## INFORMATION FOR FIRST AND SECOND RESPONDERS

EMERGENCY RESPONSE GUIDE



**BRP CAN-AM PULSE** 

MOTORCYCLE

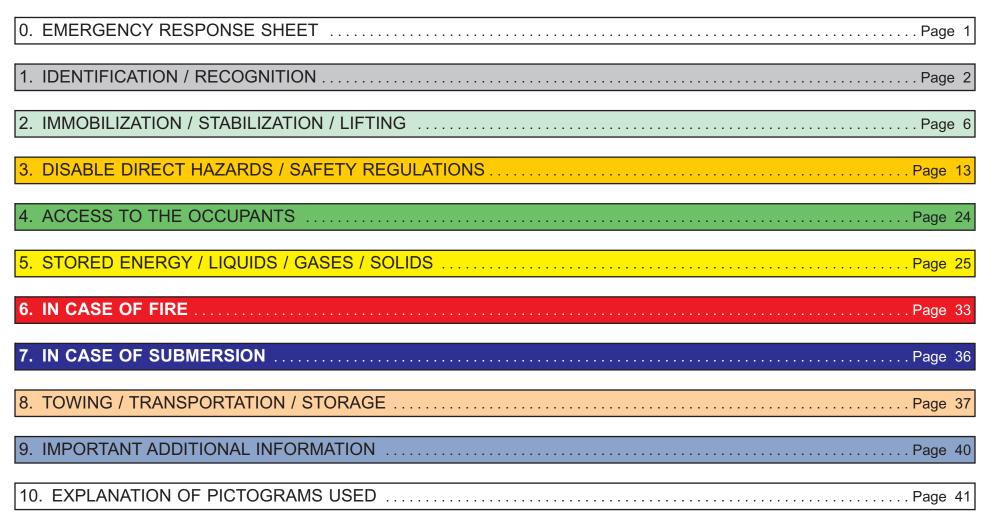
ELECTRIC

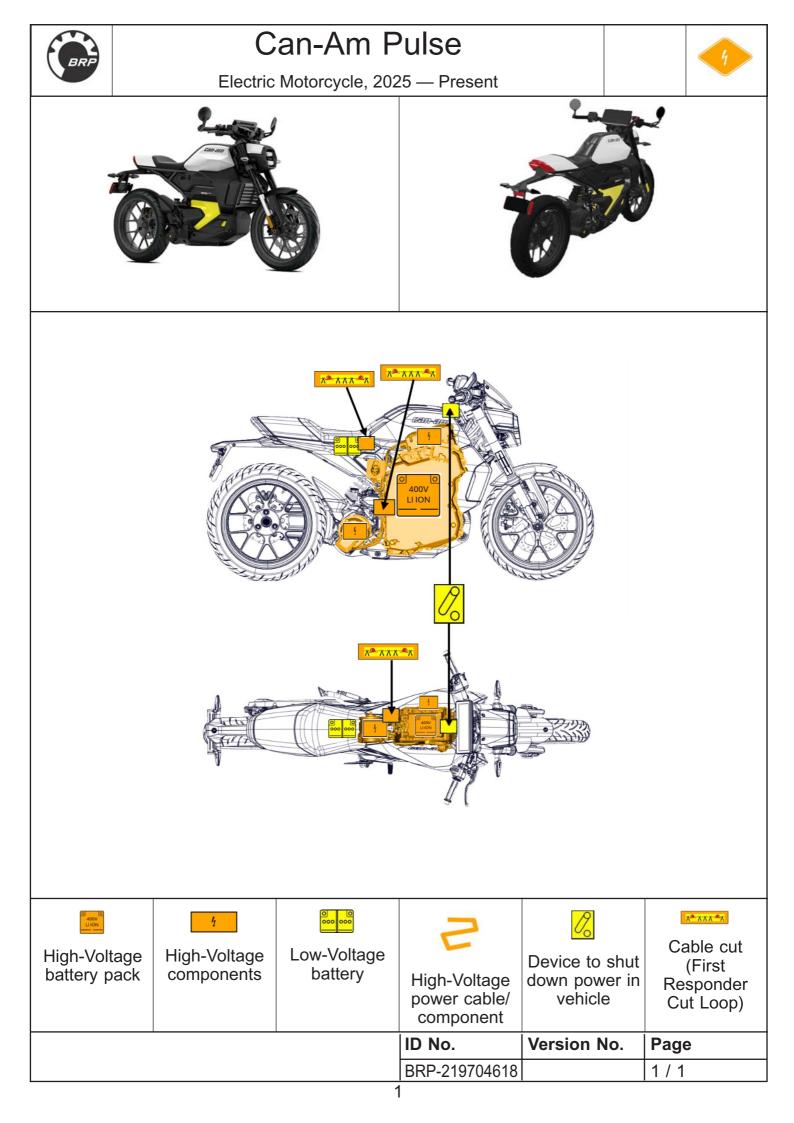




400V LI ION

#### CONTENTS





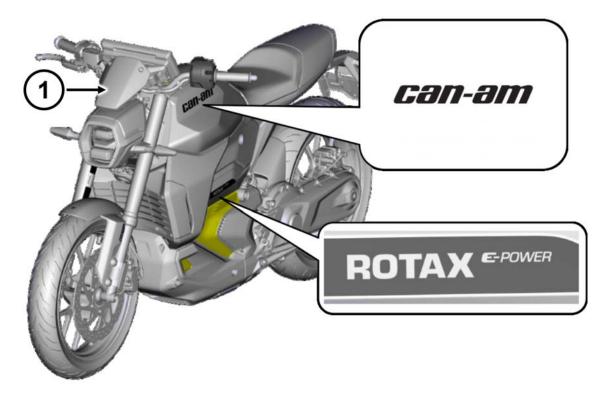
#### 1. IDENTIFICATION / RECOGNITION



Never assume a silent electric vehicle is switched off. Always treat the vehicle as if it is powered. Wear Personal Protective Equipment (PPE).

