HYUNDAI

KONA Electric

Emergency Response Guide

Contents

Introduction

Document Purpose

The purpose of this document is to familiarize emergency responders and the towing/roadside assistance industry with the proper methods to handle the Hyundai KONA Electric in an emergency situation. This guide offers a basic overview of key vehicle systems and provides instructions for dealing with the different types of situations encountered by emergency responders. The emergency response procedures for this vehicle are somewhat similar to a conventional vehicle with additional information provided on dealing with the high-voltage electrical system.

Vehicle Description

An electric vehicle is driven using a battery and an electric motor. While general vehicles use an internal combustion engine and gasoline as fuel, electric vehicles use electrical energy that is charged inside the high voltage battery. As a result, electric vehicles are eco-friendly in that they do not require fuel and do not emit exhaust gases.

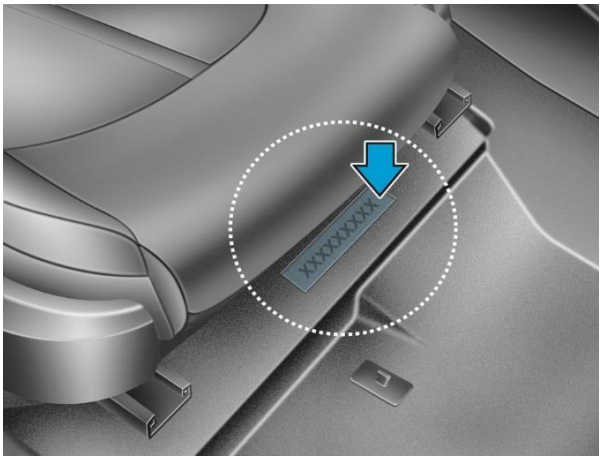
When decelerating or driving downhill, regenerative braking is utilized to charge the high voltage battery. This minimizes energy loss and increases the range of the vehicle.

When the battery charge is not sufficient, normal charge, quick charge and trickle charge are available.

VIN number

The Vehicle Identification Number (VIN) as shown in the below drawing is punched on the floor under the passenger seat. The letter "G/H" in the 8th character of the VIN indicates that it is an electric vehicle

XXXXXXXG/HXXXXXX



Motor Compartment and underside

The KONA Electric has a plastic power electric cover with "EV" clearly shown on it.

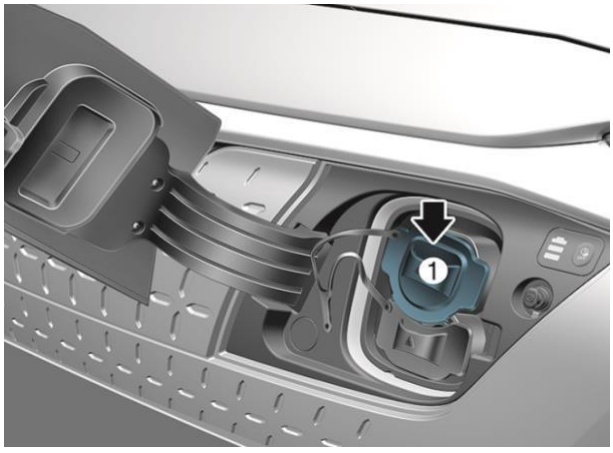
Additionally, there are orange colored high-voltage electrical cables in the motor compartment and underside. This cable runs from the center of the vehicle to the motor compartment.

Charging Port

The Charging Port is located on the front bumper covered by the charging port cap and it has one port for AC normal, fast and trickle charging.

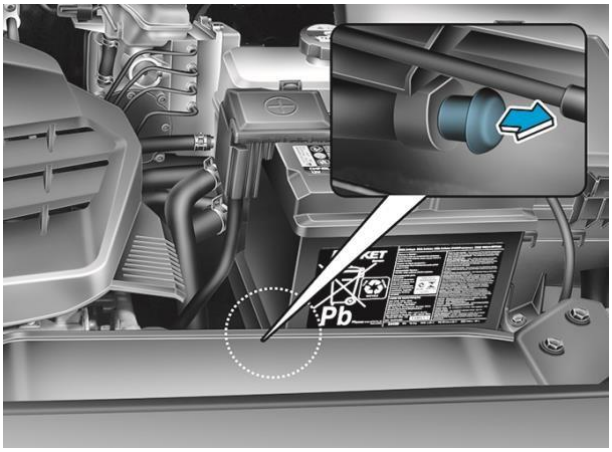
How to open the charging port

1. Depress the brake pedal and apply the parking brake.
2. Turn OFF all switches, shift to P (Park), and turn OFF the vehicle.
3. Push the charging door where the icon is located to open. The charging door opens only when the door is unlocked.



