

Emergency Procedure Manual

(For Europe)

2011-9

MITSUBISHI MOTORS

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 an electrical shock due to the high voltage battery installed on i-MiEV.

Please read and understand this manual carefully for your and the passengers safety.

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 the change of vehicle specification.

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1. Safety precaution for handling high voltage

Since i-MiEV has a high voltage circuit with maximum 330V Lithium-ion battery for the electric motor unit and other components, it is necessary to ensure “isolation” and “cut off” from the high voltage circuit in order to prevent the risk of electric shock before handling the vehicle.

(1) Isolation from the high voltage circuit

1) The high voltage circuit is insulated from the vehicle body.
2) All of high voltage components are covered up by cases/cover and high voltage wiring cables can be distinguished from normal wiring harness by their orange coloured insulation.
3) Cases of high voltage components are insulated from high voltage circuit inside.

(2) Disconnection of the high voltage circuit

i-MiEV has been designed so the high voltage current supplied from the traction battery can be isolated. This is required when it is necessary to isolate the high voltage circuit, e.g. during vehicle inspection, maintenance and/or traffic accidents.

<Disconnection mode >

Case / System	Manual mode	Automatic mode	
	Service plug	Electric motor switch linked	Collision sensing
Normal usage	N/A	Available	N/A
Inspection and maintenance	Available	Available	N/A
Crash	N/A	N/A	Available

(3) Precautions when rescuing passengers

CAUTION;

Please handle the vehicle in accordance with the instructions provided throughout this manual to reduce the risk of injury from electric shock.

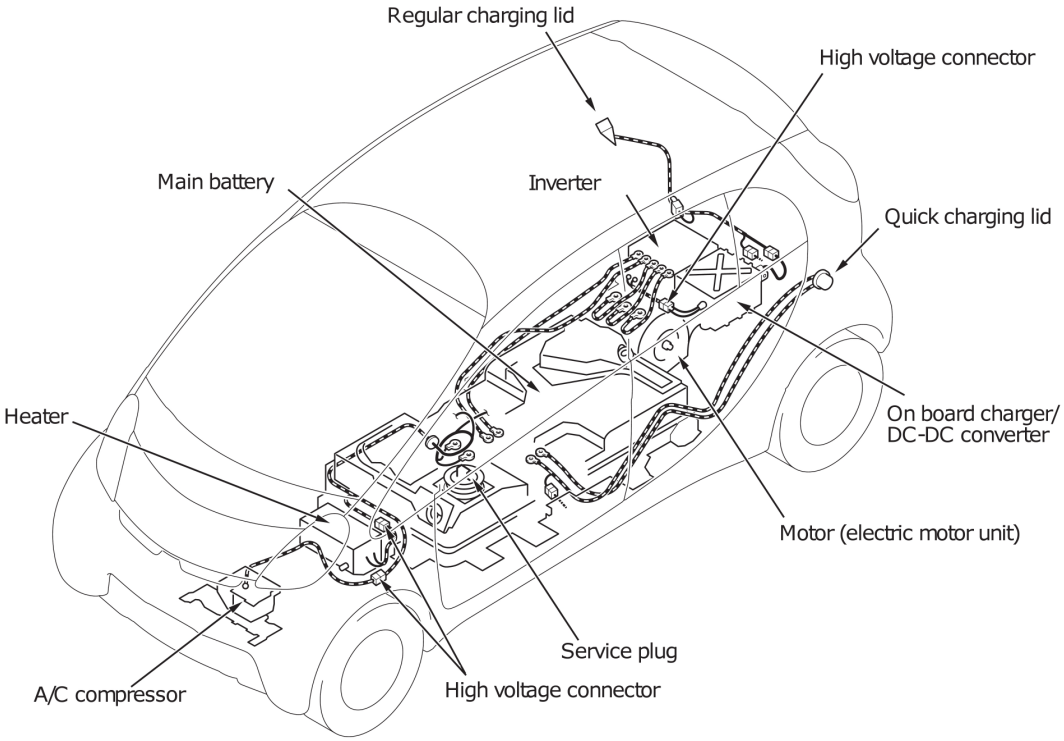
Points to note are::

(1) This vehicle uses maximum 330V high voltage circuit.
(2) Traction battery uses an electrolyte made of flammable “Carbonate ester solution of lithium salts”. When reacting with moisture in the air, this electrolyte generates acidic organic vapor which is harmful to human body.
Therefore when handling this, please use appropriate Personal Protective Equipment (PPE) including organic mask, solvent resistance gloves and eye protector and use appropriate caution.
(3) The possibility of a high volume electrolyte leak as a result of traction battery damage is reduced by the construction inside the traction battery.

