RENAULT KANGOO Z.E. Phase 2

Electric vehicle

First Responder's Guide

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Introduction

This document is intended to provide the emergency services with information regarding the response procedure in case of impact on KANGOO Z.E. PHASE 2.

KANGOO Z.E. (Zero Emission) Phase 2 is a vehicle powered solely by an electric motor. Electrical energy is stored in a rechargeable traction battery. KANGOO Z.E. PHASE 2. 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 situation involving KANGOO Z.E. PHASE 2. You will need to know how to recognize KANGOO Z.E. PHASE 2., to know and apply safety procedures as well as the warnings given in this guide.

The difference between KANGOO Z.E phase 2 and KANGOO Z.E phase 1 is the location of charging flap. THE RESPONSE PROCEDURES REMAIN ALL UNAFFECTED.

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

- to recognize 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. Identifying an electric vehicle

KANGOO Z.E. PHASE 2. is available in several versions:

Electric KANGOO Z.E. PHASE 2. panel version L1 :	**Electric KANGOO Z.E. PHASE 2. panel version L2 :**
Electric KANGOO Z.E. PHASE 2. half glazed version L2	**Electric KANGOO Z.E. PHASE 2. fully glazed version L2**

a. Vehicle exterior distinguishing features

- The main distinguishing features on the exterior of the electric vehicle are the charging flaps located on the front of the vehicle, and an exhaust pipe which is not visible at the rear (except when there is a heating device).
- From the outside, a charging flap looks similar to a fuel filler flap.

Front view : Z.E. logo on the front charging flap, ZE logo and bluely chrome plated slats

Opened charging flap

Blue or white motif

Side view : no stripping but the ZE sign

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Rear view : No stripping (white or blue). Presence of the ZE sign and blue light-extension

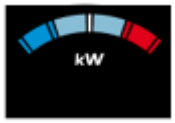
b. Passenger compartment distinguishing features

View of the passenger compartment: ① Dedicated instrument panel	

On the instrument panel:

① Blue dial graphics

② Z.E. diagram Blue

Warning lights specific to this electric vehicle	
	Charge meter
	Electrotechnical failure
	System temperature warning
	Vehicle ready, Traction active
	Additional heating (optional)
	Additional mini fuel heating warning light (optional)

Témoins spécifiques à ce véhicule électrique	
	Battery gauge
	Battery empty
	Vehicle connected up
	Pre-conditioning

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c. Motor compartment 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.

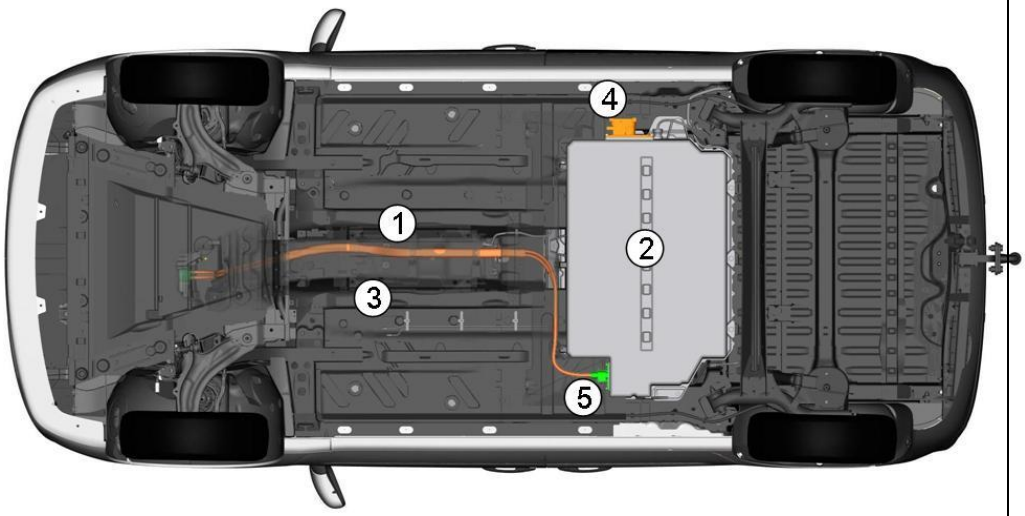
2. Technical specifications of the electric vehicle

a. Traction chain and 400 V electrical circuit

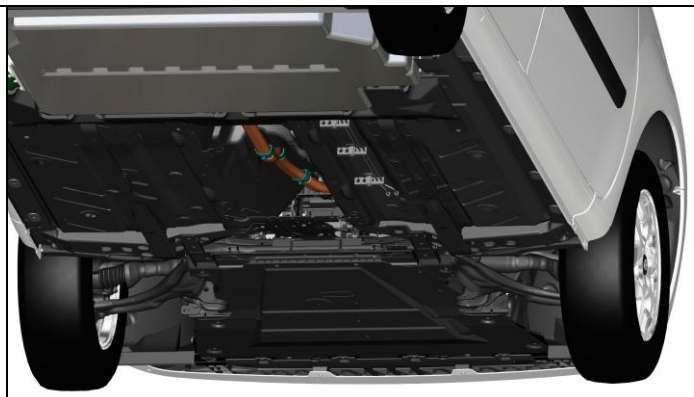
Example : panel version L1

① Electric charging socket ④ Electric motor ⑥ Traction battery	

b. Vehicle underbody

① Orange 400 V cable ② Traction battery ③ Aerodynamic casing ④ Traction battery safety circuit breaker ⑤ Connection area between the cables and the traction battery	