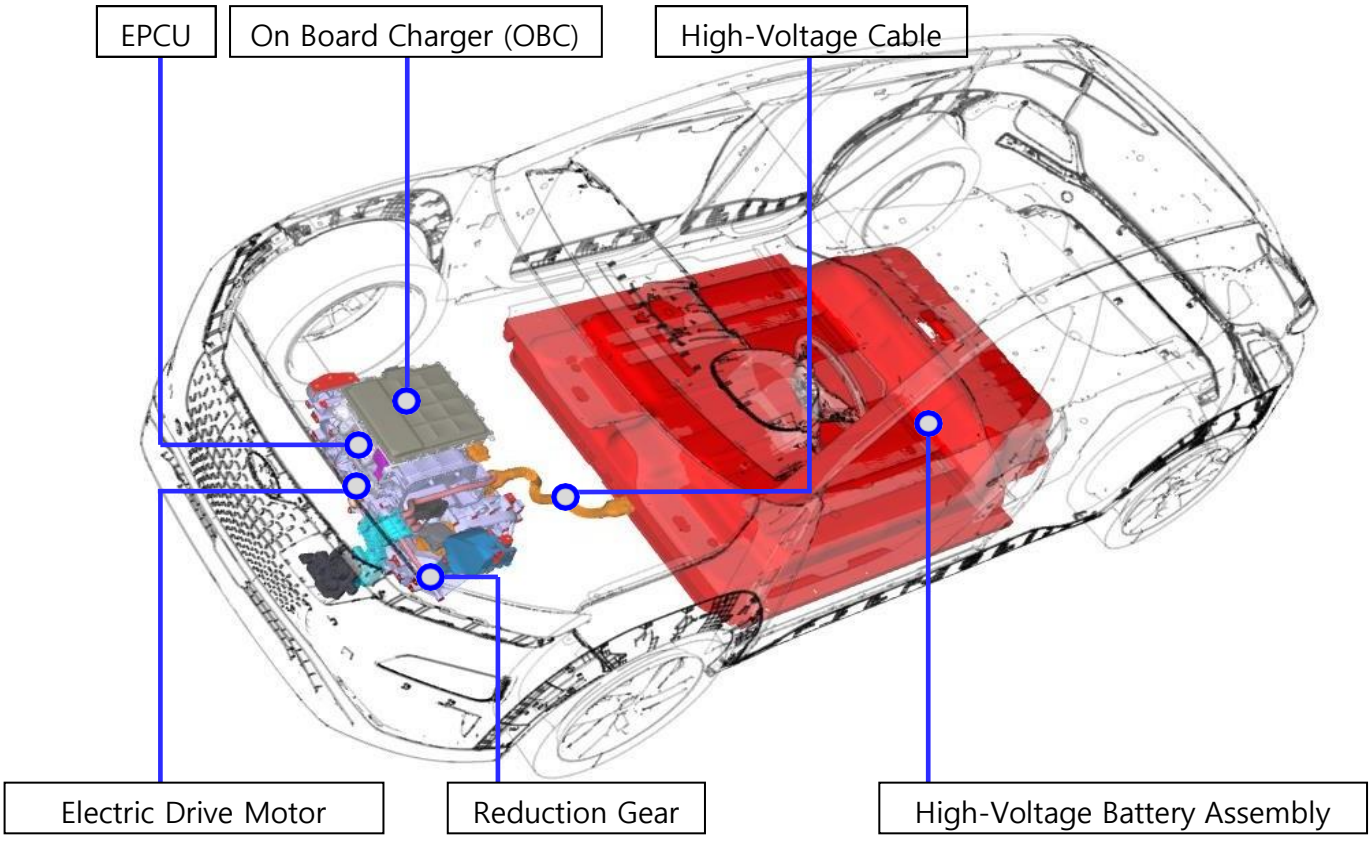
4. Remove the charging inlet cover (1).

Unlock Charging Connector in Emergency



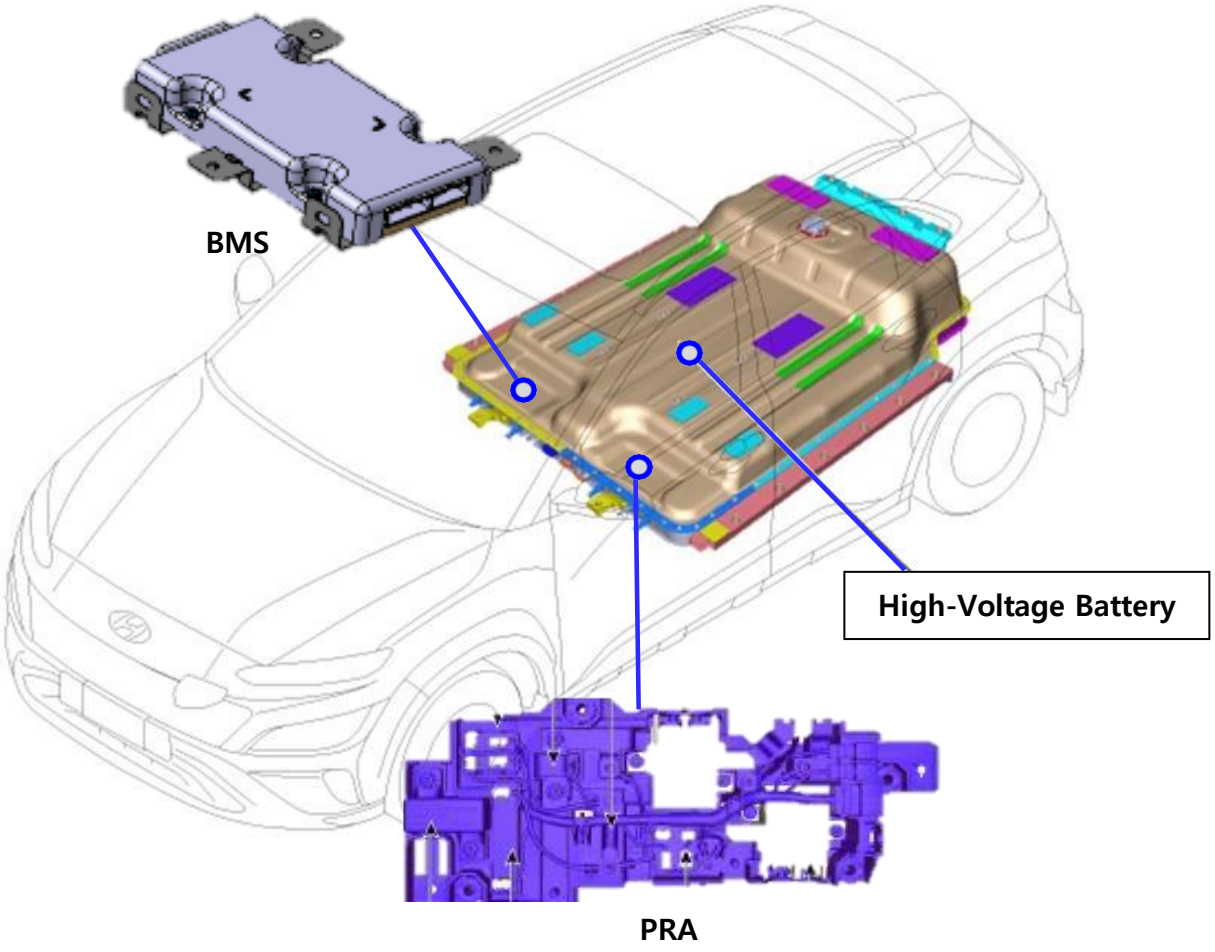
If the charging connector does not disconnect due to battery discharge and failure of the electric wires, open the hood and slightly pull the emergency cable. The charging connector will then disconnect.

