Emergency Response Guide







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Initial Response: Identify, Immobilize and Disable

The following procedures should be used whenever you are dealing with a EV6 at an emergency scene. However, all operations should be consistent with your department's standard operating procedures, guidelines, and any applicable laws. When an EV 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.



The EV6 is an electric vehicle. Emergency responders should respond to emergency scenarios involving the EV6 accordingly, exercising extreme care and caution to avoid contact with the high voltage system within the vehicle.





1.1 Identifying a EV6

"EV6" Car name emblem on Tailgate

- The EV6 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 utilize additional methods of identification before determining that the vehicle is not a electric car.



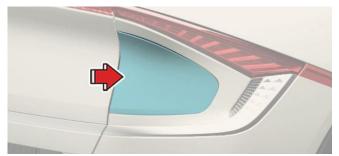
Charging Port

The charging port is located on the rear right side.

#Note: The doors must be un-locked 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.









1.1 Identifying a EV6

VIN Label

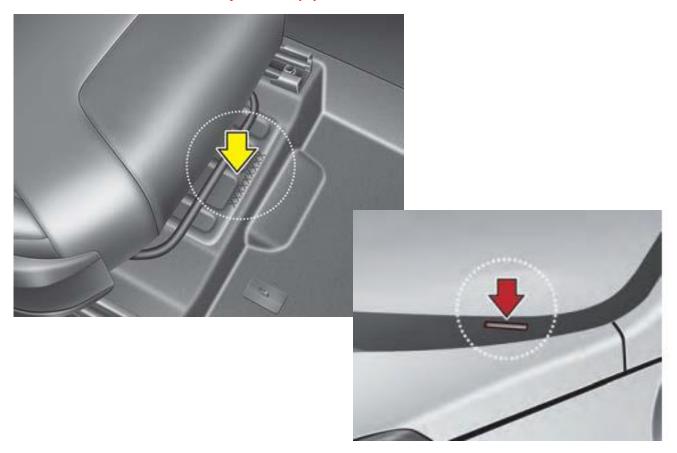
The VIN (Vehicle Identification Number) identifies an electric car with a "C" displayed in the 4th position, as shown in the below picture.

The VIN can be found:

- 1) VIN Plate also can be seen through the windshield from outside.
- 2) On the vehicle certification label attached to the driver's side (or passenger) center pillar.
- 3) Underneath the front passenger seat (or driver seat).



4th position (C)







1.1 Identifying a EV6

EV6 Cluster Instrument Panel

The EV6 Cluster Instrument Panel displays EV specific features such as high voltage battery SOC (State of Charge) as below.

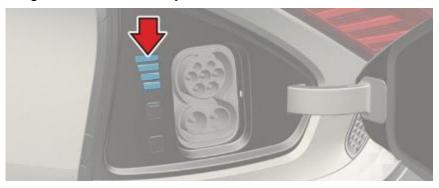


- 1. Speedometer
- 2. Distance to empty
- 3. Power/Charge gauge
- 4. Battery SOC (State of Charge)
- 5. LCD display

- 6. Warning and indicator lights
- 7. Reduction gear shift indicator
- Odometer
- 9. Regenerative braking level indicator
- 10. Electric energy economy

Charge Status Indicator

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



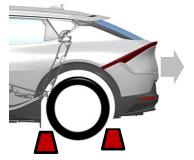




2. Immobilization / Stabilization / Lifting

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 EV6 is damaged in a crash, the vehicle may appear to be shut off, even when it actually is not, due to a lack of 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.



Chock the wheels



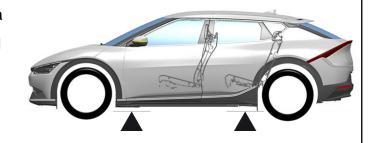
Put the vehicle in P (Park) position by pressing the 'P' button on the rotary shifter



Set the Electronic Parking
Brake (EPB)

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.



