tunnel.*
- ◆ *The sealing lip -2- must not sit loosely on the body opening.*
- ◆ *The tabs -arrows- must be completely engaged.*

Tightening Specifications

- ◆ Center Console; Overview - Center Console. Refer to ➔ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .



5.19 Condensation Water Drain, Removing and Installing

➔ **"5.19.1 Condensation Water Drain, Removing and Installing", page 265**

5.19.1 Condensation Water Drain, Removing and Installing

Removing

- Remove the right footwell center console trim panel. Refer to ➔ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .

! NOTICE

Risk of damaging the airbag control module. If moisture penetrates, the connectors will corrode.

- **Cover or seal the control module connectors after disconnecting to prevent moisture from entering.**
- Remove the connector from the Airbag Control Module - J234-4-.

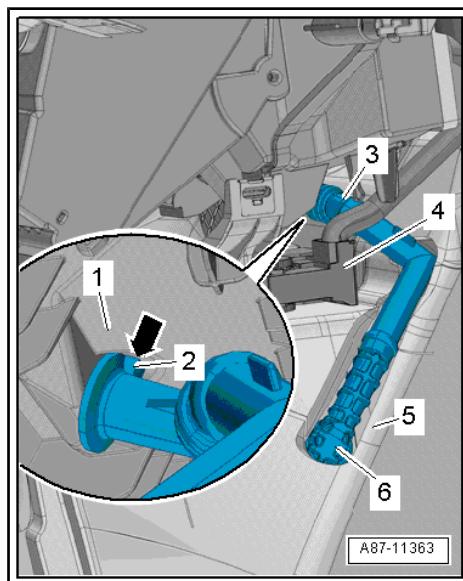


- Cover the Airbag Control Module - J234- and connector -4- with a waterproof cover.
- Carefully move the carpet aside and cover it in the area under the condensation water hose with waterproof foil and water absorbing paper.
- Remove the condensation water drain hose -3- carefully from the heater and A/C unit -1- and the vehicle body -5-.

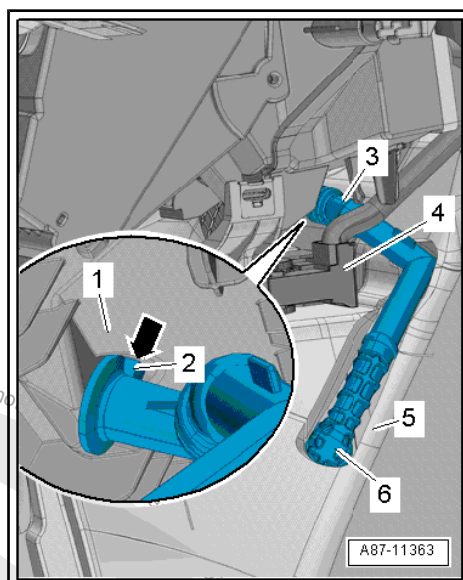
Installing

Install in reverse order of removal. Note the following:

- The condensation water drain hose can only be correctly slid onto the heater and A/C unit in one position until stop.



- The tab -arrow- on the connection must engage into the guide -2-.
- If a commercially available cable tie was used to secure the condensation water drain -3-, replace it.
- The condensation water drain hose must be routed as shown in the illustration from underneath the wiring harness of the Airbag Control Module - J234- -4-.
- Insert the condensation water drain hose -6- into the body opening until it audibly engages.



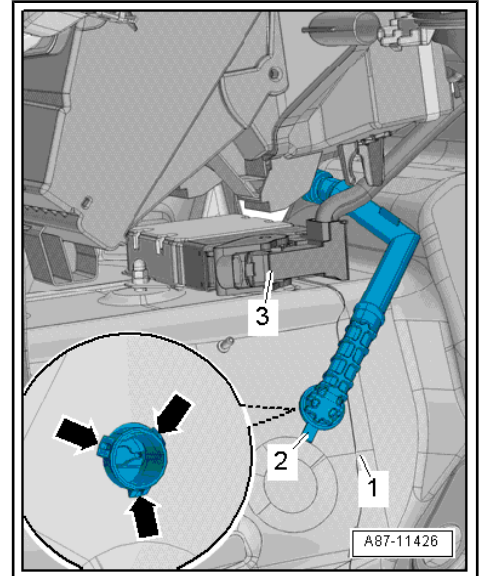


- The bracket -2- on the condensation water drain hose must be completely and with pre-tension clipped into the body opening -1-.
- The sealing lip must not sit loosely on the body opening.
- The tabs -arrows- must be completely engaged.
- If the pre-tensioning is not adequate, seal the area between the body and the bracket, for example with silicone adhesive. Refer to the Parts Catalog.



Note

- ◆ *Install the condensation water drain hose so that it is not twisted or crushed.*
- ◆ *Make sure the carpet does not push up against the condensation water drain hose when installing.*
- ◆ *If the condensation water drain hose sits too loosely on the heater and A/C unit connection secure it from falling with for example a hose clamp. Hose clamps. Refer to the Parts Catalog.*



Tightening Specifications

- ◆ Center Console; Overview - Center Console. Refer to ➤ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .

5.19.2 Condensation Water Drain, Removing and Installing, RHD

Removing

- Remove the right footwell center console trim panel. Refer to ➤ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .
- Carefully move the carpet aside and cover it in the area under the condensation water hose with waterproof foil and water absorbing paper.
- Remove the foot rest. Refer to ➤ Body Interior; Rep. Gr. 70 ; Passenger Compartment Trim; Foot Rest, Removing and Installing .



NOTICE

Risk of damaging the airbag control module. If moisture penetrates, the connectors will corrode.

- **Cover or seal the control module connectors after disconnecting to prevent moisture from entering.**
- Remove the connector from the Airbag Control Module - J234-5-.

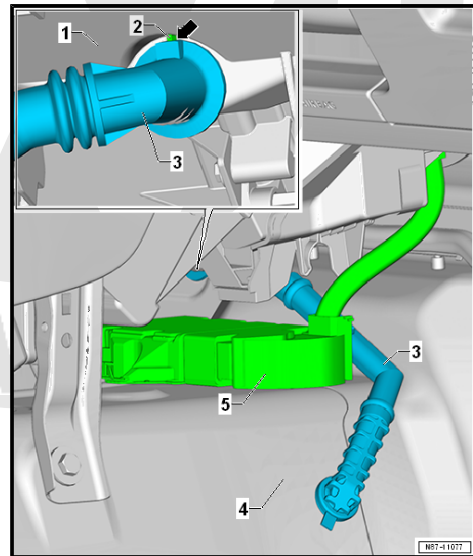
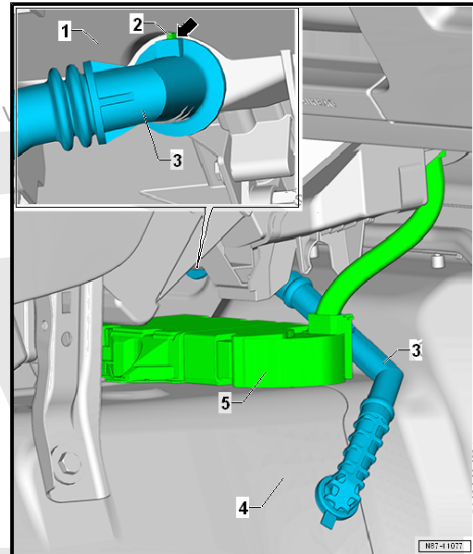


- Cover the Airbag Control Module - J234- and connector -5- with a waterproof cover.
- Carefully move the carpet aside and cover it in the area under the condensation water hose with waterproof foil and water absorbing paper.
- Remove the condensation water drain hose -3- carefully from the heater and A/C unit -1- and the vehicle body -4-.

Installing

Install in reverse order of removal. Note the following:

- The condensation water drain hose -3- can only be correctly slid onto the heater and A/C unit -1- in one position until stop.
- The tab -arrow- on the connection must engage into the guide -2-.
- If a commercially available cable tie was used to secure the condensation water drain -3-, replace it.
- The condensation water drain hose must be routed as shown in the illustration from underneath the wiring harness of the Airbag Control Module - J234- -5-.





- The bracket -1- on the condensation water drain hose must be completely and with pre-tension clipped into the body opening -2-.
- The sealing lip must not sit loosely on the body opening.
- The tabs -arrows- must be completely engaged.
- If the pre-tensioning is not adequate, seal the area between the body and the bracket, for example with silicone adhesive. Refer to the Parts Catalog.

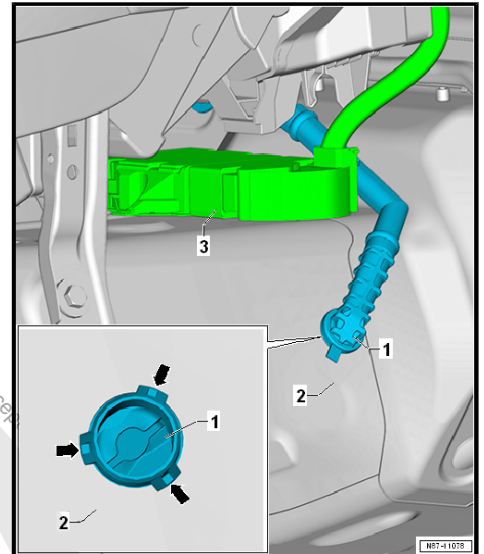


Note

- ◆ *Install the condensation water drain hose so that it is not twisted or crushed.*
- ◆ *Make sure the carpet does not push up against the condensation water drain hose when installing.*
- ◆ *If the condensation water drain hose sits too loosely on the heater and A/C unit connection secure it from falling with for example a hose clamp. Hose clamps. Refer to the Parts Catalog.*

Tightening specifications:

- ◆ Center Console; Overview - Center Console. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Overview - Center Console .



5.20 Partition, Removing and Installing

⇒ **“5.20.1 Partition, Removing and Installing”, page 269**

5.20.1 Partition, Removing and Installing

Removing

- Depending on the version remove the plastic screw or caps -2- and partition -1-.

Installing

- Install in reverse order of removal.

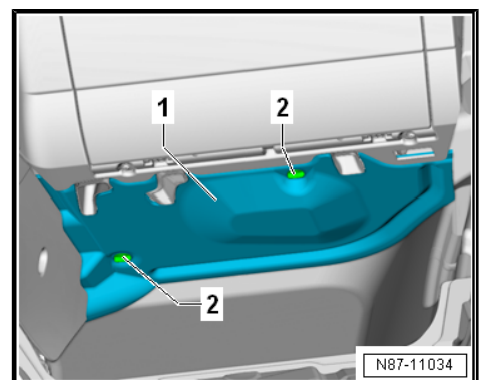


Note

Replace the caps with bolts. Refer to Parts Catalog.

Tightening Specifications

- ◆ Screws -2- -item 1- ⇒ **Item 1 (page 219)** .





5.20.2 Partition, Removing and Installing, RHD

Removing

- Depending on the version remove the plastic screw or caps -2- and partition -1-.

Installing

- Install in reverse order of removal.

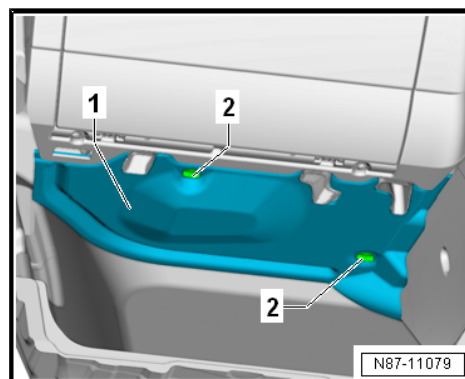


Note

Replace the caps with bolts. Refer to Parts Catalog.

Tightening specifications:

- ◆ Screws -2- ➔ [Item 1 \(page 219\)](#) .





6 Air Routing

⇒ [“6.1 Overview - Air Routing and Air Distribution in Passenger Compartment”, page 271](#)

⇒ [“6.2 Fresh Air Intake, Removing and Installing”, page 273](#)

⇒ [“6.3 Fresh Air Intake Cover, Removing and Installing”, page 274](#)

⇒ [“6.4 Air Intake Duct, Removing and Installing”, page 276](#)

⇒ [“6.5 Driver Side Footwell Vent, Removing and Installing”, page 276](#)

⇒ [“6.6 Front Passenger Side Footwell Vent, Removing and Installing”, page 277](#)

⇒ [“6.7 Rear Footwell Vent, Removing and Installing”, page 279](#)

⇒ [“6.8 Rear Center Console Vent Air Guide Channel, Removing and Installing”, page 279](#)

⇒ [“6.9 Passenger Compartment Forced Air Extraction, Checking”, page 280](#)

⇒ [“6.10 Passenger Compartment Forced Air Extraction, Removing and Installing”, page 281](#)

⇒ [“6.11 Air Guide for Defrost Air Vent, Removing and Installing”, page 282](#)

⇒ [“6.12 Center Instrument Panel Vent Air Guide, Removing and Installing”, page 282](#)

6.1 Overview - Air Routing and Air Distribution in Passenger Compartment



1 - Air Guide for Defrost Air Vent

- ❑ Removing and Installing. Refer to
⇒ [“6.11 Air Guide for Defrost Air Vent, Removing and Installing”, page 282](#) .

2 - Center Instrument Panel Vent Air Guide

- ❑ Removing and Installing. Refer to
⇒ [“6.12 Center Instrument Panel Vent Air Guide, Removing and Installing”, page 282](#) .

3 - Front Passenger Side Footwell Vent

- ❑ Removing and Installing. Refer to
⇒ [“6.6 Front Passenger Side Footwell Vent, Removing and Installing”, page 277](#) .

4 - Rear Footwell Vent, Removing and Installing

- ❑ Removing and Installing. Refer to
⇒ [“6.7 Rear Footwell Vent, Removing and Installing”, page 279](#) .

5 - Air Guide Channel in Rear Center Console

- ❑ Installed depending on vehicle equipment. For vehicles without a rear center console air guide channel vent a cap is installed on the heater.
- ❑ Removing and Installing. Refer to
⇒ [“6.8 Rear Center Console Vent Air Guide Channel, Removing and Installing”, page 279](#) .

6 - Rear Center Console Air Guide Channel Vent

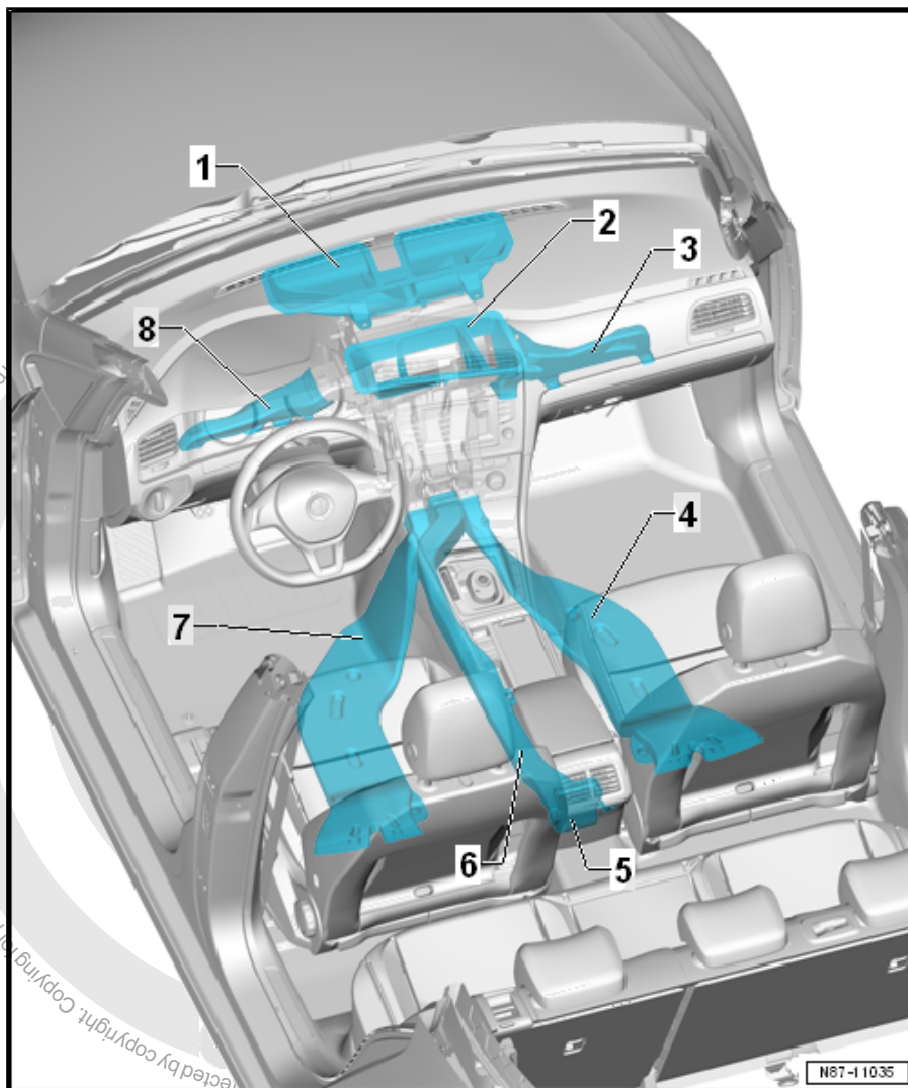
- ❑ Installed depending on vehicle equipment. For vehicles without a rear center console air guide channel vent a cap is installed on the heater.
- ❑ Removing and Installing. Refer to
⇒ [“6.8 Rear Center Console Vent Air Guide Channel, Removing and Installing”, page 279](#) .