## Badging

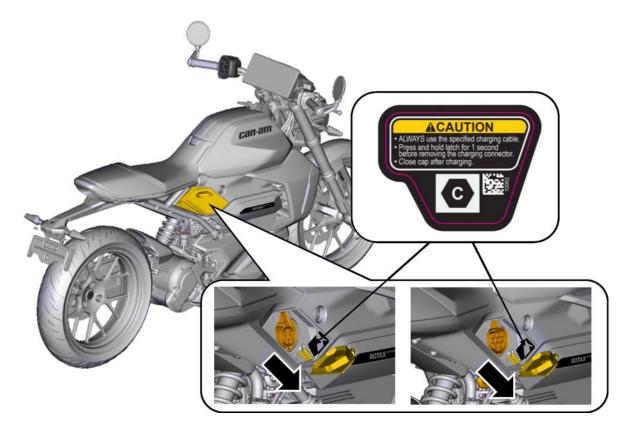
A BRP Electric motorcycle can be identified by the following indications/badging.



1. Optional Equipment

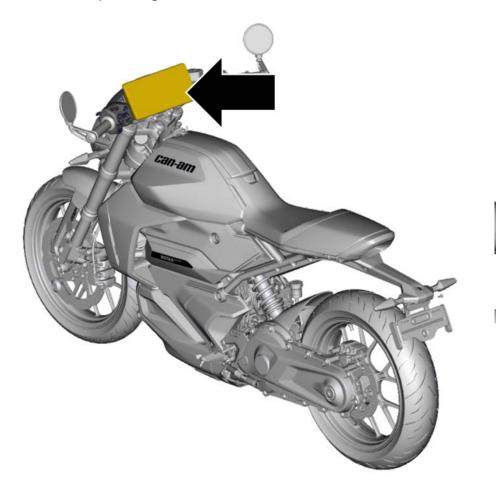
## **Charging Port**

The charging connection port is identified by a hinged cover and a caution label below it with a yellow bar.



## **Multifunction Display**

The multifunction display provides vehicle information such as the battery charge level, power gauge, and a green motorcycle indicator depending on the state of the vehicle.





## **Distinct Features**

The electric motorcycle has distinct features.

These features include no exhaust, a single swing arm without chain or sprocket, and visible yellow high-voltage battery.



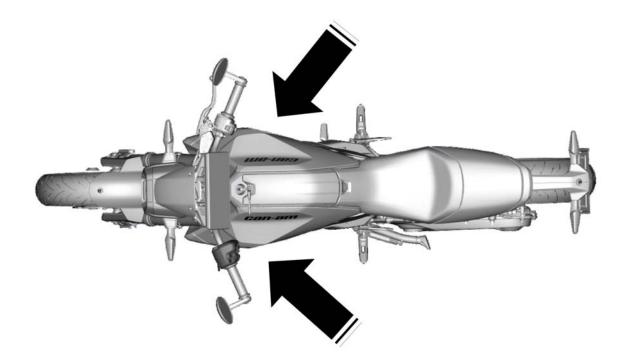
- 1. Single Swing Arm/No Chain or Sprocket
- 2. No Exhaust
- 3. Visible High-Voltage Battery

#### 2. IMMOBILIZATION / STABILIZATION / LIFTING

#### Approach the Vehicle

Wear the applicable PPE before you approach the vehicle. High-voltage components could have been damaged.

Always approach the vehicle from the sides, toward the handlebars. This will allow access to the stop switch while staying out of the potential vehicle movement path.



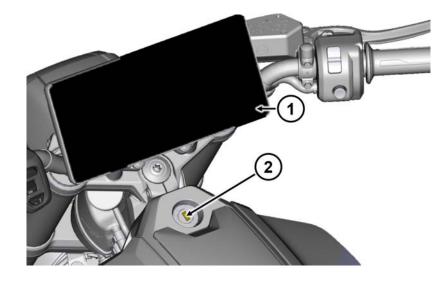
## Determine if Vehicle is ON/OFF

The three states of the vehicle are as follows:

#### **VEHICLE IS OFF**

Electrical components are turned OFF if ALL conditions are met:

- Black screen on the multifunction display, and;
- Vehicle is not connected to charging station, and;
- No key in the key switch. Inserting the key will give potential to wake up the vehicle and the high voltage components.
  - 1. Black Screen
  - 2. Key Removed from Key Switch



#### **VEHICLE IS ON**

Electrical components are turned ON when screen is lit up:

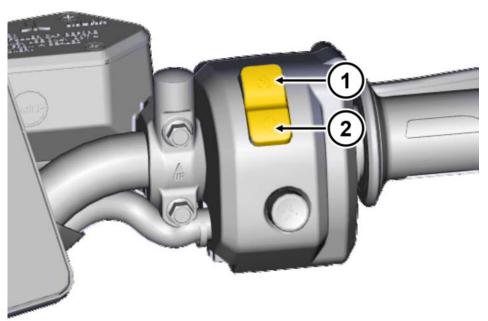
- "ON" indicator means the high voltage is enabled. Removing the key will turn off the vehicle.
- Green motorcycle indicator means the propulsion is enabled. "D" or "R" gear mode indicators may also be visible. Pressing the stop switch in the OFF position or lowering/deploying the side stand will only disable the propulsion system when the motorcycle is at a stop.