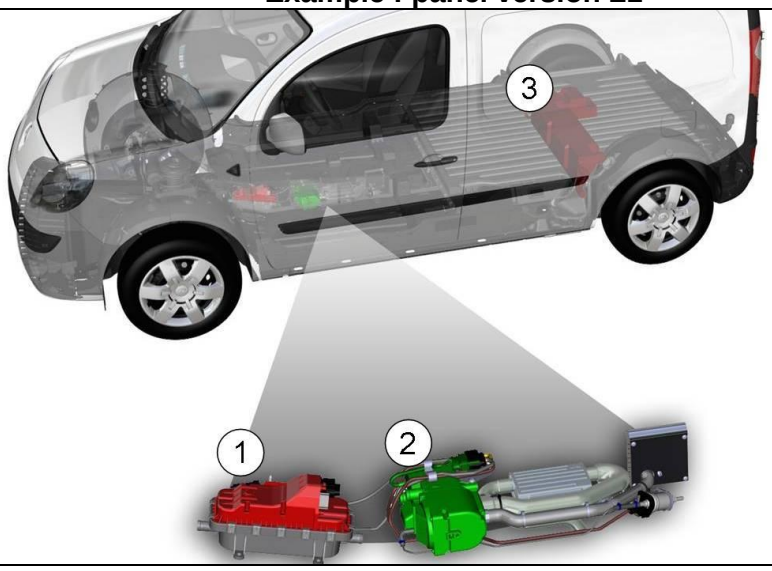
View below the middle of the front wheels:

	
Underbody	**Underbody without aerodynamic casing, orange 400 V cable**

c. Heating system

This electric vehicle offers the option of a passenger compartment heating system, using diesel fuel. It provides a 13L tank of diesel..

Example : panel version L1

① Electric heating ② Heating with exhaust outlet system ③ Fuel tank : Diesel See the pictogrammes relating to heating on the instrument panel in the section **the instrument panel : section 1.b.**	

d. 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

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e. Traction battery

Features of the traction battery	
Voltage	400 V
Amperage	300 A
Capacity	24 kWh
Weight	295 kg
Battery type	Lithium-Ion
Dimensions	1214 x 802 x 290mm

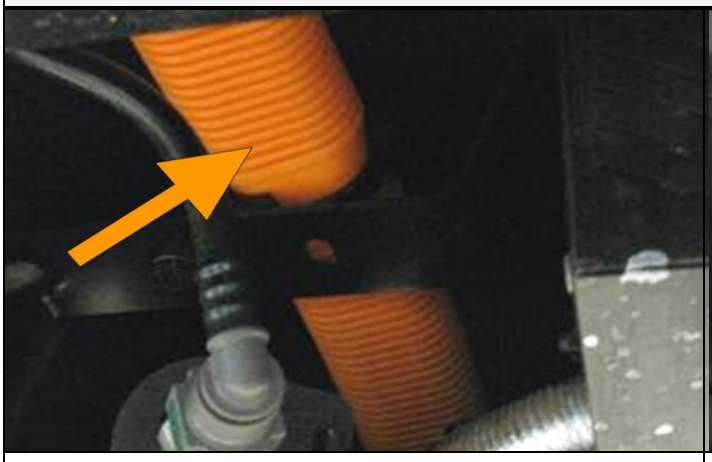
f. Energy transfer and insulation of the 400 V circuit

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

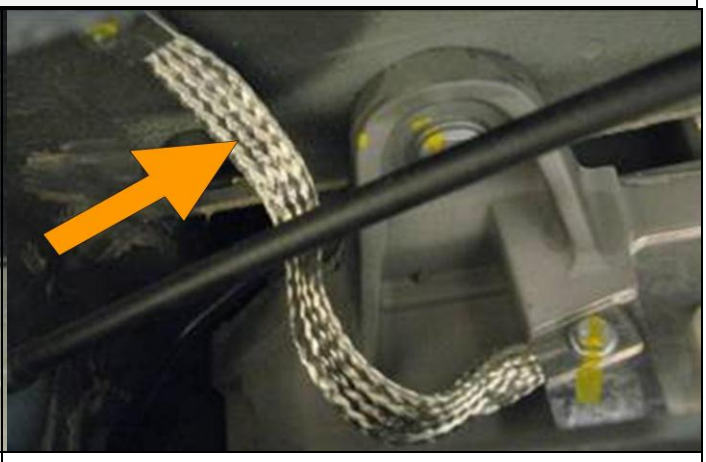
The 400 V circuit is insulated from the metal vehicle chassis.

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.

