



RENAULT ZOE

Electric Vehicle

First Responder's Guide

Introduction

This document is intended to provide the emergency services with information regarding the response procedure in case of impact on B10.

The Renault ZOE has two different types of batteries:

- A 400 volts traction battery which stores the energy used by the electric engine
- A 12V battery which provides the energy used by the vehicle equipments (front light, wipers...)

Electrical energy is stored in a rechargeable traction battery. The Renault ZOE uses both 400 V and low voltage 12 V systems.

This document provides all the details you need to know about the vehicle's unique features and about how to prevent the risk of injury and electric shocks during a call-out.

Electrical safety is an important aspect to bear in mind when responding to an emergency involving ZOE. You will need to know how to recognize a Renault ZOE, to know and apply safety procedures as well as the warnings given in this guide.

This document provides a comprehensive set of useful, relevant information to enable emergency workers:

- to recognise the vehicle model from among the range manufactured by the RENAULT Group;
- to learn about its main technical features;
- to identify the risks inherent to the onboard technology and therefore to adapt their resources and methods to act effectively in full safety.

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1. Identification du véhicule électrique

- This vehicle is electrically propelled only
- The main distinctive outside features are the lack of an exhaust and of the petrol filling door.

Front view :

Main features:

- ① Blue tinted Renault logo
- ② Charging flap

Secondary features:

- ③ LED Day Running Lights
- ④ Blue tinted upper air scoop



2. Vehicle exterior distinguishing features



Closed charging flap



Open charging flap

Side and rear view:**Main features:**

- ① Z.E. badge
- ② Special blue rear lights with internal diamond-shaped mask
- ③ Blue chrome rear diamond logo

Secondary features:

- ④ No exhaust pipe
- No petrol filling flap



a. Passenger compartment distinguishing features

Vue de l’habitacle :

- ① Blue tinted chrome Renault logo on the steering wheel
- ② Z.E gear knob
- ③ Printed circuits motive on the dashboard



On the instrument panel:



Warning lights specific to this electric vehicle		Warning lights specific to this vehicle	
	Econometer		Battery gauge

b. Engine distinguishing features

Motor compartment :

① Special stickers on accessible 400 V components



② Orange 400 V cables

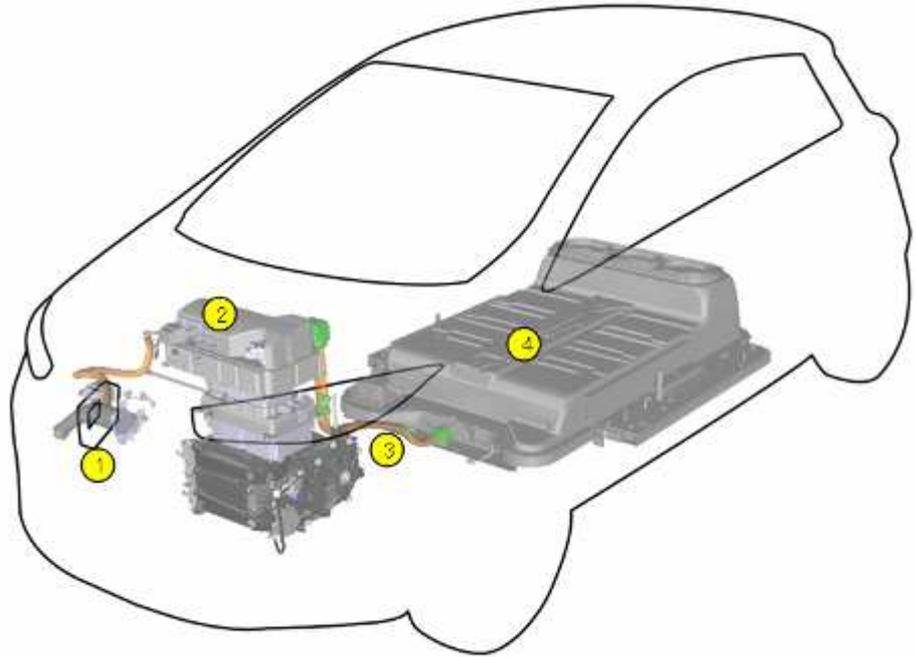


- The orange colour of the 400 V cables does not mean that these are "fire-resistant" cables.

3. Technical specifications of the electric vehicle

a. Traction chain and 400 V electrical circuit

- ① Electric charging flap behind the Renault logo
- ② Electric engine
- ③ 400 V orange cables and cables to traction battery connection area
- ④ traction battery



b. Vehicle underbody

- ① Traction battery
- ② Connection zone between the orange cables and the traction battery. It is protected by a protection casing (removed for the purpose of illustration)
- ③ Aerodynamic casing



