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# MITSUBISHI



## Emergency Response Guide



**Lithium Ion Battery Electric Vehicle**



October 2011

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## Introduction

This manual provides safety instructions that need to be followed when rescuing the passengers from the vehicle after an accident and describes how to handle the damaged vehicle.

Failure to follow these instructions and especially the warnings and cautions may result in serious injury such as electrical shock due to the high voltage battery installed on i-MiEV.

Please read and understand this manual carefully.

Throughout this manual the words **WARNING**, **CAUTION** and **NOTE** appear. These serve as reminders to be especially careful. Failure to follow instructions could result in personal injury or damage to your vehicle.

**WARNING ;**

Indicates a strong possibility of severe personal injury or death if instructions are not followed.

**CAUTION;**

Means hazards or unsafe practices that could cause minor personal injury or damage to your vehicle.

**NOTE:** gives helpful information.

\*: indicates optional equipment.

It may differ according to the sales classification; refer to the sales catalogue.

Mitsubishi Motors reserves the right to make changes in design and specification and/or to make additions to or improvements in this product without obligation to install them on products previously manufactured.

- Please note that the contents of this manual may not fit completely with actual vehicle due to changes in vehicle specification.

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## 1. **i-MiEV high voltage components**

i-MiEV uses two types of batteries. One is a 12V battery that is the same as the 12V battery used in vehicles powered by internal combustion engines. The other is a high voltage 330V lithium-ion battery (Main drive lithium-ion battery). The Main drive lithium-ion battery provides high voltage current to the high voltage components shown on page 2. Before rescue work can begin, it is important that the high voltage circuit is disconnected.

### (1) **Design features of high voltage components**

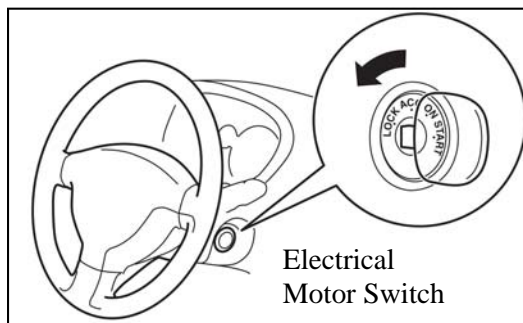
- 1) All high voltage components are insulated from the vehicle body.
- 2) All high voltage components are covered by cases or covers. These cases and covers are insulated from the high voltage circuits inside.
- 3) High voltage wiring cables can be distinguished from normal wiring by their orange insulation.

Before handling the vehicle after an accident, and in order to reduce the risk of electric shock, you must check to determine if any high voltage components have been damaged.

### (2) **Shutting off high voltage components**

The high voltage circuits can be shut off by the following procedures:

- 1) Turn off the electrical motor switch.



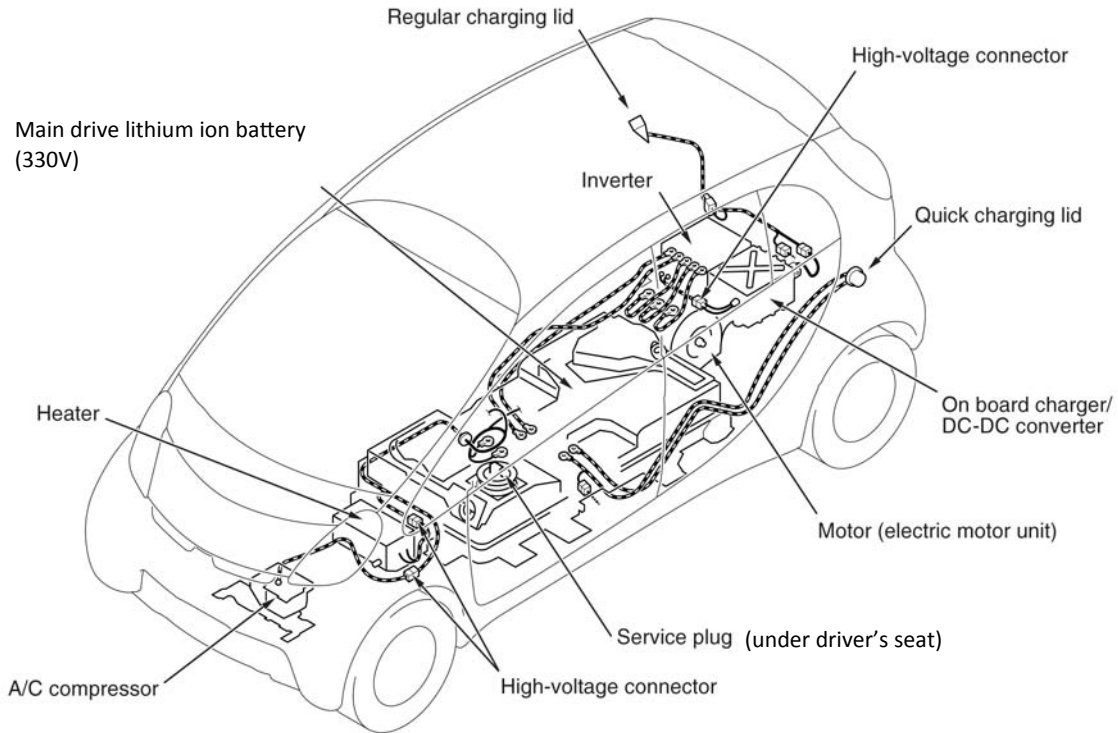
- 2) Disconnect the 12V battery or remove the power control unit fuse in the fuse box under the front hood.
- 3) Remove the service plug.

