The 2019 Audi A8 Climate Control Systems

eSelf-Study Program 980193

Audi Academy

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Service Training
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Always check Technical Bulletins and the latest electronic service repair literature for information that may supersede any information included in this booklet.

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The eSelf-Study Program (eSSP) teaches a basic understanding of the design and mode of operation of new models, new automotive components or new technologies.

It is not a repair manual! Figures are given for explanatory purposes only and refer to the data valid at the time of preparation of the SSP.

For further information about maintenance and repair work, always refer to the current technical literature.

Note

Reference

Introduction

The climate control system of the 2019 Audi A8 will mark the introduction of a new refrigerant as well as new in-car air quality enhancements.

The new refrigerant is carbon dioxide-CO_2. It has different physical properties than other refrigerants in use. For example, it is non-flammable, colorless and odorless.

Because a carbon dioxide charged system will operate at much higher pressures, the components of the refrigerant system have been adapted.

The new refrigerant will only be offered in Europe at the launch of the 2019 A8. The dates for implementation in the US have not been determined at the time of the release of this SSP.

For the North American market, the 2019 A8 will use refrigerant R-1234yf at vehicle introduction.

The new 2019 also offers air quality features such as a cabin fragrance system and an air improvement system.

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Learning objectives of this eSelf-Study Program:

This eSelf-Study Program describes the new features of the climate control system in the 2019 Audi A8, as well as the design and function of the refrigerant system filled with the new R744 refrigerant introduced in this model. Once you have completed this eSelf-Study Program you will be able to answer questions on the following topics:

- How is the air conditioning system configured for use of the new R744 refrigerant?
- What are the points to note when servicing the cabin fragrance system function unit?
- What are the new display and control features of the air conditioning system?
- What new massage functions are available in the new Audi A8?

The new R744 refrigerant

The new refrigerant is carbon dioxide. It has the chemical formula CO_2 and is also known as R744. It contains neither fluorine nor chlorine and is produced in a series of natural processes without the possibility depleting the Earth's ozone layer.

CO_2 is a colorless, non-flammable gas and is chemically slow to react with with other elements. Carbon dioxide is heavier than air. It is a naturally occurring substance which is available at an affordable price.

In the event that the refrigerant circuit should incur a leak, the refrigerant can enter the atmosphere without causing damage to the environment.

Carbon dioxide can exist in solid, liquid, gaseous and supercritical states, but it only occurs in gaseous, liquid and supercritical states in automotive refrigerant systems systems.

CO_2 based refrigerant systems operate at 10 times the pressure of systems filled with the refrigerants used previously.

The system has to be sealed more tightly because CO_2 molecules are smaller than the molecules of other refrigerants.

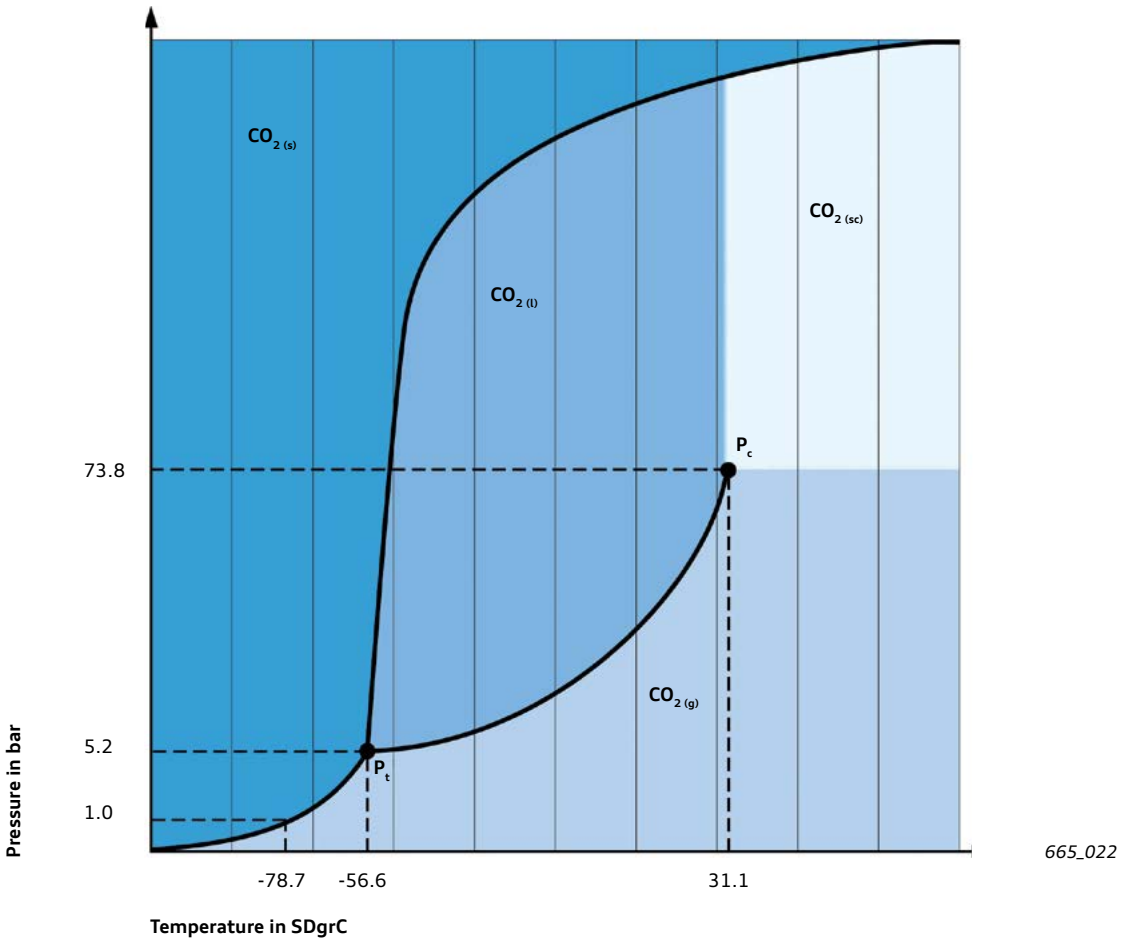
R744 refrigerant is a natural substance. It may be discharged into the environment and is not subject to the documentation requirements which apply to chemical refrigerants.

Features	
Chemical formula	CO_2
Chemical name	Carbon dioxide
Boiling point at 14.5 psi (1 bar) (absolute pressure)	109.6 °F (-78.7 °C)
Freezing point	-69.8 °F (-56.6 °C)
Triple point – Pt	-69.8 °F (-56.6 °C) at 75.4 psi (5.2 bar) (absolute)
Critical point – Pc	87.8 °F (73.8 bar) at 73.8 bar (absolute)
Purity (for refrigerant circuits in Audi models)	>99.995 %
Flammability	Non-flammable
Form	Compressed, liquefied gas
Color	Colorless
Odor	No inherent odor

Note
The new refrigerant will only be offered in Europe at launch. The dates for implementation in the US have not been determined at the time of the release of this SSP. about not available at launch.

Note
The R744 refrigerant odes not have an inherent odor and therefore is not noticeable. However, the refrigerant gas is heavier than air and can accumulate in lower-lying areas such as inspection pits, basement rooms, where it displaces the ambient air and oxygen. Working in areas with a low oxygen level can have life-threatening consequences.

Phase diagram for carbon dioxide – CO_2



The phase diagram showing the solid (s), liquid (l), gaseous (g) and supercritical (sc) phases of carbon dioxide is not to scale.

Properties of the R744:

A supercritical situation can occur in the R744 refrigerant circuit. The critical point is when a substance enters a thermodynamic state, where the densities of the liquid and gas phases become equal and the distinction between them disappears. In a supercritical situation, the state of the refrigerant in the gas cooler does not change from gaseous to liquid state, but rather is cooled only. Hence the term "gas cooler".

Due to the higher energy content of CO_2, a lower mass flow rate is required in order to achieve the same refrigerating capacity. In addition to increasing the refrigerating capacity of the system, this advantage can be used to realize a more compact unit design and to reduce the flow component cross-sections.

Global Warming Potential

The Global Warming Potential (GWP) describes the relative global warming effect of a greenhouse gas, that is, how much a gas potentially contributes to the warming of the Earth's atmosphere.

The reference value used as the basis for comparison is that of carbon dioxide (CO_2), which has a GWP of one. The smaller the GWP value, the lesser the potential global warming effect and, by implication, the less the impact on the environment.

For example, R1234yf has a GWP of four for a time horizon of 100 years. This means that one kilogram of R1234yf has four times the global warming effect of one kilogram of CO_2 within the first 100 years after its release into the environment.

Starting from 1 January 2017, vehicles using a refrigerant with a GWP value of greater than 150 cannot be type-approved in European Union countries. For this reason, the use of refrigerants such as R134a is prohibited in these countries.

For this reason, Audi has been using the R1234yf refrigerant as standard since 2016 in many countries. With the launch of the new Audi A8, carbon dioxide is available as an alternative refrigerant.