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c. 12 V battery

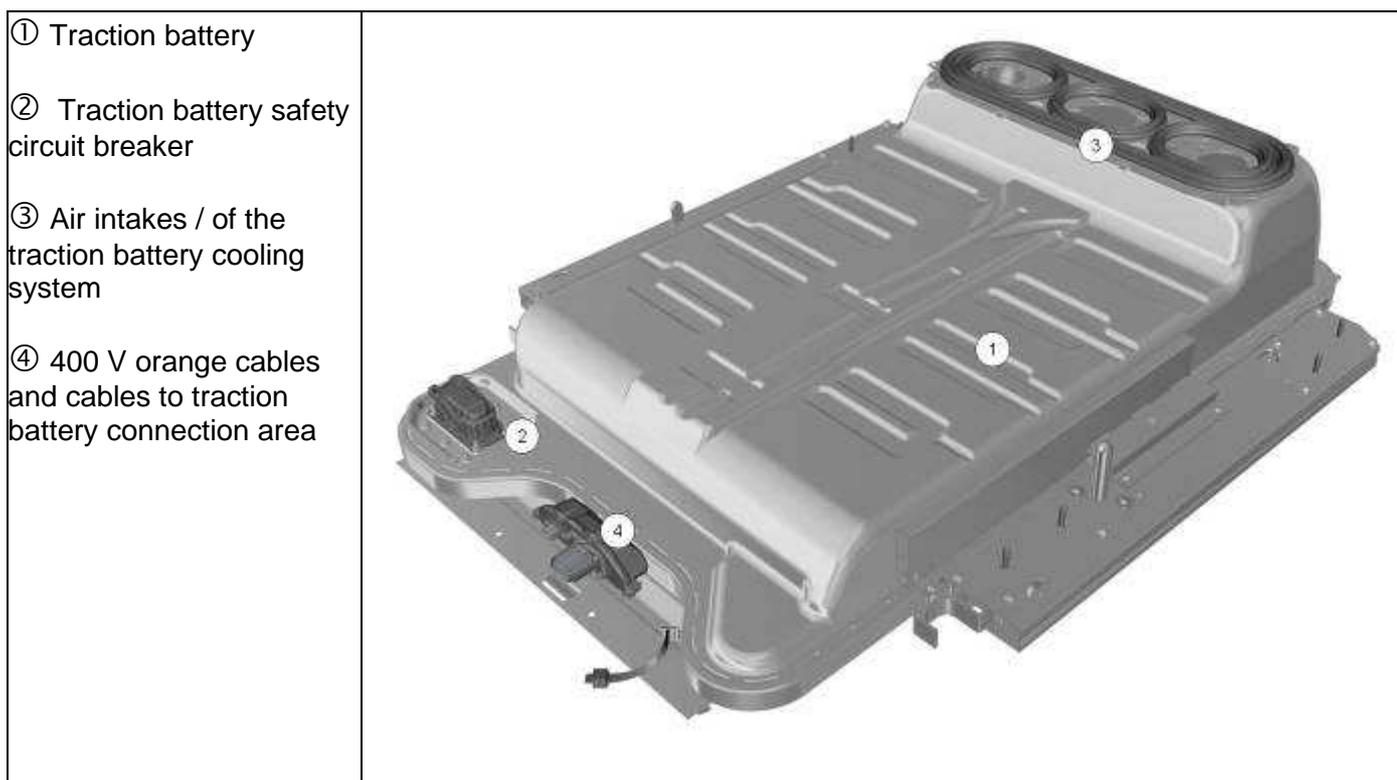
The 12 V battery on the electric vehicle is a standard 12 V direct current battery, identical to the one used in the internal combustion engine vehicle. It is located in the motor compartment at the front of the vehicle. Its negative terminal is connected to the metal chassis, creating an electrical earth.

Features of the 12 V battery	
Voltage	12 V
Amperage	70 A
Battery type	Lead
Model	L3 Standard

d. Traction battery

Features of the traction battery	
Voltage	400 V
Amperage	300 A
Capacity	26 kWh
Weight	290 kg
Battery type	Lithium-Ion
Dimensions	1280 * 1630 *335

- The vehicle's traction battery is removable with the quick change system and should not be removed outside of authorised quick change garages or stations under any circumstances.
- Risk of serious injury or electric shock and a risk to life.



e. Energy transfer and insulation of the 400 V circuit

All 400 V cables can be distinguished by their ORANGE colour.

The 400 V circuit is insulated from the metal vehicle chassis.

The various parts of the 400 V circuit are connected to the vehicle earth by an electrical connection (e.g.: earth straps, etc.). These connections constitute a safety device for the vehicle occupants and the emergency services against any risk of electric shock.

Tous les câbles 400V sont reconnaissables grâce à leur couleur ORANGE.



- The 400 V orange cables should not be cut under any circumstances.
- The earth straps should not be cut under any circumstances.
- These earth connections constitute a safety device for the vehicle occupants and the emergency services against any risk of electric shock.
- Risk of serious injury or electric shock and a risk to life.



