

Information for first and second responders
Emergency response guide for vehicle



EX90

400V/800V
Lithium-ion
Battery

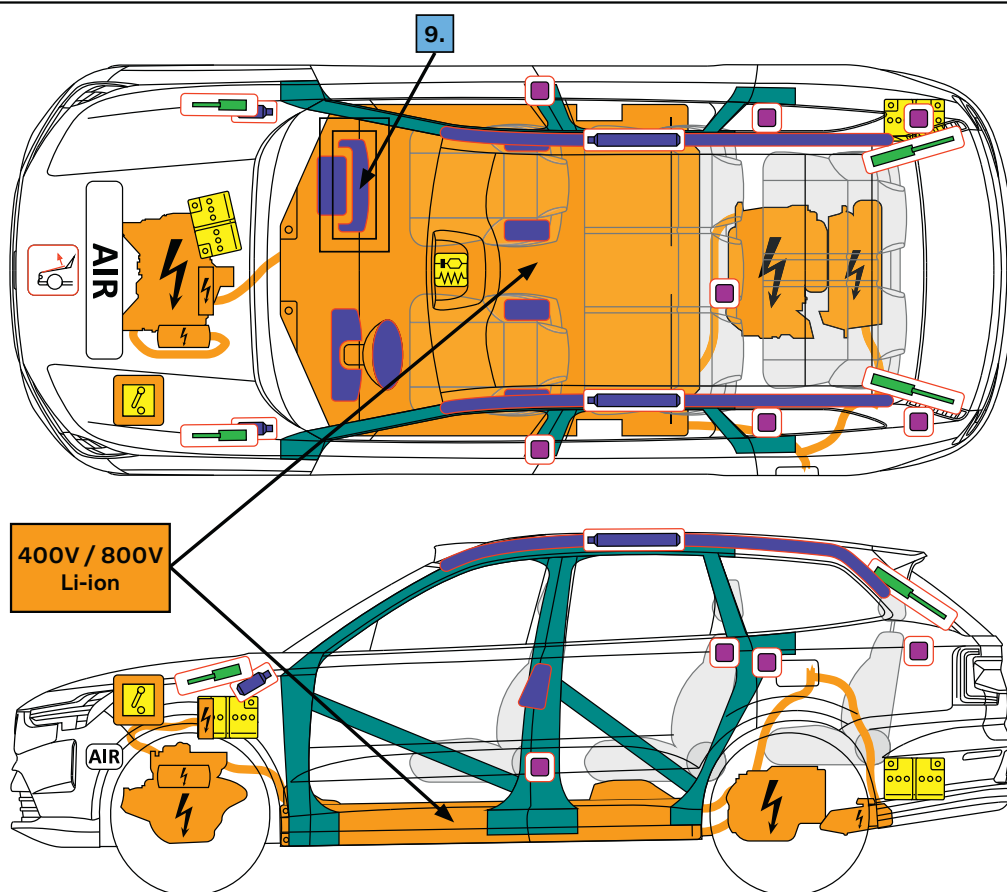


V O L V O

00 - RESCUE SHEET

V O L V O

Volvo EX90
5dr SUV
(2024 -)



- | | | | | |
|--|---|--|---|--|
|  Airbag |  Stored gas inflator |  Seat belt pretensioner |  SRS control unit |  Battery low voltage |
|  Gas strut / Preloaded spring |  High strength zone |  Low voltage device that disconnects high voltage |  High voltage component |  Battery pack, high-voltage |
|  High voltage power cable |  Pedestrian protection active system |  AIR Air tank |  Zone requiring special attention | |

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Page N°

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Introduction Electrical Vehicle Emergency Response Guide

This publication is intended for rescue personnel specially trained for rescue operations at vehicle accidents. The folder shows Volvo EX90 equipped with all optional and accessory equipment.

For information about the vehicle’s features, embedded systems and safety systems we refer to the owner’s manual which is digitally available in the center display of the vehicle.

This guide is intended to be used by trained first responders and rescuers and assumes that the reader has professional level skills in safely responding to emergencies and rescue situations described in this guide, including those involving damaged vehicles. This guide is not intended for retailers, end consumers or any other reader that is not described in the preceding sentence. This guide may be updated by Volvo Cars at any time. This guide applies to the Volvo EX90 fully electric vehicle only and includes information about the specific vehicle’s structure and components, including location and description of high voltage components. While failure to follow this guide may result in serious injury or death, each emergency situation is unique and this guide may not address every scenario and even if this guide is followed, serious injury or death may occur.

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Special texts

	Hazards / Danger
	Recommendation

Option/accessory

We continuously work to develop and improve our products. Modifications can mean that information, descriptions and illustrations in this publication differ from the equipment in the vehicle. We reserve the right to make changes without prior notice.

Vehicles may be equipped differently depending on market requirements and national or local laws and regulations. In addition to standard equipment, the vehicle can also have been modified with optional equipment (factory-installed equipment) and certain accessories (extra retrofitted equipment).

At the time of publication, all known options and accessories are marked with an asterisk (*).