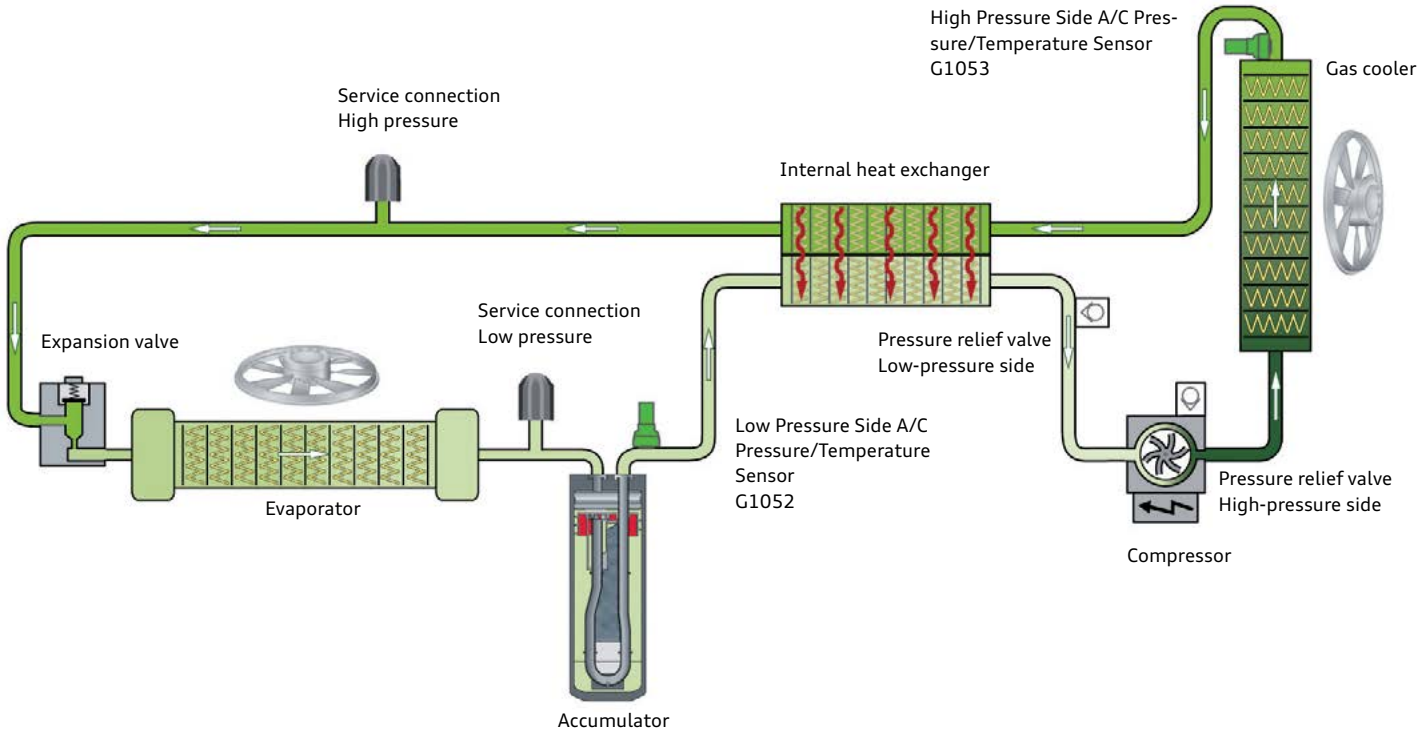
Properties of the various refrigerants

Refrigerant	**R12** (CFCs)	**R134a** (HFCs)	**R1234yf** (HFCs)	**R744** (CO_2)
Ozone layer depletion	Yes	No	No	No
Global Warming Potential (GWP)	About 10,000x that of CO_2	About 1,400x that of CO_2	About 4x that of CO_2	1x
Year of use in vehicle	Up to 1992	From 1991 onwards	From 2016 onwards	US date TBD
Refrigerant type	Synthetic	Synthetic	Synthetic	Natural
Flammable	No	No	Yes	No
Pressure	< 435.1 psi (30 bar)	< 435.1 psi (30 bar)	< 435.1 psi (30 bar)	< 2030.5 psi (140 bar)

Design of the R744 refrigerant system

Schematic diagram and function description

The key difference to the previously used refrigerant systems is the high working pressures. Higher pressures are required to make use of $C0_2$ as a refrigerant. R744 will operate at a pressure of about 2030.3 psi (140 bar) on the high pressure side of the circuit and about 1348.8 psi (93 bar) on the low pressure side.



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Component designation	Processes in the refrigerant circuit
Compressor	Compression of gaseous CO_2 to a higher pressure level
Gas cooler	Cooling of the refrigerant
Internal heat exchanger	Heat is dissipated in the internal heat exchanger. Heat is transferred from the high-pressure side to the low-pressure side.
Expansion valve	When refrigerant expands in the expansion valve, the pressure is reduced by restricting the flow.
Evaporator	The refrigerant absorbs energy from the air flowing through the evaporator.
Accumulator	The accumulator dries and stores the refrigerant and provides a place for the oil and refrigerant to mix.
Internal heat exchanger	Heat is absorbed in the internal heat exchanger. Heat is transferred from the high-pressure side to the low-pressure side.

AC compressor

The AC compressor compresses the gaseous refrigrant so that it can subsequently be allowed to expand again inside the evaporator. The expansion of the refrigerant causes the temperature to drop, allowing heat to be extracted from the passenger compartment.

The refrigerant compressor works on the same principle as an axial piston pump or axial piston compressor, with fixed pistons spaced at even intervals around the inner circumference of working cylinders and mounted movably on a rotating swashplate. By following the tilt of the swashplate, the individual pistons move in a reciprocating linear manner inside their cylinders, with the result that refrigerant is drawn into the compressor, compressed inside the piston chamber and then pumped into the refrigerant circuit.

The tilt angle of the swashplate is variable, and changes the resultant mass flow. The angle of the swashplate regulates itself according to the required mass flow.

Specifications of the compressor:

- 9 pistons.
- 31 cm³ stroke volume.
- Mass flow controlled.

665_003

Gas cooler

The gas cooler is a newly developed component which takes the place of the condenser. It cools the refrigerant down. The gas cooler dissipates process heat of the high pressure side to the atmosphere. It is designed for both supercritical operation (as a "gas cooler") and alternating phase operation (as a "condenser"). The term "alternating phase" defines a refrigerant whose aggregate state alternates between gaseous and liquid.

The gas cooler is made of flat tubes. Inside the flat tubes, smaller tubes are bundled longitudinally. The flat tubes themselves are arranged in a row next to one another. The refrigerant flows through the gas cooler into the upper segments and then back to the lower segments in the opposite direction.

High Pressure Side A/C Pressure/Temperature Sensor G1053 is located at the gas cooler.

665_004

Internal heat exchanger

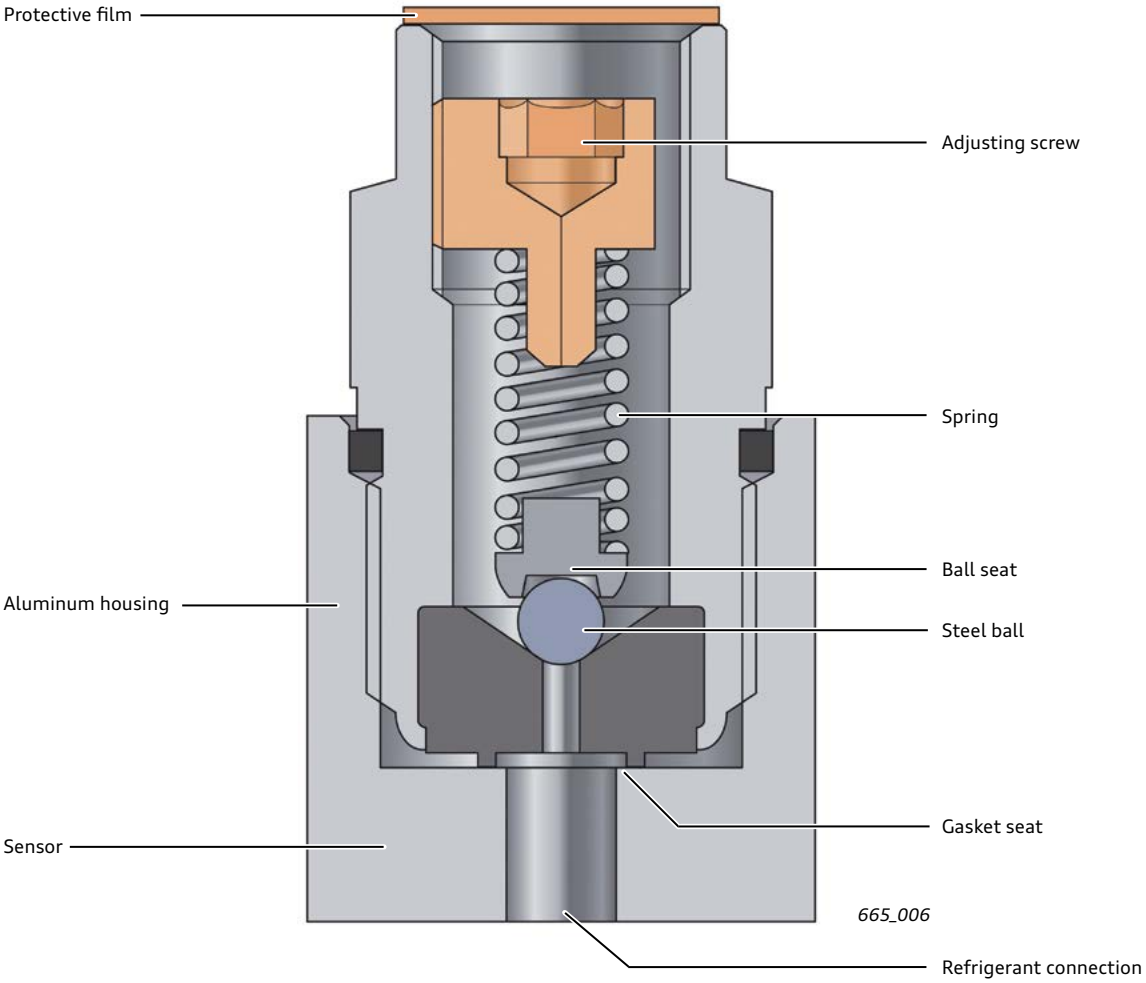
The internal heat exchanger is similar to the Coolaxial pipe used in other Audi model refrigerant systems.