7 - Rear Footwell Vent, Removing and Installing

- ❑ Removing and Installing. Refer to ⇒ [“6.7 Rear Footwell Vent, Removing and Installing”, page 279](#) .

8 - Driver Side Footwell Vent

- ❑ Removing and Installing. Refer to
⇒ [“6.5 Driver Side Footwell Vent, Removing and Installing”, page 276](#) .





6.2 Fresh Air Intake, Removing and Installing

⇒ [“6.2.1 Fresh Air Intake, Removing and Installing”, page 273](#)

6.2.1 Fresh Air Intake, Removing and Installing

Removing

- Remove the plenum chamber cover. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Bulkhead; Plenum Chamber Cover, Removing and Installing .
- Remove the fresh air intake cover. Refer to ⇒ [“6.3 Fresh Air Intake Cover, Removing and Installing”, page 274](#) .
- Remove the Air Quality Sensor - G238- (only on vehicles with climatronic). Refer to ⇒ [“9.2 Air Quality Sensor G238 , Removing and Installing”, page 304](#) .
- Remove the nuts -arrows-.
- Remove the fresh air intake -1- from the plenum chamber.

Installing

Install in reverse order of removal.

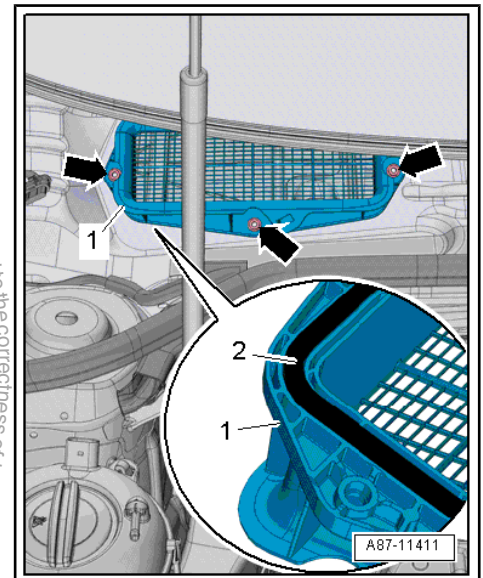
Assembly sequence:

- Align the air grille on the flange.
- Hold the air grille and install the outer nut until the center weld studs.
- Install the nut on the opposite side.
- Install the outer vehicle nut.
- Install the center nut.



Note

- ◆ The seal -2- must be seated correctly in the air grille.
- ◆ If the fresh air intake grille is damaged or installed incorrectly, water can enter the fresh air intake. Complaints due to odor problems coming from the heater/A/C system and/or there is moisture in the passenger compartment may result.



Tightening Specifications

Component	Tightening Specifications
Nut	3 Nm

6.2.2 Fresh Air Intake, Removing and Installing, RHD

Removing

- Remove the plenum chamber cover. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Bulkhead; Plenum Chamber Cover, Removing and Installing .



- Remove the fresh air intake cover. Refer to
⇒ [“6.3.2 Fresh Air Intake Cover, Removing and Installing, RHD”, page 275](#) .
- Remove the Air Quality Sensor - G238- (only on vehicles with climatronic). Refer to
⇒ [“9.2 Air Quality Sensor G238 , Removing and Installing”, page 304](#) .
- Remove the nuts -arrows-.
- Remove the fresh air intake -1- from the plenum chamber.

Installing

Install in reverse order of removal.

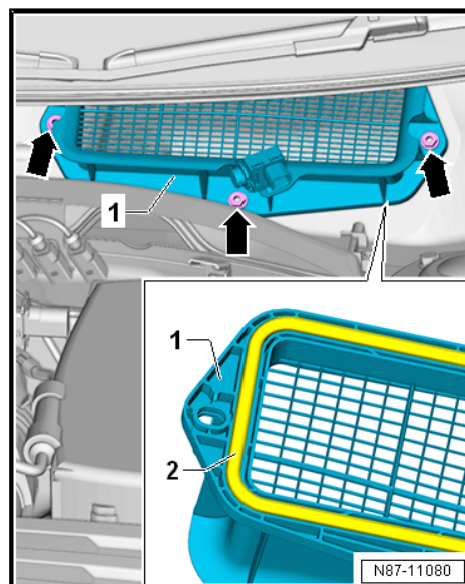
Assembly sequence:

- Align the air grille on the flange.
- Hold the air grille and install the outer nut until the center weld studs.
- Install the nut on the opposite side.
- Install the outer vehicle nut.
- Install the center nut.



Note

- ♦ *The seal -2- must be seated correctly in the air grille.*
- ♦ *If the fresh air intake grille is damaged or installed incorrectly, water can enter the fresh air intake. Complaints due to odor problems coming from the heater/A/C system and/or there is moisture in the passenger compartment may result.*



Tightening specifications:

Component	Tightening Specifications
Nut	3 Nm

6.3 Fresh Air Intake Cover, Removing and Installing

⇒ [“6.3.1 Fresh Air Intake Cover, Removing and Installing”, page 274](#)

6.3.1 Fresh Air Intake Cover, Removing and Installing

Removing

- Remove the right plenum chamber cover. Refer to ⇒ Body Interior; Rep. Gr. 50 ; Bulkhead; Plenum Chamber Cover, Removing and Installing .



- Disconnect the cable connection for vehicles with heated windshield from the cover for the fresh air intake -1-
- Unhook the fresh air intake cover -1- in direction of -arrow B- and remove in direction of -arrow A-.

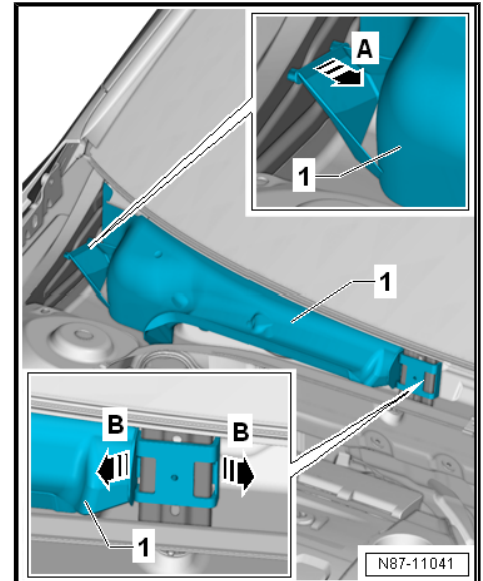


Note

- ◆ If the fresh air intake cover is damaged or installed incorrectly, water can enter the fresh air intake. Complaints due to odor problems coming from the heater/Air Conditioning (A/C) system and/or there is moisture in the passenger compartment may result.
- ◆ If the plenum chamber cover is damaged or incorrectly installed, water can enter the fresh air intake via the fresh air intake.

Installing

Install in reverse order of removal.



6.3.2 Fresh Air Intake Cover, Removing and Installing, RHD

Removing

- Remove the left plenum chamber cover. Refer to ➤ Body Interior; Rep. Gr. 50 ; Bulkhead; Plenum Chamber Cover, Removing and Installing .
- Disconnect the cable connection for vehicles with heated windshield from the cover for the fresh air intake -1-
- Unhook the fresh air intake cover -1- in the -direction of the arrow B- and remove in the -direction of the arrow A-.

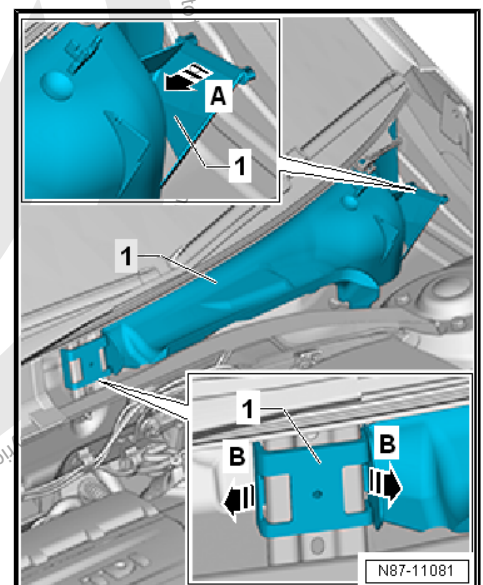


Note

- ◆ If the fresh air intake cover is damaged or installed incorrectly, water can enter the fresh air intake. Complaints due to odor problems coming from the heater/A/C system and/or there is moisture in the passenger compartment may result.
- ◆ If the plenum chamber cover is damaged or incorrectly installed, water can enter the fresh air intake via the fresh air intake.

Installing

Install in reverse order of removal.





6.4 Air Intake Duct, Removing and Installing

Removing

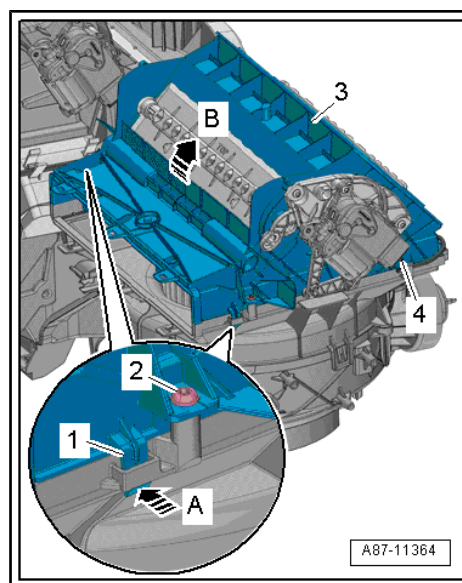
- Remove the instrument panel central tube. Refer to ⇒ Body Interior; Rep. Gr. 70 ; Instrument Panel Central Tube; Instrument Panel Central Tube, Removing and Installing .
- Remove the dust and pollen filter. Refer to ⇒ [“5.11 Dust and Pollen Filter, Removing and Installing”, page 234](#) .
- Disconnect the connector -4- and free up the wiring harness.
- Loosen the heater and Air Conditioning (A/C) unit and pull slightly forward.
- Remove screws -2-.
- Release the mounting tab -1- -arrow A-.
- Tilt the air intake duct -3- upward -arrow B- and disengage.

Installing

Install in reverse order of removal.

Tightening Specifications

- ♦ Refer to ⇒ [“5.2 Overview - Attachments for Heater and A/C Unit and Air Intake Housing”, page 218](#)



6.5 Driver Side Footwell Vent, Removing and Installing

⇒ [“6.5.1 Driver Side Footwell Vent, Removing and Installing”, page 276](#)

6.5.1 Driver Side Footwell Vent, Removing and Installing

Removing

⚠ CAUTION

Pyrotechnic components can unintentionally deploy.
Risk of injury.

- Discharge static electricity: Briefly touch the door striker pin.

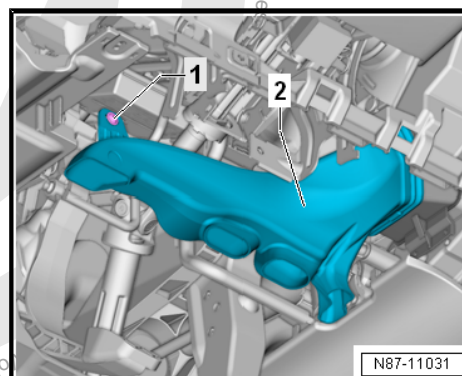
- Remove the driver side knee airbag. Refer to ⇒ Body Interior; Rep. Gr. 69 Knee Airbags; Overview - Knee Airbag .
- Remove the screw -1-.
- Remove the driver side footwell vent -2-.

Installing

- Install in reverse order of removal.

Tightening Specifications

Component	Tightening Specifications
4.2 x 16 screw	1.5 Nm



- ♦ Overview - knee airbag. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Knee Airbags; Overview - Knee Airbag .



6.5.2 Driver Side Footwell Vent, Removing and Installing, RHD

Removing

CAUTION

Pyrotechnic components can unintentionally deploy.

Risk of injury.

- Discharge static electricity: Briefly touch the door striker pin.

- Remove the driver side knee airbag. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Knee Airbags; Overview - Knee Airbag .
- Remove the bolt -2-.
- Remove the driver side footwell vent -1-.

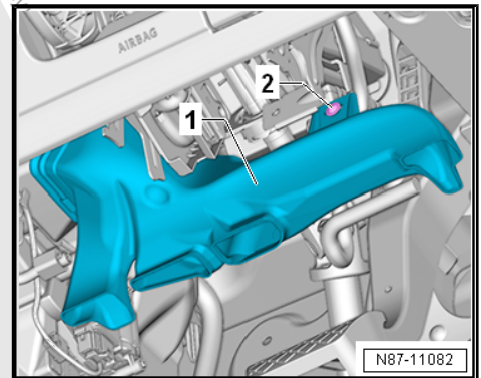
Installing

- Install in reverse order of removal.

Tightening specifications:

Component	Tightening Specifications
4.2 x 16 screw	1.5 Nm

- ◆ Overview - knee airbag. Refer to ⇒ Body Interior; Rep. Gr. 69 ; Knee Airbags; Overview - Knee Airbag .



6.6 Front Passenger Side Footwell Vent, Removing and Installing

⇒ "6.6.1 Front Passenger Side Footwell Vent, Removing and Installing", page 277

6.6.1 Front Passenger Side Footwell Vent, Removing and Installing

Removing

- Remove the glove compartment. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Glove Compartment, Removing and Installing .



- Remove the screw -2- (if installed).
- Remove the screws -3-.
- Push the clip -4- in direction of -arrow- upward and unclip the front passenger side footwell vent.
- Pull the instrument panel slightly forward.
- Remove the front passenger side footwell vent.

Installing

Install in reverse order of removal.



Note

Note the correct position of the coolant hoses for vehicles with glove compartment cooling.

Tightening Specifications

Component	Tightening Specifications
4.2 x 16 screw	1.5 Nm

- ♦ Storage Compartments and Covers; Overview - Glove Compartment. Refer to ➤ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Overview - Glove Compartment .

6.6.2 Front Passenger Side Footwell Vent, Removing and Installing, RHD

Removing

- Remove the glove compartment. Refer to ➤ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Glove Compartment, Removing and Installing .
- Remove the screw -2- (if installed).
- Remove the screws -3-.
- Push the clip -4- in the -direction of the arrow- upward and unclip the front passenger side footwell vent.
- Pull the instrument panel slightly forward.
- Remove the front passenger side footwell vent.