2. High voltage components layout

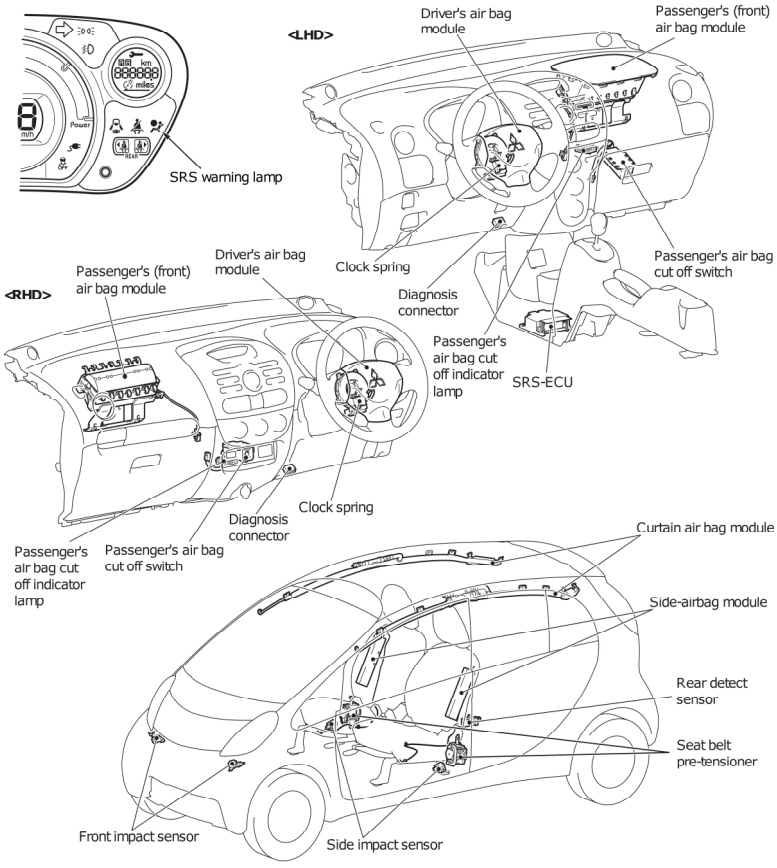
(1) Position of High voltage components and wiring cable

High voltage components and wiring cables are located as shown in the figure below.



(2) SRS airbags system

SRS airbags system (location of airbags and related wiring harness) are located as show in the figure below:



3. Exterior features to identify i-MiEV.

i-MiEV was developed from the petrol engine version of Mitsubishi's i-Car which has been distributed to global markets. Both gasoline powered and EV versions of i-Car have a similar exterior design.

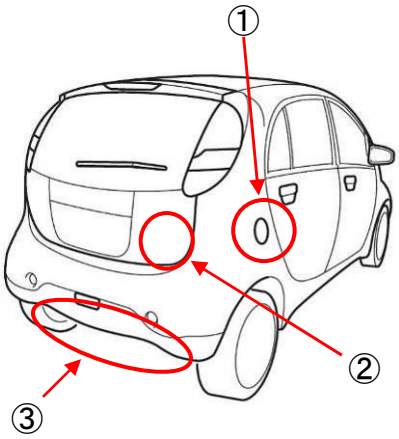
If you find i-MiEV feature listed in the below, please handle using the appropriate Personal Protective Equipment (PPE) and only the methods described in this manual.

WARNING;
Use insulating Personal Protective Equipment (PPE) (Rubber insulating gloves, Rubber soled insulating shoes: rated to a minimum of 400V voltage resistance), when contact with the vehicle body is possible,

(1) List of i-MiEV features

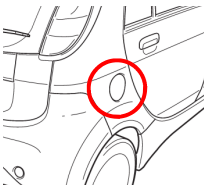
MiEV logo mark, Regular charging lid, Absence of exhaust pipe, Chassis number

(2) Exterior

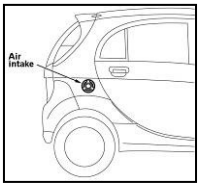


① Regular charging lid (Right side of vehicle)
i-Car petrol engine version has an air intake for engine at the same location.

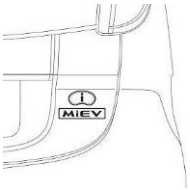
i-MiEV



(Ref.) i-Car petrol engine version

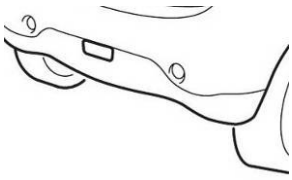


② MiEV logo mark
MiEV logo mark is indicated on right side of tailgate.





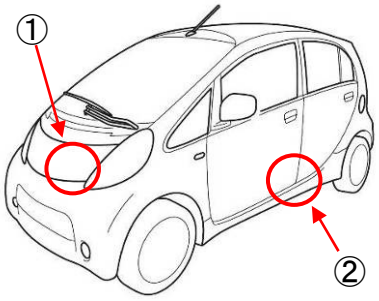
③ Absence of exhaust pipe
i-MiEV does not have an exhaust pipe.
(Petrol engine version i-Car has the exhaust pipe under rear bumper on right side)



(3) Chassis number & Model code

The Model code is stamped on the “Vehicle information code plate”.

The Chassis number is stamped on the “Manufacture’s Plate” and “Quarter trim”.

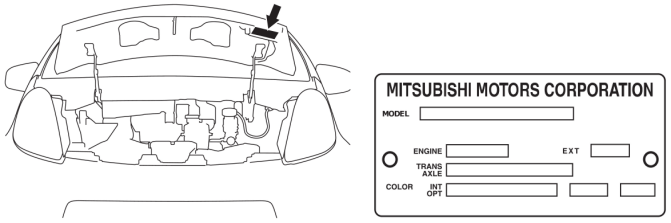


① Vehicle information code plate

The model code is stamped on this plate.

