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EUROPEAN NEW CAR  
ASSESSMENT PROGRAMME

# Technical Bulletin

## Rescue Sheet Guidelines

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## **Preface**

DISCLAIMER: Euro NCAP has taken all reasonable care to ensure that the information published in this document is accurate and reflects the technical decisions taken by the organisation. In the unlikely event that this protocol contains a typographical error or any other inaccuracy, Euro NCAP reserves the right to make corrections and determine the assessment and subsequent result of the affected requirement(s).

Copyright in ISO 17840 whether electronic or other format is owned by ISO.

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## Introduction

The purpose of this document<sup>1</sup> is to specify and illustrate how to design the content and layout for a Rescue Sheet in accordance with ISO 17840 standard (Part 1:2015 and subsequently updated in 2021, as well as Part 3 and Part 4). Following these instructions, the rescue sheet will be compliant with present Euro NCAP requirements.

Examples included (labelled “EXAMPLE” in the text) can come from official rescue sheets or they can be made up to illustrate a point. No rights can be derived from these examples.

The purpose of the Rescue Sheet format is to use as less text as possible in order to make their understanding as easy as possible and overcome language barriers. The rescue sheet (ISO 17840 Part 1) is “quick information” for the first responders on the accident scene.

The ISO 17840 Part 3 Emergency Response Guide (ERG) gives “in-depth information” by adding text in addition to the pictures or the pictograms from the Rescue Sheet. The ERG contains crucial and in-depth information linked to the Rescue Sheet to inform, train, and develop rescue procedures by first responders. The headings/contents of the Rescue Sheet and the ERG information are aligned with each other, i.e. the ERG information works as an extension to the Rescue Sheet.

Both ERG and the Rescue Sheet follow a flowchart of the main actions to take by first and second responders, arriving at the accident scene or performing towing and other activities afterwards.

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<sup>1</sup> This Technical Bulletin is based on the information contained in the document Rescue Sheet - How to create it? Guidelines following requirements from ISO 17840 Part 1 and Euro NCAP, by CTIF/IDIADA, Version 12 June 2020 and the updated Version of 15 September 2020.

## General Recommendations

It is recommended to use as little text as possible, and instead use the pictograms defined in ISO 17840 – Part 1 and/or Part 3. This way, this the information is straightforward for the first responders, and the effort to edit versions in all the different languages will be less.

- 1) Always use pictograms coming from ISO 17840-Part 1 and/or Part 3. Seek expert advice if you are uncertain about which pictogram to use.
- 2) Ensure the quality of the picture / drawings / photos / pictograms are following the General Recommendations in ISO 3864-1. This is to make certain that the document is readable and easy to understand.
- 3) Important information must be emphasized:
  - Hazards/Danger: **Red border** RGB: 255/0/0, text in black capital letters or lower case.
  - Recommendation: **Green border** RGB: 0/176/80, text in black capital letters or lower case.



**Hazards / Danger**

**Recommendation**

## Colour Codes from ISO

Pictograms are made with specific shape, pattern but also colour. The use of each colour and its RGB code is defined by ISO 17840. To understand and classify the parts, equipment, and dangers at first glance, it is important that the ISO colour codes are respected.

## Pictograms from ISO 17840

For ISO 17840 Part 1, 2 and 3 (used in the legend), it is possible to buy the full package of pictograms (in vector and high-resolution bitmaps) from the SIS site:

<https://www.sis.se/en/bcker/rescue-sheets-and-emergency-response-guides-for-road-vehicles/>

The propulsion energy labels (diamond form) in ISO 17840 Part 4 are all made by a combination of symbols that are defined in ISO 7000. Each symbol has a registration number and ISO 17840 Part 4 defines which symbol(s) need to be used for each propulsion energy.

All the ISO 7000 symbols can be found at [www.iso.org/obp](http://www.iso.org/obp), click “graphical symbols” and enter the number of the desired symbol. Symbols in vector format can be purchased and downloaded directly.

## Translations

ISO 17840 Part 1, 2, 3 and 4 defines the format of the rescue sheet and the pictograms to be used. The standard also specifies the name of the part represented by these pictograms.

Even if the idea is to use as little text as possible, there is a need to translate the rescue sheet in different languages. For this, the members of the Euro NCAP and ISO Rescue working groups also provided recommended translation of the pictograms present in the Legend, see Appendix.

A separate file “Annex to TB030 - Translation of pictograms and headers for ISO\_17840” can be downloaded from the Euro NCAP website. This file will be updated regularly.