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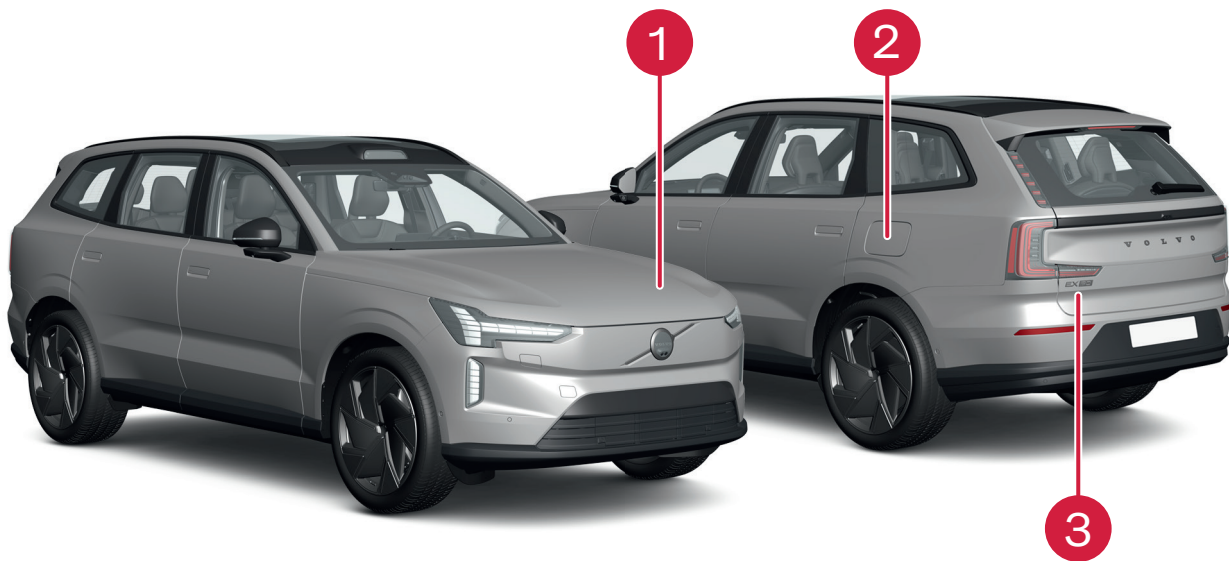
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Electric vehicle recognition

The Volvo EX90 can be identified as an electric vehicle in a number of places.



① Front of the vehicle

② Charging lid

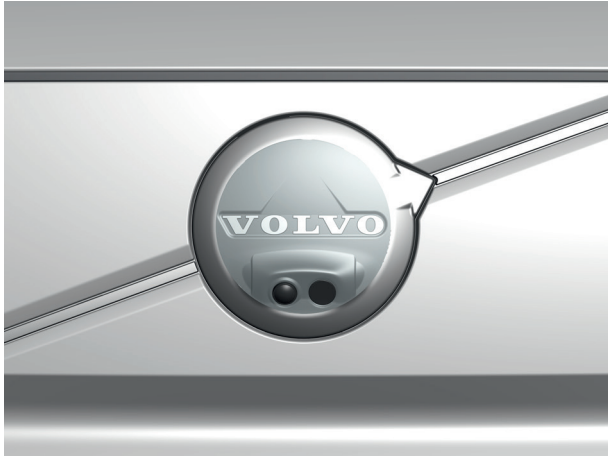
③ Lettering/badges



Lack of engine noise does not mean the vehicle is off. Silent movement or instant restart capability exists until the vehicle is shut down. Wear appropriate PPE.

01. IDENTIFICATION / RECOGNITION

Front of the vehicle



There is no grille surrounding the Volvo emblem.

Charging lid



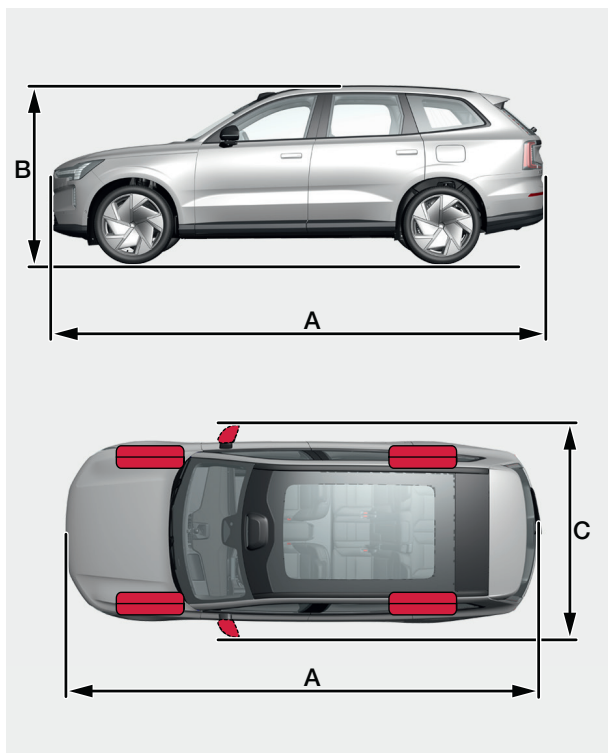
The charging lid on the left side of the vehicle.

Lettering/badges



EX90 mark on the tailgate.

Basic parameters of the vehicle¹



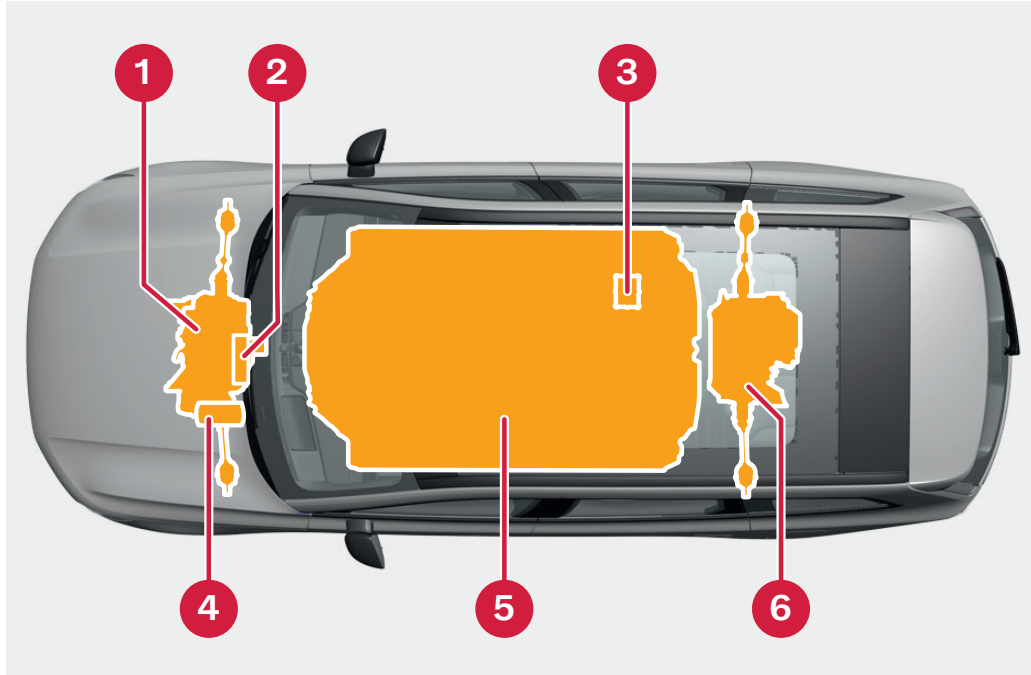
	Dimensions	mm	Inches
A	Length	5037	198.3
B	Height	1747	68.8
C	Width including folded-in door mirrors	2039	80.3



