HyFive meeting
Zaventem BE
CTIF is an international association of fire and rescue services who represent fire fighters in 37 countries all over the world.
Different Parts of New Working Item Proposals proposed by CTIF

“Fast, adequate and crucial information for first and second responders”

- **Part 1**: Rescue sheet: approved
- Part 2: Rescue sheet for busses, coaches and heavy commercial vehicles
- Part 3: Standardized Emergency Response Guides
- Part 4: Drive line signs (propulsion energy identification)

Next meeting: 4th of June, Paris (F)
Rescue sheet for busses, coaches and heavy commercial vehicles
### Example 1: Rescue Sheet

<table>
<thead>
<tr>
<th>Hydrogen tanks</th>
<th>Hydrogen pipes</th>
<th>High voltage component</th>
<th>Fuel Cell</th>
<th>Overpressure valve</th>
<th>High voltage lines</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="H2" /></td>
<td>![image2]</td>
<td>![image3]</td>
<td>![image4]</td>
<td>![image5]</td>
<td>![image6]</td>
</tr>
<tr>
<td>Emergency exit window</td>
<td>Emergency exit door</td>
<td>Battery key</td>
<td>Manual Valve</td>
<td>Li ion battery</td>
<td>A 330 Fuel Cell Bus Rescue Sheet</td>
</tr>
<tr>
<td>Swith off power</td>
<td>Airco</td>
<td>Battery low voltage</td>
<td>Direction overpressure valve</td>
<td>Fuel cell electric vehicle</td>
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<tr>
<td><img src="image" alt="H2" /></td>
<td><img src="image" alt="Z" /></td>
<td><img src="image" alt="Orange" /></td>
<td><img src="image" alt="Fuel Cell" /></td>
<td><img src="image" alt="Overpressure valve" /></td>
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Example 2: 3D Rescue Sheet

- **Dashboard**
- **H2** Hydrogen reservoir 8x205L ±350 bar
- **Lithium-ion battery** Highvoltage 600V ~ 100A
- **Component High voltage**
- **Switch off motor/High voltage**
- **Fuel Cell**
- **Inverters**
- **Low voltage battery**
- **Emergency exit**
- **Stop**
- **Lithium-ion Battery**
- **Night Charging**
- **Low voltage battery**
- **Hydrogen reservoir**

**Safe Regulations/PPE**

- **In Case Of Fire**
  - **Small fire**
  - **Big fire and High Voltage Battery Fire**

**A330 Fuel Cell bus**

**RESCE SHEET High Voltage lines**
Example 2: 3D Rescue Sheet

<table>
<thead>
<tr>
<th>H2</th>
<th>Hydrogen reservoir 8x203L, ±350 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>H2</td>
<td>High pressure relief valve 45 psi</td>
</tr>
<tr>
<td>H2</td>
<td>Shut off valve (manual)</td>
</tr>
<tr>
<td>H2</td>
<td>High pressure relief Valve 45 psi</td>
</tr>
</tbody>
</table>

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<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Traction engines</td>
<td>5. Li Ion Battery</td>
</tr>
<tr>
<td>3. Inverters</td>
<td>6. Low voltage battery</td>
</tr>
<tr>
<td>7. Air conditioning</td>
<td>8. Night Charging</td>
</tr>
</tbody>
</table>

**RESCUE SHEET**
Hydrogen lines

**A330 Fuel Cell bus**
Standardized Emergency Response Guides
Standardized Emergency Response Guide

- Information about: car, truck, bus (tram, train, airplane,..)
- Always with the same 9 recognizable chapters
- Structured (as a fireman thinks)
- We offer a template to the manufactures with:
  - Needed symbols and signs
  - Information what to fill in in each chapter

1. Recognition: type/fuel
2. Structure/overview important parts/access to them
3. Disable direct hazards: safety regulations/PPE
4. Access to the occupants
5. Dangers of gases, liquids, solid substance: safety regulations/PPE
6. Dangers in case of fire: safety regulations/PPE
7. Dangers in case of water submersion: safety regulations/PPE
8. Vehicle immobilization, lifting and stabilization
9. Information for towing
Standardized Emergency Response Guide
1. Recognition/type/fuel

- No exhaust pipe
- No petrol filling flap

3. Disable direct hazards/safety regulations/PPE

- Do not cut or pull off the earth straps
- Lithium-ion 400V battery
- Large amounts of water needed to extinguish battery