The internal heat exchanger is a tube-in-tube heat exchanger consisting of an inner high-pressure tube enveloped by low-pressure tubes. The refrigerant flowing through the low-pressure tubes absorbs heat. In the high-pressure tube, the refrigerant flowing in the opposite direction gives off heat. This allows energy to be exchanged between the low and high-pressure sides.

The principal task of the internal heat exchanger is to increase the efficiency of the refrigerant circuit. This is achieved by extending the circulation process to increase the enthalpy difference at the evaporator. For this purpose, the internal heat exchanger using refrigerant R744 is required to be about a yard (meter) long.

Note: Enthalpy is defined as a thermodynamic quantity equivalent to the total heat content of a system. It is equal to the internal energy of the system plus the product of pressure and volume.

Pressure relief valve, low and high-pressure sides



Functional principle

If overpressure occurs in the refrigerant circuit, a steel ball in the valve is pressed against a spring. This opens passage which is closed at normal pressure, allowing the refrigerant to escape.

Both pressure relief valves are reversible valves. The valve is leak-tested using gas prior to shipping. The pressure relief valves protect the refrigerant circuit against excessively high pressures.

The pressure relief valve on the low-pressure side opens when an excessively high pressure occurs in the refrigerant circuit when the system is switched off. This can occur if the refrigerant is heated in warm ambient conditions, causing the system pressure to increase. The pressure control valve opens at a pressure of about 1740.4 psi ± 145 psi (120 bar ± 10 bar)

The pressure relief valve on the high-pressure side opens if an excessively high system pressure occurs due to a fault in the control system or a damaged or clogged line on the high-pressure side.

In this case, the pressure control valve opens at a pressure of about 2320.6 psi ± 145 psi (160 bar ± 10 bar).

Two valves have different diameters to prevent from being installed in the wrong locations. **Both valves have a left-handed thread**.

A valve with an M12x1 thread is used on the high-pressure side and a valve with an M14x1 thread on the low-pressure side. The valves have different tightening torques.

The pressure relief valve on the low-pressure side is located at the block connection from the internal heat exchanger.

The pressure relief valve on the high-pressure side is located directly at the AC compressor.

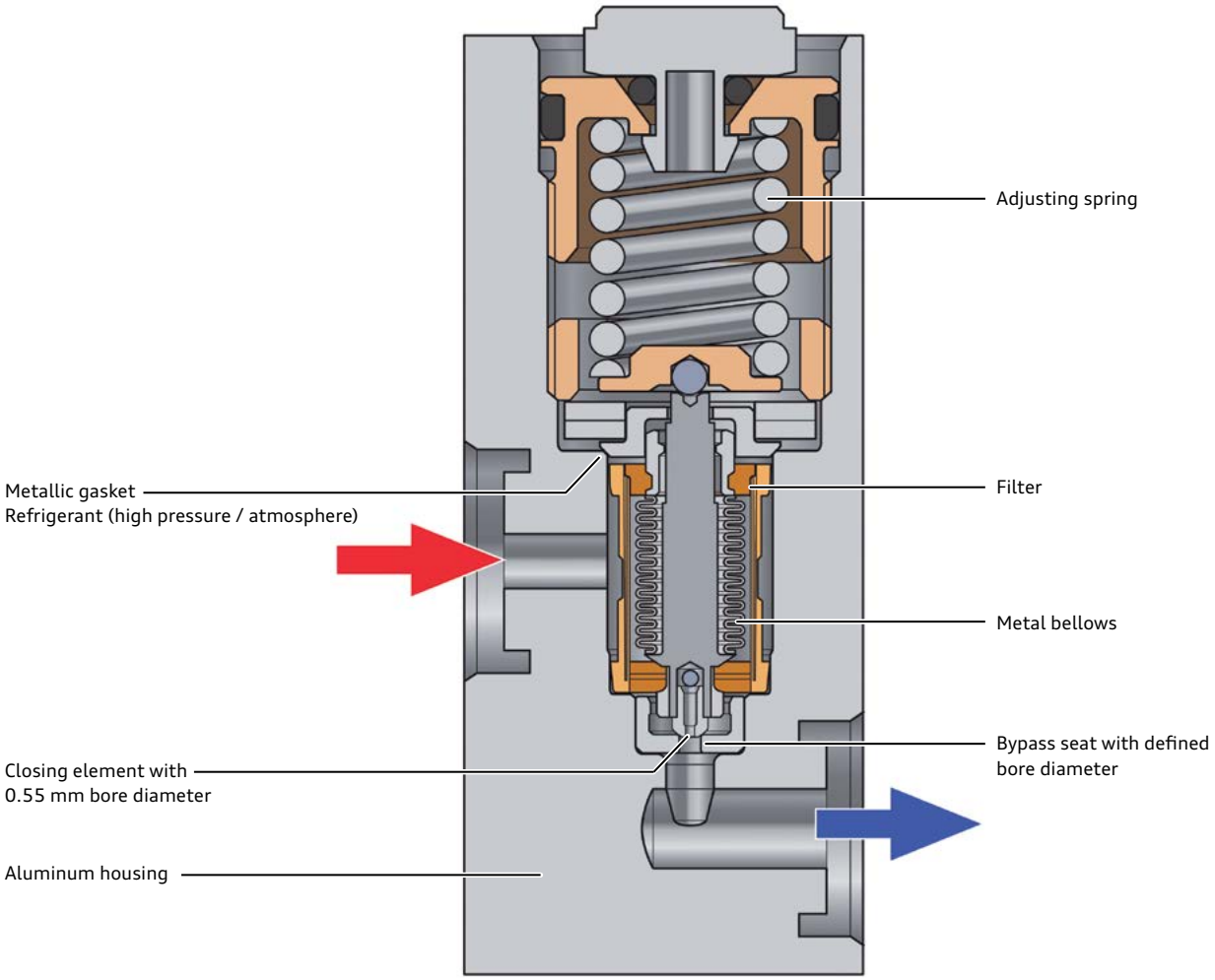
Note
If the valve has opened, it will be indicated by a broken protective foil. An opened valve must be replaced. The refrigerant must be evacuated completely before removing the valves.

Expansion valve

The expansion valve is the interface between the high and low-pressure sides.

The task of this valve is to expand and cool the highly pressurized refrigerant at a low pressure level.

It acts as a high-pressure-controlled expansion element for the evaporator. The refrigerant is expanded at medium and high load using a defined bore diameter of 0.55 mm. At high load, an additional bypass flow is opened in a controlled manner by a spring.



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Evaporator

The task of the evaporator is to extract heat the passenger compartment.

The evaporator consists of flat tubes, in each of which small tubes are bundled longitudinally. The refrigerant is circulated several times through these tubes. They are arranged in two vertical rows (one behind the other) inside the evaporator. The key here is that the refrigerant mass flow is distributed evenly to all flat tubes.

Accumulator

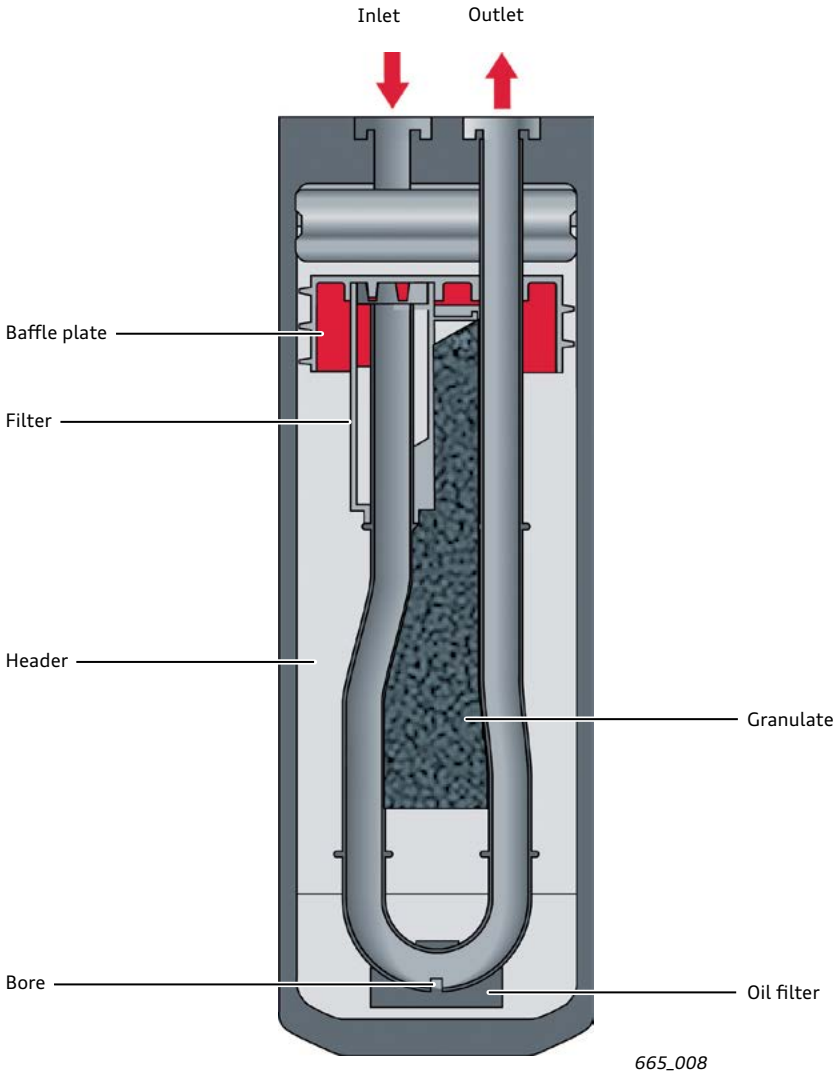
The accumulator is integrated into the refrigerant circuit on the low-pressure side between the evaporator and the internal heat exchanger. It has a diameter of about 2.95 in (75 mm) and is built into the wheel well on the driver's side under the A pillar.