Vehicle category:	SUV
Authorized passenger number:	The standard is 5-7, but it depends on the amount of seat belts in the vehicle
Max. authorised total weight (kg):	
5 seat version:	3000
6 seat version:	3300
7 seat version:	3390
Weight distribution:	
5 seat version:	Front 46%-Back 54%
6 seat version:	Front 48%-Back 52%
7 seat version:	Front 48%-Back 52%

1. These numbers are the standard and may vary depending on the equipment of the vehicle. Look at the information decal for more information.

High voltage components



- ① Front electric motor (AWD only)
- ② High voltage coolant heater
- ③ Voltage converter
- ④ High voltage air conditioning compressor
- ⑤ Traction battery
- ⑥ Rear electric motor

High-voltage battery specifications

Traction Battery System	Rated voltage (V)	Rated capacity (kWh)	Type	Drivetrain	Size		Weight of battery group (kg)
					mm	Inches	
105kWh	353	105	NMC	RWD	2302 (L)× 1524 (W)× 259 (H)	90.63 (L)× 60 (W)× 10.2 (H)	640
111kWh	375	111	NMC	AWD	2302 (L)× 1524 (W)× 259 (H)	90.63 (L)× 60 (W)× 10.2 (H)	663
92kWh	628	92	NMC	RWD	2302 (L)× 1524 (W)× 259 (H)	90.63 (L)× 60 (W)× 10.2 (H)	582
106kWh	718	106	NMC	AWD	2302 (L)× 1524 (W)× 259 (H)	90.63 (L)× 60 (W)× 10.2 (H)	645

Warning marking information

High voltage cables are colored in orange. Do not cut through high voltage cables.



Warning symbol for high voltage component.

An example of a label located on a high voltage component is shown below.



Windshield VIN code

The VIN code can be identified in the windshield.



Right door post information decal

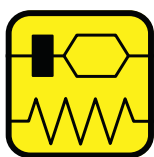
The vehicle is equipped with information decals. The certification label on the right side B-pillar (the structural member at the side of the vehicle, at the front of the rear door opening) shows information for the vehicle, such as VIN code etc.



Vehicle stopping operations

For information of how to disconnect the traction battery, please see section [03 DISABLE DIRECT HAZARDS / SAFETY REGULATION](#).

Crash



In the event of a collision, the Supplemental Restraint System (SRS) module sends a signal to the Vehicle Control Units (VCU), stating that a collision has occurred and the vehicle enters Crash mode.

In Crash mode, the following safety features among others, are activated automatically:

- The high voltage battery is disconnected
- The passenger protection system, such as belt pretensioners and airbags are activated.
- Doors are unlocked
- The parking brake is activated
- Hazard warning lights are activated

In severe crashes, the hazard warning lights and other safety functions are powered by the high voltage battery through the High to Low Voltage Converter Module (HLCM) which is located under the right rear seat inside the high voltage battery. The converter is turned off automatically 12 hours after the SRS signal has been sent.

Activating the parking brake

To engage the parking brake, press the button marked **P** on the gear selector.

The symbol in the driver display illuminate when the parking brake is activated.



The parking brake releases automatically when you select a driving gear.

Automatic activation of the parking brake

The parking brake is activated automatically:

- If the vehicle is in Crash mode.
- The charging cable is connected to the car.
- The driver leaves the car.
- If the Auto hold function is activated and
 - The vehicle has been stationary for a long time
 - If the driver's seatbelt is unbuckled (Except US market)
 - If the driver's door is opened (Except if the driver's seatbelt is buckled)

02. IMMOBILISATION / STABILISATION / LIFTING

Turn off the vehicle

The vehicle is automatically exited from drive mode and switched off when the driver leaves the vehicle and it is parked.

Turning the vehicle off manually

1. Activate the parking brake.
2. Press the car symbol  in the bottom bar of the center display and go to **Settings**.
3. Go to **Controls > Car modes > Power options**.
4. Select **Power off car**.

WARNING



- Shutting off power to an electrical vehicle does not de-energize the traction battery, and a shock hazard may still be present.
- Even though the vehicle is set to a state that is not the Drive mode, the vehicle can still be in an active state.

Stabilizing the vehicle with stop chocks

Stabilize the vehicle with stop chocks under the wheels. Stop chocks are to be placed in front of or behind the wheels.



WARNING



- Never stabilize the vehicle under the traction battery.
- If the stop chocks are placed in contact with the battery it can be damaged, which can be dangerous.
- If the battery gets damaged it poses a threat, which can result in personal injury or death.

Keys

The vehicle supports the following types of keys:

- Key card

The key card locks and unlocks the car and must be held against the door handle on the driver's side. To start the vehicle, place the key card on the card reader located on the center console.

- Key tag

The key tag allows you to lock and unlock the vehicle when you touch the sensor on the driver door handle. Certain lights activate, depending on whether you are entering or exiting the car.

WARNING



Make sure that the key is removed from the vehicle to avoid unintentional activation. Keep the key at a safe distance from the vehicle.