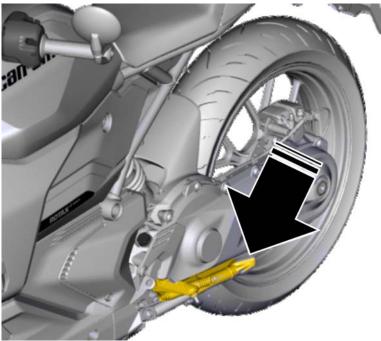


## High Voltage Enabled 1. Vehicle ON Indicator: High Voltage Enabled

#### High Voltage Enabled AND Propulsion System Enabled

- 1. Green Vehicle "READY TO MOVE" Indicator
- 2. Current Gear





## Stop Switch

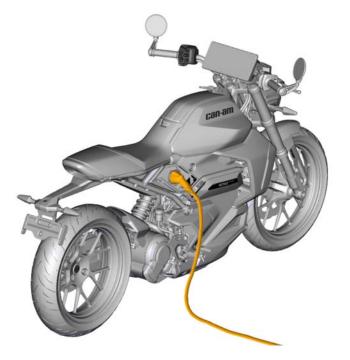
- 1. Stop Switch OFF Position
- 2. Stop Switch ON Position

Side Stand

#### VEHICLE IS CONNECTED TO CHARGING STATION

Electrical components are turned ON when the vehicle is connected to a charging station.

- Screen may be black when charging.
- Refer to Vehicle Charging in section 3 to unplug charging connector then resume section 2.



### Immobilization

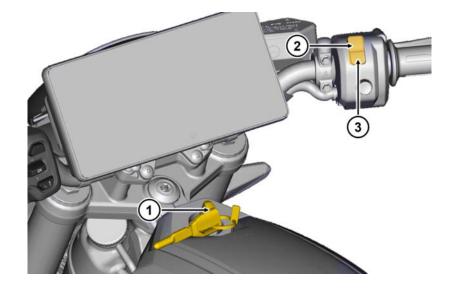
Do not press or touch the accelerator handle during all rescue activities.

Locate the vehicle components identified in the illustration below and turn OFF the vehicle.

To disable the vehicle propulsion system, press down on the Stop Switch and turn the Key Switch to OFF.

To turn OFF the vehicle, turn key counter clockwise to the OFF position and remove it from the vehicle key switch.

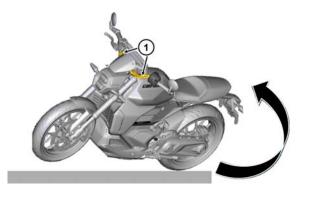
- 1. Vehicle Key
- 2. Stop Switch OFF Position
- 3. Stop Switch ON Position



This vehicle should only be lifted or manipulated by personnel properly trained, equipped and advised that the vehicle presents high-voltage hazards.



Avoid direct contact with the high-voltage battery pack or other high-voltage components when the vehicle is being lifted or manipulated. Always wear the appropriate PPE.



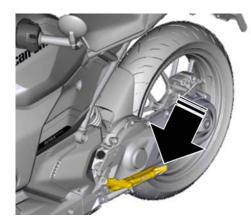
Lifting

1. Handle Bar

The vehicle should be lifted UP by the handlebar FROM A TIPPED OVER POSITION (LAYING ON THE GROUND). Use the rear seat or tail structure to help lift up the motorcyle if necessary. Make sure to not touch the twist grip on the handle bars unless the immobilization steps were performed prior to lifting. 1. Handle Bar Strap Location

Another way to lift the vehicle is by securing straps to the handle bars tube and then attaching the other end of the straps to a lifting mechanism.

Once the straps are secured on the handle bars, the vehicle can be lifted as shown. Make sure to never use the handle bar grips as lifting points, and use locations shown. If applicable or necessary to help keep balance of the vehicle, the rear wheel can be used as an additional lifting point.



Vehicle Kickstand

When the vehicle is lifted upright, the kick stand can be engaged to stabilize the vehicle. Engage the kickstand by pushing outward on it.

The kickstand needs to be engaged on a hard level surface to be effective. If no hard level surface is available, hard material can be placed underneath the kickstand feet for stability.

#### DISABLE THE HIGH VOLTAGE



After the vehicle has been in an accident, and the high-voltage disabling procedure has been performed, always assume the high-voltage components are energized because it is not known if the contactors inside the high-voltage battery pack or other high-voltage components have been damaged. NEVER damage or cut open an orange high voltage cable or the high-voltage battery pack during emergency operations.



Performing the high voltage disabling procedure will not discharge the high-voltage battery pack. The high voltage power will remain isolated WITHIN the battery pack. The high-voltage battery pack is ALWAYS energized.



When a vehicle has an incident while connected to an Electric Vehicle Supply Equipment (EVSE), or charging station, all attempts should be made to disable the charging station before executing emergency procedures to the vehicle. NEVER try to forcefully pull on the charger cable handle.

#### Access

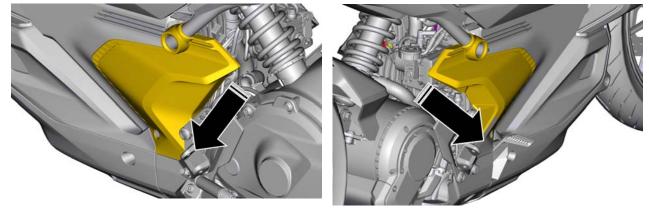
There are three (3) First Responder Cut Loops (FRCL) located on the vehicle.

The First Responder Cut Loops (FRCL) is a low voltage circuit. Its purpose is to deactivate the high voltage battery.

Two First Responder Cut Loop (FRCL) exists on each side of the vehicle. One is located under the right side lower body panel and the other on the left side lower body panel.

#### **FRCL Cut Locations**

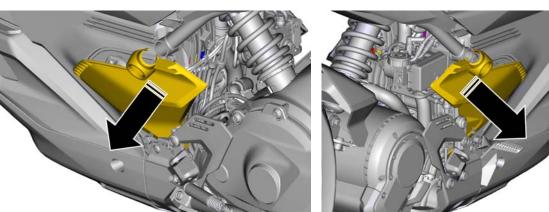
1. Grab the back part of the lower body panel. Pull and tear away the lower body panels from the vehicle.



