Berlingo First Electric

Safety procedures to be observed with an accident-damaged vehicle where the traction battery may be damaged

CONTENTS

1 VEHICLE IDENTIFICATION 4

1.1 External Identification 4
1.2 Internal Identification 5
1.3 Main characteristics 6
1.4 High voltage and 12V systems 6
1.4.1 Components of the drive train under the bonnet 6
1.4.2 The batteries 7
1.4.3 High voltage system 7

2 PRECAUTIONS TO TAKE 8

2.1 Protective equipment 8
2.2 Authorised Fire Extinguishers 8

3 THE STEPS IN INTERVENING ON A VEHICLE 9

3.1 Identify the vehicle 9
3.2 Use the recommended Personal Protective Equipment 9
3.3 Precautions to take at the site of the accident 9
3.4 Checking the state of the vehicle 10

4 MAKING THE VEHICLE SAFE 11

5 PROCEDURE FOR INTERVENING IN THE EVENT OF AN ACCIDENT 12

5.1 Minor impact or accident or one to the rear of the vehicle 12
5.2 Major impact or accident without apparent damage to the battery 13
5.2.1 Intervention on the vehicle 13
5.2.2 Vehicle recovery 13
5.3 Emergency case 14
5.3.1 Cutting open the body 14

6 BATTERY BURST/PERFORATED AND/OR LEAKING 15

6.1 Intervening on a vehicle 15
6.2 Fire, smoke or fumes from the vehicle 16
6.2.1 Intervening on a vehicle 16
6.2.2 Making the vehicle safe 16
6.2.3 Check the appearance and temperature of the battery 17
6.2.4 Move the vehicle to a safe area 17
6.3 Submerged vehicle 18

7 TRANSPORTING A DAMAGED VEHICLE 18

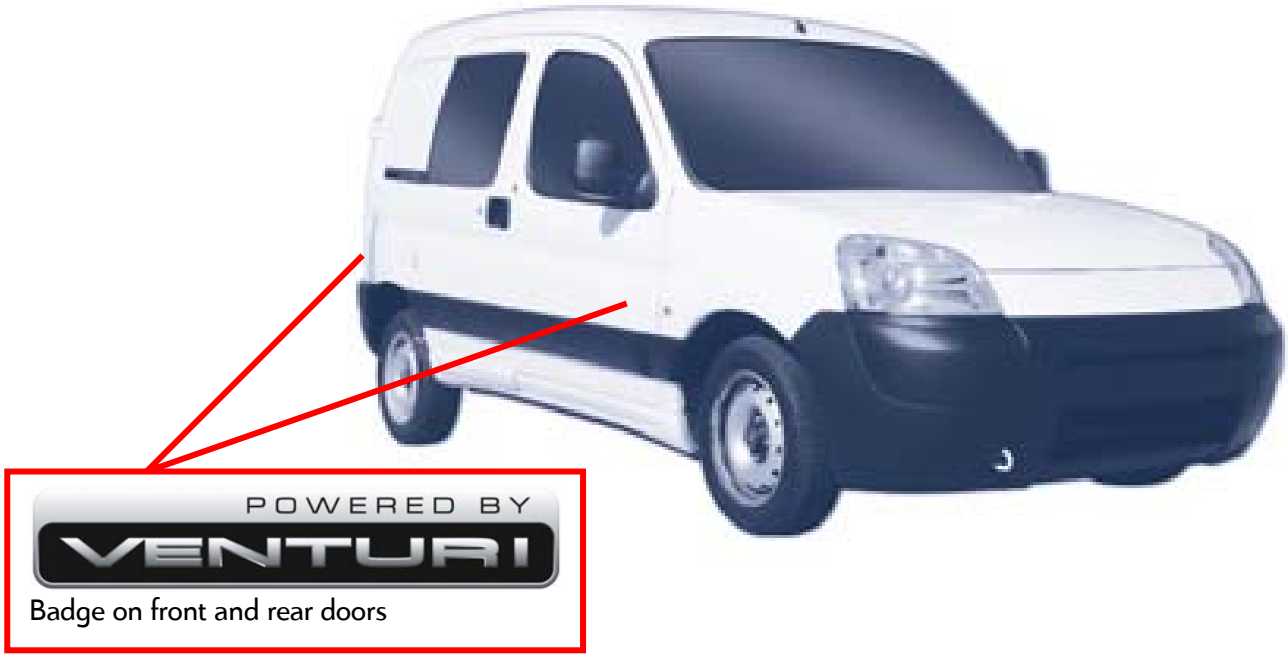
7.1 Overturned vehicle 18
7.2 Recovery 18

8 ANNEXES 18

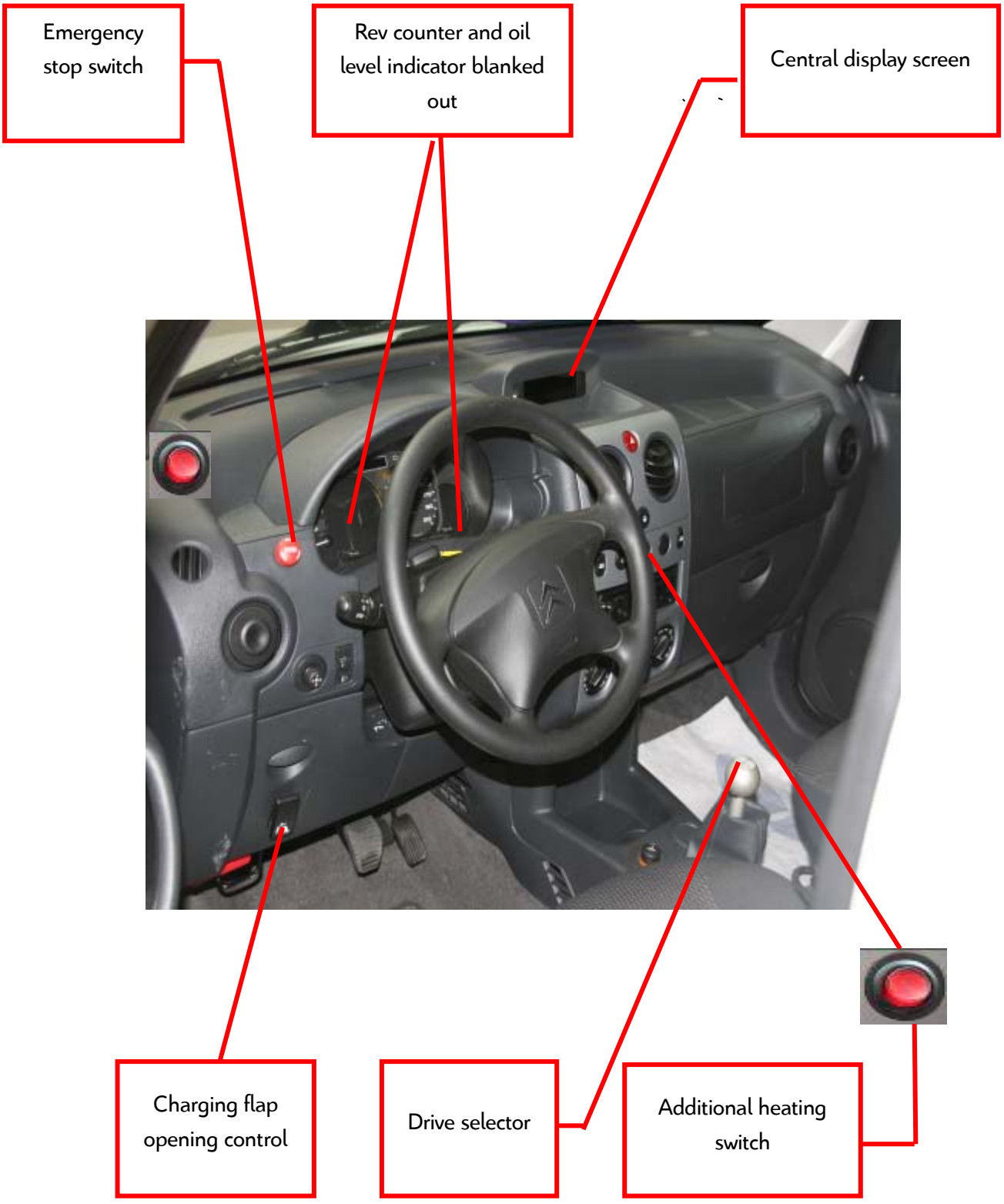
8.1 Roadside assistance sheet 19
8.2 Cutting open a vehicle (updated 6.2011) 21
8.3 ZEBRA traction battery material safety data sheet 25