Lifting

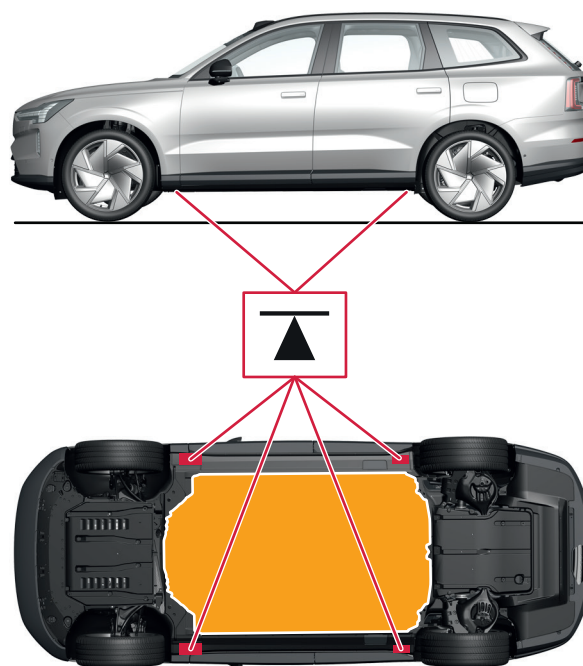


The traction battery is located under the vehicle. Use the lift areas shown in the image below. A section of the undercarriage houses the traction battery. When lifting or stabilizing the vehicle, only use the designated lift areas, as shown in the following images.



WARNING

When lifting the vehicle, use the stated lifting points as illustrated below!



Disconnection of high voltage

Automatic disconnection

If a serious accident occurs the Supplemental Restraint System (SRS) sets the vehicle to Crash mode and the traction battery pack is automatically disconnected from the rest of the high voltage system

Make sure the traction battery is disconnected before starting any rescue procedures. Please see the section "[High voltage Manual service disconnect](#)" in this chapter.

WARNING



Residual voltage can remain in the system outside the traction battery for approximately 10 seconds after the accident.

Make sure that the vehicle is stabilized and turned off



When possible, always make sure that the vehicle is turned off and stabilized. See chapter [02. IMMOBILISATION/STABILISATION/LIFTING](#) for more information.

WARNING

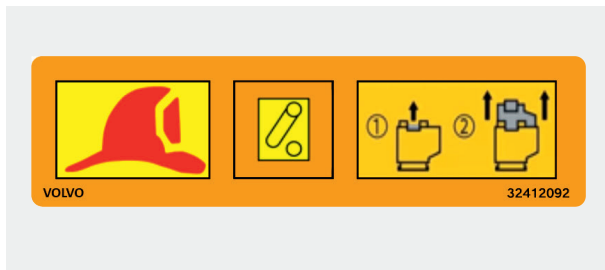
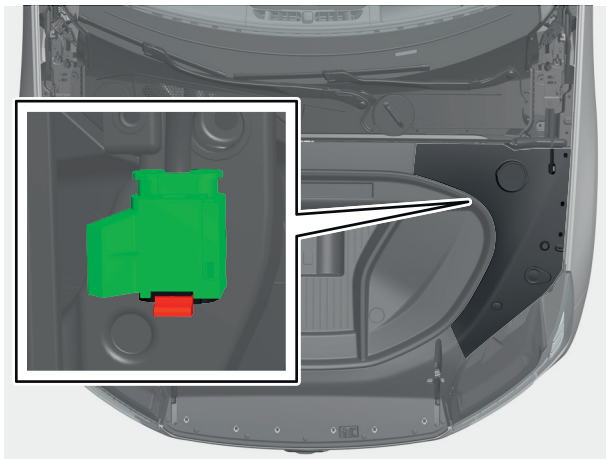
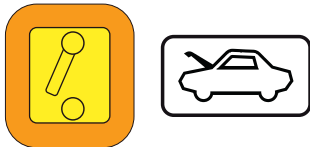


- Shutting off power to an electrical vehicle does not de-energize the battery and a shock hazard may still be present.
- Unless absolutely necessary, do not touch any of the high voltage harnesses and/or components. Touching high voltage components, wires or harnesses might result in personal injury or death.
- If the situation requires operations on any of the high voltage components and/or harnesses, always wear the appropriate Personal Protective Equipment (PPE) to avoid electrical shock. Failure to do so can result in serious injury or death.
- NEVER assume that the electrical vehicle is turned OFF because it is silent. The electrical motor is silent and may still be running. When possible, always take appropriate actions to turn the vehicle completely off and disconnect the high voltage system before performing rescue operations.
- Regardless of which procedure is used to disable the high voltage system, always assume that high voltage components are energized. Take proper actions to avoid unnecessary risks.

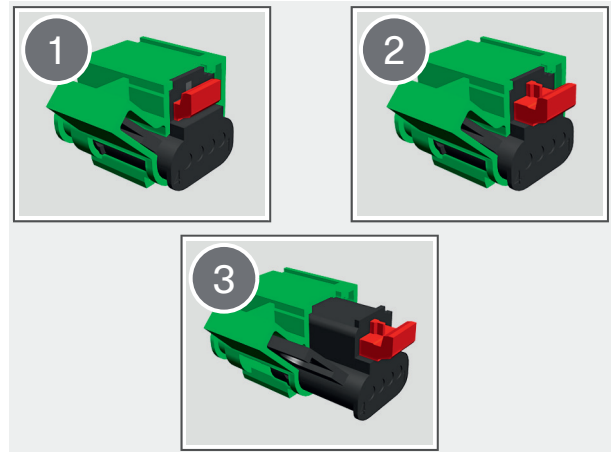
03. DISABLE DIRECT HAZARDS / SAFETY REGULATION

High voltage manual service disconnect

The vehicle has a manual high voltage service disconnect plug under the bonnet next to the 12 V battery.



1. Locate the high-voltage service disconnect plug under the bonnet next to the 12 V battery.
2. Locate the high-voltage service disconnect plug on the left side of the engine compartment. The plug can be identified by a label on the wiring harness.



3. Pull out the red safety pin then pull out the black connector.

Discharge of residual voltages



In case of an accident with airbag and/or belt pretensioner activation or after an unexpected malfunction, the discharge circuit ensures that the high voltage system is free from remaining energy after approximately 10 seconds.

PERSONAL PROTECTION CLOTHING AND EMERGENCY EQUIPMENT

- Use appropriate clothing intended for the purpose and the work to be performed, such as gloves and shoes as well as a safety shield specified to be able to withstand up to 1000 V only in case of battery damages.
- Use insulated tools when working on the vehicle and its components only in case of battery damages. Use solvent resistant protection gloves and shoes in the event of a traction battery electrolytic solution leakage.