- **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 WHICH MAY LEAD TO DEATH.**



Orange 400 V cable



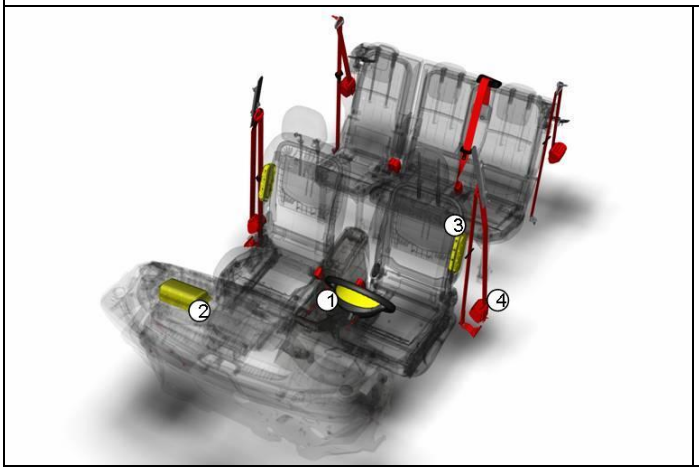
Earth strap

g. Protective systems for occupants

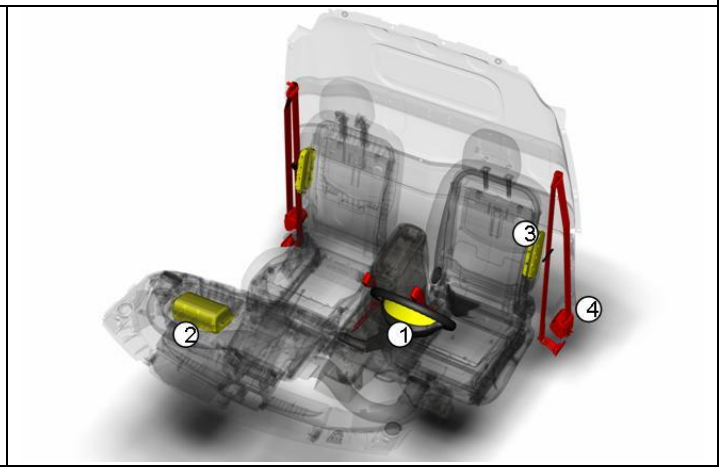
This electric vehicle is fitted with protective systems for its occupants. You will find:

- As standard:
  - Driver's front airbag,
  - Side airbags on the front seats,
  - Double pretensioners as standard (inertia reel and buckle) on the front seats
- And, depending on the equipment level:
  - Passenger's front airbag

① Driver's front airbag	③ Side airbags on the front seats.
② Passenger's front airbag optional	④ Pretentioners on the front seats



Fully glazed version L2



Panel version L1

3. 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

Insulating gloves for electrical work, class 00, 2500 V test voltage, 500 V working voltage. Class III personal protection equipment – to comply with: European standards: EN 60 903 International standards: CEI 60 903	

Example of electrical protection gloves

ii. Face shield

Protects the face against liquid and solid splashes and short-circuit electric arcs. Personal protection equipment compliant with European standards: EN 166: Personal eye protection EN 170: Personal eye protection, ultraviolet filter	

Example of face shield

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.**
- **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 and make safe the 400 V circuit (see 3.d: Opening to isolate 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)

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.

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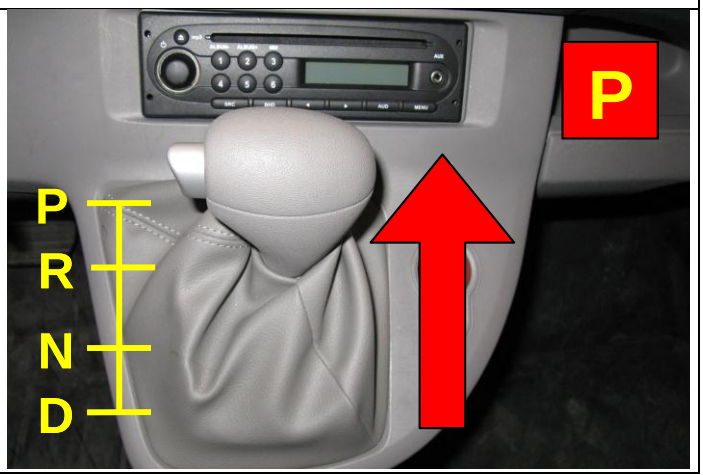
c. Immobilising the vehicle

- 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 :

a. Apply the handbrake	
b. Switch off the ignition using the key, by turning the key, then remove the key	
c. Place the gear lever in position P (Park). The drive wheels are then mechanically locked	

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d. Opening to isolate the 400 V circuit

Procedure:

a. Wear electrical protection gloves and a face shield .

b. Locate the traction battery safety circuit breaker.

c. Remove the cover of the traction battery safety circuit breaker.

d. Remove the traction battery safety circuit breaker.

Locating the traction battery safety circuit breaker: The traction battery safety circuit breaker is located behind the rear left wheel of the vehicle. ① Traction battery safety circuit breaker	

- 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). 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).