Detailed procedures for shutting off the high voltage circuits are provided later in this manual.

Be advised that this vehicle is also equipped with sensors that are designed to shut down the high voltage circuits in the event of moderate to severe impacts.

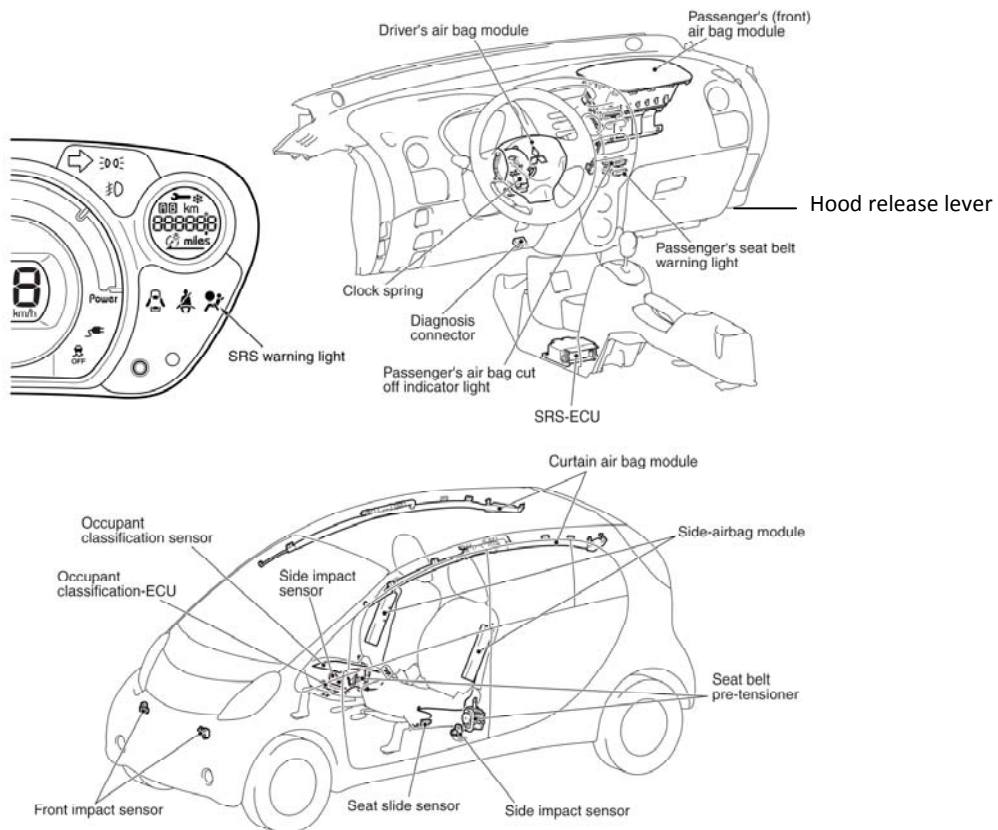
## 2. High voltage components layout

High voltage (330V) components and wiring cables are located as shown:



## 3. SRS airbag system

SRS airbag system (airbags and related wiring harnesses) (Powered by 12V)