Ending the charging of the traction battery

WARNING



Terminate the charging cycle before attempting to unplug the cable from the vehicle's charging port. If you do not, you may cause damage to the cable or to the system.

End of charging

1. Press the car symbol  in the bottom bar of the center display and go to **Settings**.
2. Go to **Charging**.
3. Select **Unlock cable**.
4. Unplug the charging cable from the vehicle.

WARNING



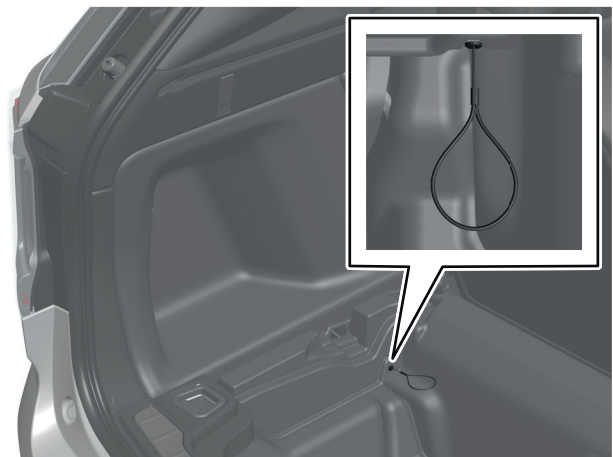
- You can also end the charging process via the charging station or by pressing the **End charging** button.
- You can also unlock the charging cable by pressing the release button next to the charging port.
- If the charging cable isn't unplugged within a short period of time, the cable will lock again and charging will resume.



Charging cable emergency release

If the charging handle doesn't release after charging is ended, you can use the emergency release wire to manually release the charging handle.

1. Open the luggage compartment and the cargo hatch.
2. Locate the emergency release handle on the left side of the luggage compartment.
3. Pull the release wire.
 - > The charging handle unlocks from the charging port.
4. Unplug the charging cable from the vehicle.



Access to the occupants

Before attempting to access occupants, inspect the level of damage of the electrical vehicle using caution.

Look for indicators that the high voltage system has been damaged, such as:

- High voltage component casings are damaged
- The harnesses are damaged or cut
- Arcing or sparking
- Smoke
- Offensive odor

In the event of a serious accident, the traction battery pack is automatically disconnected, even if it happens always make sure the traction battery is disconnected before starting any rescue procedures.

WARNING



Operating on the vehicle when the high voltage system is damaged can pose a serious risk of personal injury or death. Take extreme care and use caution when performing rescue operations.

Body framework

The body consists of five different grades of steel (steel alloys). Please see the differences in the below overview image.



-  Mild steel
-  High strength steel
-  Very high strength steel

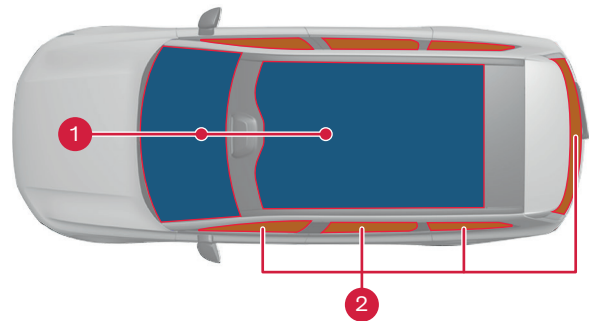
-  Extra high strength steel
-  Ultra high strength steel
-  Aluminium

04. ACCESS TO THE OCCUPANTS

Glass types

The vehicle is equipped with several different types of windows, glass and mirrors. Some of the windows in the vehicle are laminated.

The windshield and panoramic roof use laminated glass, while the side windows are tempered but can optionally be equipped with laminated glass.

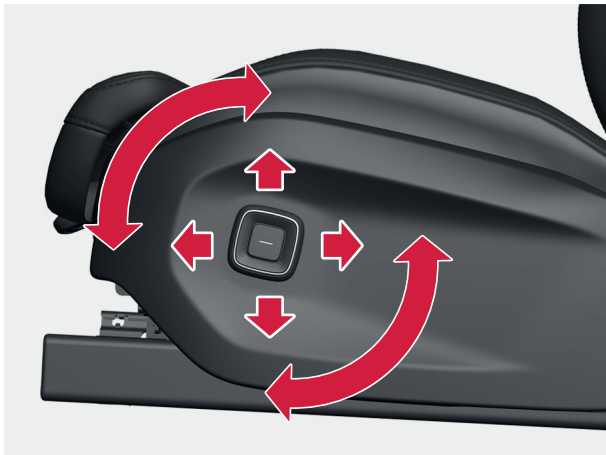


- ① Laminated glass
- ② Tempered glass with optional laminated glass

Adjusting the seats and steering wheel

Adjusting the front seat

For vehicles with power front seats, the front seats are adjusted using the control on the front seat's seating section.



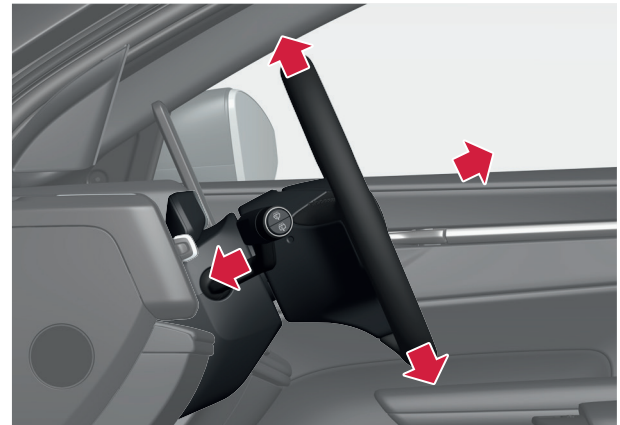
The seat adjustment knob can move up and down, left and right, as well as rotate in both directions. In the middle of the knob there's also a button you can use to change the active adjustment mode.

Adjusting the steering wheel

The steering wheel can be adjusted to different positions.