1 VEHICLE IDENTIFICATION

1.1 External Identification



1.2 Internal Identification



1.3 Main characteristics

The vehicle uses 2 types of battery:

- a 12V ancillaries battery, the same as on an internal combustion engine vehicle
- a high voltage Nickel Sodium Chloride traction battery (ZEBRA Z37).

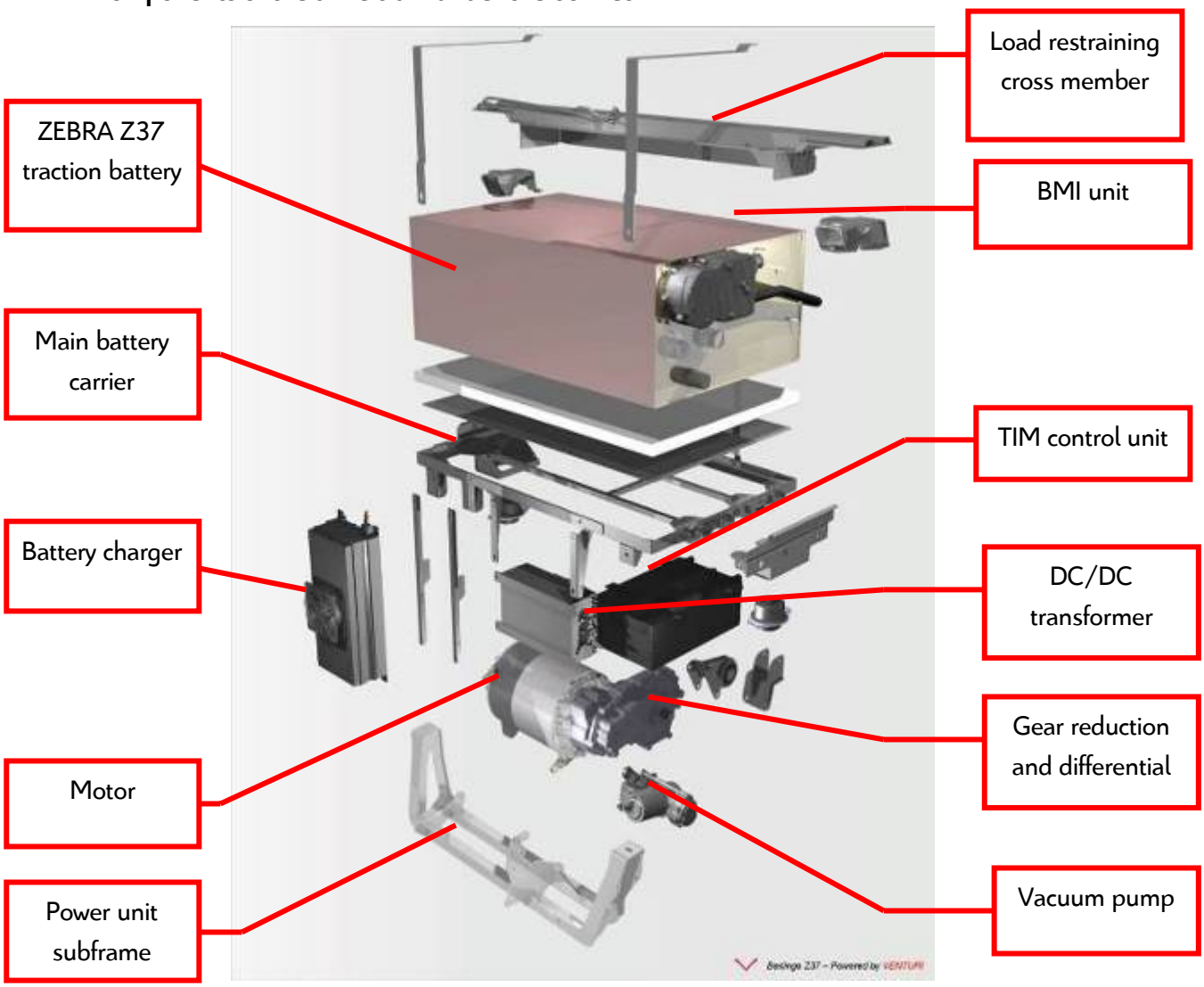
The traction battery takes the form of a box located under the bonnet.

All of the components of the drive train are fitted under the bonnet, except the AC-DC transformer and the 12V battery, located in the cabin under the passenger's seat.

To charge the traction battery, the vehicle must be connected to a mains power point. Energy recovery is also used to charge the traction battery on deceleration.