Orange 400 V cable



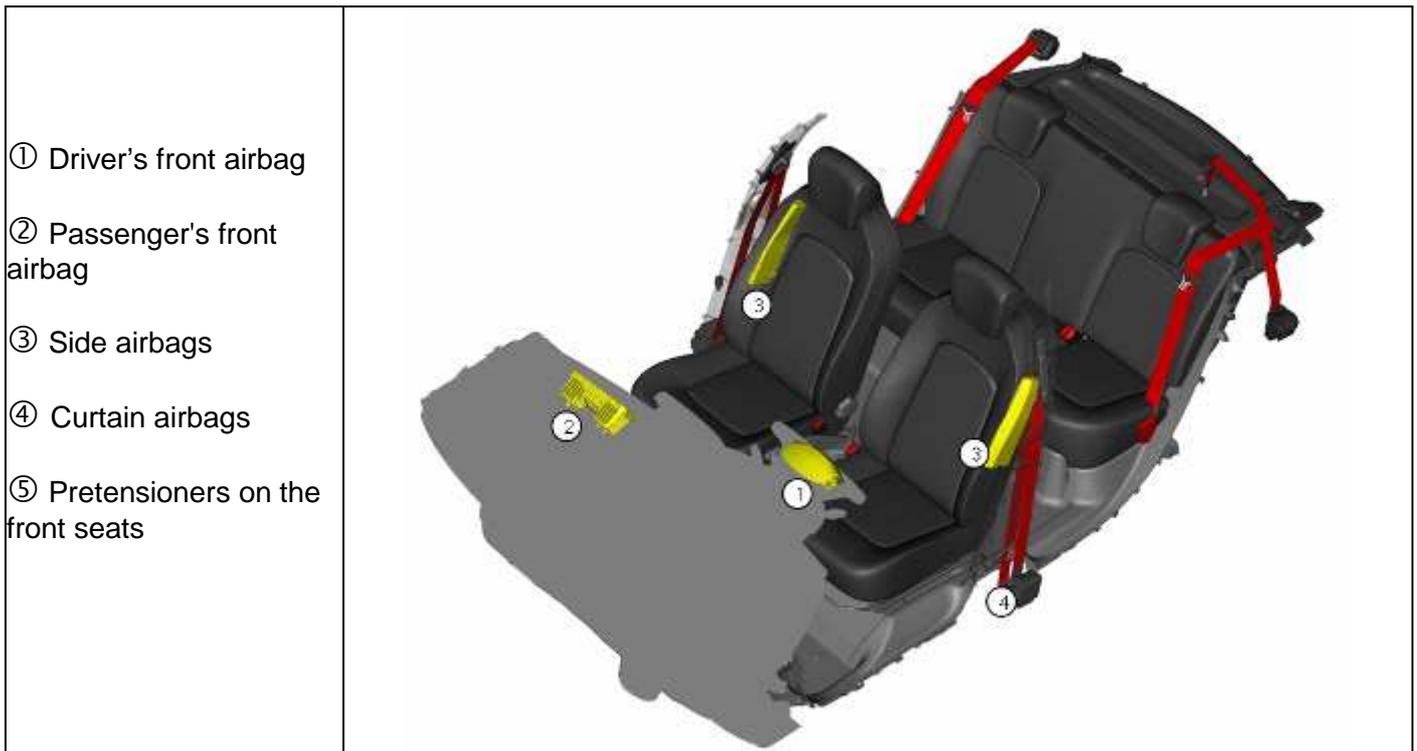
Earth strap

f. Protective systems for occupants

Ce véhicule électrique est équipé de systèmes de protection de ses occupants. On peut y trouver :

- As standard:
 - Front airbags,
 - Side airbags,
 - Double pretensioners as standard (inertia reel and buckle) on the front seats, and an Isofix system on the rear side seats
 - Anti submarining airbags under the front seats.

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4. Response procedure for a vehicle involved in an impact

a. Personal protection equipment for an emergency response

Any emergency response for a damaged electric vehicle requires each member of the response team to wear protective clothing.

For any emergency response to a vehicle involved in an impact, emergency workers must wear:

- a face shield,
- correctly fitting electrical protection gloves.

i. Electrical protection gloves

<p>Insulating gloves for electrical work, class 00, 2500 V test voltage, 500 V working voltage.</p> <p>Class III personal protection equipment - to comply with: European standards: EN 60 903 International standards: CEI 60 903</p>	
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Example of electrical protection gloves

ii. Face shield

Example of face shield

<p>Protects the face against liquid and solid splashes and short-circuit electric arcs.</p> <p>Personal protection equipment compliant with European standards: EN 166: Personal eye protection, specification. EN 170: Personal eye protection, ultraviolet filter</p>	
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b. Nature of risks and procedure prior to intervention on a vehicle involved in an impact

- A damaged 400 V circuit component or cable may cause burns or electrocution following an electric shock.
- Electrical protection gloves  and a face shield  must be worn while working on a 400 V circuit.
- Do not touch damaged orange 400 V cables or the 400 V components without wearing electrical protection equipment.

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If the traction battery is damaged, there may be a delayed risk of fire. In this case, it is necessary to place the vehicle or the damaged battery under surveillance in a dedicated and secure storage area so as to prevent the start of a fire.

- Wear electrical protection gloves  and a face shield .
- Switch off the ignition (see 3.c: Immobilising the vehicle)
- Open the 400 V circuit (see 3.d: Opening of the 400 V circuit)
- Open the bonnet (see 3.e: Opening the bonnet)
- Disconnect the 12 V battery (see 3.f: Disconnecting the 12 V battery)

c. Immobilising the vehicle

- A stationary electric vehicle is silent. The motor could be live and cause the vehicle to move.
- Only switching off the vehicle ignition using the ignition key guarantees that the power is switched off.