Installing

Install in reverse order of removal.



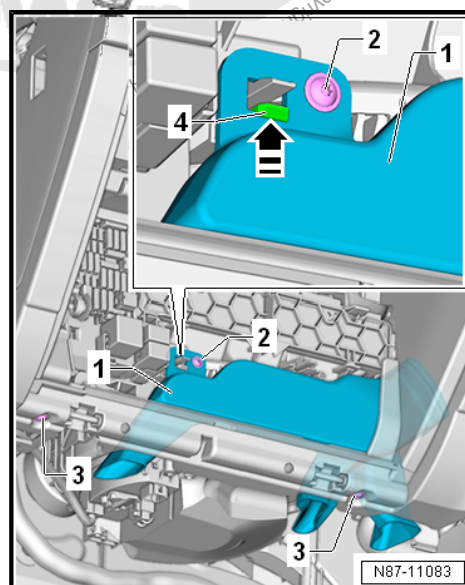
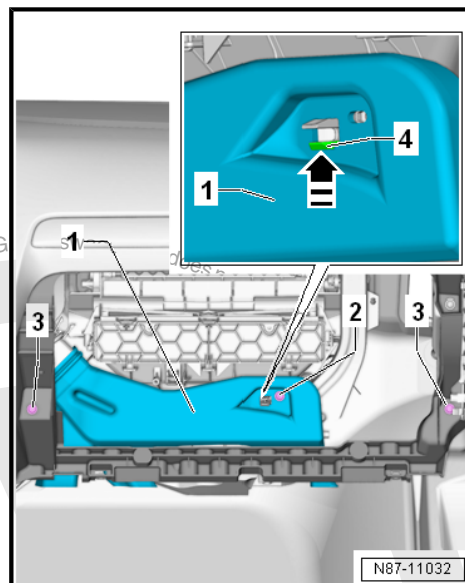
Note

Note the correct position of the coolant hoses for vehicles with glove compartment cooling.

Tightening specifications:

Component	Tightening Specifications
4.2 x 16 screw	1.5 Nm

- ♦ Storage Compartments and Covers; Overview - Glove Compartment. Refer to ➤ Body Interior; Rep. Gr. 68 ; Storage Compartments and Covers; Overview - Glove Compartment .

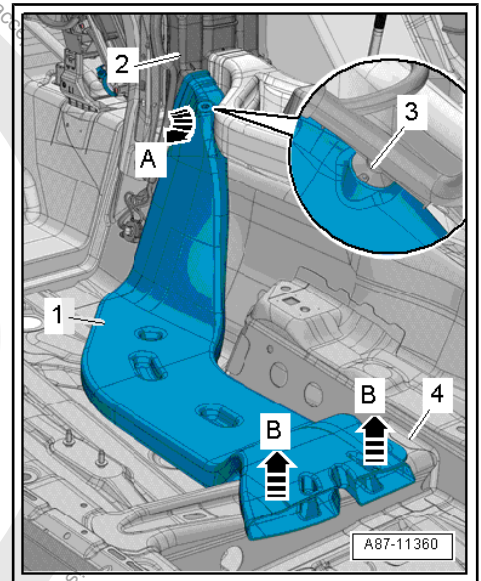




6.7 Rear Footwell Vent, Removing and Installing

Removing

- Remove the sill panel strip. Refer to ➤ Body Interior; Rep. Gr. 70 ; Passenger Compartment Trim; Sill Panel Strip, Removing and Installing .
- Remove the front seat. Refer to ➤ Body Interior; Rep. Gr. 72 ; Front Seats; Front Seat, Removing and Installing .
- Remove the center console. Refer to ➤ Body Interior; Rep. Gr. 68 ; Center Console; Center Console, Removing and Installing .
- Lift the carpet near the vent.
- Pry out the cable clip -3-.
- Lift up the rear footwell vent -1- -B arrows-, move it off of the heater and Air Conditioning (A/C) unit -2- -arrow A- and remove it to the side.



Installing

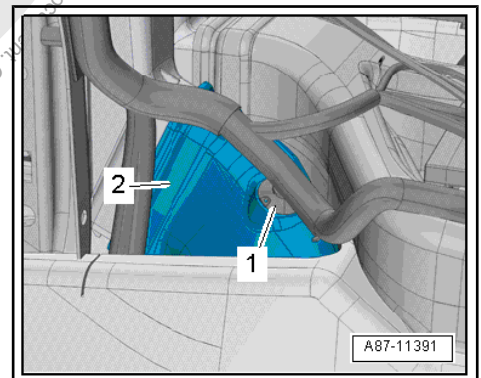
Install in reverse order of removal. Note the following:

- Check the cable clip -1- for damage before pressing onto the footwell vent -2-.



Note

A loose cable clip or a damaged seal can cause flow-generated noise.



6.8 Rear Center Console Vent Air Guide Channel, Removing and Installing

Removing

- Remove the center console. Refer to ➤ Body Interior; Rep. Gr. 68 ; Center Console; Center Console, Removing and Installing .



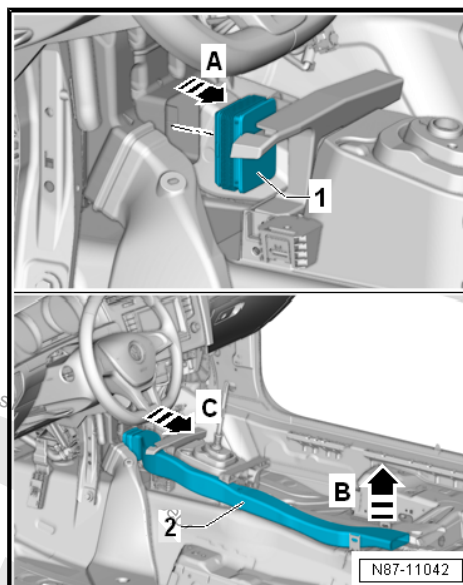
Note

If no rear vent is installed in the vehicle, a there is a cap -1- on the air distribution housing. The cover -1- is remove in direction of -arrow A-.

- Pivot the air guide channel -2- upward in direction of -arrow B-, and release the catch on the air guide channel in direction of -arrow C- and remove.

Installing

Install in reverse order of removal.



6.9 Passenger Compartment Forced Air Extraction, Checking



Note

- ◆ *The stale air escapes through the vent 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.*

The ventilation can be checked through the luggage compartment.

Depending on the vehicle equipment level, it may be necessary to remove additional components.

- Remove the side trim panels inside the luggage compartment. Refer to ➤ Body Interior; Rep. Gr. 70 ; Luggage Compartment Trim Panels; Overview - Luggage Compartment Side Trim Panel .
- The sealing lips in the vent frame on both sides of the vehicle must move freely and close by themselves.



6.10 Passenger Compartment Forced Air Extraction, Removing and Installing

⇒ ["6.10.1 Passenger Compartment Forced Air Extraction, Removing and Installing, Golf", page 281](#)

⇒ ["6.10.2 Passenger Compartment Forced Air Extraction, Removing and Installing, Golf Wagon", page 281](#)

6.10.1 Passenger Compartment Forced Air Extraction, Removing and Installing, Golf

Special tools and workshop equipment required

- ◆ Trim Removal Wedge - 3409-

Removing

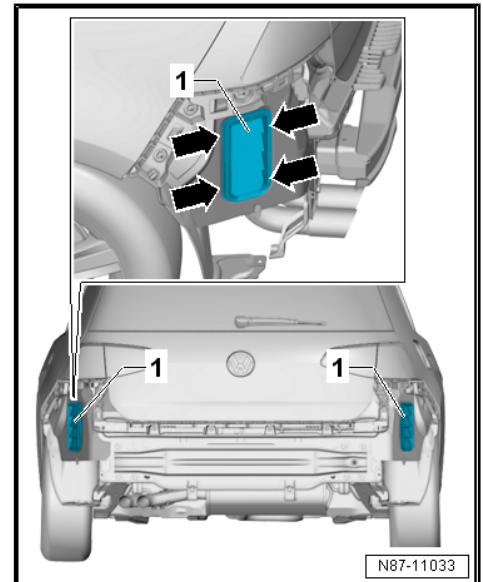
- Remove the rear bumper cover. Refer to ⇒ Body Exterior; Rep. Gr. 63 ; Rear Bumper; Bumper Cover, Removing and Installing .
- Release the tabs -arrows- using the Trim Removal Wedge - 3409- and remove the vent frame -1- from the side panel.

Installing

- Install in reverse order of removal.

Tightening Specifications

- ◆ Overview - rear bumper cover. Refer to ⇒ Body Exterior; Rep. Gr. 63 ; Rear Bumper; Overview - Bumper Cover .



6.10.2 Passenger Compartment Forced Air Extraction, Removing and Installing, Golf Wagon

Special tools and workshop equipment required

- ◆ Trim Removal Wedge - 3409-

Removing

- Remove the rear bumper cover. Refer to ⇒ Body Exterior; Rep. Gr. 63 ; Rear Bumper; Bumper Cover, Removing and Installing .



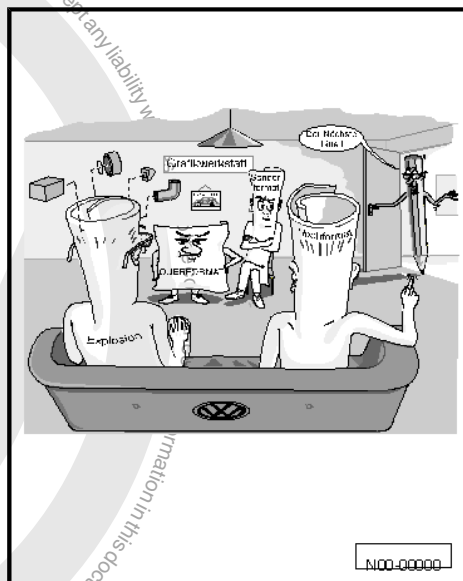
- Release the tabs -arrows- using the Trim Removal Wedge - 3409- and remove the vent frame -1- from the side panel.

Installing

- Install in reverse order of removal.

Tightening Specifications

- ♦ Overview - rear bumper cover. Refer to ➤ Body Exterior; Rep. Gr. 63 ; Rear Bumper; Overview - Bumper Cover .



6.11 Air Guide for Defrost Air Vent, Removing and Installing

Removing

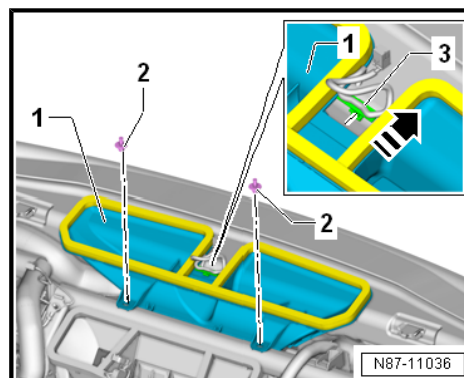
- Remove the instrument panel. Refer to ➤ Body Interior; Rep. Gr. 70 ; Instrument Panel; Instrument Panel, Removing and Installing .
- Unclip the wiring harness -3- from the Sunlight Photo Sensor - G107- in direction of -arrow-.
- Remove the clips -2-.
- Remove the air guide for the defrost -1- upward from the heater and Air Conditioning (A/C) unit.

Installing

Install in reverse order of removal.

Tightening Specifications

- ♦ Overview - instrument panel. Refer to ➤ Body Interior; Rep. Gr. 70 ; Instrument Panel; Overview - Instrument Panel .



6.12 Center Instrument Panel Vent Air Guide, Removing and Installing

Removing

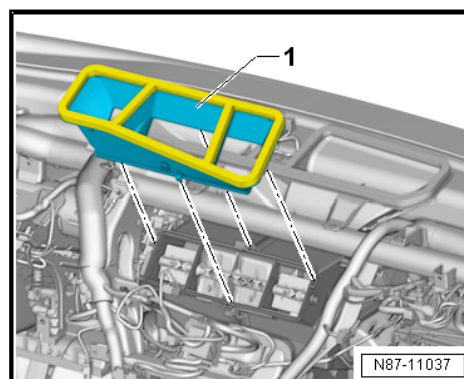
- Remove the instrument panel. Refer to ➤ Body Interior; Rep. Gr. 70 ; Instrument Panel; Instrument Panel, Removing and Installing .
- Remove the air guide for the center instrument panel vent -1- upward from the heater and Air Conditioning (A/C) unit.

Installing

Install in reverse order of removal.

Tightening Specifications

- ♦ Overview - instrument panel. Refer to ➤ Body Interior; Rep. Gr. 70 ; Instrument Panel; Overview - Instrument Panel .





7 Coolant Circuit

⇒ [“7.1 High Voltage Heater \(PTC\) Z115 , Incorporation in Coolant Circuit”, page 283](#)

⇒ [“7.2 High Voltage Battery Heat Exchanger Incorporation in the High Voltage System Coolant Circuit”, page 288](#)

⇒ [“7.3 High Voltage Battery Coolant Valve N688 , Removing and Installing”, page 290](#)

⇒ [“7.4 High Voltage Battery Coolant Pump V590 , Removing and Installing”, page 291](#)

⇒ [“7.5 High Voltage Heater \(PTC\) Z115 / High Voltage Heater \(PTC\) Control Module J848 , Removing and Installing”, page 292](#)

7.1 High Voltage Heater (PTC) - Z115- , Incorporation in Coolant Circuit



Note

- ◆ *The High Voltage Heater (PTC) - Z115- takes over the function of the auxiliary heater on vehicles with a high voltage system.*
- ◆ *For vehicles with a high voltage system and a parking heater installed as optional equipment, the High Voltage Heater (PTC) - Z115- can be activated to heat the vehicle interior instead of the parking heater. Additional information. Refer to the ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 00; General Information .*
- ◆ *For vehicles with a high voltage system without a parking heater installed as optional equipment, the vehicle interior can be heated at a low ambient temperature with the ignition switched off via the function “parking air conditioner” and the High Voltage Heater (PTC) - Z115- (or cooled at a high ambient temperature via the Air Conditioning (A/C) system).*
- ◆ *Fill with coolant and bleed the coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant .*
- ◆ *Incorporation of the A/C system heater core and the High Voltage Heater (PTC) - Z115- in the engine coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for High Voltage System Coolant Hoses).*



Note

The -arrows- show the direction of flow for the coolant.