1.4 High voltage and 12V systems

1.4.1 Components of the drive train under the bonnet

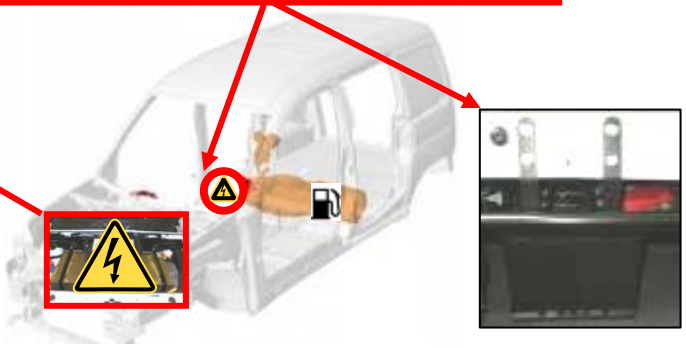


1.4.2 The batteries

Traction battery block (ZEBRA Z37)

12 V battery located under the passenger's seat supplies the pyrotechnic systems (airbag and seatbelt pretensioners …)

Switching unit



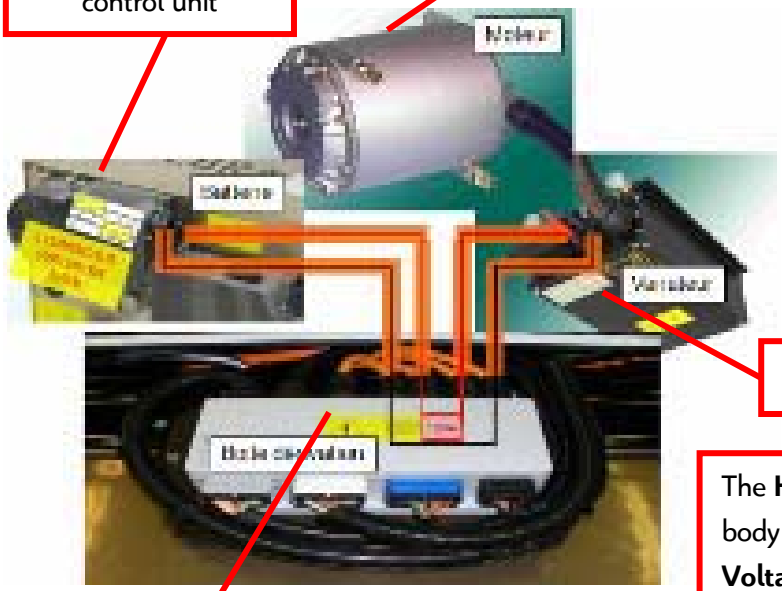
ZEBRA Z37 traction battery control unit

ZEBRA Z37 traction battery

1.4.3 High voltage system

Motor

Traction battery control unit



Controller

Switching unit

The **High Voltage** system is isolated from the body of the vehicle. A " **Danger High Voltage**'' sticker is fitted to all high voltage components. The high voltage cables can be identified by their orange protective sleeves.

2 PRECAUTIONS TO TAKE

As the **Berlingo First Electric** has a **high voltage** system with a nominal traction battery (ZEBRA Z37) voltage of 310 V, it is necessary to avoid any risk of electrocution by ensuring isolation of the High Voltage System using an Absence of Voltage Meter, after equipping oneself with the Personal Protective Equipment described in the paragraph below.

2.1 Protective equipment

Insulated personal protective equipment, rated at 400V minimum:

- Insulated protective gloves and over-gloves
- Hard hat
- Safety shoes with insulated soles
- Protective clothing

In the event of a leak of liquid (electrolyte) from the traction battery:

- Breathing apparatus or protective mask with an acid and powder filter canister (ABEKP3)
- Protective face visor
- Solvent resistant gloves
- Protective clothing

Note: items of Personal Protective Equipment are made available to Citroën Authorised Repairers via Citroën Service

2.2 Authorised Fire Extinguishers

The fire extinguisher types authorised for battery fires or to absorb liquids escaping from the battery are:

- Foam, powder or dry sand
- **Class D fire extinguishers**

CAUTION:	**THE USE OF WATER ON A DAMAGED BATTERY IS PROHIBITED** **⇨RISK OF LIQUID SODIUM CATCHING FIRE**

3 THE STEPS IN INTERVENING ON A VEHICLE

3.1 Identify the vehicle

Use the illustrations and comments given in **section 1** "Vehicle identification" to confirm that the damaged vehicle is a **Berlingo First Electric.**

3.2 Use the recommended Personal Protective Equipment

Ensure that you are equipped with the Personal Protective Equipment recommended in **section 2.1** "Personal Protective Equipment".

3.3 Precautions to take at the site of the accident

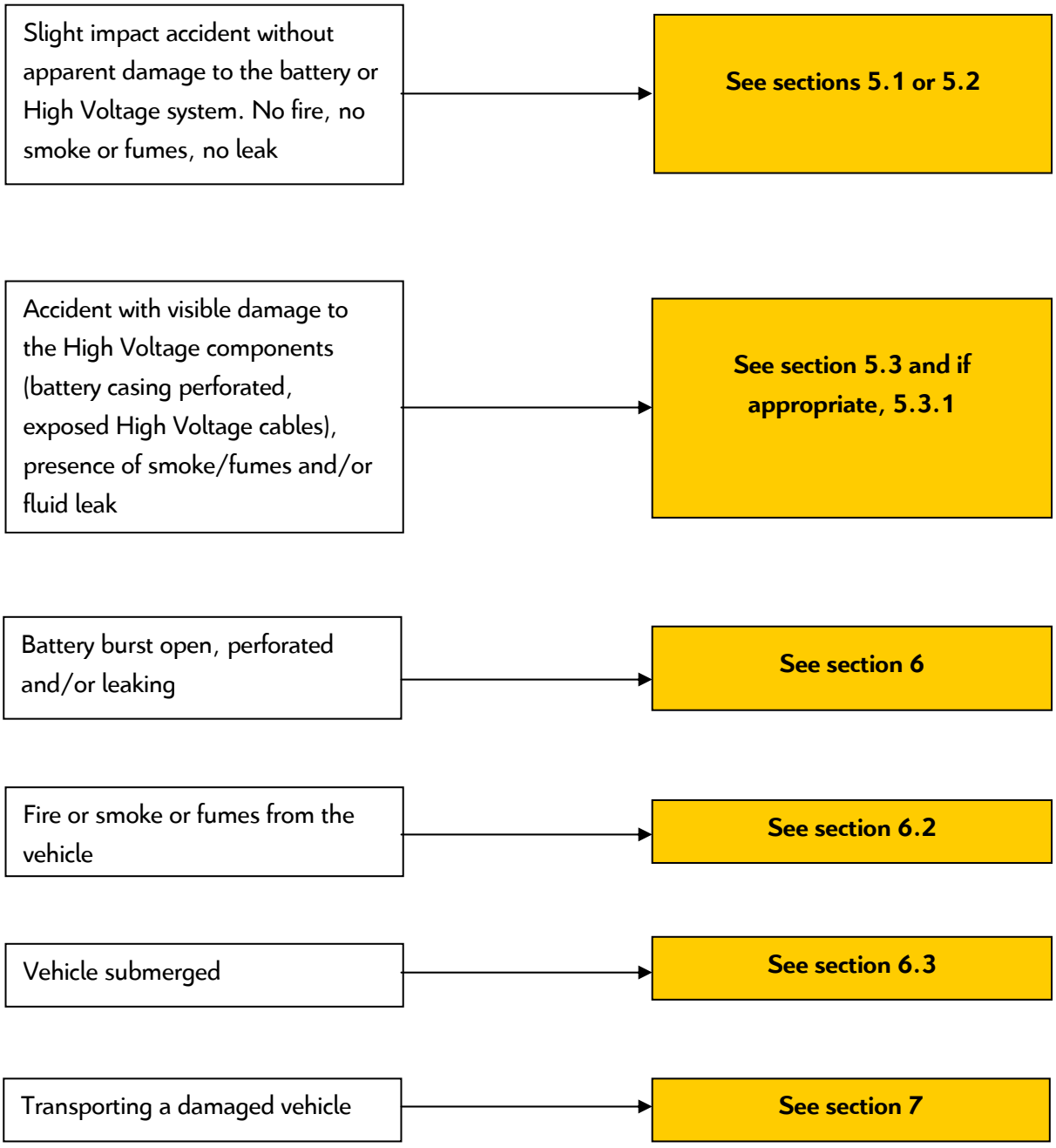
Disconnect the vehicle's **high voltage** as soon as possible (cutting the high voltage supply and disconnecting of the traction battery following the procedure in **section 4** "Making the vehicle safe").
You cannot pull or cut people out of the vehicle (see section 5.3.1) until you have ensured that the vehicle is no longer live.

