

# CUPRA BORN



MAGAZINE CUPRA MC05





Technical status 07.21. Due to the constant development and improvement of the product, the data used in this course is subject to possible variations.

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TITLE: MC05 - CUPRA BORN

AUTHOR: After Sales Training

Autovía A-2, km 585 08760 – Martorell, Barcelona (Spain)

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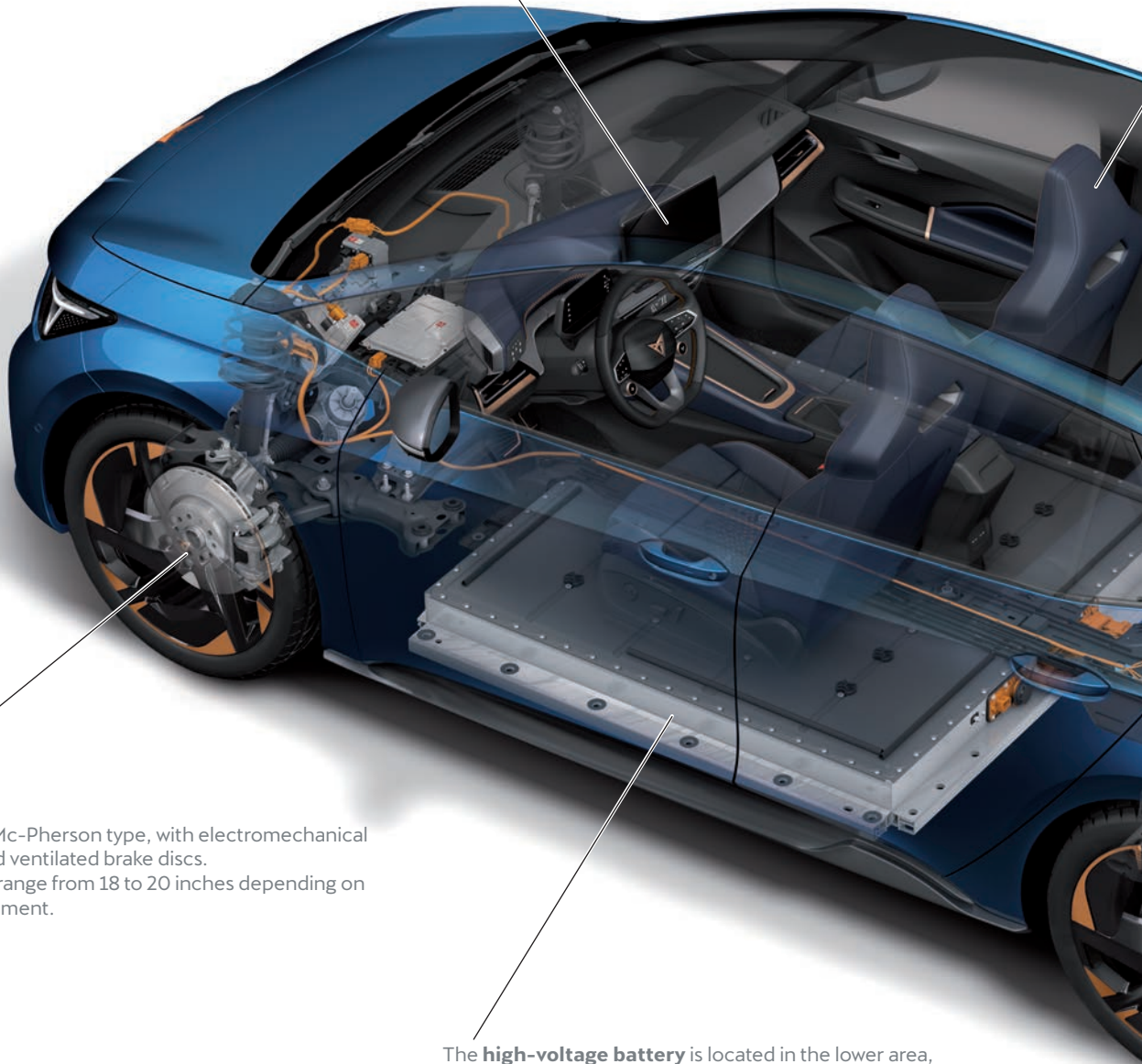
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# INTRODUCTION

The two-zone **Climatronic** is offered with a choice of two types of refrigerant circuit.

A circuit with cooling agent R1234yf is equipped as standard.

As an option, it is available with a **heat pump** and cooling agent R744. The composition of cooling agent R744 is carbon dioxide (CO<sub>2</sub>).



The **front axle** is Mc-Pherson type, with electromechanical power steering and ventilated brake discs. The **alloy wheels** range from 18 to 20 inches depending on the selected equipment.

The **high-voltage battery** is located in the lower area, between the vehicle's axles. It is protected against side impacts thanks to an aluminium reinforcement profile in the body's heel mouldings.

The **bucket seats** equipped as standard are made from recycled sea materials, in line with the CO<sub>2</sub> neutral concept. As an option, the seats are offered with massage function and power adjustment.



The **rear axle** is Multi-link type with five oscillating arms and featuring drum brakes. An electric machine is mounted on the shaft. The **motor** offering ranges from 110 kW to 170 kW, rear-wheel drive.

The CUPRA Born is the CUPRA brand's first fully electric model.

It uses the modular electric drive platform (**MEB**).

It is available in 2 trim levels:

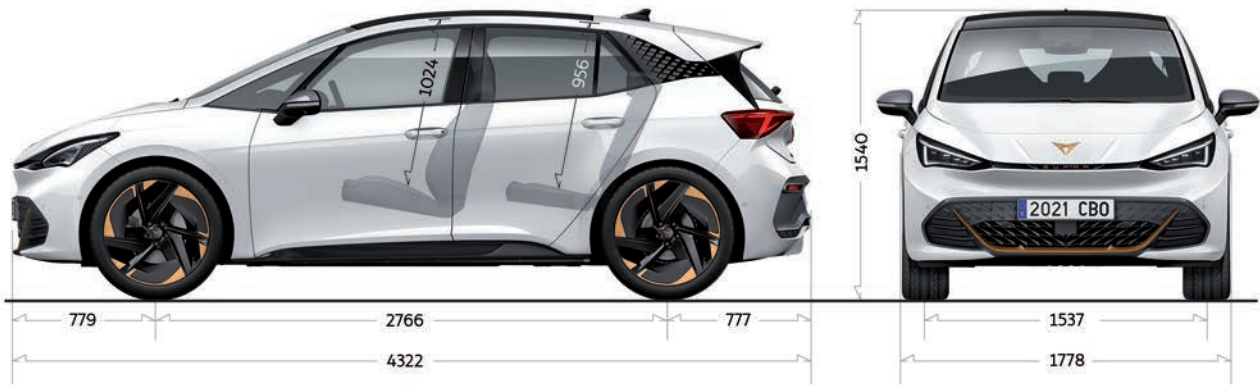
- Standard version, with a 45 kWh or 58 kWh battery.
- Performance pack version, with a 58 kWh or 77 kWh battery.

The vehicle's equipment varies based on the optional packs chosen:

### OPTIONAL PACKS

- **PERFORMANCE**, the e-boost function provides an additional 20 kW of power, that is, the power is increased from 150 kW to 170 kW, provided that the CUPRA driving mode is activated or the accelerator is stepped on all the way to kick-down.
- **DYNAMIC**, including adaptive suspension (DCC)
- **HEAT PUMP**, for the heating and climate system.
- **BEATS-AUDIO**, 9 loudspeakers in total, including a subwoofer in the boot.
- **AR-HUD**, features Head-up Display to project information onto the windscreen.
- **PILOT M/L**, expanded functions such as navigation and driving and park assists.
- **PROTECT**, including Pre-crash Assist, alarm and anti-theft rim bolts.
- **TECH M/L**, includes the Kessy advanced system with lighting on the vehicle's handles, inductive phone charger, Intelligent Park Assist (IPA) and Car 2X (WLAN communication system between vehicles and road elements).
- **BELOW ZERO**, includes heated seats and heated windscreen clear ejectors.
- **SKYLINE**, panoramic roof.
- **PRIVACY**, tinted windows.

# BODY



\* 215/45 R20 95T

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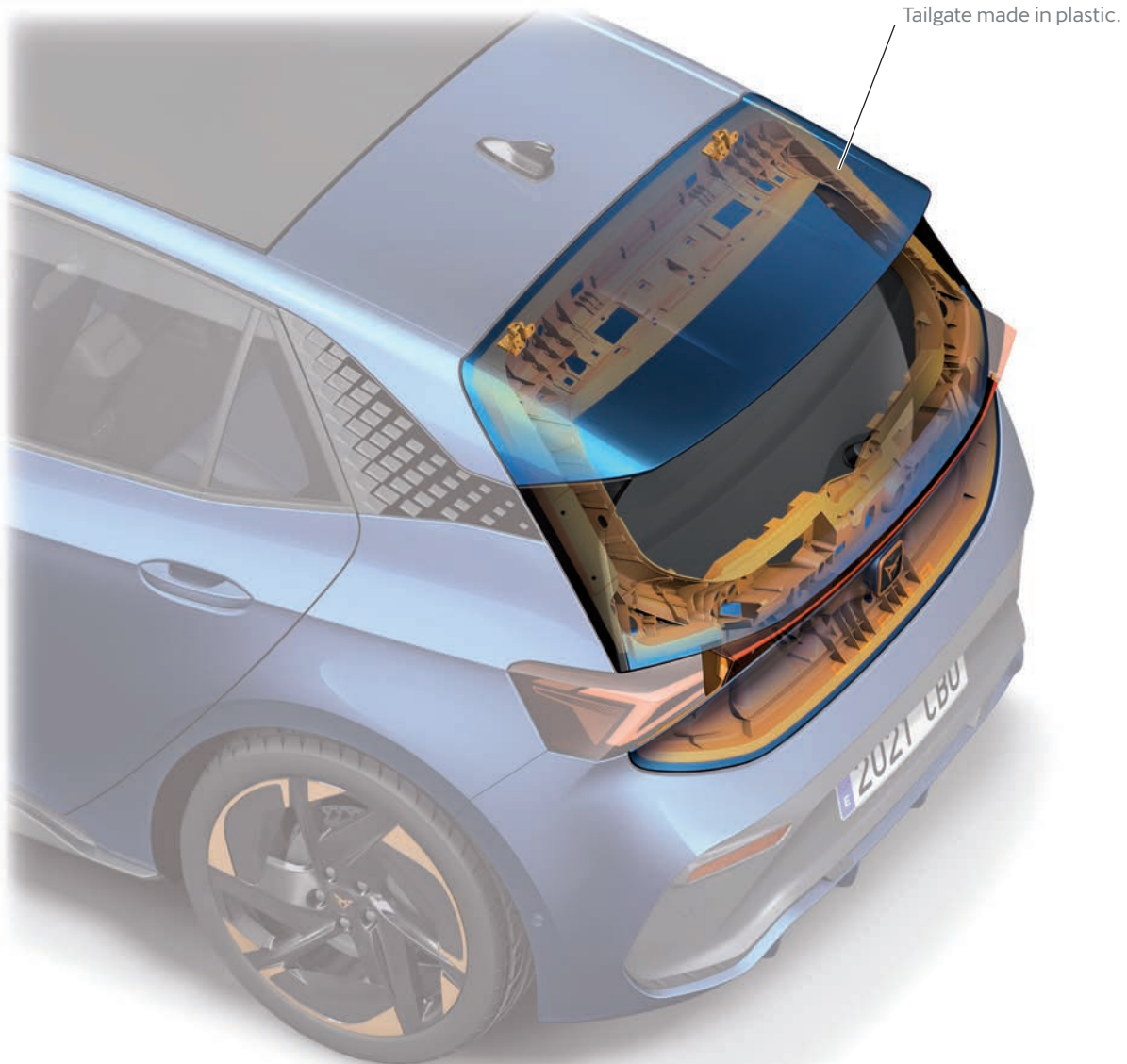
## DIMENSIONS

The CUPRA Born is built using the **modular electric drive platform (MEB)**. This new platform offers the following advantages over the MQB platform:

- The wheelbase is longer and the overhangs are shorter, improving its dynamic behaviour and increasing the interior space.
- The centre of gravity is lower, resulting in a more balanced weight distribution.
- The position of the occupants is higher, improving ergonomics.

- There is no central tunnel, so there is more space in the passenger compartment.

The low centre of gravity and the removal of the central tunnel has been achieved by placing the high-voltage battery between both axles.



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## TAILGATE

The tailgate is made in one plastic piece, thus reducing weight.

It features a thermoplastic spoiler and two side spoilers.

The trim under the spoiler is clipped and integrates the third brake light and the washer ejector.

The heated rear window is attached separately and features centring devices for its exact positioning.

The tailgate is opened manually by means of the CUPRA bootlatch badge.

# BODY

## TYPES OF STEEL

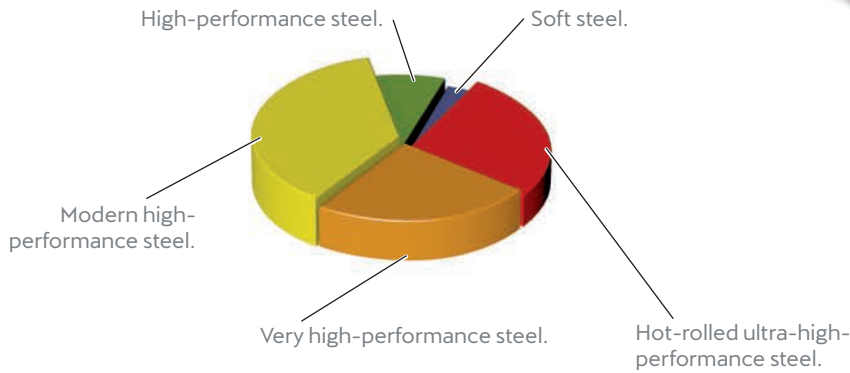
The CUPRA Born is offered in two different roofs:

- Conventional roof.
- Panoramic glass roof.

The heel mouldings are made of hot-rolled and highly elastic material.

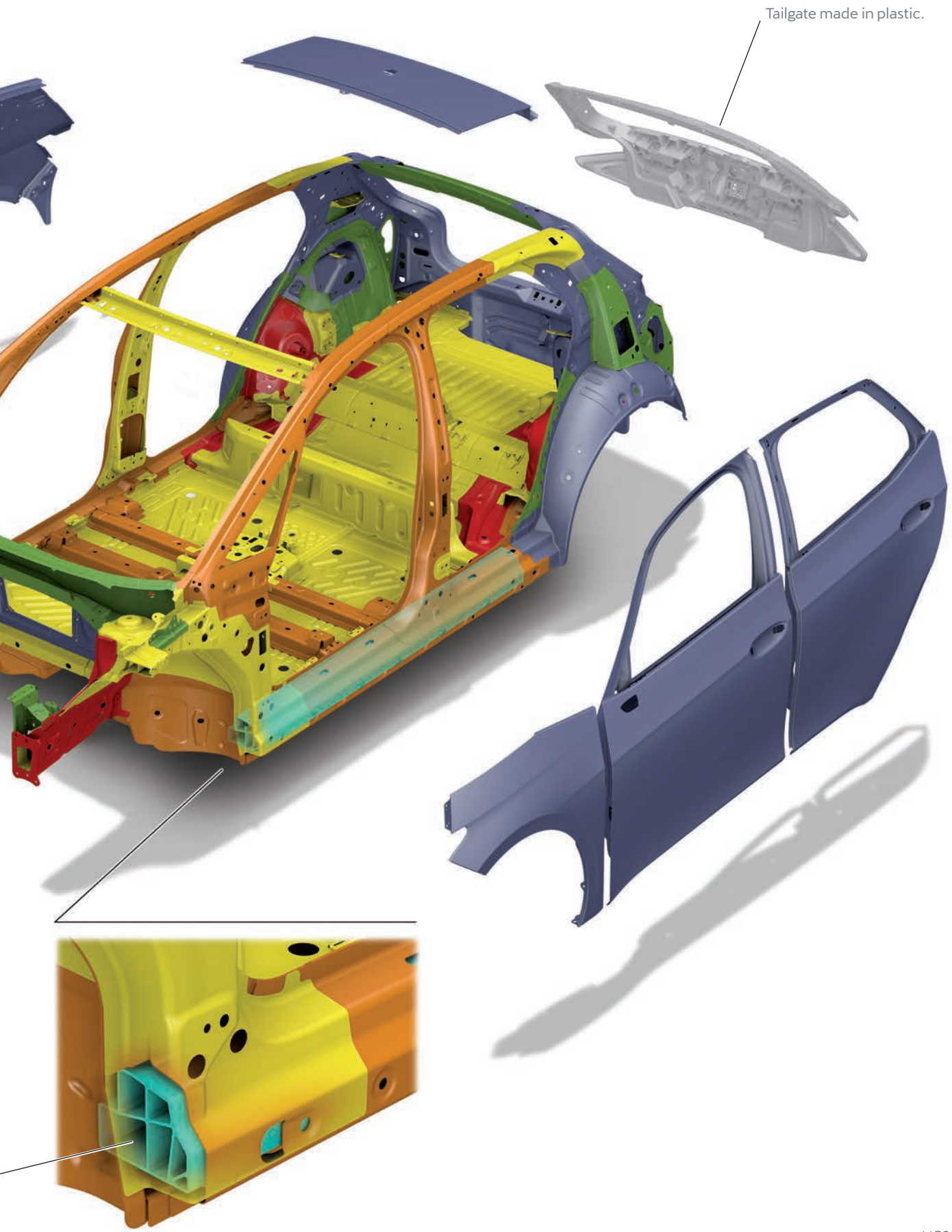
As an additional protection measure, the **heel mouldings** incorporate inside an extruded aluminium-magnesium-silicon alloy (AlMgSi) profile that protects the high-voltage battery located in the vehicle's underbody, as well as the occupants in the event of a side impact.

The reinforcement profile is glued, so there is no risk of contact corrosion.



Heel moulding reinforcement profile.

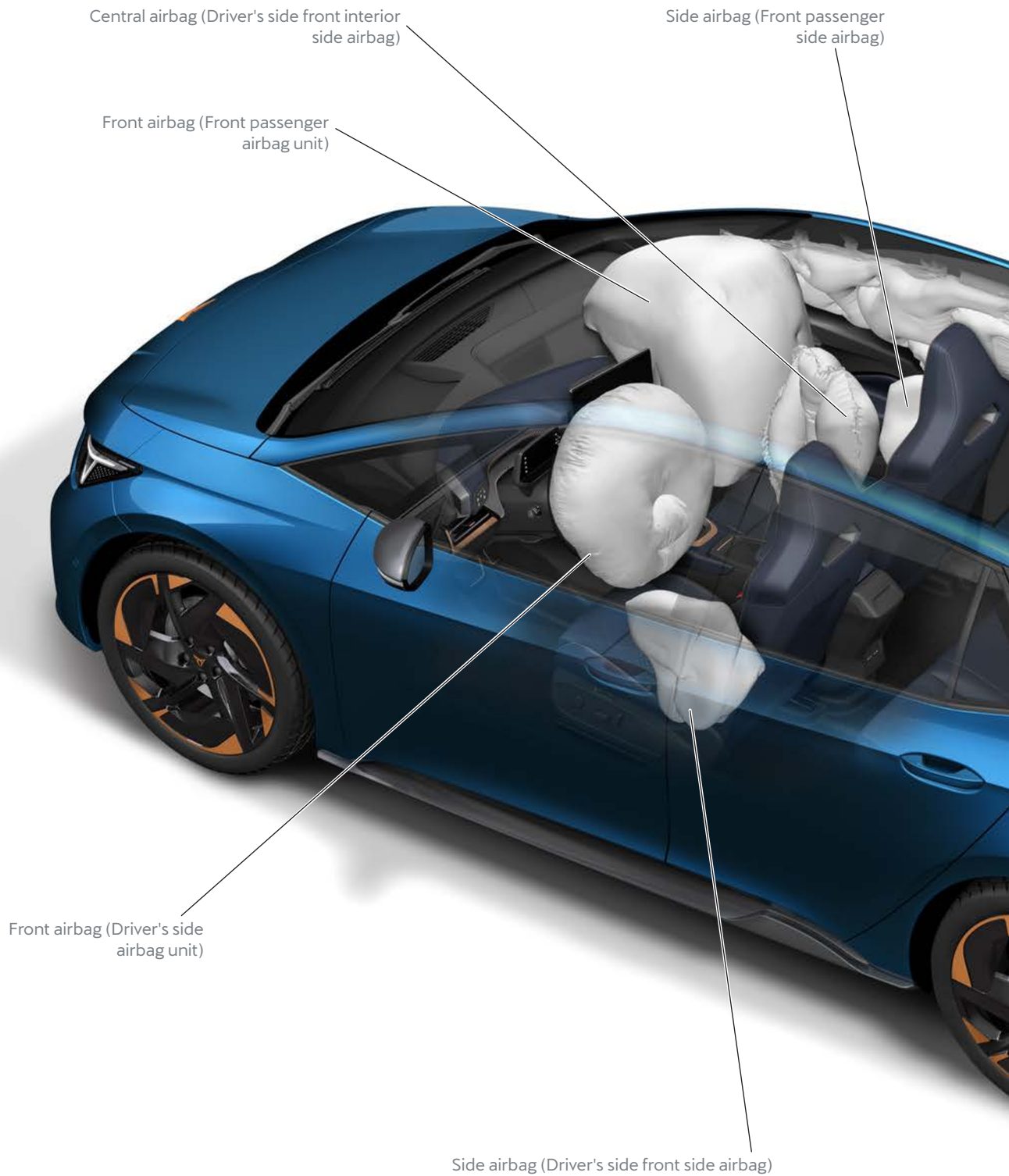




Tailgate made in plastic.

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# OCCUPANT PROTECTION





## PASSIVE SAFETY

The CUPRA Born uses Airbag management system **VW40** as a passive protection system for occupants.

The Airbag control unit J234 manages the following modules:

- Single-phase **front** airbags for the driver and front passenger.
- **Side** airbags in the front seats.
- **Central** airbag, mounted on the inside of the driver's front seat.
- **Curtain** airbags, protecting passengers in the outer seats, in both the first and second rows.

If the airbag management decides the need for the airbags to be activated, it acts as follows:

In a frontal collision, the front and head airbags are activated. The side airbags are not activated.

In a side impact, the side and head airbags are activated. The central airbag will also activate.

In the event of a rollover, the central airbag always activates.

The airbag unit also manages the following:

- The front seat belts, which feature a reversible pretensioner, 1-stage force limiter and pretensioning of the abdominal area.
- The rear side seat belts, which are equipped with pretensioners.
- The seat occupied detection system with seatbelt fastening warning on all seats.
- The passenger airbag cut-off switch.

The CUPRA Born is equipped with **Isofix** and **Top tether** on the front passenger seat and on the rear side seats.

The airbag system components may vary according to the market.

# OCCUPANT PROTECTION

In the event of an accident the Airbag control unit J234 will manage the situation as follows:

- The Heater and air conditioning system control unit J979 **deactivates** the Fresh air blower V2 and **closes** the climatic unit's flaps to prevent contaminated air from entering.
- The Onboard network control unit J519 **activates** the hazard warning lights and **unlocks** the central locking system.

The CUPRA Born's **airbag system** (for vehicles driving on the right and the driver's side on the left) consists of:

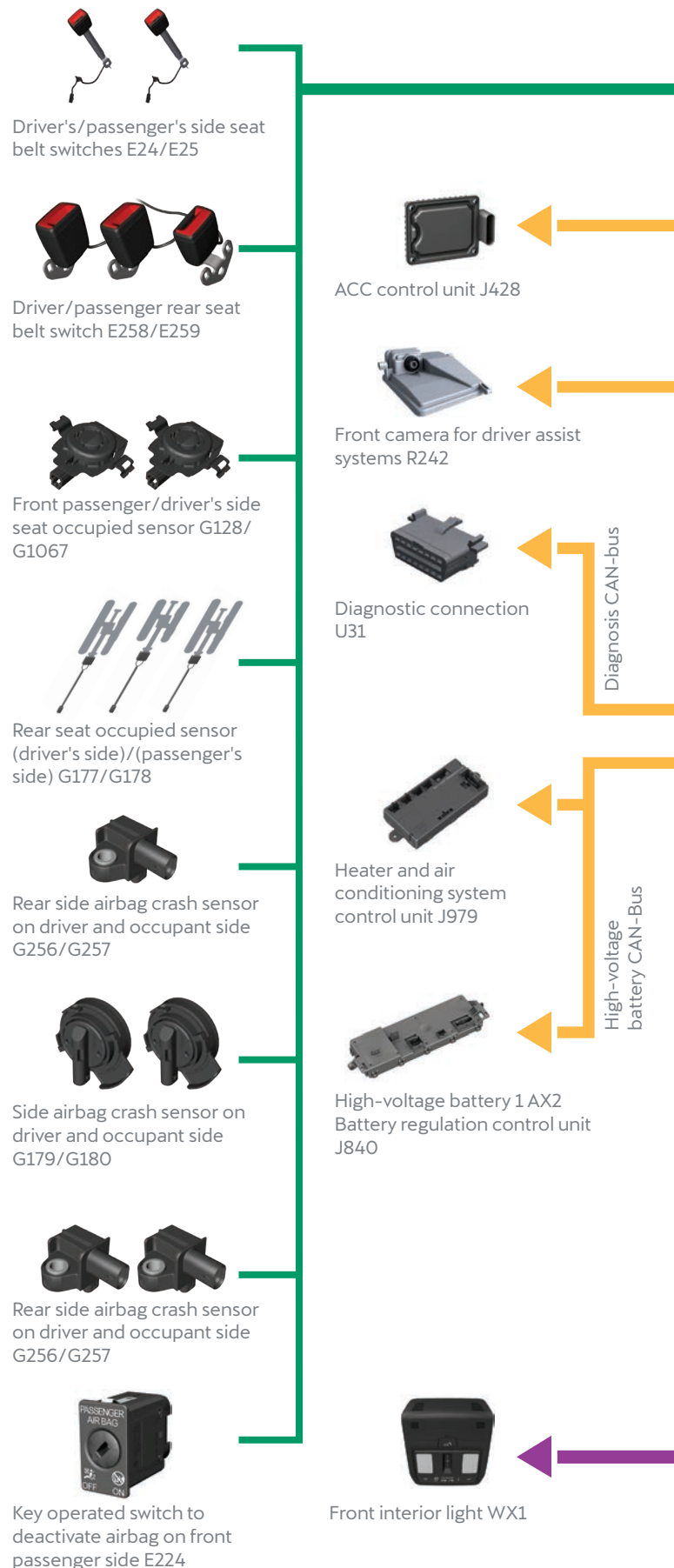
- Airbag igniter on driver side N95.
- Airbag igniter 1 on front passenger side N131.
- Igniter for central airbag for occupant collision protection, driver side N737.
- Driver side airbag igniter N199.
- Front passenger-side side airbag igniter N200.
- Driver curtain airbag igniter N251.
- Front passenger curtain airbag igniter N252.