Vehicle Components Location



OBC	On-Board Charger: Battery charging equipment (AC→DC)
EPCU	Electric Power Control Unit (Inverter + LDC + VCU)
Motor	When current flows through the coil, it generates a rotating magnetic field and generates motor torque.
Reduction Gear	Increases Motor Torque and increased Torque is transferred to the wheels.
High voltage battery	Supplies electric energy to traction motor and stores generated electric energy.
High-Voltage Cable	High-Voltage Cable is orange per the SAE standard.

Vehicle Components



High-Voltage (HV) Battery

The High-Voltage battery is located at the underside of vehicle.

BMS (Battery Management System)

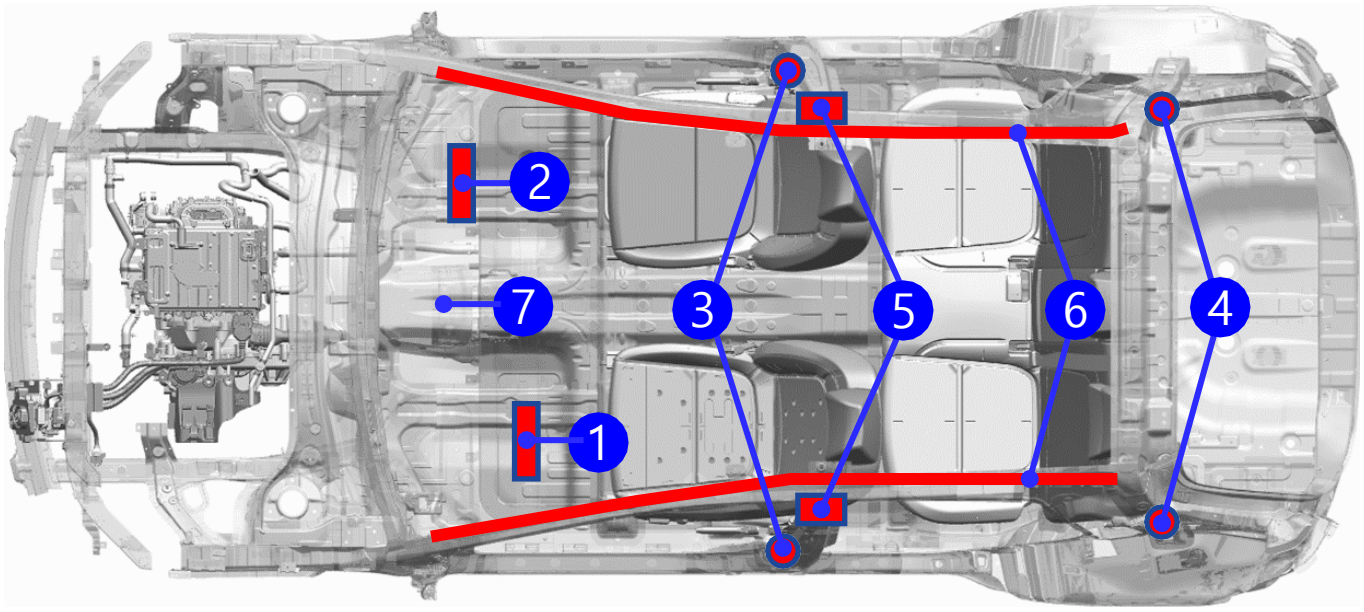
The BMS is located inside the High-Voltage Battery assembly and measures several parameters to maintain the optimal performance of the High-Voltage Battery.

In addition, if a system fault occurs, the BMS turns off the PRA to protect the system.

PRA (Power Relay Assembly)

The PRA is located inside the High-Voltage Battery Pack Assembly and controls the high-voltage power circuit between the High-Voltage Battery and the Hybrid Power Control Unit.