The first 4 digits are “HA3W” for i-MiEV.

Ex) Model code stamp : **ZAA<u>HA3W</u>LDD**



② Manufacture’s Plate (Caution plate)

(Centre pillar, passenger side)

This chassis number is stamped on this plate.

i-MiEV includes "HA3W" in the Chassis number.

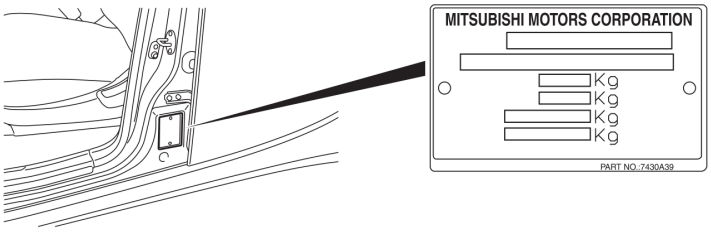
Ex) Chassis number stamp:

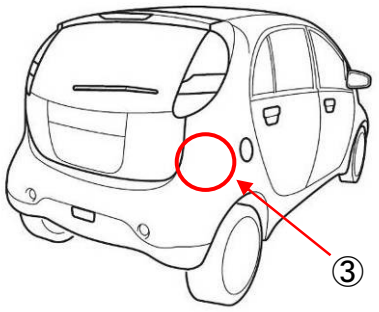
European spec. :

JMALD<u>HA3W</u>BU000001

Japanese spec. :

<u>HA3W</u>-0000010





③ Vehicle Identification Number (Chassis number)

(Inside of quarter trim in luggage area)

The chassis number is stamped on the quarter trim lower panel.

i-MiEV includes "HA3W" in the Chassis number.

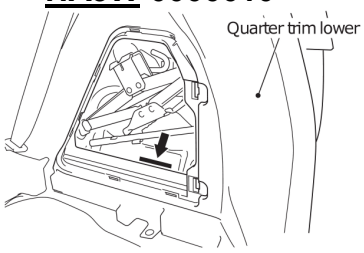
Ex) Chassis number stamp:

European spec. :

JMALD<u>HA3W</u>BU000001

Japanese spec. :

<u>HA3W</u>-0000010



4. Consideration points the vehicle at the accident site

The following precautions need to be observed when you handle the vehicle at the accident site.

(1) Required tools and equipment

Marked ★ items must be available and used. The other items to be available, if necessary.

1) ★ Insulating Personal Protective Equipment (PPE) [minimum 400V voltage resistance]
Rubber insulating gloves and Rubber sole insulating shoes (as a minimum, pants and jacket also recommended.
For prevention of electric shock while working on high voltage circuit/s.

2) ★ Double-end-wrench（size 10 x 12mm）.
To be used to loosen.

① The 2 nuts (12mm) fastening service lid to access and unplug the service plug.

② To disconnect the auxiliary battery negative terminal (10mm).

3) Organic mask, Solvent resistance gloves (or heavy-duty rubber gloves) and eyes protector.
For use when the electrolyte is leaking from the traction battery.

4) Absorption mat, sand.
For absorbing the electrolyte leakage.
An absorption mat (that is effective to absorb fuel and/or oil) and/or sand need to be available.

5) Fire extinguisher.
Fire extinguisher that is suitable for flammable liquid and electrical equipment fires is required.

6) Insulating plastic tape.
For insulating the electric circuit and tools if these are damaged.

(2) Precaution measure at the accident site

WARNING;
Use insulated Personal Protective Equipment (PPE) [Rubber insulating gloves, Rubber sole insulating shoes rated at a minimum 400V voltage resistance], in case contact with the vehicle body is possible.

1) Always wear insulated Personal Protective Equipment (PPE) while working.
2) Do not directly touch any exposed high voltage wiring cables, any disconnected or protective covers or high voltage components that might be damaged.
3) If you find fluid leakage under the traction battery, it could possibly be an acidic evaporative emission generated by the electrolyte. Wear Organic mask, Solvent resistance gloves (or heavy-duty rubber gloves) and Eye protection, then absorb the liquid with an absorption mat or sand.
   The electrolyte is flammable liquid. and appropriate caution should be used
   (The electrolyte is clear & colourless and with a slightly sweet odour. It has similar viscosity to water).

WARNING;
When electrolyte is leaking, you should put on Organic mask, Solvent resistance gloves and Eye protection.
If the electrolyte comes into contact with your skin, flush with water immediately,.
If the electrolyte gets into your eyes, don't rub your eyes and flush with large quantity of water immediately.
Then, consult an ophthalmologist.

4) If there is a possibility that high voltage components and wiring are damaged, cut off the high voltage circuit in accordance with the instruction in Article 5-(3). Please refer to the location of high voltage components and wiring cable in (1) and (2) of Article 2.

CAUTION;
DO not leave the vehicle unattended if the accident scene or vehicle is not safe for bystanders. When emergency work has been completed and attendants will be leaving the damaged vehicle, please inform any bystanders of the danger by installing a warning sign explaining "HIGH VOLTAGE" condition exists (Please refer the signboard example at the end).