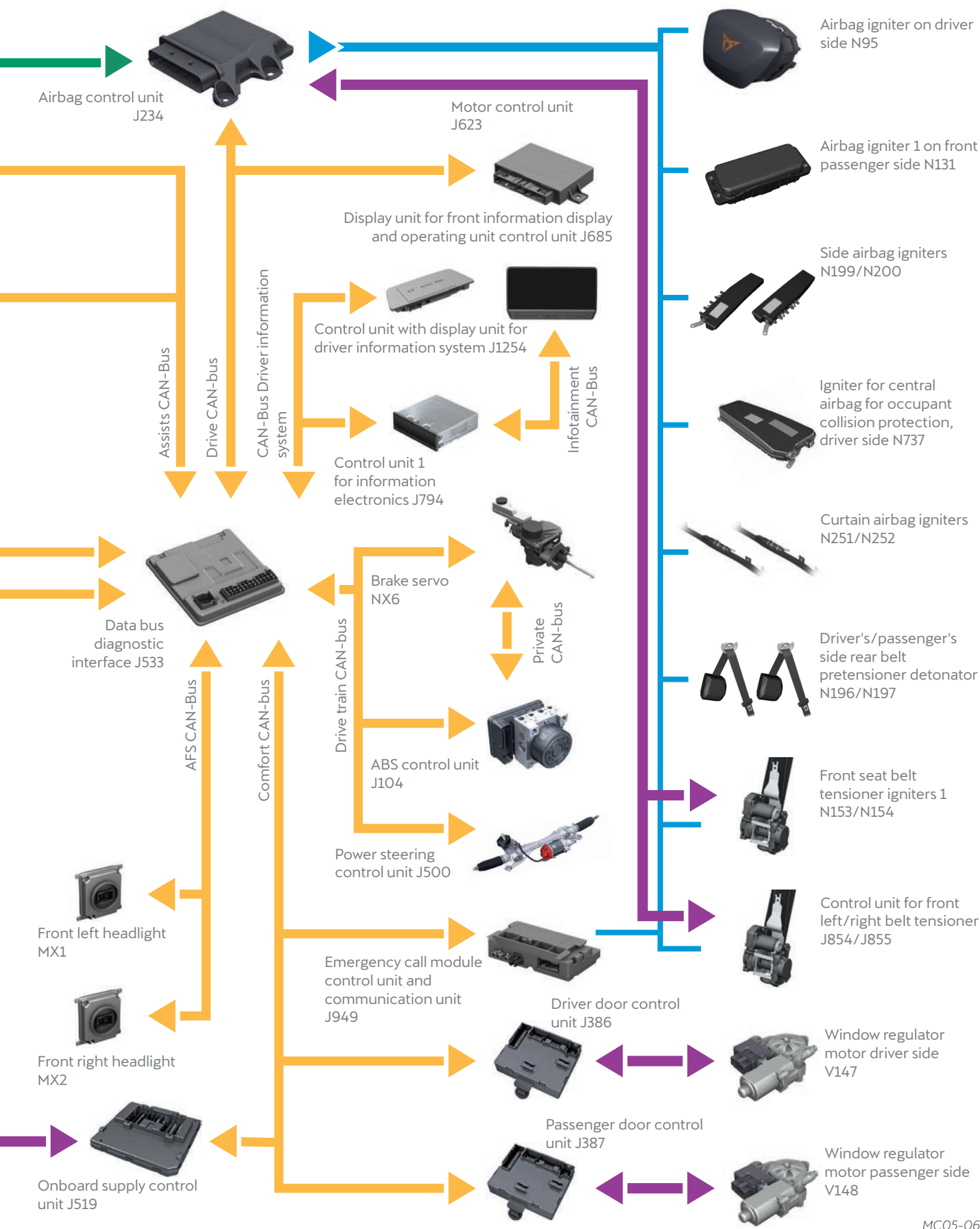
The **Key operated switch to deactivate airbag on front passenger side E224** is located on the side cover of the dash panel on the passenger side.

The Warning lamp for airbag deactivated on front passenger side K145 is integrated in the Front interior light WX1, and it cannot be removed separately.

The **safety belt system** consists of:

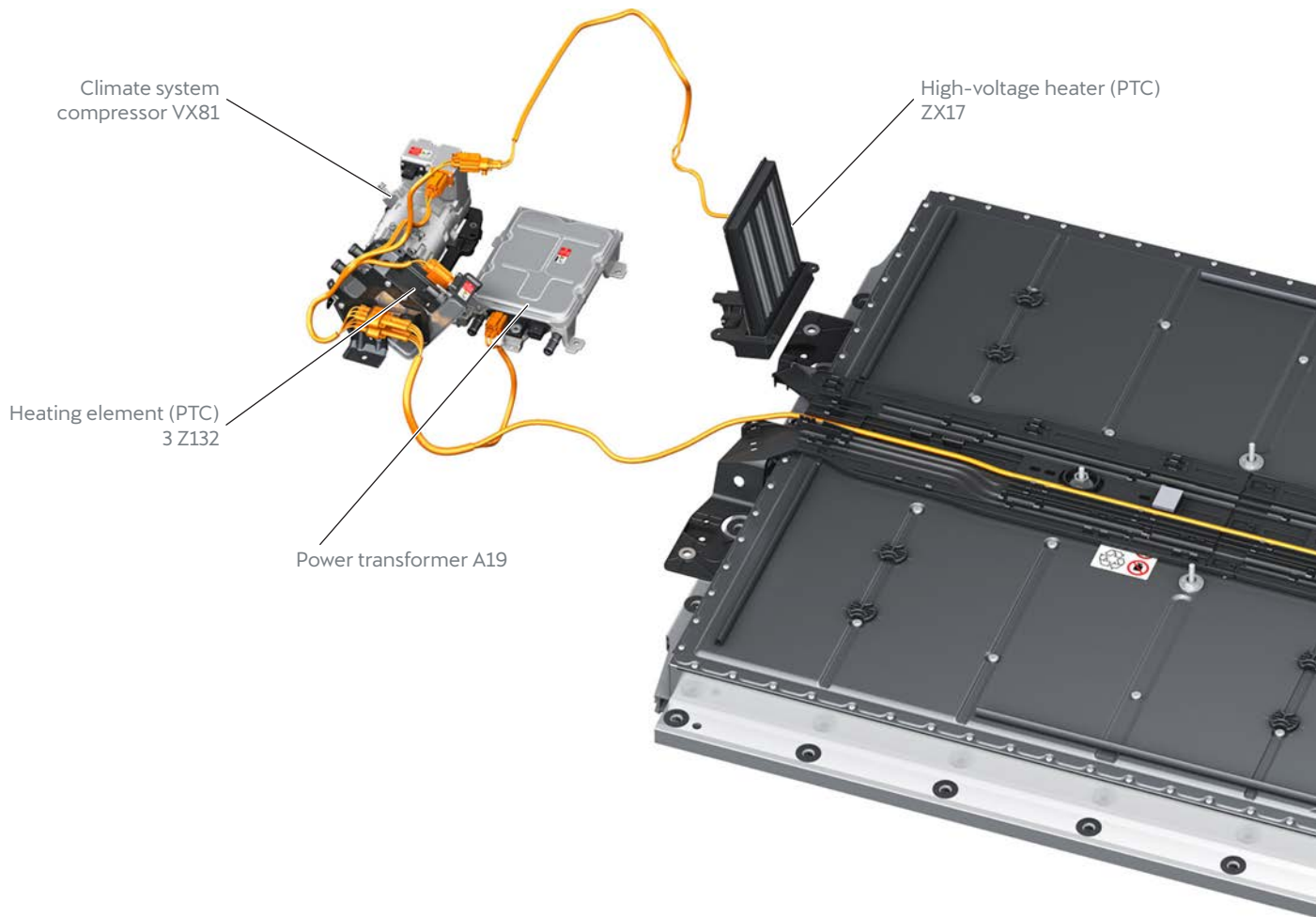
- Front seat belt tensioner igniters 1 N153/N154.
- Control unit for front left/right belt tensioner J854/J855. This unit has to be adapted after replacing the automatic belt winder.
- Driver's/passenger's side rear belt pretensioner detonator N196/N197.



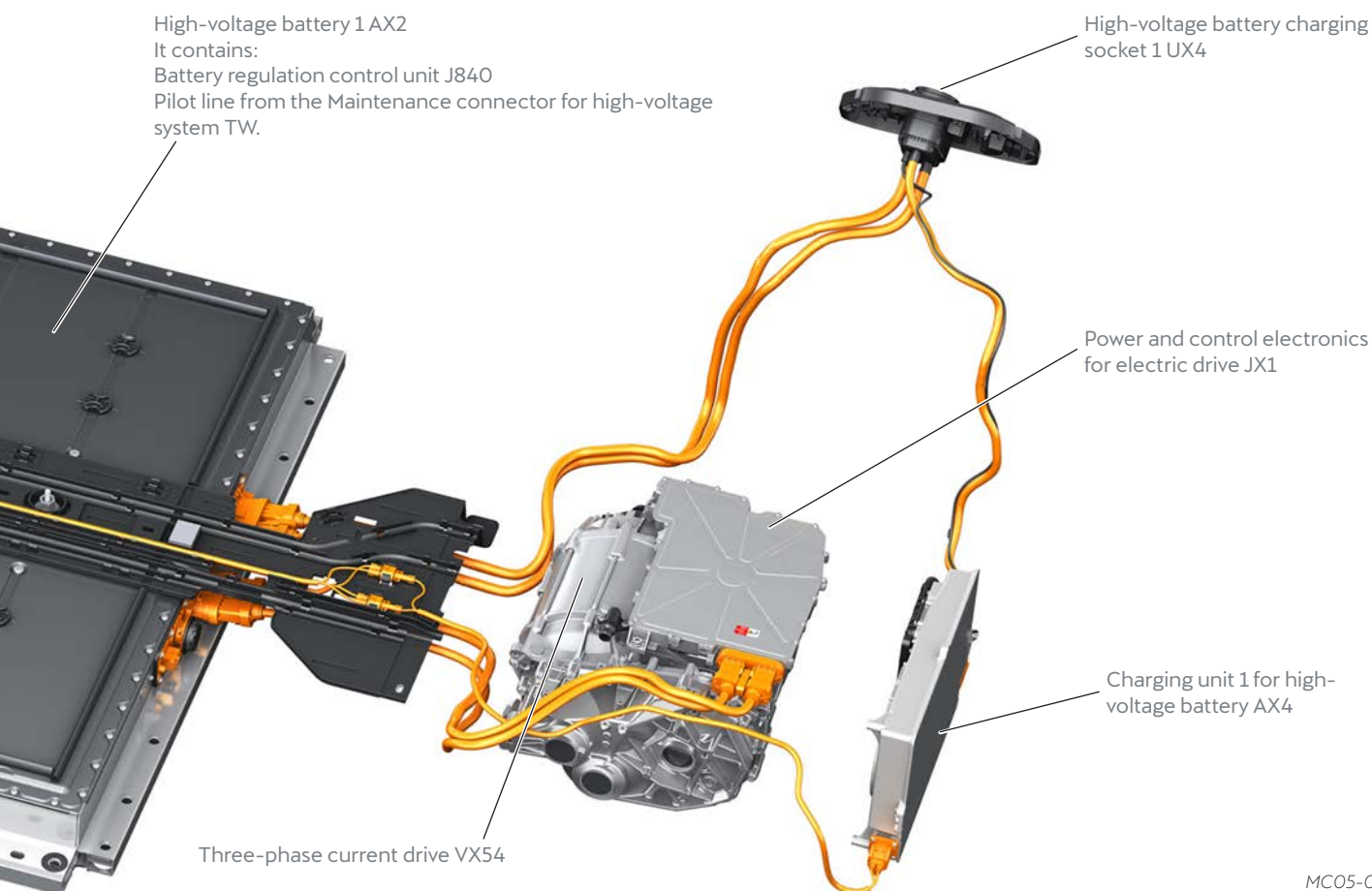


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# HIGH-VOLTAGE SYSTEM



PR (battery) no.	J9A	J9C	J9D
Battery capacity (gross)	55 kWh	62 kWh	82 kWh
Battery capacity (net)	45 kWh	58 kWh	77 kWh
Voltage	240-408 V	270-459 V	240-408 V
Number of modules	8	9	12
Cell layout (series - parallel)	96s2p	108s2p	96s3p
Cell technology	Lithium pouch cell		
Cooling	Liquid		
Protection class	IP6K7 / IP6K9K		
Weight	352 kg	382 kg	503 kg



The CUPRA Born features the most advanced high-voltage system the brand has ever launched.

**It equips a rear-drive system**, achieving a sportier, dynamic and powerful driving without generating CO<sub>2</sub> emissions.

### BATTERY PRESERVATION

The CUPRA Born can cover a range of 548 km in its most powerful version.

For the vehicle to perform at its best, the following is required:

- Limiting the maximum load to 80% in the settings.
- Avoiding charging the battery to 100% and not starting the vehicle for long periods of time.
- Avoiding the charge level from dropping below 20% for long periods of time.
- Keeping DC fast charging to a minimum.
- Avoiding parking the vehicle for several hours with a charge level below 40% in icy conditions.

### CHARGING WITH ALTERNATING CURRENT

It is recommended to charge the vehicle with AC power to avoid reducing the high-voltage battery's charging capacity.

There are two options for this type of charging:

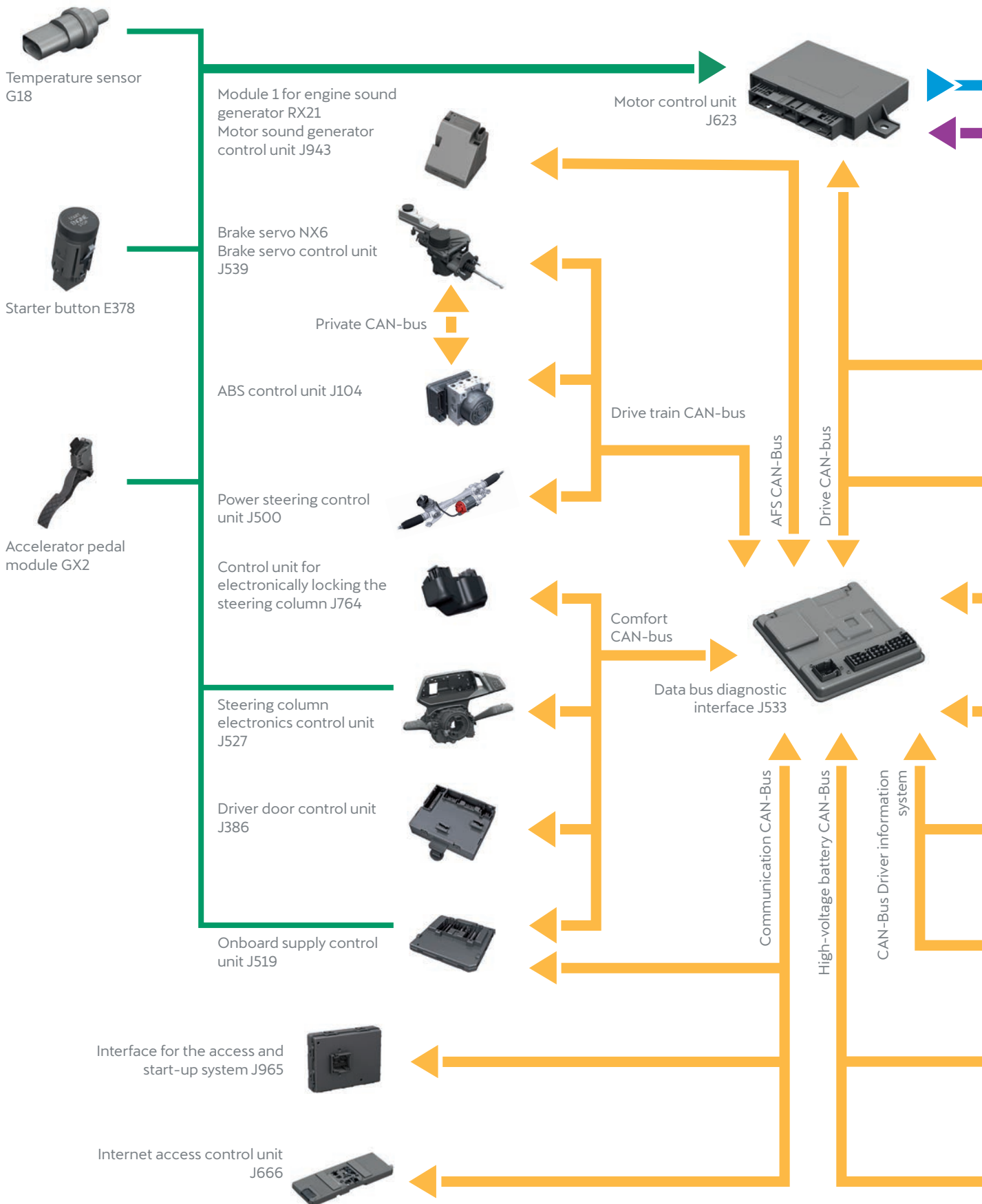
- Cable for domestic power socket (230 V at 10 A = 2.3 kW), which is the slowest option.
- Public or domestic charging station (from 7.2 kW to 11 kW). A 32 A cable is offered for increased charging capacity.

### CHARGING WITH DIRECT CURRENT

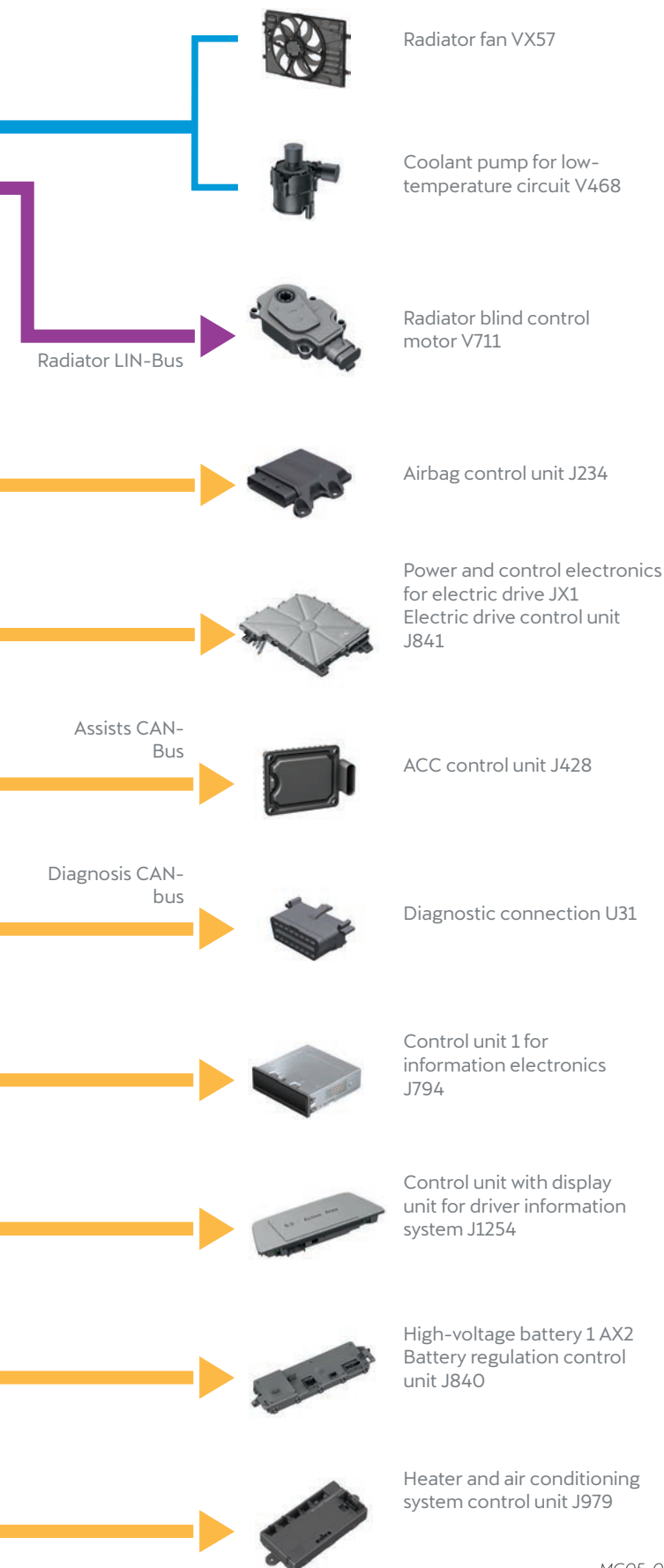
This type of charging is carried out at very high power (from 50 kW to 100kW or 125 kW), depending on the battery version.

The charging time is reduced considerably.

# POWERTRAIN







## SYSTEM DIAGRAM

The Motor control unit J623 is a **Continental ASG 1.2**.

The **selector control** is integrated in the Steering column module control unit J527 and transmits the selector positions via the Comfort CAN-Bus.

The Power steering control unit J500 **adjust the hardness according to the speed**.

The Module 1 for engine sound generator RX21 **produces sound at low speeds** to alert bystanders. It is connected via the AFS CAN-Bus to the Data bus diagnostic interface J533.

The Data bus diagnostic interface J533 transmits the datagram **"terminal 15 active"** through all its data buses if the following conditions are met:

- The key is inside the passenger compartment.
- Vehicle switched on using the Starter button E378, sending a signal by conventional cable to the Onboard supply control unit J519.
- Vehicle switched on using the brake pedal, the Brake pedal position sender G100 sends a signal via the Drivetrain CAN-Bus to the Data bus diagnosis interface J533.

The Data bus diagnosis interface J533 transmits the datagram **"terminal 50 active"** through all its data buses if the following conditions are met:

- The Driver's side seat occupied sensor G1067 detects that someone is seated.
- The key is inside the passenger compartment.
- Stepping and holding down the brake pedal, select gear D or R using the selector control. The signals are picked up by the Data bus diagnosis interface J533.

## POWERTRAIN

### THREE-PHASE CURRENT DRIVE MODULE VX54

As it is a **rear-wheel-drive** vehicle, the drive module is located on the vehicle's rear axle.

The Three-phase current drive VX54 consists of:

- The electric machine.
- The OMH 1-speed gearbox.

#### ELECTRIC MACHINE

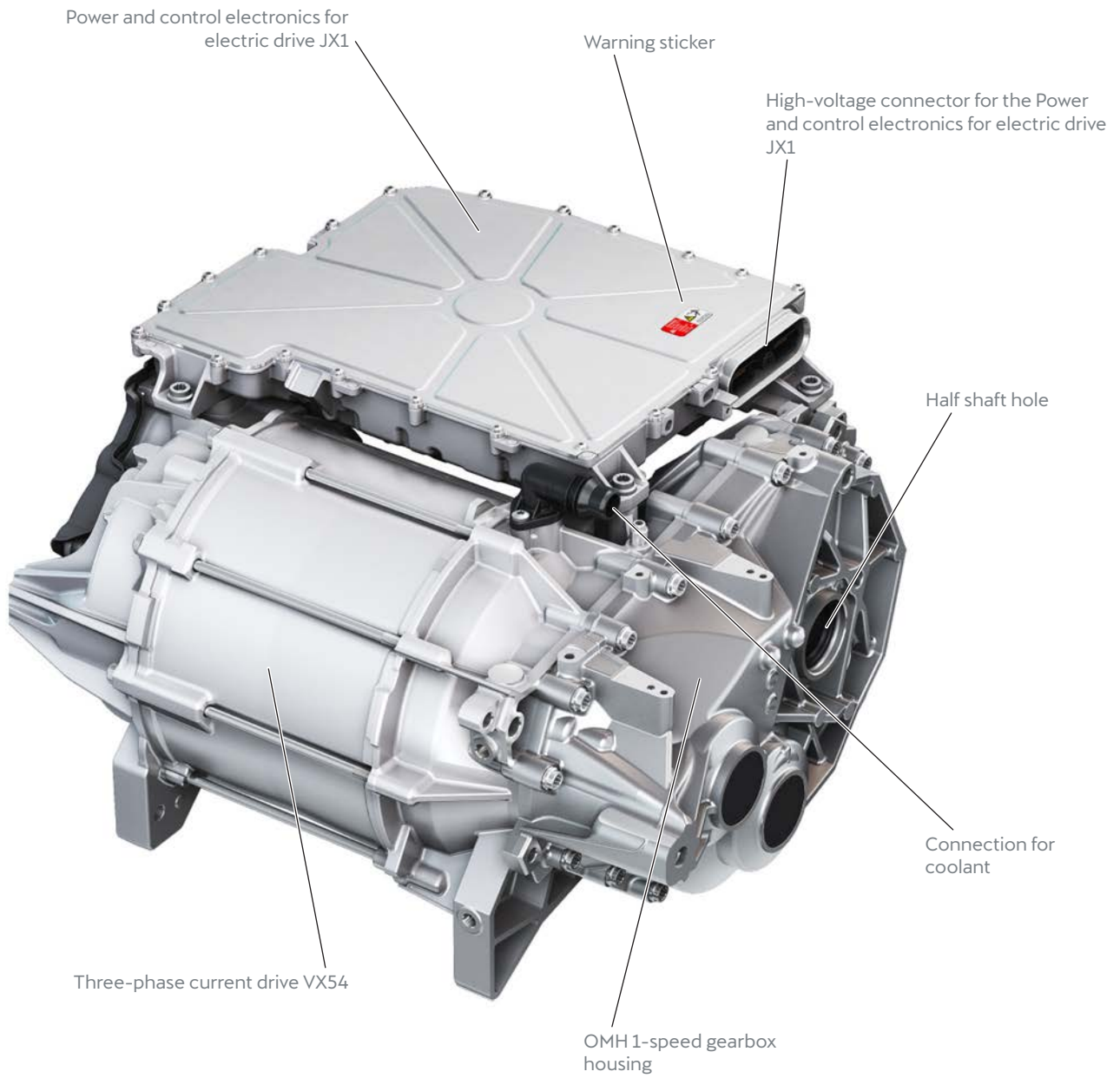
It is a synchronous motor with a permanent magnet rotor.

There are three power levels depending on the battery capacity and the selected equipment.

The **PERFORMANCE Pack** is available as an option. When selecting CUPRA mode by means of the right satellite button on the multifunction steering, the electric machine will provide an additional 20kW of power.

The possible combinations are shown below:

Motor lettering	ECWA	EBJC	EBJD
Maximum power	170 kW	150 kW	110 kW
Maximum torque		310 Nm	
Rated voltage	260 V	260 V	202 V
Maximum speed		16000 rpm	
Battery capacity (gross)	82 kWh - 62 kWh	62 kWh	55 kWh
Battery capacity (net)	77 kWh - 58 kWh	58 kWh	45 kWh
Weight		80.8 kg	80.5 kg



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# POWERTRAIN

## INTERNAL COMPONENTS

The interior of the electric machine consists of the following:

### ROTOR

The rotor has a diameter of 220 mm and functions as a crankshaft. **Its shaft is hollow**, and it has a **grooved interior** at its end that connects with the gearbox's primary shaft.

The motor stack houses the permanent magnets in a "V" arrangement and includes 2 balancing washers at the ends.

The excitation of the powertrain provides the rotor's position at all times in order to be able to apply the current in the corresponding phase.

The tone wheel connected to the rotor is essential for the Rotor position sender for the electric drive motor G713. This **resolver**-type sensor is located on the opposite side of the gearbox.

### STATOR

The motor stack consists of welded sheets with high magnetic conductivity and an electrically insulating coating on both sides.

The three-phase stator winding is made up of fork-shaped conducting plates.

The winding incorporates a housing for the Temperature sender for the electric drive motor G712. It is an **NTC**-type sensor, and its function is to record the electric drive motor's temperature.

The stator is impregnated with resin in a bath to provide it with further robustness and insulation.