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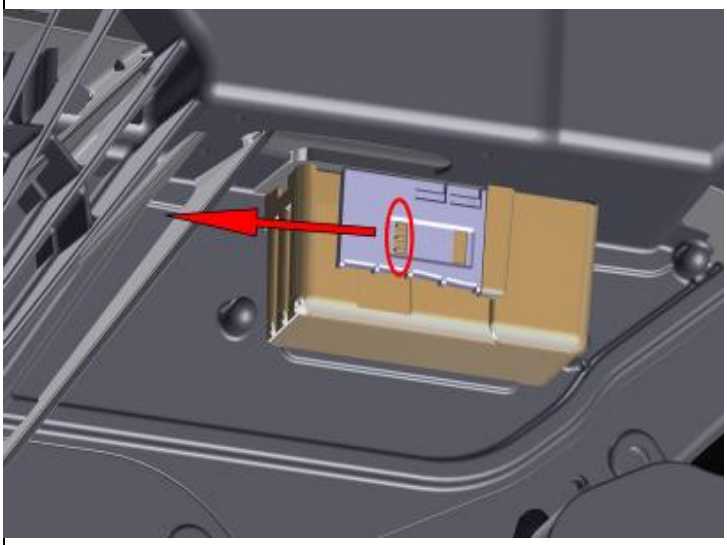
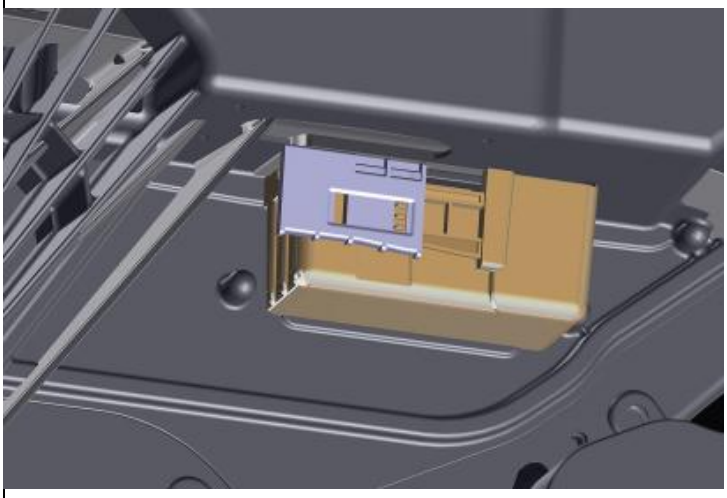
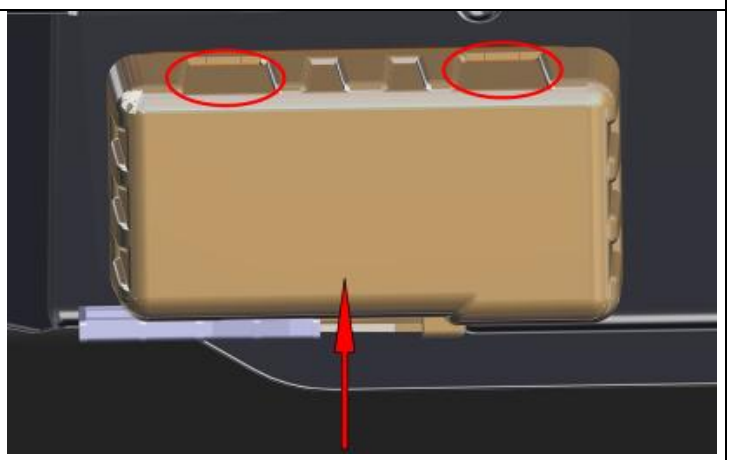
Procedure for removing the cover of the traction battery safety circuit breaker:

View of the back right underside of the vehicle To unlock the runner, press the clip and slide the part	
View of the back right underside of the vehicle Unlocked position	
Zoom of the cover Push the guard to release the two plate support lugs (outlined in red).	