Left Side

**Right Side** 

2. Pull away the left or right body panel.

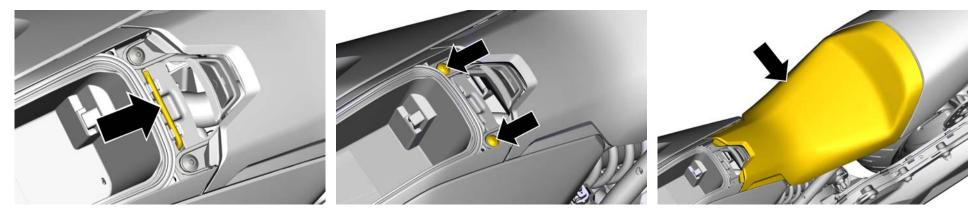


Left Side

Right Side

If access to the glove compartment and driver's seat is possible, the First Responder Cut Loop (FRCL) connector located under the driver can be disconnected.

#### **FRCL Connector Location**



**Included Tool** 

1. Open the glove compartment cover and take out the included tool.

**Glove Compartment** 

2. Using the included tool, remove the two fasteners at the front end of the driver's seat.

#### **Driver Seat**

3. Remove the driver's seat from the motorcycle by lifting up the front part and then pulling forward to disengage the back part of the seat.

## Disable

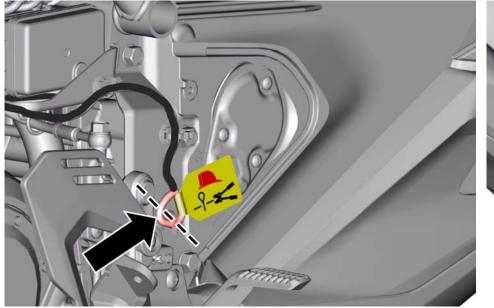


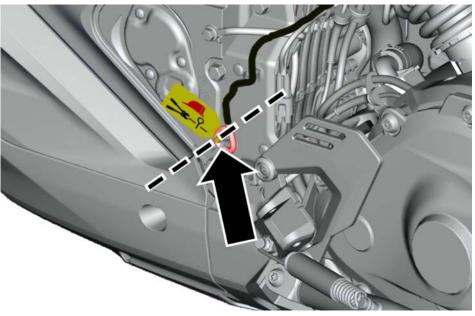
Wear the appropriate PPE. Do not touch, cut, or open high-voltage components or high-voltage battery pack. Avoid contact between the cutting tool and any surrounding metal parts. Always double cut the first responder cut loop. NEVER damage or cut open an orange high voltage cable.



To ensure that there is no remaining voltage in the high voltage system wait approximately 2 minutes after deactivation.

**NOTE: Only one First Responders Cut Loops (FRCL) needs to be disconnected or cut to disable the high-voltage.** The vehicle can be disabled by cutting one of the two First Responders Cut Loops (FRCL) as shown below:



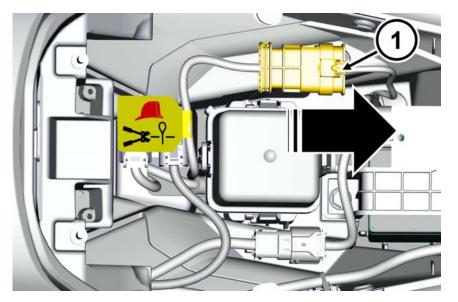


Right Side of the Vehicle: Under the Lower Body Panel

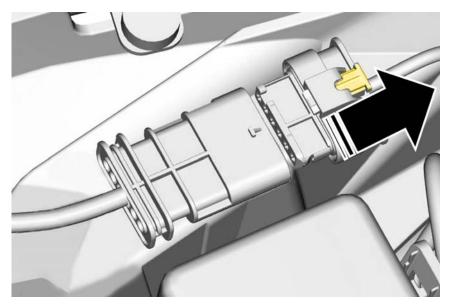
Left Side of the Vehicle: Under the Lower Body Panel

- 1. Cut the First Responder Cut Loop (FRCL) so that cable ends cannot reconnect inadvertently. Cutting the loop off completely will ensure a double cut is made.
- 2. Discard the cut section to prevent reconnection.

Alternately, there is a First Responder Cut Loop (FRCL) connector located under the driver seat.



**Connector Under Driver Seat** 



2. Press down on the connector clip and pull forward to disconnect.

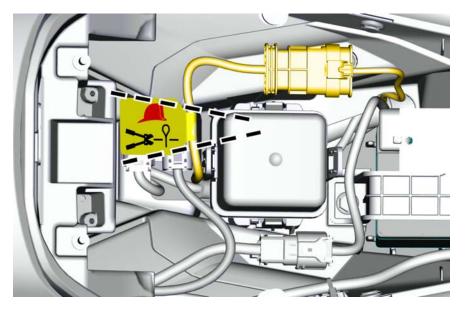
1. Pull forward on the connector clip (1).

**Connector Clip** This First Responder Cut Loop (FRCL) under the seat can be disconnected.

Manually disconnect the first responder loop connector from vehicle.

If the connector under the seat is damaged, the First Responder Cut Loop (FRCL) under the seat must be cut.

Cut the First Responder Cut Loop (FRCL) at shown locations.



First Responder Cut Loop (FRCL) Under the Seat



- Cut the First Responder Cut Loop (FRCL) so that cable ends cannot reconnect inadvertently. Harness must be cut on each side of the cable sticker. Cutting the loop off completely will also ensure a double cut is made.
  - 2. Discard the cut section to prevent reconnection.

Cutting the first responder cut loop removes low-voltage power going to the high voltage contactors inside of the high-voltage battery pack. Cutting the first responder cut loop does not disable the low-voltage battery system.

Even if the first responder cut loop has been cut, the high-voltage battery pack still have stored energy. Always treat the vehicle as if there is high-voltage active in it. It is not known if the high-voltage battery pack or other high-voltage components have been damaged.