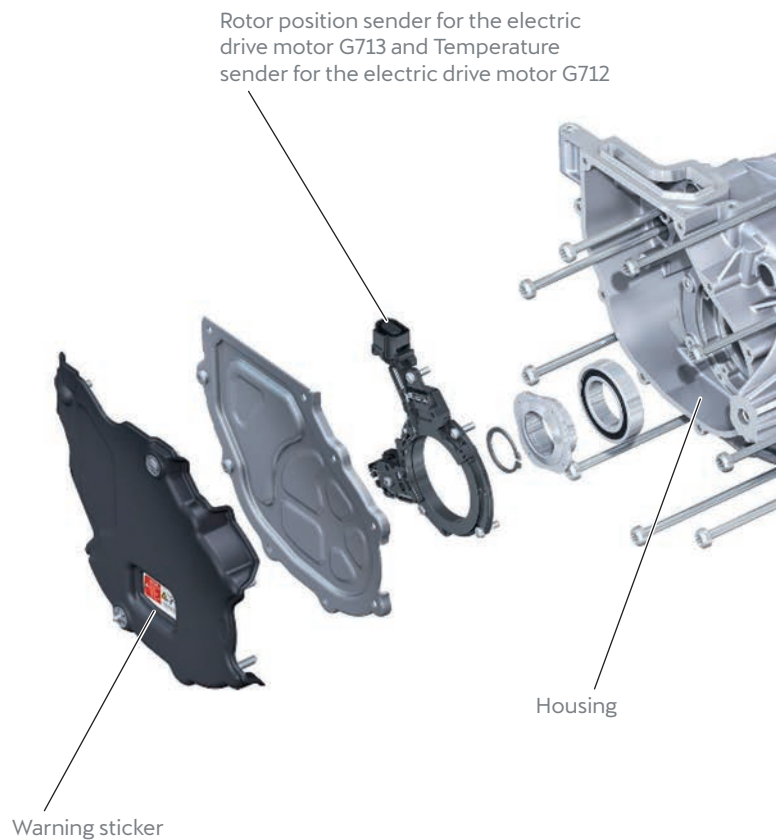
### COOLING

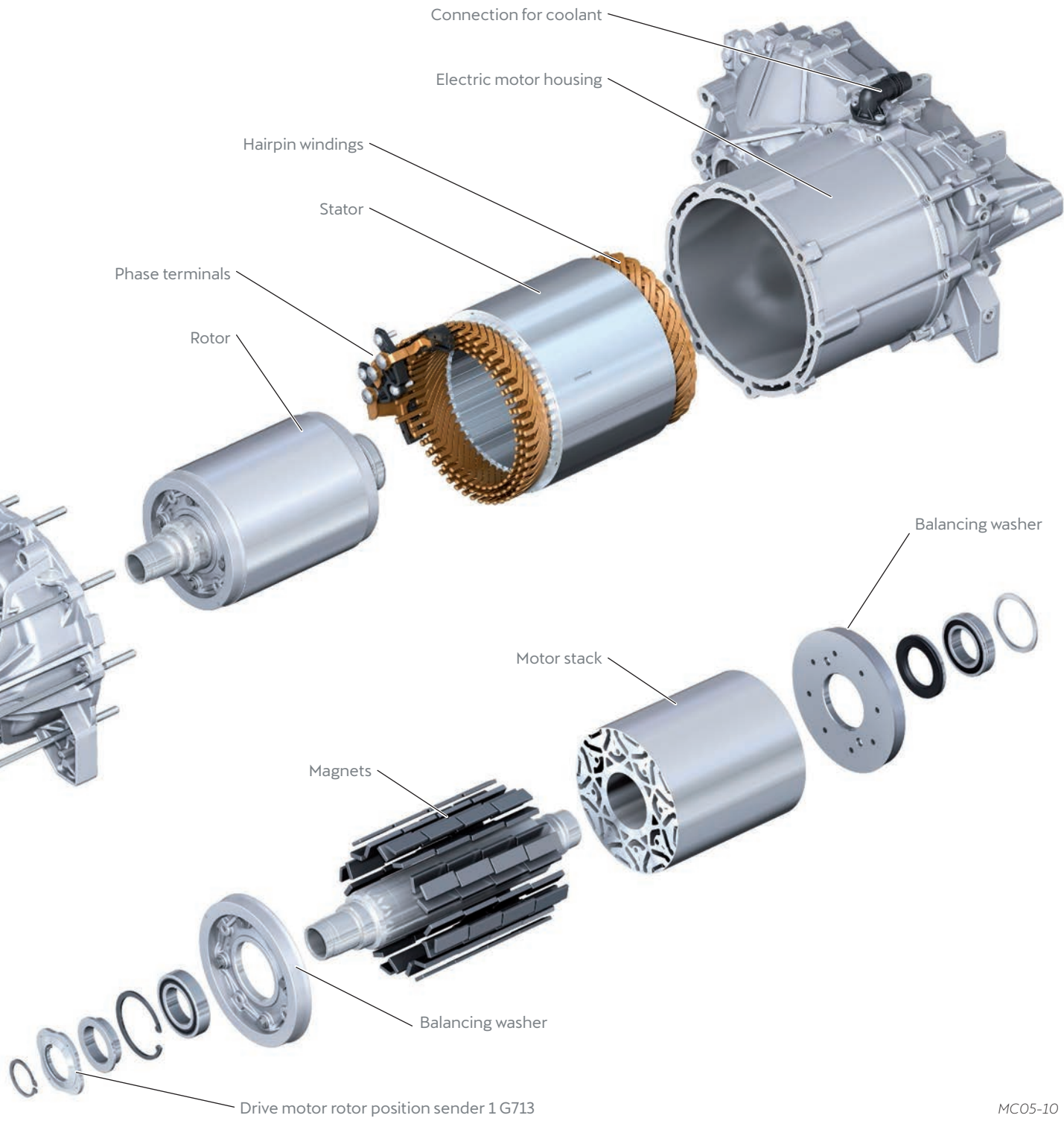
The electric machine is equipped with **Evo coolant circuit G12**.

The coolant inlet comes from the bottom of the power module. The coolant zigzags through the housing.

The heat generated in the stator winding is dissipated through the insulation system and the motor stack towards the motor housing's heat sink.

If a **temperature of 130°C** is exceeded, the electric machine's power output is reduced and the driver is informed.





# POWERTRAIN

Name in the Service Partner	OMH EQ310-1P
Gearbox lettering	UMG
Number of gears	1
Gear ratio stages	2
Gear ratio (stage 1)	Z1 =23 and Z2 =68 (2.956)
Gear ratio (stage 2)	Z3 =20 and Z4 =78 (3.900)
Gear ratio (final)	11.528
Maximum input torque	310 Nm
Maximum input speed	16000 rpm
ATF oil quantity	0.9 l
Service interval (oil change)	Lifetime
Weight	21.4 kg

## OMH 1-SPEED GEARBOX

The OMH **1-speed** gearbox is mounted on the Three-phase current drive VX54. The advantage of this design is its light and compact structure.

The **parking lock** has been discarded. This function is now performed by the **electromechanical parking brake**, via the Parking brake motor V282/V283.

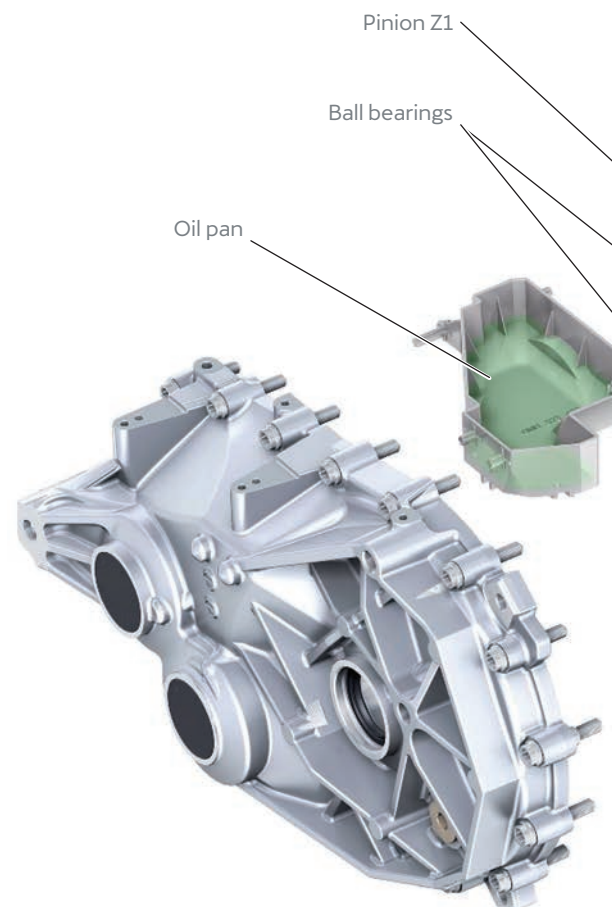
The following parts are fitted in the OMH gearbox:

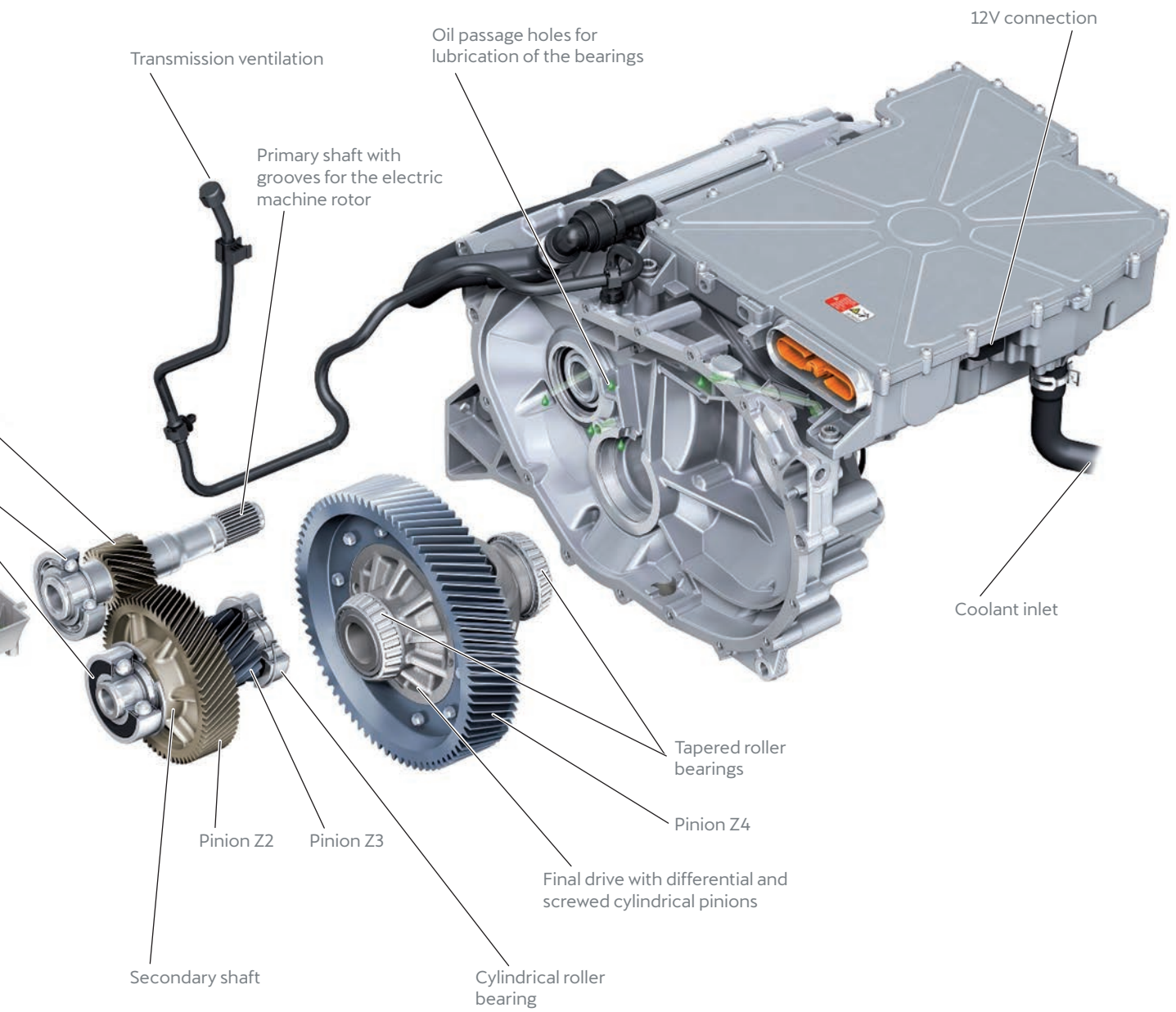
- Primary shaft with pinion Z1.
- Secondary shaft with pinions Z2 and Z3.
- Final drive with Z4 differential.
- Oil pan

The electric machine's rotor drives the primary shaft through a series of grooves.

The intermediate shaft (secondary shaft) can be used to transfer the entire gear ratio in two stages (Z1 to Z2 and Z3 to Z4).

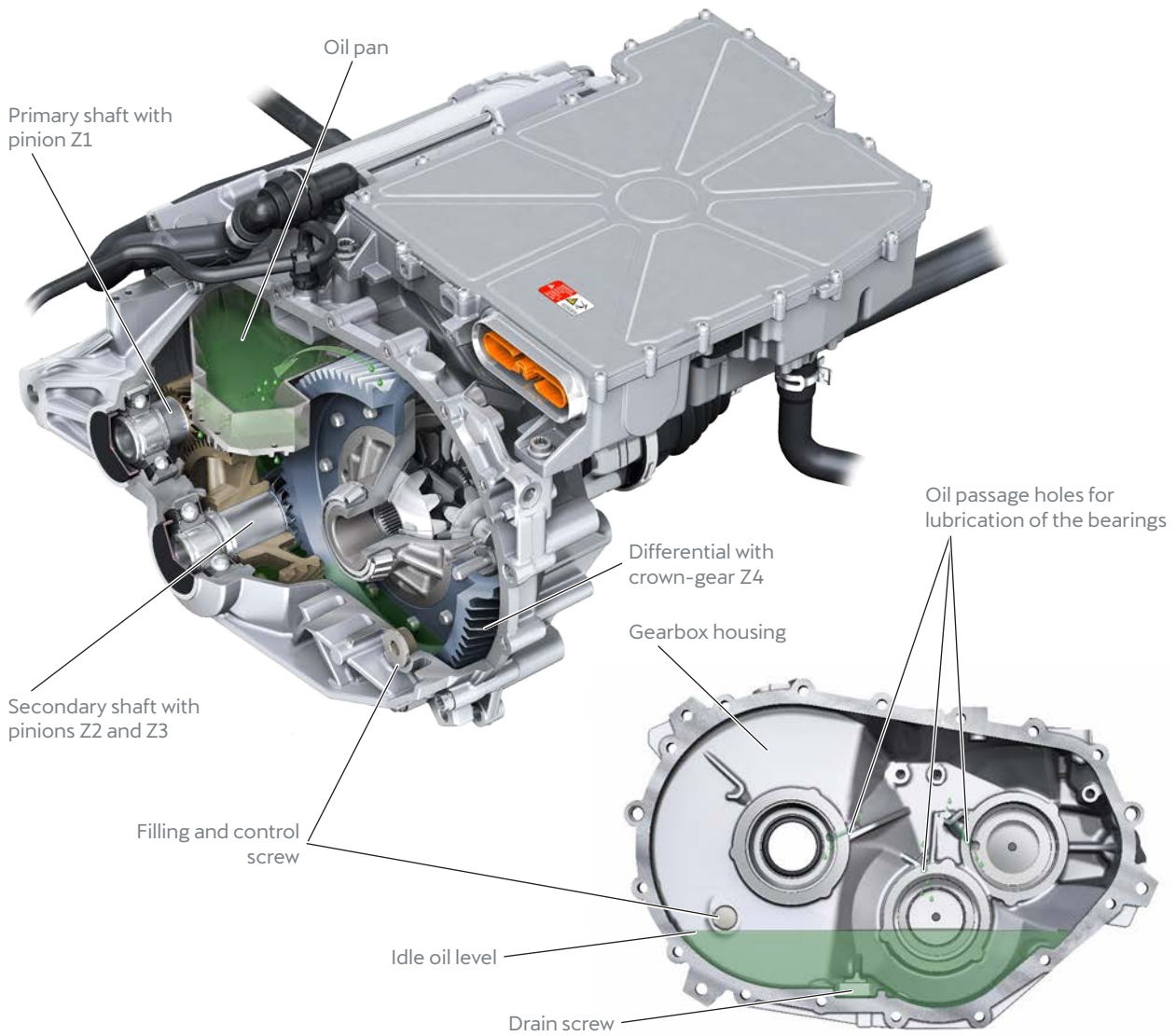
Lastly, the final drive with differential and half shafts transmit the torque to the wheels.





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# POWERTRAIN



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## LUBRICATION

The crown-gear differential functions like a vane pump, transporting the oil to the oil pan.

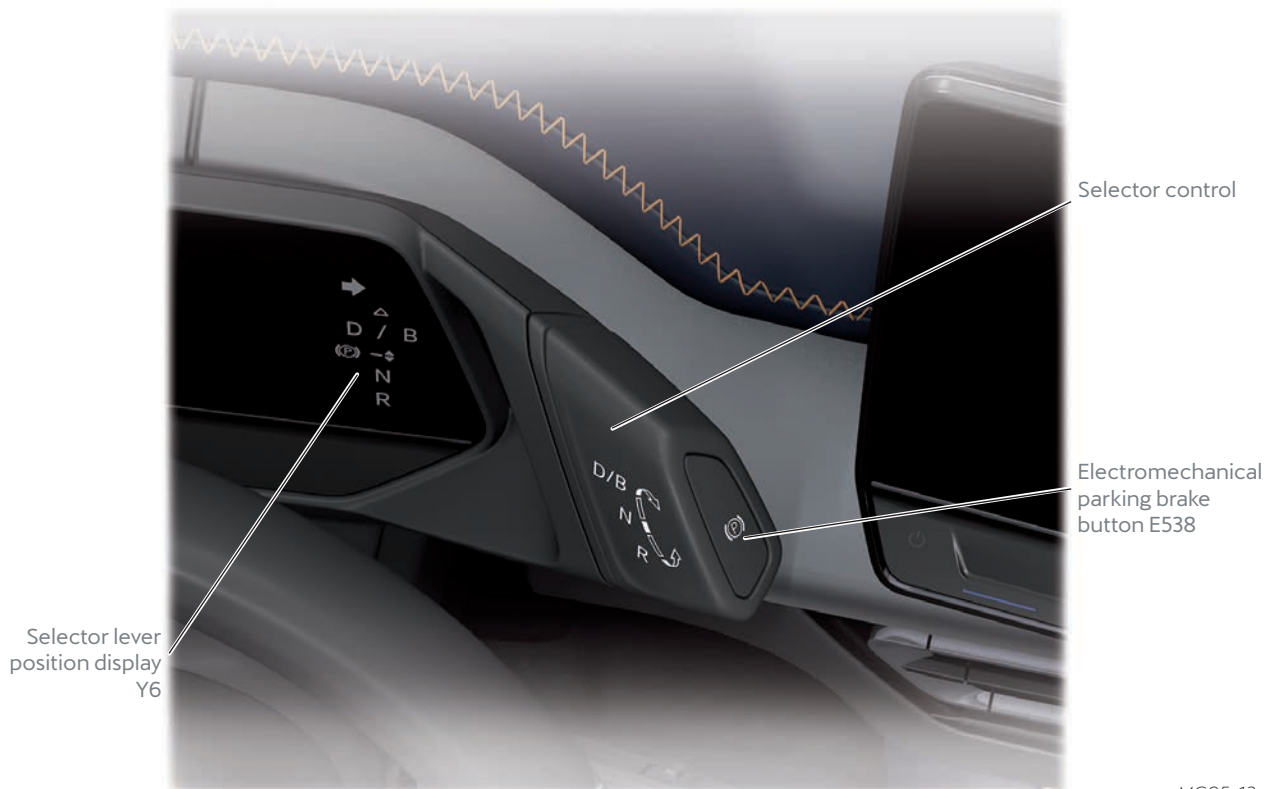
The **oil pan** distributes the oil to specific lubrication points. This reduces splashing and increases efficiency.

Through the holes in the oil pan and in the gearbox housing, the oil lubricates and cools the bearings of the shafts and the differential.

To check the oil level inside the gearbox, we must remove the filling and control screw. The gearbox's oil level will be correct if it is at the lower edge of the filling and control screw's thread.

The gearbox oil does not require replacing.





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## SELECTOR CONTROL

A remarkable new feature in the CUPRA Born is that the selector control is integrated into the Steering column module control unit J527.

The gears are changed using a selector that rotates above the frame of the Control unit with display unit for driver information system J1254.

When the selector is rotated, the selected gear is shown in amber on the Selector lever position display Y6. Non-active positions remain blank.

We can pass **one or two points of resistance** in each direction of rotation. Regardless of the mode selected, the gear selector always returns to the starting position.

- Upwards, passing one resistance point, we select the forward gear **D**.
- Rotating again upwards changes **D** to **B** position and vice versa.
- Downwards, passing one resistance point changes **D** to **N** position.
- Rotating again downwards changes **N** to **R** position.
- Upwards, passing two resistance points changes **R** to **D/B** position.
- Downwards, passing two resistance points changes **D/B** to **R** position.

This enables us to quickly change the vehicle's direction of travel.

The **parking brake/P** position is located at the end of the gear selector. It is activated using the Electromechanical parking brake button E538 (connected directly to the ABS control unit J104).

## INERTIA ROLLING DEACTIVATION

In order to be able to push the vehicle from outside, as well as in cases where it is necessary, such as when moving it:

- In the workshop.
- In the washing tunnel.
- At the MOT.

We must deactivate inertia rolling via the Infotainment system's "Vehicle" menu. To deactivate it, the vehicle must be stationary, the selector lever in **N** position and the brake pedal stepped on.

## DRIVETRAIN

The CUPRA Born is available with standard suspension and with **adaptive suspension (DCC)** as an option.

### FRONT AXLE

The front axle configuration is **Mc-Pherson type**, and it has the following characteristics:

- A steel bridge that bears the mechanics.
- The body is reinforced by a support element and a transversal member.
- The anti-roll bar is tubular, and the steering box is in front of the centre of the wheel.

The **electromechanical power steering** progressively assists the driver according to the speed. The steering's turning radius is short.

The CUPRA Born's front brakes feature ventilated discs. The size varies depending on the equipment version.

The brake calliper is a floating piston with axial anchoring system.

### REAR AXLE

The rear axle is **Multi-link type with five oscillating arms** and rear-wheel drive. Its main characteristics are as follows:

- The electric machine is mounted on the rear axle and is connected to the steel bridge by means of 3 silentbloc bushes.
- The complete rear axle is connected to the body by means of 4 silentbloc bushes.
- It is equipped with drum brakes and the Right parking brake motor V282 and V283, which is managed by the Brake servo control unit J539 and ABS control unit J104.

### TYRES

The CUPRA Born is equipped with tyres specifically designed for electric vehicles, due to their unusual dimensions (large diameter and reduced width).

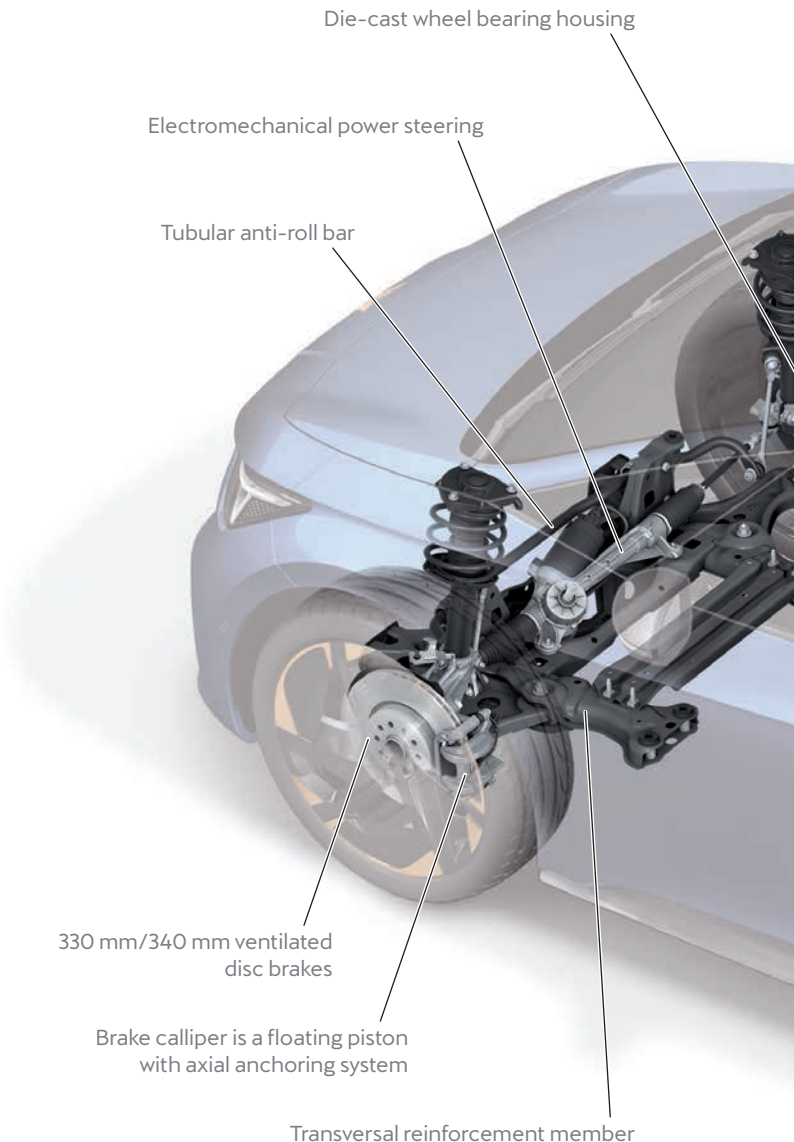
This type of tyre is marked with the symbol "+".

Its special structure provides:

- Low tyre resistance to tread, increasing the range. Energy consumption label "A".
- Low noise level, between 67dB and 71dB, depending on the wheel size and manufacturer.
- High grip in wet conditions. Wet grip rating "B".
- Speed index "T" limits the maximum speed to 190 km/h.

### ELECTROMECHANICAL BRAKE SERVO

The CUPRA Born is equipped with an electromechanical brake servo that assists the driver when braking.



### PARKING BRAKE

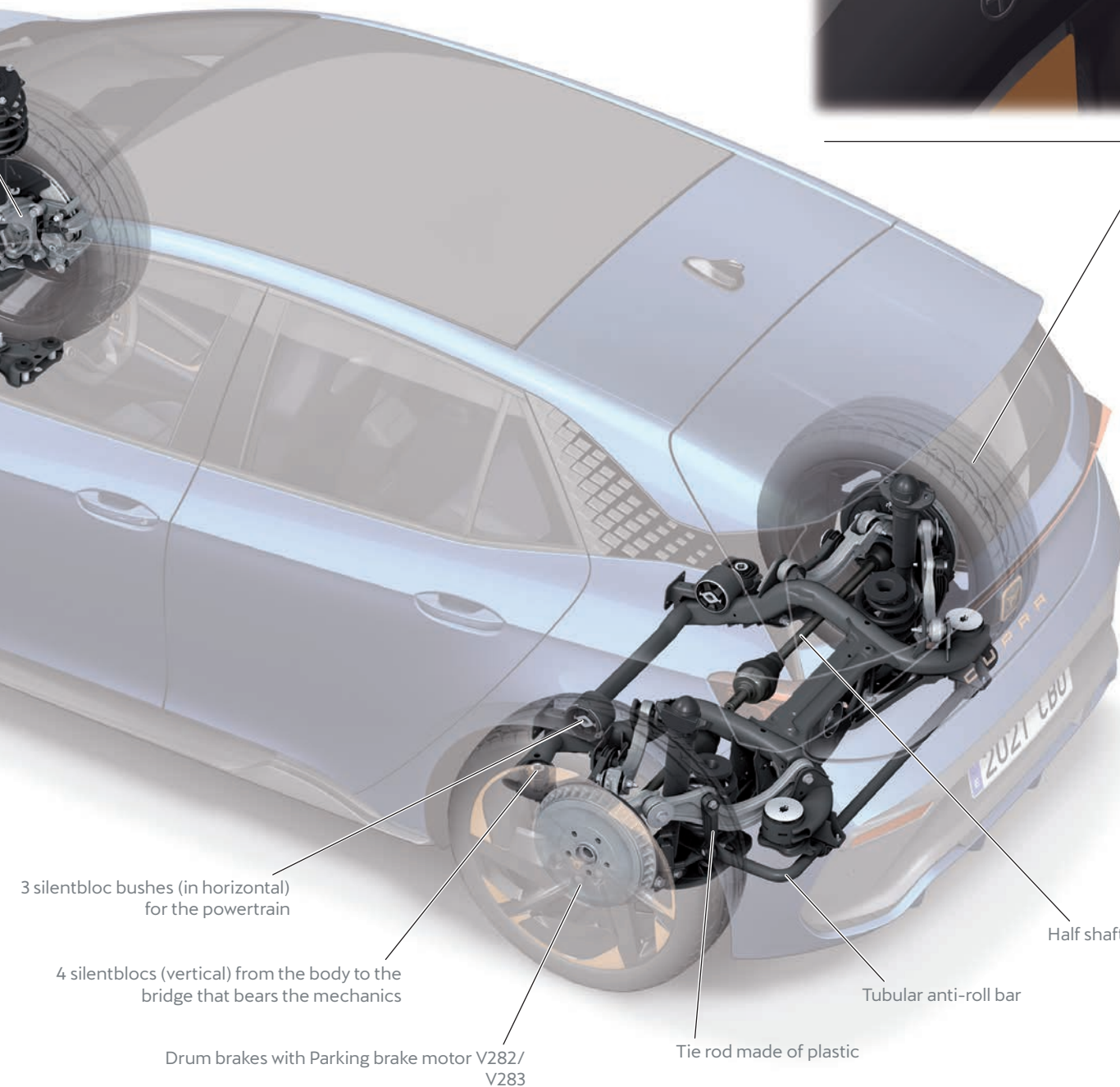
The parking brake is electromechanical and it engages:

- By pressing "P".
- When switching the vehicle on.
- When exiting the vehicle (via the open door, seatbelt detection and driver seat detection signals).