The accumulator has the following tasks:

- Header / reservoir for non-circulating refrigerant.
- Reservoir for refrigerant oil.
- Drying and extracting water from the circulating refrigerant.

The accumulator ensures that the refrigerant is of the optimal quality, that is, having the ideal vapor content for the internal heat exchanger.

After the refrigerant enters the accumulator it comes into contact with the baffle plate, where the liquid phase is separated from the gaseous phase. Excess refrigerant is stored in the header after it has been filtered and dried. The refrigerant oil is also filtered and flows through a bore in the intake manifold into the refrigerant circuit leading to the AC compressor together with the refrigerant emerging from the accumulator.



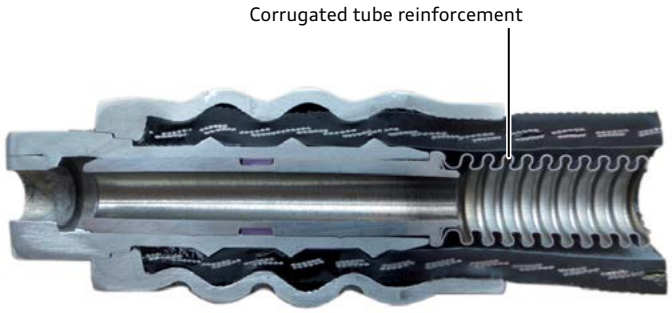
Refrigerant lines

Refrigerant lines on hot gas side

The refrigerant on the hot gas side is a hose and pipe connection from the compressor to the gas cooler.

Refrigerant lines on high and low-pressure sides

The refrigerant lines on the high and low-pressure sides are hose or tube connections without a corrugated tube reinforcement.



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665_025

The high temperatures of the compressed refrigerant necessitate channeling it through a corrugated metallic pipe held in shape by a steel-fiber reinforced tubing.

Working pressure in the refrigerant lines

- The working pressure is approximately 2030.5 psi (140 bar).
- The refrigerant lines are designed for temperatures from approximately -40 °F to 356 °F (-40 °C to 180 °C).

Note

If repairs are needed, the complete refrigerant system must always be checked for an absence of pressure. There should be absolutely no pressure in the system. Close attention must be paid to cleanliness. The connections must be perfect before tightening. The refrigerant lines must not be flexed and the refrigerant hoses must not be kinked during the tightening, removal or re-installation procedures.

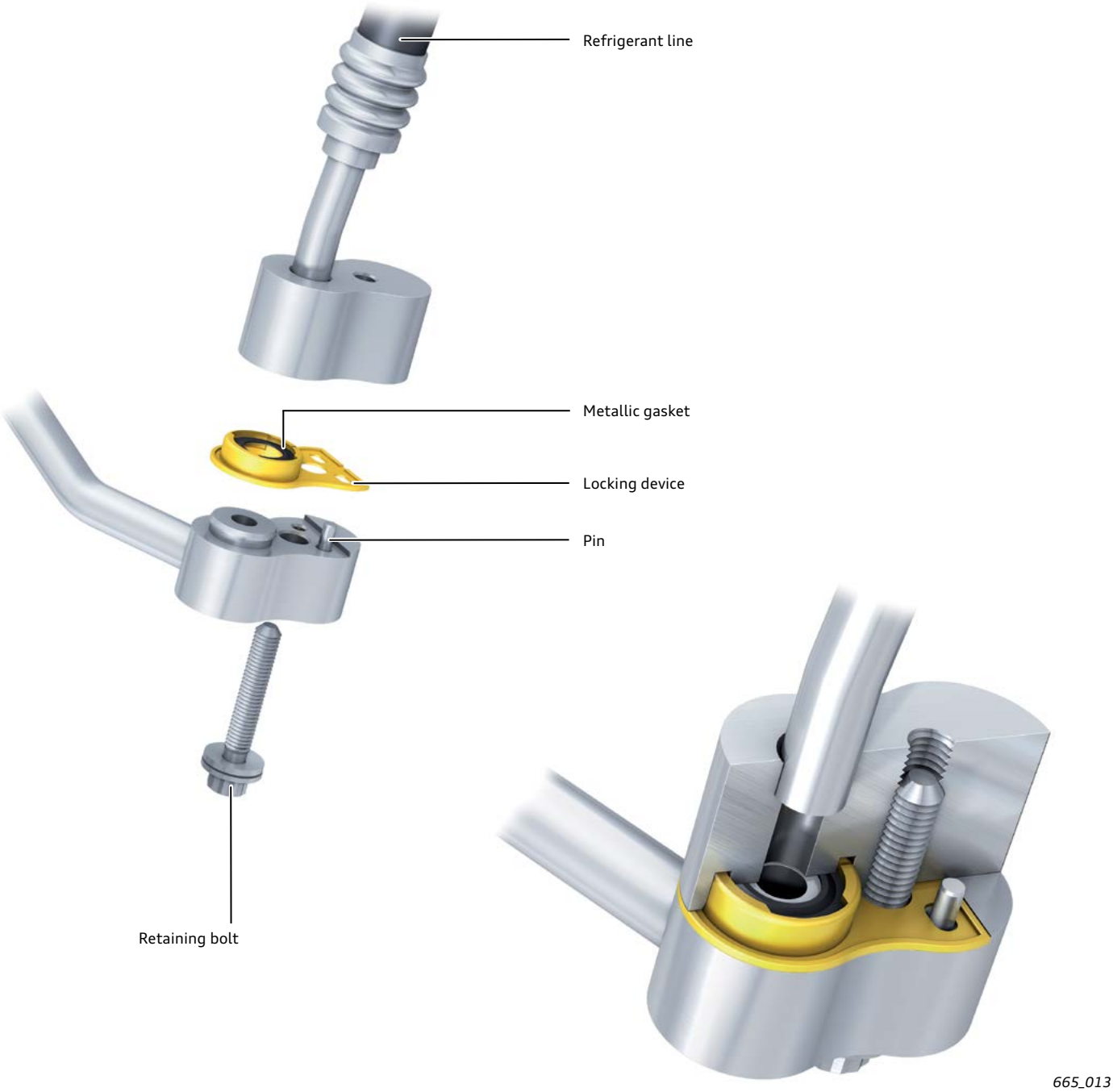
Connection system

The refrigerant lines have special gaskets which are designed to withstand the high pressures within the refrigerant circuit and to seal it against the atmosphere.

The actual metal gasket is located inside the locking device (yellow element). The refrigerant lines are interlocked with the locking device by a pin.

The locking device, including the gasket as well as the retaining bolt, must be replaced whenever the refrigerant lines are repaired. This is necessary in order to ensure the maximum integrity of the refrigerant system. When carrying out this work, pay **close attention to cleanliness** and make sure that the gasket is **properly seated** during installation.

It is also important to make sure that the sealing faces are oil and grease free before installing the refrigerant lines.



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Note
The metallic gasket can only seal the system if the retaining bolt is tightened to the correct specified torque value.

Refrigerant pressure and temperature sensors G1052 / G1053

The refrigerant pressure and temperature sensors G1052 and G1053 have different tasks and installation positions.

The tasks for Low Pressure Side A/C Pressure/Temperature Sensor G1052 are to supply signals for low pressure control and low fill level detection. It is attached to the low pressure line on the output side of the accumulator.

The tasks for High Pressure Side A/C Pressure/Temperature Sensor G1053 are to supply signals for high pressure and hot gas temperature control, in order to protect the components of the compressor. It is attached to the high pressure line directly at the inlet side of the gas cooler.

The refrigerant pressure and temperature sensors G1052 and G1053 are only installed in systems equipped with a CO_2 climate control. The reason for this is that CO_2 climate control systems operate at high pressures. If either or both of these sensors needs to be replace due to repair work, the complete refrigerant circuit must be evacuated. The two sensors must never be loosened when system is active and under high pressure because they are integrated directly in the refrigerant circuit.

G1052 and G1053, have neither a safeguard nor a pressure relief valve.

Low Pressure Side A/C Pressure/Temperature Sensor G1052

High Pressure Side A/C Pressure/Temperature Sensor G1053

665_009

Vehicle Interior Carbon Dioxide Concentration Sensor G929

(for European vehicles only)

G929 is located in the passenger compartment under the glove compartment. The working principle of the sensor is based on measuring the wavelength-dependent radiation characteristics of carbon dioxide (CO_2).

665_012

The task of Vehicle Interior Carbon Dioxide Concentration Sensor:

› Measurement of cabin CO_2 concentration in driving mode and when parking.

