

Emergency Response Guide



Kia EV9



Movement that inspires



Introduction

The ERG (Emergency Response Guide) provided by Kia describes emergency response operations, warnings, and precautions related to the vehicle. This publication is intended to provide necessary information for vehicle accident rescue operations and for the training and further education of first and second responders.

Please note that the guide may be updated by Kia on an ongoing basis. It is not intended for retailers, end consumers, or any other readers not mentioned in the preceding sentence.

The provided guide applies only to the Kia EV9 vehicle and includes information about the location and description of high-voltage components and the vehicle's structure. However, it does not cover every scenario in emergency situations.

Failure to follow the recommended procedures during emergency response may result in death or other serious injuries. It is important to read the guide in advance as it contains necessary information about the vehicle's features and other provided content in the event of an accident.

IMPORTANT INFORMATION



A WARNING indicates a situation in which harm, serious bodily injury or death could result if the warning is ignored.

Contents

1. Identification / recognition
2. Immobilization / stabilization / lifting
3. Disable direct hazards / safety regulations
4. Access to the occupants
5. Stored energy / liquids / gases / solids
6. In case of fire
7. In case of Submersion
8. Towing / transportation / storage
9. Important additional information
10. Explanation of pictograms used

Initial Response: Identify, Immobilize and Disable

The following procedures should be used whenever you are dealing with a EV9 at an emergency scene. However, all operations should be consistent with your department's standard operating procedures, guidelines, and any applicable laws. When an EV9 is damaged in a crash, the high-voltage safety systems may have been compromised and present a potential high-voltage electrical shock hazard. Exercise caution and wear appropriate personal protective equipment (PPE) safety gear, including high-voltage safety gloves and boots. Remove all metallic jewelry, including watches and rings.

WARNING

Identify

The EV9 is an electric vehicle. Emergency responders should respond to emergency scenarios involving the EV9 accordingly, exercising extreme care and caution to avoid contact with the high-voltage system within the vehicle.

Identifying a Kia EV9

“EV9” Car name emblem on tailgate

- The EV9 can be easily identified by the car name emblem attached on the tailgate on the left side.
- The car name emblem may be missing or hidden after a crash due to damage to the vehicle. Always be sure to use other identification methods in this section before determining that the vehicle is not an electric car.



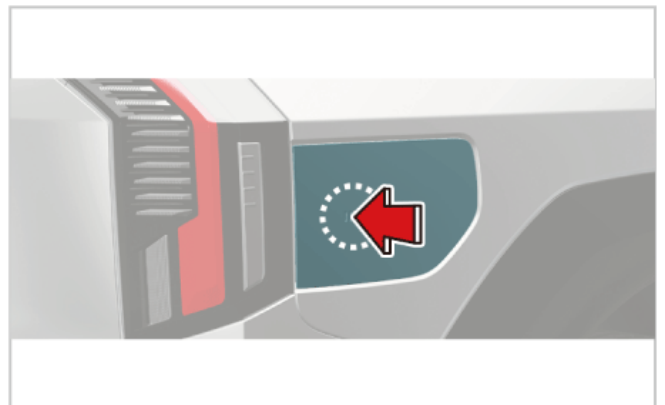
Charging Port

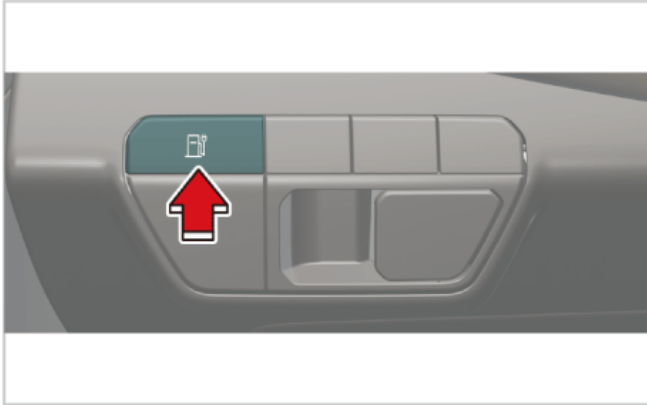
The charging port is located on the rear left side.

Note that the doors must be unlocked to open the charge port door.

How to open the charging port

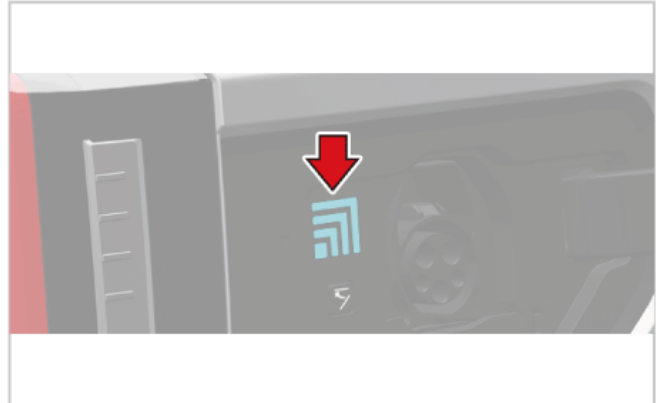
1. Press the unlock door button, depress the brake pedal and apply the Electric Parking Brake (EPB).
2. Turn OFF all switches, move the shift lever to P (Park) and turn off the vehicle.
3. Open the charging door by pressing it, or press the “charging door open button” in the crash pad.





Charge Status Indicator

The battery charge status indicator (4 separate lights), located inside the charging door, is illuminated when the vehicle is charged. The number of lights illuminated indicates the charge level of the battery.



Identifying a EV9

VIN Label

The vehicle certification label attached on the top of the dashboard through the front windshield gives the VIN (Vehicle Identification Number) as shown in the below picture.



The VIN can be also found under the driver's seat (or passenger's seat)



EV9 Cluster Instrument Panel

The EV9 Cluster Instrument Panel displays EV specific features such as high-voltage battery SOC (State of Charge) as below.



1. Speedometer
2. Distance to empty
3. Power/Charge gauge
4. Battery SOC (State of Charge) gauge
5. LCD display
6. Warning and indicator lights
7. Reduction gear shift indicator
8. Odometer
9. Regenerative braking level indicator

2.1 Immobilization

The next step is to immobilize the vehicle to prevent any accidental movement that can endanger response personnel or civilians. When the EV9 is damaged in a crash, the vehicle may appear to be shut off, even when it actually is not, due to a lack of virtual engine sounds. When the "READY" mode light is illuminated on the Instrument Panel, the vehicle can move silently using the electric motor. Responders should approach the vehicle from the sides and stay away from the front or rear as they are potential paths for vehicle movement. Be sure to immobilize the vehicle in the following manner.