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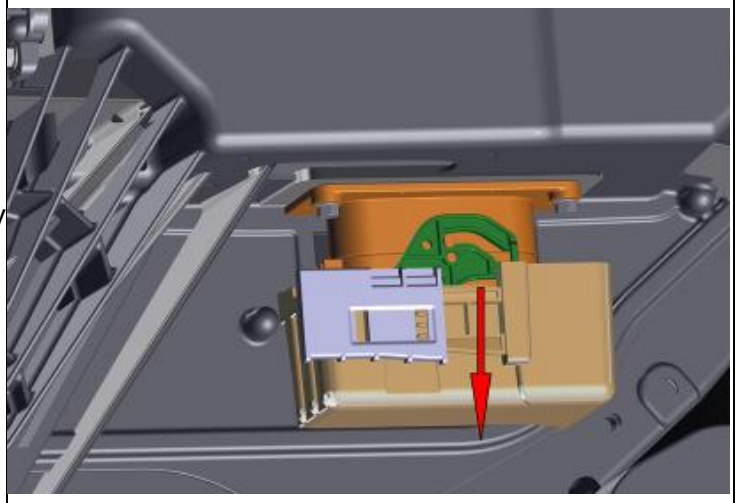
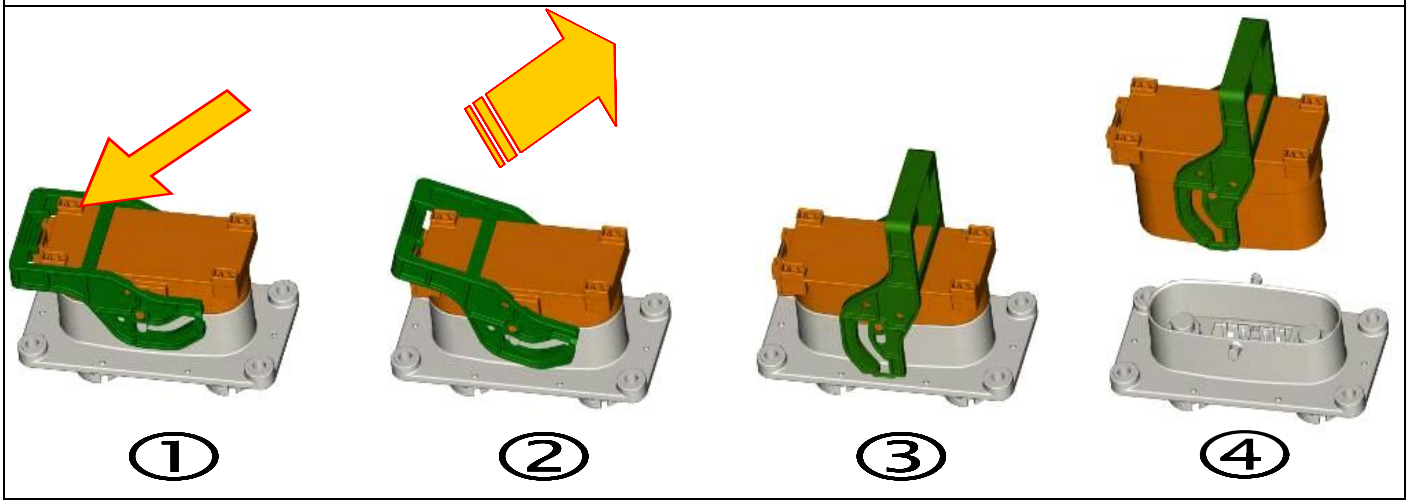
View of the back right underside of the vehicle	
Pull the guard to release the traction battery safety circuit breaker.	

Procedure for removing 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.**

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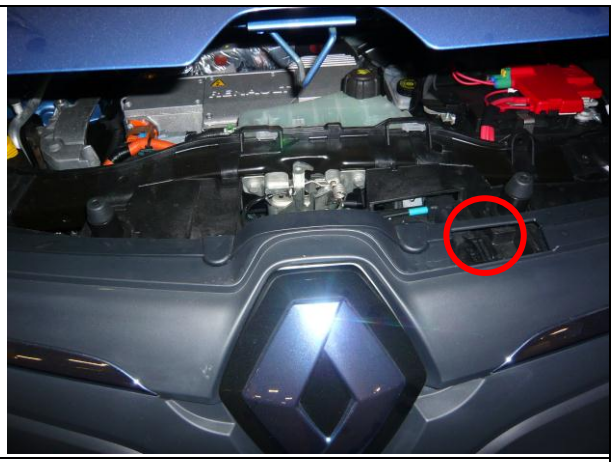
e. Opening the bonnet

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

f. Disconnecting the 12 V 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:

① 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. Disconnect the positive terminal (+) of the 12 V battery.

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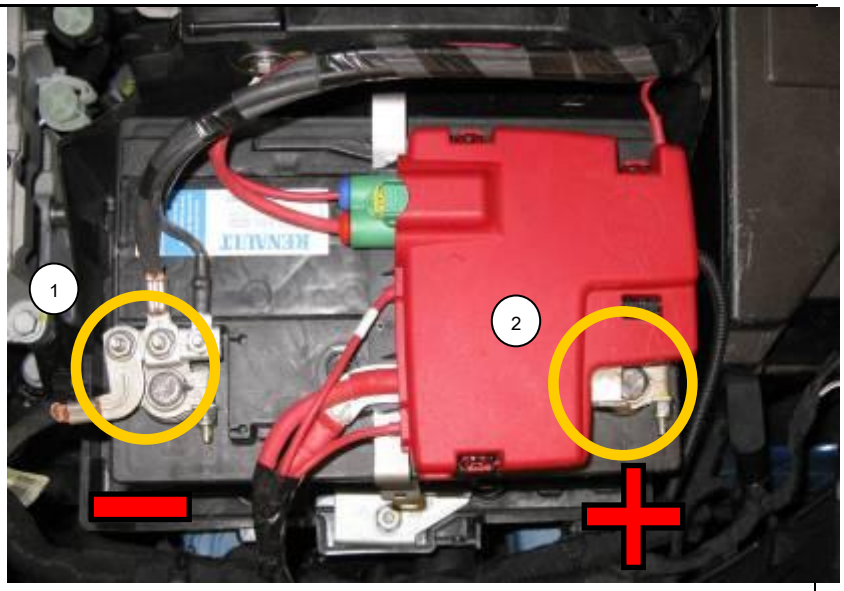
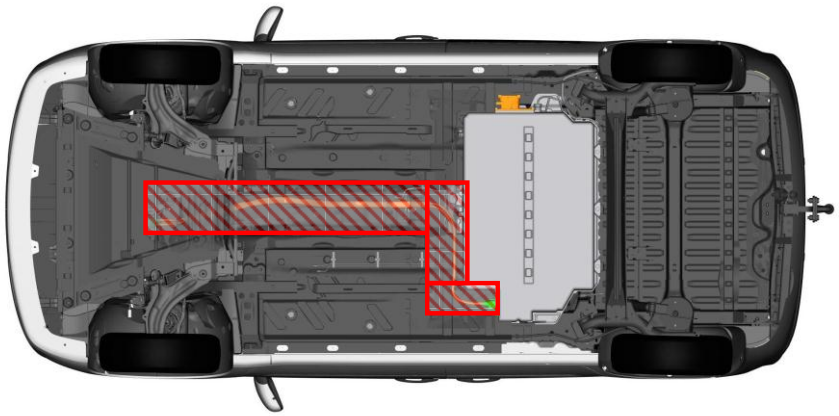
① Negative terminal (-) of the 12 V battery
② Positive terminal (+) of the 12 V battery