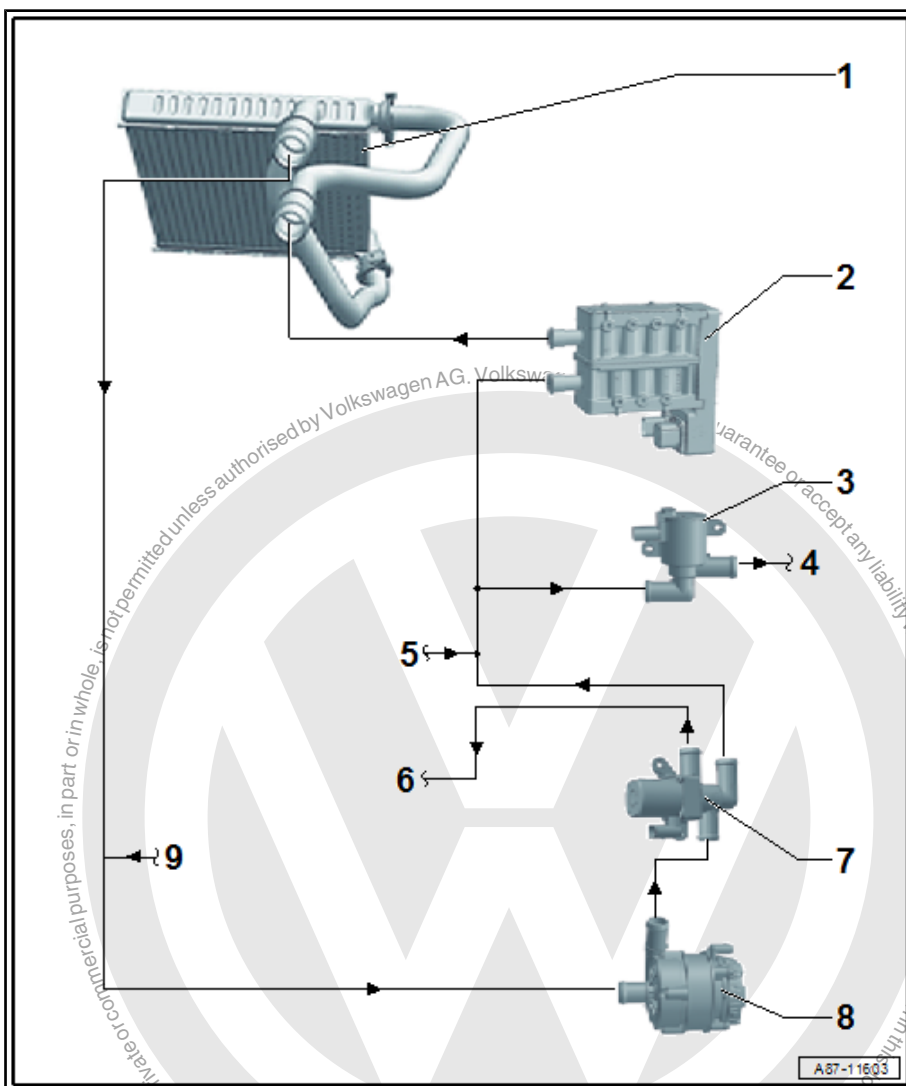


1 - Heater Core for the Heater in the A/C Unit

- ❑ Incorporation of the heater core in the engine coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).

2 - High Voltage Heater (PTC) - Z115- (with High Voltage Heater (PTC) Control Module - J848-)

- ❑ To check, use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function (of the A/C system) and refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.
- ❑ Removing and installing. Refer to ⇒ ["7.5 High Voltage Heater \(PTC\) Z115 / High Voltage Heater \(PTC\) Control Module J848, Removing and Installing", page 292](#) .
- ❑ Additional information for vehicles with a "Parking heater" as optional equipment. Refer to ⇒ Heating, Ventilation and Air Conditioning; Rep. Gr. 00 ; General Information .



3 - Transmission Coolant Valve - N488-

- ❑ Removing and installing. Refer to ⇒ Rep. Gr. 19 ; Coolant Pump/Thermostat .

4 - Coolant Supply to Transmission

- ❑ Incorporation of the parking heater in the engine (and transmission) coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).

5 - Coolant Supply from Engine

- ❑ Incorporation of the parking heater in the engine coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).

6 - Coolant Return to Engine

- ❑ Incorporation of the parking heater in the engine coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).



Note

Depending on the engine, a valve may be installed between the Coolant Change-Over Valve 2 - N633- and the engine in the coolant return which prevents the coolant from the engine from flowing to the Coolant Change-Over Valve 2 - N633- when the engine is running. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).

7 - Coolant Change-Over Valve 2 - N633-

- ☐ Incorporation of the parking heater in the engine coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).
- ☐ Removing and installing. Refer to ⇒ Rep. Gr. 19 ; Coolant Pump/Thermostat .



Note

- ◆ *The Coolant Change-Over Valve 2 - N633- is activated by the respective Engine Control Module (ECM) (for example, by the Engine Control Module - J623-) when heating output of the A/C system is requested and the vehicle is in an electric driving mode. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding " function and refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.*
- ◆ *If there is a complaint due to insufficient heating output of the A/C system with the engine off and/or with the engine running (regardless of whether the High Voltage Heater (PTC) - Z115- is activated), check that it is installed on proper side and is functioning properly. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function and refer to ⇒ Wiring diagrams, Troubleshooting & Component locations.*



- ◆ *So that the coolant warmed by the High Voltage Heater (PTC) - Z115- is delivered by the heater and A/C unit heater core, the High Temperature Circuit Coolant Pump - V467- and the Transmission Coolant Valve - N488- must be activated (by the respective ECM). So that the coolant flows in the correct direction the check valve in the coolant circuit must be installed correctly and its function must be OK. For more information, use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function and refer to ➤ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses) and ➤ Wiring diagrams, Troubleshooting & Component locations.*

8 - High Temperature Circuit Coolant Pump - V467-

- ❑ Incorporation in the engine coolant circuit. Refer to ➤ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).
- ❑ Removing and installing. Refer to ➤ Rep. Gr. 19 ; Coolant Pump/Thermostat .



Note

- ◆ *The High Temperature Circuit Coolant Pump - V467- is activated by the respective ECM (for example, by the Engine Control Module - J623-) when the heating output of the A/C system is required. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function and refer to ➤ Wiring diagrams, Troubleshooting & Component locations.*
- ◆ *If there is a complaint due to insufficient heating output of the A/C system with the engine off and / or with the engine running (regardless of whether the High Voltage Heater (PTC) - Z115- is activated), check that the High Temperature Circuit Coolant Pump - V467- is installed on proper side and is functioning properly. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function and refer to ➤ Wiring diagrams, Troubleshooting & Component locations.*



- ◆ *So that the coolant warmed by the High Voltage Heater (PTC) - Z115- is delivered by the heater and A/C unit heater core, the Coolant Change-Over Valve 2 - N633- and the Transmission Coolant Valve - N488- must be activated (by the respective engine control module). So that the coolant flows in the correct direction the check valve in the coolant circuit must be installed correctly and its function must be OK. For more information, refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses) and ⇒ Wiring diagrams, Troubleshooting & Component locations. Use the Vehicle Diagnostic Tester in "Guided Fault Finding".*

9 - Coolant Return from Transmission

- Incorporation of the parking heater in the engine (and transmission) coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant (Connection Diagram for Coolant Hoses).



7.2 High Voltage Battery Heat Exchanger Incorporation in the High Voltage Sys- tem Coolant Circuit



Note

- ◆ Fill with coolant and bleed the coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant .
- ◆ The following illustrations show only on component of the re-
frigerant circuit components for the high voltage system. For
additional components not shown here, refer to ⇒ Rep. Gr.
19 ; Coolant System/Coolant .
- ◆ Incorporation of the high voltage battery heat exchanger in the
refrigerant circuit. Refer to
⇒ ["7.1 High Voltage Heater \(PTC\) Z115 , Incorporation in
Coolant Circuit", page 283](#) .
- ◆ If there is a complaint due to a lack of cooling of the high volt-
age system components and the Air Conditioning (A/C) sys-
tem cooling output is OK, check the cooling of the high voltage
battery heat exchanger using the cooling output test. Refer to
⇒ ["4.4.5 Cooling Output, Checking, Vehicles with Automatic
Climate Control System \(with High Voltage System\)",
page 46](#) . While doing so, make sure that the high voltage bat-
tery heat exchanger is actually being cooled. The High Voltage
Battery Heater Core Refrigerant Cut-Off Valve - N542- func-
tion and the restrictor installed in the refrigerant circuit must be
OK. Refer to
⇒ ["2.1.2 System Overview - Refrigerant Circuit, Golf GTE",
page 103](#) . If no malfunctions can be determined here in the
refrigerant circuit, check the incorporation of the High Voltage
Battery Coolant Pump - V590- , the Coolant Pump in front of
Electric Drive Power and Control Electronics - V508- , the
Coolant Change-Over Valve 1 - N632- and the High Voltage
Battery Coolant Valve - N688- in the high voltage system cool-
ant circuit, as well as their activation and function. Refer to ⇒
Rep. Gr. 19 ; Coolant System/Coolant and use the Vehicle
Diagnostic Tester in "Guided Fault Finding" function (for the A/
C system and the hybrid battery management system).





1 - High Voltage Battery Coolant Valve - N688-

- ❑ Incorporation in the high voltage system coolant circuit. Refer to ➤ Rep. Gr. 19 ; Coolant System/Coolant .
- ❑ Removing and installing. Refer to ➤ ["7.3 High Voltage Battery Coolant Valve N688 , Removing and Installing", page 290](#) .
- ❑ Check the function and activation of the High Voltage Battery Coolant Pump - V590- and the High Voltage Battery Coolant Valve - N688- using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function for the A/C system and the hybrid battery management system. Refer to ➤ Rep. Gr. 19 ; Coolant System/Coolant .

2 - Coolant Return from High Voltage Battery 1 - AX2-

- ❑ Incorporation in the high voltage system coolant circuit. Refer to ➤ Rep. Gr. 19 ; Coolant System/Coolant .

3 - Coolant supply to the High Voltage Battery 1 - AX2-

- ❑ Incorporation in the high voltage system coolant circuit. Refer to ➤ Rep. Gr. 19 ; Coolant System/Coolant .

4 - Bleed Screw

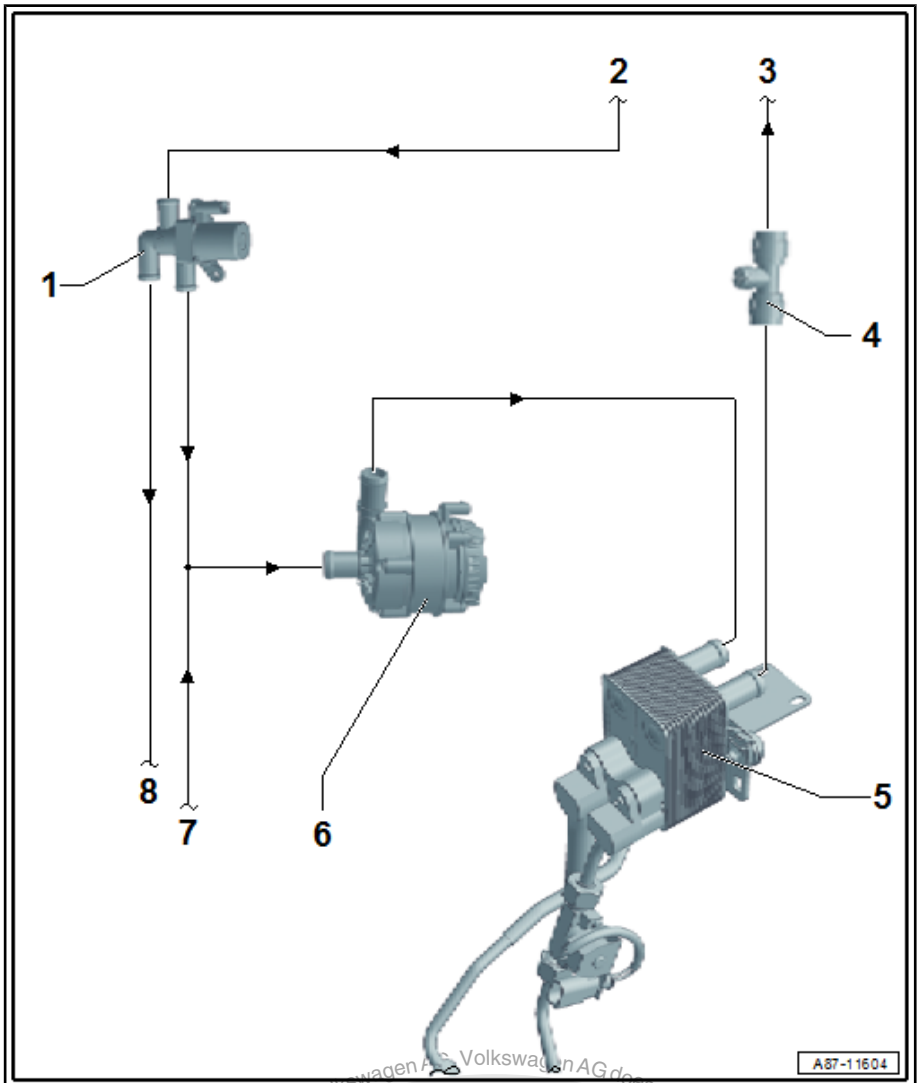
- ❑ Coolant circuit, bleeding. Refer to ➤ Rep. Gr. 19 ; Coolant System/Coolant .

5 - Heat Exchanger for the High Voltage Battery

- ❑ Incorporation in the high voltage system coolant circuit. Refer to ➤ Rep. Gr. 19 ; Coolant System/Coolant .
- ❑ Check the function and cooling of the heat exchanger via the A/C system using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function (for the A/C system and the hybrid battery management system). Refer to ➤ ["4.4.5 Cooling Output, Checking, Vehicles with Automatic Climate Control System \(with High Voltage System\)", page 46](#) .
- ❑ Removing and installing. Refer to ➤ ["2.12 High Voltage Battery Heat Exchanger, Removing and Installing", page 133](#) .

6 - High Voltage Battery Coolant Pump - V590-

- ❑ Incorporation in the high voltage system coolant circuit. Refer to ➤ Rep. Gr. 19 ; Coolant System/Coolant .
- ❑ Removing and Installing. Refer to ➤ ["7.4 High Voltage Battery Coolant Pump V590 , Removing and Installing", page 291](#) .
- ❑ To check the function and activation, use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.





Note

- ◆ *The High Voltage Battery Coolant Pump - V590- (and the High Voltage Battery Coolant Valve - N688-) is activated by the High Voltage Battery 1 - AX2- (by the Battery Regulation Control Module - J840-), when cooling for the high voltage system components (the High Voltage Battery 1 - AX2- , the Electric Drive Power and Control Electronics - JX1- and/or the High Voltage Battery Charger Control Module - J1050-) is required. Use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function (for the hybrid battery management system) and refer to ⇒ Rep. Gr. 19 ; Coolant System/ Coolant .*
- ◆ *If there is a complaint due to insufficient cooling of the high voltage system components, check for correct installation on the proper side and proper function using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function (for the hybrid battery management system) and refer to ⇒ Rep. Gr. 19 ; Coolant System/ Coolant .*
- ◆ *So that the Electric Drive Power and Control Electronics - JX1- and the High Voltage Battery Charger Control Module - J1050- are cooled, the Coolant Pump in front of Electric Drive Power and Control Electronics - V508- and the Coolant Change-Over Valve 1 - N632- must also be activated (by the respective Engine Control Module (ECM)) and their function must be OK. For additional information, use the Vehicle Diagnostic Tester in the "Guided Fault Finding" function (for the hybrid battery management system) and refer to ⇒ Rep. Gr. 19 ; Coolant System/ Coolant .*

7 - Coolant Supply from the High Voltage System Radiator

- ☐ Incorporation in the high voltage system coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/ Coolant .

8 - Coolant Supply to the Coolant Pump in front of Electric Drive Power and Control Electronics - V508-

- ☐ Incorporation in the high voltage system coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/ Coolant .

7.3 High Voltage Battery Coolant Valve - N688- , Removing and Installing

Special tools and workshop equipment required



- ◆ Hose Clamps - Up To 25mm - 3094-
- ◆ Hose Clip Pliers - VAS6362-

Removing

- Note safety precautions. Refer to
⇒ ["1.5 Cooling System Safety Precautions", page 2](#)
- Disconnect the connector -2-.



Note

Place a cloth underneath to catch any escaping coolant.

- Remove the bolts -arrows-.

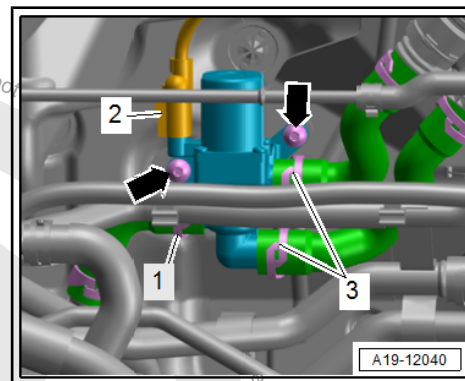


CAUTION

The cooling system is under pressure when the engine is warm.
There is a risk of scalding from hot steam and coolant.