Airbag system (SRS : Supplemental Restraint System)



1. Driver's front airbag
2. Passenger's front airbag
3. Front Seat Belt Pretensioner (FBPT)
4. Rear Seat Belt Pretensioner (RBPT)
5. Side Airbag (Driver, Passenger side)
6. Curtain Airbag (Driver, Passenger side)
7. Supplemental Restraint System Control Module (SRSCM)

⚠ WARNING

- Do not cut through any component.
- SRS components may remain powered and active for up to 3 minutes after the 12V electrical system is shut off or disabled. Disconnect the battery negative cable and wait for at least 3 minutes before beginning work.

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

Initial Response

The following procedures should be used whenever you are dealing with a KONA Electric at an emergency scene. All other operations should be consistent with your department's standard operating procedures or guides. Electric vehicles damaged by a crash may have compromised high voltage safety systems 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.

Identify

When dealing with a KONA at the scene of an accident, emergency responders should always assume that it is a electric model until it can be proven otherwise using the identification features outlined in this ERG. External badging will usually be the first clue but it can often be hidden by damage caused in a crash. Always be sure to inspect multiple sides of the vehicle as well as using the clues found under the hood and in the interior of the vehicle.

Immobilize

The next step is to immobilize the vehicle to prevent any accidental movement that can endanger the emergency response personnel and any crash victims. Since the KONA Electric doesn't have an engine, there will be instances where the vehicle appears to be off because of the absence of engine noise. When in its "ready" mode, the vehicle can move almost silently using the electric motor. Responders should approach the vehicle from the sides and stay away from the front or rear as they are both potential paths of travel. Instructions for immobilizing the vehicle are shown below.

Check the Wheels

Engage Parking Brake

Press park (P) position

Disable

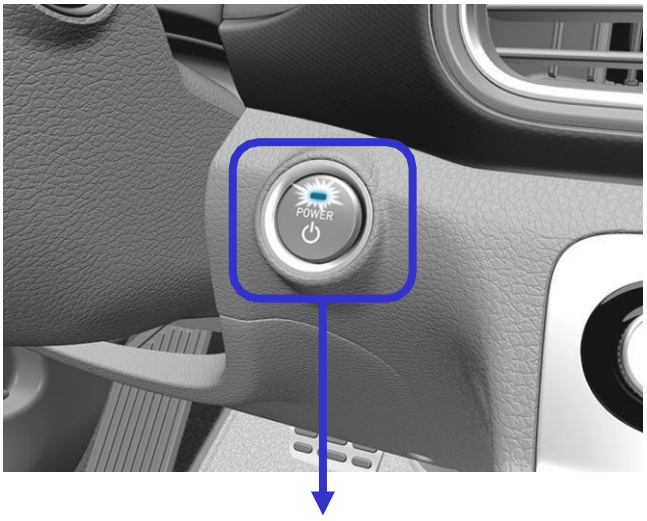
The final step in the initial response process, conducted after the vehicle is secured to prevent movement, is to disable the vehicle, its SRS components and the high voltage electrical system. To prevent current flow through the system, use one of the following procedures to disable the vehicle.

Ⅰ. Disabling the system – Smart Key System and "POWER" START/STOP BUTTON

1. Check 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 "POWER" START/STOP button because the vehicle may restart.

   b) To turn off the system, put the shift lever in the P (Park) position and press the POWER button beside the shift lever.



"POWER" START/STOP Button

Without depressing the brake pedal

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

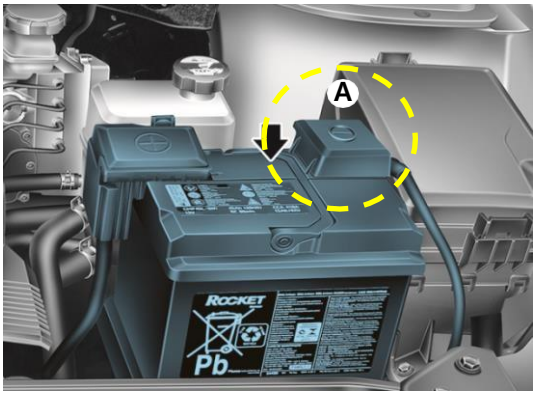
Depressing the brake pedal while a shift lever is in the P (Park) position

Pressing POWER button	Button Position	Vehicle condition
	OFF	Off
One time	-	Ready to drive

2. Before disconnecting the 12V battery, move the smart key at least 2 meters away from the vehicle to prevent accidental restart.

Smart Key

3. Disconnect the negative (-) 12V battery cable (A), located in the motor compartment, to further prevent the risk of accidental restart.

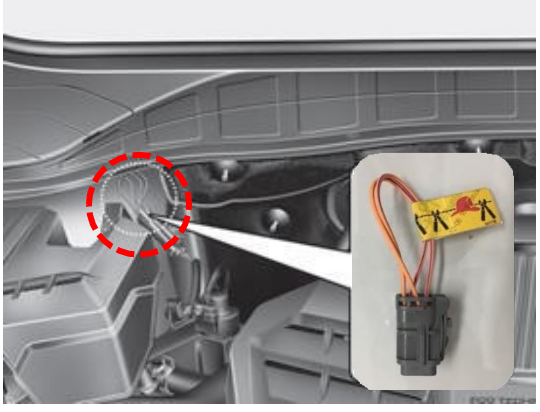


NOTICE

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

4. Use the following procedure to isolate the high voltage of the battery.

4-1 Remove the Service Interlock Connector located in the motor compartment.