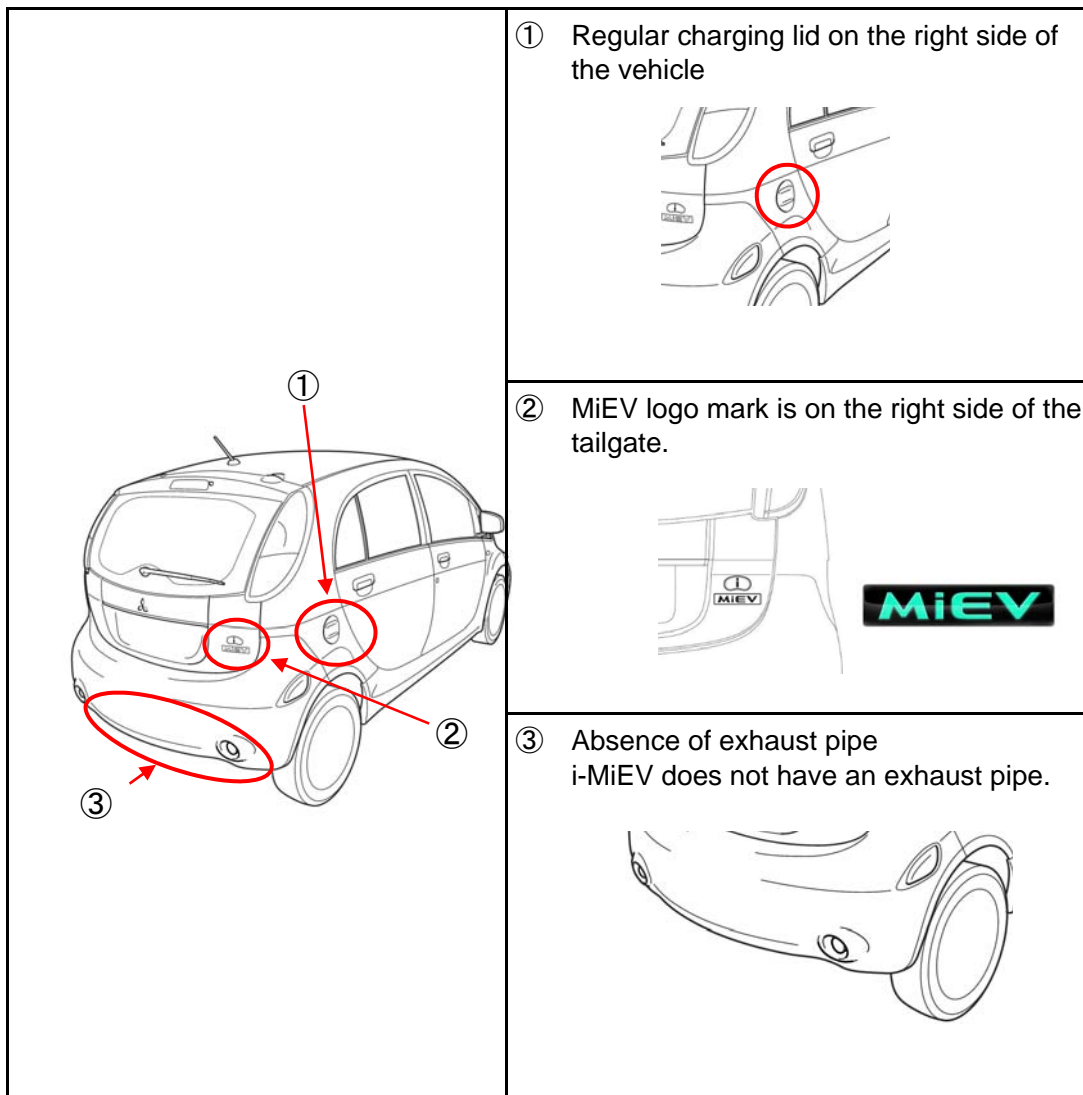
#### 4. To identify i-MiEV

Handle i-MiEV using the appropriate Personal Protective Equipment (PPE) and only the methods described in this manual.

##### (1) i-MiEV features

MiEV logo mark, Regular charging lid, Absence of exhaust pipe, Chassis number

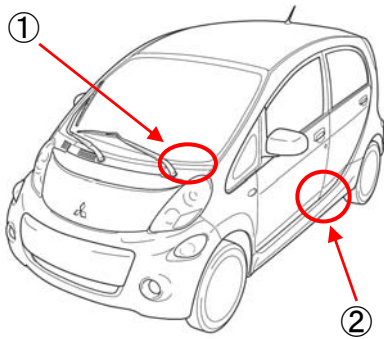
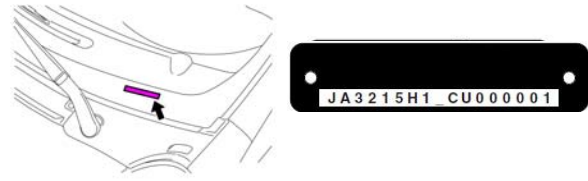
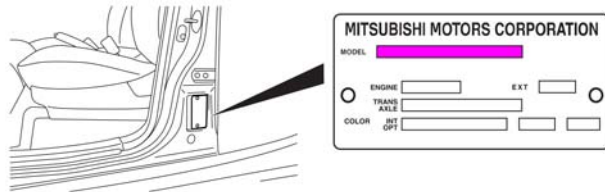
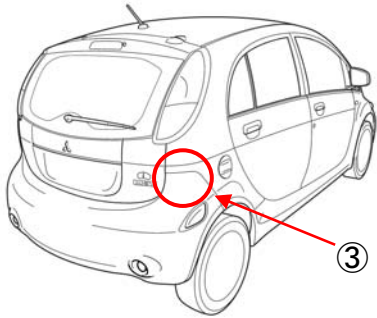
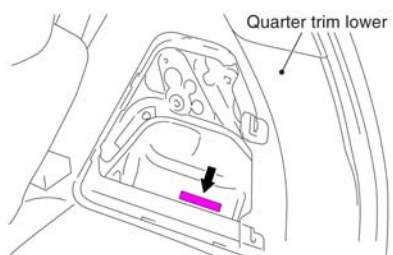
##### (2) Exterior



**(3) Chassis number & Model code**

The Model code is stamped on the "Vehicle identification number plate" and "Vehicle information code plate".

The Chassis number is stamped on the "Quarter Trim".

	<p>① VEHICLE IDENTIFICATION NUMBER PLATE The vehicle identification number (VIN) plate is located on a plate attached to the left top side of the instrument panel. The first 6 digits are "JA3215" for i-MiEV. Ex) Model code stamp : <b><u>JA3215H1_CU00001</u></b></p> 
	<p>② VEHICLE INFORMATION CODE PLATE The vehicle information code plate is riveted to the face of the driver's door sill. i-MiEV includes "HA3W" in the MODEL code. Ex) MODEL code stamp: <b><u>HA3WGLDDL2M</u></b></p> 
 <p>(inside of vehicle)</p>	<p>③ CHASSIS NUMBER The chassis number is stamped on the quarter trim lower panel inside the vehicle. i-MiEV includes "HA3W" in the Chassis number. Ex) Chassis number stamp: <b><u>HA3W-0000010</u></b></p> 

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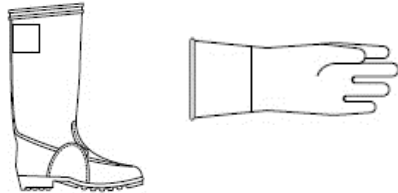
## 5. At the accident site

### (1) Required tools and equipment

Marked ★ items are required. The other items should be available and used as necessary.

- 1) ★ Insulating Personal Protective Equipment (PPE) with a minimum resistance rating of 400V.

Rubber insulating gloves and rubber soled insulating shoes should be worn to help prevent electrical shock while working on high voltage circuits.. PPE pants and jacket are also recommended.