Procedure :

<p>a. Apply the handbrake .</p>	
<p>b. Switch off the ignition using the " START STOP" button on the right of the steering wheel then remove the keycard et keep it at least 5 meters from the vehicle</p>	
<p>c. . Place the gear lever in position P (Park). The drive wheels are then mechanically locked</p>	

Description of the electrical risk protection devices

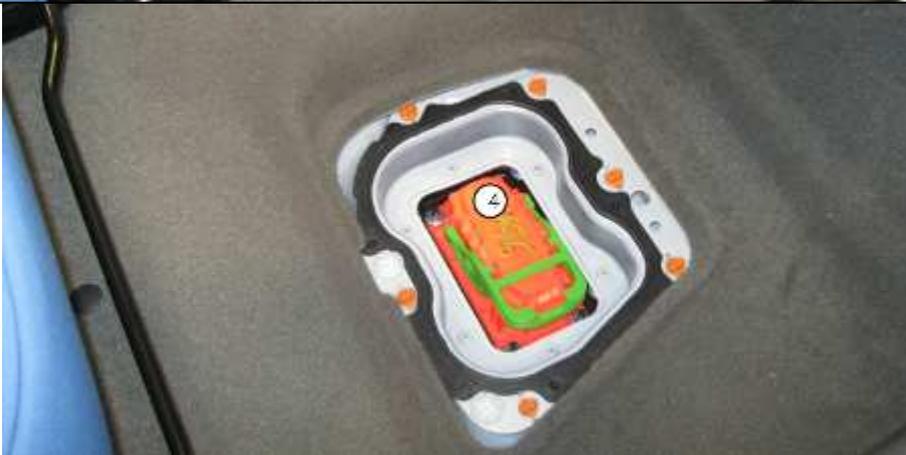
- The 400 V circuit is insulated from the metal vehicle chassis.
- The various parts of the 400 V circuit are connected to the vehicle earth by an electrical connection (e.g.: earth straps, etc.). These connections constitute a safety device for vehicle occupants and the emergency services against any risk of electric shock.
- The vehicle is fitted with an automatic traction battery disconnection system in the event of an accident. However, it is necessary to perform the procedure prior to any intervention on a vehicle involved in an impact.
- Five minutes after opening the traction battery relays (following a loss of power or a crash), the voltage on the power devices will be less than 60 V.

Electrical risk prevention procedure

- If the traction battery safety circuit breaker is not accessible, disconnect the 12 V battery (see § 3.f: Disconnecting the 12 V battery);
- Electrical protection gloves  and a face shield  must be worn when working on the 400 V circuit (orange 400 V cables and components).
- If the ignition key is not accessible, the procedure for cutting off the 400 V circuit by removing the traction battery safety circuit breaker and disconnecting the 12 V battery must be performed.

d. Opening of the 400 V circuit**Procedure :**

- a. Wear electrical protection gloves  and a face shield  .

<p>Locating the traction battery safety circuit breaker.</p> <p>Remove the cover of the traction battery safety circuit breaker using a screwdriver or any other flat tool</p>	
<p>Remove the traction battery safety circuit breaker.</p>	
<p>e. Remove the traction battery safety circuit breaker. Wear electrical protection gloves  and a face shield  is compulsory</p>	



- The traction battery safety circuit breaker is fitted with a fuse, which will blow in the event of a short circuit in the traction battery.

If the traction battery safety circuit breaker is not accessible, disconnect the 12 V battery (see § 3.f: Disconnecting the 12 V battery).

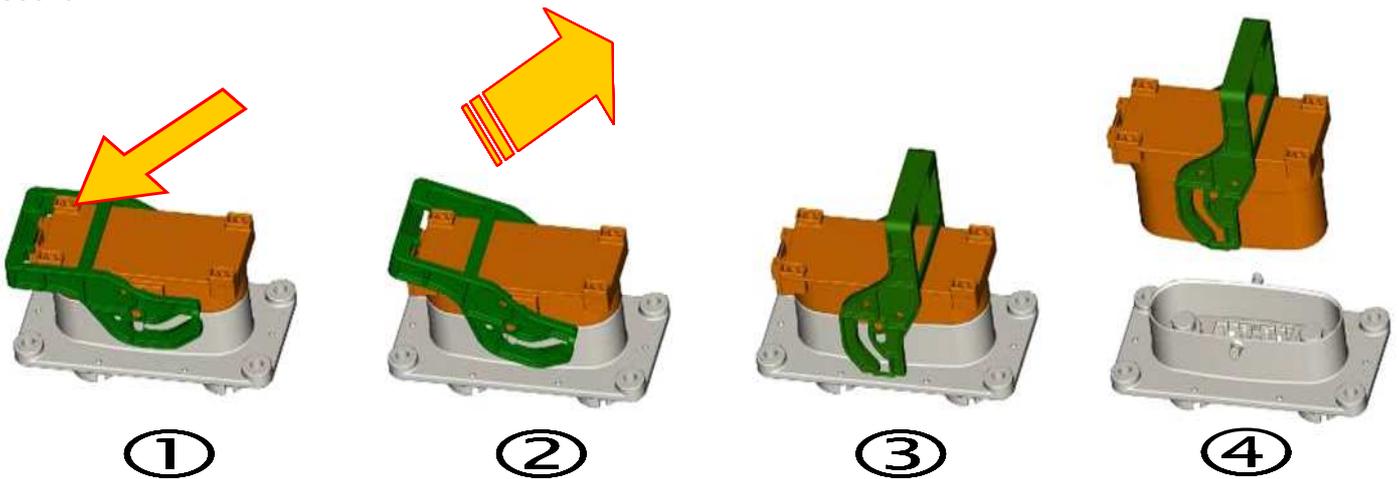
If the circuit breaker of the traction battery is damaged, do not remove it and close the lid. Risks of electrical shocks that can lead to death.