2. Put the vehicle in P (Park) position by pressing the 'P' button.



3. Set the Electronic Parking Brake (EPB)

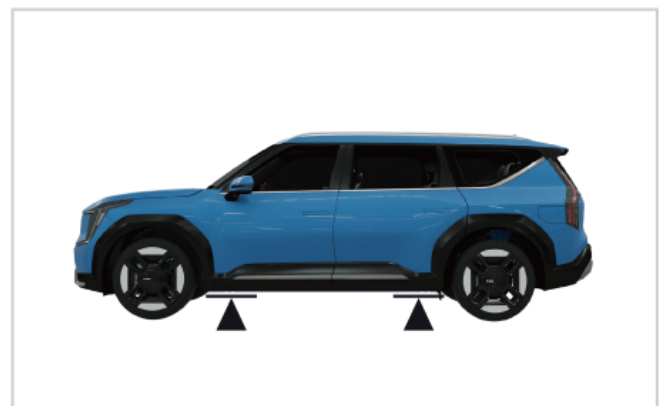


WARNING

- When installing a block or jack, avoid high-voltage cable, high-voltage battery.
- If high-voltage components or cables are exposed, do not place any support on them.

2.2 Vehicle Stabilization

Use standard stabilization (lift) points, as shown beside. Always be sure to connect to a structural component of the vehicle and avoid placing cribbing under high-voltage cables, and other areas not normally considered acceptable.



Disabling vehicle

The final step in the initial response process, conducted after immobilizing the vehicle, is to disable the vehicle, its SRS components and the high-voltage electrical system. To prevent current flow through the system, use one of the following procedures to disable the vehicle.

Case 1:

1. EV off
2. 12 V battery disconnection
3. high-voltage shut off

Case 2*:

1. Fuse removal (Fuse box)
2. 12 V battery disconnection
3. high-voltage shut off

*In case of emergency

SRS : Supplemental Restraint System

3.1 Disabling the System – Smart Key System and “EV” START/STOP Button

1. Confirm the status of the READY light on the instrument panel. If the READY light is illuminated, the vehicle is ON.

a) If the READY light is NOT illuminated, the vehicle is off. Do not push the “**EV**” **START/STOP** button because the vehicle may start (go into READY mode).

b) To turn OFF the system, press the 'P' (Park) button on the rotary shifter dial, and press the EV button.



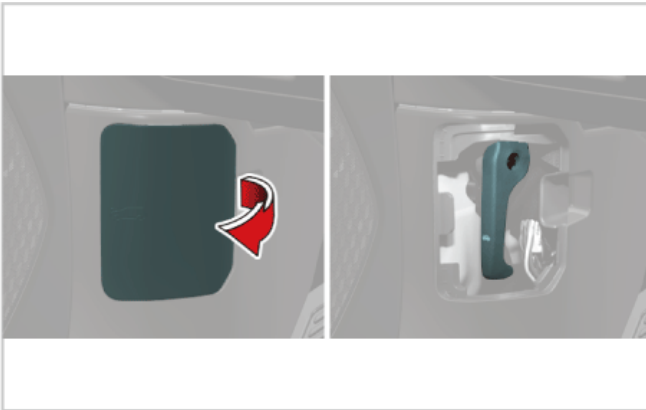
2. If necessary, lower the windows, unlock the doors and open the trunk as required, before disconnecting the 12 V battery. Once the 12 V battery is disconnected, power controls will not operate.

3. Before disconnecting the 12 V battery, remove the smart key at least 2 meters (7 feet) away from the vehicle to prevent accidental restart.

4. Open the hood after pressing the release button twice.



3. DISABLE DIRECT HAZARDS / SAFETY REGULATIONS



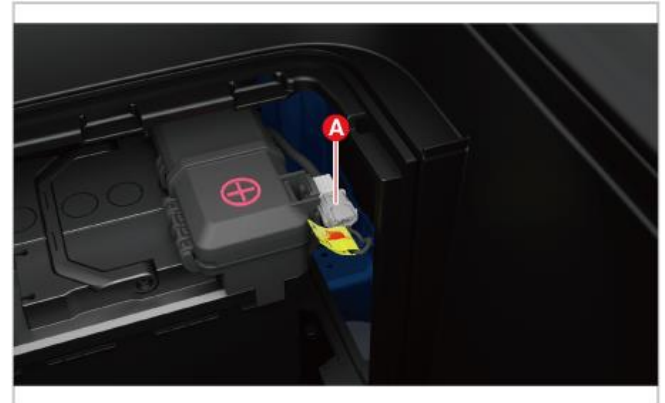
* If the release button does not work, pull the emergency lever twice after removing the emergency open cover located on the left hand side of the footrest.

4. Separate the 12 V auxiliary battery negative terminal (A) after loosening the nut.



5. Remove the PE room junction box cover.

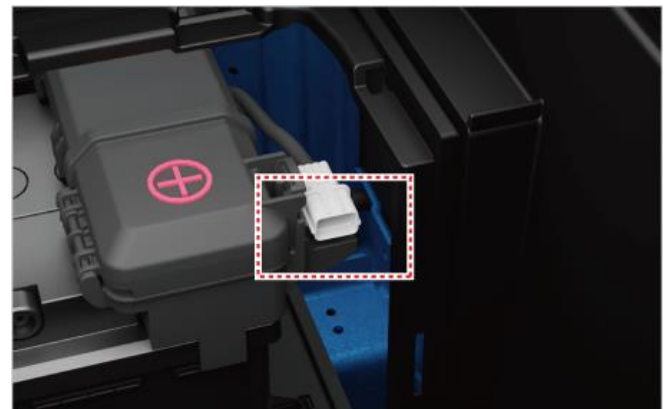
6. Disconnect the high voltage service interlock connector (A).



Before



After

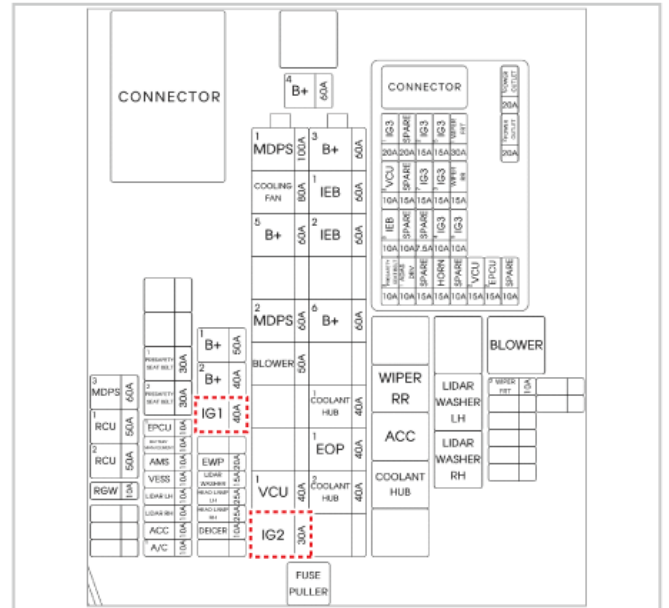


⚠ WARNING

Wait more than 5 minutes for capacitor of the high-voltage battery system to be discharged completely.

