Identification of Alternative Fuel Vehicles in the supply chain

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ECG The Association of European Vehicle Logistics

This current recommendation has the following objectives:

- Define a standard method for identifying alternative fuel vehicles in the vehicle distribution process
- Define and recommend a standard location for the alternative fuel vehicle identification label
- Provide recommendations for the quality of the alternative fuel vehicle identification label

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1. Introduction

Electric, hybrid and hydrogen vehicles and those powered by gaseous fuels, such as liquefied petroleum gas (LPG), liquefied natural gas (LNG) or compressed natural gas (CNG), might need a different treatment within the logistics chain. That is why the ECG Digitalisation Working Group's dedicated sub-groups considers these vehicles should be fitted with a specific label.

There are two groups of reasons for the inclusion of such a label on Alternative Fuel vehicles (AFVs)

- Safety reasons: when the units are marked with a specific label it would be clear from the first instance how to handle them and take the necessary safety precautions in case of problems such as an accident, fire, etc.
- Logistics/operational reasons:
  - People handling the cars see what type of vehicle they will be handling before they access the unit, this can make a big difference when less experienced people handle the units. Since there is no engine sound the driver can think the engine is not running and leave the car behind with the engine still on with all possible consequences.
  - Technical staff assisting in case of problems know immediately what they can or cannot do.
  - Clear visual indication for the crew on board.

A system of marks on Battery Electric Vehicles (BEVs) is already in application at one OEM, motivated by safety and operational considerations.

One LSP transporting the vehicles of this OEM gave feedback on this visual identification of the BEVs:

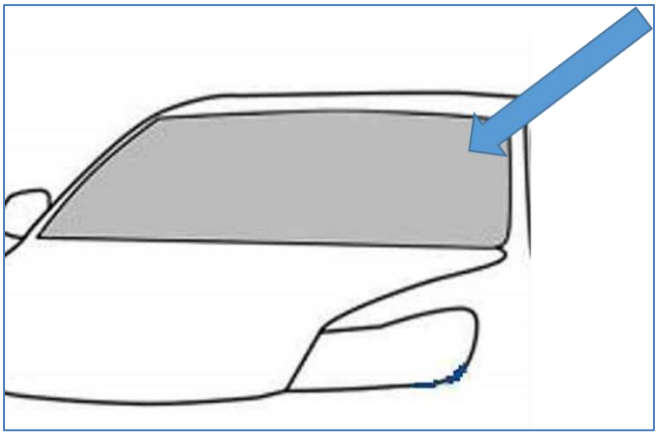
- The labels have been very well received by this company, especially the jockeys, drivers and anyone who handles the vehicles.
- This new labelling allows to differentiate between the electric and internal combustion engine variants of the same vehicle model.
- It is useful not only in case of an incident but it also allows faster decision-making on the yards, e.g. which models need to be charged.
- The system is quite new so it is not yet possible to measure its impact as far as security and safety of the personnel is concerned – it is not yet visible in statistics.

2. Scope

The scope of this document concerns all passenger cars and LCVs of all European OEMs managed by LSPs in Europe which can be considered as Alternative Fuel Vehicle.

3. Positioning and content of the label

The best location for this label is the top left corner of the windshield – for both left-hand drive and right-hand drive vehicles. This was decided by the group for a better visual identification of the vehicle also on a closed environment, like the cargo deck of a ship, where cars are parked close to each other. The label on the left rear side window (where the Close-range vehicle identification sub-group decided to add the barcode or the passive RFID tag) would not be a good position for the purposes of this new label.



For a better visual identification of the AFVs, not only a good position is needed for it on the vehicle, but also a clear colour code so that a differentiation can be made between drivetrains. The label is proposed to be of a diameter of 90mm. Below is our colour-code proposal:

	Battery Electric Vehicle	Hybrid Electric Vehicle[1]	Liquefied Petroleum Gas	Compressed Natural Gas	Liquefied Natural Gas	Hydrogen
design[2]						
colour	green	orange	yellow	brown	brown	blue
colour code	pantone 354	pantone 7549 C	pantone 803 C	pantone 7526 C	pantone 7526 C	pantone 306 C
capital letters	**BEV**	**HEV**	**LPG**	**CNG**	**LNG**	**H2**
style, size of the letters	Calibri bold - 110 pt	Calibri bold - 110 pt	Calibri bold - 110 pt	Calibri bold - 110 pt	Calibri bold - 110 pt	Calibri bold - 110 pt

The colour of the letters are suggested to be white as it is cheaper than with the additional black paint. However, for the yellow LPG label we suggest to have the letters in black for better readability.

There was a discussion to include petrol and diesel cars as well to anticipate their decreasing share in the mix. These categories will be added to the recommendation at a later stage when the document will be revised.

[1] This category covers both HEV and PHEV

[2] The example labels shown in the table are for illustrative purposes only and do not represent the label's actual size, dimensions or colour.

4. Quality considerations

4.1. Label requirements

It is very important to pay attention to the label quality. The label must be printed on carefully selected foil type substrate with Zebra printer (thermotransfer). This allows easy removal by the dealer and leaves no traces of glue.