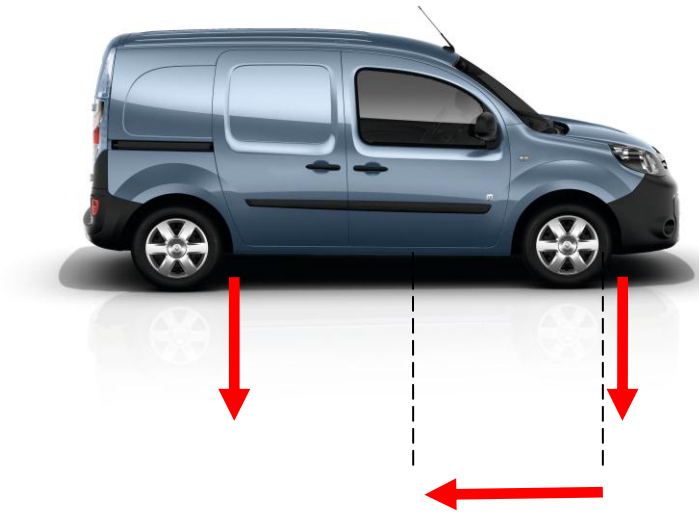
g. Lifting and supporting the vehicle

➢ **Do not fit vehicle supports :**
- Under any orange 400 V cables
- Disconnect the 12V battery connector If lifting and supporting needs to be made near to this connector.

Area where lifting and supporting is prohibited



EV Weight



769kg 875kg

Centre of Gravity at X=1081mm
(~Handbrake articulation)

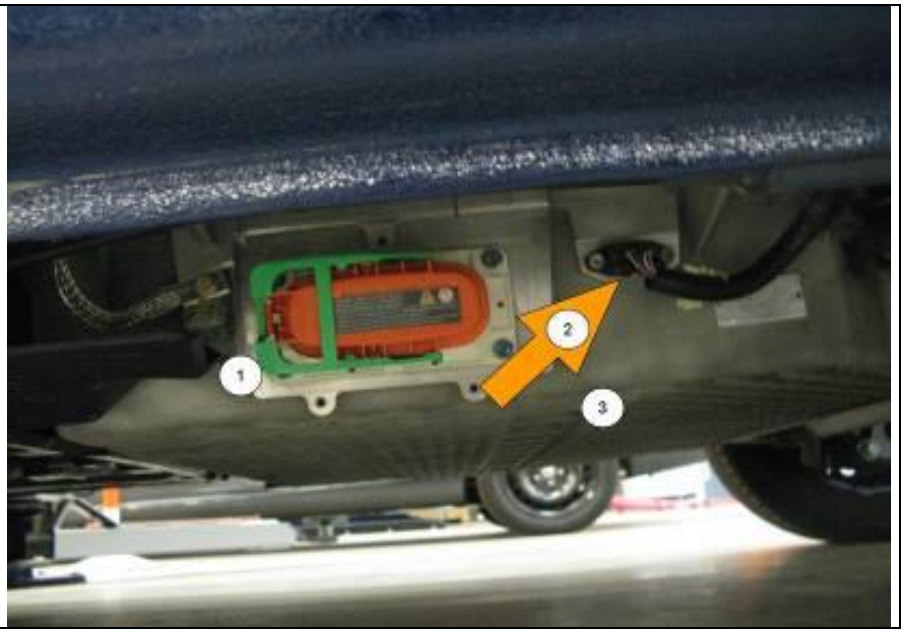
Centre of Gravity at X = 1395 mm (longitudinal)
Y = -2 (lateral)
Z = 373 (height)

Traction battery and connectors :