## Front Page Layout and Content

The front page of the ISO Rescue sheet presents the main information and is organised in several blocks/parts:

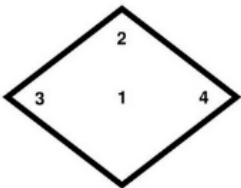
- Header (Part 1), including brand and vehicle information, etc.
- Header (Part 2), including perspective views of the vehicle (photos or virtual representations).
- Body, including top and side views of the vehicle (drawings) with pictograms are used to locate relevant components and functions.
- Legend, with standardized pictograms and text.
- Footer.

In the next sections, more detailed comments are provided on each part.

### Header - Part 1

Check the following:

- 1) Both brand name and model name are listed, even if the logo shows the brand in full letters.
- 2) Do not forget to check if the name of the model (or brand) is not different in one specific country/market.
- 3) List all body types of the model covered by this rescue sheet. For example: 3 doors-5 doors, 5 seaters vs 7 seaters, hatchback, sedan...
- 4) Use approved symbols for propulsion energy identification only, according to ISO 17840 - Part 4:

	1. First energy source
	2. Second energy source
	3. Density towards air
	4. Stored state

### EXAMPLES



- 5) Use one of these pictograms, or leave blank:
- 6) Never put the 2 pictograms at the same time! Purpose of this pictogram is to inform that the RHD rescue sheet contains significant differences from the LHD version and therefore 2 distinct Rescue Sheets are needed. In most of the vehicles this distinction is not needed. Therefore, the pictogram should not be used if there is no Rescue Sheet for the other hand of drive.

## **Header - Part 2**

Ensure the quality of the (colour) image is minimum 300 dpi and the size of the pictures is large enough to be able to distinguish the details for a first responder trying to identify the car to ensure this is the right Rescue Sheet.

Please check the following:

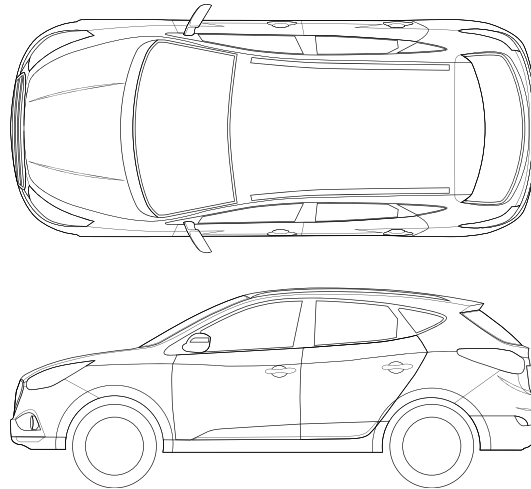
- 1) ISO standard asks for 2 pictures, not less, not more.
- 2) The image can be a photo of the real car, or a digital, virtual representation of the car model.