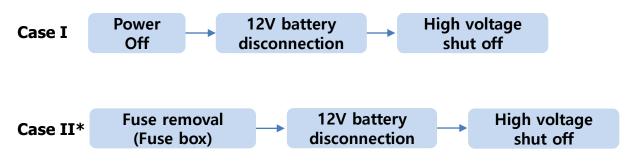


- When installing a block or jack, avoid high voltage cable, high voltage battery.
- If high voltage components or cables are exposed, do not place any support on them.





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.



^{*}In case of emergency

3.1 Disabling the System – Smart Key System and "POWER"

START/STOP Button

- Confirm the status of the READY light on the instrument panel. If the READY READY light is illuminated, the vehicle is ON.
 - a) If the READY light is NOT illuminated, the vehicle is off. Do not push the "POWER" START/STOP button because the vehicle may start (go into READY mode).



"POWER" START/STOP Button

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



Without depressing the brake pedal

Pressing POWER button	Vehicle condition	
One time	Electrical accessories are operational.	
Two times	The warning lights can be checked before the vehicle is started.	
Three times	Off	

While depressing the brake pedal

Pressing POWER button	Vehicle condition	
One time	Ready to drive	

- 2. If necessary, lower the windows, unlock the doors and open the tail gate as required, before disconnecting the 12V battery. Once the 12V battery is disconnected, power controls will not operate.
- 3. Before disconnecting the 12V battery, turn OFF ignition and remove the smart key at least 2 meters away from the vehicle to prevent accidental restart.
- 4. Open the hood and front trunk (A).

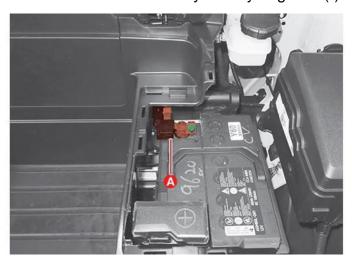


5. Open the 12V battery service cover (A).

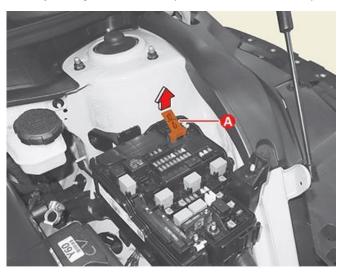




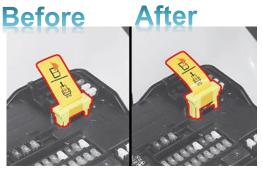
6. Disconnect the 12 auxiliary battery negative (-) terminal.



7. Pull up the yellow lever (interlock connector) to cut off the high voltage.







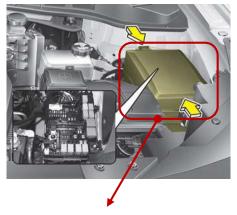
*The yellow lever doesn't get pulled out completely.



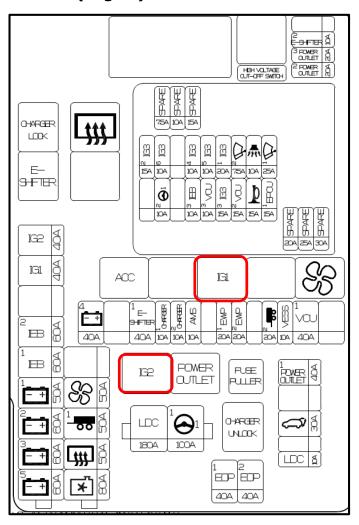


3.2 Disabling the System – IG (Ignition) Fuse Removal

- 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 12V battery (located in the left side of PE(Motor) room). Once the 12V battery is disconnected, power controls will not operate.
- 4. In the event the vehicle is unable to be disabled using the "Power" START/STOP Button, using the fuse puller located in the PE(Motor) room fuse box, pull both the IG1, IG2 fuse from the PE(Motor) room fuse box. If the IG fuses cannot be located, pull out all of the fuses and relays in the fuse box.



PE(Engine) room fuse box





5. Disconnect the 12V battery and disable the high voltage battery by referring to page 9, 10.

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.



- 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.