And it disconnects when selecting a gear position.

The Brake servo control unit J539 and the ABS control unit J104 control the parking brake.

Tyres with optimised resistance to tread  
215/55 R18 95T  
215/50 R19 93T  
215/45 R20 95T



3 silentbloc bushes (in horizontal)  
for the powertrain

4 silentblocs (vertical) from the body to the  
bridge that bears the mechanics

Drum brakes with Parking brake motor V282/  
V283

Tie rod made of plastic

Tubular anti-roll bar

Half shafts

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**Note:** You can find more information in Magazine  
CUPRA Born Transmission and drivetrain MC07.

## DRIVING ASSIST SYSTEMS

The driving assist systems offered in the CUPRA Born are those we are familiar with from other CUPRA models.

They are all listed below:



Travel Assist



Adaptive Cruise Control (ACC)



Drive Profile



Light Assist



Front Assist



Lane Assist



Park Pilot



Side Assist



Rear Cross Traffic Alert (RCTA)



Emergency Assist





Sign recognition



Rear view camera (RVC)



Autohold



Intelligent Park Assist NEW



PreCrash



Top View Camera



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# DRIVING ASSIST SYSTEMS

## PARKING SYSTEMS

A new development among the driving assist systems is the Intelligent Park Assist (IPA).

### INTELLIGENT PARK ASSIST (IPA)

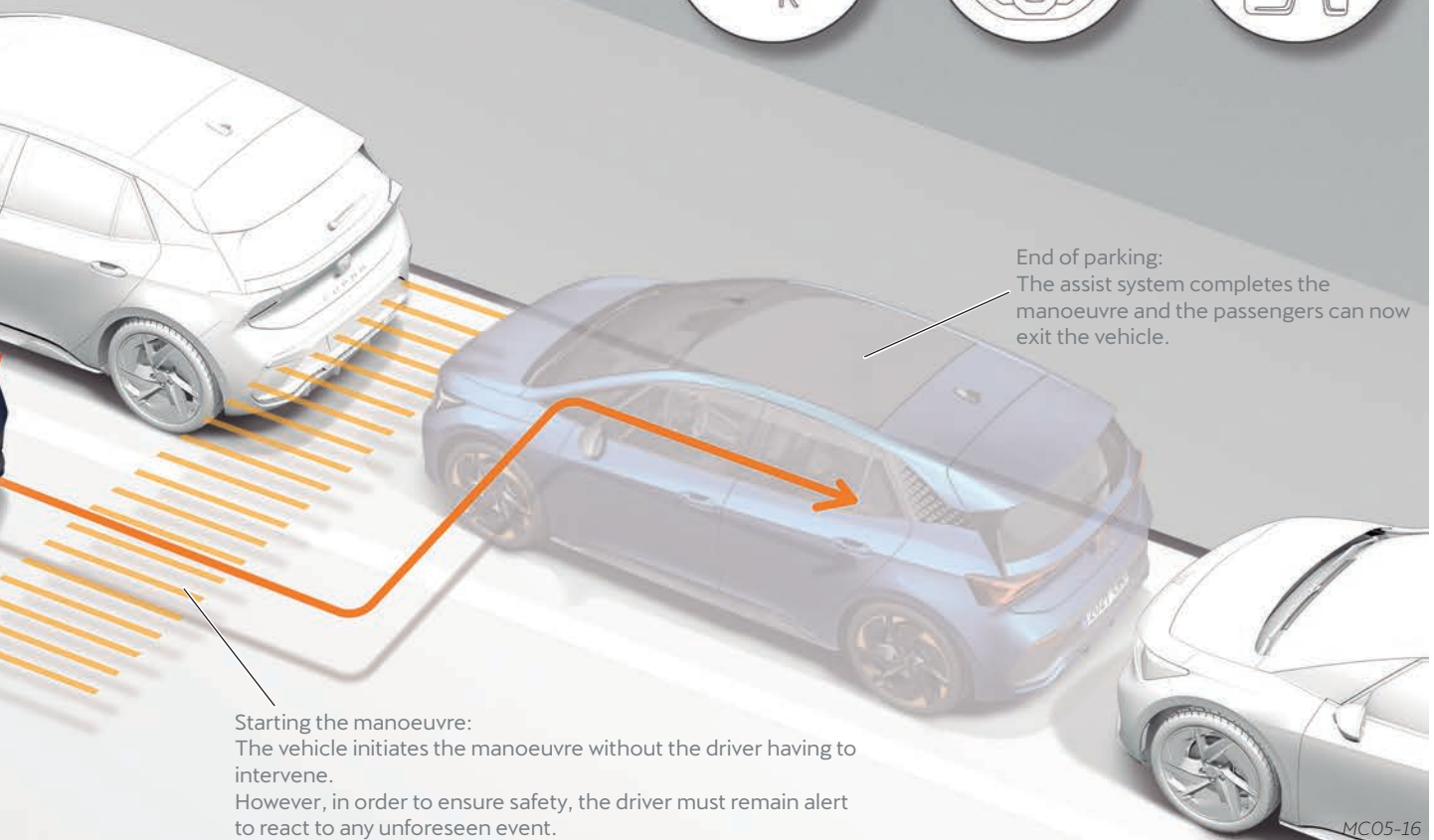
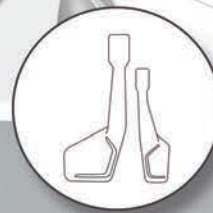
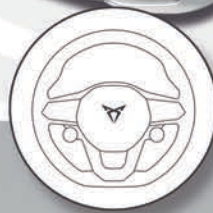
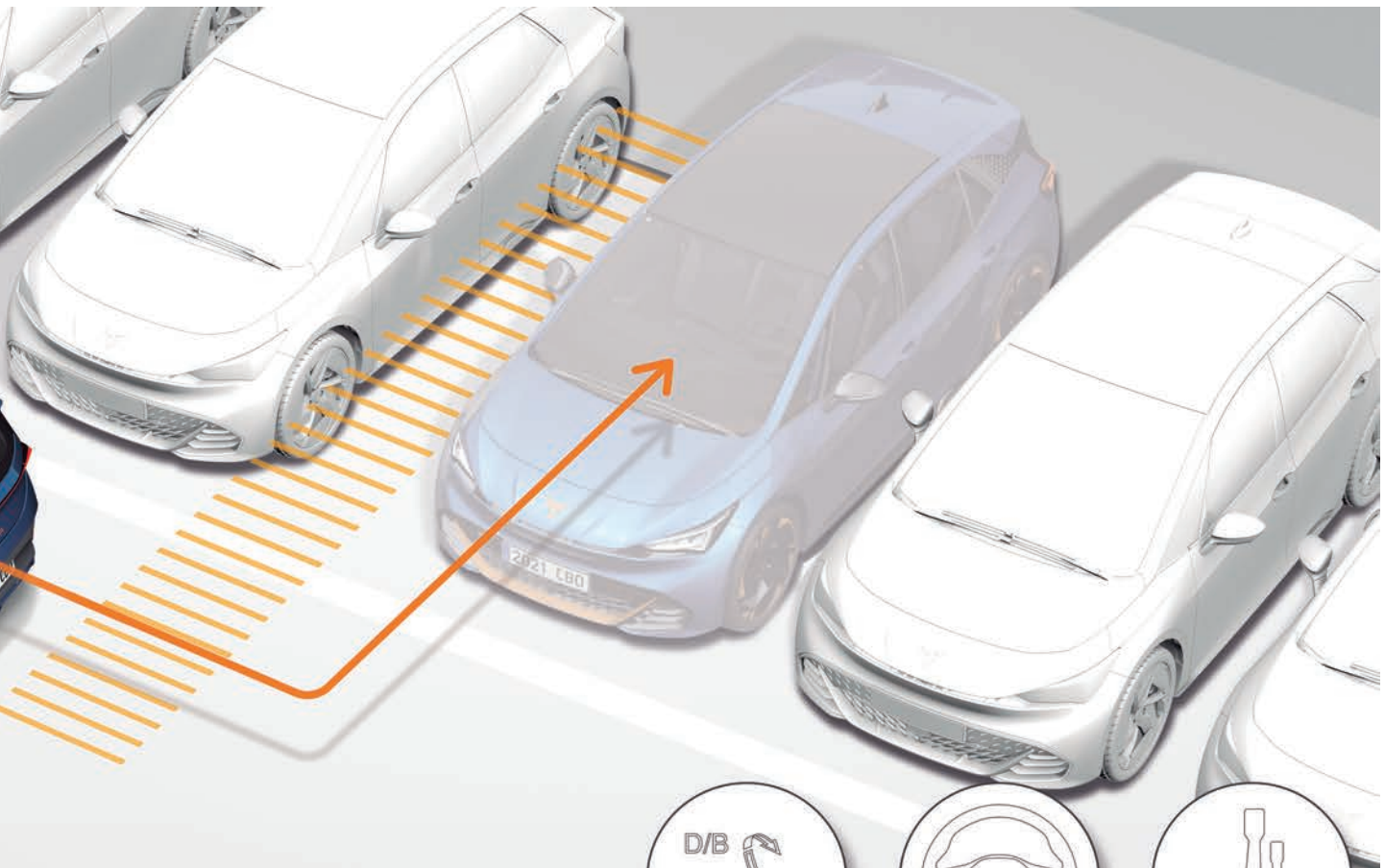
The new assist system has the same features as the previous Park Assist (PLA) with the added function of **pedal** control during the parking manoeuvre.

Thanks to this system, with a total of 12 sensors, the vehicle takes full control following its activation via the Infotainment system.

This way, the driver does not have to step on the pedals, turn the steering wheel or change the direction of travel to carry out the manoeuvre; it is carried out by the vehicle.



Activating the assist:  
The vehicle detects a parking space, either in parallel or perpendicular.  
The driver gives the command to start the manoeuvre via the Infotainment system.



End of parking:  
The assist system completes the manoeuvre and the passengers can now exit the vehicle.

Starting the manoeuvre:  
The vehicle initiates the manoeuvre without the driver having to intervene.  
However, in order to ensure safety, the driver must remain alert to react to any unforeseen event.

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## CLIMATE SYSTEM

The CUPRA Born is offered with a two-zone climate system, and we can choose between **two types of refrigerant circuit**.

A circuit with cooling agent R1234yf is equipped as standard.

It is available with a heat pump and cooling agent R744 as an option. The composition of cooling agent R744 is carbon dioxide (CO<sub>2</sub>).

### CLIMATE SYSTEM WITH COOLING AGENT R1234YF

The passenger compartment is heated using the heat generated by a high-voltage PTC heater.

While cooling is achieved thanks to the Circuit with cooling agent R1234yf. The cooling agent transmits heat in the exterior radiator (condenser) and absorbs heat from the passenger compartment (evaporator).

### CLIMATE SYSTEM WITH HEAT PUMP AND COOLING AGENT R744

It is a circuit that operates on the heat pump principle, i.e. the system can operate in two ways.

When cooling, the evaporator absorbs heat to cool the passenger compartment.

When heating, the inner gas radiator transmits heat, as if it were a condenser and the high-voltage PTC heater works partially.

This cooling and heating functionality is achieved with a series of components that are explained in this chapter.

In addition, **the R744 brings two major advantages:**

- It is more energy efficient.
- It is environmentally friendly.

### ENERGY EFFICIENCY

Using the climate system in electric vehicles affects their range; therefore, the aim is to extend the range as much as possible when in use.

Thanks to the new system with heat pump and cooling agent R744, **the range is increased** at exterior temperatures below 0°C.

By using a heat pump circuit, the high-voltage PTC heater no longer has to work so intensively.

Both climate systems are involved in controlling the high-voltage battery's temperature.



### THE ENVIRONMENT

CO<sub>2</sub> becomes a greenhouse gas when released in large quantities into the atmosphere.

The CUPRA Born with cooling agent R744 carries approximately **420 grams of CO<sub>2</sub>**.

The cooling agent is in a closed circuit and is not released into the atmosphere.





MC05-38

Due to being very similar systems, in the following pages we will simultaneously explain the handling and climatic unit of both climate systems. After that, we will see each circuit in further detail.

# CLIMATE SYSTEM

## HANDLING

The Climatronic is operated in several ways:

- Voice control.
- Lighting control unit EX59.
- Display unit for front information display and operating unit control unit J685.

## VOICE CONTROL

It is activated by saying **"HELLO HELLO"** or via the voice control button on the multifunction steering.

The phrases: I'm cold or I'm hot lower or raise the temperature by 1°C.

The phrases: I am cold or I am hot when featuring LOW or HIGH modes adjust the temperature to 22°C.

We can also activate the iClimate defrosting and demisting menu functions.

## LIGHTING CONTROL UNIT EX59

Direct access for the driver, we can activate the following functions:

- Defrosting and demisting.
- Heated rear window.

## DISPLAY UNIT FOR FRONT INFORMATION DISPLAY AND OPERATING UNIT CONTROL UNIT J685

We can operate all functions through it.

The menus are structured as follows:

### FRONT MENU

Familiar functions of a climate system menu (shown in the main illustration).

### ICLIMATE MENU

Before using these functions, we must first activate the climate system (in the top left corner or in the Front menu)

By selecting the desired function, the system will automatically make the appropriate adjustments to meet the user's need.

The system displays climate system options accompanied by illustrations, such as the following:

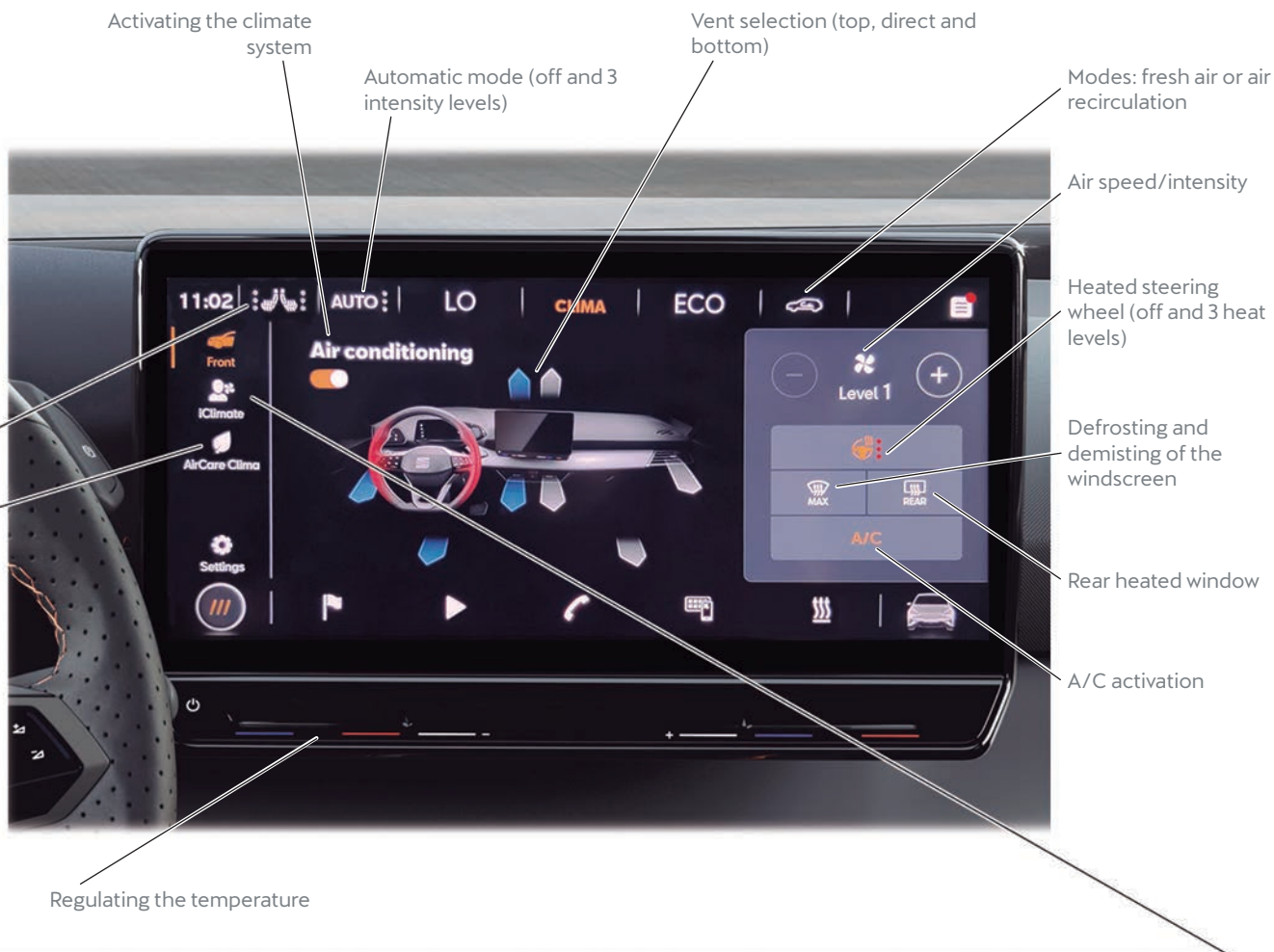
- Fast heating
- Warm up hands
- Warm up feet
- Cool feet
- Fresh air
- Demist glass



### AIRCARE CLIMA MENU

Before using these functions, we must first activate the climate system (in the top left corner or in the Front menu)

To activate this function, **all the vehicle's windows and doors must be closed.**

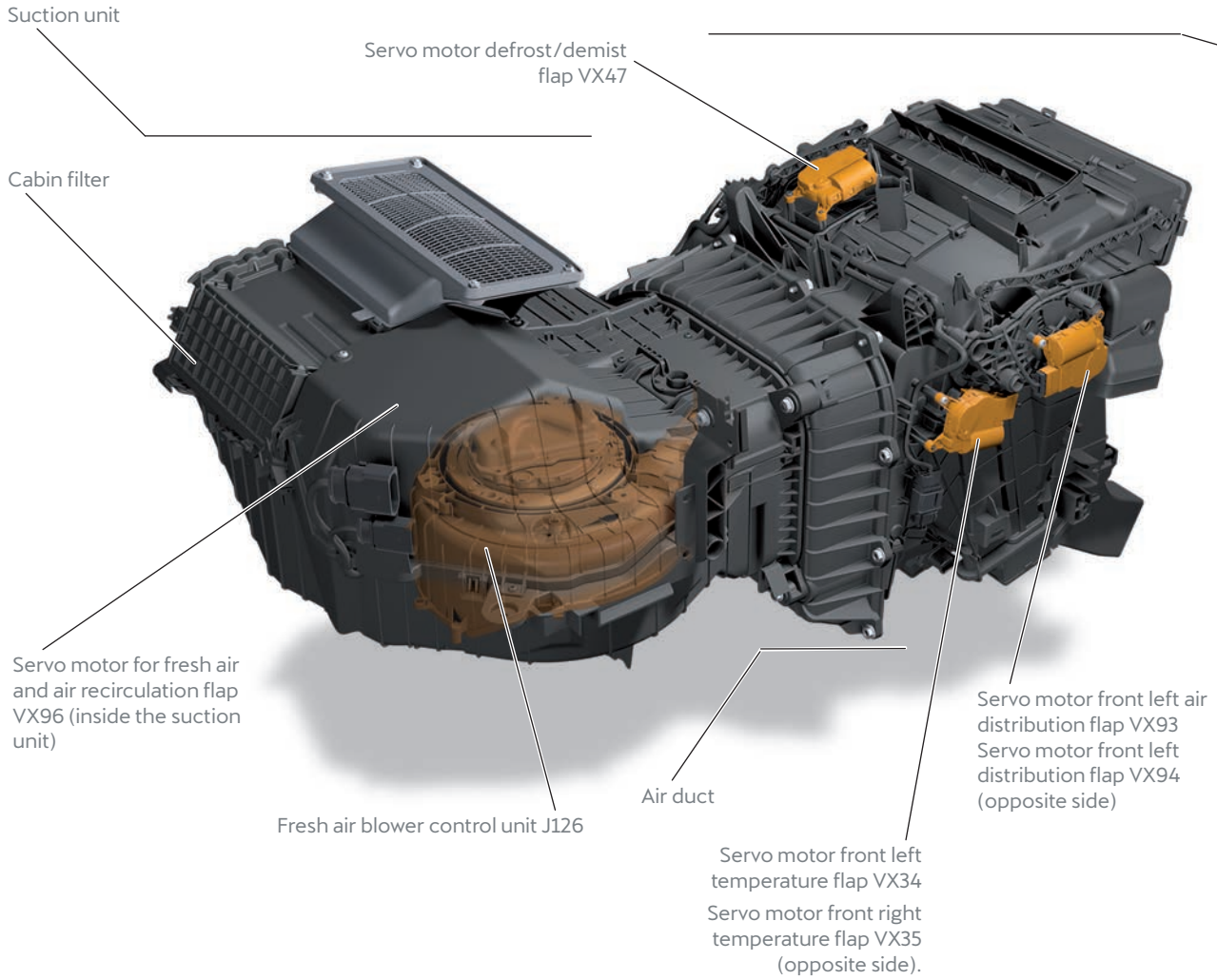


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Only the AirCare Climate function can be activated through this menu

Its function is **to filter and extract** the fine dust and pollen from the passenger compartment.

# CLIMATE SYSTEM



## CLIMATIC UNIT

There are 2 different climatic units based on the cooling agent used.

For systems **with cooling agent R1234yf**, heating is carried out exclusively by the high-voltage PTC heater.

The climatic unit has **two connections** for the evaporator tubes.

For systems **with cooling agent R744**, the heating is carried out by the high-voltage PTC heater and an additionally mounted gas radiator.

This climatic unit has **four connections**, two for the evaporator and two for the gas radiator.

Both types of climatic units are divided into three parts:

- Suction unit.

- Air duct.
- Distribution box.

### SUCTION UNIT

It is located at the front, behind the front body panel, thus reducing noise in the passenger compartment. It contains:

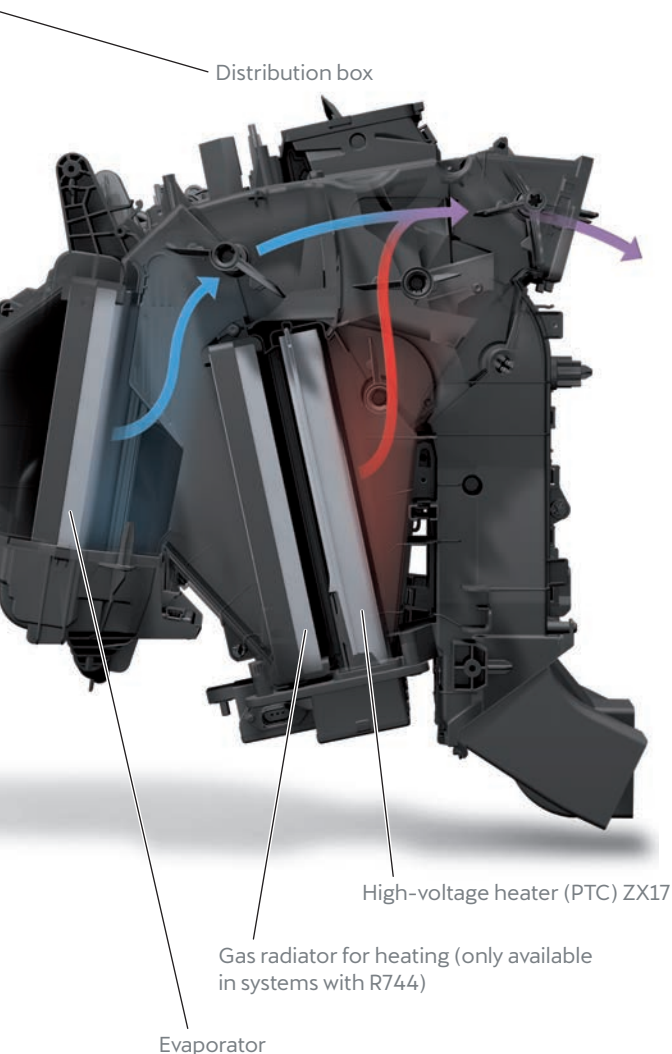
#### CABIN FILTER

The dust and pollen filter is easily accessed by removing the plastic cover.

In Europe, only one filter with an allergen coating (AirCare) is installed.

#### FRESH AIR BLOWER CONTROL UNIT J126

The air enters from outside or is recirculated air.



The air is ejected by the turbine into the air duct. The turbine is made up of the Fresh air blower control unit J126 and Motor V2.

Heater and air conditioning system control unit J979 exchanges information with the Fresh air blower control unit J126 via LIN-Bus.

The Motor V2 is excited by conventional cable.

## AIR DUCT

It connects the fresh air suction unit and the distribution box. It is fastened to the front body panel.

## DISTRIBUTION BOX

It includes the heat exchangers to generate cold or heat in the passenger compartment, the high-voltage PTC heater and the flaps.

The air passes through the evaporator, where it is cooled and dehumidified. Next, it is mixed with hot air in the mixing chamber and distributed through the flaps into the passenger compartment.

In heating mode, the air is heated to the desired temperature using the:

- Gas radiator for heating (only available in systems with R744).
- High-voltage heater (PTC) ZX17.

## HIGH-VOLTAGE HEATER (PTC) ZX17

It is on the right side of the distribution box. It consists of the High-voltage heater control unit J848 and the High-voltage heater Z115.

The excitation of the High-voltage heater (PTC) ZX17 is carried out gradually in 1% steps by the Heater and air conditioning system control unit J979 via LIN-Bus.

In vehicles with a heat pump, the high-voltage heater operates as an additional heater.

- When the user adjusts the temperature abruptly and requires an immediate response.
- Supports the slow start-up of the heat pump after switching on the vehicle.

## FLAPS

Each flap is activated by a servomotor. And the instantaneous position is recognised by means of a potentiometer. The potentiometers inform the Heater and air conditioning system control unit J979 and control the excitation of the servomotors

## AIR RECIRCULATION MODE

The air in the passenger compartment is led through the air duct and the recirculation flap to the suction unit.

The air passes through the filter, returns to the heating equipment and climate system and is distributed according to the position of the flaps.

# CLIMATE SYSTEM

## CIRCUIT WITH COOLING AGENT R1234YF

The circuit with cooling agent R1234yf works like a traditional circuit where the coolant transmits heat in the exterior radiator (condenser) and absorbs the heat from the passenger compartment in the internal radiator (evaporator) to cool the passenger compartment.

The circuit is also involved in the high-voltage **battery's temperature management** by means of the heat exchanger for the high-voltage battery (also known as Chiller).

The battery's cooling is required at different operating times:

- **When charging**, with a battery temperature above 30°C.
- **When running**, if the battery temperature exceeds 35°C, it is actively cooled with the help of the Chiller.