## **VEHICLE CHARGING**



When a vehicle has an incident while connected to an Electric Vehicle Supply Equipment (EVSE), or charging station, all attempts should be made to disable the EVSE before executing emergency procedures to the vehicle.

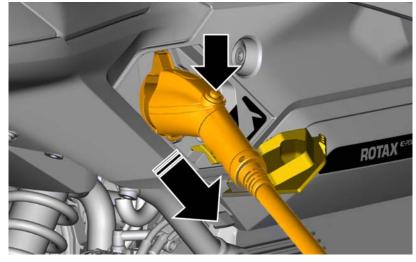
NEVER interrupt a high voltage current flow by cutting the EVSE charging cable or forcefully pulling on the charger cable handle.

In the case of an emergency incident while charging that involves collision, electrical failure, or fire, additional steps should be taken to first isolate the charging station by disabling its main service disconnect.

Before attempting any emergency manoeuvres on a vehicle that is charging or connected to a charging station, the charger cable handle must be disconnected from the vehicle.

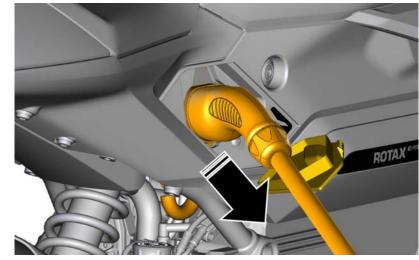
- 1. Hold down the release button on the charger cable handle for 1 second and remove it from the vehicle charging port.
- 2. Proceed with the "Disable the High Voltage" procedure.

#### North American (Type 1, SAE J1772):



- 1. Insert the vehicle key into the key switch and turn to the ON position.
- 2. Press the Unlock button on the instrument cluster.
- 3. Remove the charging cable handle.
- 4. Proceed with the "Disable the High Voltage" procedure.

#### European (Type 2, IEC 62916):

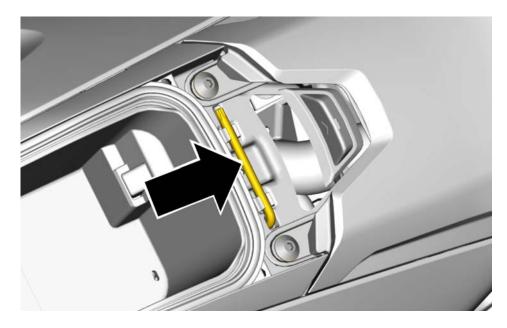


## DISABLE THE LOW-VOLTAGE

Deactivating the low-voltage battery is not sufficient to turn off the vehicle. Follow the immobilization procedure found in section 2 to turn off the vehicle. The high voltage disabling procedure found in section 3 must be performed to disable the high voltage systems of the vehicle.

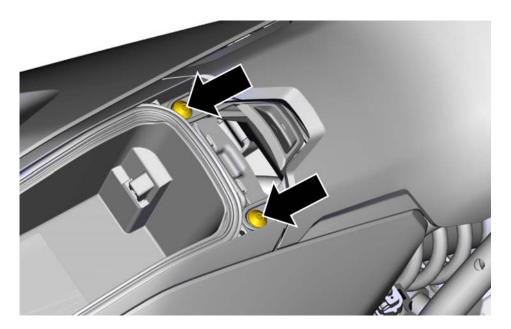
After section 2 and section 3 procedures are performed, the low-voltage system must be deactivated before handing the vehicle to the 2nd responders. Remove the vehicle seat and disconnect the negative post from the low-voltage battery.

1. Open the glove compartment cover and take out the included tool.

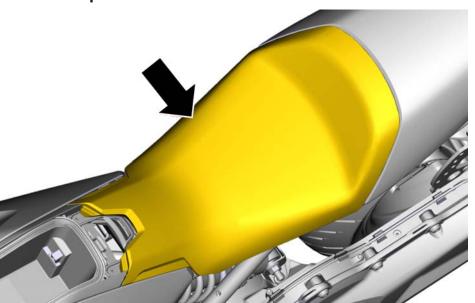


**Included Tool** 

2. Using the included tool, remove the two fasteners at the front end of the driver's seat.



**Glove Compartment** 

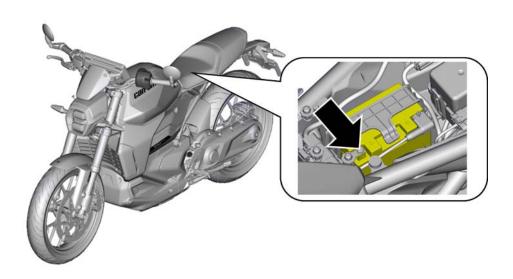


**Driver Seat** 

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3. Remove the driver's seat from the vehicle by lifting up the front part and then pulling forward to disengage the back part of the seat.

4. With a philips #2 screwdriver or a 8mm HEX socket, remove the screw from the negative post of the low-voltage battery.



5. Disconnect the cable's negative terminal from the low-voltage battery and bend the cable away from the battery post.

## 4. ACCESS TO THE OCCUPANTS

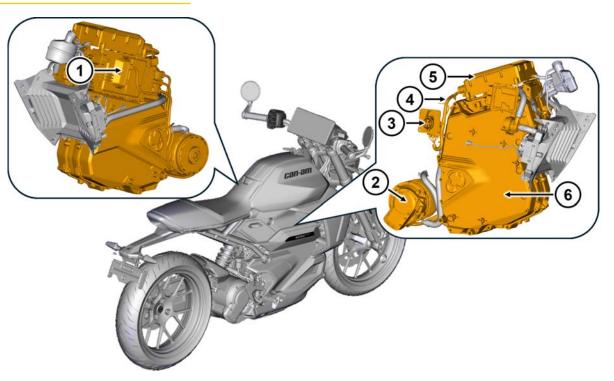
Not applicable due to vehicle type.