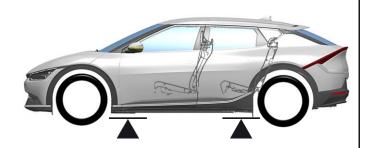


4.1 Extraction Operations

The EV6 is an electric vehicle. Because of the high voltage components contained therein, 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 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.



4.3 Extraction Tools and Procedure

When responding to an incident involving the EV6, 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.

4.4 Door open

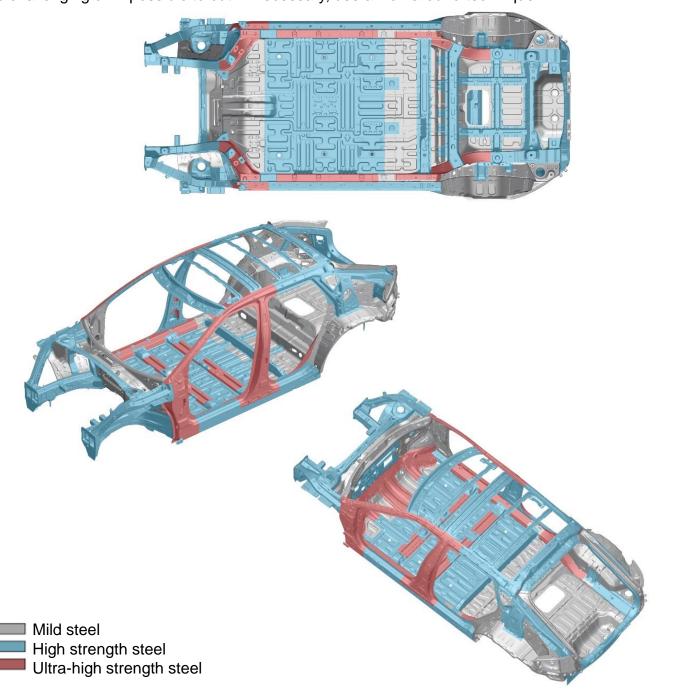
When the door outer handle doesn't pop-up, push the front side inwards.





4.5 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.





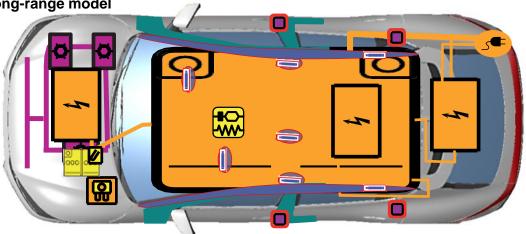
4.6 Occupants Rescue Guide

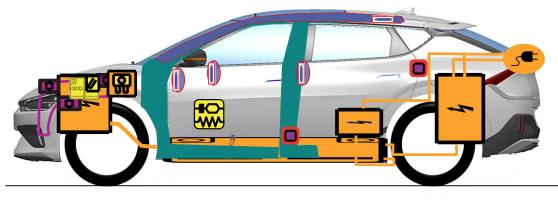
When dealing with an emergency situation, refer to the components as below.

Do not cut the body near the airbag, high voltage cable, fuel system.









Supplemental Restraint System Control Module (SRSCM)	Airbag	Airbag Inflator
High voltage cable	Seat belt pretentioner	Air-conditioning line
High Voltage Battery	12V battery (-) connector	Ultra-High Strength Steel
12V battery	Air-conditioning component	High voltage c omponent
High voltage charge p ort	Fuse box (with the service p can disable the high voltage	



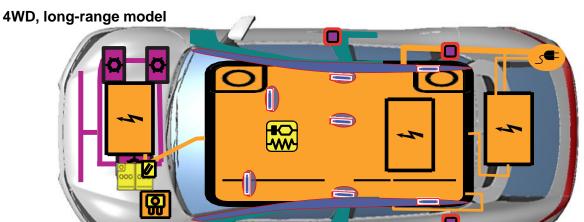


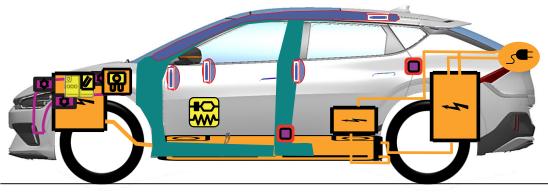
4.6 Occupants Rescue Guide

When dealing with an emergency situation, refer to the components as below.