3.2 Disabling the system – IG (Ignition) Fuse Removal

1. Open the hood.
2. Remove the PE (Motor) room fuse box cover.
3. If necessary, lower the windows, unlock the doors and open the tailgate as required, before disconnecting the 12 V battery (located in the left side of PE(Motor) room). Once the 12 V battery is disconnected, power controls will not operate.
4. In the event the vehicle is unable to be disabled using the “EV” START/STOP Button, using the fuse puller located in the PE(Motor) room fuse box, pull both the IG1, IG2 fuse from the PE room fuse box. If the IG fuses cannot be located, pull out all of the fuses and relays in the fuse box.



5. Remove the service interlock connector and disable the high-voltage battery.

- If previously mentioned methods of disabling the vehicle’s system are unsuccessful, any emergency procedures involving the electric vehicle may cause the accidental deployment of undeployed airbags and electric shock from high-voltage components.

WARNING

Electrocution risk

- Before engaging in any emergency response procedures, ensure the vehicle is disabled and wait 5 minutes to allow the capacitor in the high-voltage system to discharge to avoid electrocution.
- Exposed cables or wires may be visible inside or outside the vehicle. Never touch the metal chassis wires, cables, connectors, or any electric components before disabling the system.

Failure to follow these instructions will lead to serious bodily injury or death by electrocution.

4. ACCESS TO THE OCCUPANTS

4.1 Extraction Operations

The EV9 is an electric vehicle. Because of the high-voltage components contained within, first responders should pay special attention when they extract occupants in the car. Before performing any extraction operations, the first responders should “Identify, Immobilize and Disable“ the vehicle as discussed in sections on emergency procedures.

4.2 Extraction Tools and Procedure

When responding to an incident involving the EV9, we recommend that the first responders follow their organization’s standard operating procedures for dealing with vehicle emergencies. When the first responders cut the vehicle, they should always pay special attention to the airbag system, orange colored high-voltage cables and other high-voltage components so that the parts are not damaged and to prevent a risk of explosion or electrocution.

4.3 Door open

When the door outer handle doesn’t pop-up, push the front side inwards.

When the door outer handle doesn’t pop-up, push the front side inwards.

Push

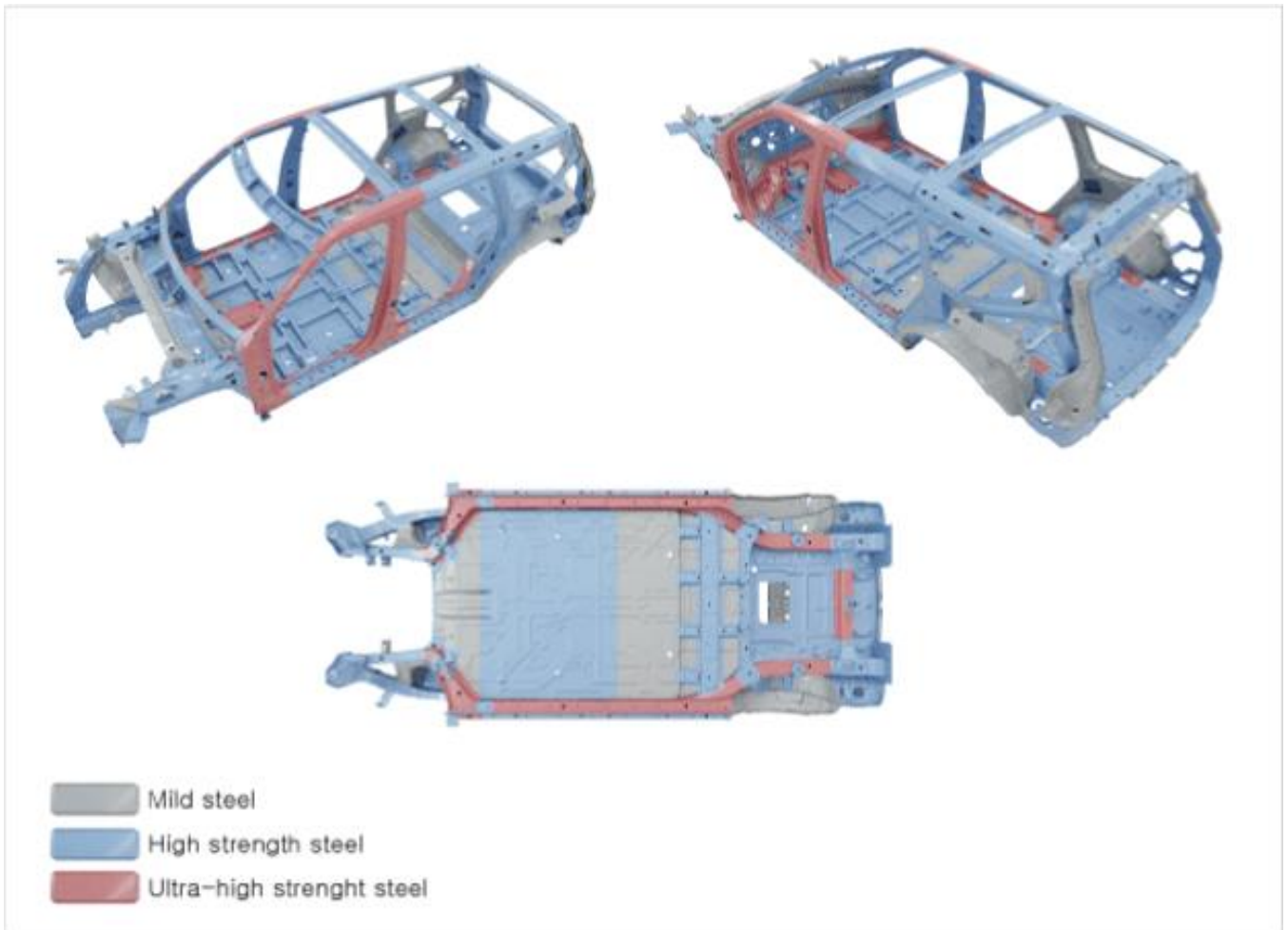


Pull



4.4 Location of Ultra-high Strength Steel

In these images, high strength steel is used in the areas colored in blue and ultra-high strength steel is used in the red colored areas. Depending on the tools used, ultra-high strength steel can be challenging or impossible to cut. If necessary, use a workaround technique.