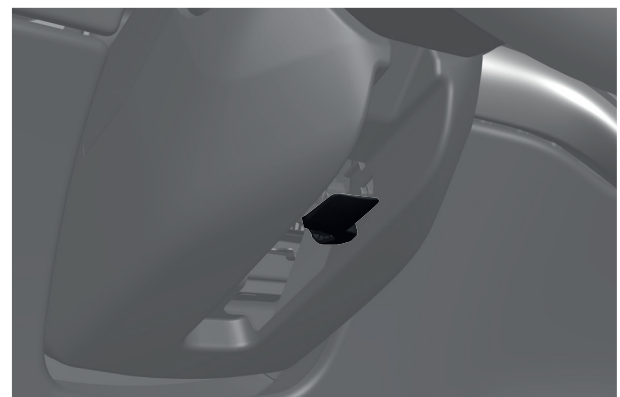


Power adjustable steering wheel



1. Press the car symbol  in the bottom bar of the center display and go to **Settings**.
2. Go to **Controls > Steering wheel and seats > Adjust steering wheel**.
3. Adjust the steering wheel position using the steering wheel buttons.

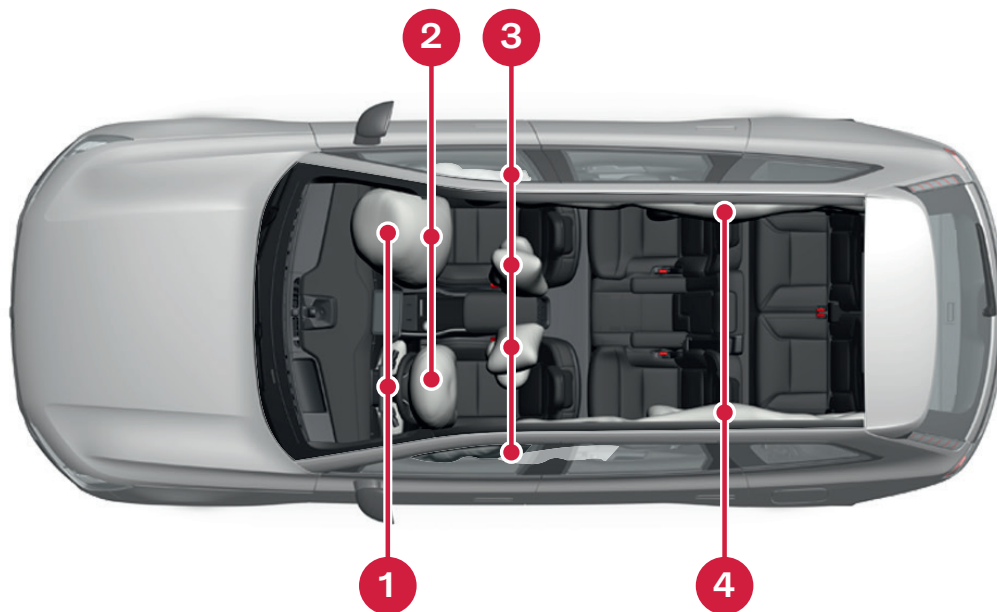
Manual adjustable steering wheel



1. Push the lever forwards to release the steering wheel.
2. Adjust the steering wheel to the desired position.
3. Pull the lever back to fix the steering wheel in place.

Airbags and seat belt pretensioners

The vehicle is equipped with a number of different airbags in order to protect the driver and passengers.



- ① Knee airbags
- ② Front airbags
- ③ Side airbags
- ④ Inflatable curtains

Knee airbag

- Driver knee airbag available in all markets
- Passenger knee airbag available only in the U.S. market.

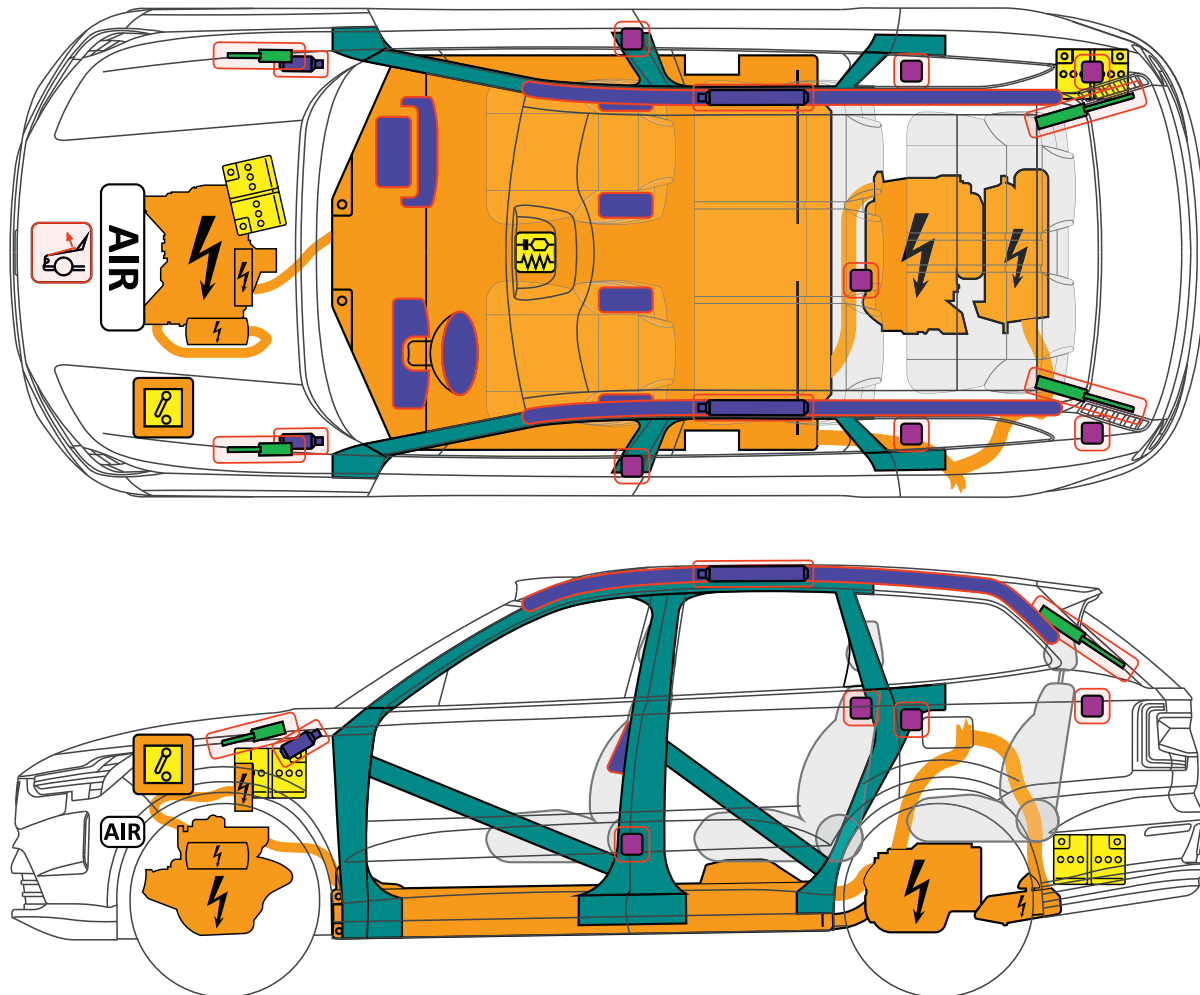
In addition to the airbags, the seat belts help reduce injury to occupants of the vehicle. Seat belt pretensioners are placed in connection to the seat belts. Please see the section “[Component overview](#)” in chapter [05. STORED ENERGY / LIQUIDS GASES / SOLIDS](#) for an overview of the placement of the seat belt pretensioners.