Intervention points:

› The intervention point varies depending on operating state.

› At low CO_2 concentration levels during normal operation.

› At elevated CO_2 concentration levels in air recirculation mode.

› At high CO_2 concentration levels in the parked vehicle.

The following steps are taken if excessively high CO_2 levels are detected:

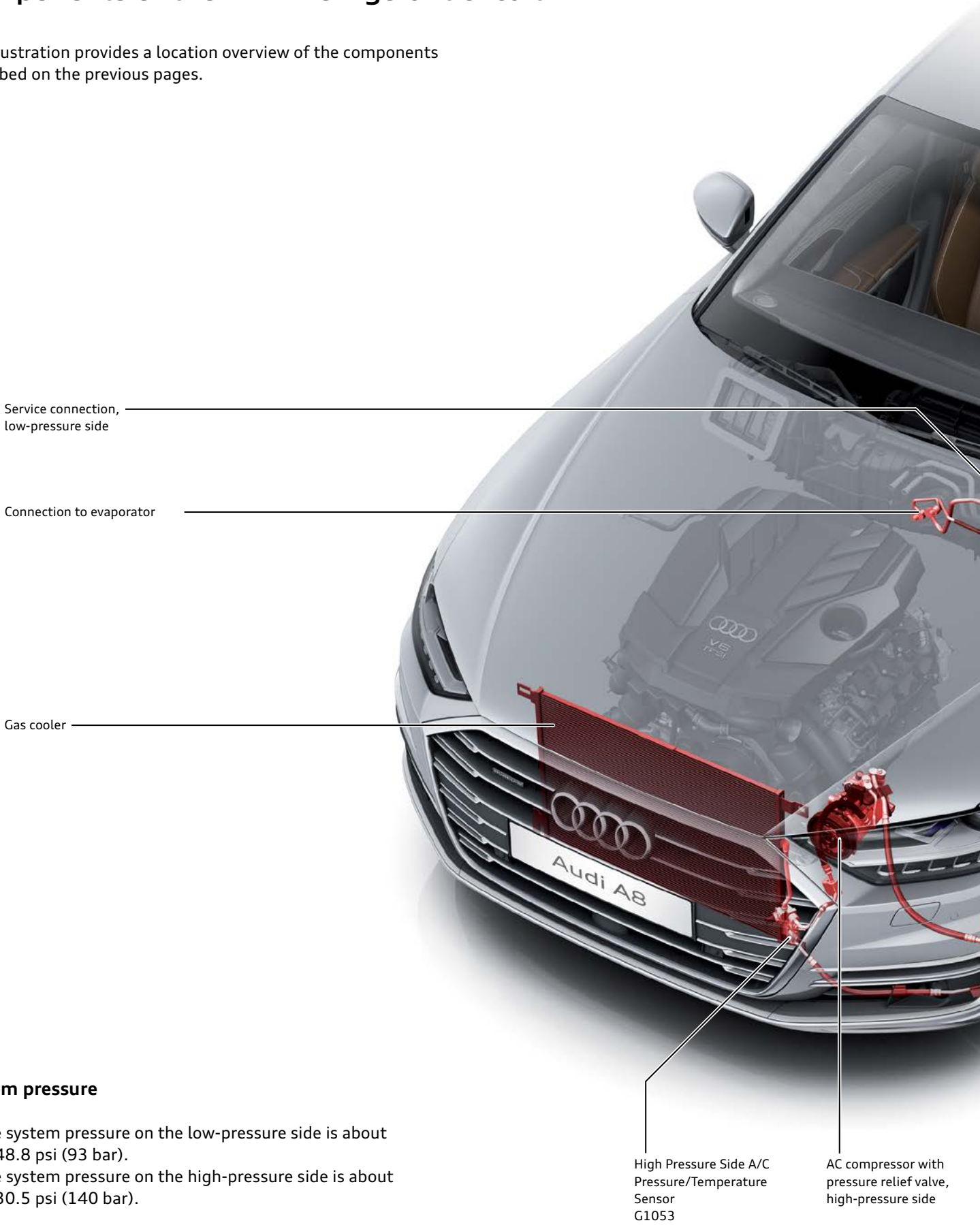
› The ambient air supply is increased by opening the ambient air flap / air recirculation flap in order to reduce CO_2 concentration levels. If the CO_2 concentration level continues to rise, the speed of the cabin fan is increased to the maximum level.

› If the concentration level rises still further, the driver information system in the instrument cluster issues the following warning: "Air conditioning system: high CO_2 concentration. Ventilate vehicle. See owner's manual“.

› If high CO_2 values are detected inside the parked vehicle, the fan is started by Vehicle Electrical System Control Module 1 J519.

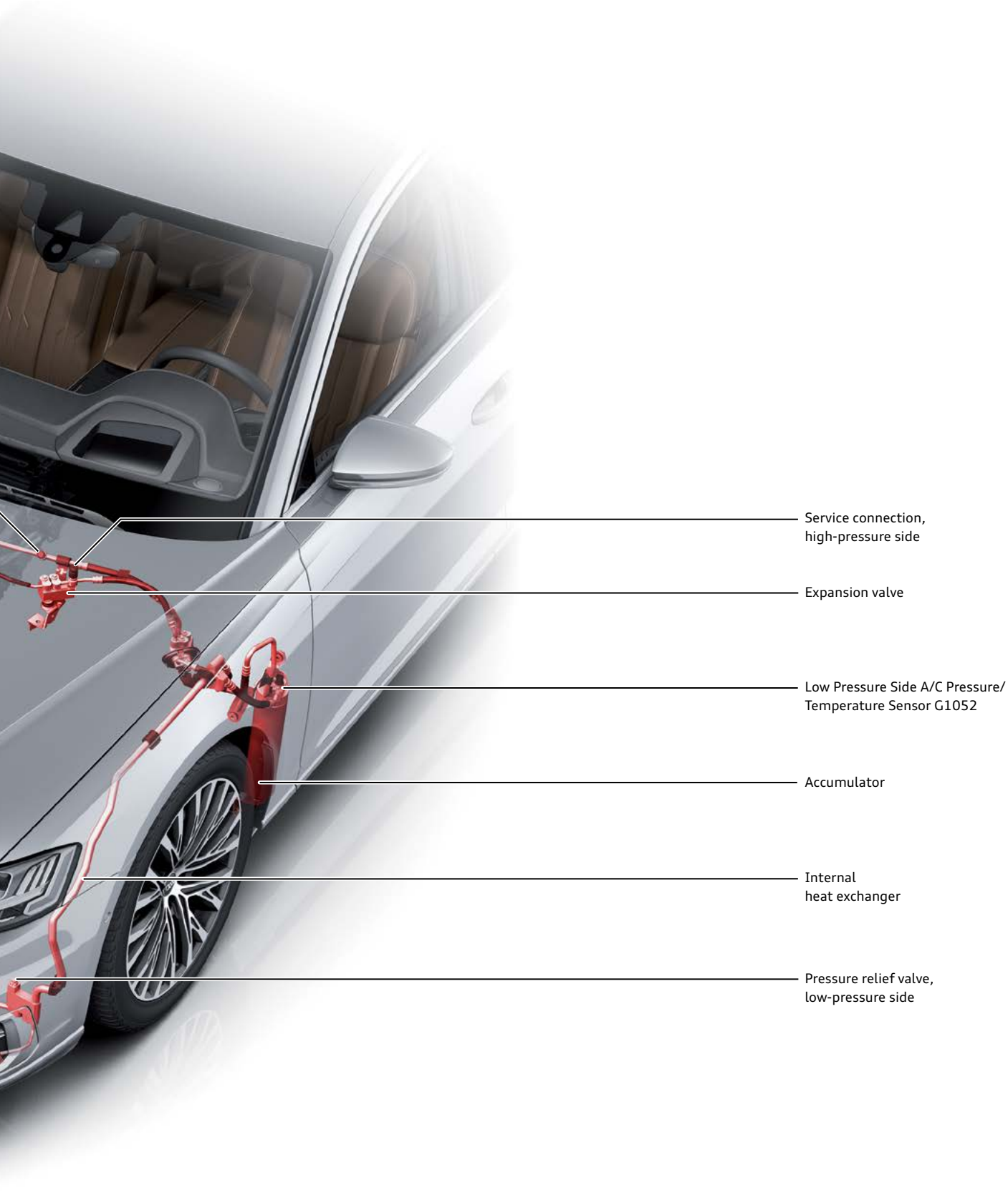
Components of the R744 refrigerant circuit

The illustration provides a location overview of the components described on the previous pages.