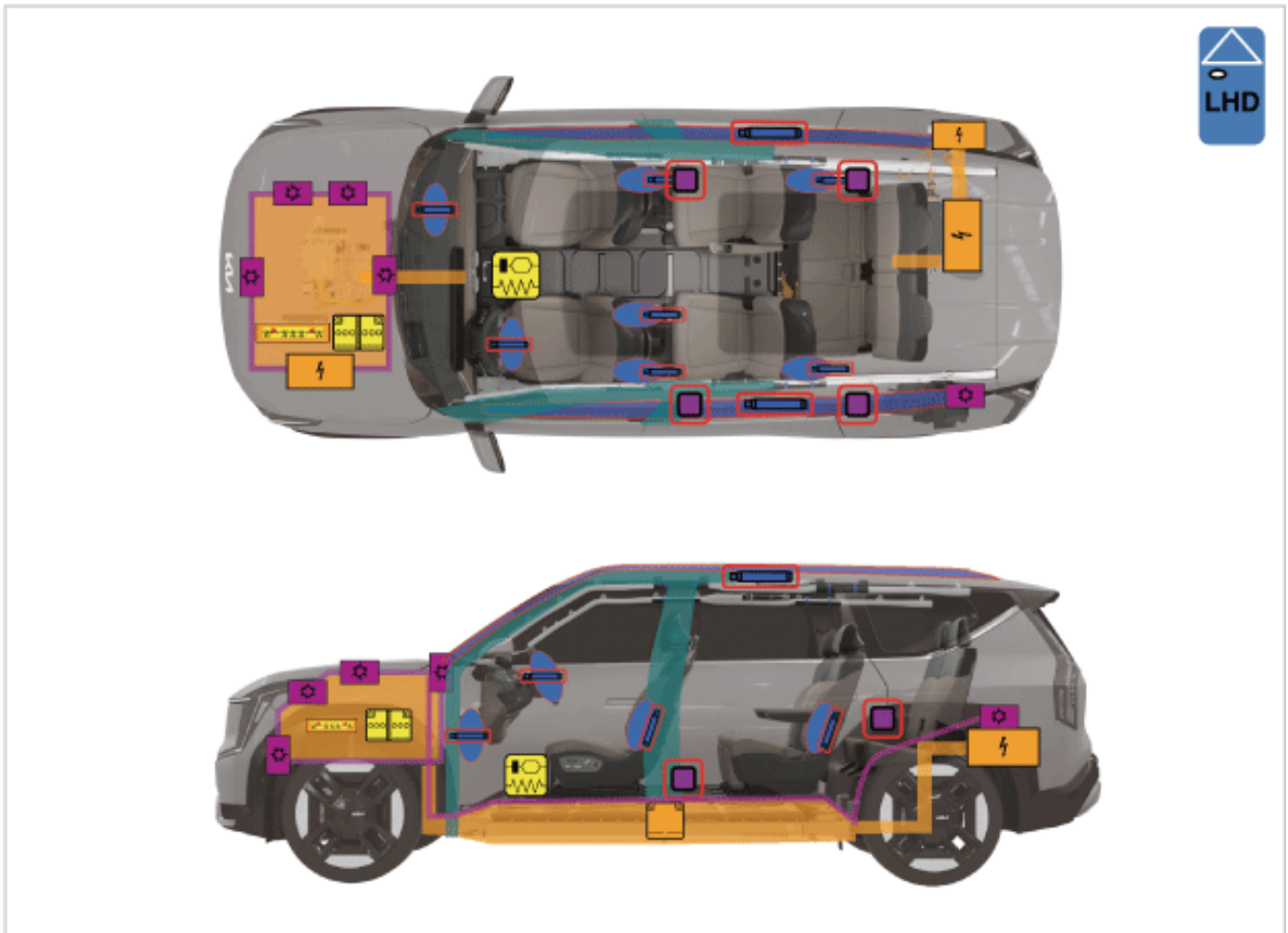
















4. ACCESS TO THE OCCUPANTS

4.5 Occupants Rescue Guide

When dealing with an emergency situation, refer to the components as below.
Do not cut the body near the airbag, high-voltage cable, high-voltage system.

4WD, long-range model, 6P



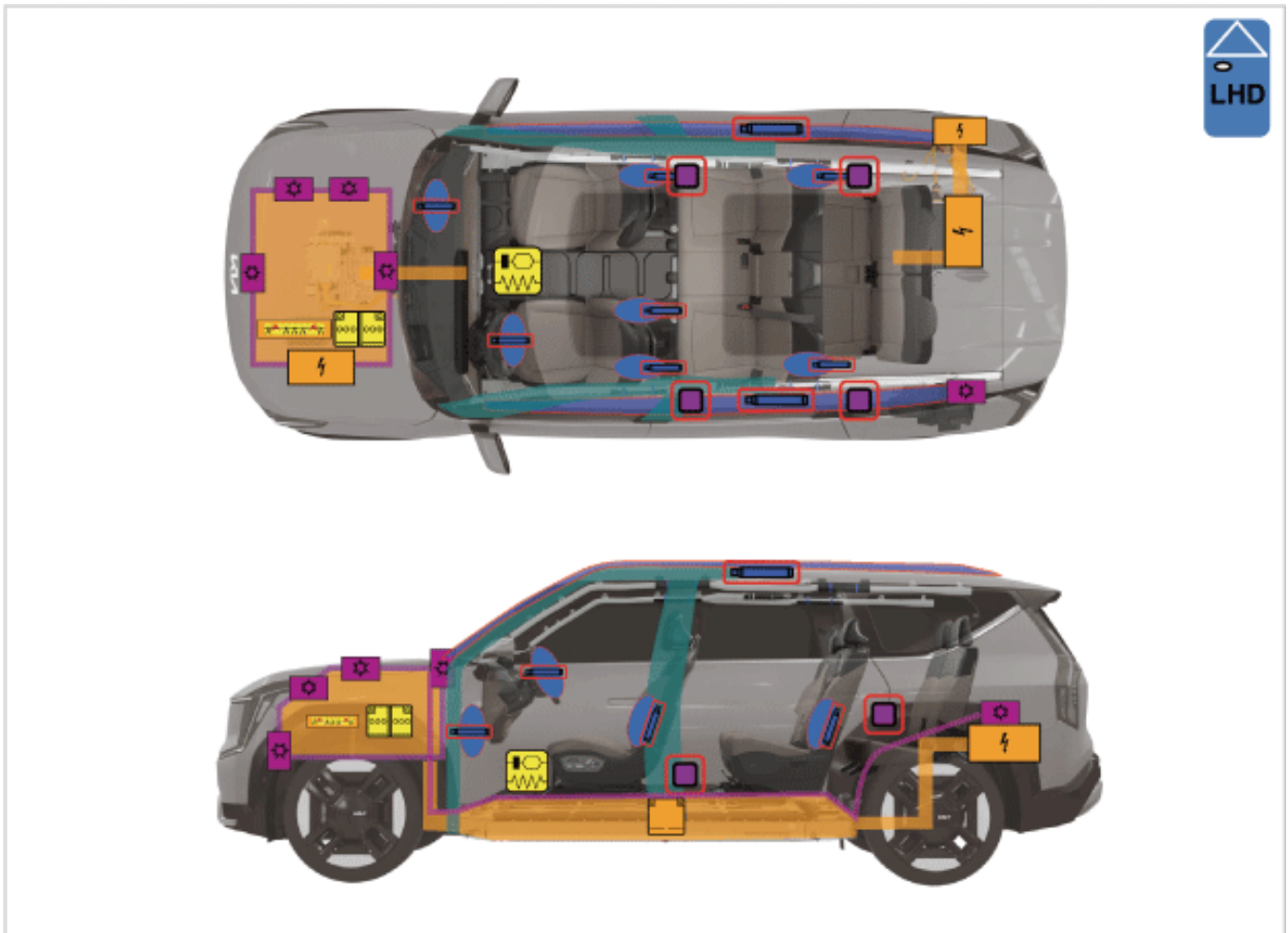
 Supplemental Restraint System Control Module (SRSCM)	 Airbag	 Airbag Inflator
 High-voltage cable	 Seat belt pretensioner	 Air-conditioning line
 High-voltage Battery	 12 V battery (-) connector	 Ultra-High Strength Steel
 12 V battery	 Air-conditioning component	 High-voltage component
 High-voltage charge port	 Cable Cut (with the service plug that can disable the high-voltage system)	