## 5. STORED ENERGY / LIQUIDS / GASES / SOLIDS

|   | 400V   |
|---|--|
| 0 0<br>000 000                            | 12V  |
| Coolant for<br>High-<br>Voltage<br>system | 0.9 Gallons/3.3 Litres<br>50/50 pre-mix<br>coolant* / Orange       |
| Brake fluid                               | 5.07 oz/150 ml<br>Dot4 Specification /<br>Clear                    |
| Chaincase<br>oil                          | 11.8 oz/350 ml APl<br>GL-5 Specification** /<br>dark brown - black |

\* Ethyl glycol and distilled water or coolant specifically formulated for aluminium engines. \*\* 75W140 synthetic gear oil that meets the API GL-5 specification.

## **High-Voltage Components**



- 1. High-Voltage Inverter
- 2. High-Voltage E-Motor
- 3. High-Voltage Charging Port: North America (Type 1, SAEJ1772) European (Type 2, IEC 62196)
- 4. High-Voltage Cables
- 5. High-Voltage Charger
- 6. High-Voltage Battery Pack

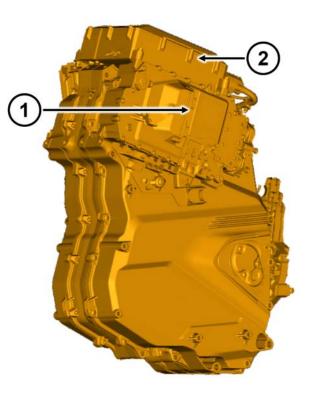
## High-Voltage Battery Pack



Never breach or damage the high-voltage battery pack when the vehicle is lifted, manipulated or when you remove panels from the vehicle. When rescue equipment is used, care must be taken to make sure the battery pack is not damaged in any way.

This vehicle uses a 400V lithium lon (Li-ion) battery, made up of multiple cells. These cells are used to store energy within the battery. The cells of the high-voltage battery pack are sealed and there is not enough electrolyte to create a pool of electrolyte if damaged.

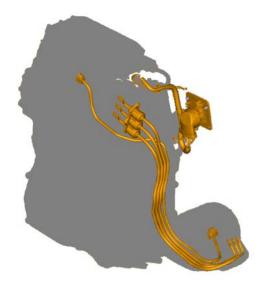
The inverter and on-board charger for the high-voltage system are directly mounted onto the high-voltage battery pack.

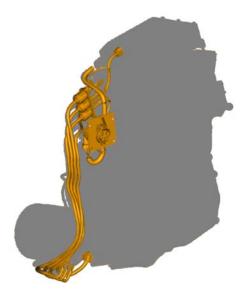


- 1. High-Voltage Inverter
- 2. High-Voltage Charger

# High-Voltage Cables

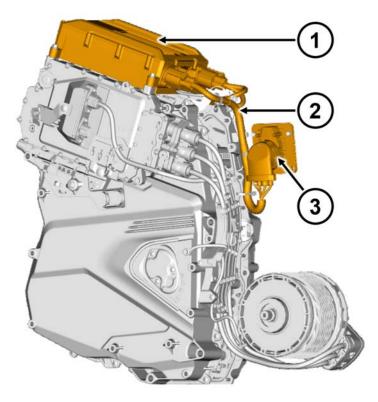
All high-voltage cables on the vehicle are orange in appearance. Do not cut or otherwise damage the orange high-voltage cables with rescue tools, and always treat the orange high-voltage cables as if they were live and powered.







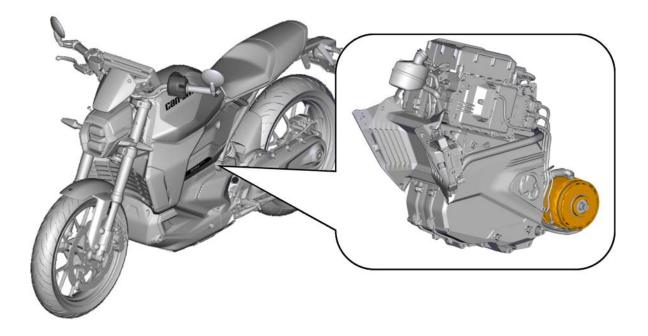
The cooling system will be automatically activated, as required, when connected to a high-voltage charging station and under normal vehicle usage. The charging system and its related components are as follows:



- 1. High-Voltage Charger
- 2. High-Voltage Connector Cable
- 3. High-Voltage Charging Socket



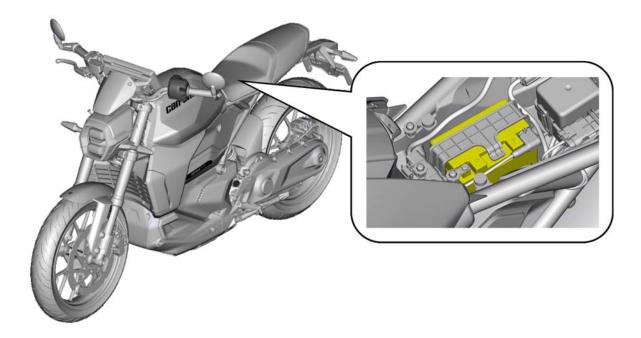
This vehicle is equipped with an electric motor capable of generating a voltage when rotated. The motor is mechanically connected at all times to the rear wheel/drive system. Wherever possible, the vehicle should not be pulled or towed to cause the rear wheel to move, refer to section 8 for more information.





## Low-Voltage Battery

The low-voltage battery (12V) is required to activate low-voltage and high-voltage components. During normal operation and charging, the vehicle's high-voltage battery through a DC-to-DC converter provides charging current to the low-voltage battery. The low-voltage battery can be disconnected by disconnecting the negative cable terminal from the low-voltage battery.