CAUTION:
Intervening on a vehicle without first cutting off the High Voltage system and disconnecting the battery is dangerous.
To avoid any accident, injury or loss of life due to an electric shock, **do not touch high voltage cables and components with bare hands.**
If it necessary to touch a high voltage cable or other component **the wearing of appropriate protective equipment is mandatory to avoid any risk of electric shock (see section 2.1)**

CAUTION:
Do not leave the vehicle at the accident location without surveillance if the location is not secure.
If the emergency services have to leave the location leaving the damaged vehicle behind, a "**DANGER**" sign must be placed on the vehicle to warn of the potential danger (high voltage battery).

3.4 Checking the state of the vehicle

Depending on the type of accident (slight impact, heavy impact..), the type of damage and the physical signs (fire, leak..),after identifying the vehicle and following the recommendations in section 3, **use the diagram below to determine the instructions to follow, explained in detail in sections 5, 6 and 7**



4 MAKING THE VEHICLE SAFE

IMPORTANT: Observe the safety instructions and rules described in section 3 to avoid any risk of electric shock.

CAUTION:
Use personal protective equipment (insulated gloves and over-gloves, safety shoes with insulated soles rated at 400 V minimum) if contacting the body of the vehicle.

The objective is to put the vehicle into a safe condition, to avoid the potential electrical risks, by disconnecting the traction battery (ZEBRA Z37) High Voltage system. This procedure, described below, takes less than 5 minutes:

- **Press the emergency stop switch alongside the steering wheel**

- **Disconnect the 12V battery located behind the passenger's seat (quick release terminals)**

- **If the underbonnet is accessible and the situation permits**, disconnect the 2 connectors at the Z37 traction battery control unit.

CAUTION:
Use appropriate personal protective equipment **in there is smoke or fumes or fluid leaks** (insulated gloves and protector gloves, safety shoes with insulated soles rated at 400 V minimum, breathing apparatus, protective face visor,…)

5 PROCEDURE FOR INTERVENING IN THE EVENT OF AN ACCIDENT

5.1 Minor impact or accident or one to the rear of the vehicle

CAUTION:
Where a cable with an orange sleeve or a component using High Voltage is exposed or partly bare, refer to section **5.3 Emergency case.**
If the emergency services have to cut the bodywork, refer to section **5.3.1 Cutting open the body.**

- **Press the emergency stop switch**
- If the vehicle is being charged, disconnect the mains plug.
- Pull the bonnet release and open the bonnet
- Check that the traction battery is not damaged, has no leak, and is emitting no smoke or fumes
- Check that no High Voltage cable has been exposed or is bare

If no fault message has appeared in the display screen, the battery is showing no damage and no High Voltage cable is damaged, the vehicle may be returned to running condition. To do this, press the emergency stop switch again, then check the display screen again. If an error message appears, the vehicle should be transported to the nearest Citroën dealer (see the instructions on returning the vehicle to running condition in the roadside assistance sheet, **in annex Section 8.1**).

5.2 Major impact or accident without apparent damage to the battery (no fire, no smoke or fumes, no leak of fluids)

CAUTION:
Where a cable with an orange sleeve or a component using High Voltage is exposed or partly bare, refer to section **5.3 Emergency case.**
If the emergency services have to cut the bodywork, refer to section **5.3.1 Cutting open the body.**

5.2.1 Intervention on the vehicle

- Check that the vehicle is immobilised
- If the vehicle is being charged, disconnect the mains plug (if the vehicle is in a car park or connected to a mains socket)
- **Operate the emergency stop switch**
- Wait at least **1 minute** before proceeding to the next step
- Disconnect the 12V ancillaries battery (quick release negative terminal)
- Pull the bonnet release and open the bonnet
- Check that the traction battery is not damaged, has no leak, emitting no smoke or fumes
- Check that no High Voltage cable has been exposed or is bare
- **Disconnect the connectors at the Z37 traction battery control unit (see page 11)**

Before starting any operation on the vehicle, **check for the absence of voltage**, using an Absence of Voltage Meter. Once the absence of voltage is confirmed, it is then possible for rescue operations such as cutting open the vehicle to be carried out.

5.2.2 Vehicle recovery

Once the emergency services have finished their work, the vehicle can be recovered to the nearest Citroën dealer. For recovery instructions refer to section *7* **TRANSPORTING A DAMAGED VEHICLE**

5.3 Emergency case

An **Emergency case** is one where there is evidence of damage to the High Voltage components:

- ✓ Smoke or fumes
- ✓ Fluid leak
- ✓ Perforation
- ✓ A high level of deformation of the battery
- ✓ Exposure of High Voltage cables.

Before any check for damage, the vehicle must first be made safe (see section 4). Emergency services can then start any rescue operations.

CAUTION:
A cable with an orange sleeve is part of the High Voltage system.

Proceed as follows

- Check that the vehicle is immobilised
- If the vehicle is being charged, disconnect the mains plug
- **Press the emergency stop switch**
- Wait at least 1 minute before proceeding to the next step
- Disconnect the 12V ancillaries battery (quick release negative terminal)
- Pull the bonnet release and open the bonnet
- **Disconnect the connectors at the Z37 traction battery control unit (see page 11)**

Before starting any operation on the vehicle, **check for the absence of voltage**, using an Absence of Voltage Meter. Once the absence of voltage is confirmed, it is then possible for rescue operations such as cutting open the vehicle to be carried out. Refer to section **5.3.1 Cutting open the body**.