Reference) List of color of fluid each unit

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
Traction battery	Electrolyte	Clear & colorless
12V battery	Electrolyte	Clear & colorless

5. The procedure to rescue passengers

There could be a serious risk of electric shock to the passengers and the rescuer if handled incorrectly.

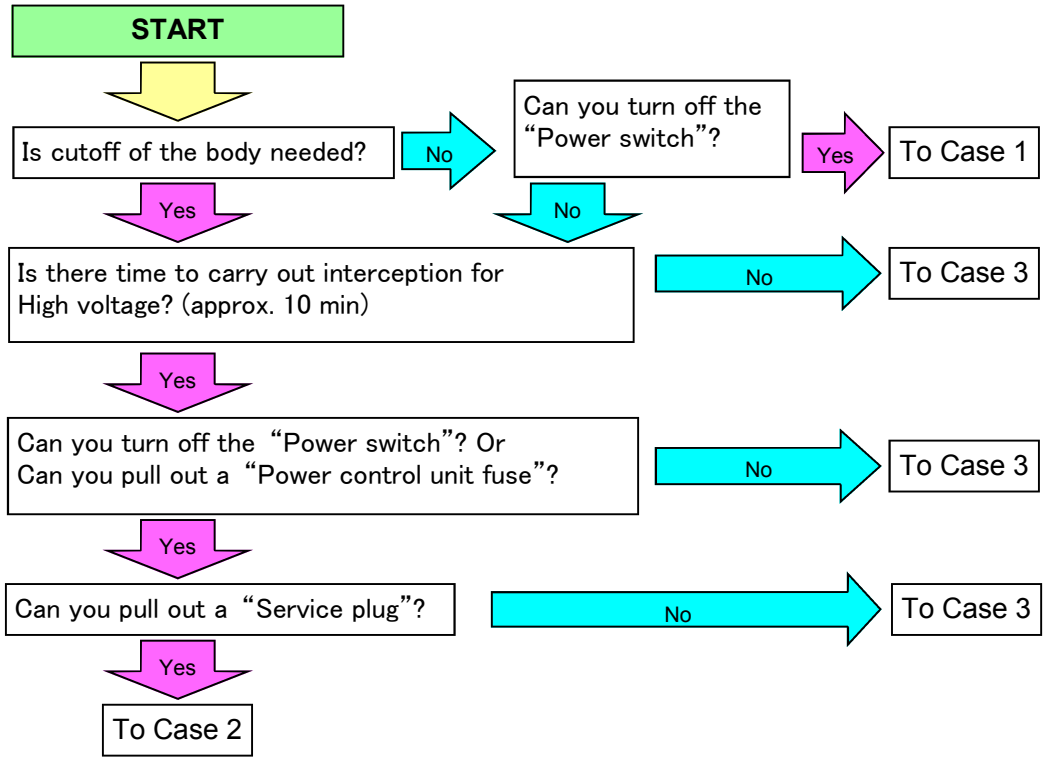
WARNING;
Use insulated Personal Protective Equipment (PPE) (Rubber insulating gloves and rubber sole insulating shoes as a minimum: rated to a minimum of 400V voltage resistance), in case contact with the vehicle body is possible.

(1) Preparation

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

CAUTION;
Please note that when the auxiliary battery is removed, you cannot open the tale gate

Flowchart to divide the case of operation procedures



(2) Case1 :

Not necessary to cut the vehicle body or isolate the high voltage circuit

Check the vehicle damage to assess whether high voltage components or wiring has been damaged.
Orange-coloured wiring cables indicates high voltage circuits and cables
After high voltage wiring cables are checked and are confirmed to not be exposed, it is safe to commence appropriate rescue actions
If it is necessary to remove window glass and/or doors, use the same process as used for ordinary vehicles.

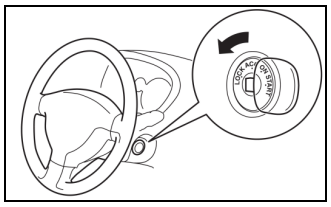
CAUTION;
When an orange-coloured wiring cable or high voltage components is exposed,
please refer Case 2.
If cutting the vehicle body is necessary for rescue operations, please refer to Case 2 or 3.

(3) Case2:

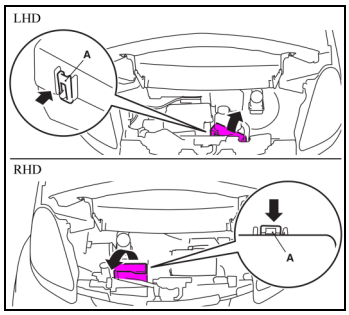
It is necessary to cut the vehicle body, but immediate rescue is not essential
(About 10 minutes preparation time is required.)

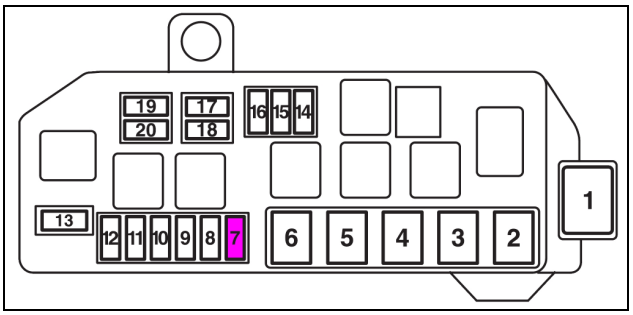
1) Shutdown the vehicle's EV system using one of the following 2methods:
(For disconnecting the High voltage electricity current supplied from traction battery.)