### EXAMPLE





## Top and Side Views

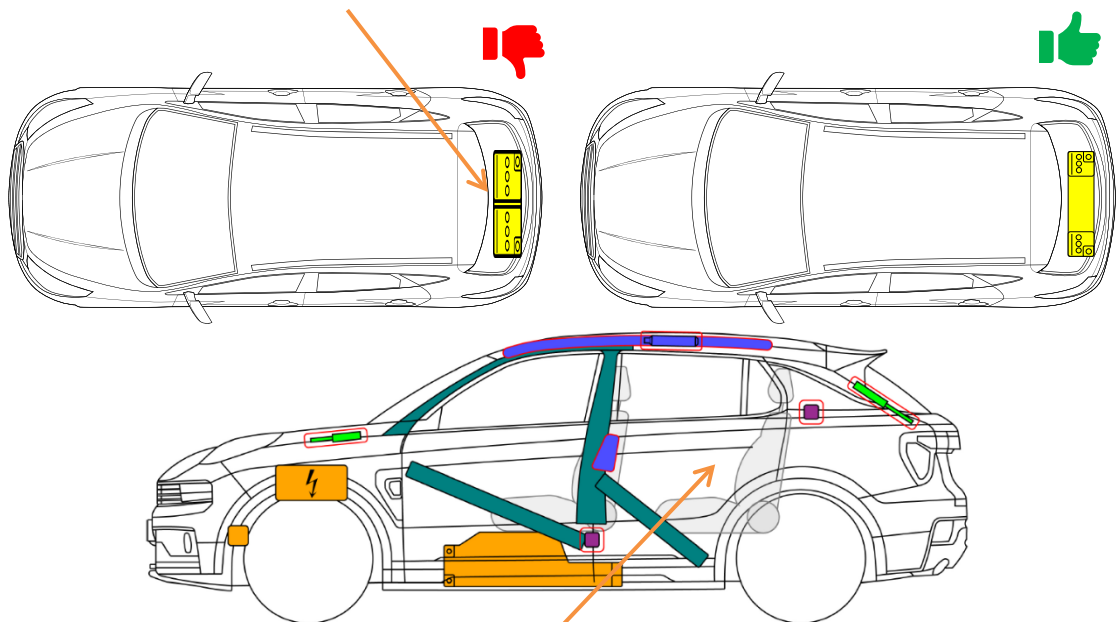


Please check the following:

- 1) Use the pictograms as shown in the legend. If you need to use pictograms from Part 3, do not forget to add a line in the legend to display them (see page 13).
- 2) Do not deform (stretch) existing symbols but when the volume is important draw realistic adapted components keeping the colour code of the symbol/border strip (e.g., HV battery)

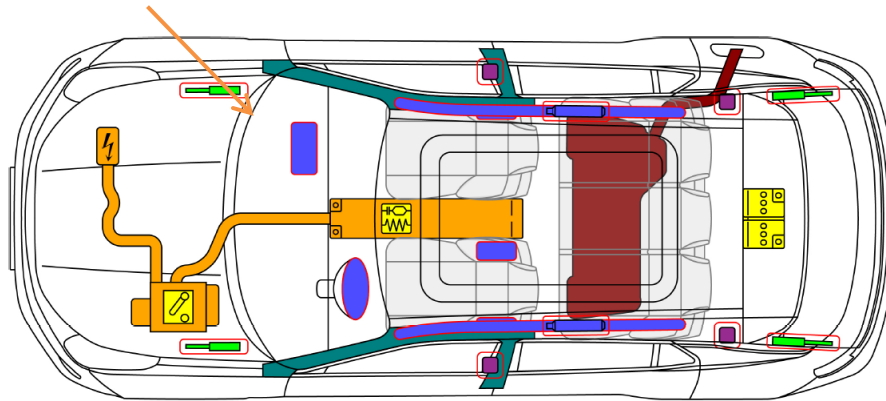
### EXAMPLES

Do not stretch the pictogram



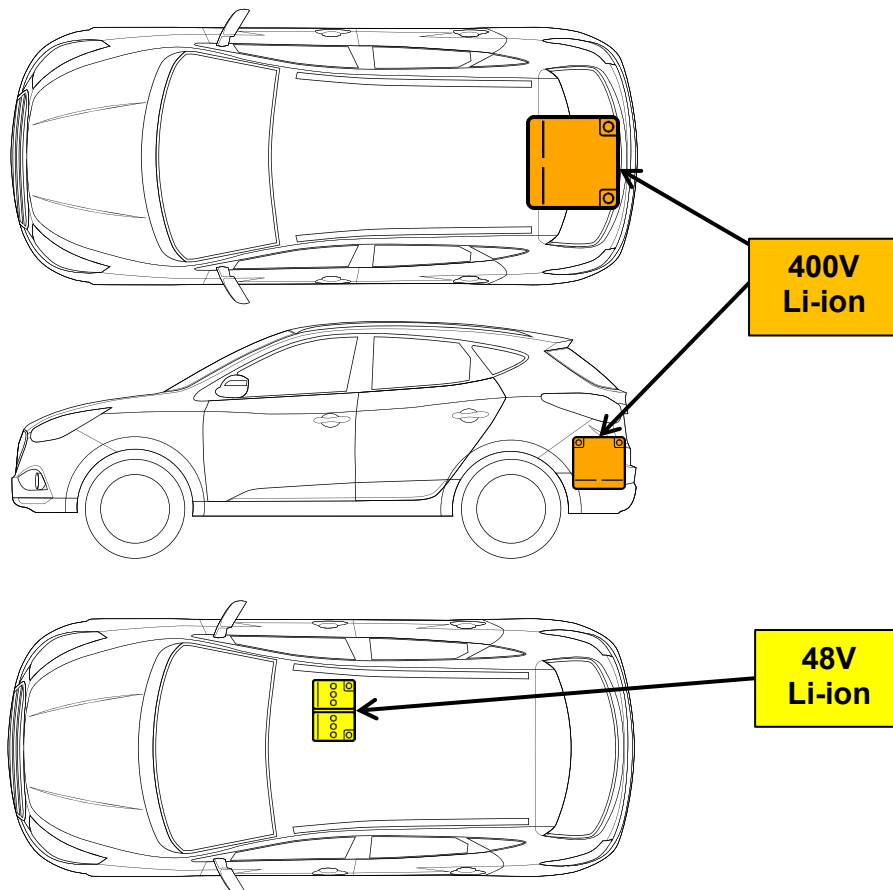
Show seating

Draw realistic shape components (e.g. airbag)



Do not show unnecessary components

The HV voltage & battery type (in this order) must be indicated with an arrow pointing towards the battery pictogram and a text box using the same colour code as the pictogram. This requirement is also applicable for low voltage batteries (from 24V to 60V).