4. ACCESS TO THE OCCUPANTS

4.6 Occupants Rescue Guide

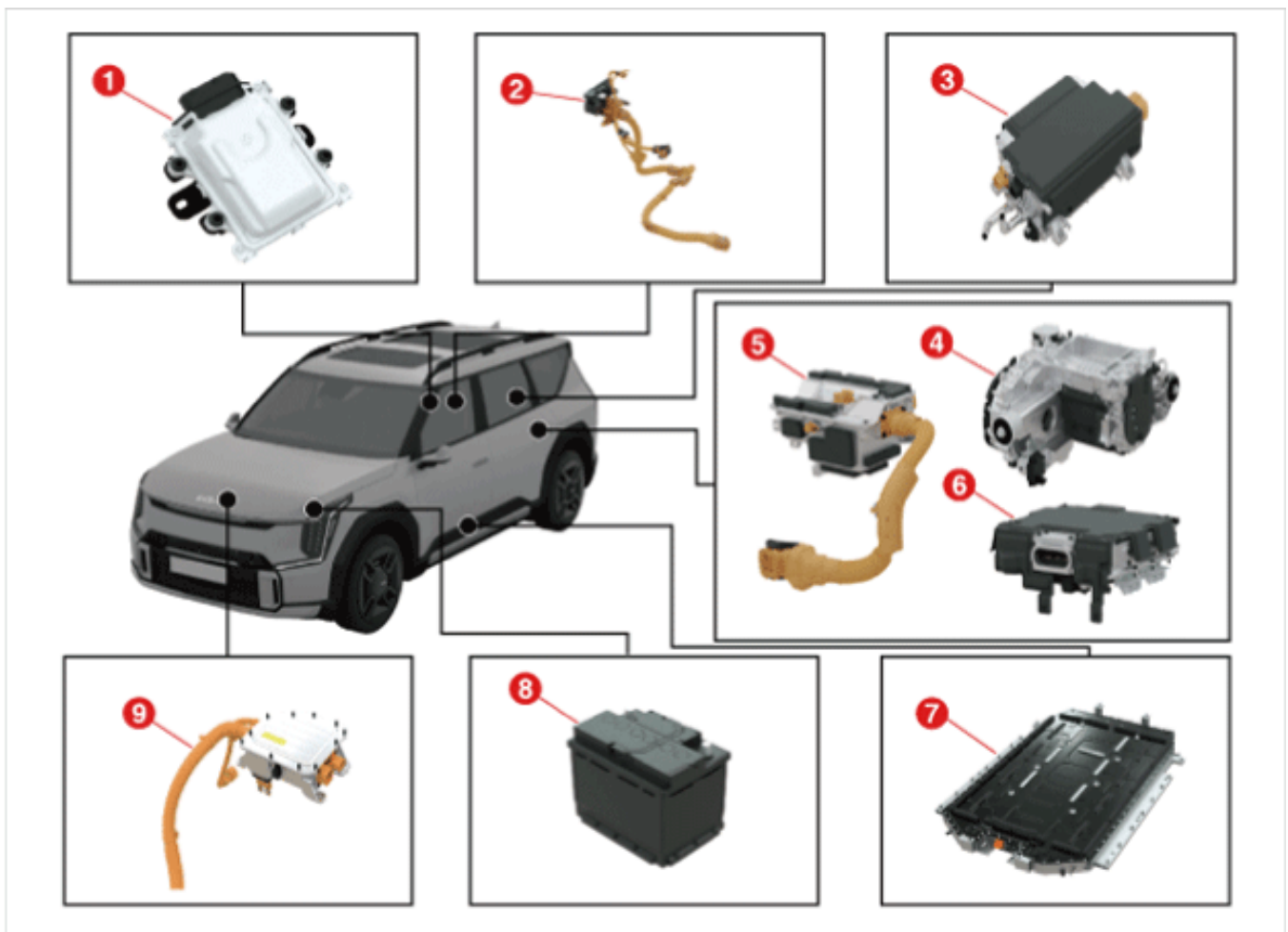
When dealing with an emergency situation, refer to the components as below.
Do not cut the body near the airbag, high-voltage cable, high-voltage system.

4WD, long-range model, 7P



 Supplemental Restraint System Control Module (SRSCM)	 Airbag	 Airbag Inflator
 High-voltage cable	 Seat belt pretensioner	 Air-conditioning line
 High-voltage Battery	 12 V battery (-) connector	 Ultra-High Strength Steel
 12 V battery	 Air-conditioning component	 High-voltage component
 High-voltage charge port	 Cable Cut (with the service plug that can disable the high-voltage system)	

5.1 High-voltage System



1. Vehicle Charging Management System (VCMS)
2. Combo Charger Inlet Assembly
3. Integrated Charging Control Unit (ICCU)
4. Motor & Reduction Gear Assembly
5. Rear High Voltage Junction Box
6. Multi Inverter Assembly
7. Battery System Assembly (BSA)
8. 12 V Auxiliary Battery
9. Front High Voltage Junction Box

High-voltage Battery System

Standard

Capacity (kwh)	76.2
Rate Voltage (V)	636
Composition	174 cell (29 module)

Long-range

Capacity (kwh)	99.8
Rate Voltage (V)	552
Composition	152 cell (38 module)

5.2 High-voltage Orange Cabling

The high-voltage cabling is orange, per Society of Automotive Engineer standards. Cables run under the floor of the vehicle and connect the High-voltage Battery to the ICCU, Motor, Inverter, Junction box, A/C compressor and Voltage components located towards the front of the vehicle.