Do not cut the body near the airbag, high voltage cable, fuel system.



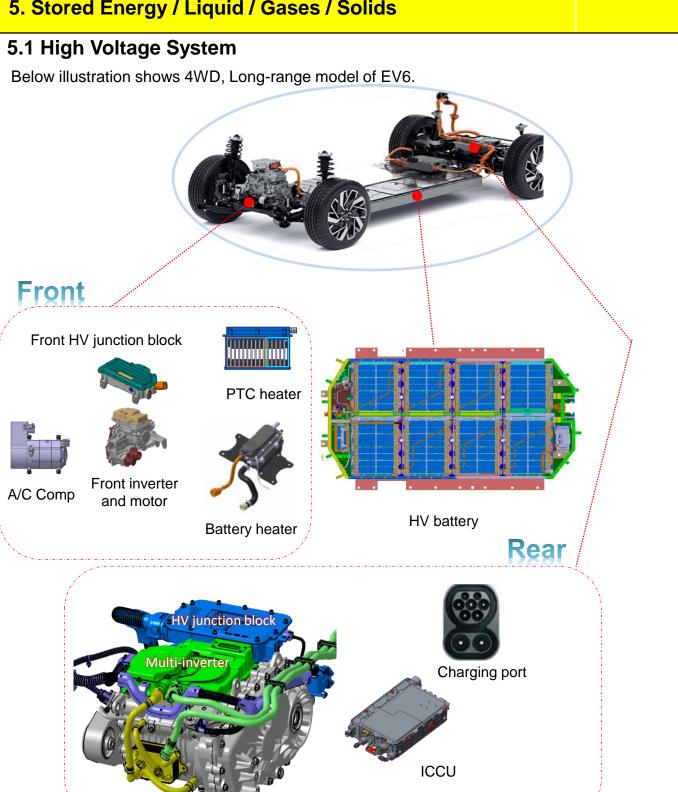




Supplemental Restraint System Control Module (SRSCM)	Airbag	Airbag Inflator
High voltage cable	Seat belt pretentioner	Air-conditioning line
High Voltage Battery	12V battery (-) connector	Ultra-High Strength Steel
12V battery	Air-conditioning component	High voltage c omponent
High voltage charge p ort	Fuse box (with the service possible the high voltage	









Rear motor



5.1 High Voltage System

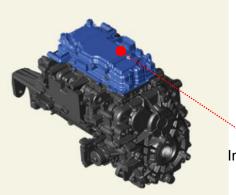
ICCU

The ICCU, located under the 2nd-row seats, incorporates an On-Board Charger (OBC) and Low Voltage DC-DC Converter (LDC).

- OBC: HV battery charging equipment that converts external AC to DC, to charge the high voltage battery.
- LDC: High voltage of battery is converted low voltage (DC 12V) through the LDC for supplying power to electrical components.



- Front (4WD only): Inverter converts the DC voltage to an AC voltage to control the motor.
- Rear (Multi-Inverter): The multi-inverter is an advanced charging system designed to allow flexible charging with multiple voltage sources of 400 V and 800 V. In a 400 V charging infrastructure, it boosts the voltage to 800 V via the motor and inverter and then uses the boosted voltage to charge the 800 V battery. In a 800 V charging infrastructure, it uses the high voltage sent from the charger to charge the battery.



Multi-Inverter (Rear)

Inverter (Front)





There is the capacitor inside the inverter. Wait 5+ minutes for the capacitor to discharge after removing the service plug.





5.1 High Voltage System

High Voltage Battery

The HV lithium-ion polymer battery supplies and stores electric energy. It is located under the EV6 chassis.

12V Auxiliary Battery

The 12V auxiliary battery powers all of the vehicle's standard electronics like a radio, lights, door locks, power windows, etc. Also, it powers the VCU(Vehicle Control Unit), VCMS (Vehicle Charging Management System) which controls the high voltage current and vehicle.