System pressure

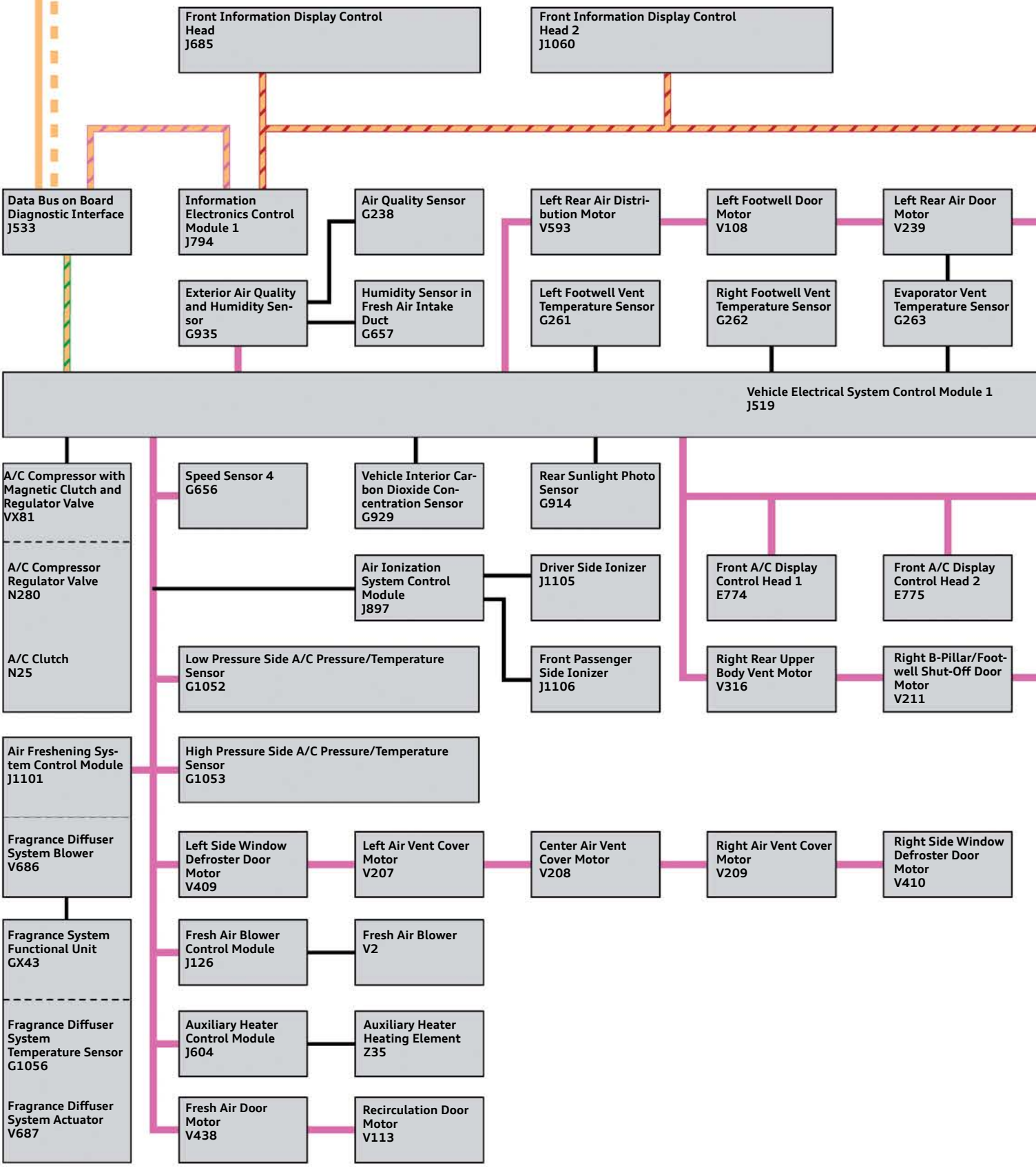
- The system pressure on the low-pressure side is about 1348.8 psi (93 bar).
- The system pressure on the high-pressure side is about 2030.5 psi (140 bar).

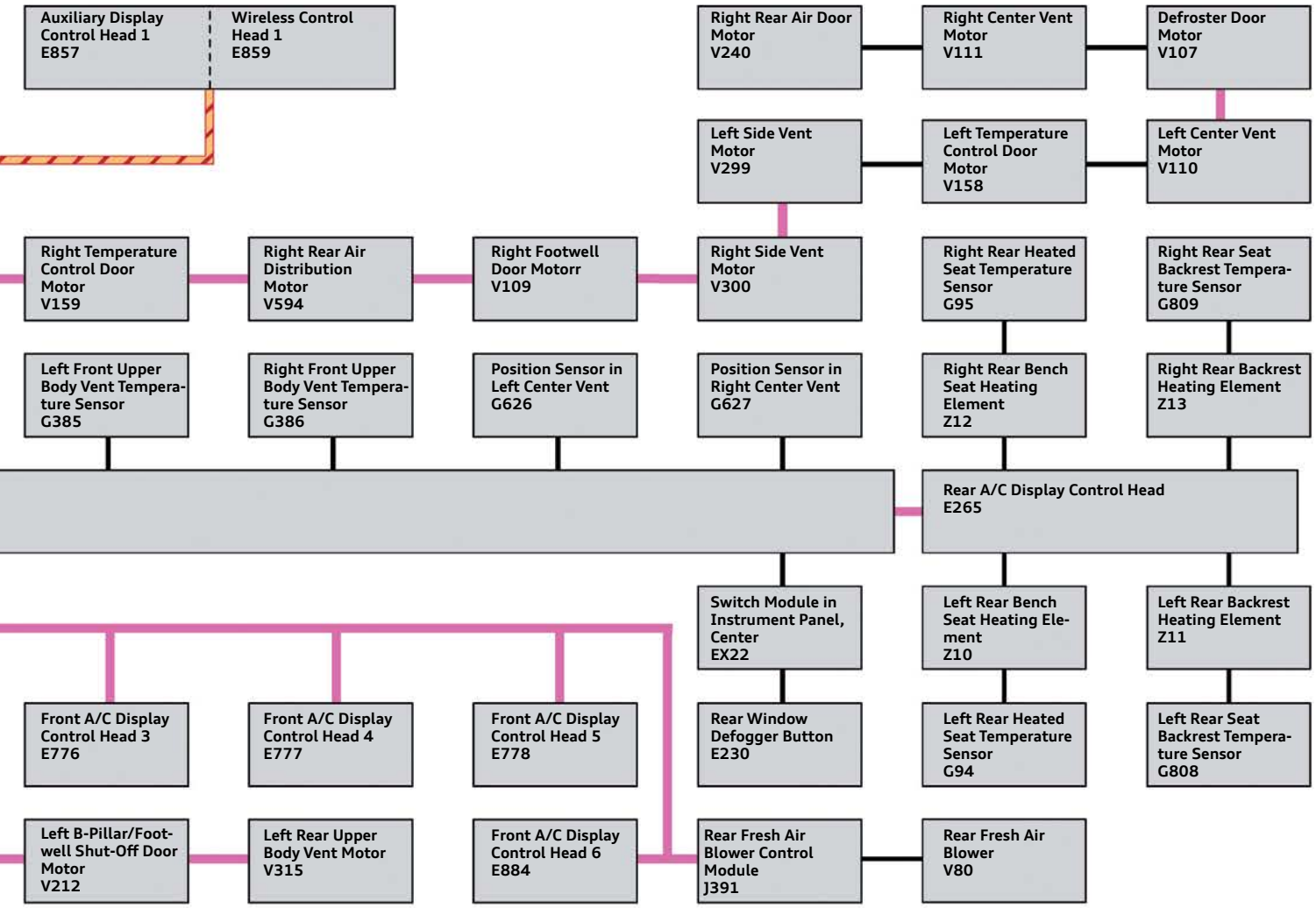

Service connection,
high-pressure side
Expansion valve
Low Pressure Side A/C Pressure/
Temperature Sensor G1052
Accumulator
Internal
heat exchanger
Pressure relief valve,
low-pressure side

665_011

Topology

Data Link Connector





Key:

- Infotainment CAN
- Comfort/convenience systems CAN 2
- MIB CAN
- Diagnostics CAN
- LIN bus
- Discrete cable
- Ethernet port for diagnose interface VAS 6154