Service Interlock Connector

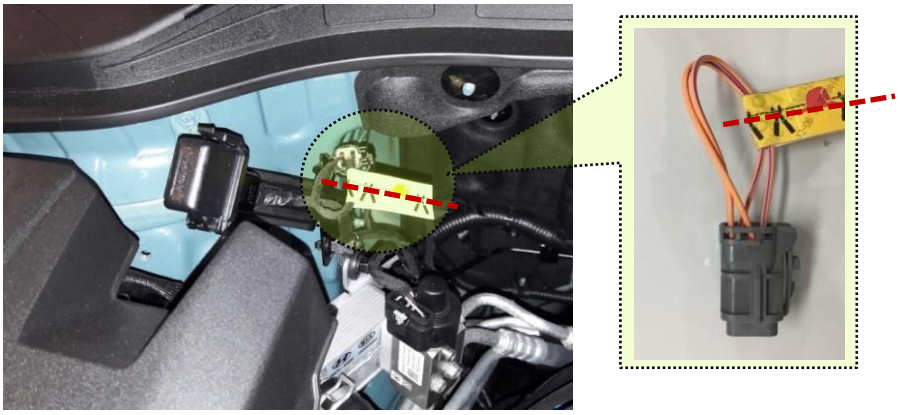
4-2. If the Service Interlock Connector can not be removed, remove the Service Plug under the rear seat.

a) Remove the Service Plug cover (A) located under the rear seat.

b) Remove the Service Plug using the following procedure :

①: Unlock, Release → ② : Remove

4-3. If the Service Plug can not be removed as well, cut the Service Interlock Connector cable.

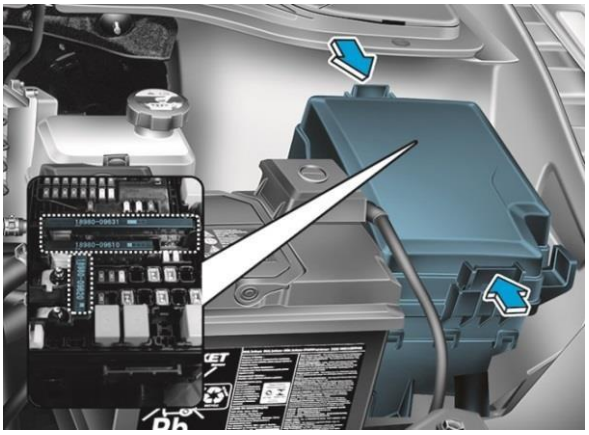


Service Interlock Connector cable cutting position

Ⅱ. Disabling the system – IG Relay Removal (Alternate Method)

1. Open the hood.

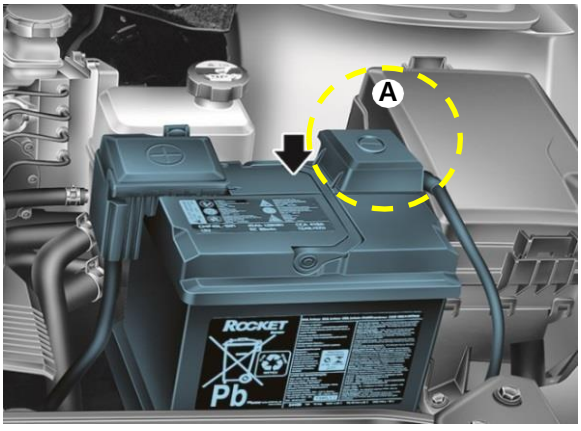
2. Remove the motor compartment fuse box cover.



3. In the event the vehicle cannot be disabled using the "Power" START/STOP Button, pull the IG1, IG2 fuses or relays from the motor compartment room fuse box. If the IG fuses cannot be located, pull out all the fuses and relays in the fuse box.

motor compartment fuse box

4. Disconnect the negative (-) 12V battery cable (A), located in the motor compartment, to further prevent the risk of accidental restart.

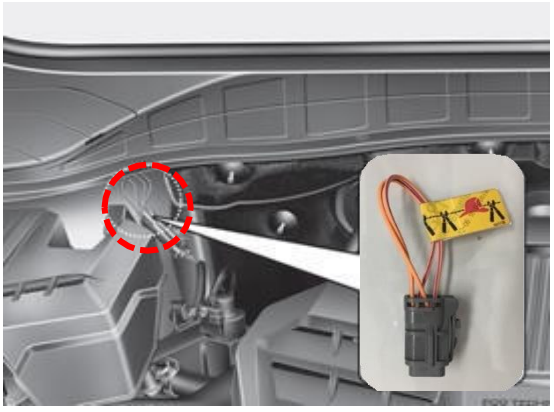


NOTICE

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

5. Use the following procedure to isolate the high voltage of the battery.

5-1 . Remove the Service Interlock Connector located in the motor compartment.



Service Interlock Connector

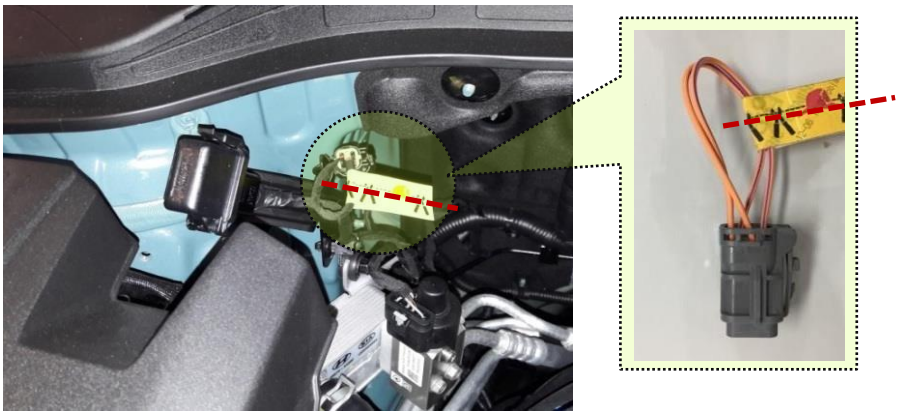
5-2. If the Service Interlock Connector can not be removed, remove the Service Plug under the rear seat.

a) Remove the Service Plug cover (A) located under the rear seat.

b) Remove the Service Plug using the following procedure :

①: Unlock, Release → ② : Remove

5-3. If the Service Plug can not be removed as well, cut the Service Interlock Connector cable.