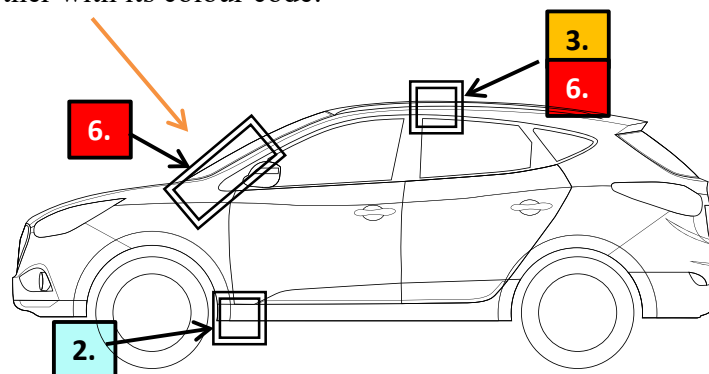


## Double Frame Rectangle

To highlight specific items, you can combine the double frame rectangle with the reference to the chapter number together with its colour code.

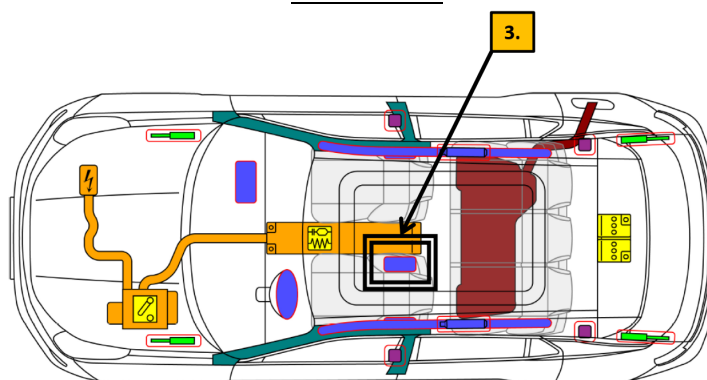
A double frame rectangle can be displayed on the 2<sup>nd</sup> part of header or on the top or side view. It is recommended to do so for any new equipment the first responders are not used to see in the accidents.

Use the double frame rectangle with the reference to the chapter number together with its colour code:



Example below show the case for the far side airbag (also called centre airbag - CeAB). This airbag is unknown to most European car models, however expected to be more popular in the coming years because of Euro NCAP's incentive. It will remain scarcely present in accidents for the coming years due to the low market penetration of new models. Therefore, it is important to highlight this new system for the next years and its location to first responders, as shown below.

### EXAMPLE



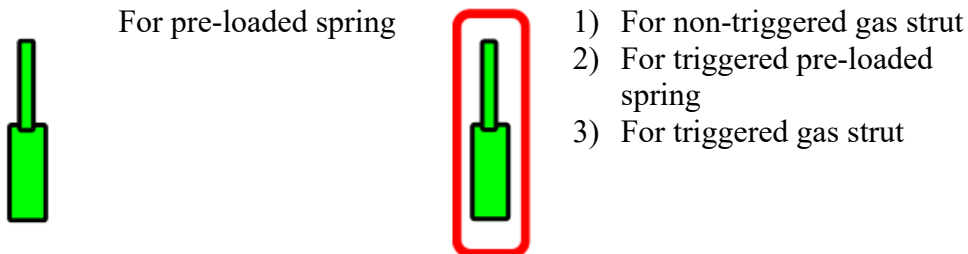
## Gas Strut

The Red colour code has been initially reserved for actively triggered equipment only (e.g., via pyrotechnic) as shown in Table 1. However, gas struts have traditionally been displayed in the Rescue Sheets with a red contoured pictogram and first responders are used to see this equipment displayed in this way.