5. Dangers in case of fire/safety regulations/PPE

- Prohibited stabilization point

7. Guidelines concerning immobilisation/stabilisation/lifting

- Ø 5 meter

8. Information for towing-services

- Ø 50 F
- Ø 15 M
Quick rescue information

1. Recognition/type/fuel

- LI-ION
- ZE
- No exhaust pipe
- No petrol filling flap

3. Disable direct hazards/safety regulations/PPE

- No cut or pull off the earth straps

5. Dangers in case of fire/safety regulations/PPE

- Lithium-ion 400V battery
- Large amounts of water needed to extinguish battery

7. Guidelines concerning immobilisation/stabilisation/lifting

- Ø 5 meter
- Prohibited stabilisation point

9. Information for towing-services

- Ø 60 ft
- Ø 15 m

Detailed rescue and training information

INFORMATION FOR FIRST AND SECOND RESPONDERS
RESCUE AND TRAINING MANUAL VEHICLE
RENAULT ZOE
FULL ELECTRIC VEHICLE

CONTENT

1. Recognition/type/fuel
2. Structure/overview important vehicle parts/access to them
3. Disable direct hazards/safety regulations/PPE
4. Access to the occupants
5. Dangers/contents stored liquids/gasses/solids/PPE
6. Dangers in case of fire/safety regulations/PPE
7. Dangers in case of water submersion/safety regulations/PPE
8. Guidelines concerning immobilisation/stabilisation/lifting
9. Information for towing-services
10. Explanation used symbols

Note:
First responders: Fire Fighters, Police, Medical personal, EMT
Second responders: Towing and maintenance personnel
This template training manual is developed to give specialized information about the batteries build in a hybrid, full electric and fuel-cell vehicle, to rescue workers/towing and maintenance.

Always 6 recognizable chapters

The training manual template should be completed by the battery supplier in consultation with the vehicle manufacturer for this specific model and type.
Standardized Emergency Response Guide Battery

DATA

Type of battery
Location
Chemicals
Response in absence of Fire
Response to spillage
Neutralisation
Response to a fire
Use of water / no water
Gaseous emissions
Storage & Transport

Maximum of info / Pictograms: ISO/GHS NFPA
Standardized Emergency Response Guide Symbols
Drive line signs (propulsion energy identification)
The proposed signs

- Are using existing pictures (e.g. fuel pump);
- Are made from the perspective of a firefighter;
- Are using common names (HEV, PHEV, EV…);
- Are made to maximum inform the fire fighter/rescue worker just using 1 sign (e.g. Fuel-Cell Electric Vehicle);

  - orange: high voltage;
  - blue: hydrogen;
  - H2: hydrogen;
  - FCEV: Fuel Cell Electric Vehicle);
  - C: compressed hydrogen;

- Are usable for trucks, busses, cars,…;
- The location of the signs has yet to be determined.
Uniform standard on colours

The colors are mostly common used in vehicle indication.

- blue R/G/B: 0/176/240: Hydrogen;
- Green R/G/B: 0/176/80: Gas;
- Yellow R/G/B: 255/255/0: Low voltage;
- Orange R/G/B: 255/165/0: High voltage;
- Gray R/G/B: 127/127/127: Diesel;
- Red R/G/B: 161/37/3: Gasoline;

These colors are also usable for:
- Highlight content by coloring pipe/tank/reservoir in rescue information;
- Coloring symbols to be used in rescue information;
- Coloring specific components of the vehicle (e.g.: orange = high voltage);
- Coloring indication specific fuel stations/pumps…
The proposed signs

Gasoline-powered vehicle.

Diesel-powered vehicle.

Bio diesel-powered vehicle.

Bio diesel-powered vehicle with for example 85% ethanol.

Hybrid Electric Vehicle and Diesel

Plug In Hybrid Electric Vehicle And Diesel
The proposed signs

- **Plug In Hybrid Electric Vehicle and Gasoline**
- **Electric Vehicle**
- **Fuel Cell Electric Vehicle**
- **Hydrogen powered vehicle (liquefied)**
- **Hydrogen powered vehicle**
- **LPG (liquefied petroleum gas)**
The proposed signs

- **LNG (liquified natural gas)**
- **CNG (compressed natural gas)**
- **Super capacitor low-voltage**
- **Diesel powered vehicle with super capacitor**
- **Gasoline/LPG powered vehicle**
- **Super capacitor high-voltage**
Information

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