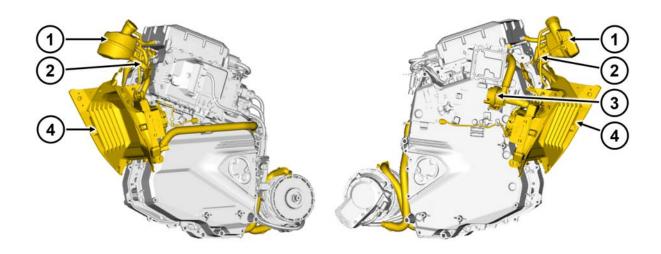


## **Cooling System**

If coolant is leaking from the high-voltage battery pack, there is a risk of a thermal reaction inside the high-voltage battery pack. Monitor the high-voltage battery pack temperature with thermal infrared camera.



The cooling system will be automatically activated, as required, when connected to a high-voltage charging station and under normal vehicle usage. The high-voltage battery pack has an integral liquid cooling circuit to cool the battery. If the vehicle has been involved in an accident and the high-voltage battery pack casing is damaged, coolant may leak from within the unit. Other liquid-cooled components that may leak if damaged are the charger, E-motor, and inverter. The coolant used is orange in appearance.



- 1. Reservoir
- 2. Hose and Fittings
- 3. Pump
- 4. Radiator

#### 6. IN CASE OF FIRE





Always assume high-voltage systems to be energized. During firefighting activities avoid contact with high-voltage components. Cutting of high-voltage component or attempting to open the high-voltage battery pack could cause serious injury or death.



A burning lithium-ion battery releases super-heated gases and toxic vapours. This release may include volatile organic compounds, hydrogen gas, carbon dioxide, carbon monoxide, soot, particulates which contain oxides of nickel, aluminium, lithium, copper, cobalt, and hydrogen fluoride. Responders must always protect themselves with full PPE, including SCBA, and take appropriate measures to protect civilians downwind from the incident.



Lithium-ion batteries can self-ignite spontaneously or after a delay if damaged or used incorrectly. Lithium-ion batteries can re-ignite after a fire has been suppressed or when they have not burned out completely. Monitor with a thermal infrared camera to confirm the battery pack has cooled down completely.





USE LARGE AMOUNT OF WATER TO EXTINGUISH THE HIGH-VOLTAGE BATTERY PACK



Use water to fight a fire involving a high-voltage battery pack. If the battery itself is on fire, is exposed to high heat or generates heat or gases, large quantities of water must be applied directly to the battery to cool it. Always make sure there is a sufficient supply of water as fast as possible. High-voltage battery fires can take large quantities of water to fully extinguish and be cooled down.

If water is not immediately available, CO2, dry chemicals, or other typical fire-extinguishing agents can be used to fight the fire from other surrounding combustibles but will have no effective cooling effect on the battery.

Water should be applied directly to the battery. If it is safe to do so, lift or tilt the vehicle to allow for direct access to the battery.

Never open the battery for the purpose of cooling it. If an opening is available from a collision, it can be used to apply water directly onto the high-voltage battery pack.

Water must continue to be applied until a complete suppression of fire and smoke is observed from the battery pack. A thermal camera should be used to check for remaining heat sources and monitor the temperature of the battery pack.

For small fires that do not involve the high-voltage battery pack, these can be tackled using typical vehicle firefighting procedures. When extinguishing a fire, do not touch any of the high-voltage components with rescue equipment. Always use insulated tools.

## **Battery Pack Damage**

The high-voltage battery pack and high-voltage components are liquid cooled with a glycol-based automotive coolant that is orange in appearance. If damaged, this coolant can leak out.

The high-voltage battery pack contains lithium-ion cells. If damaged, electrolyte can leak, often creating chemical reactions that release heat. This heat can then damage other battery cells, creating a chain reaction.

If there is smoke, steam, or noises such as audible popping or hissing coming from the battery pack, treat it as heated and take appropriate action as described above.

#### **Release of Battery/Vehicle to Second Responder**

High voltage battery fires can take up to 24 hours to fully cool.

A thermal imaging camera can be used to measure the temperature of the high-voltage battery and monitor the rate of heating or cooling. Before the vehicle can be released to second responders (such as law enforcement, vehicle transporters, etc.) there must be clear sign that fire, smoke, or heating is not present in the high-voltage battery for at least one hour.

The battery must be completely cooled before the vehicle is released to second responders or otherwise leaving the incident. Even if all deactivation procedures are properly executed, second responders must be advised that there is a risk of re-ignition from the stranded energy still in the battery. During transport a thermal imaging camera or infrared thermometer should be used to monitor the battery heating or cooling trend to detect signs of re-ignition.

The battery is divided in two halves separated by the cooling system. For maximum efficiency water should be applied internally or externally on the side of the battery where smoke and fire erupts.

#### 7. IN CASE OF SUBMERSION

Always handle any submerged vehicle with the appropriate PPE for water rescue. Failure to do so can result in serious injury or death.

Handle a submerged electric vehicle like any other submerged vehicle. The body of the vehicle does not present a greater risk of shock because it is in water. However, vehicles that have been submerged in water should be handled with greater caution due to the potential risk of a high-voltage electrical battery fire. Always treat any submerged vehicle while wearing the appropriate PPE for water rescue.

First Responders should be prepared to respond to a potential fire risk.

After the vehicle is removed from the water, continue with the disabling procedures as outlined in section 3.

#### 8. TOWING / TRANSPORTATION / STORAGE



Lack of sounds does not mean the vehicle is off. Before moving or transporting the vehicle, make sure the high voltage disabling procedure has been performed. Wear appropriate PPE.



After the vehicle has been in an accident, the high-voltage battery and components can be damaged and compromised. Always treat these components as being energized. Avoid direct contact with the high-voltage battery and the high-voltage components. Always wear appropriate PPE. Failure to do so may result in serious injury or death.





If the high-voltage battery pack has been damaged or the vehicle has been involved in a fire, any vehicle movement could lead to self-ignition or re-ignition of the high-voltage battery pack.