*** Specification**

Motor		Туре	Interior Permanent Magnet Synchronous Motor (IPMSM)
		Max. Output (kW)	Front: 70 / Rear: 160
		Max Torque (Nm)	Front: 255 / Rear: 350
Inverter (Front/Rear)		Input Voltage(V)	452.5~778.3
ICCU LDC	Max. Output(kW)	10.9	
	Output Voltage(V)	DC 360~826	
	LDC	Max. Output (kW)	1.8
	LDC	Input Voltage(V)	DC 360~826
High Voltage Battery		Туре	Lithium-ion polymer
		Rated Voltage (V)	Long-range: 697 / Economy: 523
		Energy (kWh)	Long-range: 77.4 / Economy: 58.0
		Quantity for Pack (Number of Modules)	Long-range: 32 / Economy: 24



5.2 High Voltage Orange Cabling

The high voltage cabling is orange, per Society of Automotive Engineers (SAE) 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 other high voltage components located towards the front of the vehicle.

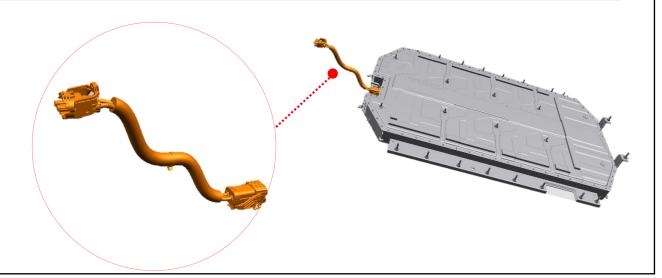
You can identify the vehicle as an electric vehicle with the presence of orangecables under the hood, in the under-floor battery compartment, or HV cables under the car,



WARNING | High Voltage Cables

- Never cut or disconnect the high voltage orange cabling and connectors without disabling the HV system by removing the safety plug (refer to page 8 to 10).
- Exposed HV 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 electrical shock.







6.1 Firefighting Operations

Strict precautions must be taken while firefighting due to following reasons:

- Lithium-ion Polymer batteries contain gel electrolyte which can explode, ignite, and make sparks when subject to temperatures above 300°F.
- 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-ignition.
- 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.
- 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.

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

Fire

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

Damaged battery or Fluid leak*

Disconnect 12V Battery (-) terminal, Disable the high voltage system, Neutralize the battery by applying a large volume of water. (Process will not discharge the battery.)

Battery discharging

*To be used if electrolyte solution leakage or damage to the high voltage battery casing is observed. Check battery pack temperature with thermal imaging camera.

6.3.1 Vehicle Fire

- Use a large volume of water (max. 100,000 liter). Water must cool down the battery.
- If water is applied directly onto the high voltage battery module inside the casing, it will better cool the battery. (But, never attempt to penetrate the HV battery or its casing to apply water.)



- Putting water into the high voltage battery can be difficult due to the battery case.
- Put water through the hole that might be made due to the accident or fire.





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 help 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.



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 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 runaway* and reignition.

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

*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. Stranded energy can cause a high voltage battery to reignite multiple times after a fire has been extinguished.

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

- 1. 12V battery (-) terminal disconnection (To depower battery management system)
- 2. High voltage shut off
 - *refer to page 8-10
- 3. Discharging the high voltage battery
 - *refer to page 27-28



7. In Case of Submersion.

7.1 Submerged or Partially Submerged Vehicles

Some emergency responses can involve a submerged vehicle. The EV6 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 8-12 to disable the vehicle.

⚠ 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 safety plug while the vehicle is in water.

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



8. Towing / Transportation / Storage

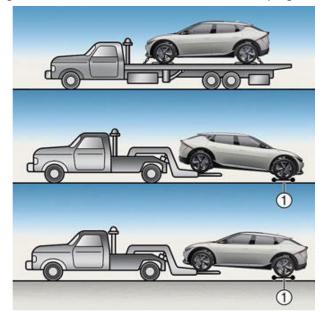
8.1 Towing and Transportation

In the event of an accident, the high voltage system must be disabled. The safety plug must be removed from the high voltage battery according to one of the methods described in page

8-12 to disable the vehicle.