Service Interlock Connector cable cutting position

If both methods of disabling system are unsuccessful, the vehicle is not secured from accidental deployment of airbags and electric shock from high-voltage components.

⚠WARNING Electrocution Risk!

- Before engaging in emergency response procedures, ensure the vehicle is disabled and wait for more than 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. To prevent injury or death due to electrical shock, never touch the wires or cables before disabling the system, to prevent injury or death due to electrical shock.

Failure to follow any of these instructions may result in serious injury or death by electrocution.

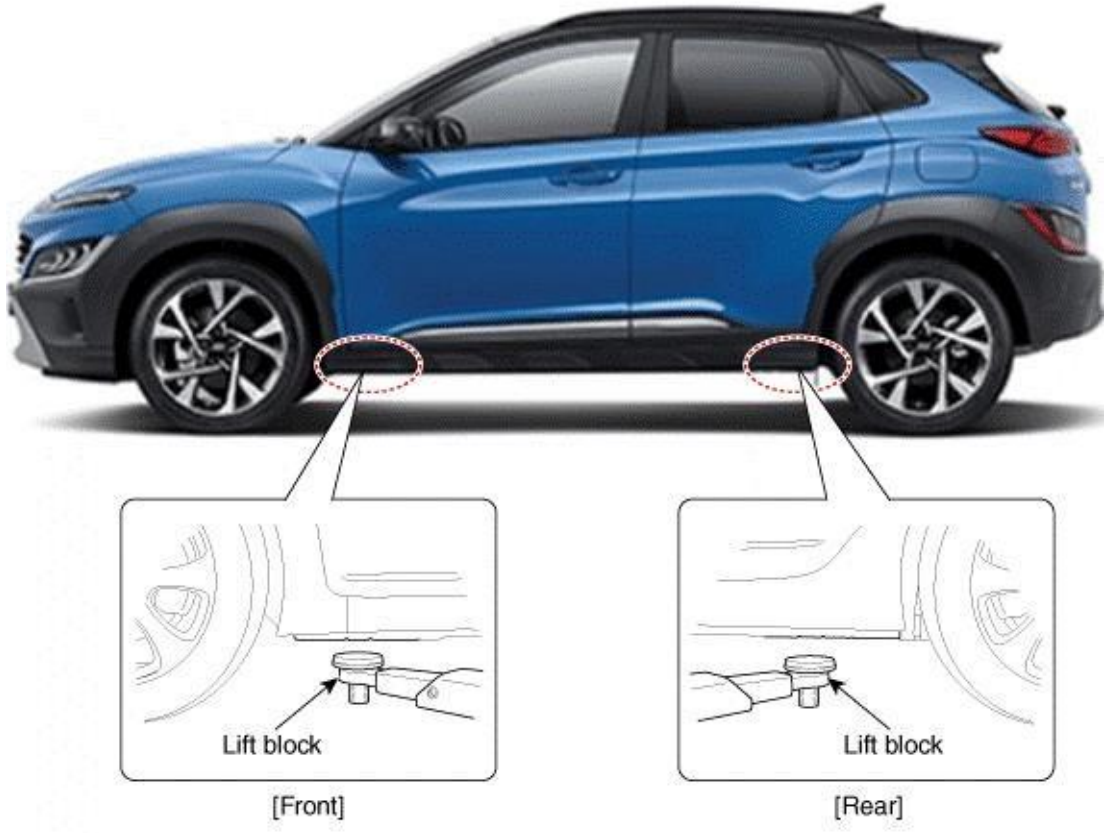
⚠WARNING Explosive Risk!

- Do not cut through any component.
- SRS components may remain powered and active for up to 3 minutes after the 12V electrical system is shut off or disabled. Disconnect the battery negative cable and wait for at least 3 minutes before beginning work.

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

Extrication Operations

The extrication operations for the KONA Electric are similar to the conventional vehicle. However, the first responder should pay special attention when they extract occupants in the vehicle. Before extrication operations, the first responders should carry out "Initial Response: Identify, Immobilize and Disable" procedure section in page 7 to 14.