Initially, before ISO 17840 creation, the red contour was used to distinguished between a pre-loaded spring and a gas-strut. This distinction was considered crucial

because in case of fire the gas strut can be a real danger compared to a pre-loaded spring. For this reason, the ISO Working Group has decided to change the definition of the red colour code, to keep the red contour for any gas strut in the ISO 17840 Part 1 new version (publication pending).

Check the following:



## Reinforcements

The purpose of this information is to highlight structural reinforcements in the vehicle relevant to the rescue process, i.e., those structures that may be cut by the first responders to extricate the occupant. It can be used to highlight the reinforcements that can be used as a support to opening tools such as spreaders.

Reinforced structures can be difficult to cut because they may use high-strength steel or an accumulation of several layers of “standard steel”. For this reason, for instance, cutting the D-Loop area in the B-Pillar should normally be avoided.

Other types of reinforcements, such as inside the doors, are not relevant so it is not needed to present them.

## Fuel Tank




















A difference in the fuel type normally does not justify the creation of two distinct Rescue Sheets. In other words, one unique Rescue Sheet can cover Diesel and Gasoline variants. In such case, the fuel colour is to be used on the Top and Side View diagrams is based on the worst-case fuel type.

For instance, in the case of Diesel and Gasoline variants, the worst-case is Gasoline because it is flammable at any pressure. For this reason, the dark red colour must be used in the top and side views. In any case, both diamonds (propulsion energy labels) must be displayed on the title part, so the first responders will know that this Rescue Sheet applies to both cases.




## Legend

The FULL and EXACT legend of ISO 17840-Part 1:2015 must be displayed. This is a requirement from this version of the standard. Otherwise, the Rescue Sheet is not compliant with ISO and therefore not compliant with Euro NCAP requirements. If you need to use pictograms from Part 3, add a line in the legend to display them.

Legend of  
ISO 17840-  
Part 1:2015

	Airbag		Stored gas inflator		Seat belt pretensioner		SRS control unit		Pedestrian protection active system
	Automatic rollover protection system		Gas strut/Preloaded spring		High strength zone		Zone requiring special attention		
	Battery low voltage		Ultra capacitor, low voltage		Fuel tank		Gas tank		Safety valve
	High voltage battery pack		High voltage power cable/component		High voltage disconnect		Fuse box disabling high voltage system		Ultra capacitor, high voltage

Additional  
pictograms  
from Part 3

	High voltage disconnect (cutting solution)		Disconnect high voltage device		Fuel tank content gasoline / ethanol				
---	--	---	--------------------------------	---	--------------------------------------	--	--	--	--

Note: Once the new version of the ISO standard will be published, the legend will be a dynamic legend where only the pictograms used on this rescue sheet will have to be displayed. (Older versions of ISO compliant rescue sheets already accepted by Euro NCAP would not be required to be updated to meet the latest ISO standard for the legend)

## Footer

Check the following:

- 1) The total number of pages of the Rescue Sheet must be listed in the footer.

## Additional Pages Layout and Content

Additional information is organised in Chapters. Page 2 list the relevant headers with colours, as shown below. The RGB colours (the text colour and the background colour) are imposed by ISO 17840 Part 3. The Rescue Sheet with additional information should not exceed 4 pages (including the front page).

1. Identification / recognition

2. Immobilisation / stabilisation / lifting

3. Disable direct hazards / safety regulations

4. Access to the occupants

5. Stored energy / liquids / gases / solids

6. In case of fire

7. In case of submersion

8. Towing / transportation / storage

9. Important additional information

10. Explanation of pictograms used

If there is no specific information to give in one chapter, then the header of the chapter does not need to be displayed. But the next chapter will keep the chapter number as displayed above. There is no renumbering. However, if a hazard is applicable to several chapters, the general principle is that it should be repeated under each chapter.

Euro NCAP expects that for BEV, HEV, PHEV, Hydrogen, Fuel Cell powered vehicles almost all chapters will be completed. Even for a traditional ICE (Internal Combustion Engines e.g. Diesel or Gasoline) vehicle, some information is relevant to be presented in the Rescue Sheet, such as:

- 48 Volt battery,
- New type of airbags (such as Occupant to Occupant Side Airbag),
- Other new active or passive safety technology/items,
- Special constructions/materials that has been used,
- New types of access to the vehicle,
- New types of communication V2X, etc.

Remember that the ISO 17840 Emergency Response Guide is made to be used as a direct link with the ISO 17840 Rescue Sheet to give further in-depth information. The combination of the two documents therefore can be very effective.

## General

It is recommended that each of the additional page contains a small header listing: the brand / model / type and validity.