- 2) Organic mask, solvent-resistant gloves (or heavy-duty rubber gloves) and eye protection should be used in case there is electrolyte leakage from the Main drive lithium-ion battery.
- 3) ★ Wrench, size 10mm, to disconnect the negative terminal on the 12V battery.
- 4) ★ Needle-nose pliers, to remove the power control unit fuse.
- 5) Absorption mat and/or sand to help absorb leaking electrolyte or oil.
- 6) Fire extinguisher suitable for flammable liquid and electrical equipment fires.
- 7) Insulating plastic tape which can be used to cover exposed high voltage wiring.



## 6. Rescue Procedures

### WARNING

Inappropriate rescue procedures can increase the risk of serious injury or death to rescuers and/or vehicle occupants. Always follow the instructions described in this manual.

- Always wear insulated Personal Protective Equipment (PPE).
- Never directly touch any exposed high voltage wiring cables, protective covers detached from high voltage components, or high voltage components that might be damaged.
- If fluid leakage is observed under the body, the fluid may be electrolyte leaking from the main drive lithium-ion battery. This electrolyte is flammable and poisonous acid gas will evaporate from the electrolyte. Wear an organic mask, solvent-resistant gloves (or heavy-duty rubber gloves) and eye protection. Use an absorption mat or sand to absorb spilled electrolyte.
- If electrolyte comes into contact with your skin, flush with water immediately.
- If electrolyte gets into your eyes, do not rub your eyes. Immediately flush your eyes with a large quantity of water and seek medical treatment as soon as possible.
- Before starting rescue work, shut off the high voltage circuits in accordance with instructions on the following pages, unless immediate rescue is required.
- Do not assume high voltage components have been shut off simply because the vehicle is quiet.
- If a charge connector is connected to the vehicle, remove it.
- If the damaged vehicle must be left unattended, display a sign indicating that a “HIGH VOLTAGE” condition exists. Refer to the signboard example at the end of this manual.

Colors of fluids used on i-MiEV:

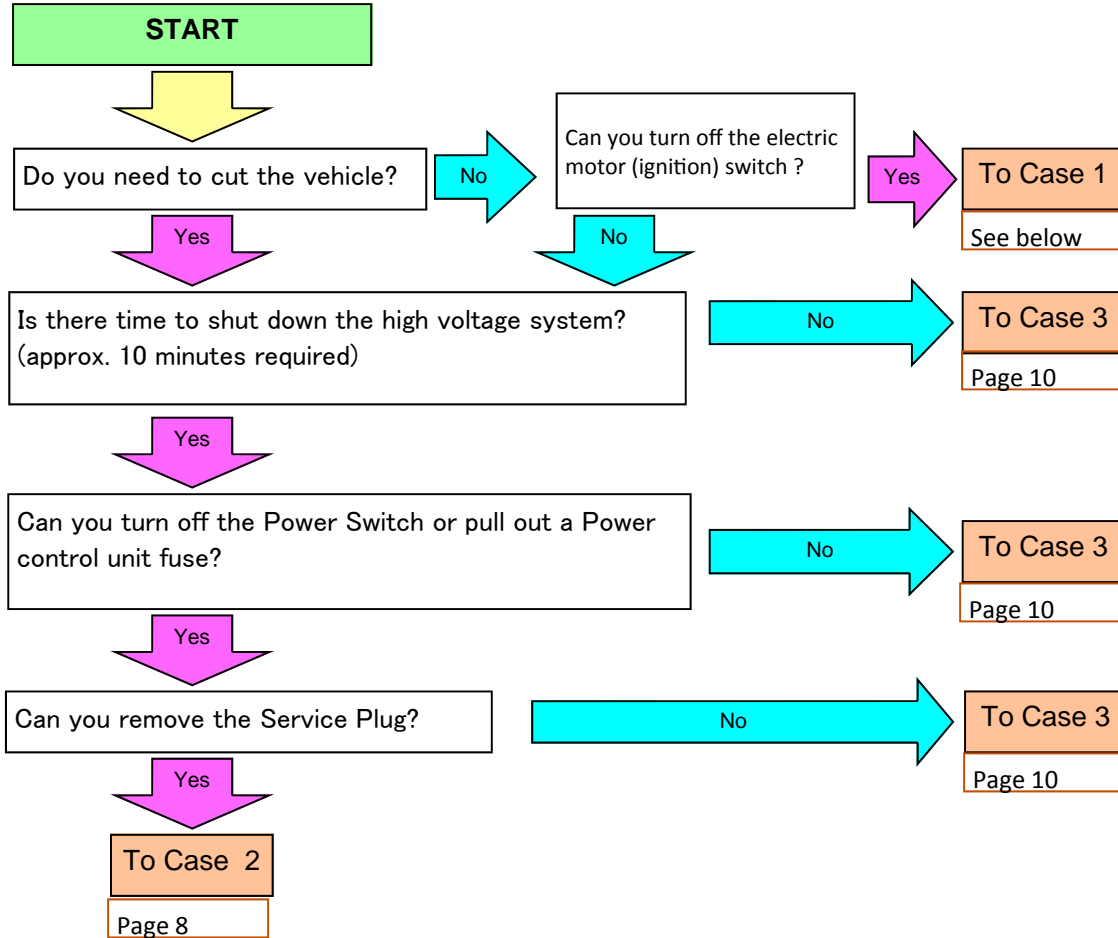
Unit name	Liquid (Fluid) name	Color
Transmission	ATF	Red
Cooling system	Coolant	Blue-green
Heater (Air-conditioning)	Coolant	Blue-green
Brake	Brake fluid	Clear & colorless
Main drive lithium-ion battery	Electrolyte	Clear & colorless
12V battery	Electrolyte	Clear & colorless

(1) **Preparation**

Set the select lever to “P (Parking)” position, apply the parking brake, and install wheel chocks.