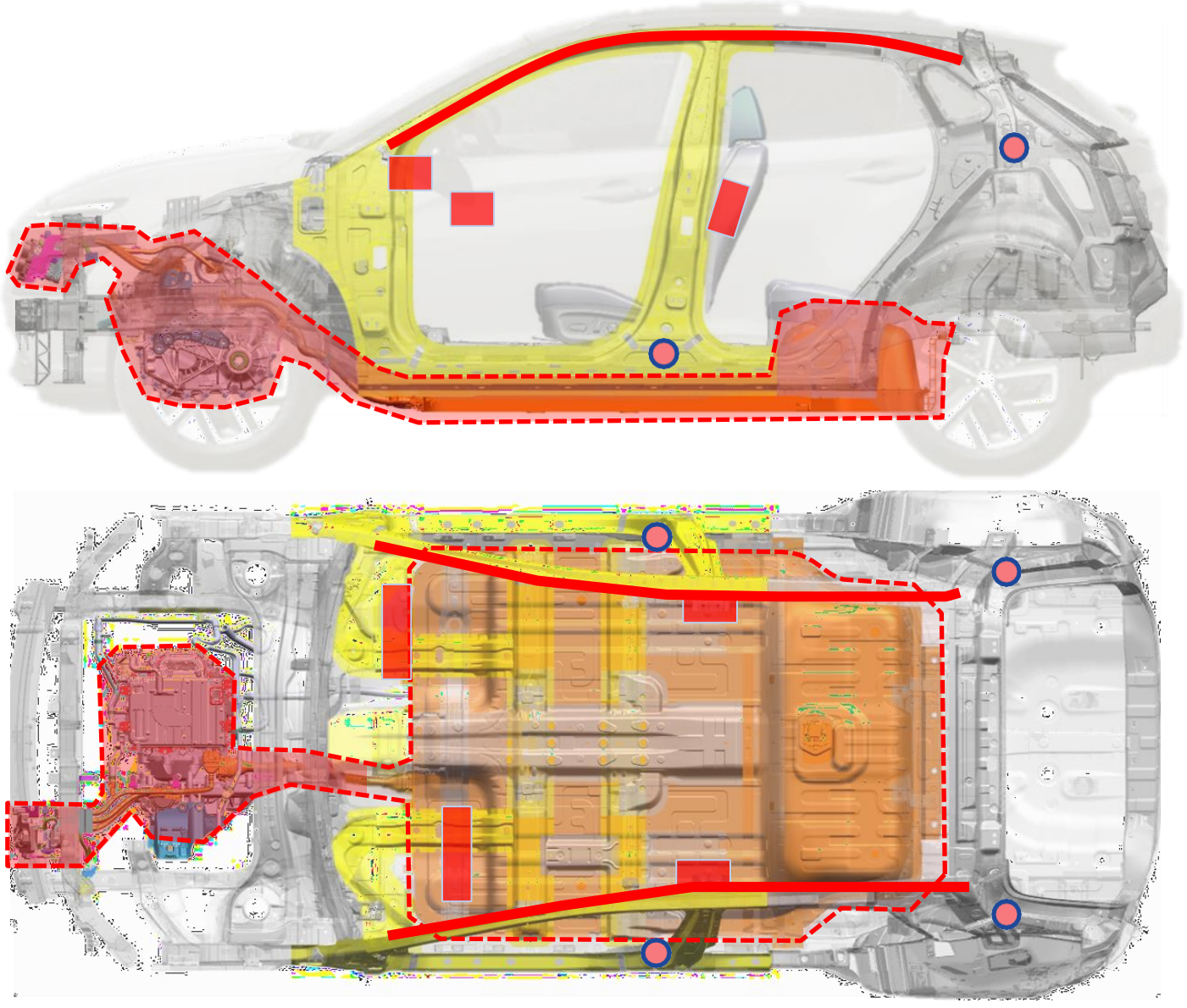
Vehicle Stabilization

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

Extrication Operations

When responding to an incident involving a KONA Electric, we recommend that the first responders follow their organization's standard operating procedures for assessing and dealing with vehicle emergencies. When the first responders cut the vehicle, they should always pay special attention to airbag system, orange colored high voltage cables and other high voltage components as below image to avoid damage to parts which may increase the risks of explosion.

Yellow marked zone is Hot stamped steel. So this zone can not be cut with general tools.



Airbag

High Voltage System

Belt pre-tensioner

Ultra High Strength Steel
(hot stamped steel)

Submersion

Some emergency responses can involve a submerged vehicle. A KONA Electric that is submerged does not have high-voltage component 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 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 sections of page 7 to 14 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 Service Disconnect Plug while in the water

Failure to follow any of these instructions may result in serious injury or death by electrocution.

Vehicle Fire

After Initial Emergency Response Procedures have been applied, Firefighting Procedures may begin. Hyundai recommends that each response team follow their own department's standard operating procedures for fighting vehicle fires in combination with the KONA Electric specific details that are covered in this section.

Firefighting Operations

If the high-voltage battery pack is either involved in or at risk of being involved in a fire in a KONA Electric, strict cautions must be taken while conducting firefighting operations due to following reasons:

- Lithium-ion Polymer batteries contain gel electrolyte that can vent, ignite, and produce sparks when subjected to temperatures above 300°F.
- 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.
  - 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.

Extinguishers

- Small fires that high voltage battery is not involved : Extinguish fires using a ABC extinguisher for an electric fire.
- Fires that the high voltage battery is involved or the high voltage battery is heating : Extinguish fires using large and sustained amount of water to cool the high voltage battery. Do not extinguish fire with a small amount of water. Firefighters should not hesitate to pour large amounts of water on the vehicle.

High-Voltage Battery Damage and Fluid Leaks

The HV Battery assembly is enclosed in a sturdy metal case that is rigidly mounted to structural components of the vehicle. This construction helps prevent damage to the HV Battery assembly even in severe crashes. This section provides emergency responders with information regarding how to mitigate the severity of a damaged HV Battery assembly or gel electrolyte spill, however unlikely that might be.

- Cease all smoke, spark, flame activity 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 oil, sand, or a dry cloth to clean up the spilled electrolyte. Be sure to adequately ventilate the area.

⚠WARNING **Irritant Substance Risk!**

- Internal components of HV Batteries are irritants and sensitizers.
- To avoid contact with these irritants and sensitizers wear positive pressure self- contained breathing apparatus (SCBA) and other personal protective equipment (PPE) designed for use with these types of hazards.