Nota : Some electrical features may still be in use. Disconnecting the 12V battery may generate electrical arcs. Be extremely careful during this operation.

- The wearing of electrical protection gloves  and a face shield  remains compulsory when working on the 400 V circuit (orange 400 V cables and components).

Procedure for removing the cover of the traction battery safety circuit breaker:

Remove the traction battery safety circuit breaker using the green handle. To unclip, press the orange section



Reminder: the traction battery safety circuit breaker should only be removed while wearing electrical protection gloves  and a face shield .

e. Opening the bonnet

The bonnet is opened in exactly the same way as a traditional internal combustion engine vehicle.



Bonnet release in the passenger compartment

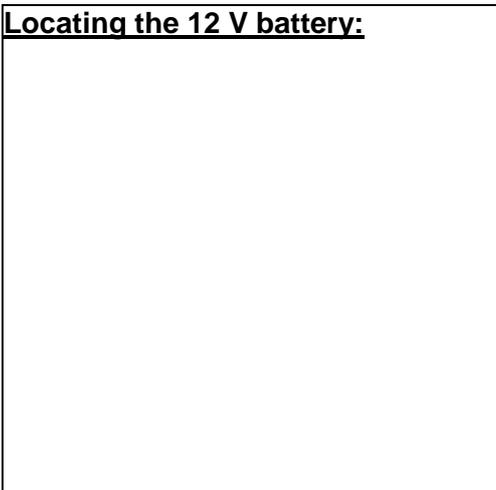


Bonnet release catch on the right of the logo

f. Disconnecting the 12V battery

The 12 V battery is disconnected in exactly the same way as with a traditional internal combustion engine vehicle.

Locating the 12 V battery:



Procedure :

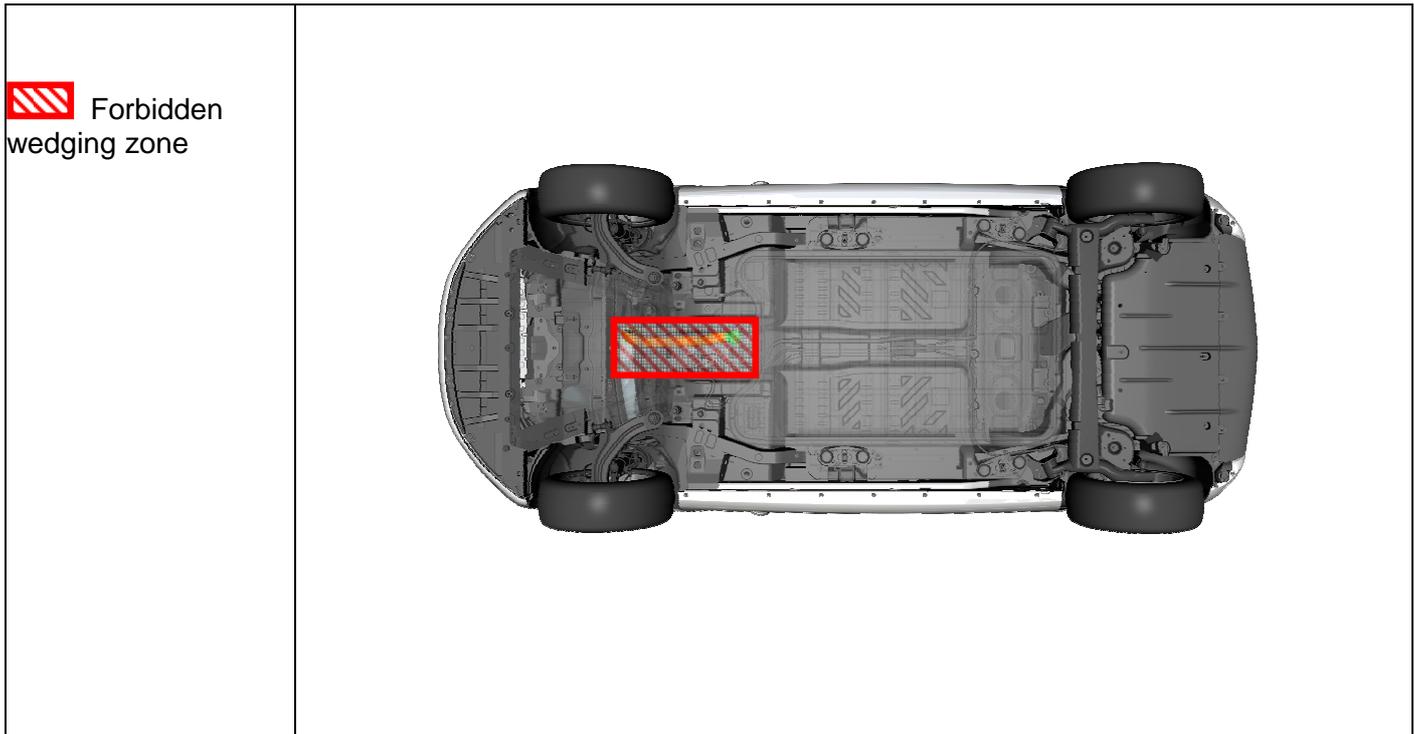
- a. Wear electrical protection gloves  and a face shield .
- b. Check that the ignition is switched off.
- c. Disconnect the negative terminal (-) of the 12 V battery.
- d. Remove the red protection from the positive terminal (+) ②
- e. Disconnect the positive terminal (+) of the 12 V battery.