665_015

Air quality and freshening quality

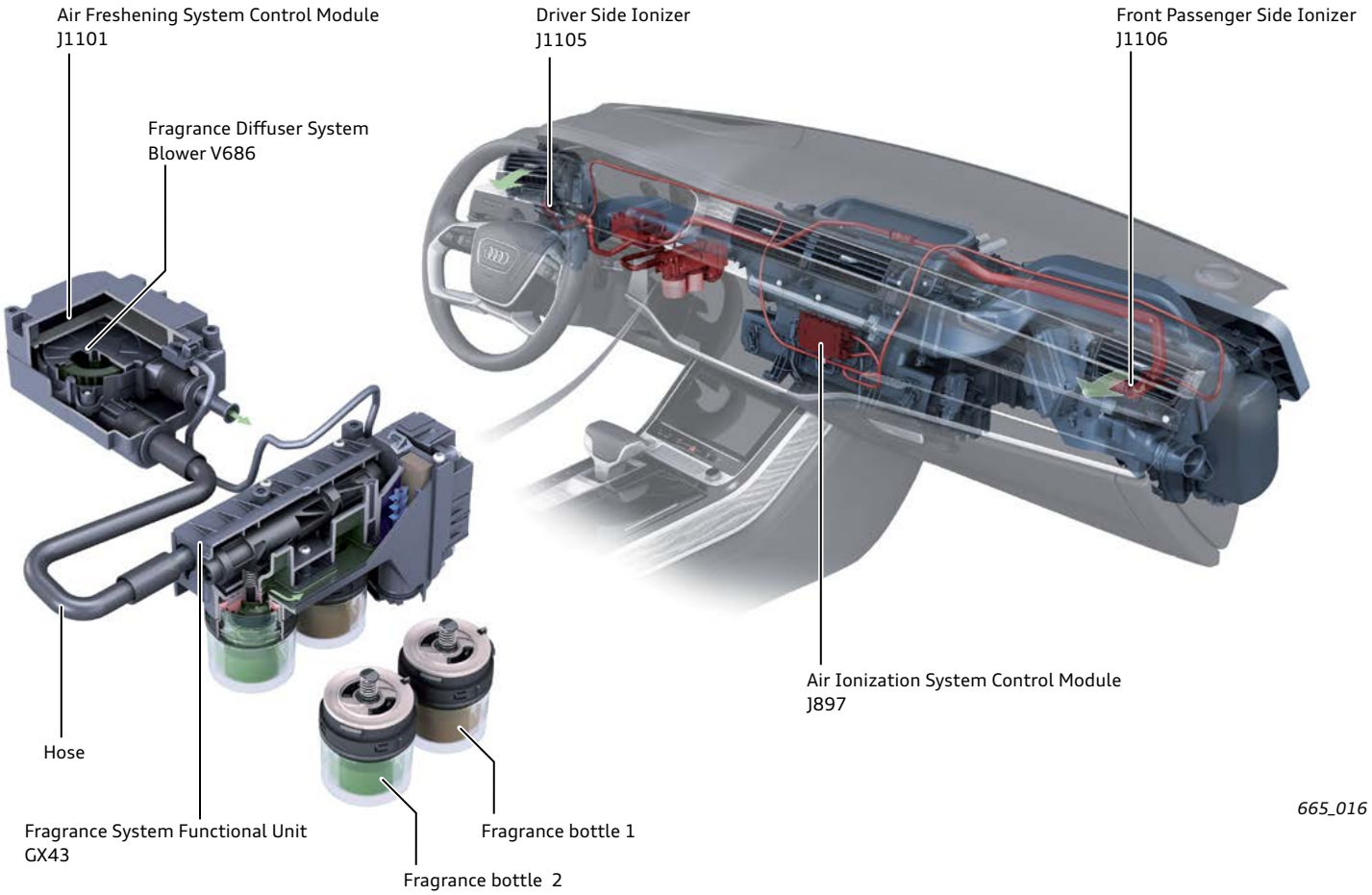
Interior fragrance system

An air freshening system will be offered on the 2019 Audi A8 in addition to the air quality functions used on the previous model.

There is a choice of two fragrances: a summer fragrance and a winter fragrance. The choice of scent and scent intensity can also be set via Front Information Display Control Head J685 while driving. The actual scent fill level is also indicated.

The fragrances are stored in two cylindrical bottles in Fragrance System Functional Unit GX43 located to the left of the steering wheel below the instrument panel. A small fan the blows the fragrance from the container into the outer front air outlets. The fragrance bottles are referred to as “flacons” in the service literature.

Overview of aromatization and air quality systems



Each of the bottles used in the Fragrance System Functional Unit GX43 is labelled with the fragrance it contains.

Note
The fragrance bottles are only replaceable by service personnel. After replacement, Air Freshening System Control Module J1101 must be adapted using the VAS Scan Tool.

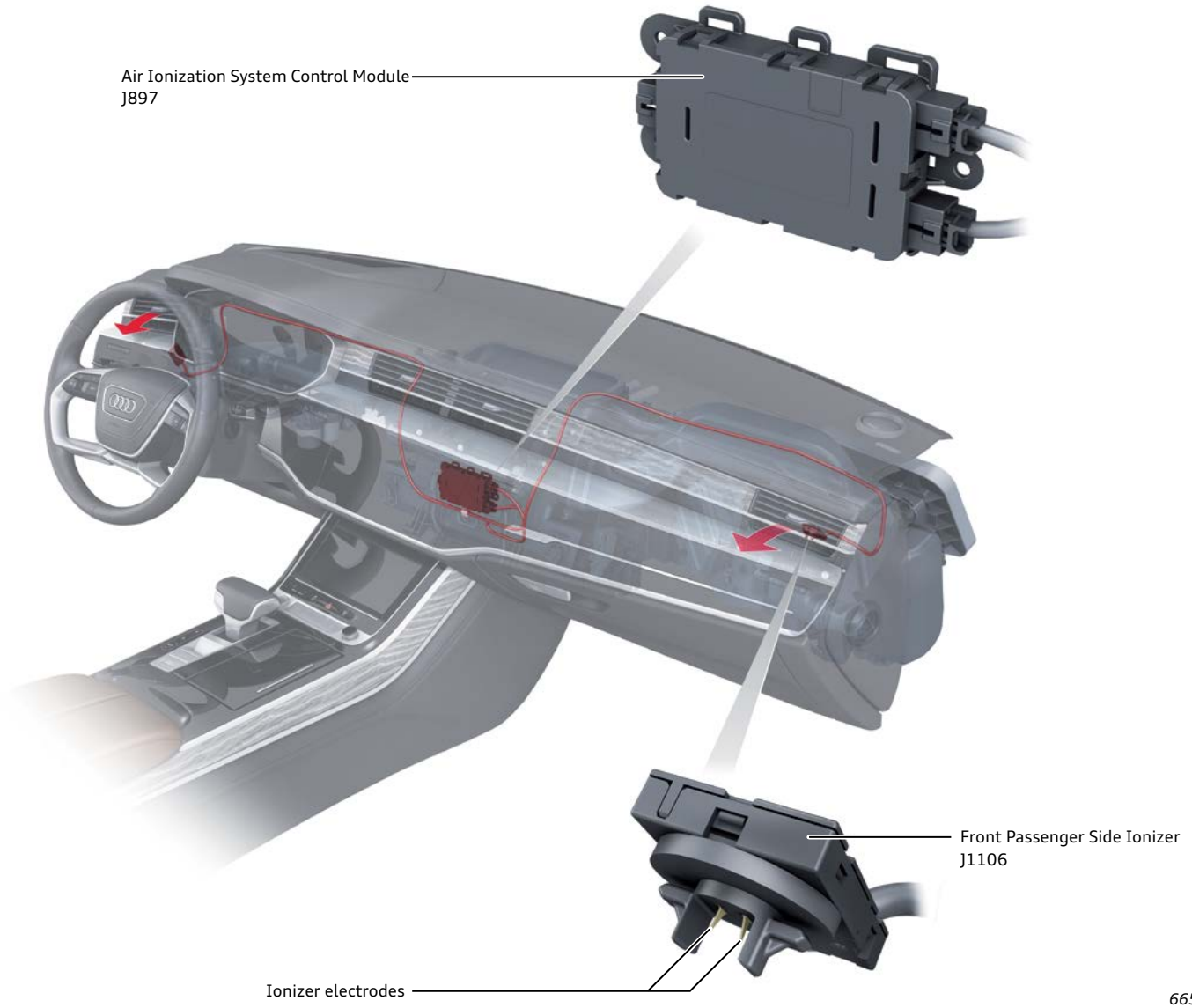
Note
To avoid installation errors, the bottles should be replaced in sequence. **Both fragrance bottles have left hand threads**.

Air improvement system

Ionizers improve air quality through the controlled negative charging of air particles before they are discharged into the interior from the outer front air outlets. The negative ions in the air can help enhance the well-being and concentration of the vehicle's occupants.

Ionization can reduce the concentration of harmful airborne particles and germs and improves air quality inside the interior.

The two ionizers, Driver Side Ionizer J1105 and Front Passenger Side Ionizer J1106 can be replaced individually. The electrodes can be replaced separately and must not be damaged. It is important to pay attention to the color codings of the wires when installing new electrodes.



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AC control panels in the front and rear

Front area

The Audi A8 no longer requires the Climatronic Control Module J255. The AC is operated via two touchscreens. Control is now implemented in Vehicle Electrical System Control Module 1 J519. The LIN bus system is used for communication between J519 and the participating AC components. Refer to the topology for further information.

In terms of visual appearance and tactile feel, both displays are the key innovation in terms user operation. The upper MMI display and the lower touchscreen are installed at the center of the instrument panel and at the center of the center console respectively. The climate control functions in the upper MMI display can be accessed via the Car menu.

Overview of the MMI display for AC operation

665_019

Depending on trim level, the following functions and their settings can be selected at Front Information Display Control Head J685:

- Ionization.
- Aromatization.
- Steering wheel heating.
- A/C synchronization for driver and front passenger sides.
- Climate control for rear occupants / for rear.
- Climate control.

Overview of lower touchscreen for climate control operation

665_020

Individual climate control functions can be set separately for the driver and front passenger sides with Front Information Display Control Head 2 J1060.

- Temperature.
- Fan speeds.
- Air distribution.
- Seat heater.
- Seat ventilation.
- Climate control functions.
- Air recirculation.
- Rear roller blind operation.
- Zoom in display.
  (creates space for shortcuts in upper half of screen).
- Automatic start/stop.
- Switching display on / off.

Overview of climate control synchronization function

665_021

The climate control settings can also be synchronized by using a touch control feature. Synchronization is activated by pinching two fingers together and deactivated by spreading two fingers apart.

Rear area

Various control panels are available for the rear seat occupants, depending on trim level. A new control panel, the Rear Seat Remote, will be available as an option at the Start of Production (SOP) of the new Audi A8.

Two buttons are available for operation of the seat heating in standard trim: Left Seat Heating Button E653 and Right Seat Heating Button E654. These buttons are connected discretely to Vehicle Electrical System Control Module 1 J519.

Note
Seat Heating Control Module J882 is not accessible via the VAS Scan Tool.

Rear Seat Remote

The Rear Seat Remote unit has:

- Vertical Control Button (Down) in Driver Seat Switch Module E869.
- Auxiliary Display Control Head 1 - E857.

The holder is a separate CAN control module integrated in the MIB CAN.

Both front displays have similar functions, layout and appearance. The Rear Seat Remote is also operated via a touchscreen.