Failure to wear proper SCBA and PPE can result in serious injury or death

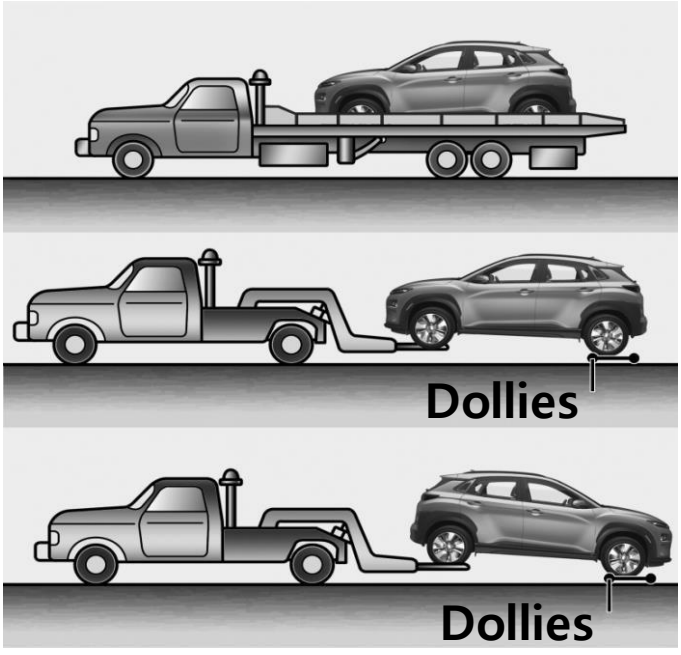
- Electrolyte solution is an eye irritant – If contact with eyes, rinse with plenty of water for 15 minutes.
- Electrolyte solution is a skin irritant. Therefore, if there is contact with skin, wash off with soap.
- Electrolyte liquid or fumes that have come into contact with water vapors in the air will create an oxidized substance. This substance may irritate skin and eyes. In these cases, rinse with plenty of water and see a doctor immediately.
- Electrolyte fumes (when inhaled) can cause respiratory irritation and acute intoxication

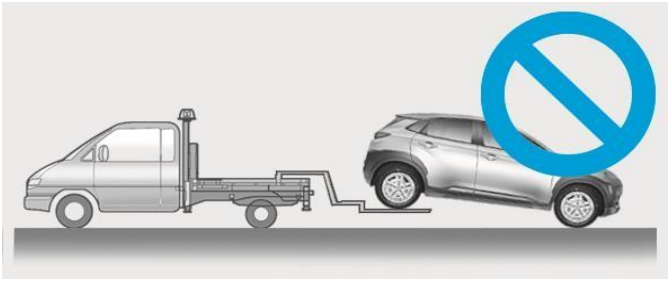
Move to a well ventilated location for fresh air and wash mouth with water. See a doctor immediately.

Towing

When towing KONA Electric vehicle, all wheels should be off the ground and not in contact with the road. If you must tow the vehicle using only two wheels, lift the front wheels off the ground and tow the vehicle with the rear wheels on the ground(without dollies).

If emergency towing is necessary, we recommend having it done by an authorized Hyundai dealer or a commercial tow-truck service. The use of wheel dollies or flatbed is recommended.

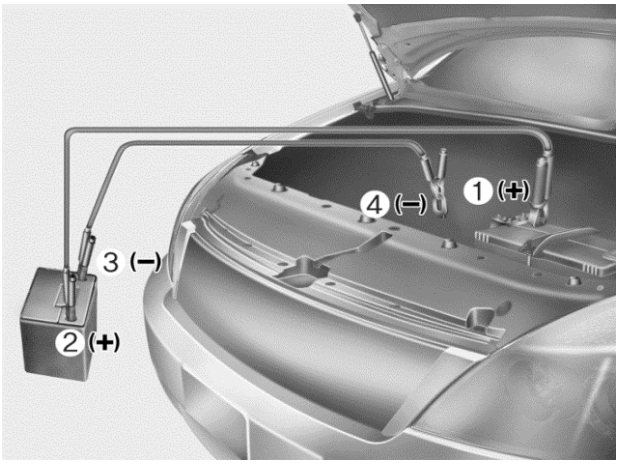




⚠ CAUTION

- Do not tow the vehicle backwards with the front 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.
- Never tow the vehicle with the front wheels on the ground (forward or backward), as this may cause damage to the vehicle.

Jump Starting



1. Make sure the booster battery is 12-volt.
2. If the booster battery is in another vehicle, do not allow the vehicles to touch.
3. Turn off all unnecessary electrical loads.
4. First connect one end of a jumper cable to the positive terminal (1) of the discharged battery in the motor compartment, then connect the other end to the positive terminal (2) on the booster battery.
Proceed to connect one end of the other jumper cable to the negative terminal (3) of the booster battery, then the other end to a solid, stationary, metallic point (4) away from the battery (for example, the hood latch).

⚠ CAUTION

- Do not connect the cables to or near any part that moves when the vehicle is started.
- Do not allow the jumper cables to contact anything except the correct battery terminals or the correct ground.
- Do not lean over the battery when making connections.

5. Start the vehicle with the booster battery, then start the vehicle with the discharged battery.
6. After a few minutes, turn off both of the vehicles.
7. Remove the negative terminal cable first, and then remove the positive terminal cable. If the cause of your battery discharging is not apparent, we recommend that the system be checked by an authorized HYUNDAI dealer.