Burns on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Reduce the pressure: cover the coolant reservoir cap with a cloth and carefully open.



- Clamp off and remove the coolant hoses with the Hose Clamps - Up To 25mm - 3094- by loosening the hose clamps -3-.
- Remove the High Voltage Battery Coolant Valve - N688- .

Installing

Install in reverse order of removal. Note the following:



Note

Secure all hose connections with hose clamps used in standard production. Refer to the Parts Catalog.

- Check the coolant level. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant .

Tightening Specifications

- ◆ Overview - Coolant Valves. Refer to ⇒ Rep. Gr. 19 ; Coolant Pump/Thermostat .

7.4 High Voltage Battery Coolant Pump - V590- , Removing and Installing

Special tools and workshop equipment required

- ◆ Hose Clamps - Up To 25mm - 3094-
- ◆ Hose Clip Pliers - VAS6362-

Removing

- Note safety precautions. Refer to
⇒ ["1.5 Cooling System Safety Precautions", page 2](#) .
- Remove the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation .



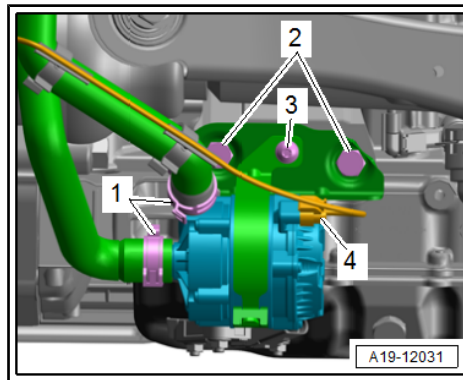
- Disconnect the connector -4-.

⚠ CAUTION

The cooling system is under pressure when the engine is warm. There is a risk of scalding from hot steam and coolant.

Burns on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Reduce the pressure: cover the coolant reservoir cap with a cloth and carefully open.



- Clamp off and remove the coolant hoses with the Hose Clamps - Up To 25mm - 3094- by loosening the hose clamps -1-.
- Remove the bolt -3- and remove the High Voltage Battery Coolant Pump - V590- .

Installing

Install in reverse order of removal. Note the following:



Note

Secure all hose connections with hose clamps used in standard production. Refer to the Parts Catalog.

- Check the coolant level. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant .

Tightening Specifications

- ◆ Refer to ⇒ Rep. Gr. 19 ; Coolant Pump/Thermostat
- ◆ Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation; Overview - Noise Insulation .

7.5 High Voltage Heater (PTC) - Z115- / High Voltage Heater (PTC) Control Module - J848- , Removing and Installing

Special tools and workshop equipment required

- ◆ Commercially available five star bit-insert "TS30H" with Torx Bit - tamper proof
- ◆ Hose Clamps - Up To 25mm - 3094-
- ◆ Engine Bung Set - VAS6122-
- ◆ Cooling System Tester - VAG1274B-
- ◆ Spring Clip Pliers - VAS6499-

Removing

- Turn off the ignition.
- Note safety precautions. Refer to ⇒ ["1.1 Handling Refrigerant Safety Precautions", page 1](#) .
- See notes. Refer to ⇒ ["4.1 Working on the Refrigerant Circuit", page 8](#) .
- Note safety precautions. Refer to ⇒ ["1.5 Cooling System Safety Precautions", page 2](#) .



- Observe safety precautions when working on the high voltage system. Refer to
⇒ [“1.3 High Voltage System Safety Precautions”, page 1](#) .
- Pay attention to safety precautions for working near high voltage components. Refer to
⇒ [“1.4 Safety Precautions near High Voltage Components”, page 2](#) .
- Pay attention to the high voltage system danger classification. Refer to ⇒ Rep. Gr. 00 ; High Voltage System Danger Classification .

DANGER

Danger to life due to high voltage.

Death or serious bodily injury by electric shock.

- Have the high voltage system de-energized by a qualified person.

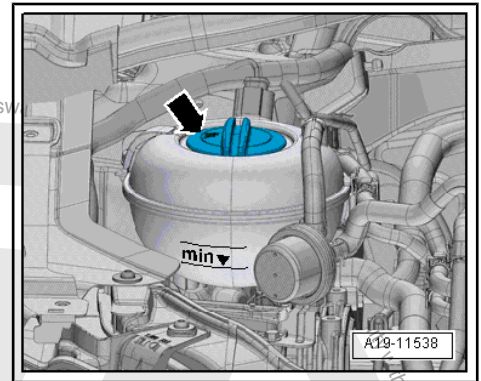
- De-energize the high voltage system. Refer to ⇒ Rep. Gr. 93 ; High Voltage System, De-Energizing .

CAUTION

The cooling system is under pressure when the engine is warm. There is a risk of scalding from hot steam and coolant.

Burns on the skin and other parts of the body is possible.

- Wear protective gloves.
- Wear protective eyewear.
- Reduce the pressure: cover the coolant reservoir cap with a cloth and carefully open.

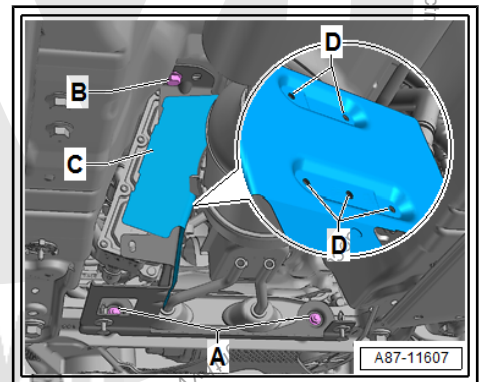


- Open the coolant reservoir cap -arrow- for the engine coolant circuit.
- Remove the rear noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Noise Insulation .

Note

The High Voltage Heater (PTC) - Z115- is installed with the bracket and the heat shield -C- on the underbody in the center tunnel in the area of the catalytic converter.

- Remove bolts -A and B-.
- Carefully tilt the High Voltage Heater (PTC) - Z115- with the bracket and heater core cover -C- downward.
- Remove the bolts -D-.

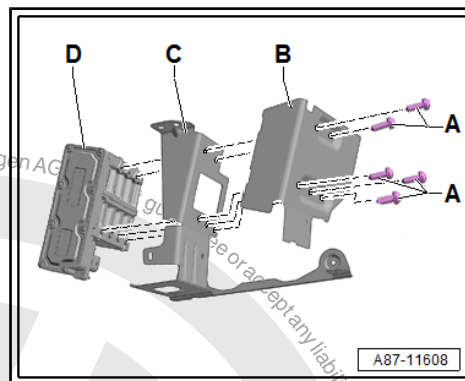


Note

At the start of production the heater core cover is bolted with the thread-cutting flat-head screws (M6 x 12) -D-. To remove and install a five star bit-insert “TS30H” with TORX® bit - tamper proof is necessary.



- Remove the heat shield -B- and bracket -C- from the High Voltage Heater (PTC) - Z115- -D-.

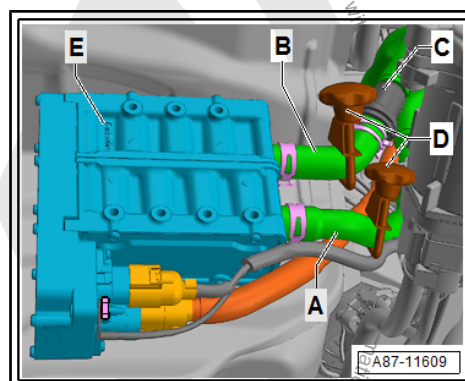


- Clamp the coolant hoses -A and B- with Hose Clamps - Up To 25mm - 3094- -D-.



Note

The High Voltage Heater (PTC) - Z115- -E- is designed for a specific coolant flow direction, for this reason coolant hoses must be connected on the correct sides.

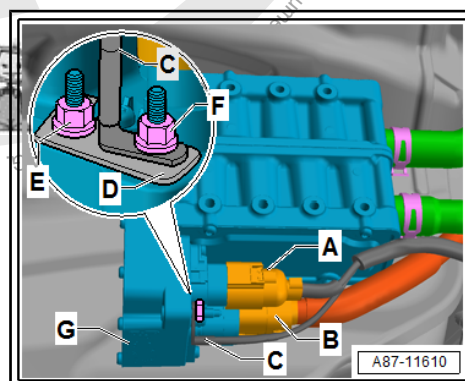


- Remove the coolant hoses -A and B- from the connections on the High Voltage Heater (PTC) - Z115- -E-.
- Close the open connections for the coolant hoses on the High Voltage Heater (PTC) - Z115- -E- with clean plugs from the Engine Bung Set - VAS6122-.
- Remove the connectors -A- (for low voltage) and -B- (high voltage cable) from the High Voltage Heater (PTC) - Z115- .
- Cover the high voltage cable connector and socket on the High Voltage Heater (PTC) - Z115- -G- (for example with a clean plug from the Engine Bung Set - VAS6122-) to protect them from debris and damage.

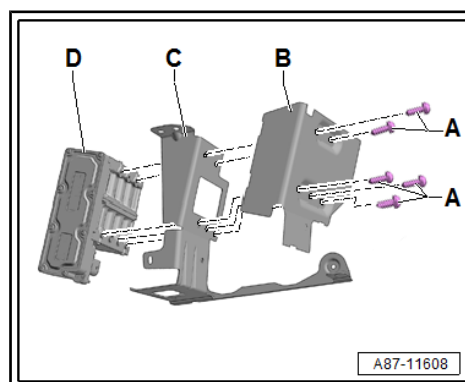
Remove the nut -F- (or -E-) and Ground (GND) cable -C- (or GND cable -C- with the bracket -D-).

Installing

Install in reverse order of removal. Note the following:



The heat shield -B- and the bracket -C- are bolted with thread-cutting flat-head screws (M6 x 12) -A- on the High Voltage Heater (PTC) - Z115- -D-. If a new High Voltage Heater (PTC) - Z115- -D- is installed no threads are formed on the attaching points. So that the bolts can be installed easier when installing a new High Voltage Heater (PTC) - Z115- -D-, position the bolts -A- before installing the High Voltage Heater (PTC) - Z115- -D- and screw them in approximately 6 mm.



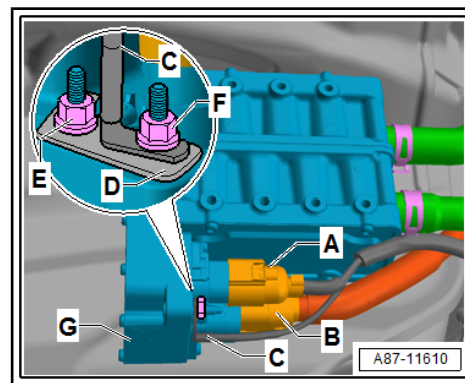


Check the contact surfaces for the GND cable -C- on the bracket -D- and for the bracket -D- on the High Voltage Heater (PTC) - Z115- -G- before installing and clean if necessary.



Note

The attachment points on the High Voltage Heater (PTC) - Z115- -G- and on the bracket -D- as well as the GND cable -C- on the nut -F- are to be checked before installing. The contact surfaces must be clean and rust and grease-free. Otherwise service the contact surfaces using the Contact Surface Cleaning Set - VAS6410- .

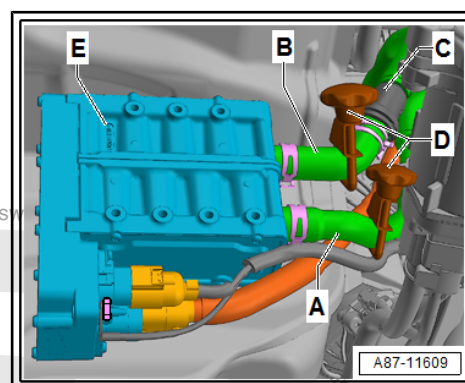


Install the bracket -D- and GND cable -C- on the High Voltage Heater (PTC) - Z115- -G-.

Tightening Specifications:

Component	Tightening Specifications
Nuts -E- and -F- (M6 threads)	8 Nm

- Attach the connectors -A- (for low voltage) and -B- (high voltage cable) to the High Voltage Heater (PTC) - Z115- -G-.
- If necessary, fill the coolant in the coolant expansion tank for the engine. Refer to ➔ Rep. Gr. 19 ; Coolant System/Coolant .
- Install the coolant hose -A- on the High Voltage Heater (PTC) - Z115- -E-.
- Carefully open the hose clamp -D- on the coolant hose -A- and let the coolant flow into the High Voltage Heater (PTC) - Z115- -E-.
- As soon as coolant flows out of the connection for the coolant hose -B- on the High Voltage Heater (PTC) - Z115- -E- (the High Voltage Heater (PTC) - Z115- -E- is completely filled with coolant), install the coolant hose -B- on the High Voltage Heater (PTC) - Z115- -E-.



Note

- ◆ *So that the High Voltage Heater (PTC) - Z115- -E- is completely filled with coolant, hold the connection for the coolant hose -B- as far upward as possible when the coolant is flowing in.*
- ◆ *When the removal and installation of the High Voltage Heater (PTC) - Z115- -E- is performed as described above there should be no air in the engine coolant circuit. If, for some other reason, there is still some air in the coolant circuit, bleed the coolant circuit. Refer to ➔ Rep. Gr. 19 ; Coolant System/ Coolant .*
- Remove both hose clamps -D-.
- Check the contact surfaces for the bracket -C-, on the High Voltage Heater (PTC) - Z115- -D- and on the heat shield -B- before attaching and clean if necessary.



- Install the heat shield -B- and bracket -C- on the High Voltage Heater (PTC) - Z115- -D-.



Note

The heat shield -B- and the bracket -C- are bolted with thread-cutting flat-head screws (M6 x 12) -A- on the High Voltage Heater (PTC) - Z115- -D-.

Tightening Specification:

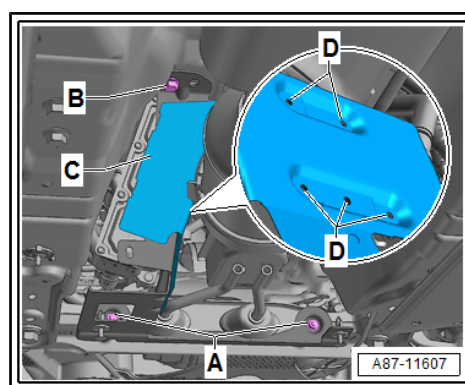
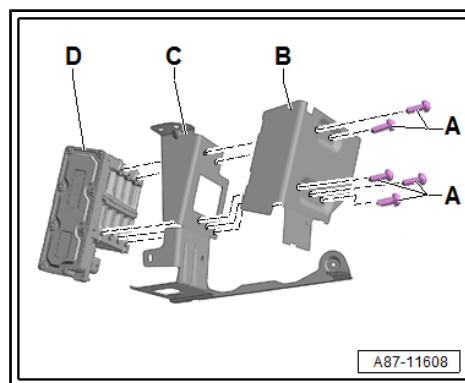
Component	Tightening Specifications
Bolts -A-	8 Nm

- Install the bracket -C- with the High Voltage Heater (PTC) - Z115- .

Tightening Specifications

Component	Tightening Specifications
Bolts -A-	8 Nm
Bolts -B-	20 Nm

- Re-install are removed or loosened components.
- If necessary, fill the coolant in the coolant expansion tank for the engine coolant circuit. Refer to ⇒ Rep. Gr. 19 ; Coolant System/Coolant .
- Remove the Hose Clamps - Up To 25mm - 3094- and install all removed or loosened components.
- After installing the High Voltage Heater (PTC) - Z115- switch on the ignition and prepare the ready mode (the engine must not run), set the A/C system to the maximum heating output and let the A/C system run for two minutes at this setting.