The **Climate system compressor VX81** is mounted on a separate support with silentbloc bushes in order to reduce the transfer of noise to the passenger compartment. The compressor works on the spiral compressor principle and is driven by a high-voltage electric motor.

The Climate system compressor VX81 internally consists of the following:

- Control unit for air conditioning compressor J842.
- Electrical air conditioner compressor V470.

The compressor's rotation is adjusted by the Heater and air conditioning system control unit J979 via a LIN-Bus signal.

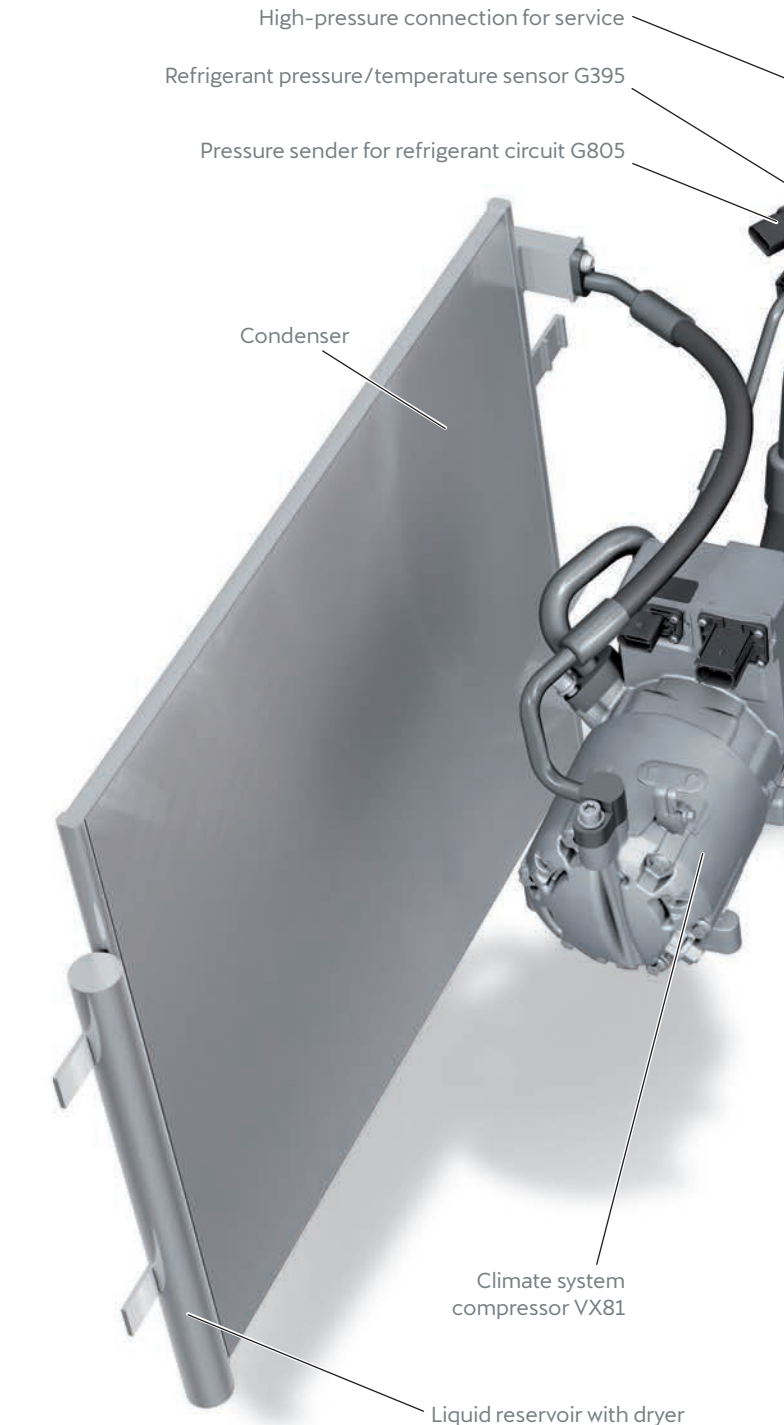
## REFRIGERANT CUT-OFF VALVE FOR HEATER AND AIR CONDITIONER UNIT N541

The cut-off valve is a solenoid valve that **remains open without current**. When the induction coil is excited, the flow of coolant to the **evaporator** is cut off.

This optimises energy consumption in the battery's cooling phase, as no unnecessary refrigerant agent has to be pumped through the evaporator circuit.

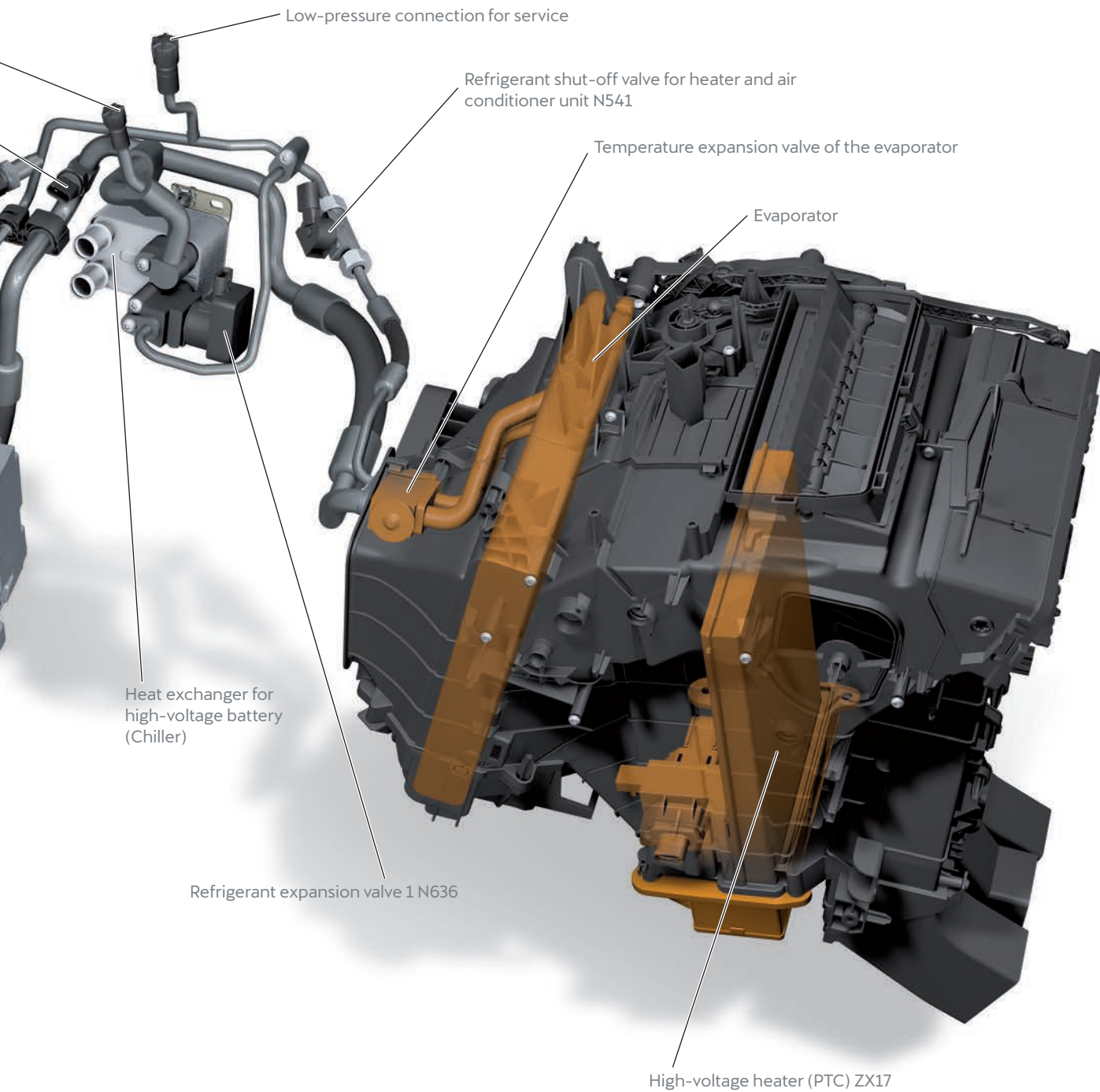
## REFRIGERANT EXPANSION VALVE 1 N636

The valve is regulated thanks to the Refrigerant pressure/temperature sensor G395, located on the suction side. This way, the cooling requirement



is regulated by changing the cross-section of the Refrigerant expansion valve N636.

This electric expansion valve is comparable to a ball valve. Depending on the angle of rotation, more or less cooling agent is expanded in the heat exchanger for the high-voltage battery (**Chiller**).



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## TEMPERATURE EXPANSION VALVE OF THE EVAPORATOR

The valve regulates the flow of cooling agent, making pressure drop abruptly and allowing the cooling agent to evaporate.

The result is a sharp drop in temperature. At the valve's outlet, the cooling agent is in a gaseous state at low temperature and low pressure.

# CLIMATE SYSTEM

## SYSTEM DIAGRAM. CIRCUIT WITH COOLING AGENT R1234YF

The Heater and air conditioning system control unit J979 processes the signals it receives from its own sensors and from other systems via CAN-Bus and LIN-Bus and excites the flaps' servomotors.

This Climatronic management has several **particularities:**

- The Front passenger seat occupied sensor G128 intervenes in activating the ECO function.
- A blind is incorporated in the front radiator, in front of the vehicle.
- The high-voltage battery's temperature management incorporates specific components.

## ECO FUNCTION AND FRONT PASSENGER SIDE SEAT OCCUPIED SENSOR G128

The sensor is located under the passenger seat upholstery. It informs the Airbag control unit J234 if the seat is occupied. The latter dumps the information in Drive CAN-Bus.

The Heater and air conditioning system control unit J979 controls the position of the flaps in ECO mode when it recognises that the passenger seat is empty.

## BLIND ON THE FRONT RADIATOR

Its purpose is to improve aerodynamic efficiency by covering the radiator when heat exchange is not necessary.

The Motor control unit J623 controls the radiator blind control motor via LIN-Bus and excites Radiator fan VX57.

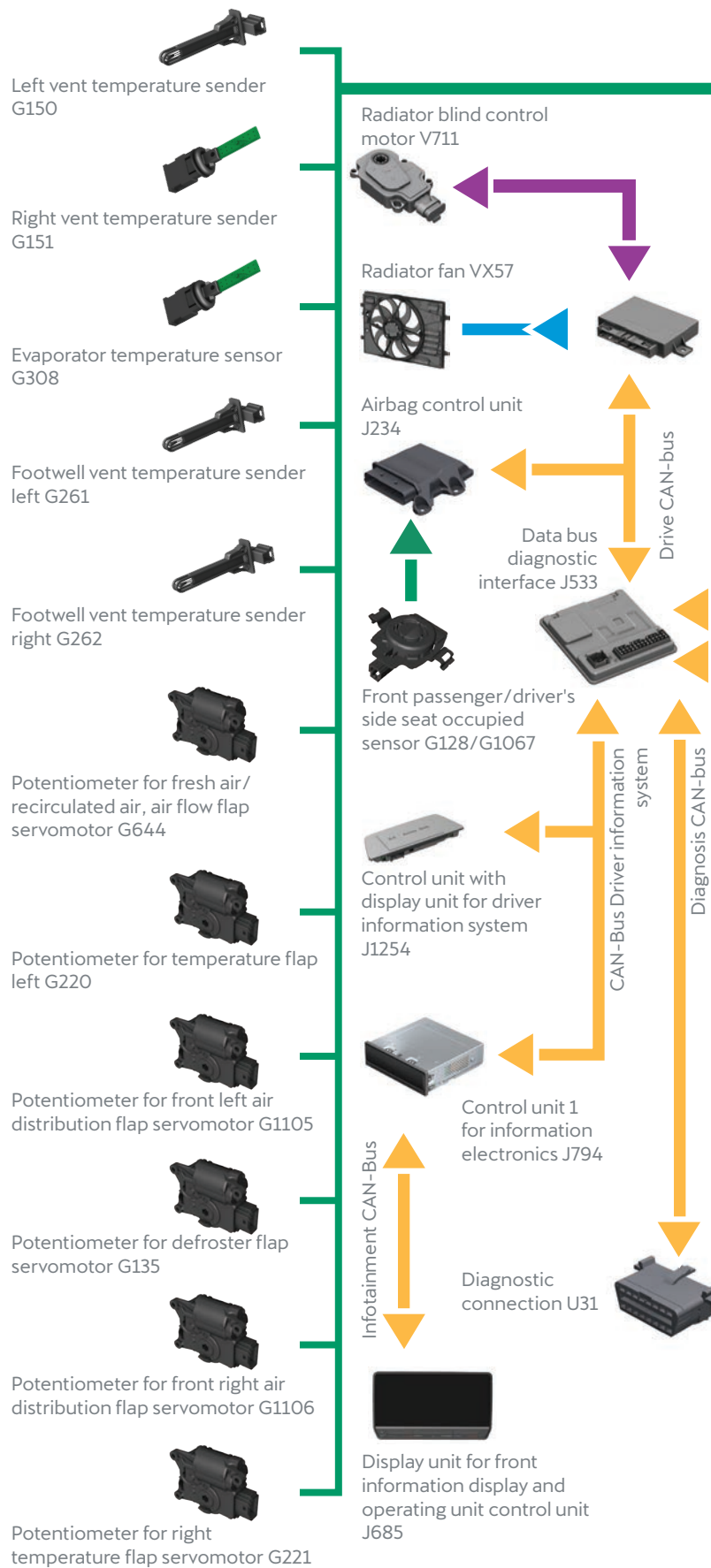
The blind is regulated according to the needs of the climate system and the high-voltage components' temperature management.

If the Heater and air conditioning system control unit J979 determines the need to operate the blind, it will dump a CAN message.

## HIGH-VOLTAGE BATTERY TEMPERATURE MANAGEMENT

The following components intervene:

- Refrigerant shut-off valve for heater and air conditioner unit N541.
- Expansion valve for refrigerant N636 at the inlet of the heat exchanger.
- Refrigerant pressure/temperature sensor G395.

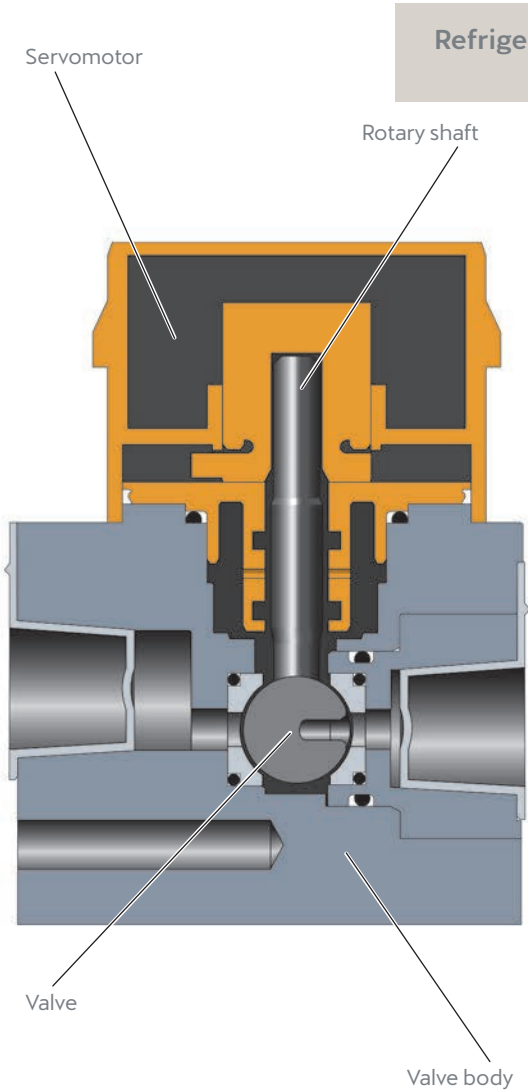




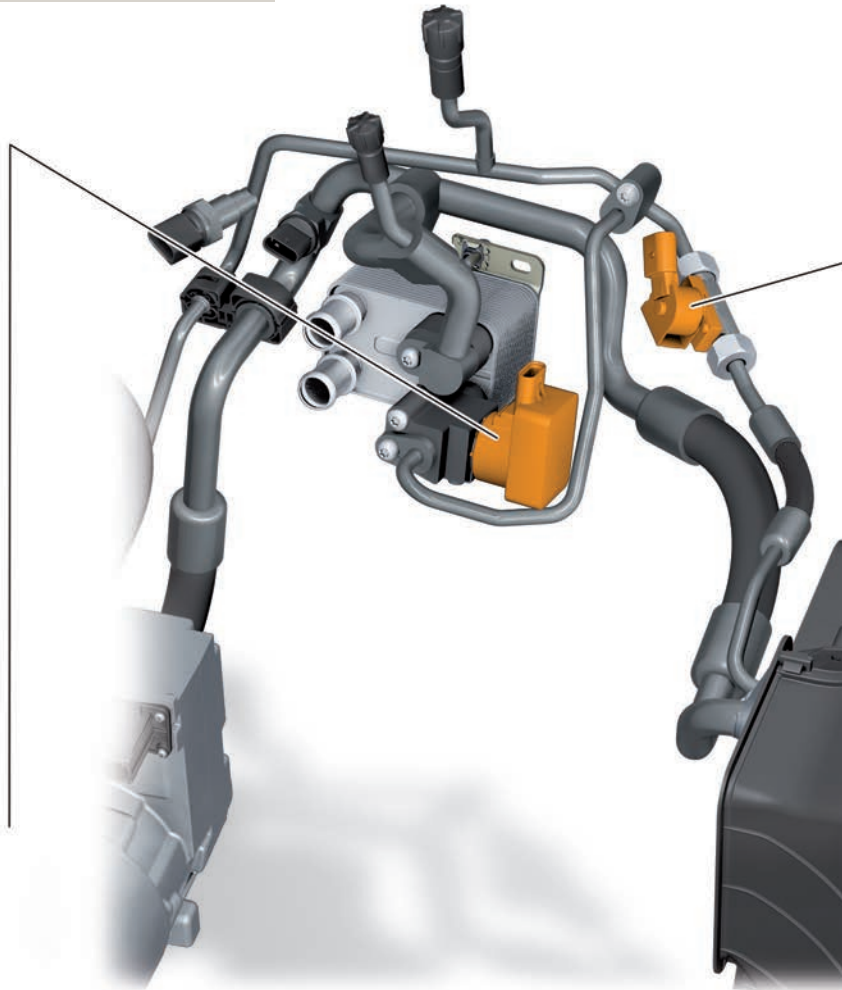


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# CLIMATE SYSTEM



Refrigerant expansion valve 1  
N636



## REFRIGERANT EXPANSION VALVE 1 N636

The valve is mounted on the heat exchanger's inlet for the high-voltage battery.

It is controlled by the Heater and air conditioning system control unit J979 via LIN-Bus signal.

It assumes the function of **regulating the flow of cooling agent to the heat exchanger** for the high-voltage battery. Behaving like an expansion valve.

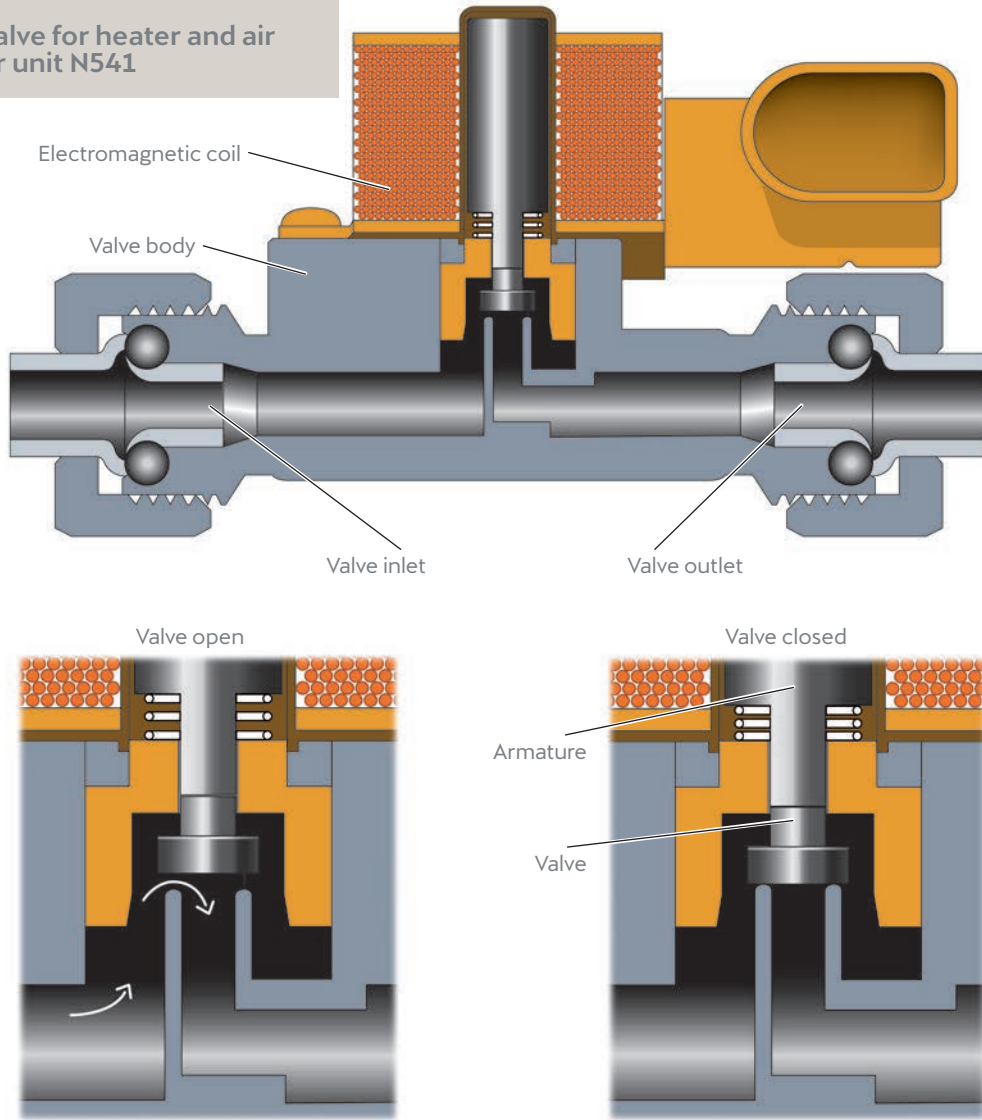
The valve consists of an electronic control (fed by the battery's positive and ground terminals), a motor and a shaft.

Depending on how the shaft is adjusted, the flow of cooling agent will vary and can be closed.

The pressure in the circuit at the valve's inlet is approximately 45 bar and it can reach a pressure differential of 30 bar at the outlet.

When calculating the expansion valve's degree of opening or closing, the Heater and air conditioning system control unit J979 employs the pressure and temperature of the cooling agent as a reference value. This signal is provided by the Refrigerant pressure/temperature sensor G395.

## Refrigerant shut-off valve for heater and air conditioner unit N541



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### REFRIGERANT SHUT-OFF VALVE FOR HEATER AND AIR CONDITIONER UNIT N541

The valve is mounted on the evaporator's inlet. It is controlled by the Heater and air conditioning system control unit J979 via LIN-Bus signal. Its function is **to open or close the flow of cooling agent**; when idle, it is open.

On the valve's housing there is an arrow indicating the direction of flow of the cooling agent to facilitate correct assembly.

The valve consists of an electronic control (fed by the battery's current and ground terminals), an electromagnetic coil and a core.

When the electromagnetic coil is excited, flow to the evaporator is closed.

This way, **energy consumption is reduced** in the battery's cooling phase, as the compressor does not force the cooling agent to the evaporator.

Therefore, the high-voltage battery is cooled regardless of the passenger compartment's climate system status.

# CLIMATE SYSTEM

## CIRCUIT WITH HEAT PUMP AND COOLING AGENT R744

The circuit with heat pump is able to cool and heat the passenger compartment using cooling agent R744. It also intervenes in the battery's temperature management.

El R744 (CO<sub>2</sub>) works above its critical point (T = 31.1°C and P = 73.8 bar).

In a state diagram, the fusion, sublimation and evaporation curves show zones where two states of matter coexist.

But a change of state does not occur above the critical point; therefore, at these temperatures and pressures, the cooling agent is always in the **supercritical** state, behaving like a hybrid, between gas and liquid states. It is noted for the wide range of densities that can be adopted.

This is why the exterior radiator is not called a condenser but a radiator for gas, because it acts as a heat exchanger without changing the state of the cooling agent.

This is achieved by the main elements of the CUPRA Born's circuit, which are the following:

The **Climate system compressor VX81** in the R744 circuit has the following particularities compared to the compressor in the R1234yf circuit.

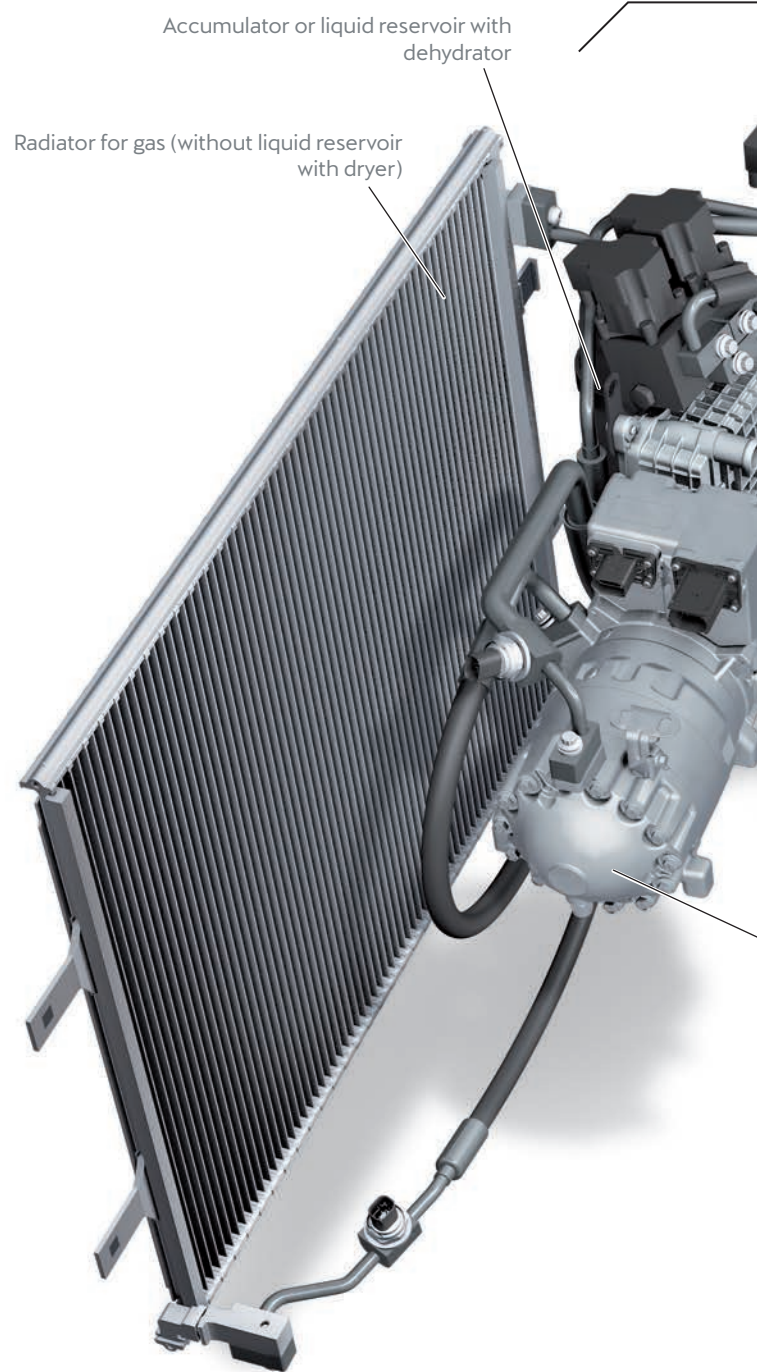
- The housing is thicker to minimise vibrations.
- Inside is a silencer that reduces the transfer of noise into the passenger compartment.
- Lower flow rate propelled per stretch (5.3 cm<sup>3</sup> vs. 27 cm<sup>3</sup> of R1234yf compressor).
- The pipe connections have been adapted to the requirements of R744.
- So the compressor does not suction directly liquid cooling agent. The accumulator with filter-drier is mounted on the suction side.