5.3.1 Cutting open the body

CAUTION:
Use appropriate cutting equipment that does not produce sparks, as they could cause serious injuries to passenger and emergency services.
Use the sheet on cutting open the body attached as an annex in section 8.2

6 BATTERY BURST/PERFORATED AND/OR LEAKING

6.1 Intervening on a vehicle

CAUTION: The fluid escaping from the battery may be toxic; to intervene on the vehicle **it is necessary to wear personal protective equipment**: protection for respiratory tracts (breathing apparatus or protective mask with an ABEKP3 acid and powder filter canister and a face visor, protective clothing, gloves with thermal, chemical and electric protection.

The chemicals present in the battery are listed in the ***material safety data sheet (see annex section 8.3)***.

1. **Making the vehicle safe**

- Check that the vehicle is immobilised
- If the vehicle is being charged, disconnect the mains plug
- **Operate the emergency stop switch**
- Wait at least 1 minute before proceeding to the next step
- Disconnect the 12V ancillaries battery (quick release negative terminal)
- Pull the bonnet release and open the bonnet
- **Disconnect the connectors at the Z37 traction battery control unit (see page 11)**
- If required, proceed with cutting open the vehicle (see section 5.3.1).

2. **Check the external temperature of the battery casing.**

If the temperature of the battery casing is **above 70°C**, the battery and its surroundings must be cooled **using foam.**

CAUTION:	**THE USE OF WATER OR CO_2 OR HALON FIRE EXTINGUISHERS IS PROHIBITED**

3. **If the temperature remains above 70°C or continues to rise**

Move the vehicle to a safe area (with 10 metres clear around the vehicle), for example, a car park or waste ground. For the instructions on recovery refer to section **7 TRANSPORTING A DAMAGED VEHICLE**.

Continue to cool the battery with foam until the temperature stabilises (around 70°C).

NOTE: It is a possible that smoke, fumes or gas may be released: refer to section **6.2 Fire, smoke or fumes from the vehicle**

IF THE SAFETY INSTRUCTIONS ARE OBSERVED, THERE IS NO RISK OF EXPLOSION OF THE BATTERY.

Remember that the vehicle contains petrol fuel for the heating system.

4. **Once the temperature has stabilised and is below 70°C and there is no more fluid leaking, it is possible to recover the vehicle to the nearest Citroën dealer.** the instructions on recovery refer to section **7 TRANSPORTING A DAMAGED VEHICLE**.

6.2 Fire, smoke or fumes from the vehicle

6.2.1 Intervening on a vehicle

The chemicals present in the battery are listed in the ***material safety data sheet (see annex section 8.3)***.

The smoke or fumes coming from the battery show one or more of the following characteristics:

- dense
- white or yellowish
- odorous
- escape mainly from the left hand front of the vehicle (battery cooling system)

CAUTION:

The smoke or fumes escaping from the battery may be toxic; **to intervene on the vehicle it is necessary to wear personal protective equipment**: protection for respiratory tracts (breathing apparatus or protective mask with an ABEKP3 acid and powder filter canister and a face visor, protective clothing, gloves with thermal, chemical and electric protection.

6.2.2 Making the vehicle safe

- Vehicle connected to the mains (on charge), disconnect the mains plug.
- Vehicle not connected (not on charge)

  In the event of smoke or fire from the vehicle, call the fire brigade immediately and proceed as follows:
  - Check that the battery is not leaking (fluid under the vehicle)
  - Start to put the fire out if possible using fire extinguishers:
    - For the underbonnet area, use a Class D fire extinguisher, compatible with metal fires.
    - For the rest of the vehicle, use class A, B or C extinguishers.

CAUTION:

FOR THE VEHICLE'S UNDERBONNET AREA: USE ONLY CLASS D FIRE EXTINGUISHERS, POWDER OR DRY SAND

REMINDER:

THE USE OF WATER ON A DAMAGED BATTERY is STRICTLY PROHIBITED. The use of CO_2 or halon extinguisher is also prohibited in the underbonnet area or on fluid leaking from the battery:

⇨RISK OF SETTING FIRE TO THE SODIUM FLUID

Where smoke or fumes from the underbonnet area (escaping via the bonnet or under the vehicle)

Carry out the procedure for disconnecting the high voltage as soon as possible

- Check that the vehicle is immobilised
- **Operate the emergency stop switch**
- Wait at least 1 minute before proceeding to the next step
- Disconnect the 12V ancillaries battery (quick release negative terminal)
- Pull the bonnet release and open the bonnet
- **Disconnect the connectors at the Z37 traction battery control unit (see page 11)**

6.2.3 Check the appearance and temperature of the battery

It is possible that:

- The temperature of the battery rises strongly (internal exothermic reactions)
- The battery "bulges" slightly

NOTE:
IF THE SAFETY INSTRUCTIONS ARE OBSERVED, THERE IS NO RISK OF EXPLOSION OF THE BATTERY.
However, remember that the vehicle contains petrol fuel for the heating system.

Cool the vehicle's underbonnet area **with foam**.

6.2.4 Move the vehicle to a safe area

Find a safe area near to the location of the accident (e.g.: car park or waste land) that allows a safe zone of 10 metres around the vehicle to be established.

Contact a recovery agent, cool the vehicle's underbonnet **using foam** then charge the vehicle. Refer to section **7 TRANSPORTING A DAMAGED VEHICLE**

Escort the vehicle with, for example, a police vehicle in front of the recovery vehicle and a fire services vehicle behind.

Place the vehicle in the safe area and establish a safer area of 10 metres around the vehicle.

Wait several hours for any chemical reactions to stabilise.

Place a container under the vehicle if necessary to collect fluid leaking from the battery.

Continue to cover the battery and its surroundings with foam until the smoke and fumes subside and the temperature stabilises.

Note: The size of the reaction and its duration depend on the energy in the battery (its state of charge). A battery that is close to fully charged may continue to emit fumes for around 8 hours.

Once the temperature has stabilised and below 70°C and there is no more fluid leaking or fumes, **it is possible to recover the vehicle to the nearest Citroën dealer.** Refer to section **7 TRANSPORTING A DAMAGED VEHICLE**

6.3 Submerged vehicle

Check the damage on the vehicle.

Where the vehicle is seriously damaged or the traction battery is deformed or perforated, wear the recommended insulated protective equipment and handle the vehicle with care avoiding any contact with the traction battery.

CAUTION:
After pulling the vehicle out of the water and evacuating the water from the cabin, proceed with making the vehicle safe. Wear protective equipment (insulated gloves and protective over-gloves, safety shoes with insulated soles rated at 400V minimum).