You can identify the vehicle as an electric vehicle with the presence of orange the hood, in the under-floor battery compartment, or HV cables under the car.

WARNING

High-voltage Cables

- Never cut or disconnect the high-voltage orange cabling and connectors without first disabling the HV system by removing the service interlock connector. (refer to page 7)
- Exposed cables or wires may be visible inside or outside the vehicle. Never touch the metal chassis wires, cables, connectors, or any electric components before disabling the system, and; or shorted to the vehicle chassis.

Failure to follow these instructions will lead to serious bodily injury or death by electrical shock.



6.1 Firefighting Operations

Strict precautions must be taken while conducting firefighting operations following Reasons:

- Lithium-ion batteries contain liquid electrolyte that can vent, ignite, and produce sparks when subjected to temperatures above 300°F (150°C).
- Vehicle may burn rapidly with a flare-burning effect.

Even after the high-voltage battery fire appears to have been extinguished, renewed or delayed fire can occur.

- Use a thermal imaging camera to ensure the high-voltage battery is completely cooled before leaving the incident.
- Always advise second responders that there is a risk of the battery re-igniting.
- In a fire, submersion or a collision that has compromised the high-voltage battery, always store it in an open area with no exposures within 50 feet (15m).

- A burning battery could release hydrogen fluoride, carbon monoxide, and carbon dioxide gasses. Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear. Even if the high-voltage battery pack is not directly involved in a vehicle fire, approach the vehicle very carefully.

NIOSH: National Institute of Occupational Safety & Health

MSHA: Mine Safety and Health Administration

6.2 Extinguishers

- Small fires that do not involve the high-voltage battery should be extinguished using an ABC fire extinguisher. (ex. Fire caused by wiring harnesses, electrical components, etc.)
- Do not attempt to extinguish fires that involve the high-voltage battery with small amounts of water as this can result in electrocution. Fires that involve the high-voltage battery should be extinguished using large amounts of water (Max 100,000 liter) to cool the high-voltage battery. Fire fighters should not hesitate to pour larger amounts of water on the vehicle in such scenarios. Make sure the battery is fully cooled to avoid fire re-ignition.

6.3 How to Deal with the Situation

When there is a fire:

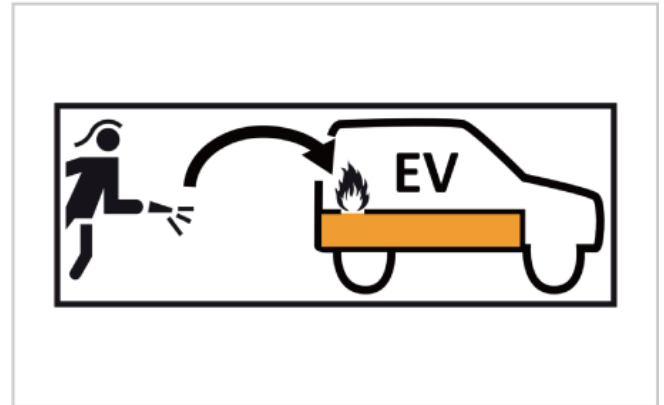
Extinguish the fire with a large amount of water. Don't use seawater or salt water. It can generate the toxic vapor or cause the re-ignition.

When damaged battery or fluid leak:

- Disconnect 12 V Battery (-) terminal
- Disable the high-voltage system
- Neutralize the battery by applying a large volume of water. (Note: this doesn't discharge the battery)
- Discharge battery

6.3.1 Vehicle Fire

- Use a large volume of water (max. 100,000 liter). Water must cool down the battery.
- Adding water to the high-voltage battery casing can enhance the battery's cooling process. However, it is crucial to avoid attempting to penetrate the HV battery or its casing in order to apply water.
- Introducing water into the high-voltage battery can be difficult due to the battery case.
- Introduce water into any openings that may have resulted from the accident or fire.



High-voltage battery

6.3.2 High-Voltage Battery Damage and Fluid Leaks

If electrolyte solution leakage, or any damage to the Lithium ion battery casing is observed, the first responders should attempt to neutralize the battery by applying a large volume of water to the battery pack while wearing appropriate Personal Protective Equipment (PPE). The neutralization process helps stabilize the thermal condition of the battery pack but does not discharge the battery.

- Do not put any smoke, spark, flame around the vehicle.
- Do not touch or step on the spilled electrolyte.
- If electrolyte leak occurs, wear appropriate solvent resistant PPE and use soil, sand, or a dry cloth to clean up the spilled electrolyte. Be sure to adequately ventilate the area.

 **WARNING**
Electrolyte Irritation

The high-voltage battery contains electrolyte solution. To avoid exposure to electrolyte solution and serious personal injury, always wear appropriate solvent resistant PPE (Personal Protective Equipment) and SCBA (Self-contained Breathing Apparatus).

- Electrolyte solution is an eye irritant – In the event of contact with eyes, rinse with plenty of water for 15 minutes.
- Electrolyte solution is a skin irritant. Therefore, in the event of contact with skin, wash off with a soap.
- Electrolyte liquid or fumes coming into contact with water will create vapors in the air from oxidization. These vapors may irritate skin and eyes. In the event of contact with vapors, rinse with plenty of water and consult a doctor immediately.
- Electrolyte fumes (when inhaled) can cause respiratory irritation and acute intoxication. Inhale fresh air and wash mouth with water. Consult a doctor immediately.

6.4 High-voltage Battery Re-ignition by Stranded Energy

Damaged cells in the high-voltage battery can experience thermal run away* and re-ignition.

To prevent re-ignition, the first responder and second responder need to be aware of the risk of stranded energy* which remains in the damaged cells and lead to re-ignition.

*Thermal runaway: The originating cause of thermal runaway is generally short circuiting inside a battery cell and a resulting increase in the cell's internal temperature.

Battery produces heat with thermal runaway and it can spread from one battery cell to many cells, in a domino effect.

*Stranded energy : Energy remains inside any undamaged battery cells after the accident. That stranded energy can cause a high-voltage battery to re-ignite multiple times after a fire has been extinguished.