① Traction battery safety cut off

② Traction battery 12V connector

③ 400V traction Battery



h. Instructions for freeing vehicle occupants

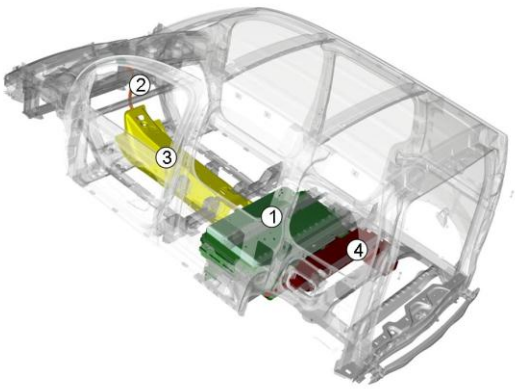
- Before starting to cut the vehicle, the following actions must be completed:
  - vehicle immobilisation procedure,
  - open and make safe the 400 V circuit wearing electrical protection gloves and a face shield,
  - disconnect the 12 V battery wearing electrical protection gloves and a face shield,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

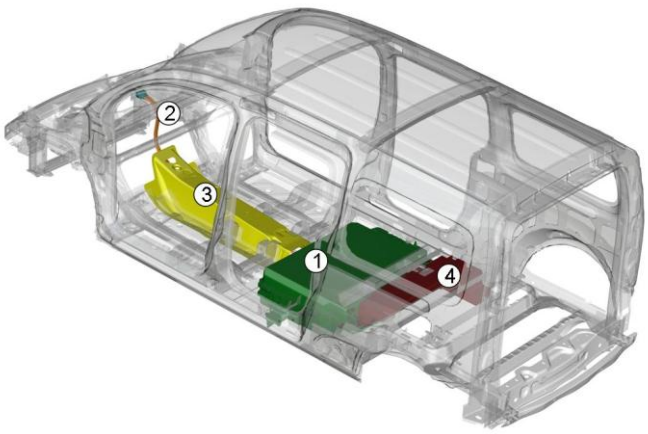
① Traction battery
② Orange 400V cables
③ 400V cables routing tunnels
④ Fuel tank

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

AREAS NOT TO BE CUT



Panel version L1



Fully glazed version L2

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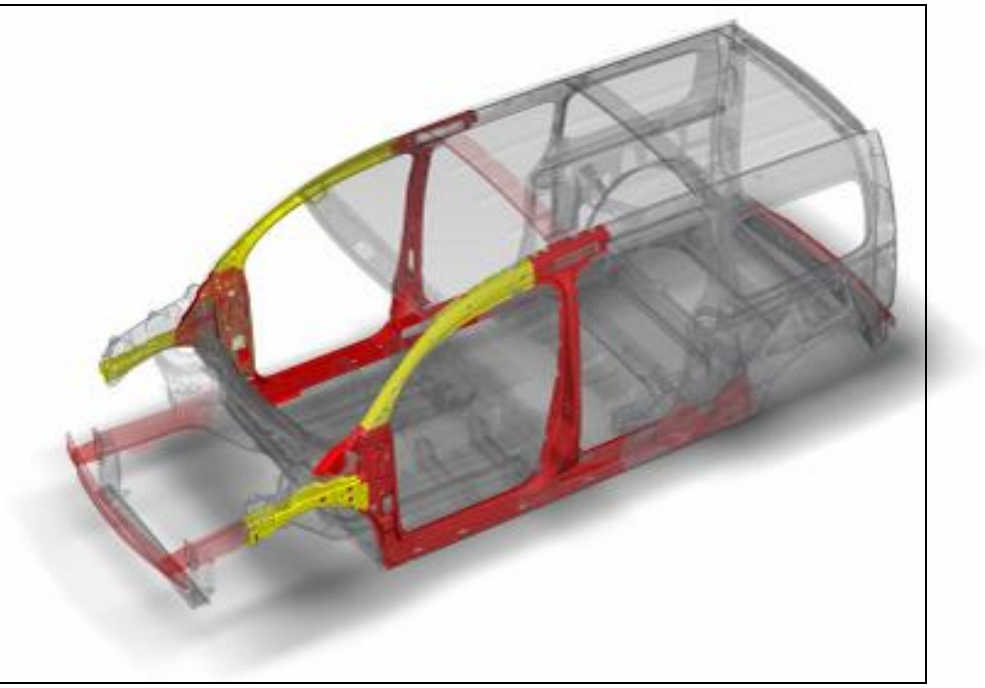
ii. Recommended cutting areas