8 Display and Control Head

⇒ ["8.1 Component Location Overview - Display and Control Head", page 297](#)

⇒ ["8.2 Display and Control Head, Removing and Installing", page 301](#)

8.1 Component Location Overview - Display and Control Head


⇒ ["8.1.1 Component Location Overview - Display and Control Head, Electric-Manual Climate Control System", page 297](#)

⇒ ["8.1.2 Component Location Overview - Display and Control Head, Climatronic", page 299](#)

8.1.1 Component Location Overview - Display and Control Head, Electric-Manual Climate Control System



Note

- ◆ An indicator lamp inside the controls indicates when the selected function is on.
- ◆ If the lamp in the  button does not come after the button is pushed, there may be a fault in the control module. Call up the Diagnostic Trouble Code (DTC) memory using the Vehicle Diagnostic Tester. If the fault stored in the DTC memory "A/C compressor first start not performed" is present, then is it necessary to perform a basic setting and an adaptation "A/C compressor first start" either in Guided Fault Finding or in Guided Functions.
- ◆ Pay attention to the turn off conditions for vehicles with the Start/Stop System. Refer to [⇒ "3.2 Vehicles with Start/Stop System General Information", page 6](#).



1 - Left Seat Heating Button - E653-

- ☐ Optional
- ☐ The seat heating as 3 settings. A Light Emitting Diode (LED) indicates which setting is selected.
- ☐ If no LED is illuminated, the seat heater is switched off.

2 - **A/C** Button

- ☐ The Air Conditioning (A/C) compressor is set to almost 0 delivery when the **A/C** button is off.

3 - Rear Window Defogger Button

- ☐ Rear window defroster remains on for 4 to 20 minutes, depending on exterior temperature.

4 - Recirculating Air Mode Button



Note

The recirculating air mode turns off during ignition and returns to fresh air mode.

5 - Immediate Heating Button for Parking/Auxiliary Heater ON/OFF or OFF Button for Heating and Air Conditioning ON/OFF

- ☐ Depending on the equipment level
- ☐ **OFF** button is pressed, the A/C does not work. There is no heating or ventilation.

6 - Right Seat Heating Button - E654-

- ☐ Optional
- ☐ The seat heating as 3 settings. An LED indicates which setting is selected.
- ☐ If no LED is illuminated, the seat heater is switched off.

7 - Air Distribution Control Knob

8 - Air Distribution Display

9 - Blower Speed Control Knob

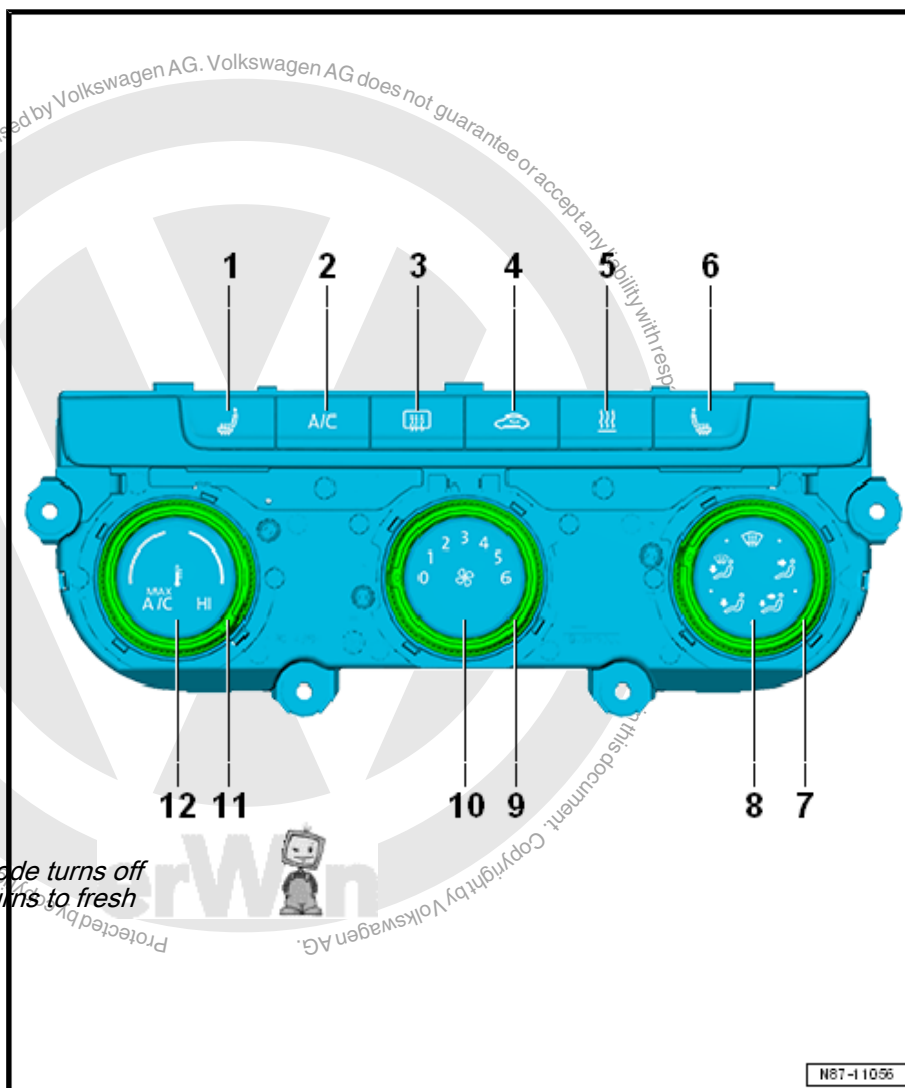
- ☐ To the left: decreases the blower speed
- ☐ To the right: increases the blower speed

10 - Blower Speed Display

11 - Temperature Control Knob

- ☐ To the left: lower the temperature
- ☐ To the right: increases the temperature

12 - Temperature Setting Display





8.1.2 Component Location Overview - Display and Control Head, Climatronic



Note

- ◆ An indicator lamp inside the controls indicates when the selected function is on. In addition to this, whenever a button or a control is selected, the function will briefly appear in the radio or radio/navigation system display.
- ◆ To change from °C and °F in the radio or radio/navigation system display, go to the main menu in the instrument cluster. Call up the main menu with the rocker switch in the windshield wiper lever. Select settings, units and temperature.
- ◆ If a new Heater and A/C Controls - EX21- with Climatronic Control Module - J255- was installed, perform the Guided Fault Finding or Guided Functions, the basic setting and adaptation "Air Conditioning (A/C) compressor first start".
- ◆ Pay attention to the turn off conditions for vehicles with the Start/Stop System. Refer to ["3.2 Vehicles with Start/Stop System General Information", page 6](#).
- ◆ If the lamp in the **AC** button does not come after the button is pushed, there may be a fault in the control module. Call up the Diagnostic Trouble Code (DTC) memory using the Vehicle Diagnostic Tester. If the DTC memory entry "A/C compressor first start not performed" is present, then is it necessary to perform a basic setting and an adaptation "A/C compressor first start" either in Guided Fault Finding.
- ◆ Pressing the button **AUTO** will reverse all settings which deviate from the automatic operation.
- ◆ If there are differences from automatic operation, see the corresponding user guide.
- ◆ When the **OFF** button is activated, the Climatronic does not work. There is no heating or ventilation.
- ◆ When the **OFF** button is deactivated, the Climatronic works.
- ◆ The **A/C** button is pressed and the A/C compressor is on. The heating and ventilation operation continues to be controlled electronically.
- ◆ If the **AC** button is off, the A/C compressor is set to almost 0 delivery. The heating and ventilation operation continues to be controlled electronically.
- ◆ Pay attention to the turn off conditions for vehicles with the Start/Stop System. Refer to ["3.2 Vehicles with Start/Stop System General Information", page 6](#).



1 - Left Temperature Display

- ☐ Shows the set temperature for the driver side.

2 - Left Seat Heating Button - E653-

- ☐ Optional
- ☐ The seat heating as 3 settings. An LED indicates which setting is selected.
- ☐ If no LED is illuminated, the seat heater is switched off.

3 - Windshield Air Distribution Button

- ☐ The LED turns on when the system is active.

4 - Center Air Distribution Button

- ☐ Air distribution to the upper body via the center vents
- ☐ The LED turns on when the system is active.

5 - Lower Air Distribution Button

- ☐ Air distribution into the footwell.
- ☐ The LED turns on when the system is active.

6 - Air Recirculation Button

- ☐ The LED turns on when the system is active.
- ☐ Manual and automatic recirculating air mode.
- ☐ Press the button for recirculating air function to prevent polluted air from entering interior.

Recirculating air is switched on automatically under the following conditions:

- When the windshield washer system is operated,
- When the Air Quality Sensor - G238- is activated.
- When the reverse gear is engaged (this function is only active for two minutes after the engine is started).
- Blower speed on the Heater and A/C Controls - EX21- off
- Heater and A/C Controls - EX21- "OFF".

7 - Right Seat Heating Button - E654-

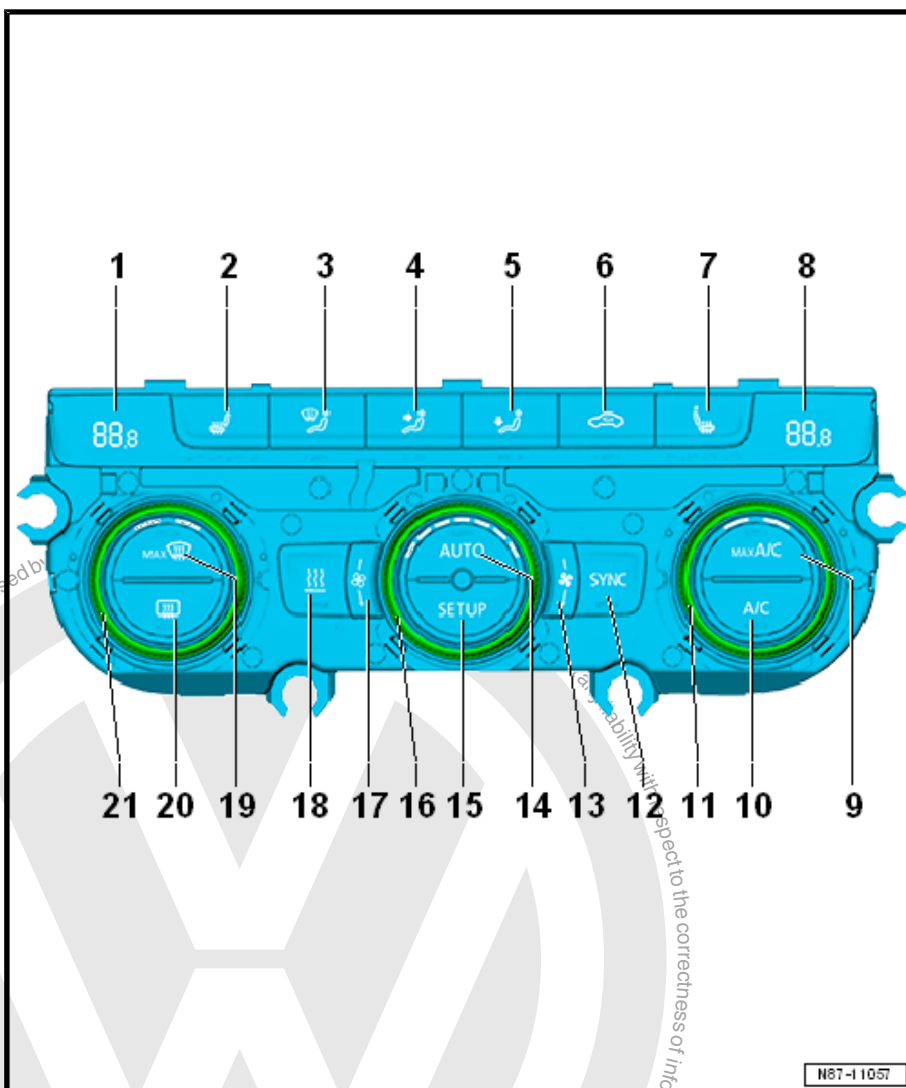
- ☐ Optional
- ☐ The seat heating as 3 settings. An LED indicates which setting is selected.
- ☐ If no LED is illuminated, the seat heater is switched off.

8 - Right Temperature Display

- ☐ Shows the temperature set for the front passenger side

9 - Max A/C Button

- ☐ The LED turns on when the system is active.
- ☐ Run A/C system with MAX A/C.





10 - **A/C** Button

- ☐ The LED turns on when the system is active.
- ☐ The A/C compressor is set to almost 0 delivery when the **A/C** button is off. If the **AUTO** button is activated, the heating and ventilation mode continues to be controlled electronically.

11 - **Right Temperature Control**

- ☐ The selected temperature will be shown in the display.

12 - **Sync** Button

- ☐ The LED turns on when the system is active.
- ☐ Synchronization of the climate zones to the driver value.

13 - **Low Blower Speed**

- ☐ Only for display no function

14 - **AUTO** Button

- ☐ The LED turns on when the system is active.
- ☐ In automatic mode the Climatronic maintains the selected vehicle temperature automatically. The air temperature, the blower speed and the air distribution are adjusted automatically.

15 - **SETUP** Button

- ☐ Pressing the **SETUP** button calls up the climate control menu for adjustment for example of the recirculating air mode, and default functions.

16 - **Blower Control**

- ☐ By turning the knob, the blower speed can be individually adjusted.
- ☐ If the blower speed is manually adjusted, the function **AUTO** is automatically deactivated.

17 - **High Blower Speed**

- ☐ Only for display no function

18 - **Immediate Heating Button** Button for Parking/Auxiliary Heater On/Off or **OFF** -Button for the A/C System On/Off

- ☐ Depending on the equipment level
- ☐ When the **OFF** button is activated, the Climatronic does not work. There is no heating or ventilation.

19 - **Max Defrost Button**

- ☐ Air sucked in from the outside is directed to the windshield if installed causing the recirculating air mode to shut off automatically.
- ☐ In order to remove fog from front windshield quickly, the air temperature must be above 1.5 °C (34.7 ° F). The A/C compressor is switched on and the blower is set to the highest.

20 - **Rear Window Defogger Button**

- ☐ The LED turns on when the system is active.
- ☐ It only works when the engine is running and turns off on its own after 10 minutes.

21 - **Left Temperature Control**

- ☐ The selected temperature will be shown in the display.

8.2 Display and Control Head, Removing and Installing

⇒ **"8.2.1 Display and Control Head, Removing and Installing, Electric-Manual Climate Control System and Climatronic", page 301**

8.2.1 Display and Control Head, Removing and Installing, Electric-Manual Climate Control System and Climatronic

Special tools and workshop equipment required



◆ Trim Removal Wedge - 3409-



Note

- ◆ Perform the replace control module function, a basic setting and an adaptation "A/C compressor first start" either in Guided Fault Finding or in Guided Functions when installing a new Climatronic Control Module - J255- or A/C Control Module - J301- .
- ◆ Pay attention to the turn off conditions for vehicles with the Start/Stop System. Refer to [⇒ "3.2 Vehicles with Start/Stop System General Information", page 6](#) .

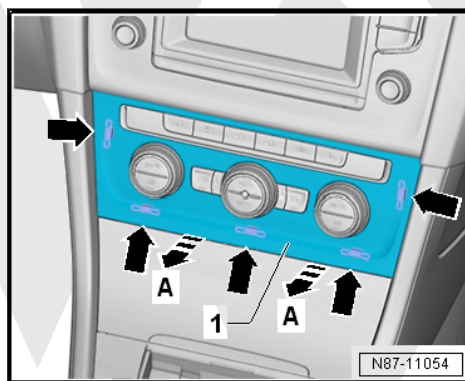
Removing



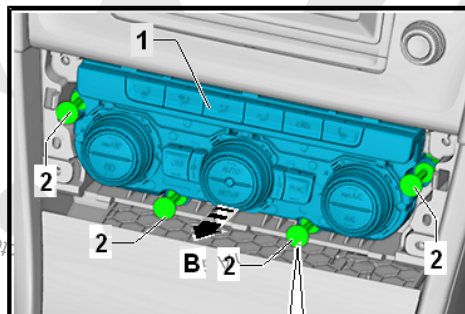
Note

The image shows a vehicle with Climatronic. Removing and installing on vehicles with an electric-manual climate control system is identical.