## Chapter 1 – Identification / Recognition

### 1. Identification / recognition

When applicable, please start with the following warning (for Electric, Hybrid, Fuel Cell vehicles):

LACK OF ENGINE NOISE DOES NOT MEAN VEHICLE IS OFF: SILENT MOVEMENT OR INSTANT RESTART CAPABILITY EXISTS UNTIL VEHICLE IS FULLY SHUT DOWN. WEAR APPROPRIATE PPE.

- 1) General safety remarks are needed to approach safely the vehicle and give the possibility to identify/recognize safely the vehicle model.
- 2) All relevant information with applicable symbols/drawings/pictures/photos for the full identification of the vehicle. Information concerning symbols, model name, etc. on the vehicle, such as brand logo, model logo.
- 3) Information to identify the propulsion system:
  - Information of what to identify under the hood,
  - Information of what to identify on the dashboard,
  - Specific information to recognize this vehicle (e.g., hybrid, EV, FCEV, or other identification),
  - Specific REESS or alternative propulsion fluid / energy source,
  - Identification of the type of battery: chemistry family, voltage class, location in vehicle,
  - Inclusion of applicable ISO 17840 pictograms.

### EXAMPLE

### 1. Identification / recognition



LACK OF ENGINE NOISE DOES NOT MEAN VEHICLE IS OFF. SILENT MOVEMENT OR INSTANT RESTART CAPABILITY EXISTS UNTIL VEHICLE IS FULLY SHUT DOWN. WEAR APPROPRIATE PPE.

Brand logo



Model name



Source: Lynk & Co

## Chapter 2 – Immobilisation / Stabilisation / Lifting

- 1) Show relevant information for immobilisation and/or stabilisation actions on/around the vehicle
  - Provide images/illustrations of these elements,
  - Identify appropriate vehicle specific stabilisation-lifting points,
  - Identify prohibited vehicle specific stabilisation-lifting points.
- 2) It is recommended to separate the two main items, as follows:
  - A. IMMOBILISE THE VEHICLE. Generally, recommend to:
    - Block the wheels,
    - Set the parking brake,
    - Put the car in “P” for automatic gearbox,
    - Use pictures to show parking brake,
    - location and gear lever location.
  - B. LIFTING POINTS. Generally, a bottom view of the car to show the jack points and the High Voltage cables, if any

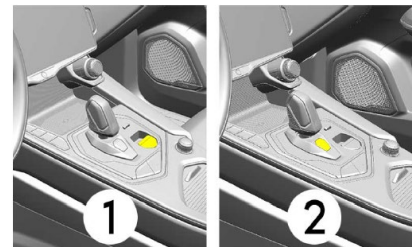
Use the titles above (A and B) to be consistent with other Rescue Sheets.

### EXAMPLE

#### 2. Immobilisation / stabilisation / lifting

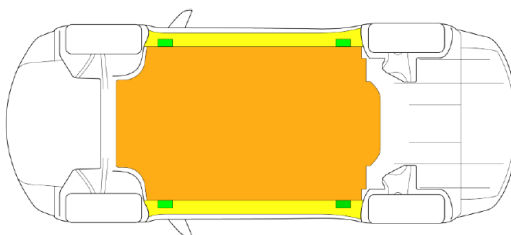
##### Immobilise vehicle:

1. Block wheels and set parking brake;
2. Push the P (park) button to select the P (park) position;



Source: LYNK&CO

##### Stabilisation-lifting points:



Source: TESLA

- Appropriate stabilisation-lifting points
- Appropriate stabilisation points vehicle on side
- High voltage battery



## Chapter 3 – Disable Direct Hazards / Safety Regulations

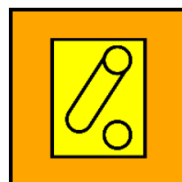
### 3. Disable direct hazards / safety regulations

- 1) Use as little text as possible to avoid language difficulties. Extensive use of the pictograms from ISO 17840-Part 3 is recommended. These pictograms can be on the left side of the page to symbolise the actions to take and where to do them.
- 2) It is important as well to define if the disabling process needs to be done with PPE, or not. Extra care should be taken of the correct use of the following:



#### Disconnect High Voltage Device (HVD)

To identify HVD that disconnect the high voltage where appropriate PPE is needed for the action



#### Disconnect High Voltage Device (HVD)

To identify the low voltage device that disconnect the high voltage (No PPE required)