Nota : Some electrical features may still be in use. Disconnecting the 12V battery may generate electrical arcs. Be extremely careful during this operation.

g. Wedging the vehicle

- **Do not fit vehicle wedging pieces**
 - under any orange 400 V cables



h. Instructions for freeing vehicle occupants

- Before starting to cut the vehicle, the following actions must be completed:
 - vehicle immobilisation procedure,
 - open the 400 V circuit wearing electrical protection gloves and a face shield,
 - disconnect the 12 V battery wearing electrical protection gloves and a face shield,

Nota : Some electrical features may still be in use. Disconnecting the 12V battery may generate electrical arcs. Be extremely careful during this operation.

- If the traction battery safety circuit breaker is not accessible, disconnect the 12 V battery (see § 3.f:

Disconnecting the 12 V battery). The wearing of electrical protection gloves  and a face shield



remains compulsory when working on the 400 V circuit (orange 400 V cables and components).

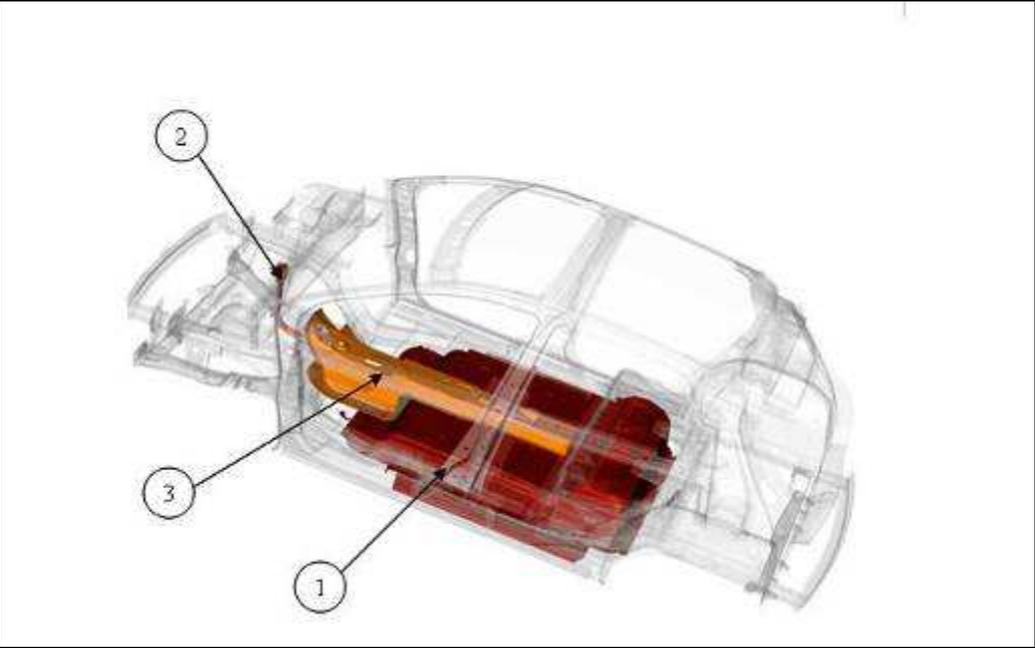
- Five minutes after opening the traction battery relays (following a loss of power or a crash), the voltage on the power devices will be less than 60 V.

i. Prohibited cutting areas

① Traction battery
 ② Orange 400 V cables
 ③ 400 V cable routing tunnels

Earth strap routing areas
 (see image in Section 2.e)

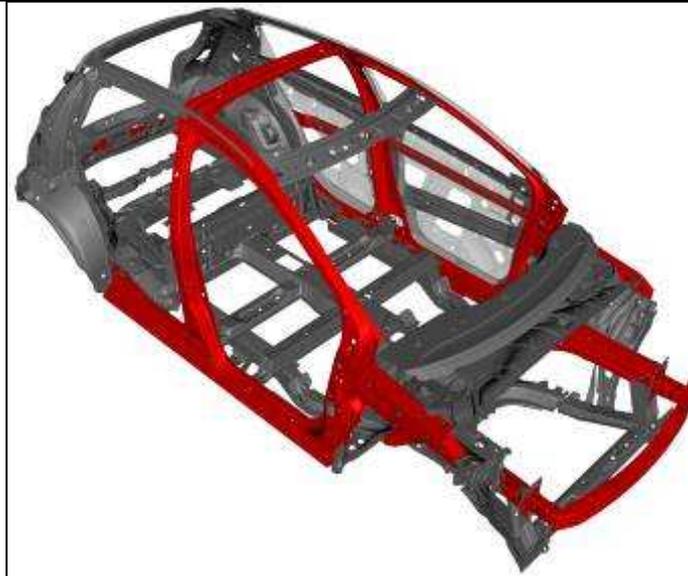
AREAS NOT TO BE CUT



ii. Recommended cutting areas

The procedures for adjusting the seats and the steering wheel, cutting the windows and the roof are the same as those used on traditional internal combustion engine vehicles.

The easiest areas to cut are the areas made of standard steel, shown in grey on the picture.



RECOMMENDED CUTTING AREAS IN GREY

5. Emergency response procedure for a vehicle involved in an impact whilst charging

Charging ZOE may be carried out at a charging station with a standard charge cable (1) or at a domestic socket with an occasional charging cable (2).