The maximum pressure on the low-pressure side is around 90 bar. The system's pressure on the high-pressure side varies according to the operating mode.

Pressure regulation is calculated by means of the pressure and temperature sensors in the refrigerant circuit.

**The Climatic unit** contains:

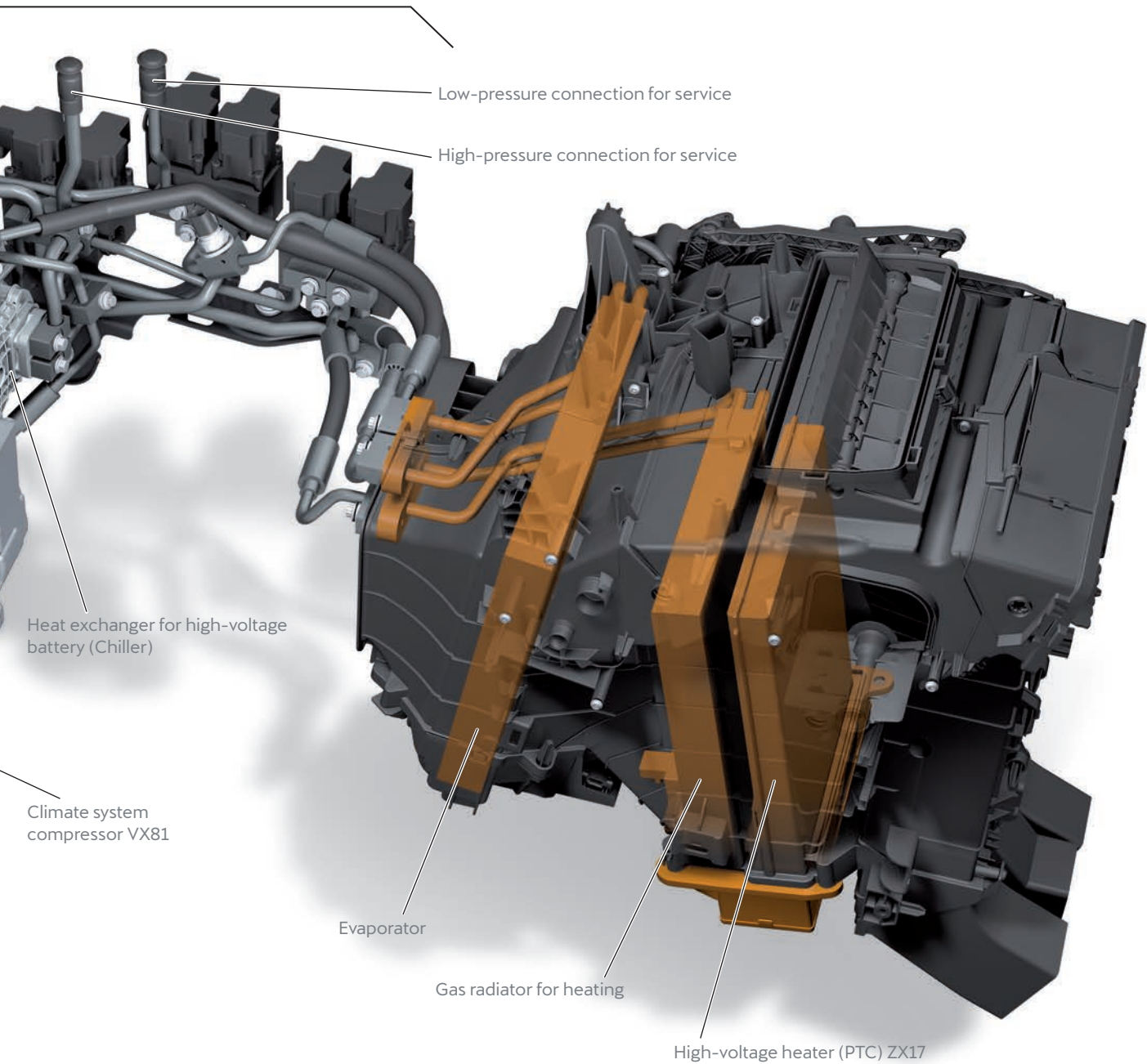
- An **evaporator** that absorbs heat from the passenger compartment and cools it.
- A **heating condenser**, which transfers the heat to the passenger compartment and heats it up.
- A high-voltage PTC heater that acts at specific moments when the heating condenser needs support.



**Radiator for gas**, located in the vehicle's front and works in two ways:

The gas radiator is used to transfer outside the heat produced by the process through the high-pressure side.

## Heat pump valve assembly



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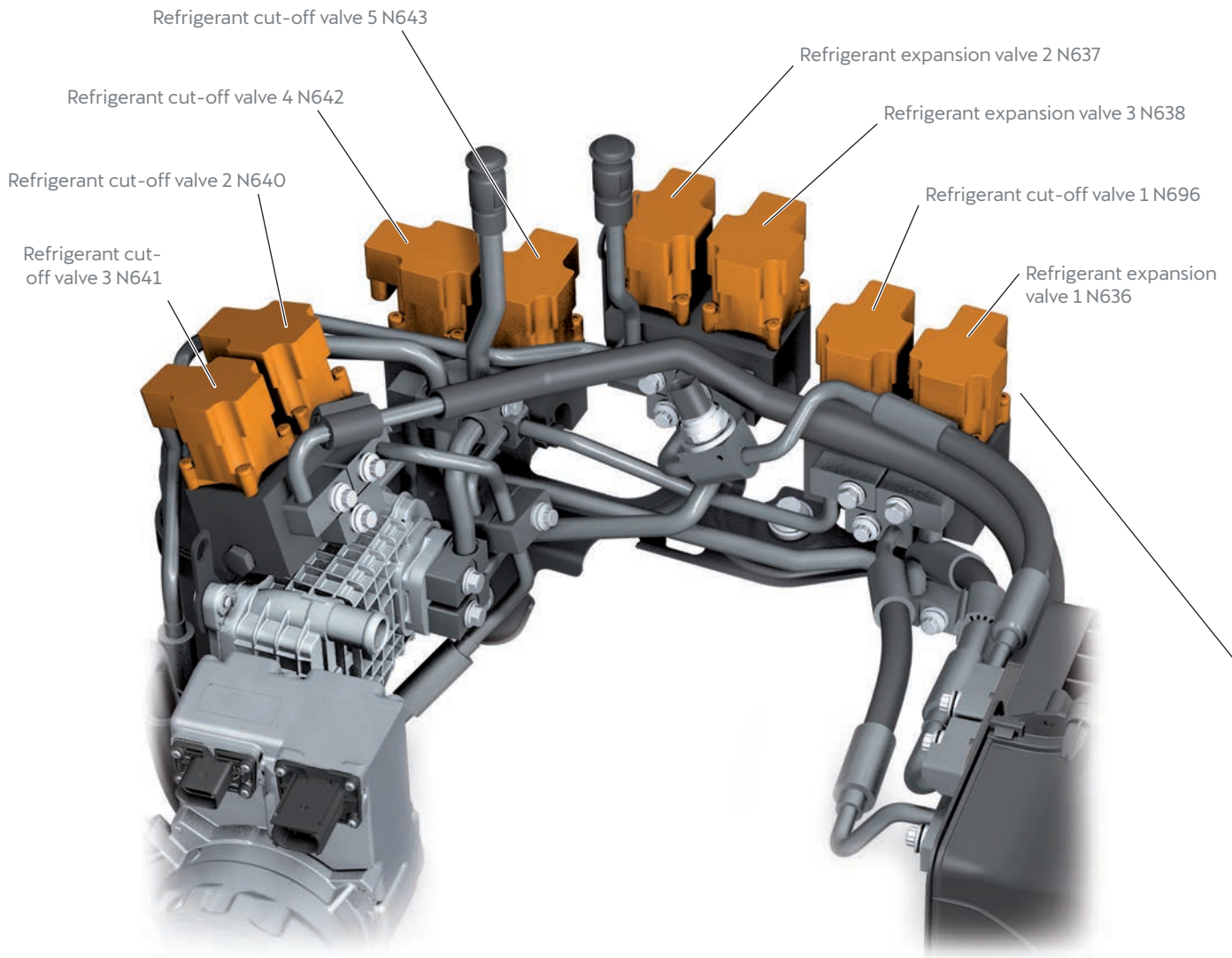
The **valve unit assembly**, located between the compressor and the climatic unit, is used to determine the circuit flow.

Basically, the valve unit consists of the following:

- 4 double valve blocks, with electric expansion valves and cut-off valves.

- Heat exchanger for the high-voltage battery.
- Pressure and temperature sensors.
- Accumulator with filter-drier, which also functions as an internal heat exchanger.

# CLIMATE SYSTEM



## HEAT PUMP VALVE ASSEMBLY

The heat pump valve assembly consists of the following:

- Connections for the service.
- A heat exchanger for the high-voltage battery (same as in the system with R1234yf).
- An accumulator with filter-drier (also functions as an internal heat exchanger).
- 4 double solenoid valve blocks (5 cut-off valves and 3 expansion valves).

Externally the blocks look the same - the block can consist of 2 cut-off valves, 2 expansion valves or one cut-off valve and one expansion valve.

The valves are grouped into four functional blocks:

Block 1:

- Refrigerant cut-off valve 1 N696
- Refrigerant expansion valve 1 N636

Block 2:

- Refrigerant expansion valve 2 N637
- Refrigerant expansion valve 3 N638

Block 3:

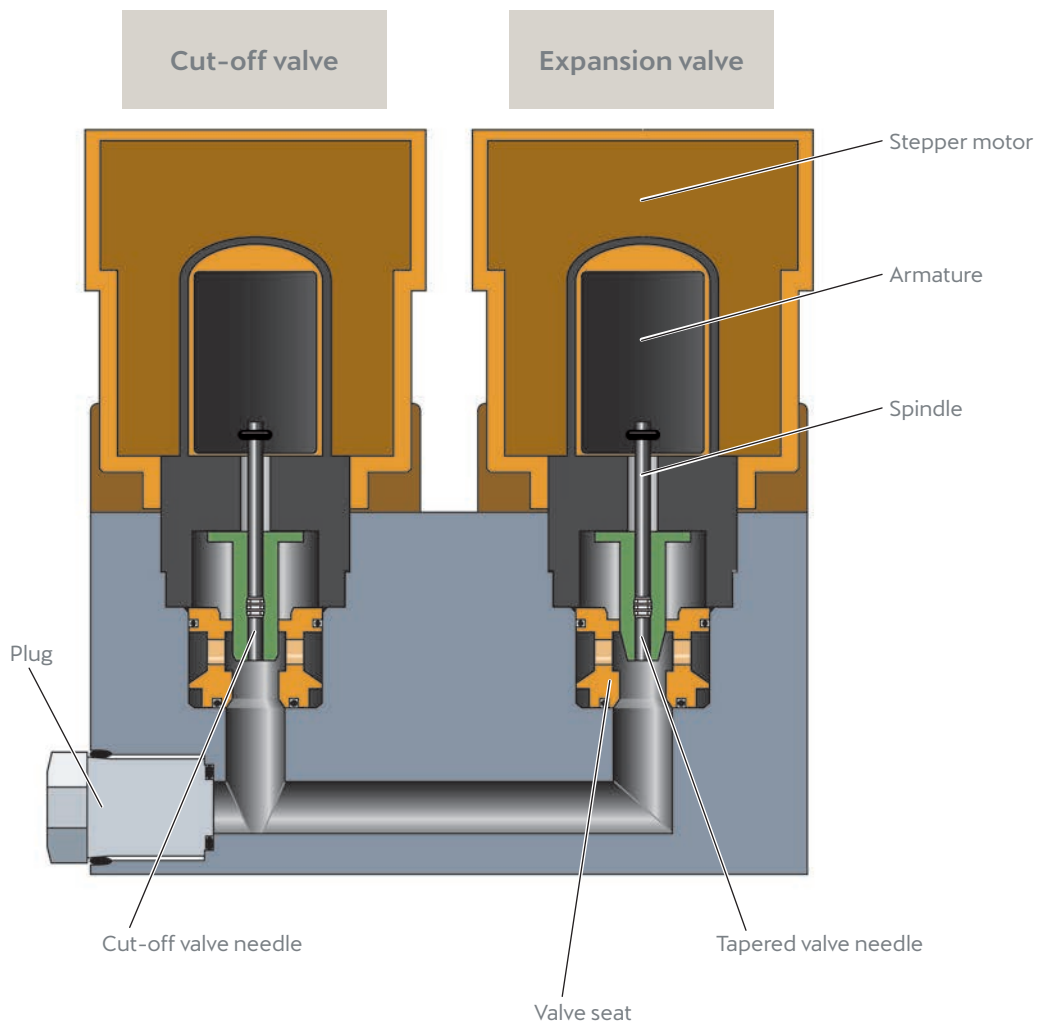
- Refrigerant cut-off valve 2 N640
- Refrigerant cut-off valve 3 N641

Block 4:

- Refrigerant cut-off valve 4 N642
- Refrigerant cut-off valve 5 N643

Each block has an inlet and two outlets.

The valves are electrically controlled by the Heater and air conditioning system control unit J979 via LIN-Bus.



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## EXPANSION VALVES

They consist of a stepper motor, which rotates the armature with spindle, and the latter is attached to a needle valve that rests on its seat when it is closed.

The expansion valve needle is tapered and is **regulated progressively**, the further the needle moves away from the valve seat, the larger the cross-section in the expansion chamber.

## CUT-OFF VALVES

They consist of a stepper motor, which rotates the armature with spindle, and the latter is attached to a needle valve that rests on its seat when it is closed.

The expansion valve needle is cylindrical and **has only 2 stages** (open and closed).

## DISCHARGE VALVES

Solenoid valves N643 and N638 include discharge valves that protect the circuit components.

These protect the system if the pressure regulation is not carried out correctly or a solenoid valve jams. They prevent the cooling agent from leaking completely in the event of an overpressure rupture.

## CONNECTIONS FOR THE R744 SERVICE

To prevent removing or recharging unsuitable cooling agent, the connections and couplings are mechanically coded differently from the connections used for other cooling agents.

# CLIMATE SYSTEM

## VALVE UNIT ASSEMBLY

At a hydraulic level, the heat pump's valve assembly is responsible for controlling the flow of the cooling agent according to the stage at that moment.

The valves are:

- Refrigerant cut-off valve 1 N696.
- Refrigerant expansion valve 1 N636.
- Refrigerant expansion valve 2 N637.
- Refrigerant expansion valve 3 N638.
- Refrigerant cut-off valve 2 N640.
- Refrigerant cut-off valve 3 N641.
- Refrigerant cut-off valve 4 N642.
- Refrigerant Cut-off Valve 5 N643.

## ACCUMULATOR WITH FILTER

The accumulator with filter-drier acts as an internal heat exchanger through a tubular spiral.

The dehydrating bag absorbs residual moisture from the system.

The cooling agent's flow path varies according to the climate system's stage in execution.

## PRESSURE AND TEMPERATURE SENSORS

For the circuit to function correctly, the Heater and air conditioning system control unit J979 has to recognise the temperature and pressure at four points in the circuit:

- Refrigerant pressure/temperature sensor G395.
- Pressure and temperature sensor G826.
- Pressure and temperature sensor G827.
- Pressure and temperature sensor G828.
- Pressure and temperature sensor G829.

## CLIMATE SYSTEM STAGES

There are two stages in the climate system:

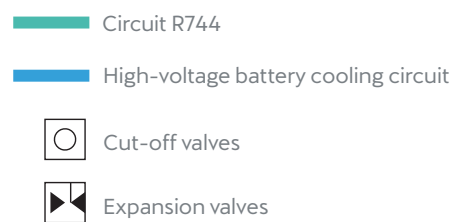
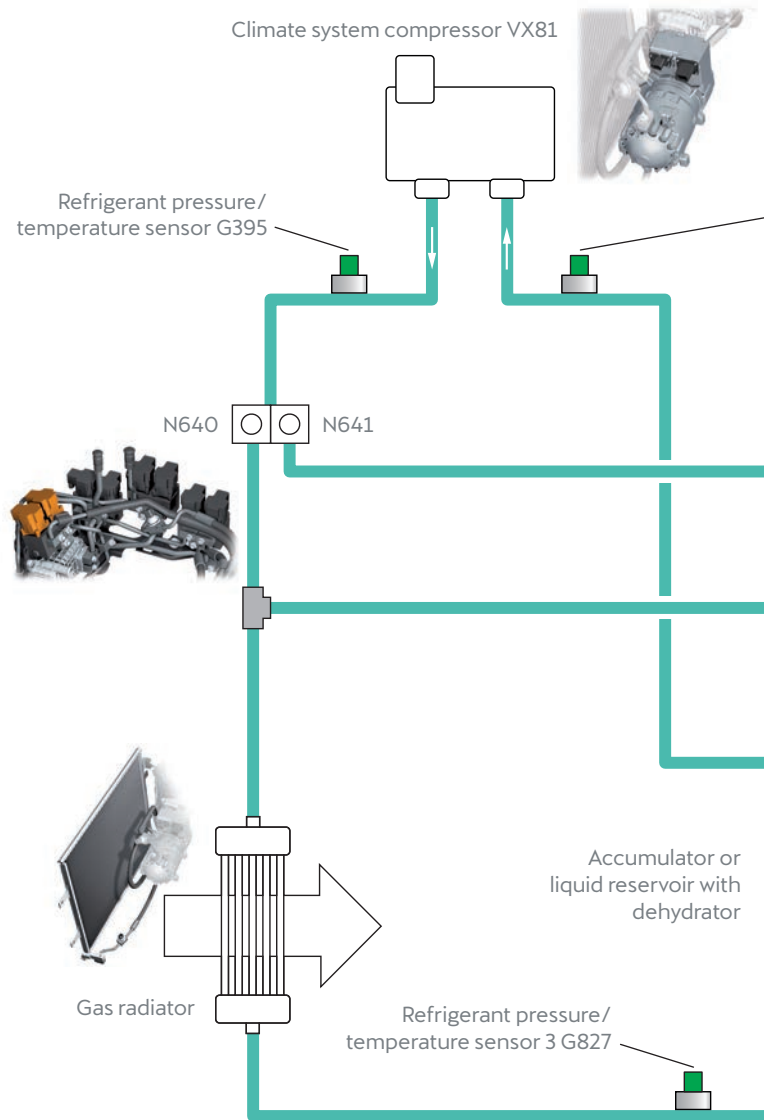
- Cooling.
- Heating.

### COOLING STAGES

During the cooling stages, the heat pump functions as a normal climate system and cools the passenger compartment using the evaporator and the high-voltage battery via the Chiller. The cooling stages are as follows:

- Cooling the passenger compartment.
- Cooling the passenger compartment and the battery.
- Only cooling the battery.
- Reheat stage.

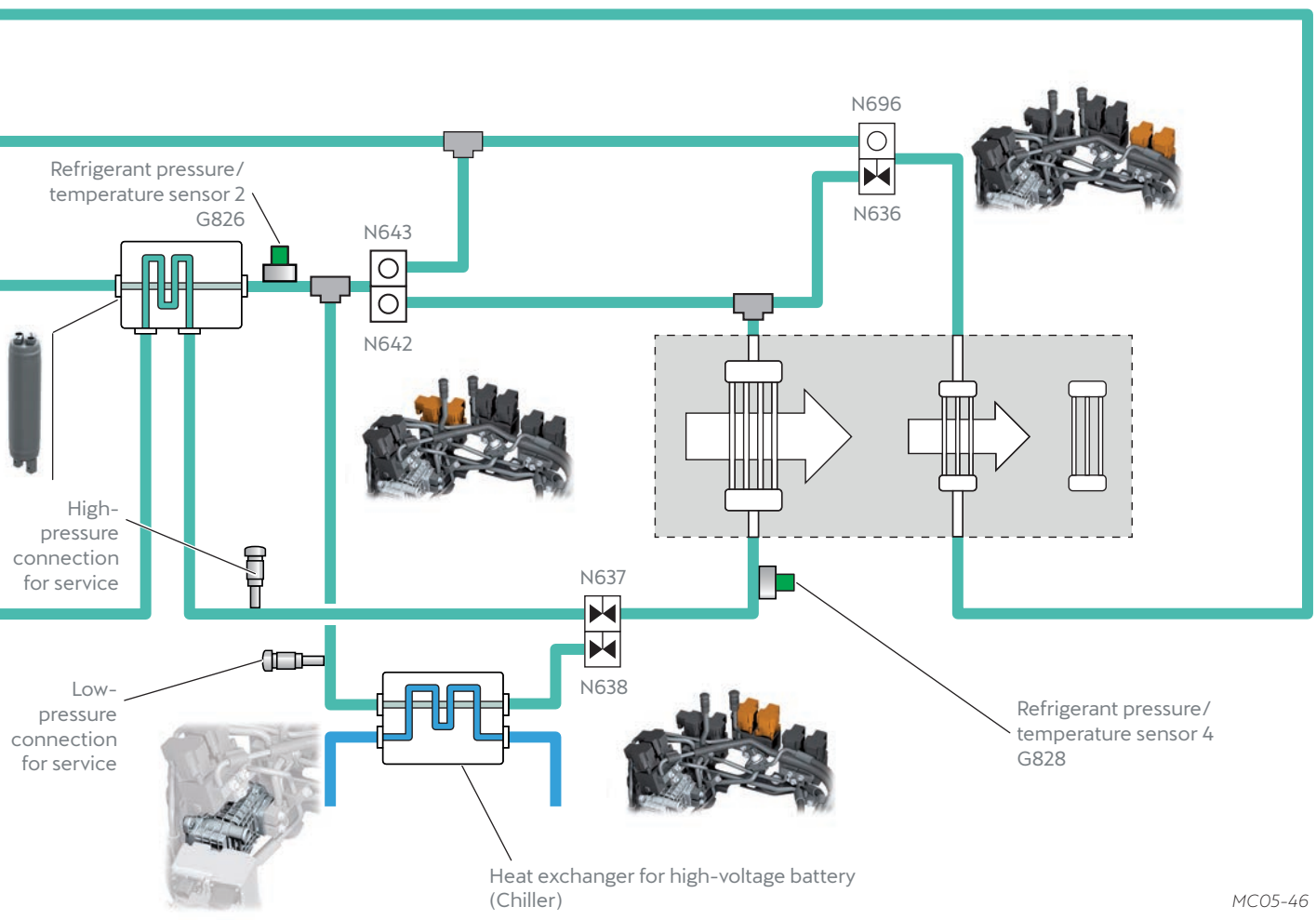
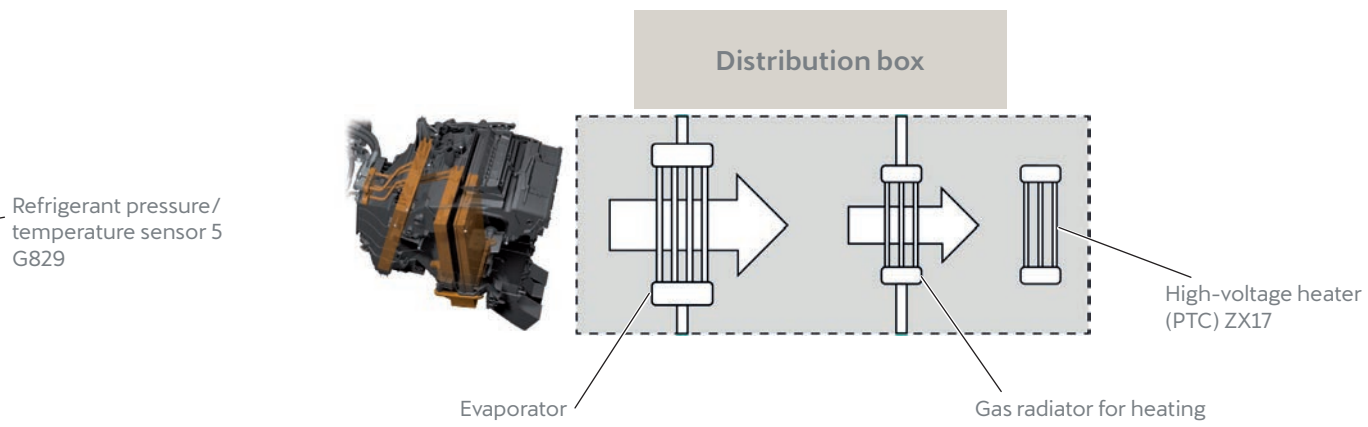
During the Reheat stage, the fresh air is cooled first in order to dehumidify it and then reheated as required.



### HEATING STAGES

When the heating is working, the heat pump consumes less energy than during an exclusive functioning of a PTC air heater, thus increasing the vehicle's range.





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The heat generated by the compressor is delivered directly to the gas radiator of the climatic unit's distribution box.  
 In water mode, the high-voltage zone is also heated by the Chiller.