① Kill the electric motor unit, by turning off the electric motor switch on the steering column to "LOCK" position.



② If it is impossible to turn off the electric motor switch,
remove the "Power control unit" fuse (No.7 15A fuse shown in below figure)
from the fuse box under the bonnet.
If you cannot find the fuse, remove all fuses and relays in the fuse box.



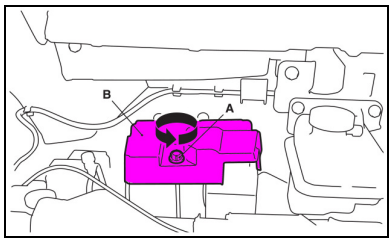


2) Wait at least 1 minute, before proceeding to the next step.
Shut down of an EV system is performed in this waiting time.

3) Disconnect the auxiliary battery negative terminal.
This will disconnect the power supply to SRS airbags system and discharge the high voltage electricity of the EV system.

- Disconnect auxiliary battery negative terminal.
Disconnect auxiliary battery negative terminal by using a 10mm spanner by following the procedure below.

① Remove the cover of auxiliary battery under the bonnet.
Turn the plastic nut (A) anticlockwise, and then remove the auxiliary battery upper cover (B).



② Disconnect negative terminal from auxiliary battery.

CAUTION;
Since SRS-ECU capacitors retain required voltage until approx. 1 minute after power disconnection. This means airbag deployment function is still possible, If you proceed to the next step without waiting for this time period, there is potential for a serious injury due to inadvertent airbag deployment (inflation).

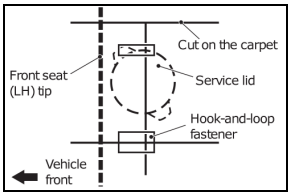
4) Please wait at least 5 minutes before proceeding, to wearing Personal Protective Equipment (PPE), remove the service plug by following procedure to disconnect the high voltage circuit in the traction battery.

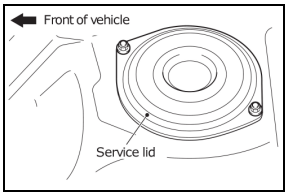
WARNING;
There are some high voltage components and wiring cable which retain high voltage for 5 minutes after removing service plug.
When it is necessary to cut the high voltage components and wiring cable, wait for at least 5 minutes after the process of cutting off the high voltage circuit, before commencing the next action.

WARNING;
When removing service plug, please wear Personal Protective Equipment (PPE).

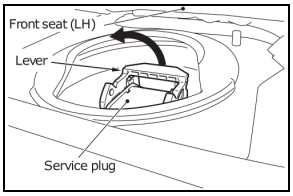
Procedure to remove service plug

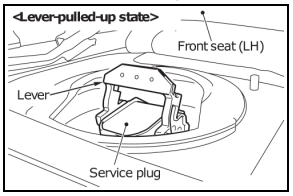
① Slide the front left side seat (LHD : Driver seat / RHD : Passenger seat) to its rear most position and roll up the carpet under the seat.
After remove the service lid (12mm x 2 Nuts or Butterfly nut x 2 Nuts)



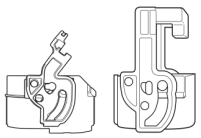


② Whilst wearing Personal Protective Equipment, unplug the service plug.
- Pull up the lever of service plug.
- Pull the service plug upwards to remove.
  (Shape varies depend on a model year)



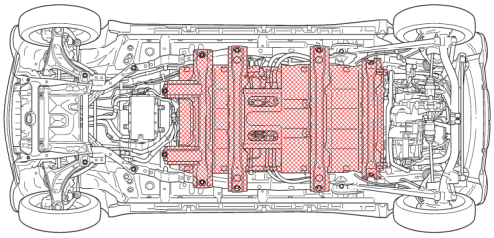


Shape of Service plug



5) Please begin an appropriate rescue action such as cut off of the vehicle body.
- NEVER CUT THE TRACTION BATTERY ITSELF.
- It is possible to cut the body part except TRACTION BATTERY.

The bottom view
Coloured area shows traction battery. (With under cover removed).



WARNING;
If the service plug is removed without observing the proper procedure above, it could cause injury such as burn wound, to rescuers due to the flying pieces of melted metal of service plug terminal, caused by short circuit
NEVER cut the traction battery itself.

(4) Case3：

It is necessary to cut the vehicle body and immediate rescue is essential or in case of the orange-coloured high voltage wiring cables are exposed

- Pre-checking

  Cut the vehicle body after carefully checking both page 2 and this page in this manual.