When the vehicle is charged using the cable 1 on a charging point, the tension is 230V AC phase 1 with a maximum 16A.

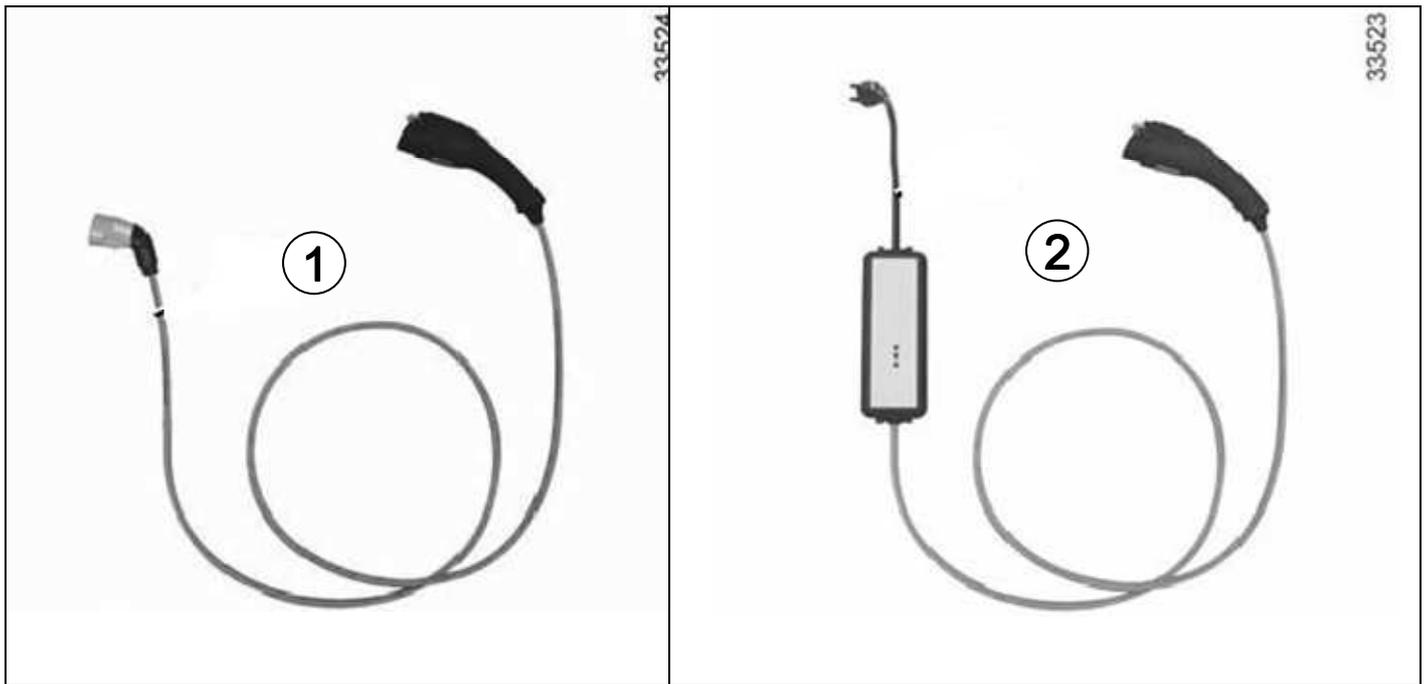
The fast charge uses a phase 1 230V / 16A or a phase 3 (400V / 63A) depending on the cable of the charging point.

The top up charge is performed through a domestic 230V AC / 16A socket, using the top up cable (2)

a. Unplugging a vehicle involved in an impact



- The wearing of electrical protection gloves  and a face shield  is compulsory when unplugging the charging vehicle as part of this procedure..

Standard charging cableTop up cable

- The main power supply should be switched off before any action is taken, if possible.
- Do not cut the charging cable. Risk of serious injury or electric shock and a risk to life.
- If the traction battery is damaged, there may be a delayed risk of fire. In this case, it is necessary to place the vehicle or the damaged battery under surveillance in a dedicated and secure storage area so as to prevent the start of a fire.



- **DO NOT touch damaged orange 400 V cables or 400 V components with your bare hands. Risk of serious injury or electric shock and a risk to life.**
- **If necessary, you may touch the damaged orange 400 V cables and components with wearing electrical protection gloves  and a face shield .**

Procedure:

- a. Wear electrical protection gloves  and a face shield .
- b. If possible, switch off the power supply being used to charge the vehicle.
- c. Unplug the charging lead from the power supply end.
- d. If it is not possible to unplug the cable from the power supply end, unplug the cable from the vehicle end.

An actuator prevents the charger from being removed when the vehicle is locked. It is difficult, but possible, to remove the plug. This operation presents no risk of a second accident, even in damp conditions, as long as the emergency workers wear electrical protection gloves  and a face shield .

6. Response procedure for a vehicle on fire

- The procedures given in this section should be applied in the event of a vehicle on fire, and also if the vehicle's traction battery is emitting smoke.
- A vehicle whose battery is emitting smoke can quickly catch fire.

a. Hazards and protective equipment

A burning electric vehicle, just like a standard internal combustion engine vehicle, produces toxic gases. Gases specific to the burning of the traction battery do not exceed the regulatory accepted thresholds.