- The climate system has the following stages:
- Heat pump air
  - Air/Water
  - Heat pump water

# CLIMATE SYSTEM

## SYSTEM DIAGRAM.CIRCUIT WITH COOLING AGENT R744

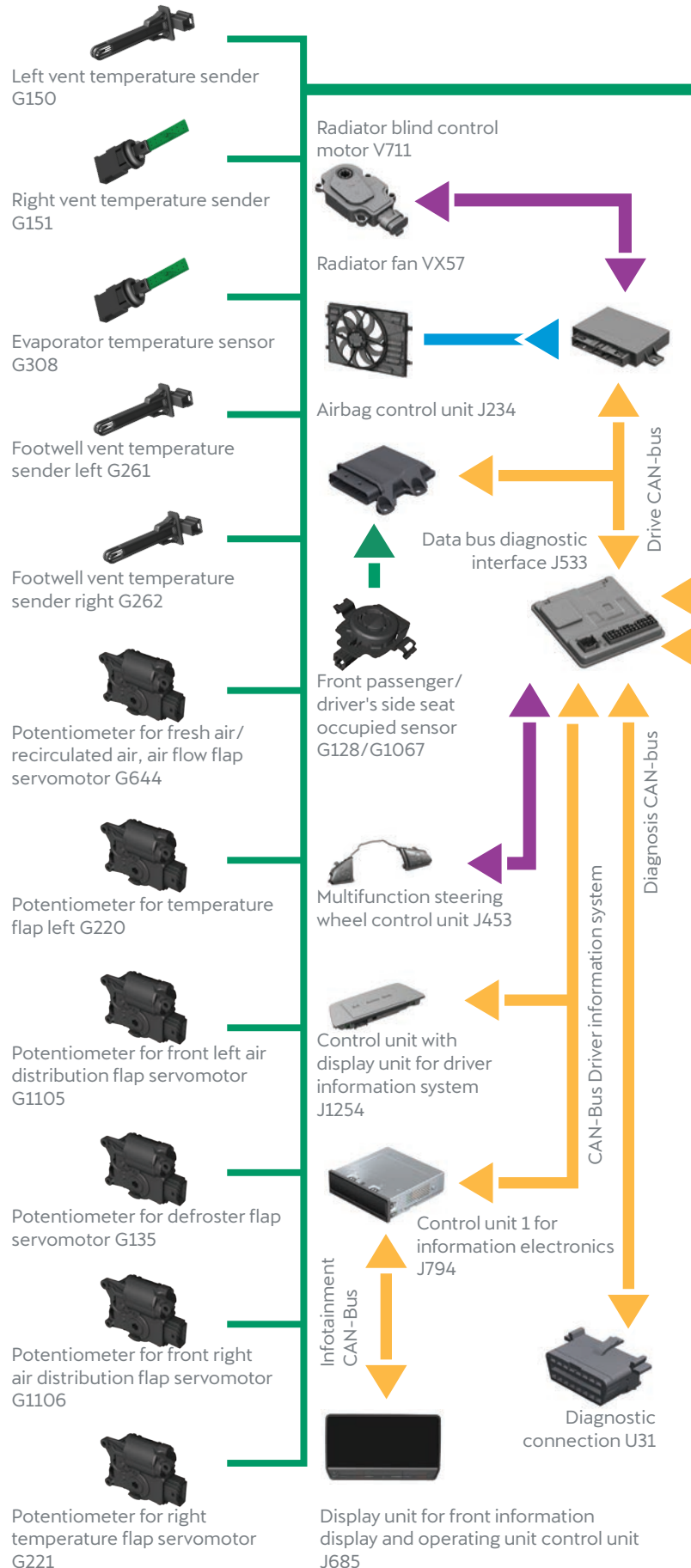
The Heater and air conditioning system control unit J979 receives signals from the following sensors via LIN-Bus:

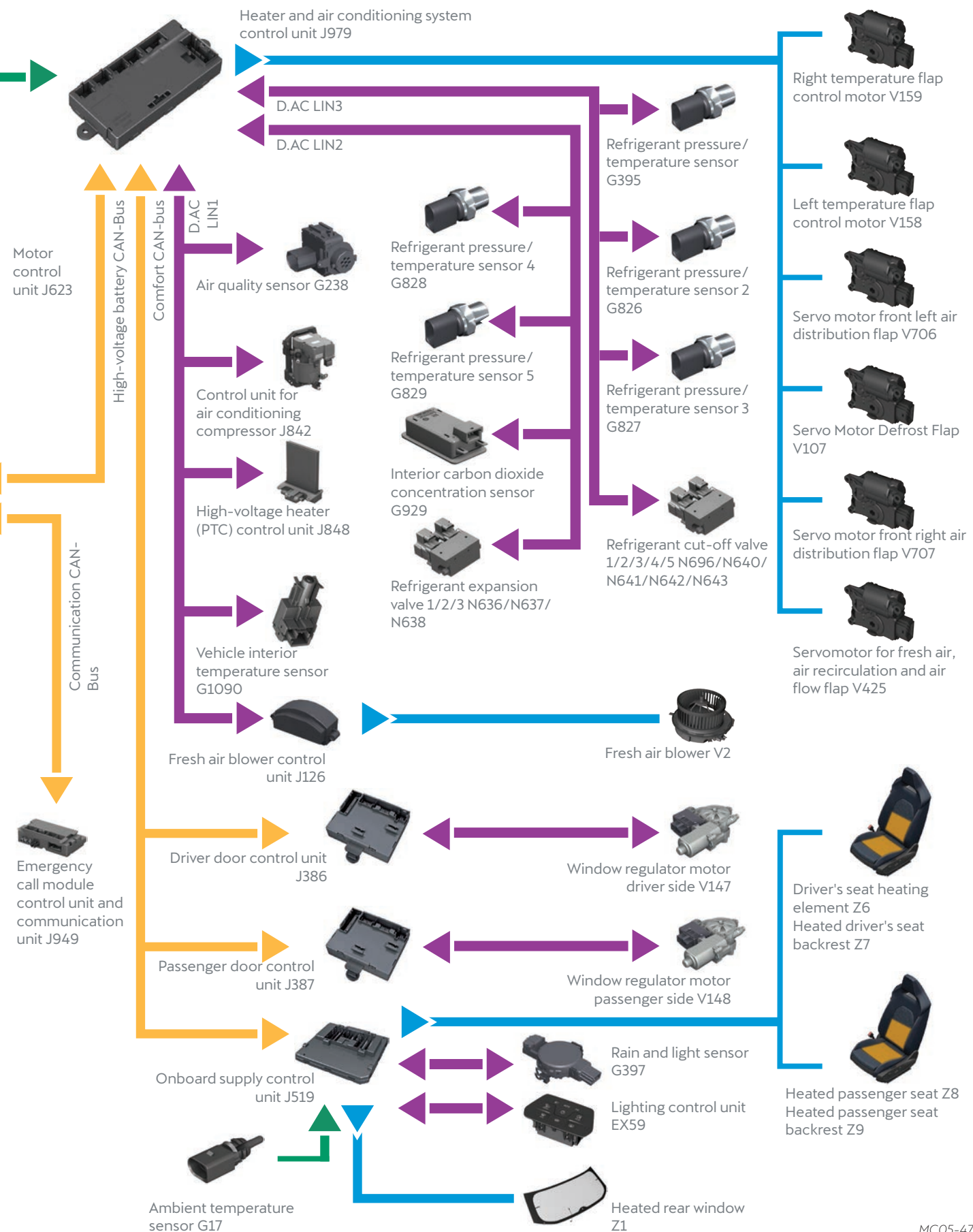
- **Interior carbon dioxide concentration sensor G929**, for safety purposes due to the characteristics of the cooling agent.
- **Refrigerant pressure/temperature sensor G395**, which directly records the pressure and temperature at the compressor outlet.
- **Refrigerant pressure/temperature sensor 2 G826**, which records the pressure and temperature directly at the inlet of the tray with filter-drier in all stages of operation.
- **Refrigerant pressure/temperature sensor 3 G827**, which records the temperature at the outlet of the gas radiator (at the front of the vehicle) during the cooling and reheat stages of operation. In the air heating stage this sensor records the measurement values in front of the gas radiator inlet (at the front of the vehicle). The direction of the cooling agent's flow in the different operating modes.
- **Refrigerant pressure/temperature sensor 4 G828**, which records the pressure and temperature at the evaporator inlet, during the cooling and reheat stages of operation. In heat pump mode the sensor takes measurements at the evaporator outlet due to the change of flow direction.
- **Refrigerant pressure/temperature sensor 5 G829**, which records the pressure and temperature at the compressor inlet in all stages of operation.

With the information from the sensors, the Heater and air conditioning system control unit J979 calculates the theoretical compressor speed.

This management has points in common with that of the circuit with cooling agent R1234yf, and these are:

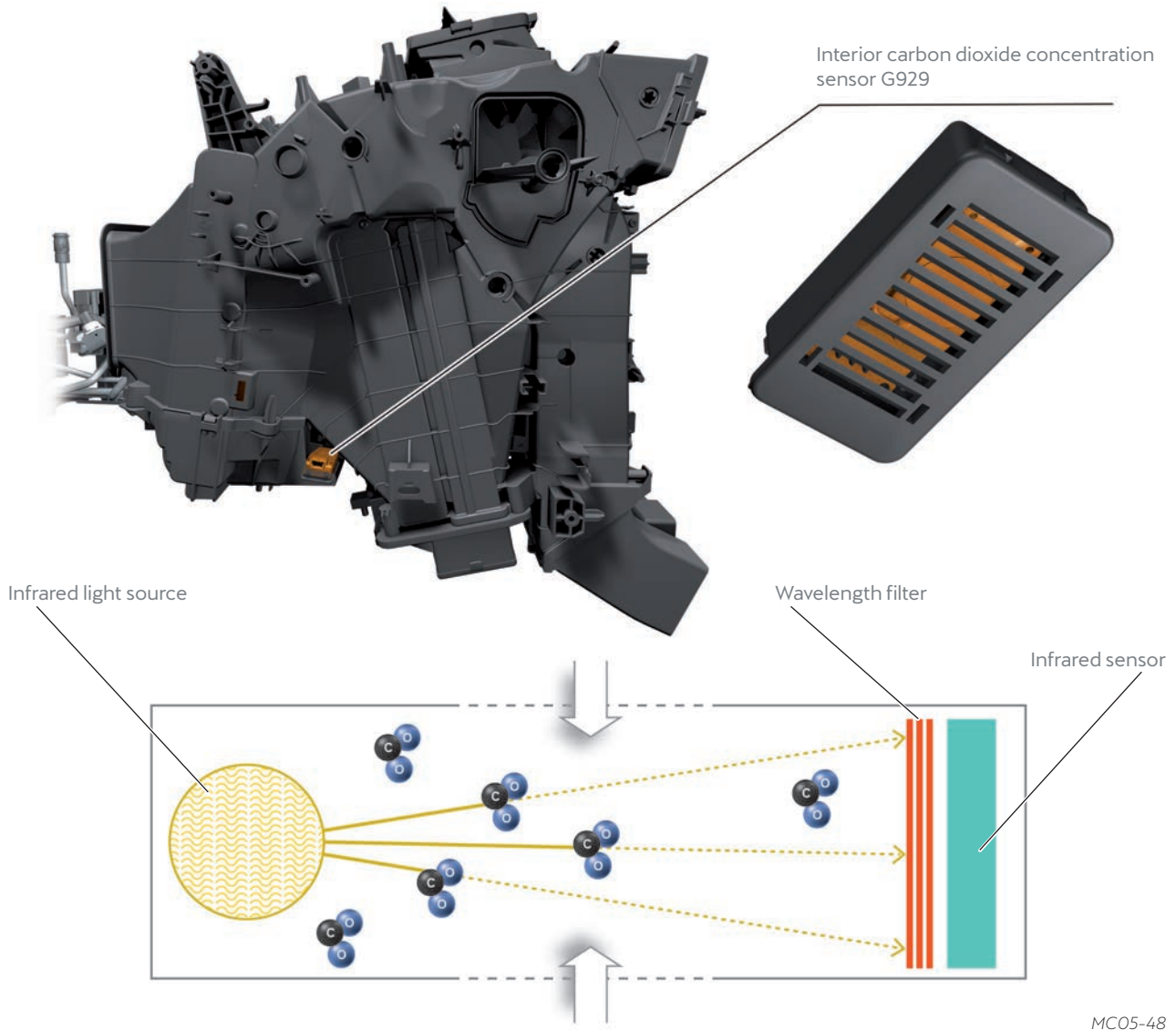
- ECO function and Front passenger seat occupied sensor G128.
- Radiator blind control motor V711.





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# CLIMATE SYSTEM



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## INTERIOR CARBON DIOXIDE CONCENTRATION SENSOR G929

It is located in the lower left area of the climatic unit. The sensor can be accessed by first removing the central tunnel cover.

The sensor works on the NDIR (Non-dispersive Infrared) principle.

The sensor consists of an infrared light source, a duct, a wavelength filter and an infrared sensor.

The air molecules containing CO<sub>2</sub> transversely flow through the duct.

Each gas molecule has the property of absorbing a specific wavelength. In CO<sub>2</sub>'s case, the wavelength is 4.3 μm.

The filter removes all light except the wavelength absorbed by the CO<sub>2</sub> molecules (4.3 μm). The higher the CO<sub>2</sub> concentration, the less light with a wavelength of 4.3 μm will reach the infrared sensor.

The sensor has a connector with three occupied contacts (terminal 30, LIN 2 and terminal 31).

The information is transmitted from the sensor to the Heater and air conditioning system control unit J979 via LIN-Bus.

When CO<sub>2</sub> concentrations above the set values are detected, a warning lamp will appear in the Control unit with display unit for driver information system J1254



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## WARNINGS

The dash panel insert can display the following pop-up messages, together with a warning light and an acoustic signal:

### **Vehicle overheated, climate system is necessary.**

- White symbol and no acoustic signal.

Possible cause:

- Temperature of the Data bus diagnosis interface too high.

### **Faulty climate system, go to a workshop.**

- Yellow symbol and long acoustic signal.

Possible cause:

- CO<sub>2</sub> sensor failure, detected for more than 10 seconds.
- Failure in the fresh air and air recirculation flap or in the turbine.

### **Ventilate the vehicle by opening the windows.**

- Yellow symbol and long acoustic signal.

Possible cause:

- The CO<sub>2</sub> sensor warns of a CO<sub>2</sub> concentration between 1.5% and 2.5% of the passenger compartment's volume.

### **Ventilate the vehicle urgently by opening the windows or leave the vehicle.**

- Red symbol and 3 short acoustic signals with repetition.

Possible cause:

- The CO<sub>2</sub> sensor warns of a high CO<sub>2</sub> concentration, that is, higher than 2.5% of the passenger compartment's volume.


## ELECTRICAL SYSTEM

The most remarkable new developments in the new CUPRA Born's electrical and Infotainment system are described in the following chapters.

These include:

- Capacitive touch controls with haptic sensation.
- Exterior lighting for easy access to the vehicle.
- Interior ambient lighting.
- Terminal management for the access and start-up system.
- Head-up Display for projecting navigation instructions and information about the driving assist systems.
- Sound system.
- Aerial system.
- Control unit for information electronics 1 J794, for Infotainment management.
- Car2x, which provides WLAN communication with other vehicles and road elements.

The **Head-up Display** with two projection zones on the windscreen dynamically displays navigation instructions and information on the driving assist systems.



**E-Sound.** The law requires a warning sound at low speeds, called AVAS (Acoustic Vehicle Alerting System). This requirement is fulfilled in Europe by means of a single loudspeaker in the front of the vehicle (Module 1 for engine sound generator RX21). The Motor sound generator control unit J943 regulates the perceptible sound according to the speed. The control unit is installed on the loudspeaker's housing.

It includes **capacitive touch controls** with haptic sensation. The controls' haptic effect produces a vibration to the touch, and a sound is emitted through the vehicle's loudspeakers, providing the sensation of a traditional button. The **selector control** and button for the **parking brake** are integrated into the Steering column module control unit J527.

It includes the new **CUPRA CONNECT Gen 4**, which extends the connectivity functionalities. Thanks to the My CUPRA application, it benefits from the CUPRA CONNECT technology by extending the connectivity possibilities through online services. The functionalities can be managed remotely, which include managing the high-voltage battery without having to be in the vehicle.



It has **exterior lighting** on the front handles and side-view mirrors for easier access.

It features **interior ambient lighting** in the front doors and main console, with multiple colours to choose from.

# ELECTRICAL SYSTEM

## CONTROLS

The CUPRA Born features capacitive touch controls with haptic sensation in the following areas:

- Top roof controls.
- Driver door controls.
- Steering wheel controls.
- Vehicle lights control.
- Bottom edge of the Infotainment screen.

The controls' haptic effect produces a vibration to the touch, and a sound is emitted through the vehicle's loudspeakers, providing the sensation of a traditional button.



MC05-18

The courtesy lights are activated when opening the vehicle doors or are activated individually by touching them.

The sunroof blind is operated by sliding your finger in the desired direction.

Button for emergency call.



Rear window locking and central locking.

Selection wheel:  
By turning the wheel, the selected function will light up yellow.  
By means of these functions, we can adjust the side-view mirrors, fold them or activate the heating function.

The REAR control has two modes of use:  
When pressing once, it lights up in yellow and the rear power windows are activated.  
When pressing and holding for two seconds, the light starts to flash and the 4 power windows are activated simultaneously.

MC05-19



**Left panel of the multifunction steering.**

The Travel Assist and Adaptive Cruise Control (ACC) functions are operated on this panel. You can adjust the cruising speed, the distance to the vehicle in front and switch to speed limiter mode.

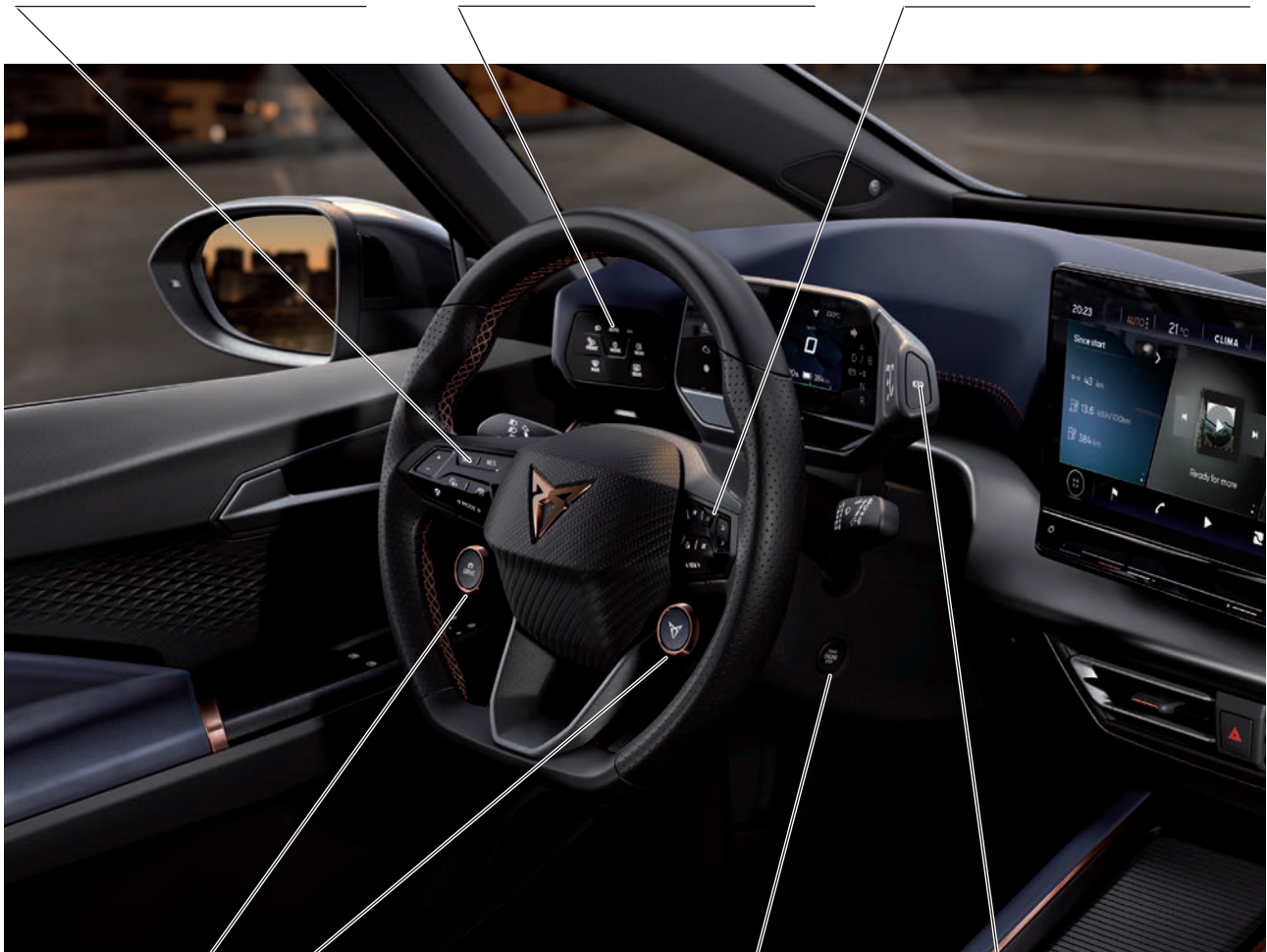
**Lighting control unit EX59.**

Direct access for the driver, controlling the following functions: Defrosting and demisting. Heated rear window. Position lights, dipped beam and automatic mode.

**Right panel of the multifunction steering.**

With this panel, we select the desired view in the Control unit with display unit for driver information system J1254.

You can also adjust the volume, activate voice control and browse through the Infotainment system.



MC05-20

**SATELLITE BUTTONS**

The left satellite button changes the CUPRA drive profile; these are the available driving modes: Comfort (vehicle starts in this mode) Performance Cupra Individual Range

The right satellite button activates the CUPRA e-boost, which provides an additional 20 kW of power.

Starter button E378 for starting the vehicle

Selector control and selector lever position display Y6.

## ELECTRICAL SYSTEM



MC05-21



MC05-22

## LIGHTING

The CUPRA Born is equipped with full LED headlights in all its optical groups.

When approaching and opening the vehicle, the headlights perform a welcome light choreography. The front optical groups incorporate small triangles on their sides that improve their static appearance. They also include fog lights in the same unit.

The side-view mirrors project the CUPRA emblem on the ground from their lower area.



MC05-23

Exterior door handle lamps



MC05-24

The front handles include lights for easier access to the vehicle.

The interior features different ambient lighting that can be selected by the user. We can change the colour of the light on the doors and main console.



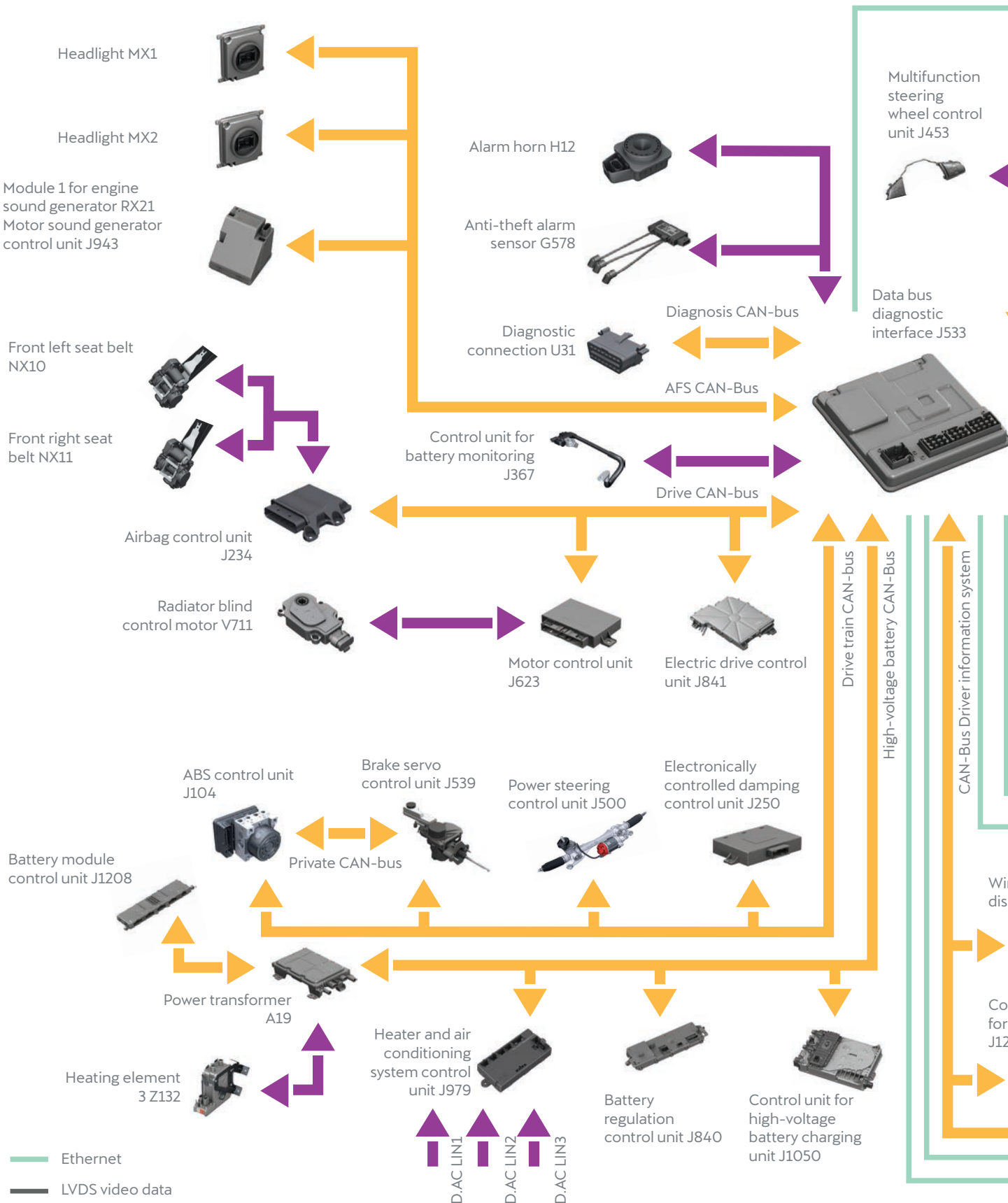
MC05-25

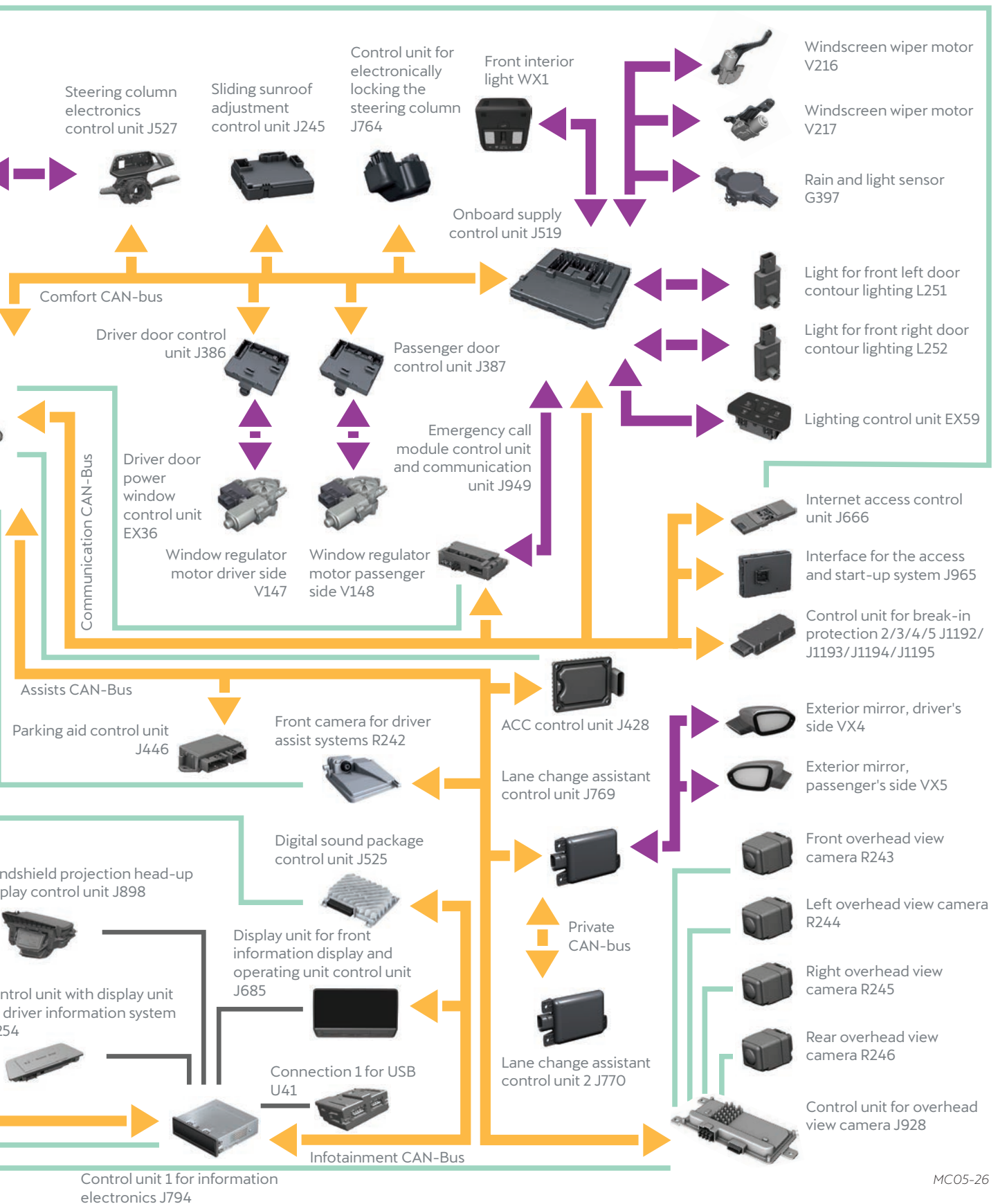
# ELECTRICAL SYSTEM

The data bus architecture is managed by the Data bus diagnostic interface J533, also called **ICAS 1**.

A new feature in the CUPRA Born is the Control unit 1 for information electronics J794, also called **ICAS 3**.

This unit is responsible for processing the Infotainment system's information.





MC05-26

# ELECTRICAL SYSTEM



The Keyless Access system intervenes in locking and unlocking the vehicle when approaching to it without having to actively use your key.