**NOTE: When the 12V battery is disconnected or removed, you cannot open the tailgate.**

(2) **Procedures**



The vehicle is submerged → To CASE 4 Page 11

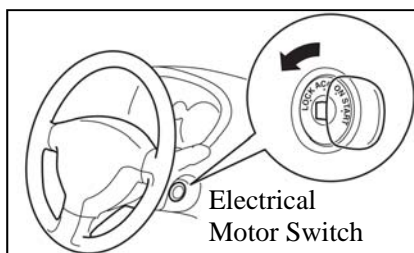
The vehicle is rolled over → To CASE 5 Page 12

The vehicle is on fire → To CASE 6 Page 12

**CASE 1**

**It is not necessary to cut the vehicle body and the high voltage components are intact**

Inspect the vehicle to determine if the high voltage components or wiring have been damaged. Orange-colored wiring cables indicate high voltage components. If large body damage is observed in areas where high voltage components are located, or if an orange-colored cable of high voltage component is exposed, use the CASE 2 procedure described on page 8.

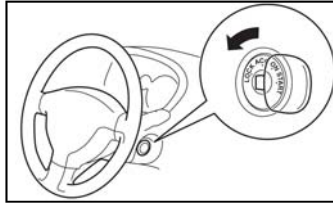


Otherwise, turn the electric motor switch to the LOCK position first. Then you can follow the same rescue actions used with an ordinary internal combustion engine vehicle.

## CASE 2

It is necessary to cut the vehicle body, but immediate rescue is not essential (About 10 minutes is required before actual rescue work can begin.)

- 1) Shut down the vehicle's high voltage system using one of the following two methods. This will disconnect the high voltage electricity current supplied from the main drive lithium-ion battery.

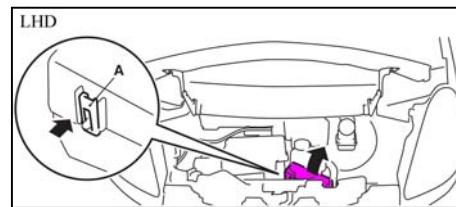


Electric motor switch  
(ignition switch)

- ① Turn the electric motor switch on the steering column to the "LOCK" position.
- ② If it is impossible to turn off the electric motor switch, use needle-nose pliers to remove the Power control unit fuse from the fuse box under the hood. It is the No.7 15A fuse shown in below figure. If you cannot locate this fuse, remove all fuses and relays in the fuse box.



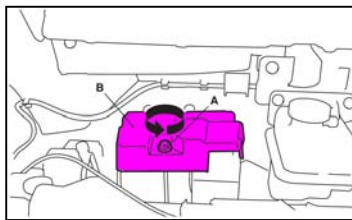
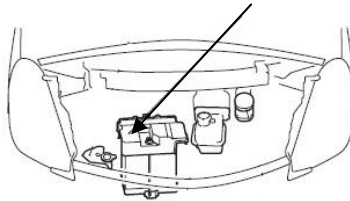
The hood release is under the instrument panel beside the **front passenger's** door.



Pull Fuse No. 7



- 2) Wait at least 1 minute before proceeding to the next step. High voltage system shut down is performed during this waiting time.



- 3) Disconnect the 12V battery negative terminal. This will disconnect the power supply to SRS airbags system and the EV ECU.

Disconnect the 12V battery negative terminal by using a 10mm wrench as follows:

- ① Remove the cover of the 12V battery under the hood. Turn the plastic nut (A) counterclockwise, and then remove the battery upper cover (B).
  - ② Disconnect the negative terminal from the 12V battery.
- 4) If necessary, cut the negative 12V battery cable, then wrap electrical tape to insulate the cable ends.

- 5) Wait at least 5 minutes before proceeding to the next step. High voltage electricity discharging of the SRS air bag system and EV system can be performed after 5 minutes.
- 6) Remove the service plug by following the procedures below.

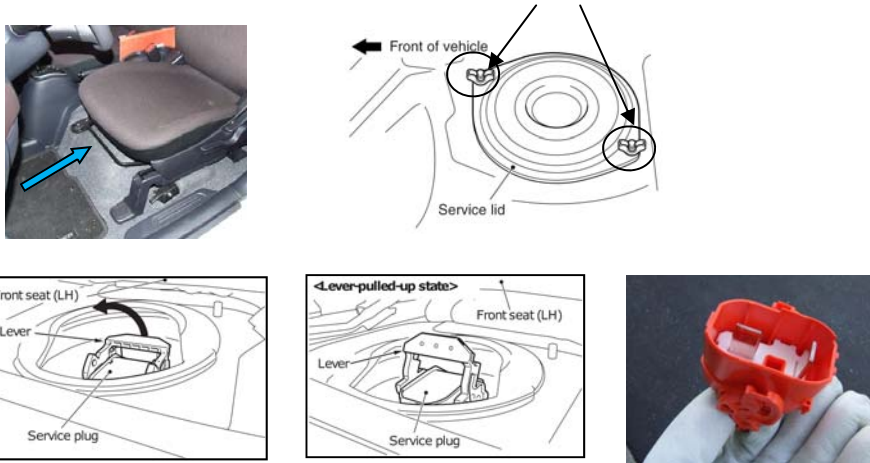
**WARNING**

After disconnecting the 12V battery negative terminal, to avoid the risk of inadvertent air bag deployment, **wait at least 60 seconds**. The SRS air bag system is designed to retain enough voltage to deploy the air bag for a short time even after the 12V battery has been disconnected.