Firefighters should wear Open-Circuit Self-Contained Breathing Apparatus as well as their standard protective equipment when near a fire, both indoors and outdoors.

After the fire, the vehicle can still present an electrical hazard due to the presence of exposed live parts.

b. Action procedure to extinguish the vehicle

The action procedure for an electric vehicle is the same than a thermic vehicle. Water is recommended to extinguish the fire on the vehicle.



- **Spray the vehicle with very large amounts of water until the complete battery's extinguishing.**
- **To extinguish the traction battery, swamp it through the vents located behind the rear passenger bench seat.**
- **Keep a suitable distance, taking into account the risk of flames from the combustion of electrolyte.**
- **Do not insert the fire hose directly into the traction battery's compartment. RISK OF SERIOUS INJURY OR ELECTRIC SHOCKS WHICH MAY LEAD TO DEATH.**
- **Fully ventilate if in a confined space.**

Picture 1



7. Procedure in the event of an electrolyte leak from the traction battery.

An electrolyte leak from the traction battery is unlikely.

However, in the event of an electrolyte leak, wear anti-corrosion chemical protective gloves. Spread absorbent products and collect them up for treatment with standard organic solvents.

The electrolyte in the Lithium-ion traction battery is a clear liquid and has a distinctive organic solvent odour.

Electrolyte is a flammable solution.

In the event of a leak, ventilate the accident area, if necessary.

The battery electrolyte is corrosive. Contact with it may cause serious burns to the skin and damage to the eyes.

Do not breathe the vapours while equipping yourself with an Open Circuit Self-contained breathing apparatus.

Wear protective gloves and goggles.

In the event of ingestion, inhalation, contact with the skin or the eyes, wash with plenty of water as quickly as possible; contact a poison control centre or a doctor immediately.

8. What to do in the event of a submerged vehicle



WARNING:
Making the vehicle safe is only possible after removing the vehicle from the water. In the event of needing to respond to an emergency in a damp environment, it is essential to follow the following recommendations.

If it is an electric vehicle, the electrical energy uses the negative terminal of the traction battery as the reference. There is only a risk of electrocution if a person comes into contact with both electric terminals of a circuit supplied by the traction battery. There is therefore no risk involved in touching the submerged vehicle body or the water.

Accident victims can be rescued, even if the vehicle is still in contact with the water.



- As a precaution, when attending a vehicle that is totally or partially submerged and generally in a damp environment, do not touch directly the 400 V orange cables or components or the traction battery.
- RISKS OF SERIOUS INJURIES OR ELECTRIC SHOCKS WHICH MAY LEAD TO DEATH.



- If the vehicle is submerged in a closed room (garage, parking), it is essential to ventilate the room before any rescue operation.

Vehicle safety procedure after removing from the water.



- After removing the vehicle from the water, it is essential to make the vehicle safe to prevent risks of a secondary accident in the recovery chain (breakdown, storage, etc.)

- Wearing electrical protection gloves and a face shield is compulsory.
- Switch off the ignition (see 3.c: Immobilising the vehicle)
- Open the protection flap of the circuit breaker on the traction battery
- Open the traction battery safety circuit breaker cover avoiding any contact with water running off the battery onto the skin.
- Remove the circuit breaker from the traction battery (chapitre 3.d)
- Close the traction battery safety circuit breaker cover
- Disconnecting the 12 V battery (see 3.f: Disconnecting the 12 V battery).

Nota : Some electrical features may still be in use. Disconnecting the 12V battery may generate electrical arcs. Be extremely careful during this operation.



When removing the traction battery safety circuit breaker from a vehicle that has been submerged, insulating gloves and a face shield must be worn.

Be careful! Avoid any contact of the water coming from the traction battery with the skin when removing the safety circuit breaker.

RISKS OF SERIOUS INJURIES OR ELECTRIC SHOCKS WHICH MAY LEAD TO DEATH.

9. Towing an electric vehicle that has been involved in an impact (section aimed at workers by the side of the road qualified to work on electric vehicles)

To find out about the procedures and instructions relating to the towing of an electric vehicle involved in an impact, please see the methods on the “stakeholder guide” on INFOTECH on the internet:

<http://www.infotech.renault.com>

10. Storage

After emergency response, if ZOE has to be storage, always indicate this is an electric vehicle with an electric potential risk (an example may be found on the next page. It has to be printed out and to be displayed on the vehicle)

- Marking: post and chain with the display “Z.E. Parking” 
- **Confinement period for a damaged ZE vehicle: 48 hours**
- **Space dedicated to the storage of a damaged ZE vehicle during the confinement period:**
 - o A non covered exterior parking space framed by an empty space on each side, in the front and behind the vehicle as well (6 free spaces for a damaged ZE vehicle)
 - o Localisation : same as the thermic damaged vehicles (access restricted, at least 12 meters from a building).



DANGER – DO NOT TOUCH



**VEHICLE INVOLVED IN AN IMPACT – ELECTRIC RISK
ACCESS PROHIBITED TO UNAUTHORISED PERSONS**

Print this document and put it on the vehicle
(Roof, windshield, rear window)

DANGER – DO NOT TOUCH



**VEHICULE INVOLVED IN AN IMPACT – ELECTRIC RISK
ACCESS PROHIBITED TO UNAUTHORISED PERSONS**

Print this document and put it on the vehicle
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