If the Driver's side seat occupied sensor G1067 recognises someone inside, the Infotainment system provides limited operation of functions, such as the climate system and audio system.



When opening the door, the display unit for driver information system will show a welcome message.

MC05-27

## TERMINAL MANAGEMENT

To start the vehicle, we must be aware of how the terminal management functions and the status of the high-voltage battery contactors.

The terminal management consists of four vehicle statuses:

- Idle** (vehicle parked without occupants).
- Comfort Ready** (available access to the Infotainment system and climate system).
- Park** (stationary vehicle and switched on).
- Ready** (vehicle ready to drive).

### IDLE

The vehicle is switched off and the high-voltage battery's **contactors** are **open**.

**We cannot charge the 12V battery** using the high-voltage system.

## COMFORT READY

When the Airbag control unit detects that the **driver's seat is occupied**, the system activates the functions of the **Infotainment system** and **climate system**, regardless of whether the key is inside the car or not.

The high-voltage battery's **contactors** will **close** as soon as the Driver's side seat occupied sensor G1067 detects that someone sits, in fact, they do so audibly.

Power transformer A19 has priority over the rest of the high-voltage components, and it is responsible for transforming the high-voltage battery's DC current into low-voltage DC current in order to charge the 12V battery. As a result, the vehicle will not drain the 12V battery when in COMFORT READY status, due to the low-voltage system being **essential** in starting the vehicle.



Once the driver is inside the passenger compartment and carrying the key, the vehicle can be switched on and the functions that were not available without the key will now become available, such as the settings for the assist systems and ambient lighting.



MC05-28

The Battery monitoring control unit J367 informs the Data bus diagnostic interface J533 via LIN-Bus of the 12V battery's charge status. The 12V battery's charge status is controlled at around 90% of its capacity.

### UNLOCKING THE STEERING COLUMN

Before enabling the PARK position, we can unlock the steering column **by closing the driver's door**, if the key is inside the vehicle.

The Driver door locking unit VX21 sends the locking signal via conventional cable to the Driver door control unit J386. The Onboard network control unit J519 picks up the signal via Comfort CAN-Bus.

When closing the door, the Interface for the access and start-up system J965 initiates the **key search in the passenger compartment** via Interior aerial 1 for entry and start system R138. This verifies that the keys are inside.

The Onboard network control unit J519 receives the vehicle keys' radio frequencies through the UHF transceiver, via the Communication CAN-Bus. The Data bus diagnostic interface J533 additionally checks the immobiliser data; if positive, the steering column will unlock.

Lastly, the Control unit for electronically locking the steering column J764 receives the signal to release the steering column via the Comfort CAN-BUS.

# ELECTRICAL SYSTEM



MC05-29

## PARK

To activate the PARK function, the keys must be inside and the vehicle switched on. The vehicle can be switched on in two ways:

- **Using Starter button E378**, which sends a signal by conventional cable to the Onboard supply control unit J519.
- **By stepping on the brake pedal**, the Brake pedal position sender G100 together with the Brake servo NX6 sends a signal via the Drivertrain CAN-Bus to the Data bus diagnosis interface J533.

This function is useful, as it allows the vehicle occupants to access the **Infotainment** and **climate system** functions in the driver's absence. If you want to activate the air conditioning, the keys must be in the passenger compartment and you have to operate the Starter button E378 so that the high-voltage battery's contactors close and it can feed the compressor.

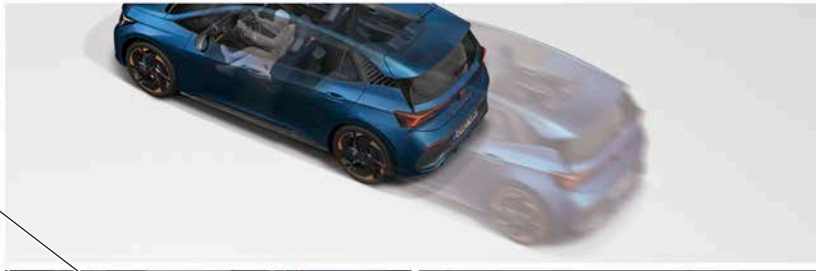
## PROPAGATION OF THE TERMINAL 15 SIGNAL

Regardless of the method used to start the vehicle, the Data bus diagnosis interface J533 transmits the datagram "**terminal 15 active**" through all its data buses.

The Onboard network control unit J519 sends a discrete signal from terminal 15 to the Motor control unit J623 and excites the Terminal 15 voltage supply relay J329 in fuse holder C.

The current is distributed to various components in the vehicle, including the Electric drive control unit J841.





To start the vehicle, we must turn the gear selector.



For safety reasons, the brake pedal must be held down when selecting a gear.

Once the vehicle is ready to drive, the word **READY** will appear on the display unit for driver information system. In addition, the AVAS sound of Module 1 for engine sound generator will be heard.



MC05-30

## READY

To activate the **READY** status, the driver's seat must be occupied and terminal 15 must be active.

First of all, **step on the brake pedal** and without releasing it **select gear D or R** using the selector control. The signals are picked up by the Data bus diagnosis interface J533.

A search for the key in the passenger compartment will be carried out again if the **READY** status process was not initiated 12 seconds before the last check, as the results will be considered obsolete.

Lastly, the Data bus diagnosis interface J533 transmits the datagram "**terminal 50 active**" **through all its data buses**. The Electric drive control unit J841 will pick up this signal via the Drive CAN-Bus Drive and will be ready to drive.

**Note:** Find out more information in the Magazine CUPRA Born Electric System MC06.

# ELECTRICAL SYSTEM

## WINDSHIELD PROJECTION HEAD-UP DISPLAY CONTROL UNIT J898

The Head-up Display is projected onto the windscreen.

Thanks to the polarised glass, we can differentiate between two projection areas. A nearby projection area will display information in 2D format and another projection, further away, will display information in 3D format.

The lower area of the Head-up Display shows the following information:

- Information specific to the active driving assist system.
- Speed limit (traffic sign recognition).
- Vehicle speed.
- Navigation prompts.



MC05-31

The upper area of the Head-up Display dynamically projects three-dimensional graphics. While driving, the graphics change, giving the driver the sensation as if they were projected on the road. The ACC indications allow adjusting the distance to the vehicle in front. The Head-up Display shows a yellow bar that represents the distance maintained by the assist to the vehicle in front.



MC05-32

When Travel Assist is activated, the ACC's preset distance and the lane lines will be displayed. For safety reasons, the driver must remain alert by taking control of the vehicle at all times.



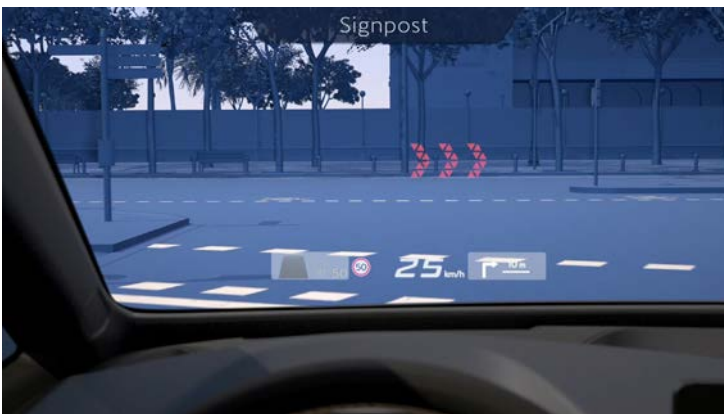
MC05-33

In this case, the Head-up Display will show the driver the assist's interpretation on the lane markings.



MC05-34

The navigation indications are displayed dynamically. In the image, the Head-up Display is showing the right-hand turn indication.



MC05-35

As the vehicle approaches the intersection, the Head-up Display will adapt the graphics. The optical effect perceived by the driver makes it easier to recognise the exact turning point. Once the indication has been passed, the graphic fades out to show the next one, if required.



MC05-36

The end-of-trip graphic is displayed using a flag icon.



MC05-37

The same appears as in the turning indications. As the vehicle approaches the programmed destination, the graphics will create the optical effect of approaching it.

## INFOTAINMENT

The CUPRA Born's Infotainment system is divided into four sections:

- CONNECT System.
- Sound system.
- Aerial system.
- Car2X.

Car2X is a communication system by means of which the vehicle communicates via WLAN with other vehicles and elements on the road.

### CONNECT SYSTEM

The Infotainment system consists of the following:

- Display unit for front information display and operating unit control unit J685
- Control unit 1 for information electronics J794

### DISPLAY UNIT FOR FRONT INFORMATION DISPLAY AND OPERATING UNIT CONTROL J685

The 12" display is located in the upper central area of the instrumentation panel.

At the bottom of the screen, there are a series of touch switches that control the following functions.

- Switching the display on and off.
- Volume control.
- The driver area's temperature control.
- The passenger area's temperature control.

The display has two connectors:

- One connector with power, ground and CAN-Bus signal.
- An LVDS (Low Voltage Differential Signal) connector, which is responsible for transmitting the video signal.

### CONTROL UNIT FOR INFORMATION ELECTRONICS 1 J794

This unit is responsible for processing the Infotainment system's information.

It is located behind the passenger glove box in an upright position.

The unit has 8 connectors:

- 2 connectors for the aeriels: one Black (DAB) and one White (FM1 and FM2).
- 4 FAKRA connectors (LVDS) in different colours.
- 1 Ethernet connector.
- 1 Quadlock connector with 5 standardised connectors.

The Control unit 1 for information electronics J794 **assumes the following functions:**

- Control of Comfort functions, such as the Climatronic or central locking.
- Support for My CUPRA App and Media Control.



Display unit for front information display and operating unit control unit J685

- Bluetooth with hands-free and audiostreaming.
- USB-C port control.
- Compatibility with the Connectivity Box.
- Digital microphone with improved voice recognition and noise cancellation.
- Compatibility with Beats Audio.
- Compatibility with digital dash panel insert.



Control unit 1 for information electronics  
J794

FAKRA (LVDS) connectors:

**Pink**, for Display unit for front information display and operating unit control unit J685.

**Yellow**, for connection 1 for USB U41.

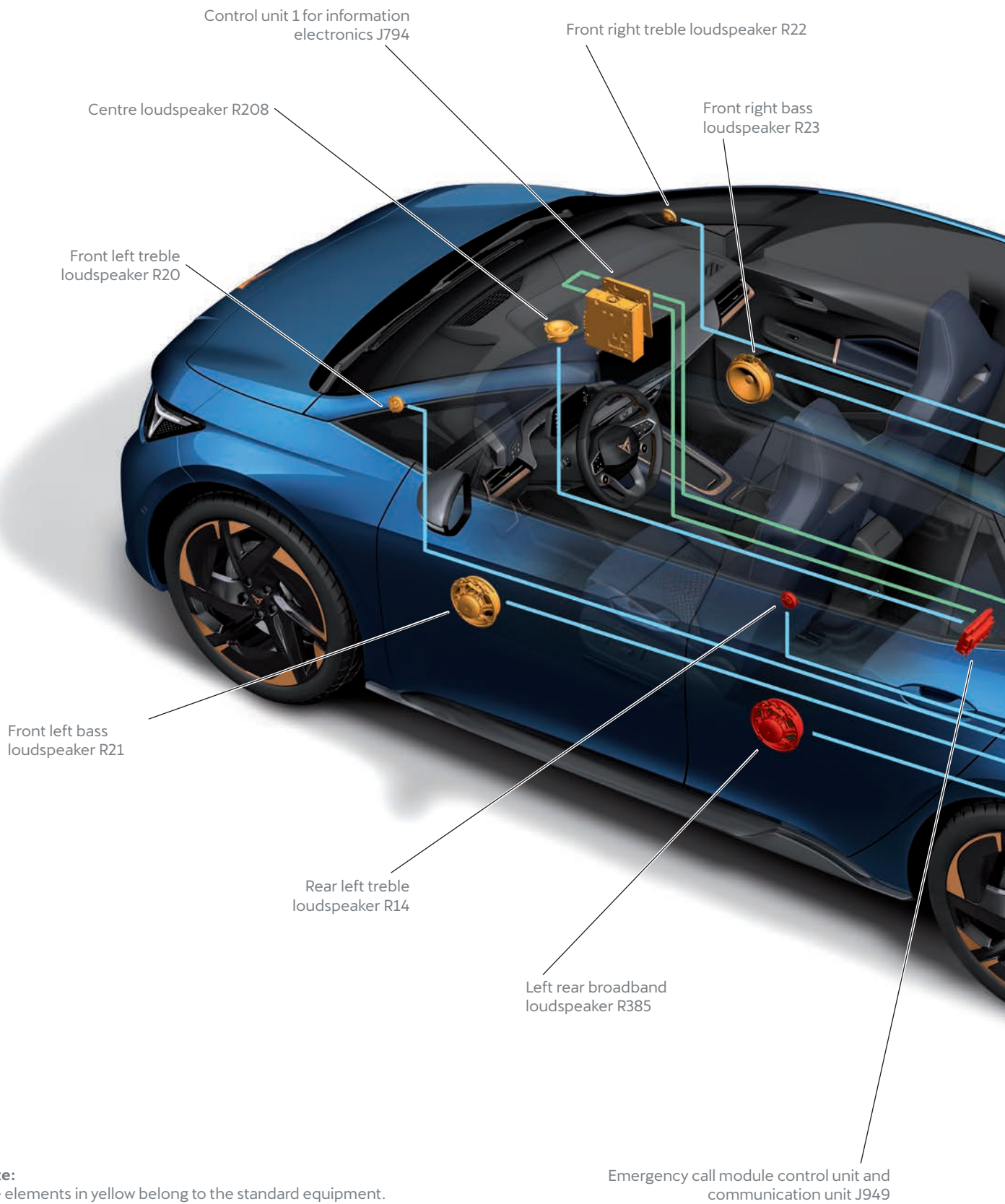
**Green**, for Windshield projection head-up display control unit J898.

**Blue**, for Control unit with display unit for driver information system J1254.

MC05-50

- Compatibility with the emergency call.
- Digital Radio (DAB).
- Full Link and wireless Full Link.
- 3D Navigation.
- Compatibility with Head-up Display.
- Compatibility with CUPRA CONNECT.

# INFOTAINMENT



**Note:**  
The elements in yellow belong to the standard equipment.  
The elements in red belong to the Beats audio equipment.



## SOUND SYSTEMS

The CUPRA Born's loudspeaker system varies depending on the selected audio equipment. There are two sound configurations: Standard equipment or Beats audio.

### STANDARD EQUIPMENT

This is the standard configuration and includes the following components:

- Control unit for information electronics 1 J794.
- Front left treble loudspeaker R20.
- Front left bass loudspeaker R21.
- Front right treble loudspeaker R22.
- Front right bass loudspeaker R23.

### BEATS AUDIO

This is the most comprehensive configuration. The loudspeakers are connected via **Ethernet** for optimal sound quality.

In addition to the 5 loudspeakers equipped as standard, the system includes the following components:

- Digital sound package control unit J525.
- Rear left treble loudspeaker R14.
- Rear right treble loudspeaker R16.
- Left rear broadband loudspeaker R385.
- Right rear broadband loudspeaker R386.
- Subwoofer on the boot floor R211.

### EMERGENCY CALL

Both configurations have an emergency call function.

The Emergency call module control unit and communication unit J949 is located under the rear seat.

The control unit is connected via Ethernet to a loudspeaker, called **Centre loudspeaker R208**.

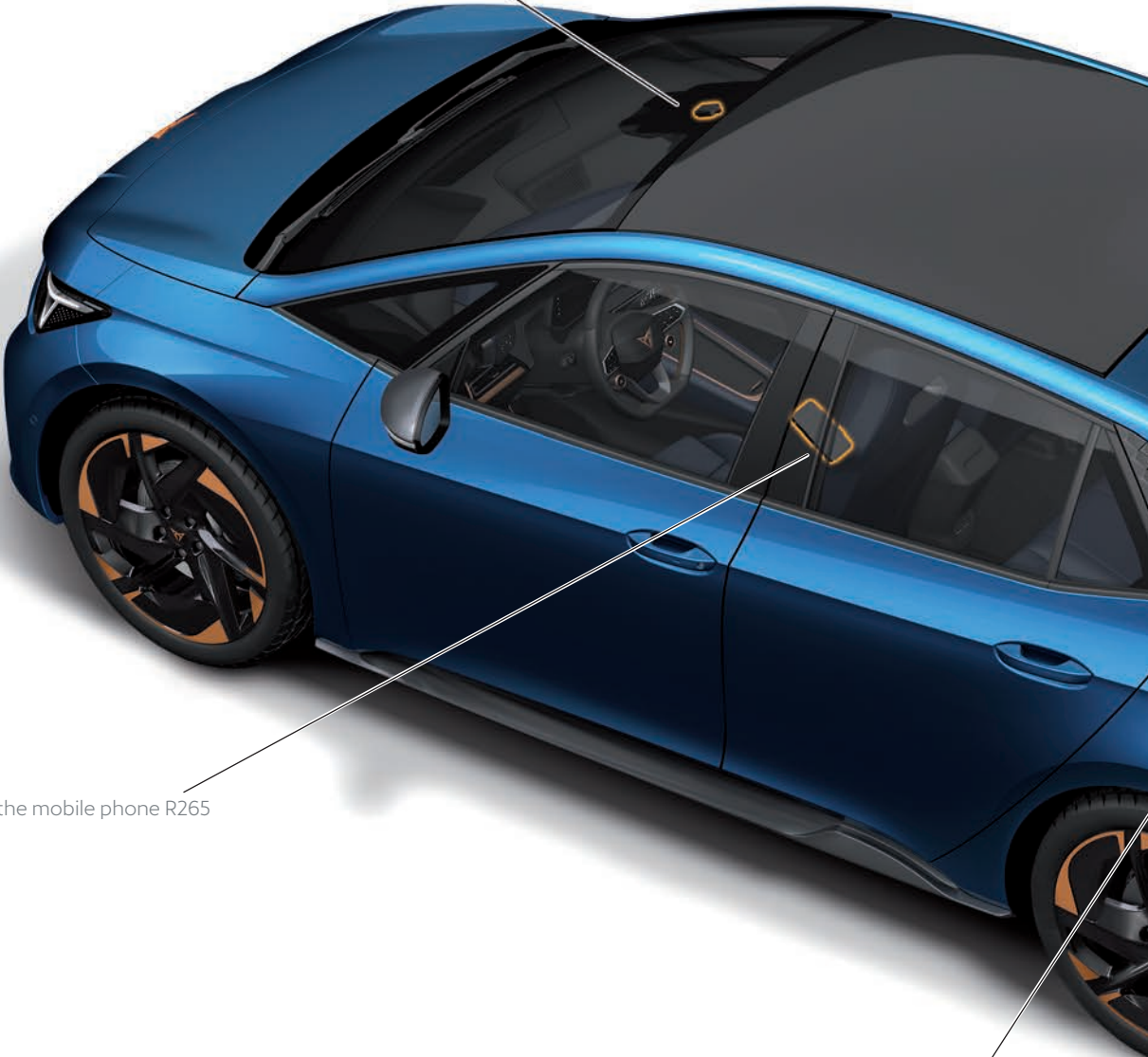
The loudspeaker is located in the upper centre area of the instrument panel behind the Infotainment display.

This loudspeaker emits the audio of navigation instructions, conventional calls and the emergency call.

# INFOTAINMENT



Data radio transmission aerial R180



Support for the mobile phone R265

Digital radio aerial R183



## AERIAL SYSTEM

The CUPRA Born has six aerials relating to the Infotainment system:

The **Aerial 2 for radio R93** picks up the FM radio signal and is mounted in the upper right-hand area of the tailgate.

The **Aerial for digital radio R183** picks up two signals: DAB digital radio and FM2 for the diversity function. This aerial is also on the tailgate but on the upper left side.

LTE **aerial 1 R297** is used to capture the 4G signal. The signal is used by the exclusive functions of the online services and the control unit of the Emergency call module control unit and communication unit J949. The aerial is mounted under the rear bumper moulding, on the right side.

The **LTE 2 aerial R306** also picks up 4G. In this case the signal is amplified by the Control unit for the stabilisation of transmission and reception R308. Once amplified, the signal is used by the mobile device via the Support for the mobile phone R265.

The aerial is mounted under the rear bumper moulding, on the left side. And the control unit on the right side of the boot.

The **Roof aerial RX5** incorporates two aerials:

- GPS aerial R50 for navigation functions.
- GSM aerial R205 for emergency calls, information and service via the Emergency call module control unit and communication unit J949.

The Internet access control unit J666 is fastened to the roof, just below the aerial.

The **Data radio transmission aerial R180** picks up the 5G Wi-Fi signal.

The aerial is mounted on the interior mirror.

Its signal is used by:

- Internet access control unit J666.
- And the Car2X system.



Internet access control unit J666



Aerial 2 for radio R93

Transmission and reception stabilisation control unit R308

LTE aerial 1 R297

LTE aerial 2 R306

MC05-52

## INFOTAINMENT



MC05-53

### CUPRA CONNECT GEN.4

A new development linked to the CUPRA Born is the launch of CUPRA CONNECT Gen.4, which enables vehicles to access online services via the mobile device application **My CUPRA App** or the vehicle's Infotainment system.

For the customer to enjoy CUPRA CONNECT Gen.4, verification is required:

During the Cupra Born's **Check-out inspection**, **check** that the digital user manual is available in the Infotainment system.

#### CUPRA ID

It is the identification required to use "My CUPRA App" with the vehicle in an integrated way. Generating the "CUPRA ID" is easy, just follow these steps:

- Download "My CUPRA App".
- Create an account.
- Verify the created account.
- Log in and fill out the profile.

#### Identify vehicle (ENROLMENT)

During the Enrolment process, the vehicle must be present, the application must be installed on the phone and we should have a CUPRA ID user.

The process is carried out via the Infotainment screen, in the "Settings" menu, selecting "Link to CONNECT".

We have to enter the vehicle's VIN in My CUPRA App and scan the QR code that appears on the Infotainment screen.

#### USER

The new generation of CONNECT allows for one main user per vehicle. No other type of user is currently allowed.

Service and safety



Remote access



Infotainment online



MC05-54

## FUNCTIONALITY OF THE CUPRA CONNECT GEN4

The functions available in CUPRA CONNECT Gen.4 are presented in three groups of services:

- Service and safety.
- Remote access.
- Online Infotainment.

### SERVICE AND SAFETY

Within "Service and Safety", the user can manage:

- Enrolment.
- Privacy mode.
- Legal notice.
- Delete user.
- Emergency call.

### REMOTE ACCESS

The "Remote Access" pack allows the user to manage aspects related to the following:

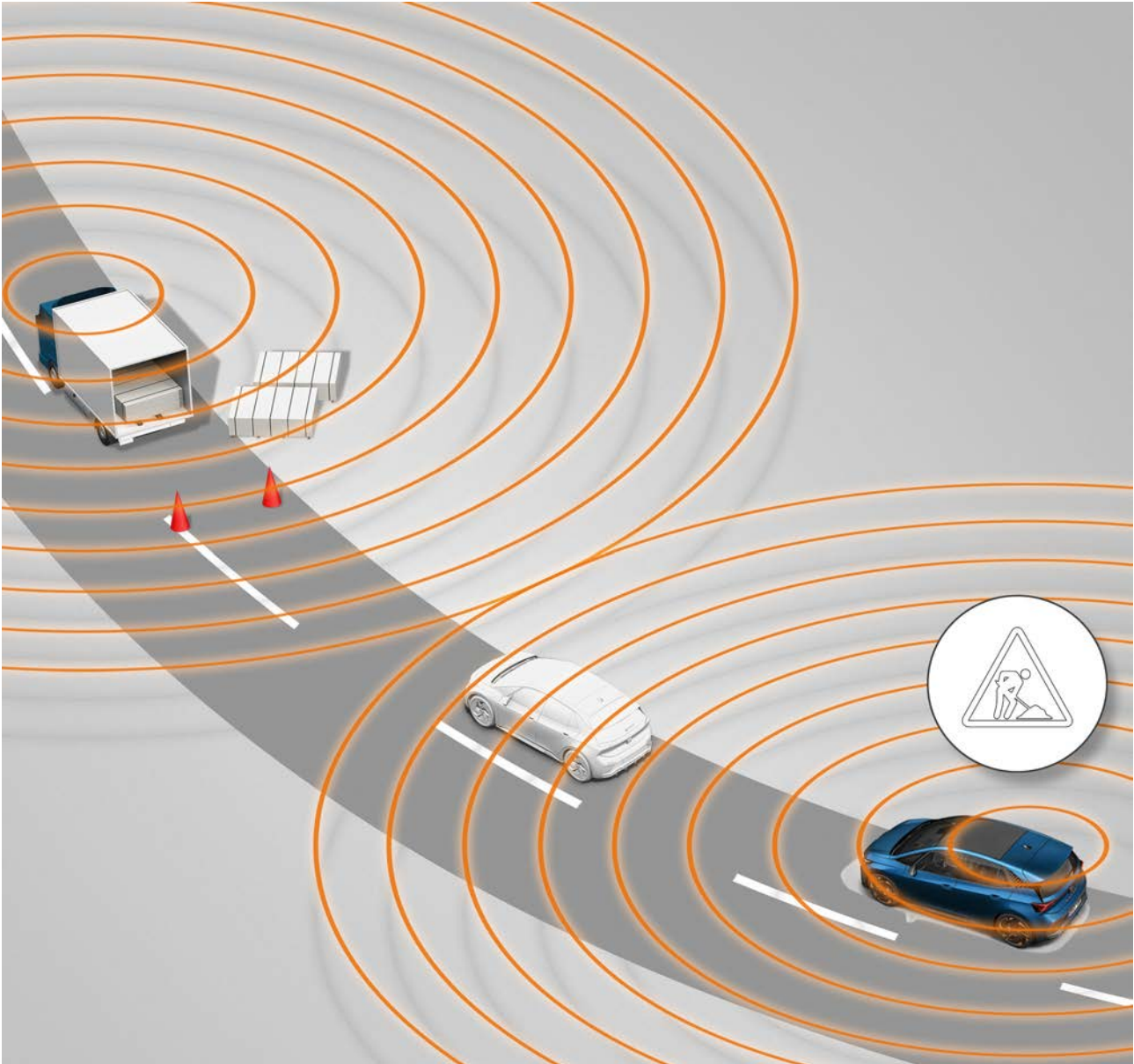
- Remote climate system.
- Remote battery charging.
- Remote profiles and timer.

### ONLINE INFOTAINMENT

Provides the customer access to information of interest, such as:

- Online traffic information.
- Online route calculation.
- Online map update.
- Dynamic PDIs.
- Online voice control.
- Internet radio.

## INFOTAINMENT



MC05-54

### CAR2X

Car2x is a WLAN-based system that enables the CUPRA Born to communicate with elements on the road it is driving (such as traffic control elements) and with other nearby vehicles to avoid potential danger.

If a preceding vehicle is equipped with this system, that vehicle will be able to detect a dangerous situation, such as road works, an accident or a traffic jam. By means of this technology, it will report the situation to the CUPRA Born via a WLAN connection.

The CUPRA Born informs the driver of the situation via the Infotainment display and the Head-up Display.

The CUPRA Born also participates in the safety of other vehicles by sharing information about the road.

# MAINTENANCE



MC05-56

## MAINTENANCE OPERATIONS

The inspection shall be carried out **every 2 years**, performing the following operations:

- Dust and pollen filter change.
- Brake fluid change.
- Inspection of the condition of wear and tear elements (brakes, ball joints...).

You can see the **maintenance interval's** remaining time in days in the "Driving data and Service" menu.

You can also select the option of windscreen wipers in service position. This makes it easier to replace the **wiper blades**.

When refilling **cooling agent R744** in vehicles with a heat pump, the workshop must have the specific tools for this operation. Among them is the new Air conditioning service device VAS 581 009.

The **user manual** in paper format provided to the customer is a reduced version with key points of the vehicle's use.

The customer must be instructed during the car delivery on how to access the complete user manual via the Infotainment screen.







CUPRA