665_026

Control panels to be introduced at a later date

Rear A/C Display Control Head E265 will be available for rear seat occupants as an option. It does not have a sensory surface. This control panel can be used to set the seat heating in addition to temperature and blower speed

665_036

A control panel with a sensory surface will be optionally available as an additional control panel for the rear seat occupants.

The following settings can be made:

- Temperature.
- Fan speed.
- Air distribution.
- Automatic climate control.
- Climate control on / off.
- Seat heater.

665_027

Setting the fan speed

The fan speed can be adjusted by “sliding” any of the four front or two rear touch sliders.

The sliders have the following designations:

Left front area	Front A/C Display Control Head 1 E774
Center left front area	Front A/C Display Control Head 2 E775
Center right front area	Front A/C Display Control Head 3 E776
Right front area	Front A/C Display Control Head 4 E777
Center left rear area	Front A/C Display Control Head 5 E778
Center right rear area	Front A/C Display Control Head 6 E884

Seats and available functions

Massage function

Back massage

An enhanced back massage function is available in the new Audi A8. Up to 16 bladders are integrated in the front seat and up to 18 in the rear seat. In standard trim, the seats are equipped with double lift bladders. The optional triple lift bladders are designed to provide a higher intensity back massage.

For a back massage, there is a choice of three intensity levels and the following seven programs:

- Shaft
- Circular motion
- Stretch
- Relaxation
- Shoulders
- Activation
- Vitalization

665_029

Foot massage

Depending on equipment version, a foot massage is available for the first time.

To be able to activate the foot massage function, the front passenger seat back must be moved from a reclining position to a folded forward position. The massage program offers two options allowing the soles of the feet to be massaged either by the linear application of pressure by massaging the reflex zones.

For the foot massage there is a choice of:

- Two programs (Wave, Stretch).
- Three intensity levels.
- Three foot sizes (S-M-L).

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A178308

Surface heating

The armrests in the door trims as well as the center armrests in the front and rear are heated surfaces.

The one-piece front center armrest in is not heated. Only split front armrests are heated.

All heated surfaces are deactivated and regulated through the seat heater.

665_018

Depending on trim level, three surface heating variants are available:

- For the front seats only.
- For the rear seats only.
- Or for the front seats and rear seats.

All surface heating variants are coupled directly to the seat heaters and cannot be operated independently of the seat heaters.

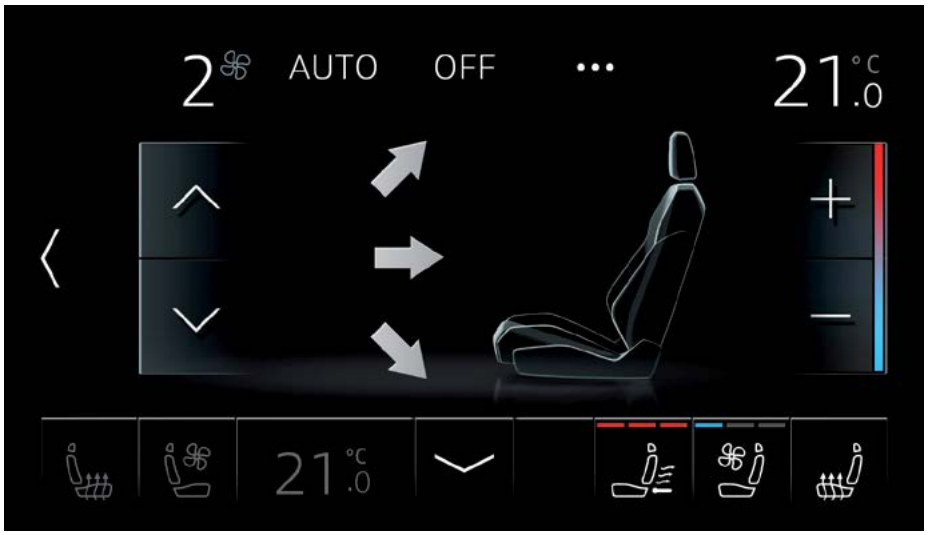
The surface heating of the door armrests depends on what heating output is selected for the seat in question.

The heating level for the center armrests in the front and rear of the vehicle is determined by whichever seat heating setting is higher in each row of seats.

If, for example, the seat heater of the left, rear seat is set to level three and the seat heater of the right, rear seat is set to level one, the common armrest is switched to level three.

Foot heater

Overview of foot heater control system



665_030

Depending on equipment, the foot heater in the footrest can only be activated in the unfolded position and in the reclined position of the front passenger seat.

It is operated through the Smart Remote Control unit and, like the seat heater and the seat ventilation system, is adjustable to three levels.

Optional seat heating and ventilation

The seat heater and the seat ventilation system have three levels, which can be set at the front and rear control panels.

Workshop equipment

A/C service station

The introduction of the new R744 refrigerant in the Audi A8 also sees the introduction of a new A/C service station for service.

The previous A/C service stations cannot be used to service R744 refrigerant systems. Due to the new requirements for R744 regarding pressure and integrity, it was necessary to completely redesign the A/C service station.

The following tasks can be carried out using the new A/C service station:

- Hose emptying
- Drainage
- Evacuation
- Filling
- Pressure testing
- Fresh oil and UV additive injection

The multifunction steering wheel can be used for operation and menu navigation. There is an automatic mode and a manual mode in which operations can be selected individually.

665_033

The automatic "A/C service" mode includes the following operations:

- Self test
- Drainage
- Evacuation
- Filling

665_034

Note
The refrigerant circuit cannot be flushed with the AC service station for R744.
This must be done with one of the previously used AC service stations and the appropriate refrigrant (e.g. R1234yf or R134a).

Service connections

The caps covering the service connections of R744 air conditioning systems are snap fitting, and no longer screwed on. The snap fitting provides added safety since, unlike a threaded cap, refrigerant pressure cannot build up under the caps. This prevents the cap from becoming detached by itself due to high pressure, and reduces the risk of an accident.

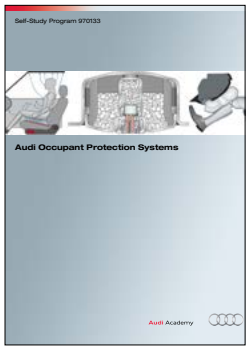
To avoid accidentally evacuating or refilling the A/C system with the wrong refrigerant when carrying out service work, the service connections and the service couplings are coded mechanically. This means that the connections for R134a, R1234yf and R744 differ in their geometry, such as diameter and connection length.

665_014

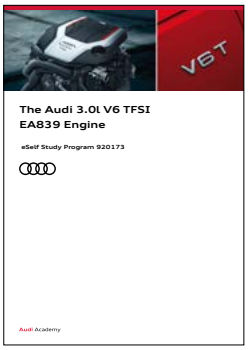
Appendix

eSelf-Study programs

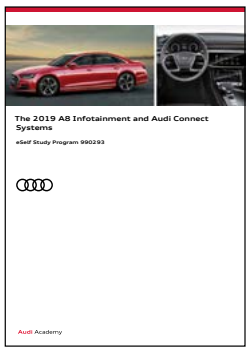
For more information about the technology of the Audi A8, please refer to the following eSelf-Study programs.



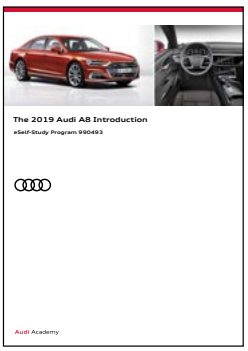
SSP 970133
Audi Occupant Protection Systems



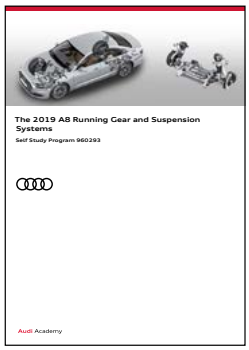
SSP 920173
The Audi 3.0l V6 TFSI
EA839 Engine



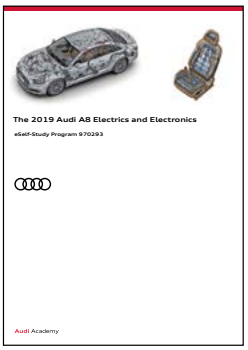
SSP 990293
The 2019 Audi A8
Infotainment and Audi Connect Systems



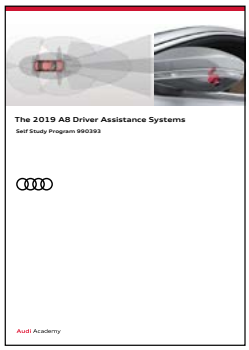
SSP 990493
The 2019 Audi A8 Introduction



SSP 960293
The 2019 A8 Running Gear
and Suspension Sytems



SSP 970293
Audi A8
The 2019 Audi A8 Electrics and
Electronics



SSP 990393
The 2019 A8 Driver Assistance Systems

Knowledge assessment

An On-Line Knowledge Assessment (exam) is Available for this eSelf-Study Program.

The Knowledge Assessment is required for Certification credit.

You can find this Knowledge Assessment at: **www.accessaudi.com**

From the accessaudi.com Homepage:

- Click on the "App Links"
- Click on the "Academy site CRC"

Click on the Course Catalog Search and select "980193 - The 2019 Audi A8 Climate Control Systems"

Please submit any questions or inquiries via the Academy CRC Online Support Form which is located under the "Support" tab or the "Contact Us" tab of the Academy CRC.

Thank you for reading this eSelf-Study Program and taking the assessment.

980193

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