If a vehicle has been involved in a submersion, fire, or collision that has damaged the highvoltage battery pack, there is a risk of battery re-ignition several days after the initial incident. Store the vehicle outside in an open area at least 15 m (50 ft) from any flammable materials and other vehicles or structure, and monitor the vehicle temperature to detect signs of thermal runaway.



When transporting the damaged vehicle, always carry a water-based fire extinguisher and have the tow truck followed by a support vehicle for monitoring and ready for calling fire response.

The electric motor installed in this vehicle can generate electricity when rotated. The electric motor is mechanically connected to the rear wheel.

BRP RECOMMENDS TO AVOID PULLING OR PUSHING THE VEHICLE TO CAUSE THE REAR WHEEL TO ROTATE AT A SPEED HIGHER THEN 10 KM/H (6 MPH).

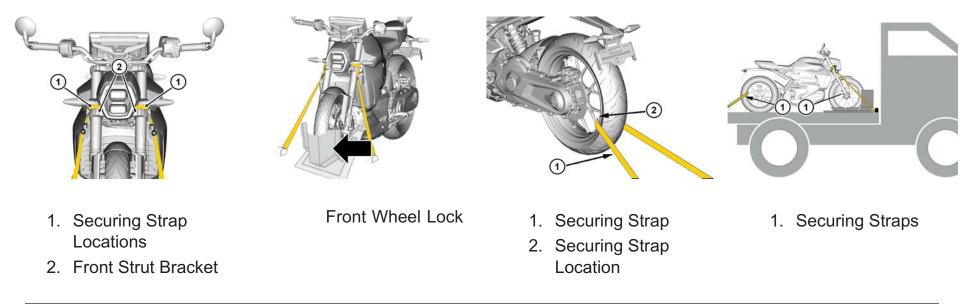
The vehicle should be secured in an upright position whenever it is being transported or manipulated. Never use metal or conductive components to lift, manipulate, or secure the vehicle. Refer to section 2 for appropriate lifting method.



Transport vehicle on a flatbed truck or comparable transport vehicle to prevent the rear wheel from rotating. The vehicle needs to be secured onto the platform facing forward using a front wheel lock for a motorcycle. A strap can be used on each of the front struts. Secure the rear wheel using a strap on each side.

**NOTE:** Front and rear fenders should not be used as sole attachment points when towing a motorcycle on a trailer/flatbed platform.

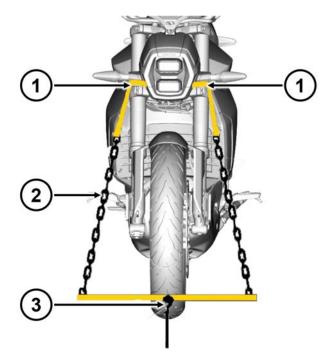
Secure the vehicle at the locations identified in the illustration below:



## Pulling or Pushing the Vehicle

Never transport this vehicle with the rear wheel on the ground or so that the propulsion system can rotate at a speed higher than 10 km/h (6 mph). This can cause the motor to generate a voltage which can do significant damage, cause the motor to overheat and cause the vehicle to have erratic behavior. In rare cases, extreme overheating can ignite surrounding components.

If the vehicle cannot be pushed onto the flatbed, it can be winched while holding the motorcycle in an upright position. If a flatbed is not available and the vehicle must be recovered, it may be winched or temporarily towed while holding the motorcycle in an upright position at a speed below 10 km/h (6 mph). Use a tow rope attached to the front struts, at the location identified in the illustration below. Towing at low speeds should be done while walking besides the vehicle to keep it upright.



1. Securing Straps

0 km/h

6 mph

- 2. Pull Chains
- 3. Pull Rope

#### 9. IMPORTANT ADDITIONAL INFORMATION

This guide contains important instructions and warnings intended to assist emergency response professionals and safely respond to incidents involving a Can-Am Electric Motorcycle.

Copies of the Emergency Response Guide and the Operator's Guide for this vehicle and other vehicles are available for reference and downloading at: https://operatorsguides.brp.com

#### **Contact Information:**

If you have any questions, please contact a local BRP authorized dealer or visit https://can-am.brp.com/on-road/us/en/, or call BRP Customer Services Department at:

Australia: 1800 531 996 Austria: +49 (0) 210 3574 9955 Belgium: +32 9 218 26 00 Brazil: 19 3113-9600 Canada: 1-888-272-9222 China: 021 31076140 Finland: +35 89 74 79 04 12 France: +33 9 70 24 11 85 Germany: +49 (0) 210 3574 9955 Italy: +39 800 978 851 Japan: 03 6718 4701 Mexico: 442 256 4000 Netherlands: +32 9 218 26 00 New Zealand: 0800 470 020 Norway: +47 71 39 07 41 Russia: +7 812 777 78 45 Spain: +34 931 222 831 Sweden: +46 8 50 51 59 86 UK: +44 20 88 65 04 89 USA: 1-888-272-9222

## 10. EXPLANATION OF PICTOGRAMS USED

| 4 | Electric Vehicle              | 2   | Device to shut<br>down power in<br>vehicle |    | Explosive                     |
|---|-------------------------------|---|--|----|-------------------------------|
|   | Battery pack,<br>high-voltage | 0 00  | Battery,<br>low-voltage                    |    | Corrosive                     |
| 4 | High-voltage<br>component     | <mark>⊼<sup>®</sup>-⊼⊼⊼<sup>®</sup>⊼</mark> | Cable cut                                  |    | Hazardous to the human health |
| 2 | High-voltage<br>power cable   |   | Use thermal infrared camera                |    | Acute toxicity                |
|   | General warning<br>sign       |   | Lifting point                              | ¥2 | Environmental<br>hazard       |
| 4 | Warning, Electricity          | A STATE                                     | Use water to extinguish the fire           |    | Flammable                     |