How to Prevent Re-ignition (Mitigating Stranded Energy Risk)

1. 12 V battery (-) terminal disconnection (To depower battery management system)
2. High-voltage shut off (refer to page 7~9)
3. Discharging the high-voltage battery (refer to page 22)

7.1 Submerged or Partially Submerged Vehicles

Some emergency responses can involve a submerged vehicle. An EV9 that is submerged does not have high-voltage components on the vehicle's body or framework. It is safe to touch the vehicle's body or framework if there is no severe damage to the vehicle, whether it is in water or on land. In the event that the vehicle is submerged or partially submerged, remove the vehicle from the water before attempting to disable the vehicle. Drain the water from the vehicle. Use one of the methods described in page 7~9 to disable the vehicle. Then, discharge the battery by referring to page 22.

WARNING

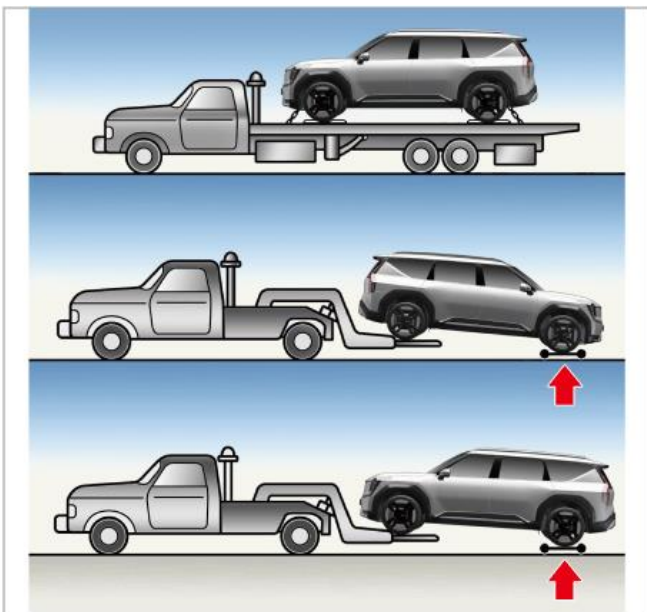
- If severe damage causes high-voltage components to become exposed, responders should take appropriate precautions and wear appropriate insulated personal protective equipment.
- Do not attempt to remove a service interlock connector while the vehicle is in water.

Failure to follow these instructions can lead to death or serious injury by electrocution.

8.1 Towing and Transportation

In the event of an accident, the high-voltage system must be disabled. The service interlock connector must be removed from the high-voltage battery according to one of the methods described in page 8-11 to disable the vehicle. Towing the EV9 vehicle is not different from towing a conventional All-Wheel Drive (AWD) vehicle.

If emergency towing is necessary, we recommend having it done by an authorized Kia dealer or a commercial tow-truck service. Proper lifting and towing procedures are necessary to prevent damage to the vehicle. The use of wheel dollies or flatbed is recommended.



WARNING

- Do not tow the vehicle with the rear wheels of 2WD and front/rear wheels of AWD on the ground as this may cause damage to the vehicle (the vehicle motor may generate electricity and the motor components may be damaged or a fire may occur.)

- Do not tow with sling-type equipment. Use wheel lift or flatbed equipment.



8.2 Storage of damaged vehicle with the damaged battery

- Drain fluids and water, then disconnect the negative (-) terminal of the 12 V battery before storing a damaged vehicle.
- In addition, remove the water inside the battery or vehicle, then remove the service interlock connector from the high-voltage battery before storing a damaged vehicle.
- Place the vehicle in an open space away from any structure, vehicle, or building.
- Then, monitor the vehicle until the discharging procedures are completed.
- If the battery can be removed from the vehicle by moving the vehicle on the lift, remove and discharge the battery. (refer to the next page)

- In the event that the battery cannot be taken out, establish a water pool and pour water until the entire battery is immersed.
Water pool condition : tap water or pond water that does not contain salt
- Maintain this water level for at least 90 hours.
- Then, put salt into the water pool to make 3.5 % salt water.
- Wait for additional 48 hours in salt water.
- Drain the water and dry it.
- If it is impossible to remove or discharge the battery from the vehicle or submerge the vehicle, put a waterproof cover on the vehicle. (prevention of rainwater)
- Even after the high-voltage battery fire appears to have been extinguished, renewed or delayed fire can occur.
- In a fire, submersion or a collision that has compromised the high-voltage battery, always store it in an open area with no exposures within 50 feet (15m).

WARNING

Battery discharging

- **DO NOT USE SALT WATER** for the first step.
- A large volume of flammable hydrogen gas can be generated in salt water due to electrolysis.
- After submerging the vehicle in pure water for at least 90 hours, put salt in the water pool.



Battery discharging in the water pool

8.3 Damaged Battery Storage

- To store the damaged battery safely, the battery must be discharged.
- If the battery can be removed from the vehicle, discharge the battery to prevent re-ignition.
- Discharge up to 1 volt per cell.
- Prepare water that does not contain salt such as tap water or pond water.
- Leave the battery in water for at least 90 hours
- Then, put salt in water to make 3.5% salt water.
- Wait for additional 48 hours in salt water.
- Take out the battery from the container and dry it.

WARNING

- Extinguish all smoke, spark, flame around the vehicle.
- Electrolyte solution is a skin irritant.
- Do not touch or step on the spilled electrolyte.
- If electrolyte leak occurs, wear appropriate solvent resistant PPE and use soil, sand, or a dry cloth to clean up the spilled electrolyte. Be sure to adequately ventilate the area.



9.1 Emergency Starting

Jump Starting

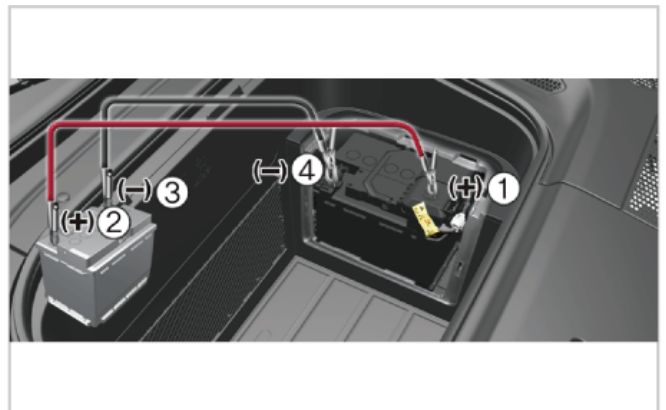
Do not attempt to jump start the high-voltage battery, as it cannot be jump started. In case of full discharge of the high-voltage battery, the vehicle must be towed as mentioned on the previous page. In case the 12 V auxiliary battery is discharged, connect a starting device to the jump terminal in the motor room. Refer to the “Emergency Starting” section of the Owner’s Manual for additional information. Connect jumper cables in the order shown in the image and disconnect in reverse order.