WARNING



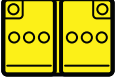
Make sure that the vehicle's electrical system is fully depowered and no other power source is connected. Note that the pyrotechnical safety equipment is always powered. Do not attempt to turn on the ignition since the airbags may deploy. When recovering the vehicle, Volvo recommends that it be transported to an authorized Volvo workshop.

Component overview



05. STORED ENERGY / LIQUIDS / GASES / SOLIDS

Figure	Meaning
	Airbag/side air curtain
	Traction battery, high voltage
	Stored gas inflator
	Gas strut/Preloaded spring
	High voltage power cable
	Seat belt pretensioner

Figure	Meaning
	Battery, low voltage
	Reinforced structure of vehicle body
	Low voltage device that disconnects high voltage system
	SRS Control unit
	Active pedestrian protection
	High voltage component

First Aid Measures

Under normal conditions of use, there is no risk of exposure to the contents of the traction battery and the high voltage system.

Please see the section “[High voltage Manual service disconnect](#)” in chapter [03. DISABLE DIRECT HAZARDS/SAFETY REGULATIONS](#).

For handling in workshop, please see Vida.

Electric Shock/Electrocution



Seek immediate medical assistance if an electrical shock or electrocution has occurred (or is suspected).

Vent Gas Inhalation



The constituent battery cells are sealed and venting of cells should not occur during normal use. If inhalation of vent gases occurs, move the person into fresh air. If they are not breathing, give artificial respiration. Seek immediate medical assistance.

Treatment of waste water



According to normal procedure.

Emergency rescue in case of fire

In case of fire not involving the traction battery



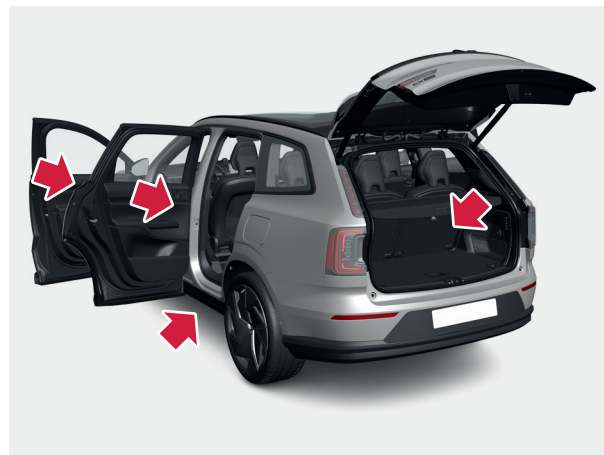
If there is a fire that has not spread or affects the traction battery, it can be extinguished using typical vehicle fire fighting procedures.

WARNING



- Do not make contact with any high voltage components.
- While performing operations on the vehicle when a fire has been involved, always consider the vehicle to still be energized. Do not touch any part of the vehicle. Use appropriate personal protective equipment, including Self Contained Breathing Apparatus (SCBA).

In case of fire involving the traction battery



Use continuous fresh water to cool down the area around the battery.



If the traction battery catches fire or is venting or gives off odor, always use water to cool the battery. Use pure water to cool down the area around the battery. It may be prudent to have a sufficiently large water supply and/or the possibility to obtain/request additional water supplies when responding to a vehicle accident that involves fire.

WARNING

- Battery fires can take a long time to fully extinguish. This means that the battery might start burning again even after a fire has seemingly been extinguished.
-  Never assume that the battery has cooled down or that it no longer poses a threat of a new fire emerging. Always take proper actions to make sure that the battery is cooled down completely, i.e. by use of a heat camera or some other (equally suitable) tool to determine the status of the battery heat level.
- Smoke and/or steam, among other irregularities, may indicate that the battery is still heating somewhere.
- Turning, tipping or lifting the vehicle can cause a re-ignition of the traction battery. Always inform the next responder of the risk of the battery re-igniting and what to do in such event.



The traction battery needs to be monitored until it has been determined to be completely cooled before leaving an accident and/or releasing the vehicle to second line responders, such as law enforcement and/or towing personnel.

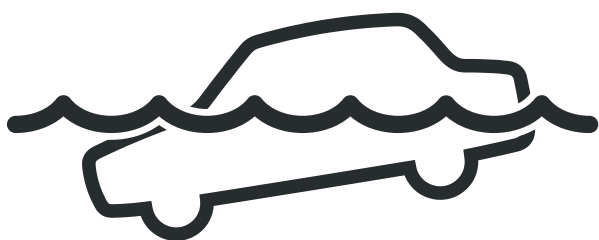
WARNING

When the vehicle has been the subject of a fire, submersion or collision that in any way has compromised the integrity of the traction battery, the vehicle should be stored in an area safe from any exposure. Always follow local regulations regarding storage and quarantine zones.