**WARNING**

- Always wear Personal Protective Equipment (PPE) when removing the service plug.
- If the service plug is removed without following the procedures described in this section, a short circuit can occur and melted metal debris may fly from the service plug terminal, resulting in injury to rescuers and/or vehicle occupants.

- ① Adjust the **front left side seat** to its rear most position and roll up the carpet under the seat. Detach the service lid by removing two wing nuts.



- ② Pull up the lever of the service plug and then remove the service plug by pulling upward on the lever.

NOTE: The shape of the plug may vary depending on the model year.

**WARNING**

After removing the service plug, keep it in a secure place away from other rescue workers to prevent any accidental handling.

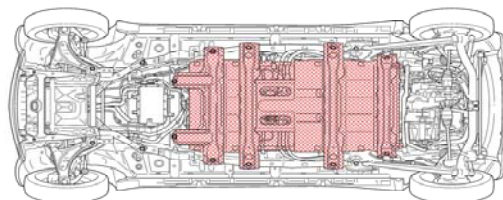
- 7) Begin appropriate rescue action, such as cutting the vehicle body.

**WARNING**

**NEVER** cut the Main drive lithium-ion battery.

Bottom view of vehicle

Shaded area indicates Main drive lithium-ion battery (with under cover removed).






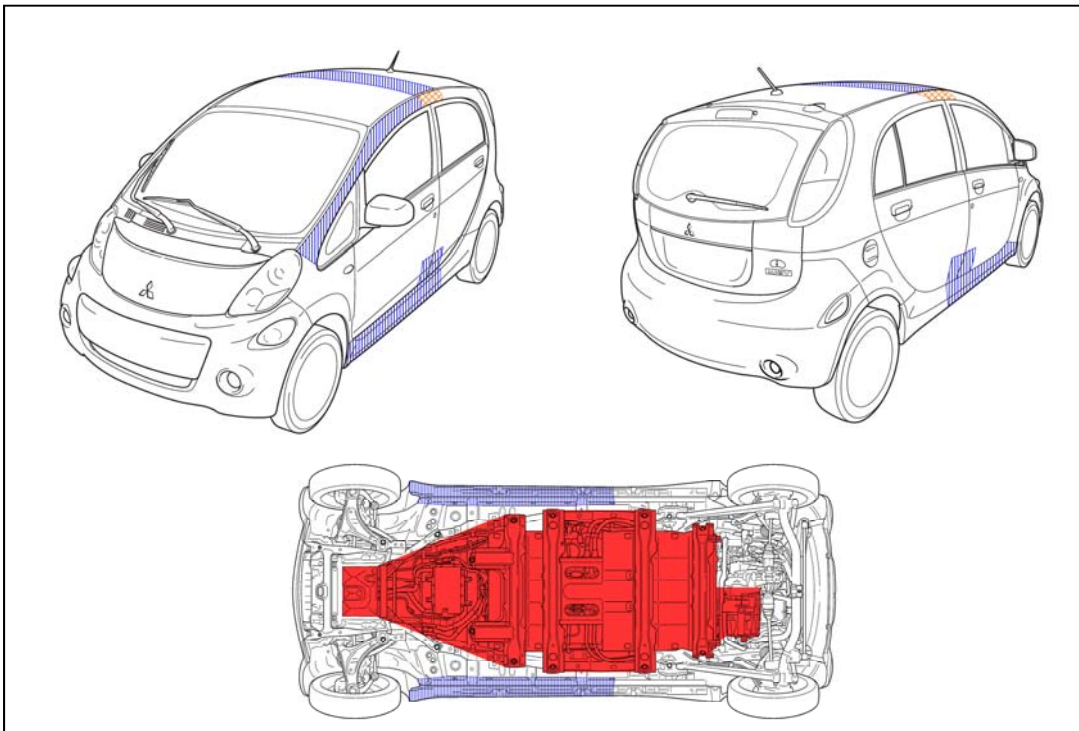
## CASE 3

It is necessary to cut the vehicle body and immediate rescue is essential or the orange-colored high voltage cables are exposed

### WARNING

- Always wear appropriate Personal Protective Equipment (PPE).
- Before cutting the vehicle body, confirm the locations of the orange high voltage wiring, high voltage components, and SRS air bag components shown on page 2 and in the illustrations below.
- **NEVER CUT THE MAIN DRIVE LITHIUM-ION BATTERY, ORANGE HIGH VOLTAGE WIRING, HIGH VOLTAGE COMPONENTS, OR THE SRS AIR BAG COMPONENTS.**

	<b><u>Risk of high voltage shock</u></b> Never cut this area. Risk of serious injury or death.
	<b><u>Risk of curtain airbag deployment</u></b> Never cut this area. It contains a device to generate compressed gases for curtain airbag deployment. If the curtain airbag already deployed, it's possible to cut here.
	<b><u>Risk of side airbag and/or curtain airbag deployment</u></b> Do not cut this area because there is at risk that a side airbag and/or a curtain airbag may deploy due to a short circuit cause by the accident. If both side airbag and curtain airbag have already been deployed, this area can be cut. If at least 1 minute has elapsed after removing the negative terminal of 12V battery or turning off the power switch, it is possible to cut this area.



## CASE 4

### Submerged vehicle

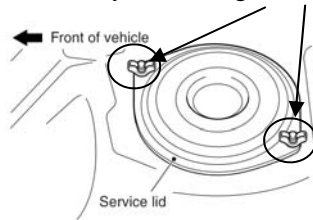
When a vehicle is submerged, flammable hydrogen gas may be generated from the main drive lithium-ion battery. Flush the inside of the main drive lithium-ion battery using the following procedures.