- Unclip the trim -1- from the display and control head at the points indicated -arrows- with the Trim Removal Wedge - 3409- in direction of -arrow A-.



- Push the display and control head in the direction of the instrument panel to release the expanding rivets.
- Remove the expanding rivets -2- in direction of -arrow A-.
- Remove the display and control head -1- in direction of -arrow B-.

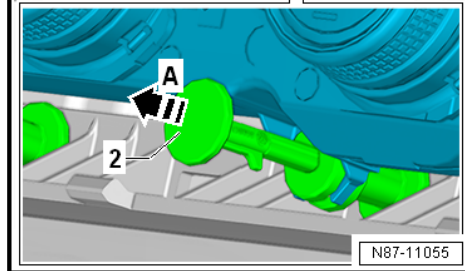


Installing



Note

Perform the replace control module function, a basic setting and an adaptation "A/C compressor first start" either in Guided Fault Finding or in Guided Functions when installing a new Climatronic Control Module - J255- or A/C Control Module - J301- .





9 Additional Components for Control and Regulation

⇒ [“9.1 Sunlight Photo Sensor G107 , Removing and Installing”, page 303](#)

⇒ [“9.2 Air Quality Sensor G238 , Removing and Installing”, page 304](#)

⇒ [“9.3 Function of Air Quality Sensor G238 ”, page 305](#)

⇒ [“9.4 Outside Air Temperature Sensor G17 , Removing and Installing”, page 307](#)

⇒ [“9.5 A/C Humidity Sensor G260 , Removing and Installing”, page 307](#)

⇒ [“9.6 Left Vent Temperature Sensor G150 , Removing and Installing”, page 307](#)

⇒ [“9.7 Right Vent Temperature Sensor G151 , Removing and Installing”, page 308](#)

⇒ [“9.8 Footwell Vent Temperature Sensor G192 , Removing and Installing”, page 309](#)

9.1 Sunlight Photo Sensor - G107- , Removing and Installing

Special tools and workshop equipment required

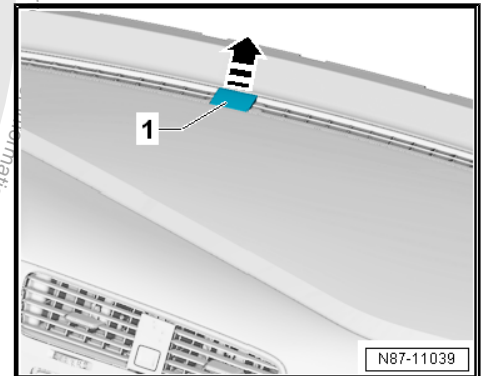
- ◆ Trim Removal Wedge - 3409-

Removing

- Unclip Sunlight Photo Sensor -1- in direction of -arrow- out of the instrument cluster.
- Disconnect the connector.

Installing

- Install in reverse order of removal.





9.2 Air Quality Sensor - G238- , Removing and Installing

⇒ [“9.2.1 Air Quality Sensor G238 , Removing and Installing”, page 304](#)

9.2.1 Air Quality Sensor - G238- , Removing and Installing



Note

- ◆ *The Air Quality Sensor - G238- is installed at the right front on the intake air grille in the plenum chamber.*
- ◆ *The Air Quality Sensor - G238- contains a highly sensitive electronic component that can be damaged if it comes in direct contact with solvents, fuels or chemicals.*
- ◆ *Do not install a sensor that has been kept, for example, in a tool box.*
- ◆ *Do not store removed sensors in areas where they can come into contact with solvents, fuels and certain chemical compositions (fluids or vapors).*
- ◆ *The Air Quality Sensor - G238- is only installed on vehicles with climatronic.*

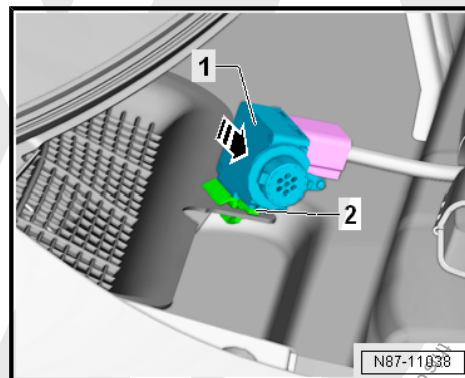
Removing

- Remove the fresh air intake cover. Refer to ⇒ [“6.3 Fresh Air Intake Cover, Removing and Installing”, page 274](#) .
- Release the securing tab -2- downward.
- Pull the Air Quality Sensor - G238- -1- in direction of -arrow-.
- Disconnect the connector.



Note

Do not store a removed Air Quality Sensor - G238- in areas where they can come into contact with solvents, fuels, and certain chemical compositions (fluids or vapors).



Installing

- Install in reverse order of removal. Note the following:
- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.

Tightening Specifications

- ◆ Bulkhead; overview - plenum chamber cover. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Bulkhead; Overview - Plenum Chamber Cover .



9.2.2 Air Quality Sensor - G238- , Removing and Installing, RHD



Note

- ◆ The Air Quality Sensor - G238- is installed at the left front on the intake air grille in the plenum chamber.
- ◆ The Air Quality Sensor - G238- contains a highly sensitive electronic component that can be damaged if it comes in direct contact with solvents, fuels or chemicals.
- ◆ Do not install a sensor that has been kept, for example, in a tool box.
- ◆ Do not store removed sensors in areas where they can come into contact with solvents, fuels and certain chemical compositions (fluids or vapors).
- ◆ The Air Quality Sensor - G238- is only installed on vehicles with climatronic.

Removing

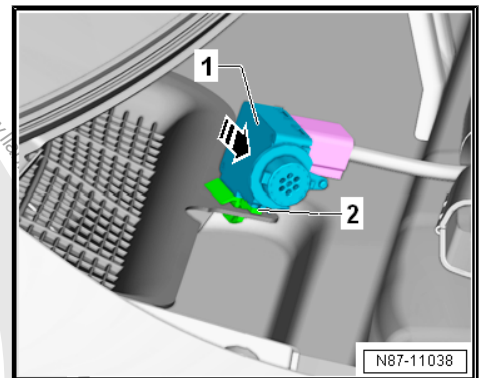
- Remove the fresh air intake cover. Refer to ➤ [“6.3 Fresh Air Intake Cover, Removing and Installing”, page 274](#).



Note

The illustration shows LHD. The removal is identical.

- Release the securing tab -2- downward.
- Pull the Air Quality Sensor - G238- -1- in the -direction of the arrow-.
- Disconnect the connector.



Note

Do not store a removed Air Quality Sensor - G238- in areas where they can come into contact with solvents, fuels, and certain chemical compositions (fluids or vapors).

Installing

- Install in reverse order of removal. Note the following:
- Check the DTC memory and erase any displayed entries using the Vehicle Diagnostic Tester in the “Guided Fault Finding” function.


Tightening Specifications

- ◆ Bulkhead; overview - plenum chamber cover. Refer to ➤ Body Exterior; Rep. Gr. 50 ; Bulkhead; Overview - Plenum Chamber Cover .

9.3 Function of Air Quality Sensor - G238-

- ◆ Sensor for air quality detects pollutants in the ambient air (mostly gasoline and/or diesel fumes).
- ◆ The Climatronic Control Module - J255- evaluates the signal from the Air Quality Sensor - G238- . The Air Conditioning (A/



- C) system is activated depending on the strength and type of heavily polluted air.
- ◆ At an outside temperature above approximately +2 °C (35.6 °F) the recirculating air mode is switched on when there is only a slight increase in pollutants in the ambient air.
 - ◆ At an outside temperature between approximately +2 °C (35.6 °F) and approximately -5 °C (23 °F), the change over to recirculating air mode only occurs at a sharp increase of pollutant concentration, during which the compressor is switched on simultaneously.
 - ◆ At an outside temperature less than approximately -5 °C (23 °F), the system still only changes to recirculation mode when there is a strong increase in the level of pollutants. However, it only switches on for approximately 15 seconds and the A/C compressor does not switch on. If the concentration decreases, the A/C system switches to the fresh air mode.
 - ◆ “Automatic recirculating air mode” can be switched off at any time. If the function is active, the A/C compressor is switched on with a request for “automatic recirculating air mode” and also when the outside air temperature is below 2 °C (35.6 °F). If the temperature is below -5 °C (23 °F), it is not possible to use the A/C compressor.
 - ◆ If the vehicle has “automatic recirculating air mode”, the A/C compressor can also be manually switched on when the temperature is approximately -5 °C (23 °F).
 - ◆ To ensure that the A/C system does not operate constantly in the recirculating air mode in areas with a consistently higher pollution, the sensor is self-learning (it adjusts its sensitivity to the environmental conditions).
 - ◆ If the pollutant level in the ambient air remains relatively high for a lengthy period, the sensor starts to adapt to the change in ambient conditions by way of an adaptation program, with the result that a recirculated-air request is generally applied for less than 12 minutes given uniform ambient air pollution. If a succession of peaks in the polluted air is detected, the A/C system can operate over a longer period of time in recirculating air mode.
 - ◆ A certain amount of time is required for repositioning of the air conditioning system doors. In the event that a sudden increase in pollutants is encountered (for example, when driving through a diesel exhaust cloud) gaseous pollutants can be taken in with the fresh air into the passenger compartment until the door can be closed. For this reason, a dust and pollen filter is installed with a charcoal layer. A filter that is saturated with pollutants is no longer effective and needs to be replaced.
 - ◆ In order to avoid frequent shifting of the recirculated air/fresh air door, a slight increase of pollutants in the ambient air will not allow for immediate shifting (the sensor does not send a request to the Climatronic Control Module - J255-). The filtering of the activated charcoal insert in the dust and pollen filter will be sufficient.
 - ◆ In order to avoid frequent shifting of the recirculating air/fresh air door, the requirement from the sensor for “Automatic air recirculation” mode remains for at least 25 seconds (minimum duration period), even if the pollutant concentration is so far reduced that recirculating air mode is no longer necessary.
 - ◆ If the A/C compressor is switched off (the  button is off), then the Climatronic Control Module - J255- limits the “automatic recirculating air mode” to approximately 15 seconds to prevent the windows from fogging up.



- ◆ So that fogged windows are cleared as quickly as possible, the Climatronic Control Module - J255- does not permit recirculated air operation during the "Defrost" operating mode.
- ◆ The Air Quality Sensor - G238- requires approximately 30 seconds to become operational once the ignition has been switched on (warm-up time). During this time there is no requirement from the sensor to Climatronic Control Module - J255- for "automatic recirculating air mode".
- ◆ The Air Quality Sensor - G238- contains a highly sensitive electronic component which can be damaged if it comes in direct contact with solvents, fuels or chemicals. For this reason, do not install sensors that may have come into contact with these substances.

9.4 Outside Air Temperature Sensor - G17- , Removing and Installing

Removing

- Remove the radiator grille. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Radiator Grille/Front Trim; Radiator Grille, Removing and Installing .
- Unclip the Outside Air Temperature Sensor - G17- -1- from the bracket -arrow-.
- Remove the Outside Air Temperature Sensor - G17- upward.
- Disconnect the connector.

Installing



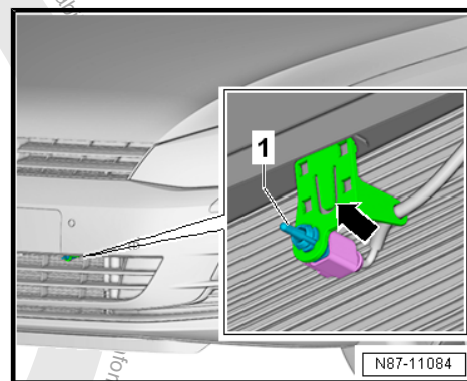
Note

Ensure electrical connector is seated correctly (water entry).

- Install in reverse order of removal.

Tightening Specifications

- ◆ Overview - Radiator Grille. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Radiator Grille/Front Trim; Overview - Radiator Grille .



9.5 A/C Humidity Sensor - G260- , Removing and Installing

The A/C Humidity Sensor - G260- and the Rain/Light Recognition Sensor - G397- are one component and are vehicle-specific.

- Removing and Installing. Refer to ⇒ Electrical Equipment; Rep. Gr. 92 ; Windshield Wiper System; Rain/Light Recognition Sensor, Removing and Installing .



Note

The diagnosis occurs via the Vehicle Electrical System Control Module - J519- .

9.6 Left Vent Temperature Sensor - G150- , Removing and Installing

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester



Removing



Note

- ◆ *Only for vehicles with Climatronic. For vehicles with heater or electronic-manually regulated A/C system the openings on the air guide channels are closed with plugs.*
- ◆ *The illustration shows RHD. The procedure is identical.*
- Remove the instrument panel side cover. Refer to ➤ Body Interior; Rep. Gr. 70 ; Instrument Panel; Instrument Panel Side Cover, Removing and Installing .
- Turn the vent temperature sensor -1- in direction of -arrow- and remove it from the mount.
- Disconnect the connector -2-.

Installing

Install in reverse order of removal. Note the following:

- Replace the seal -3- if it is damaged or faulty.



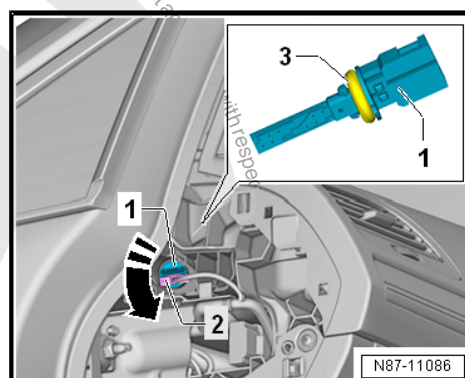
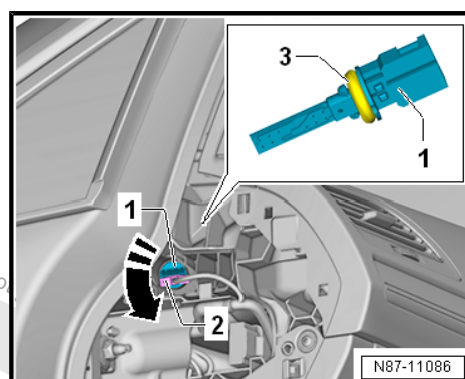
Note

An incorrectly installed vent temperature sensor causes flow-generated noise.

- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.

Tightening Specifications

- ◆ Instrument panel; instrument panel side cover removing and installing. Refer to ➤ Body Interior; Rep. Gr. 70 ; Instrument Panel; Instrument Panel Side Cover, Removing and Installing .



9.7 Right Vent Temperature Sensor - G151- , Removing and Installing

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester

Removing



Note

- ◆ *Only for vehicles with Climatronic. For vehicles with heater or electronic-manually regulated Air Conditioning (A/C) system the openings on the air guide channels are closed with plugs.*
- ◆ *The illustration shows RHD. The procedure is identical.*



- Remove the instrument panel side cover. Refer to ➤ Body Interior; Rep. Gr. 70 ; Instrument Panel; Instrument Panel Side Cover, Removing and Installing .
- Turn the vent temperature sensor -1- in direction of -arrow- and remove it from the mount.
- Disconnect the connector -2-.

Installing

Install in reverse order of removal. Note the following:

- Replace the seal -3- if it is damaged or faulty.