7 TRANSPORTING A DAMAGED VEHICLE

7.1 Overturned vehicle

Check that nothing has dropped onto the road and carefully return the vehicle to its wheels, avoiding any contact with the traction battery or High Voltage system (orange cable sleeves).

7.2 Recovery

See **roadside assistance sheet in the annex** (section 8.1)

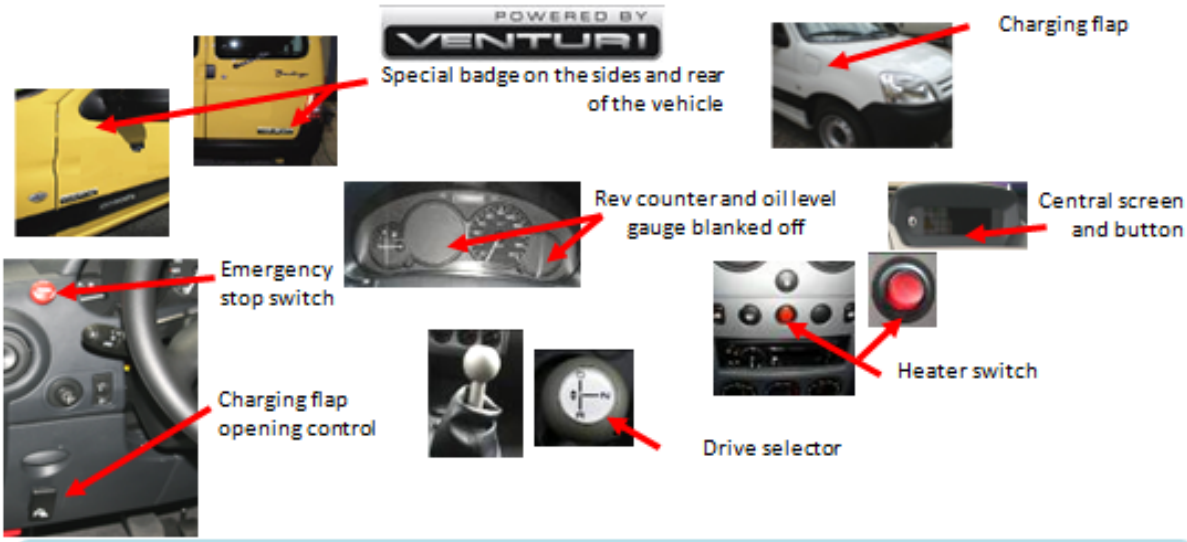
8 ANNEXES

Roadside assistance sheet (section 8.1 pages 19 and 20)
Cutting open the vehicle sheet (section 8.2 pages 21 to 24)
ZEBRA traction battery material safety sheet (section 8.3 pages 25 to 27)

8.1 Roadside assistance sheet

Citroën Berlingo /Peugeot Partner "Powered By Venturi" Roadside Assistance

How to identify whether a vehicle has a "Powered by Venturi" drive train?



The scope of roadside assistance possible

Without electrical qualifications and training on "Powered by Venturi" vehicles, IT IS PROHIBITED to take any action under the bonnet and on any of the components located there (drive train / high voltage cables / battery / switching unit)

Operations to carry out before intervening on a "Powered by Venturi" vehicle that has broken down or been involved in an accident

A circuit breaker (inertia switch) operates in the event of an impact, even a slight one.

However, the roadside assistance agent should:

- ✓ press the emergency stop switch: isolate the Z37 traction battery

- ✓ Disconnect the 12v battery (not essential just for recovery)
  - ✓ The 12V battery is under the passenger's seat
  - ✓ Disconnect the negative (-) terminal of the 12v battery

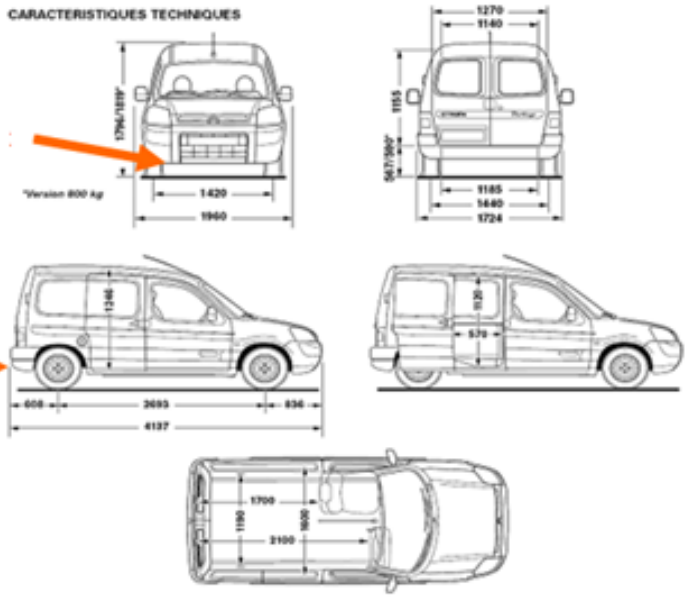
Recovery instructions for a “Powered by Venturi” vehicle

✓ **<u>Distance greater than 6 miles (10 km)</u>: recovery on a flat-bed MANDATORY**
- ✓ Voltage disconnected (push switch operated, 12V negative terminal disconnected)
- ✓ Ignition switched off, key in unlocked position
- ✓ **Place the vehicle on the flat bed** (use of straps authorised)

✓ **<u>Distance less than 6 miles (10 km)</u>: lift and tow possible**
- ✓ Towing with the front wheels lifted, rear wheels on the ground
- ✓ Do not exceed **50 mph (80 km/h)**

✓ **<u>Movements other than on the road</u>: pulling the vehicle out of its location**
- ✓ Use of the front and rear towing eyes is possible ONLY in this case.