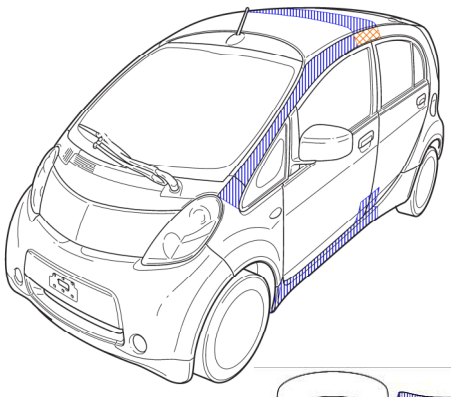
- Precautions when cutting the vehicle body

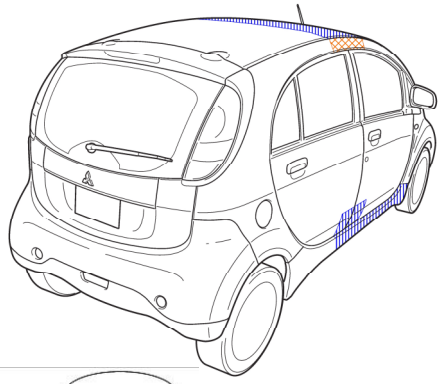
WARNING;
Use an appropriate cutting machine that will not spark, otherwise it could cause serious injury to passengers and rescuers.
In addition, please avoid cutting the area shown below (shaded) and avoid touching any exposed orange-coloured electric wiring cable

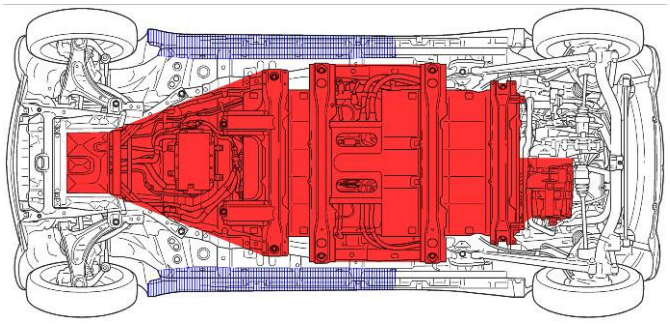
WARNING;
NEVER CUT THE TRACTION BATTERY ITSELF.

Do not cut the areas coloured (shaded) to prevent the risk of a high voltage electric shock and deployment of SRS airbags system.

	Part at risk of shocking by high voltage Never cut this area because of any risk of fatal damage.
	Part at risk of curtain airbag deployment Never cut the this area. Because there is a device to generate compressed gases for curtain airbag deployment. But if a curtain airbag was already deploying, it's possible to cut here.
	Part at risk of Side airbag and/or Curtain airbag deployment Do not cut this area because there is at risk that a side airbag and/or a curtain airbag to be deployed by short circuit in wiring harness or any impact to the body. If both Side airbag and Curtain airbag have already been deployed, it can be cut. If it has already been 60 seconds after removing the negative terminal of 12V battery or turning off the “Power switch”, it’s possible to cut this area.







(5) Case4：

Submerged vehicle

When a vehicle was submerged, there is a possibility that a battery is flooded.
Therefore please deal with the following points.

1) Work procedure

① Vehicle retrieval

Check the vehicle damage first.
If you find serious damage on the vehicle and find the traction battery deformed/damaged or battery internals exposed, wear insulating protection, handle carefully and avoid touching the traction battery.

② Procedure following vehicle retrieval

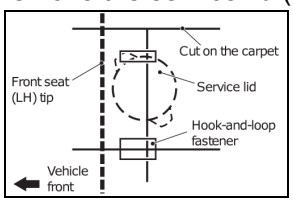
After removing the vehicle from the water and draining the water from the cabin, remove the service plug whilst wearing Personal Protective Equipment (PPE) [rubber insulating gloves, rubber soled insulating shoes rated to a minimum 400V voltage resistance].
Then fill up the water via the traction battery's service lid using de-ionised water.
Monitor and maintain this water level for at least 72 hours.

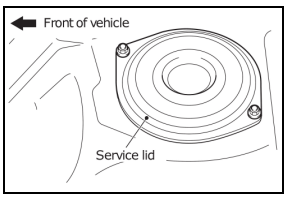
WARNING;
Do not pour seawater into Traction Battery because this may result in sudden electrolyzing which generates a large volume of hydrogen which is highly flammable.
When seawater penetrates the traction battery, thoroughly flush the seawater out of the traction battery using de-ionized water under pressure.

CAUTION;
As electrolytically-generated hydrogen will be produced within the traction battery internals for approx. 72 hours after filling the water, the vehicle should be kept in a well ventilated area located outside with all windows open to reduce the risk of fire.

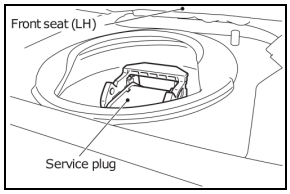
2) Procedure to fill up the water into the traction battery

① Slide the front left side seat (LHD : Driver seat / RHD : Passenger seat) to its rear most position and roll up the carpet under the seat.
Remove the service lid (12mm x 2 Nuts or Butterfly nut x 2 Nuts)





② Add water through the service lid hole.