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	

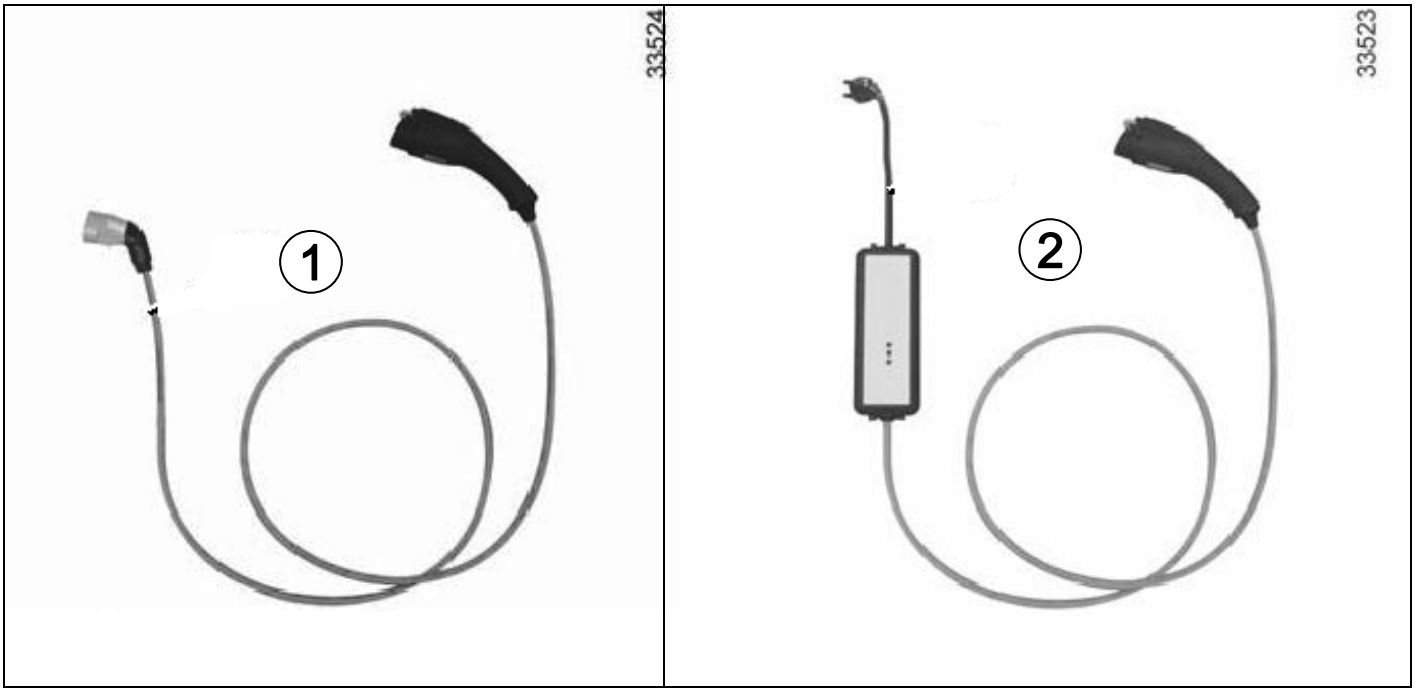
4. Emergency response procedure for a vehicle involved in an impact whilst charging.

Charging the FLUENCE Z.E 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).

In both cases, charging is carried out at a voltage of 220 V single phase and a maximum amperage of 16A.

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 cable **Occasional usage charging cable**

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.

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- **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.**

- 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 .

5. 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.

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.

- **DO NOT touch damaged orange 400 V cables or 400 V components with your bare hands. RISK OF SERIOUS INJURY OR ELECTRIC SHOCK WHICH MAY LEAD TO DEATH.**
- **if necessary, you may touch the damaged orange 400 V cables and components wearing electrical protection gloves** **and a face shield** **.**
- **In the case of an electric vehicle fire, there may be a delayed risk of a fire restarting from the traction battery. In this case, it is necessary to place the vehicle under surveillance in a dedicated and secure storage area so as to prevent any fire from restarting.**

b. Action procedure to extinguish the vehicle

In the event of fire on the while vehicle:

- **Spray the vehicle with very large amounts of water until the battery is completely extinguished.**
- **To extinguish the traction battery, water directly with large amout of water**
- **Keep a suitable distance**
- **Fully ventilate if in a confined space**

In the event of fire on a part of the vehicle:

- **Powder extinguishers (ABC,BC), water spray extinguishers with additive, or carbon dioxide extinguishers can be used in case of electric fire caused by wiring bundles, electric components… or in case of fire caused by flammable substance (liquid brakes…)**

6. 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 in 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.

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7. 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.

In the event of a submerged vehicle:

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 flooded confined space (car park, garage), fully ventilate the area before carrying out any work.**

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.)**

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- Wear electrical protection gloves and a face shield.
- Switch off the ignition (see 3.c: Immobilising the vehicle)
- Remove the traction battery safety circuit breaker cover avoiding any contact with water running off the battery onto the skin.
- Disconnect the 12 V battery (see 3.f: Disconnecting the 12 V battery).

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.

8. 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 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

9. Storage

After emergency response, if KANGOO Z.E. PHASE 2. has to be placed in storage, always indicate that this is an electric vehicle with an electric potential risk.

Please find an example on the following page, which can be printed and placed on the vehicle.

Print this page and put the paper on the vehicle
(Roof, windscreen, rear window)

VEHICLE DAMAGED → ELECTROCUTION RISK
ACCESS PROHIBITED TO UNAUTHORISED PERSONS

DANGER – DO NOT TOUCH

DANGER – DO NOT TOUCH

VEHICLE DAMAGED → ELECTROCUTION RISK
ACCESS PROHIBITED TO UNAUTHORISED PERSONS

Print this page and put the paper on the vehicle
(Roof, windscreen, rear window)

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