Front towing eye :



The rear towing eye is to be used ONLY for movements not on the road (pulling the vehicle out of its location

Maintenance centre

✓ **“Powered by Venturi” vehicles require specific maintenance centres with staff that have been trained on working on these vehicles**

✓ **Contact the nearest Marque dealership if this has not been done by the customer or the roadside assistance call centre**

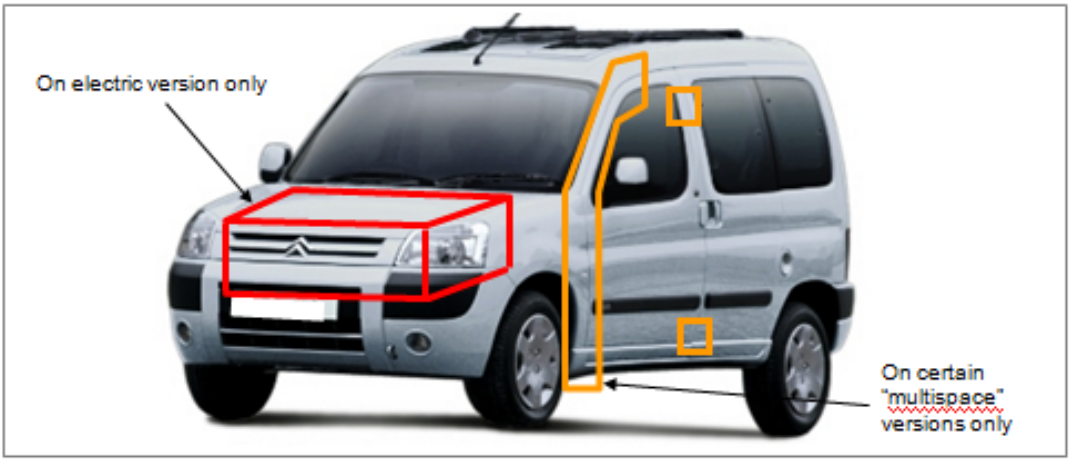
8.2 Cutting open a vehicle (updated 6.2011)

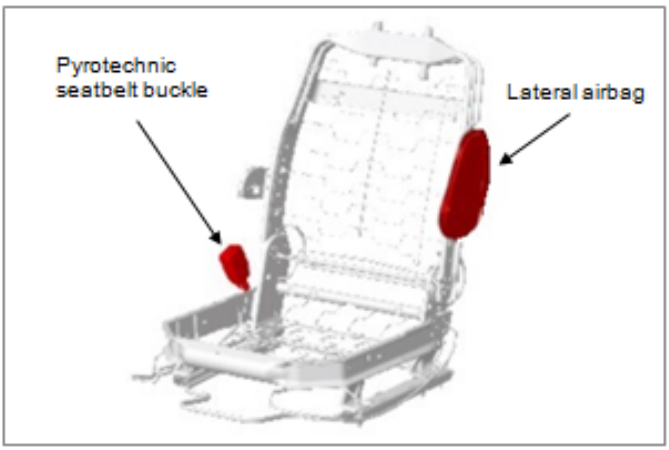
MINISTERE DE L'INTERIEUR,
DE L'OUTRE-MER
ET DES COLLECTIVITES TERRITORIALES

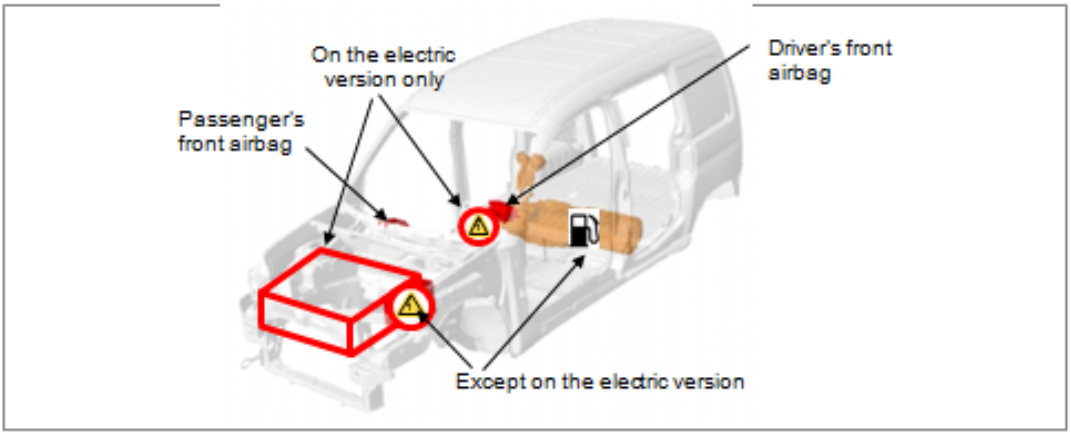
Citroën

Berlingo First

(= second generation)







Marque	Modèle	Empattement	Année de lancement	Référence interne	Date création	Date mise à jour	N° de version
Citroën	Berlingo First	-	1996	DMFV_BBV04_0147	23/05/2006	08/09/2011	V06

CITROËN

MINISTERE DE L'INTERIEUR,
DE L'OUTRE-MER
ET DES COLLECTIVITES TERRITORIALES

Citroën

Berlingo First

(= second generation)

CITROËN

	Main energy source	Stop & Start	CNG	Hybrid electric
Diesel	X		X *	
Petrol	X		X *	
Electric	X **			

* See additional CNG sheet – reference : DMFV_SSV06_0467_GNV
** See additional electric sheet – reference : DMFV_SSV06_0467_Venturi

Pyrotechnic devices driver:

front airbag :	Steering wheel
lateral airbag :	Seat backrest
curtain airbag :	
knee airbag :	
seat airbag :	
rear impact protection :	
pretension 1 – belt :	buckle strap
pretension 2 – belt **:**	

Pyrotechnic devices passenger:

front airbag :	Dashboard
lateral airbag :	Seat backrest
curtain airbag :	
knee airbag :	
seat airbag :	
rear impact protection :	
pretension 1 – belt :	buckle strap
pretension 2 – belt **:**	

passenger row 2:

front airbag :	
lateral airbag :	
curtain airbag :	
knee airbag :	
seat airbag :	
rear impact protection :	
pretension – belt :	

Comments:

- ✓ Electric version:
  - 12 V battery located behind the front passenger's seat. Access is by tipping the seat forwards.
  - Nickel Sodium Chloride traction battery ➔ metals fire => class D fire ➔ use an appropriate fire extinguisher

Marque	Modèle	Particularités	Année de lancement	Référence interne	Date création	Date mise à jour	N° de version
Citroën	Berlingo First	-	1996	DMFV_SSV06_0467	23/05/2006	08/09/2011	V06

Citroën Berlingo First "Powered By Venturi"