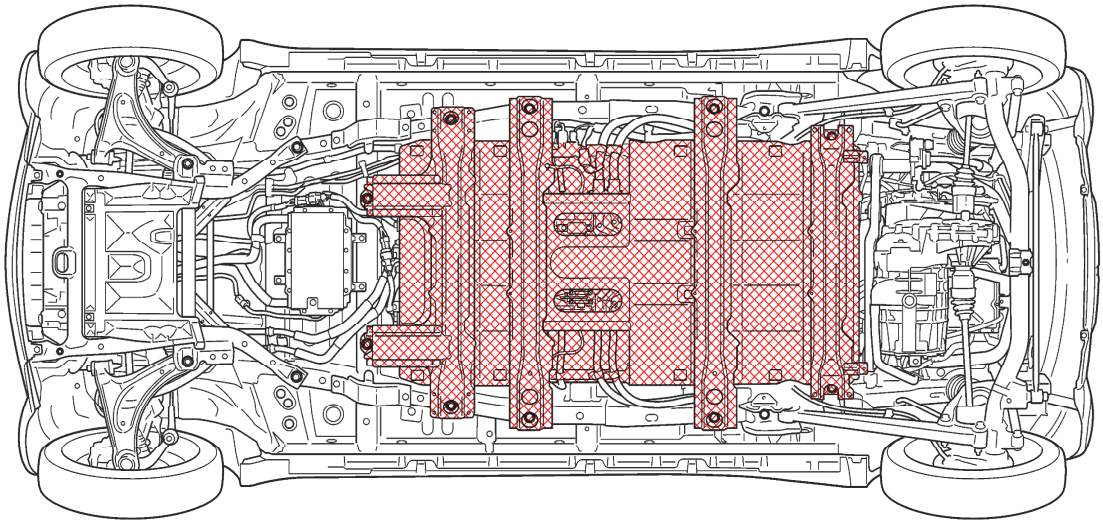
(6) Case5:

Re-inverting a rolled vehicle

Check that there is no projection on the road and re-right the vehicle slowly and carefully, avoiding contact with the traction battery under the floor.

WARNING;
If a traction battery is damaged, be careful of leakage of electrolyte and short circuit.

The bottom view
Coloured area shows traction battery. (With under cover removed).



(7) Case6:

Vehicle fire

In case of vehicle fire, inform fire department immediately and start extinguishing the fire if possible.

1) By fire extinguisher
Use a fire extinguisher type which is suitable for flammable liquid and electrical equipment fires.

2) By water
NEVER EXTINGUSH BY SMALL VOLUME OF WATER. It is quite dangerous.
This is only possible if you can use a large volume of water (e.g. from fire-hydrant), otherwise wait for fire department to arrive on the scene.

6. Transportation of the damaged vehicle

(1) Possible to drive

You can drive the damaged vehicle for transportation purpose provided 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 (meaning ready to drive) 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 procedure 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 off the electric motor switch to “LOCK” position.
④ Disconnect auxiliary battery negative terminal at least 1 minute later.
⑤ Whilst wearing Personal Protective Equipment, unplug the service plug.
(at least 5 minutes after disconnecting the auxiliary battery negative terminal)

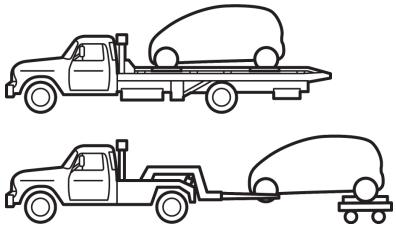
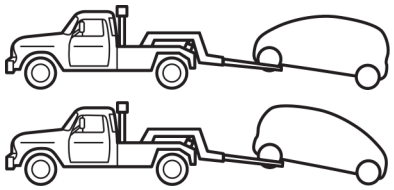
When driving the damaged vehicle is not possible, please be sure to remove after high voltage is cut off by a procedure of Article 5 Case 2 on page 8.
The transportation instruction follows.

WARNING;
Always wear suitable Personal Protective Equipment when you unplug the service plug!

(2) Transportation of the accident car (vehicle) by tow truck

When the tow truck is used for the transportation of the damaged vehicle, all four wheels should be elevated.

WARNING;
If the damaged vehicle is carried with the rear wheels on the ground, it could cause vehicle fire due to short circuit by the electricity generated from the electric motor (electric motor unit) being driven by the rear wheels.

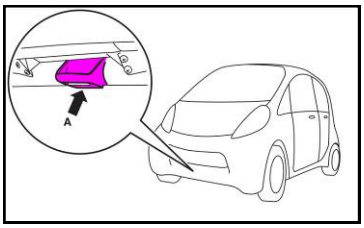
	Carrying method	Remarks
Acceptable	Lift up all wheels 	・ Carry the vehicle with the selector lever in the “P (Parking)” position and the parking brake applied.
Not acceptable	Lift up either front or rear wheel 	・ Carrying the vehicle with rear wheels on the ground could cause vehicle fire due to short circuit by the electricity generated from the electric motor (electric motor unit) through rolling rear wheels on the ground. ・ Do not carry the accident vehicle with keeping either front or rear wheel lifted up, because this transportation method is unstable.
Not acceptable	Hang front wheel 	・ Do not carry the accident vehicle by a truck with sling-type towing devices because a bumper and/or a body may become damaged.

・ Figure shows examples of carrying statement.
・ When loading the vehicle on carrier, please handle carefully in order to not damage the vehicle further.