#### WARNING

- Never pour seawater or any water containing salt into the Main drive lithium-ion battery. This can result in sudden electrolyzing, which generates a large volume of flammable hydrogen gas.
- To reduce the risk of fire, the vehicle should be kept in a well-ventilated outside location with all windows open for at least 72 hours after being removed from the water.

- 1) Inspect the vehicle for damage. If you find serious damage to the vehicle and/or the main drive lithium-ion battery is deformed/damaged or the battery internals are exposed, wear appropriate personal protection equipment (PPE). Never touch the main drive lithium-ion battery.
- 2) After pulling the vehicle out of the water and draining the water from the cabin, remove the service lid while wearing Personal Protective Equipment (PPE).

- ① Move the **front left seat** to its rearmost position and roll up the carpet under the seat. Detach the service lid by removing two wing nuts.



- ② Flush at least 8 gallons (30 liters) of non-saline water (water not containing salt) through the service lid hole.

## CASE 5

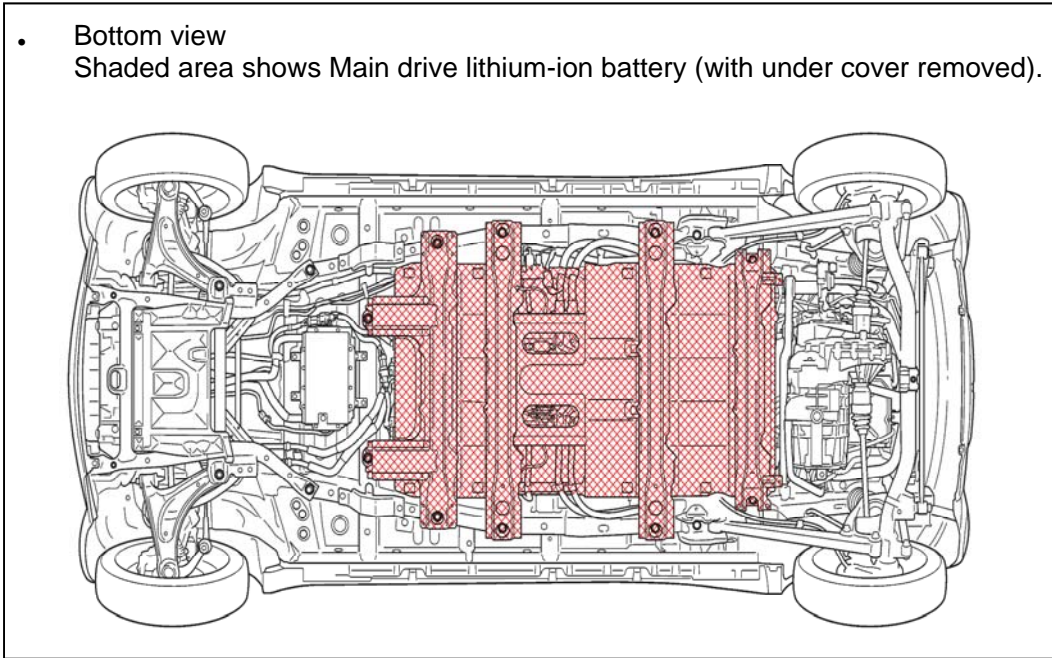
### Before righting a rolled over vehicle

Inspect the area for debris or objects that could damage the Main drive lithium-ion battery when the vehicle is righted. Right the vehicle slowly, taking care not to contact or damage the main drive lithium-ion battery.

#### **WARNING;**

If the main drive lithium-ion battery is damaged, electrolyte can leak from the battery and possibly cause a short circuit. If you see electrolyte leaking or observe damage to the battery, wear appropriate personal protection equipment (PPE).

- Bottom view  
Shaded area shows Main drive lithium-ion battery (with under cover removed).



## CASE 6

### Vehicle fire

In case of vehicle fire, alert the fire department immediately and start extinguishing the fire using the following procedures where possible.

- 1) By fire extinguisher  
Use a fire extinguisher which is suitable for flammable liquid and electrical equipment fires.
- 2) By water  
A large volume of water, such as from a fire hydrant must be used. DO NOT attempt to extinguish the fire with a small amount of water. If a small amount of water contacts the inner portion of the main drive lithium-ion battery, a short circuit can occur causing the release of toxic gas.

## 6. Transporting a damaged vehicle

### (1) If the vehicle can be driven

You can drive the damaged vehicle for transportation purpose if there is no significant damage to the vehicle. Do not drive if any of the following conditions are evident:

- High voltage components and/or wiring cables are damaged.
- Electric motor (electric motor unit), transmission, brakes, suspension, and/or tires are damaged.
- Oil and/or cooling water are leaking.
- “READY” indicator lamp does not illuminate in the instrument panel after turning on the electric motor switch, with the selector lever in the “P (Parking)” position and with the foot brake applied.

If the “READY” indicator lamp turns off and/or EV related warning lamps turn on in the instrument panel, or if you find an abnormal noise, smell and/or strong vibration from the vehicle during driving, the following procedures should be carried out:

- ① Stop the vehicle as soon as possible in a safe location.
- ② Set the selector lever to “P (Parking)” position and apply the parking brake.
- ③ Turn the electric motor switch to the “LOCK” position.
- ④ Wait at least 1 minute, then disconnect the 12V battery negative terminal. Then wait 5 minutes.
- ⑤ Wearing Personal Protective Equipment, unplug the service plug. Refer to page 9 for details.
- ⑥ Transport the vehicle using a tow truck.