Jump Starting Procedure

Connect the jumper cables as shown.

- Positive (+) terminal of the flat battery (1) and the booster battery (2).
 - Negative (-) terminal of the flat battery (3) and the grounding point (4).
2. Start the vehicle with the booster battery for several minutes.
 3. Try to start the vehicle with the flat battery again.
 4. If the vehicle starts, disconnect the jumper cables as following:
 - Negative (-) terminal of the booster battery (3).
 - Positive (+) terminal of the booster battery (2).

- Flat battery (1), (4).
- If the vehicle still does not start, contact a professional workshop or seek other qualified assistance.
Kia recommends to call an authorized Kia dealer/service partner.

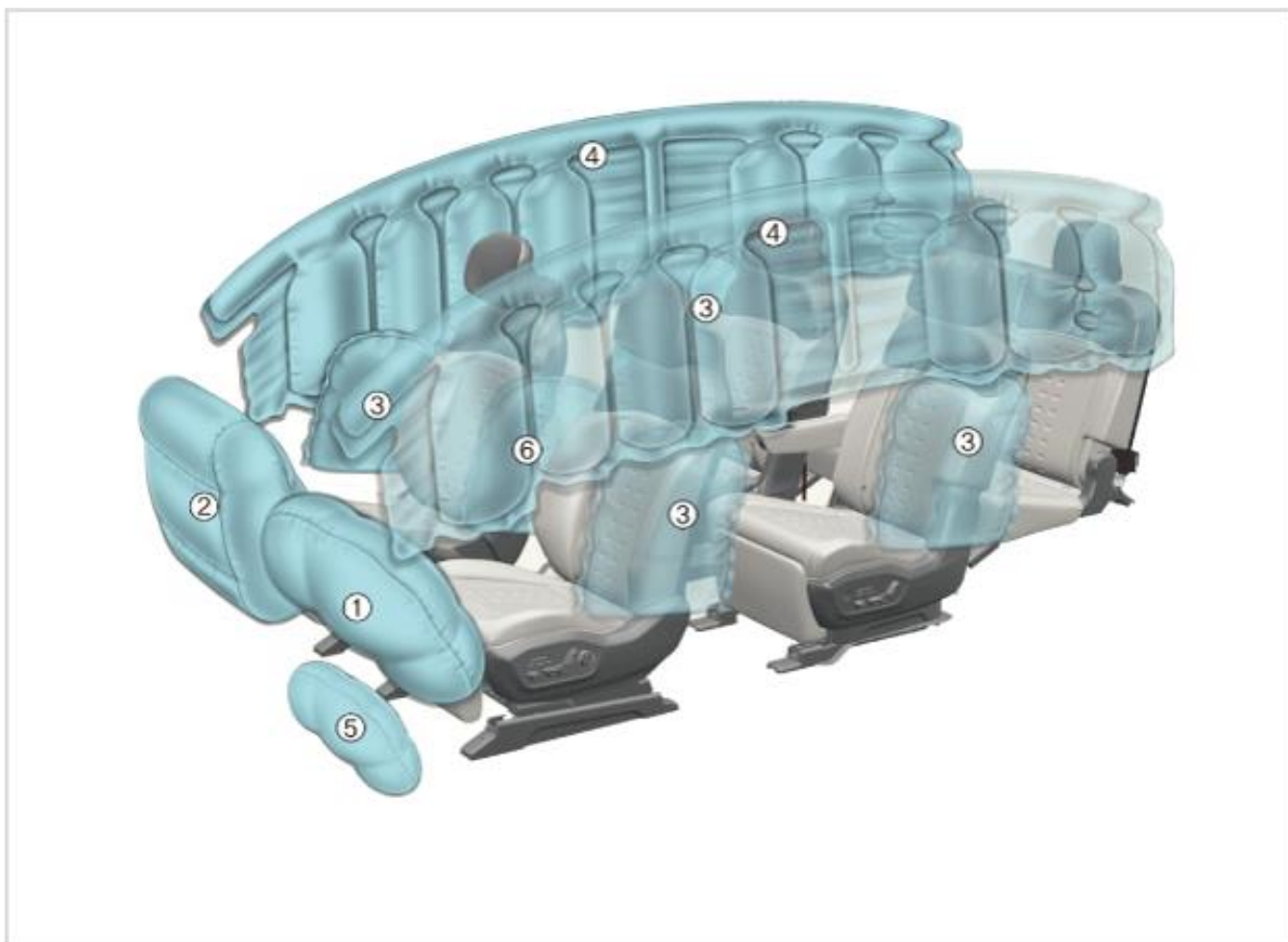


WARNING

Do not attempt to jump start the EV9 high-voltage battery.

Failure to follow these instructions will lead to serious bodily injury or death by electrical shock.

9.2 Airbag system (SRS : Supplemental Restraint System)



Airbag

Note that the actual airbags and seats in the vehicle may differ from the illustration.

Airbags are installed in the EV9, located in the areas shown in the image. Before performing any emergency procedure, make sure the vehicle ignition switch is turned off and disconnect the negative connector from the 12 V auxiliary battery (located in the left side motor compartment) to prevent accidental deployment of undeployed airbags.

1. Driver's front air bag
2. Passenger's front air bag
3. Side air bag
4. Curtain air bag
5. Driver's knee air bag (If equipped)
6. Front center side air bag

Seat Belt Pretensioner

In the EV9, the driver's and front passenger's seat belts, as well as the second row passengers' seat belts (except the center) are equipped with pretensioners. When the seat belt pretensioners are activated in a collision, a loud noise may be heard and fine dust, which may appear to be smoke, may be visible in the passenger compartment. These are normal operating conditions and are not hazardous. The seat belt pretensioner assembly mechanisms may become hot during activation, and may need several minutes to cool down after they have been activated.



WARNING

Undeployed airbags

To avoid injuries caused by accidental deployment of undeployed airbags.

- Make sure the vehicle ignition switch is turned off, the negative cable from the 12 V auxiliary battery (located in the left side of motor room) and wait 3 minutes or longer to allow the system to deactivate.

Failure to follow any of these instructions may result in serious injury or death from accidental deployment of the airbag system.

10. EXPLANATION OF PICTORGRAMS USED










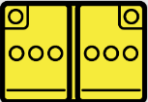







Figure	Meaning
	Electric vehicle
	High-voltage component
	Special battery access
	General warning sign
	Air-conditioning component
	Air-conditioning line
	Airbag inflator
	Airbag
	SRS control unit
	Battery, low-voltage
	Cable Cut (with the service plug that can disable the high-voltage system)
	High-voltage power cable
	Battery pack, high-voltage
	Seat belt pretensioner

Figure	Meaning
	Left hand drive
	Right hand drive
	High strength zone



Movement that inspires