Tow the EV6 vehicle with a flatbed equipment with all wheels off the ground.

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 (1) or flatbed is





recommended.

- Do not tow the vehicle forwards with the rear wheels on the ground as this may cause damage to the vehicle.
- Do not tow with sling-type equipment.
 Use wheel lift or flatbed equipment.
- The 4WD vehicle should never be towed with the wheels on the ground. This can cause serious damage to the vehicle or the 4WD system.







8. Towing / Transportation / Storage

8.2 Storage of Damaged Vehicle with the Damaged Battery (Discharge)

- Drain fluids and water, then disconnect the negative (-) terminal of the 12 V battery.
- In addition, remove the water used for the extinguisher inside the battery or vehicle, then remove the service plug 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, keep an eye on 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)
- If the battery can't be removed, create water pool and pour water until the entire battery is submerged.
 - # 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 by removing the BMU service cover.



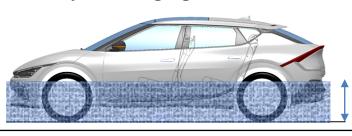
↑ WARNING | Battery Discharging

- 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.

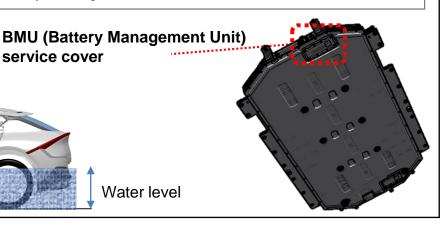
service cover

Do this procedure if there is a possibility of re-ignition.

Battery discharging



Water level







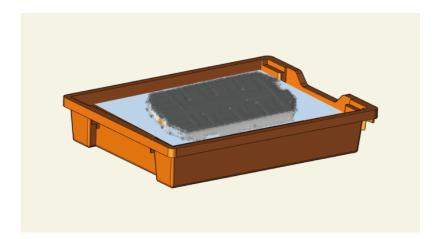
8. Towing / Transportation / Storage

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.



- 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.
- · 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.





9. Important Additional Information

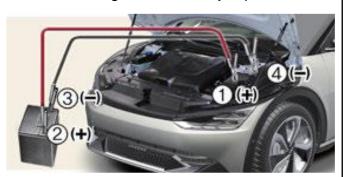
9.1 Emergency Starting

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 12V auxiliary battery is discharged, connect a starting device to the jump terminal

in the motor room as you would any 12V battery (see image). 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.





Do not attempt to jump start the EV6 high voltage battery.

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

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).

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.





9. Important Additional Information

9.2 Airbag system (SRS : Supplemental Restraint System)

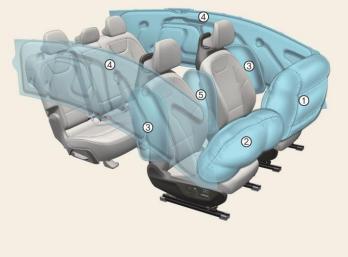
Airbag

Seven (7) airbags are installed in the EV6, located in the areas shown in the image below. Before performing any emergency procedure, make sure the vehicle ignition switch is turned off and disconnect the negative connector from the 12V auxiliary battery (located in the left side motor compartment) to prevent accidental deployment of undeployed airbags.





- (1) Passenger's front air bag
- (2) Driver's front air bag
- (3) Side air bag
- (4) Curtain air bag
- (5) Front center side air bag





- (1) Passenger's front air bag
- (2) Driver's front air bag
- (3) Side air bag
- (4) Curtain air bag
- (5) Front center side air bag

* The actual air bags and seats in the vehicle may differ from the illustration.





9. Important Additional Information

Seat Belt Pretensioner

In the EV6, the driver's, front passenger's and rear seat belts 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.







To avoid injuries caused by accidental deployment of undeployed airbags

- Do not cut the red colored part shown in the image above.
- Make sure the vehicle ignition switch is turned off, disconnect the negative cable from the 12V 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.