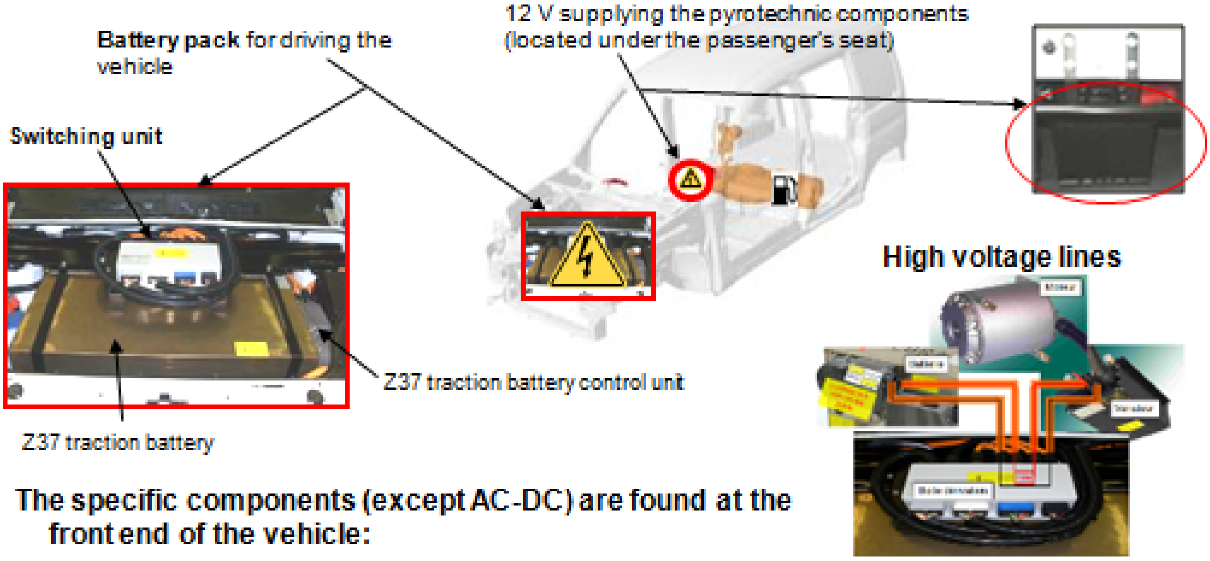
MINISTERE DE L'INTERIEUR, DE L'OUTRE-MER ET DES COLLECTIVITES TERRITORIALES

VENTURI

This sheet supplements the Help in Cutting open a Citroën Berlingo First sheet. All of the information on the pyrotechnic components and the structural reinforcements apply also to this version. Only the special features of Electric version are given in this supplement.

How to identify whether a vehicle has a "Powered by Venturi" drive train?

The special features of the "Powered By Venturi" version



The specific components (except AC-DC) are found at the front end of the vehicle:

- ✓ **High voltage sodium traction battery pack**
- ✓ **Emergency stop switch**: located in the cabin, to the left of the steering wheel
- ✓ **High voltage lines**: - Battery to the **switching unit**
  - AC-DC towards the switching unit
  - Controller towards the switching unit

Citroën	Berlingo Powered By Venturi	-	2010	[illegible]_Venturi	06/06/2011	06/06/2011	VCR

CITROËN

MINISTERE DE L'INTERIEUR,
DE L'OUTRE-MER
ET DES COLLECTIVITES TERRITORIALES

Citroën Berlingo First "Powered By Venturi"

VENTURI

Action to take when intervening in the event of an emergency on the "Powered By Venturi" version

✓ **Press the emergency stop switch:** isolates the Z37 traction battery

✓ **Disconnect the battery:**

Disconnect the 2 connectors at the Z37 traction battery control unit

In the event of a fire on the "Powered By Venturi" version

✓ Nickel Sodium Chloride traction battery ➔ metals fire
=> class D fire ➔ use an appropriate fire extinguisher

Marque	Modèle	Motorisation	Année de lancement	Référence interne	Date création	Date mise à jour	N° de version
Citroën	Berlingo	-	2010	DMFV_BERL06_0447	06/06/2011	06/06/2011	VOR

8.3 ZEBRA traction battery material safety data sheet

MATERIAL SAFETY DATA SHEET

According to European Regulation n. 1907/2006

Issuing date: 01.04.04 *Reviewed date on: 15.03.10*

Trade name: ZEBRA Battery

4. First aid measures

General information:
Go immediately away from the danger area

- After inhalation:
Seek medical treatment.

- After skin contact:
Drench affected skin with plenty of water, then wash with soap and water and seek medical treatment.

- After eye contact:
Immediately wash out with plenty of water and continuing the treatment until medical assistance is provided

5. Fire-fighting measures

Keep public away from danger area. Keep upwind and use selfbreathing apparatus.
Notify police and fire brigade as soon as possible.

NOT USE water to extinguishing fire or washing spilled chemical substances from the battery.
NO smoking.

Extinguishers allowed:
Extinguisher Class D,
Powder or dry sand,
Sodium carbonate,

Extinguishers forbidden:
Water
Carbon Dioxide, CO_2 extinguishers
Extinguishing halogen agents

Personal protection:
Selfbreathing apparatus
Protective clothing

MATERIAL SAFETY DATA SHEET

According to European Regulation n. 1907/2006

Issuing date: 01.04.04 *Reviewed date on: 15.03.10*

Trade name: ZEBRA Battery

6. Accidental release measures

The spilling of chemical substances contained inside the battery can happen only in case of a battery damage causing the breaking of all the multiple cases present in the battery.

Caution measure for people:

Wear protective clothing:	Selfbreathing apparatus or protective mask with filter against acid gas and powder (ABEKP3) Goggles or face shield Protective gloves.

Keep away the not equipped people

Intervention equipment	Shovel Broom Vacuum cleaner with high efficiency filters Sand or other absorbent.

Actions to do:
Any action has to be done only if there are no risk for people.
PROTECT against water,
CONTAIN or COVER spilled substance with dry sand or dry earth
Collect powders and adsorbed liquids avoiding dust clouds and convey in sealed plastic box to dispose as potentially toxic material

NEVER USE WATER

7. Handling and storage

HANDLING
- Instruction for a safety handling:
  Handling with care and caution, avoid always that the items come in contact with water
  Terminals should not be put in short circuit
  Do not punch or damage the battery case.

STORAGE
- Storage place requirements:
Keep in dry area, away from heating sources and with temperature between – 40 and +50 ℃

- Packaging:
  The batteries can be shipped unpacked or in wooden crates.

- Storage class:
  not defined

8. Exposure controls/personal protection

Control of the professional use:

In standard conditions of use, the battery does not need any individual protection measure for the exposure to chemical agents.

MATERIAL SAFETY DATA SHEET

According to European Regulation n. 1907/2006

Issuing date: 01.04.04 *Reviewed date on: 15.03.10*

Trade name: ZEBRA Battery

9. Physical and chemical properties

ZEBRA Battery

Solid object composed by a metal casing completely closed, which completely includes the chemical substances potentially dangerous.

Shape: cubical
Color: metallic
Smell: no one
Using temperature Range: -40 ÷ +50 °C
Energy density: 100 ÷ 125 Wh/kg
Instantaneous power: 150 ÷ 180 W/kg

10. Stability and reactivity

The battery is stable under standard conditions of use.

11. Toxicological information

The intact battery does not permit any contact between the chemical products and the external environment.

12. Ecological information

The intact battery does not permit any contact between the chemical products and the external environment.
For any qualitative information about the chemical products see point 3.

13. Disposal consideration

Do not dispose together with household waste materials
Do not burn

Return to the producer company FZ Sonick SA in Switzerland for the dispose and the recycling.