### (2) If the vehicle cannot be driven

#### WARNING

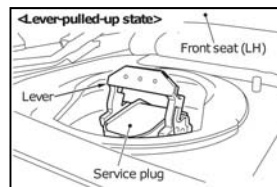
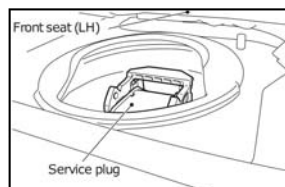
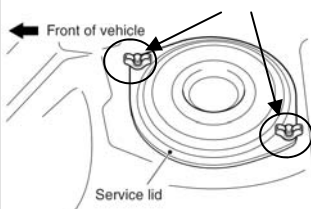
- Always wear Personal Protective Equipment (PPE) when removing the service plug.
- If the service plug is removed without following the procedures described in this section, a short circuit can occur and melted metal debris may fly from the service plug terminal, resulting in injury to rescuers and/or vehicle occupants.

- ① Shut off the high voltage circuits by turning the electric motor switch to the LOCK position, or by removing the #7 fuse from the fuse box before towing (see page 8).
- ② Remove the service plug as follows:



a. Move the **front left seat** to its rearmost position and roll up the carpet under the seat. Detach the service lid by removing two wing nuts.

b. Pull up the service plug lever and then remove the service plug by pulling upward on the lever.





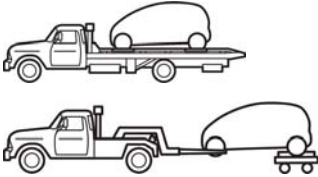
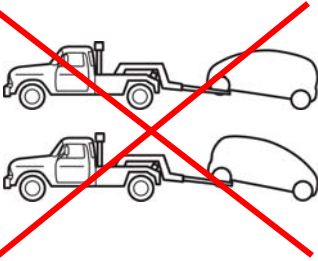
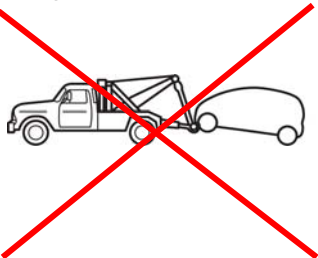
**WARNING**

Wait at least 5 minutes after removing the service plug before proceeding to the next step.

- c. Towing instructions are described below.

**(3) Towing the vehicle**

**Transport the vehicle on a flatbed truck or tow the vehicle with all wheels off the ground.**

	Carrying method	Remarks
Acceptable	Lift up all 4 wheels 	Carry the vehicle with the selector lever in the "P (Parking)" position and the parking brake applied.
Not acceptable	Lift up either front or rear wheel 	Carrying the vehicle with rear wheels on the ground could cause vehicle fire due to short circuit by the electricity generated from the electric motor (electric motor unit) through rolling rear wheels on the ground.  Do not carry the vehicle with front or rear wheel lifted up.
Not acceptable	Hang front wheel 	Do not carry the vehicle by a truck with sling-type towing devices. Bumper and/or body damage may result.

**WARNING:**

Never tow the vehicle with the rear wheels (drive wheels) on the ground. It could cause damage to the electric motors. Also this may cause a fire if wiring in the electric motor unit room becomes damaged.

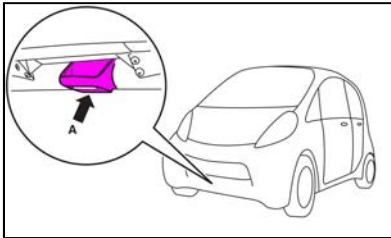
- When loading the vehicle on the truck, handle carefully to prevent further damage.

#### (4) Towing by tow rope (for emergency situations only)

##### **WARNING**

Towing the vehicle with the rear wheels on the ground may cause vehicle fire due to short circuit by the electricity generated from the electric motor (electric motor unit).  
If there is no other alternative, and you must tow the vehicle using a tow rope, the vehicle speed must not exceed 18 mph (30 km/h) and the towing distance must be minimized.  
While towing, set the selector lever to "N (Neutral)" position.

- 1) Set the tow rope on the towing hook (A) of the body.
2. Turn the electric motor switch to the **ACC** position.



3. Set the selector lever to "N" (Neutral) position.
4. Turn on the hazard lamps to provide warning to other vehicles.

##### **CAUTION**

When the electric motor unit is stopped, braking efficiency is reduced and steering effort increases. If the electric motor switch is in the "LOCK" position, it is impossible to use steering due to steering lock function and it could cause an accident.  
Ensure there is proper tension in the tow rope at all times during towing to avoid breakage of the tow rope or the towing hook and to avoid injury to bystanders or vehicle damage.

- If you find an abnormal noise, smell and/or strong vibration from the vehicle while towing, stop towing and carry out the following procedures:
  - ① Stop the vehicle as soon as possible in a safe location.
  - ② Set the selector lever to "P" (Park) position and apply the parking brake.
  - ③ Turn the electric motor switch to the "LOCK" position.
  - ④ Wait at least one minute, then disconnect the 12V battery negative terminal. Then wait 5 minutes.
  - ⑤ Wearing Personal Protective Equipment, unplug the service plug. Refer to page 9 for details.
  - ⑥ Transport the vehicle using a tow truck.

**DO NOT TOUCH!  
DANGER!  
IN PROGRESS!!  
HIGH VOLTAGE WORK**

**HIGH VOLTAGE WORK  
IN PROGRESS!!  
DANGER!  
DO NOT TOUCH!**

\*When doing high-voltage work, please display this signboard,  
Fold on the dotted line, and place it on the roof of the vehicle.



It is recommended that a warning sign (example provided above) is fixed to or on the vehicle during any emergency work on the vehicle. A sign that complies with local regulation should be used.