- 3) Generally, there are some main actions and then some different alternatives for the hazard disabling. Clearly identify MAIN and ALTERNATIVE disabling methods:
  - MAIN DISABLING METHOD
  - ALTERNATIVE DISABLING METHOD(S)
  - ACCESS

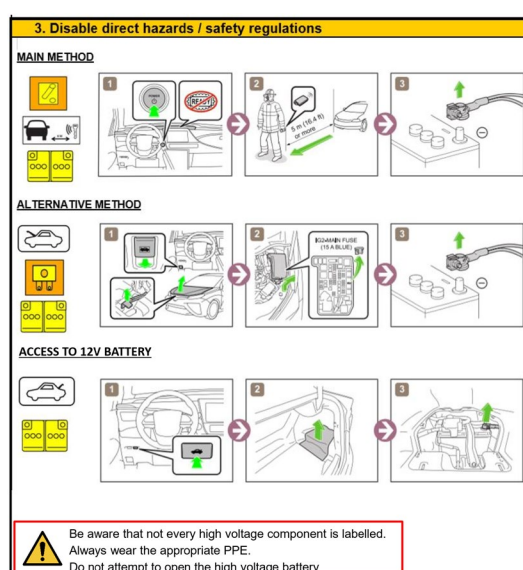
Use the text above to be consistent with other rescue sheets.

- 4) Recommended content for this Chapter includes:
  - How to eliminate immediate danger, which safety requirements are needed.
  - Including “preferred” procedure and “alternative” procedure(s) for disabling direct hazards (e.g., disabling high voltage or shutting off gas pressure);
  - Procedure when EV / PHEV are connected on charging.
  - Illustrate “specific type” of disconnections, with necessary information.

### EXAMPLES



Source: SKODA



Source: Toyota

## Chapter 4 – Access to the Occupants

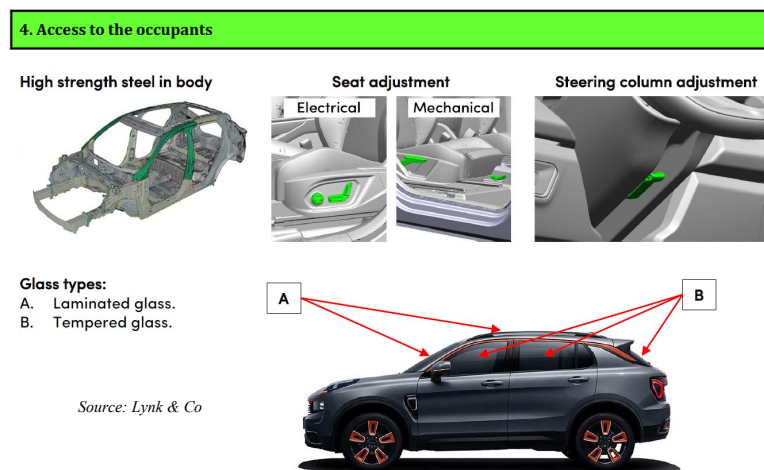
### 4. Access to the occupants

1) Identify glass types (All windows): Laminated and Tempered glass.

It is also possible to add information in this chapter in case the car has very specific or distinct features, that are not present or located in the same place as most other cars, or that are not operated in the usual way. For this reason, in addition to 1), information could be included, such as:

- 2) Seat adjustment (electric/mechanical).
- 3) Steering column adjustment.
- 4) High strength steel in body.
- 5) Door latches/command.

### EXAMPLE



## Chapter 5 – Stored Energy / Liquids / Gases / Solids

### 5. Stored energy / liquids / gases / solids



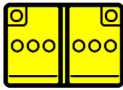









Focus on the following key points:


- 1) Primarily use pictograms here. A more detailed table will be available in the ERG so it is not needed in the Rescue Sheet.
- 2) List of stored energy/ liquids/Gases/Solids with mention of the dangers with the use of ISO 17840 pictograms:
  - Batteries with mention of voltage.
  - Propulsion fuel tank with mention of content in litre.
  - Propulsion gas tanks with mention of content in litre.
  - Solar cells with mention of voltage.
  - Carbon / Magnesium / Titanium used in vehicle.
  - Dangers when broken/leaks/dust (e.g Carbon fibres).
  - HV battery pack coolant.
  - Specific air-conditioning coolant.

Do not mention braking fluids, motor oil, etc. if they do not present any specific hazard.


- 3) For specific materials mentioned above, the location must be displayed on the front page with a double frame rectangle and the reference to this chapter (see also Double Frame Rectangle, page 10).