Emergency rescue in the case of submersion

Handle a submerged vehicle while wearing appropriate Personal Protective Equipment (PPE). Remove the vehicle from the water and continue with normal high voltage disabling.



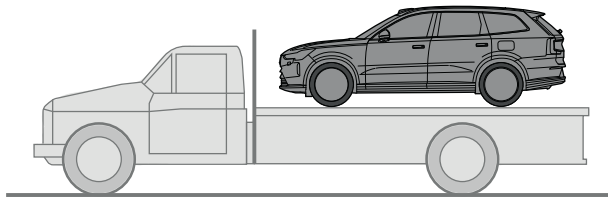
WARNING



- Always wear Personal Protective Equipment (PPE) while handling a submerged vehicle, otherwise it can result in serious injury or death from electrical shock.
- Do not touch the high voltage components or harnesses when the vehicle is in the water.

Hauling of the vehicle from the scene after an accident

If the vehicle cannot start after an accident, it needs to be hauled from the scene of the accident.



When hauling an electrical vehicle, it should either be lifted off from the ground or towed up onto a recovery vehicle's platform.

When lifted, all four wheels must be lifted off the ground.

It is only permitted to tow the vehicle up onto a recovery vehicle's platform. It is not permitted to haul the vehicle with any of its wheels rolling on the ground.

While hauling, no person is allowed to be inside the vehicle being hauled.

WARNING



After a reaction from a damaged traction battery, it must be secured until it has reached approximately ambient temperature. The use of a thermal imaging camera or an IR thermometer is recommended. Before transporting the vehicle (e.g. by a towing company), the condition of the lithium-ion battery must be re-checked.

WARNING

- If it is impossible to utilize platform-type goods vehicle to perform vehicle hauling, rigid attachment means may be used to remove the vehicle to a temporary safe zone awaiting rescue.
- For the method of rigid hauling, long distance hauling shall be avoided and the hauling vehicle shall not exceed a speed of 5 km/h.
- The vehicle may not be hauled away from the scene if the vehicles poses a safety risk in any way.
- A damaged traction battery can react either immediately or with a delay due to severe damage or exposure to water or fire. Therefore, watch out for any signs (e.g. smoke, heating, noise, sparks, etc.) while working on a vehicle with a lithium-ion battery which has been damaged in a very severe accident. If the lithium-ion battery reacts, protective measures must be taken.



WARNING

- The vehicle may only be loaded and transported if the reaction has ended to such an extent that it can be assumed that no further reaction is to be expected on the transport route. The shortest and safest route must be chosen. Passages through tunnels should be avoided. In some cases it may be appropriate for the towing vehicle to be accompanied by a fire-fighting vehicle. Do not touch the high voltage components or harnesses when the vehicle is in the water.
- The responsible persons of the towing company, the workshops and, if applicable, the disposal companies must be informed of the special features and risks of the vehicle!



Storage recommendations

A damaged traction battery can react either immediately or with a delay due to severe damage (e.g. crushed, broken or cracked housing) or exposure to water or fire. Therefore the vehicle involved in the accident must be parked in a suitable place outside unless it is analyzed as safe, because the traction battery still has the theoretical potential to react until the system is secured. Please see chapter [03. DISABLE DIRECT HAZARDS / SAFETY REGULATION](#).

The parking space must be marked accordingly (signage/delimitation). A distance of at least 5 meters (15 feet) from other vehicles, buildings or combustible objects must be maintained.

WARNING



- If a vehicle has been damaged (battery enclosure has been dented or compromised), it is possible that heating is occurring that may eventually lead to a fire. The responsible persons of the towing company, the workshops and, if applicable, the disposal companies must be informed of the special features and risks of the vehicle!
- Damaged or opened cells/batteries can result in rapid heating (due to exothermic reaction of constituent materials), the release of flammable vapours, and propagation of self-heating and thermal runaway reactions to neighbouring cells.

Smoke may be an indication that a thermal reaction is in progress. If no smoke, flame, sign of coolant leakage, or signs of heat have been observed, the vehicle may be disconnected and moved to a safe location. To obtain specific instructions for evaluating, disconnecting, and preparing a damaged vehicle for transport, please contact the Volvo team. A damaged vehicle should be monitored during storage for evidence of smoke, flame, sign of coolant leakage, or signs of heat.

If full-time monitoring of the vehicle is not possible (for example, during extended storage), the vehicle should be moved to a safe storage location. A safe storage location for a damaged battery will be free of flammable materials, accessible only by trained professionals, and 5 meters (15 feet) away from occupied structures. For example, a fenced, open yard may be an appropriate safe location. It is possible that a damaged battery may sustain further damage during transportation and may lead to a fire. To further reduce this risk, handle the damaged battery with extreme caution until analyzed.

09. IMPORTANT ADDITIONAL INFORMATION

Knee airbag

The vehicle is equipped with knee airbags.



The driver side knee airbag is integrated into the lower dashboard above the pedals.

The passenger-side knee airbag, exclusive to U.S. models, is located below the glove compartment in the lower dash

10. EXPLANATION OF PICTOGRAMS USED

Figure	Meaning
	Electric vehicle
	Warning/Caution
	High voltage component
	SRS Control unit
	High voltage manual service disconnect
	Removable cable
	Lifting point
	Traction battery pack, high voltage
	Airbag inflator
	Opening hood
	Seat adjustment, longitudinal
	Seat height adjustment
	Steering wheel tilt
	Airbag
	Battery, low voltage

Figure	Meaning
	Gas strut/Preloaded spring
	High voltage power cable
	Seat belt pretensioner
	High strength zone
	Dangerous voltage
	Flammable
	Hazardous to human health
	Environmental hazard
	Use water to extinguish
	Use wet foam to extinguish
	Use dry foam to extinguish
	Use IR Camera
	Active pedestrian protection

V O L V O