(3) Towing by tow rope

WARNING;
Depending on the vehicle damage, carrying 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 alternative to towing the vehicle using a tow rope, the vehicle speed must not exceed 30km/h and the 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 While towing, turn on the electric motor unit if possible.
If this is not possible, turn on the electric motor switch to ACC.

③ The regulations concerning towing may differ from country to country. It is recommended that you obey the regulations of the area where you are towing the vehicle.

CAUTION;
When the electric motor unit is stopped, the brake 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.
Driver of the towed vehicle to look at the stop lamp of the towing vehicle carefully and ensure tension in the tow rope at all times.

④ Set the selector lever to “N (Neutral)” position.

⑤ Turn on the hazard lamp to provide warning to the other road users.

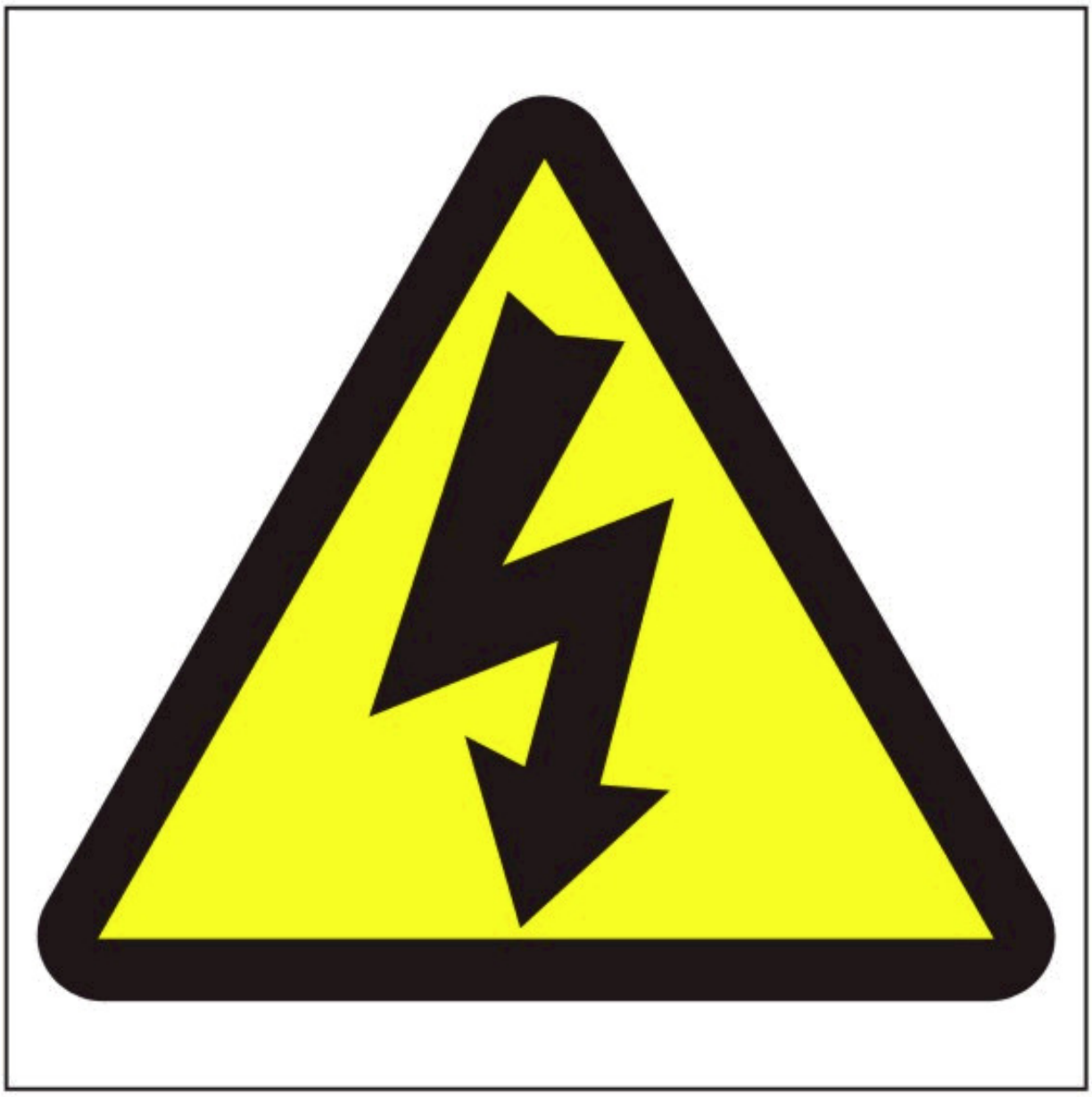
WARNING;
Prevent driving in such a way that may cause high tension in the tow rope and towing hook as this could cause breakage with the potential to cause serious injury to bystanders.

- Please tow carefully taking precautions to not increase damage to the vehicle.
- If abnormal noise, smell and/or strong vibration are observed from the vehicle while towing, stop towing immediately.

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

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

*When doing high-voltage works, please putting up this signboard,
make the dotted line part a mountain fold and put up it on the roof of MiEV.



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.


MITSUBISHI MOTORS