### EXAMPLE

		Full body
		48 V
		400V
		700 bar
		50 l
		0,9 l



When coolant leaks from the battery pack, it can become unstable with risk of thermal runaway. Check battery pack temperature with thermal imaging camera.







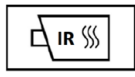












## Chapter 6 – In Case of Fire

### 6. In case of fire

- 1) Again, mainly use pictograms here.
- 2) Extinguish method: recommendations specific for this type/model (e.g.)
  - How to put water into the HV battery (e.g., Fireman access, direction of jet of water for better efficiency, ...);
  - Clear warning if it is not recommended to apply a certain methodology to extinguish fire (e.g., not to put the car into container with water).
- 3) Hazards specific for this type/model.
- 4) Hazards also after fire (e.g., Carbon Fibres, reignition).
- 5) Recommendations specific for this model e.g., venting direction of the CNG or of the HV battery, if any.

## EXAMPLES

Electric Powered	<div>6. In case of fire</div> <div>  <b>Use large amount of water</b> </div> <div>      </div> <div>  <div>  <b>BATTERY RE-IGNITION!</b> </div> </div>
	<div>6. In case of fire</div> <div>           Temperature Pressure Release Device(TPRD) opens at 110°C (loud hissing noise) 90 seconds before all CNG gas is released from a tank             </div>
CNG Powered	<div>6. In case of fire</div> <div>           Temperature Pressure Release Device(TPRD) opens at 110°C (loud hissing noise)            </div>
	<div>6. In case of fire</div> <div> <div>  <b>USE LARGE AMOUNT OF WATER ON BATTERY PACK</b> </div> <div>     </div> <div>  <b>BATTERY RE-IGNITION</b> </div> </div>
Fuel Cell Powered	

## Chapter 7 – In Case of Submersion

### 7. In case of submersion

- 1) In most cases, a reference to Chapter 3 will suffice.
- 2) Where specific functions exist in the vehicle, addition information can be presented here, such as:
  - What to do in case of immersion in water, the specific dangers.
  - Which procedure to follow concerning e.g. high voltage.

### EXAMPLE

### 7. In case of submersion

Wear appropriate PPE. Remove the vehicle from the water and continue with normal high voltage (see chapter 3). Vehicles submerged in salt water should be handled with a greater potential risk of a HV battery fire.

Tilt the vehicle to one side to allow water to drain out of the vehicle and the high voltage battery.

## Chapter 8 – Towing / Transportation / Storage

### 8. Towing / transportation / storage

This section is specially made for second responders like towing services, garage technicians, etc. Focus on the following key points:

- 1) Present where to secure the towing hook tool in the car (front and rear) and if relevant where the tool is located
  - Towing/transportation method specific for this type/model or general.
  - Storage method specific for this type/model or general.
  - Hazards and recommendations specific for this type/model or general.

### EXAMPLE

#### 8. Towing / transportation / storage

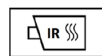
Location front hook



Location rear hook



**STORE AT SAFE DISTANCE FROM OTHER VEHICLES!**



**BATTERY RE-IGNITION!**



Source: Lynk & Co

## Chapter 9 – Important Additional Information

### 9. Important additional information

Standard information that can be displayed here is:

- 1) Contact information manufacturer.
- 2) Link to ERG (effective working link).

In addition, this chapter can be used to share more details about new to market technology, such as the deployed state of a new airbag system (centre or roof airbag for instance).

- 3) Attention can be drawn to the first responders using a double frame rectangle and the reference to this chapter (or to Chapter 3) that will be displayed on the front page (see also page 10).
















## Chapter 10 – Explanation of Pictograms Used

### 10. Explanation of pictograms used

When there is enough space to fit this chapter inside the Rescue Sheet, it is good practice to insert a table with all the pictograms that are not yet presented in the legend displayed in the 1st page.

Otherwise, if not possible, insert the link to the ISO 17840 ERG where they can be displayed and defined.

### EXAMPLE

10. Explanation of pictograms used			
	Smart key distance		Risk of flammability
	Warning high voltage		Risk of damaging human health
	Caution		Risk of acute toxicity
	Warning low temperature		Risk of an explosion
	Air-conditioning component		Risk of corrosive material / substances
	Hybrid Gasoline vehicle		Use water to extinguish the fire
	Use IR Camera (thermal imaging)		Bonnet
			Trunk

**Please note:** A separate file is available from the Euro NCAP website containing the rescue sheet symbols, explanatory text for each symbol and also translations of this text along with a file naming convention.