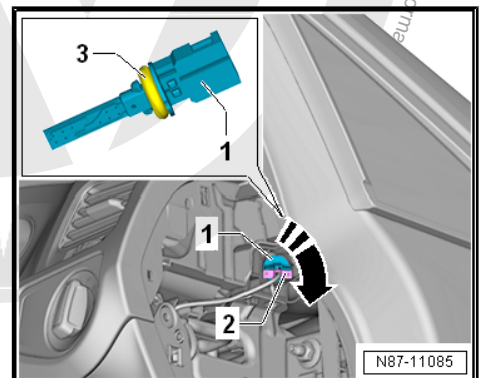
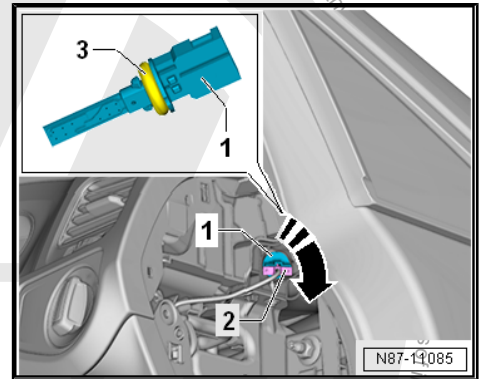
Note

An incorrectly installed vent temperature sensor causes flow-generated noise.

- Check the Diagnostic Trouble Code (DTC) memory and erase any displayed entries using the Vehicle Diagnostic Tester in the "Guided Fault Finding" function.

Tightening Specifications

- ◆ Instrument panel; instrument panel side cover removing and installing. Refer to ➤ Body Interior; Rep. Gr. 70 ; Instrument Panel; Instrument Panel Side Cover, Removing and Installing .



9.8 Footwell Vent Temperature Sensor - G192- , Removing and Installing

Special tools and workshop equipment required

- ◆ Trim Removal Wedge - 3409-
- ◆ Vehicle Diagnostic Tester

Removing



Note

Only for vehicles with Climatronic. For vehicles with heater or electronic-manually regulated Air Conditioning (A/C) system the openings on the air guide channels are closed with plugs.

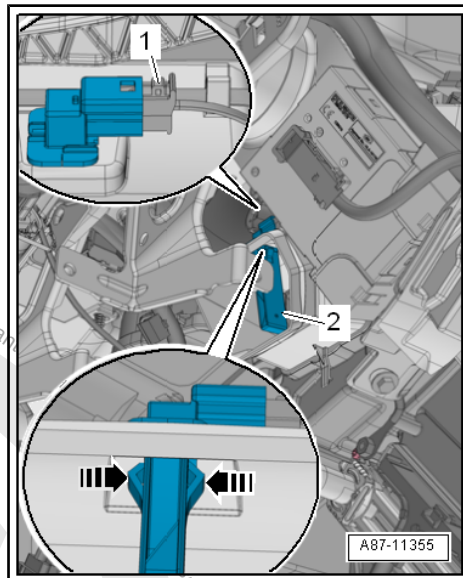
- Remove the driver footwell vent. Refer to ➤ ["6.5 Driver Side Footwell Vent, Removing and Installing", page 276](#) .



- Slightly lift the Footwell Vent Temperature Sensor - G192- -2-.
- Release the catches -arrows- with a Trim Removal Wedge - 3409- .
- Remove the Footwell Vent Temperature Sensor - G192- -2- upward.
- Disconnect the connector -1-.

Installing

- Install in reverse order of removal.

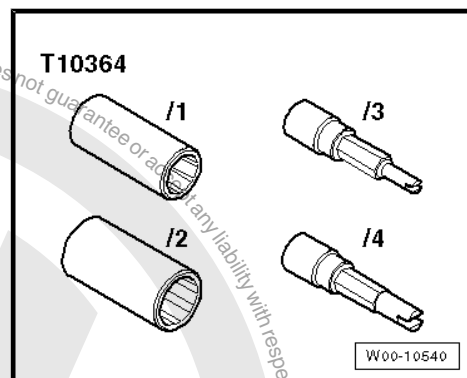




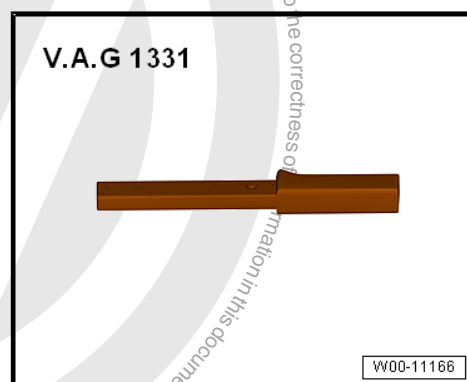
10 Special Tools

Special tools and workshop equipment required

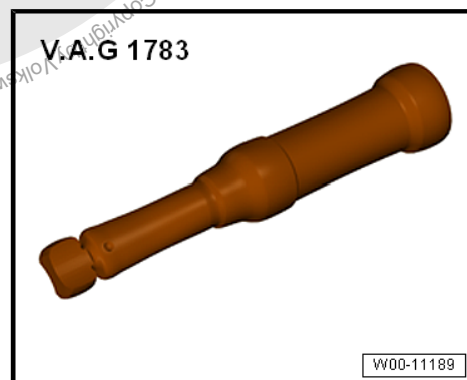
- ◆ Refrigerant Sockets - T10364-



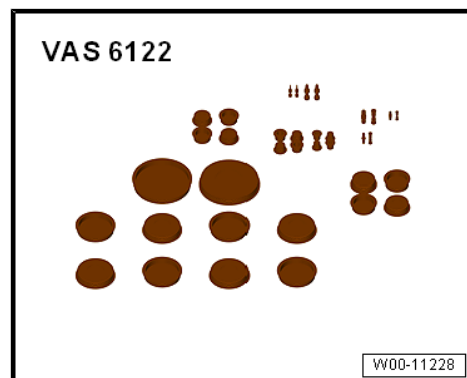
- ◆ Torque Wrench 1331 5-50Nm - VAG1331-



- ◆ Torque Wrench 1783 - 2-10Nm - VAG1783-

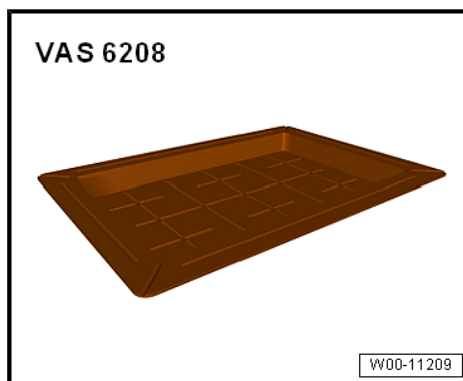


- ◆ Engine Bung Set - VAS6122-

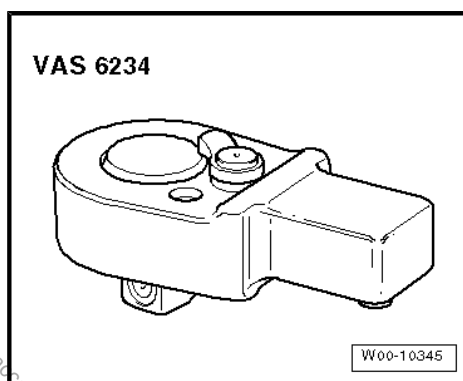




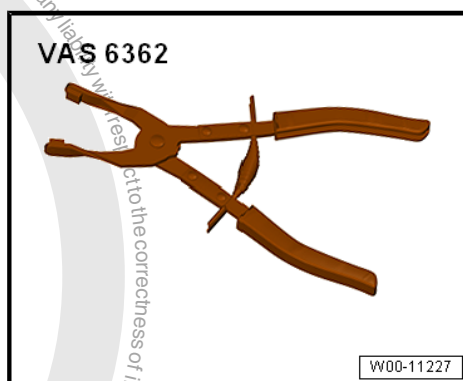
◆ Shop Crane - Drip Tray - VAS6208-



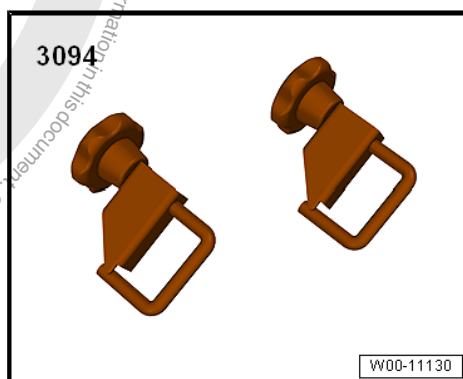
◆ Torque Wrench 1783 - 1/4" Drive Ratchet - VAS6234-



◆ Hose Clip Pliers - VAS6362-

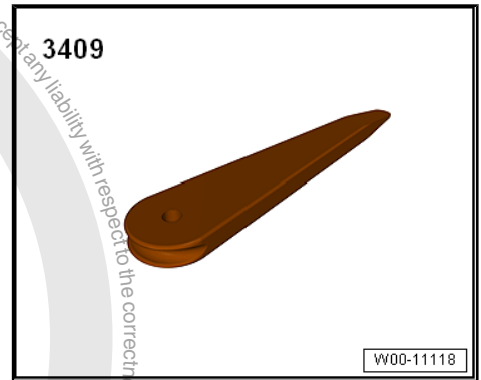


◆ Hose Clamps - Up To 25mm - 3094-





◆ Trim Removal Wedge - 3409-



- ◆ A/C Service Station
- ◆ Cooling System Tester - VAG1274B-
- ◆ Spring Clip Pliers - VAS6499-
- ◆ Commercially available extra-long 12 edge socket, 1/2" 24-wrench size (Dimensions DxL 32x82 mm)

Edition: K0059210721 - FNLC - 11/19/2014 - JLH





11 Revision History

Re vi- sion	Date	Job Type	Feedback #	Notes	Editor
2	11/ 19/ 201 4	Link Check- ing			Tom Perry
1	11/ 12/ 201 4	Factory New	N/A		Jim Harder

Cautions & Warnings

Please read these WARNINGS and CAUTIONS before proceeding with maintenance and repair work. You must answer that you have read and you understand these WARNINGS and CAUTIONS before you will be allowed to view this information.

- If you lack the skills, tools and equipment, or a suitable workshop for any procedure described in this manual, we suggest you leave such repairs to an authorized Volkswagen retailer or other qualified shop. We especially urge you to consult an authorized Volkswagen retailer before beginning repairs on any vehicle that may still be covered wholly or in part by any of the extensive warranties issued by Volkswagen.
- Disconnect the battery negative terminal (ground strap) whenever you work on the fuel system or the electrical system. Do not smoke or work near heaters or other fire hazards. Keep an approved fire extinguisher handy.
- Volkswagen is constantly improving its vehicles and sometimes these changes, both in parts and specifications, are made applicable to earlier models. Therefore, part numbers listed in this manual are for reference only. Always check with your authorized Volkswagen retailer parts department for the latest information.
- Any time the battery has been disconnected on an automatic transmission vehicle, it will be necessary to reestablish Transmission Control Module (TCM) basic settings using the VAG 1551 Scan Tool (ST).
- Never work under a lifted vehicle unless it is solidly supported on stands designed for the purpose. Do not support a vehicle on cinder blocks, hollow tiles or other props that may crumble under continuous load. Never work under a vehicle that is supported solely by a jack. Never work under the vehicle while the engine is running.
- For vehicles equipped with an anti-theft radio, be sure of the correct radio activation code before disconnecting the battery or removing the radio. If the wrong code is entered when the power is restored, the radio may lock up and become inoperable, even if the correct code is used in a later attempt.
- If you are going to work under a vehicle on the ground, make sure that the ground is level. Block the wheels to keep the vehicle from rolling. Disconnect the battery negative terminal (ground strap) to prevent others from starting the vehicle while you are under it.
- Do not attempt to work on your vehicle if you do not feel well. You increase the danger of injury to yourself and others if you are tired, upset or have taken medicine or any other substances that may impair you or keep you from being fully alert.
- Never run the engine unless the work area is well ventilated. Carbon monoxide (CO) kills.
- Always observe good workshop practices. Wear goggles when you operate machine tools or work with acid. Wear goggles, gloves and other protective clothing whenever the job requires working with harmful substances.
- Tie long hair behind your head. Do not wear a necktie, a scarf, loose clothing, or a necklace when you work near machine tools or running engines. If your hair, clothing, or jewelry were to get caught in the machinery, severe injury could result.
- Do not re-use any fasteners that are worn or deformed in normal use. Some fasteners are designed to be used only once and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow the recommendations in this manual - replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.

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- Illuminate the work area adequately but safely. Use a portable safety light for working inside or under the vehicle. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.
- Friction materials such as brake pads and clutch discs may contain asbestos fibers. Do not create dust by grinding, sanding, or by cleaning with compressed air. Avoid breathing asbestos fibers and asbestos dust. Breathing asbestos can cause serious diseases such as asbestosis or cancer, and may result in death.
- Finger rings should be removed so that they cannot cause electrical shorts, get caught in running machinery, or be crushed by heavy parts.
- Before starting a job, make certain that you have all the necessary tools and parts on hand. Read all the instructions thoroughly; do not attempt shortcuts. Use tools that are appropriate to the work and use only replacement parts meeting Volkswagen specifications. Makeshift tools, parts and procedures will not make good repairs.
- Catch draining fuel, oil or brake fluid in suitable containers. Do not use empty food or beverage containers that might mislead someone into drinking from them. Store flammable fluids away from fire hazards. Wipe up spills at once, but do not store the oily rags, which can ignite and burn spontaneously.
- Use pneumatic and electric tools only to loosen threaded parts and fasteners. Never use these tools to tighten fasteners, especially on light alloy parts. Always use a torque wrench to tighten fasteners to the tightening torque listed.
- Keep sparks, lighted matches, and open flame away from the top of the battery. If escaping hydrogen gas is ignited, it will ignite gas trapped in the cells and cause the battery to explode.
- Be mindful of the environment and ecology. Before you drain the crankcase, find out the proper way to dispose of the oil. Do not pour oil onto the ground, down a drain, or into a stream, pond, or lake. Consult local ordinances that govern the disposal of wastes.
- The air-conditioning (A/C) system is filled with a chemical refrigerant that is hazardous. The A/C system should be serviced only by trained automotive service technicians using approved refrigerant recovery/recycling equipment, trained in related safety precautions, and familiar with regulations governing the discharging and disposal of automotive chemical refrigerants.
- Before doing any electrical welding on vehicles equipped with anti-lock brakes (ABS), disconnect the battery negative terminal (ground strap) and the ABS control module connector.
- Do not expose any part of the A/C system to high temperatures such as open flame. Excessive heat will increase system pressure and may cause the system to burst.
- When boost-charging the battery, first remove the fuses for the Engine Control Module (ECM), the Transmission Control Module (TCM), the ABS control module, and the trip computer. In cases where one or more of these components is not separately fused, disconnect the control module connector(s).
- Some of the vehicles covered by this manual are equipped with a supplemental restraint system (SRS), that automatically deploys an airbag in the event of a frontal impact. The airbag is operated by an explosive device. Handled improperly or without adequate safeguards, it can be accidentally activated and cause serious personal injury. To guard against personal injury or airbag system failure, only trained Volkswagen Service technicians should test, disassemble or service the airbag system.

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- Do not quick-charge the battery (for boost starting) for longer than one minute, and do not exceed 16.5 volts at the battery with the boosting cables attached. Wait at least one minute before boosting the battery a second time.
- Never use a test light to conduct electrical tests of the airbag system. The system must only be tested by trained Volkswagen Service technicians using the VAG 1551 Scan Tool (ST) or an approved equivalent. The airbag unit must never be electrically tested while it is not installed in the vehicle.
- Some aerosol tire inflators are highly flammable. Be extremely cautious when repairing a tire that may have been inflated using an aerosol tire inflator. Keep sparks, open flame or other sources of ignition away from the tire repair area. Inflate and deflate the tire at least four times before breaking the bead from the rim. Completely remove the tire from the rim before attempting any repair.
- When driving or riding in an airbag-equipped vehicle, never hold test equipment in your hands or lap while the vehicle is in motion. Objects between you and the airbag can increase the risk of injury in an accident.

I have read and I understand these Cautions and Warnings.