Below we describe the tests of the label quality performed in laboratory:

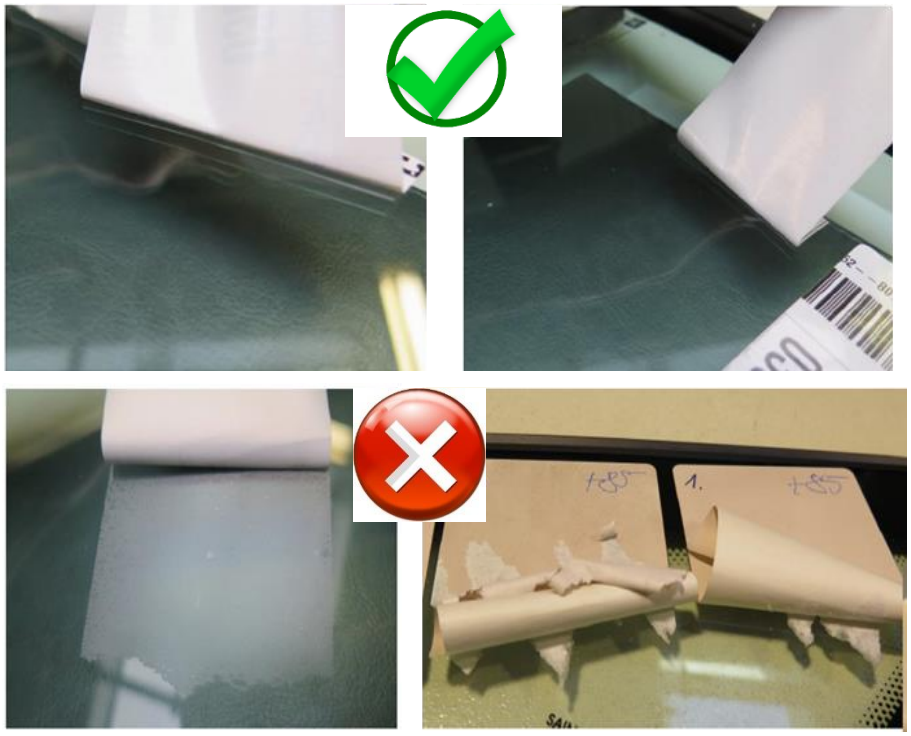
- 9 different tests
- 10 different types of paper and glue (5 producers)

Conditions of the test:

- Labels were affixed on the glass and conditioned for 9 to 18 days
- Room temperature
- Humidity (+40°C / 40%RH)
- Heating in +75°C
- Cooling in -30°C
- Temperature - humidity cycles (+40°C / 40%RH)

Final result:

- label does not leave traces of glue on the glass,
- the peel strength for the label is low (easy for dealer to remove the label)



Afterwards, the labels were affixed to the window glass for 50 cycles of closing and opening of the window.

Conditions:

- Humidity (+40°C / 95%RH)
- 50 cycles

Results:

After 50 cycles, there is no change to the printing, the labels stick to the glass. The peel strength is low, no glue stays on the glass.

Below is the example of UECC Label and Material Specification:

Material
C502P

Matt White Plasticised Vinyl Film with good flexibility and conformability on cured surfaces

Weight	110g/m^2 +/- 10%	ISO-536
Thickness	80 microns +/- 10%	ISO-534-80

Adhesive

Type	Semi-permanent acrylic	
Min Application temp	+10 Degrees C	
Service temperature	-40 degrees C - +100 degrees C	
Shear	High	
Tack	Medium N/25mm	FINAT FTM9
Final Adhesion	Medium N/25mm	FINAT FTM2

Liner

Type	1 sided Siliconized Glassine	
Colour & Finish	White	
Weight	90g/m^2 +/-10%	PP-032-ISO536
Thickness	77 microns +/- 10%	ISO534

4.2 Recycling

All future ISO/IEC and/or Odette recommendations and standards on transponder recycling must be taken into account.

5. Acknowledgements

The ECG Digitalisation Working Group's sub-group on "Close-range vehicle identification" has produced this best practice recommendation.

Supporting Stakeholders:

Axess Logistics, Autoterminal, GEFCO, Grimaldi Group, ICO Terminal, MOSOLF Group, Neptune Lines, PSA Groupe, Tesla and UECC

Disclaimer:

The contents of this document reflect the latest level of technical information. Application of this recommendation is the total responsibility of the user and Odette/ECG cannot be held responsible in any way for its use or application. This recommendation has been developed from Odette standard "RFID in vehicle Distribution Process" (version N 1R0, doc ref LR02. Date January 2010) and updated to reflect the needs, including the latest technical developments.

6. Glossary

Term	Definition
CNG	A natural gas vehicle (NGV) is an alternative fuel vehicle that uses compressed natural gas (CNG) or liquefied natural gas (LNG).
Electric vehicle	electric-powered vehicle means a heavy motor vehicle that is powered by one or more electric motors or traction motors.
Hybrid vehicle	hybrid vehicle means a heavy motor vehicle that is powered by an internal combustion engine (regardless of fuel type) and at least one electric motor or traction.
Hydrogen vehicle	hydrogen-powered vehicle means a heavy motor vehicle that is powered by a hydrogen fuel system and has one or more hydrogen fuel containers fitted to the vehicle for the system.
LNG	A natural gas vehicle (NGV) is an alternative fuel vehicle that uses compressed natural gas (CNG) or liquefied natural gas (LNG).
LSP	Logistics Service Provider
LPG	Liquefied petroleum gas or liquid petroleum gas (LPG or LP gas), is a flammable mixture of hydrocarbon gases used as fuel in heating appliances, cooking equipment, and vehicles.

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