Handling of Battery Electric Vehicles in maritime transport

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This manual is primarily intended to help achieve the highest quality in handling of finished vehicles throughout the industry. Although safety issues are sometimes relevant to this, they are often covered by national legislation and then differ by country. Consequently, this manual may sometimes refer to best practice but in general it avoids making specific reference to safety issues and requirements as responsibility for this lies with the operators.

This current recommendation has the following objectives:

- Define good practices for shipping lines in terms of booking, labelling, stowing of Battery Electric Vehicles (BEVs) on board vessels
- Give guidance on risk reduction and the management of flat batteries in maritime transport
- · Provide practical information until internationally recognized instructions are developed

ECG would like to thank the shipping line members for their active participation in developing this manual:

COSCO Shipping Specialized Carriers (Europe), DP World, Erkport, Finnlines, Grimaldi Group, Höegh Autoliners, Horizon Auto Logistics, MCCL, MOL (Europe Arica), Neptune Lines, NYK Group Europe, Polaris Autoliners, Sallaum Lines, Stena Line Scandinavia, Suardiaz Shipping Lines, Toyofuji Shipping, TT-Line, UECC, UGR Lines, Wallenius Wilhelmsen

Handling of new BEV units in maritime transport

1. Booking

1.1 State of play

- Carriers are not always able to identify the engine type (Internal Combustion Engine, ICE and Battery Electric Vehicle, BEV) at the time of booking.
- This depends largely on the shipper and the number of vehicles: in volume bookings, the details on individual vehicles are often received later.
- Information on engine type is transmitted via EDI message by a few OEMs/shippers, others send Excel files and some provide instructions on extracting this information from the VIN number. HS codes can also be used to extract the engine type.¹
- Some carriers maintain a database that assigns engine type based on brand and model, which works as long as each model can be unambiguously assigned to a specific engine type. However, ambiguity remains for models that exist in both ICE and electric versions (including hybrids).
- In certain cases the loading list is only shared after the loading already took place.
- The shipper is responsible for declaring vehicles under the correct UN number and reporting any damage to the battery pack of a BEV.

1.2 Good practices

- Ideally, engine type information should to be transmitted digitally by the OEM at the time of booking, as this is also suggested in an ECG document on the information that carriers need on the transported vehicles.²
- For volume bookings, shipper should provide approximate figures for the engine type mix.
- The VIN number could also be used to identify engine type, provided the OEM supplies the necessary decoding scheme.
- Where a lithium battery in a booked vehicle is damaged or defective, it shall be removed from the vehicle and transported in accordance with SP376, unless otherwise approved by the competent authority.

2. Labelling

2.1 State of play

- Some shippers use labels to indicate engine type, however these are inconsistent.
- Many BEVs are already produced with emblems/badges showing that the unit is hybrid or full electric. However, these are never located on the windshield or on the vehicle's windows where they would be easily seen by the operators.
- If neither labels or badges are present, BEVs cannot be visually identified by the operators.
- In such cases, crew or stevedores can decide to apply their own labels on the vehicles.
- At terminals where there is an agreement of segregation, BEVs are labelled systematically.
- Otherwise, the BEVs are visually identified by the crew through a combination of experience, model distinctions, compound separation, visual cues (lack of exhaust / grille design / location of charging/gas cap, listed weight, etc.)

¹ https://www.tariffnumber.com/2025/87

The codes used for BEVs is 870380

² Recommendation on the information shared on transported vehicles (August 2024) https://www.ecgassociation.eu/publications-and-reports/info-on-transported-vehicles/

2.2 Good practices

- The European Maritime Safety Agency in its Guidance on Alternative Fuel Vehicles (AFVs) states that the crew should be able to quickly identify these vehicles (i.e. visually identify), although it doesn't give details on how this should be done.³
- ECG has developed recommended labels which can be applied throughout the supply chain to indicate the power type.⁴
- Shipping lines prefer these labels to be placed on the windscreen.
- Alternatively, the ECG-Odette VIN label standard includes a field for the power type, where an abbreviation would be used instead of colour codes. The recommended place for the label is on the rear left side window.⁵

3. Stowing

3.1 State of play

- As the EMSA Guidance document (chapter 3.2.1) stipulates that "the crew should be aware of the location and type of AFVs onboard (as indicated in the stowplan) and be able to quickly identify the type of AFV based on the information provided."
- When shippers provide correct engine type information at booking, it is generally passed to the vessel command.
- However, without visual labels this information might be of very little help during stowage operations, because it can be difficult to differentiate BEVs from ICE vehicles and the crew can't check each VIN number during loading.
- Two prevailing methods are used for stowing BEVs on board:
 - 1. Block stowage of BEVs: BEVs grouped among themselves. This gives the Vessel Command an overview of where the units are stowed on board, but
 - BEVs are not always visually differentiated from conventional vehicles unless they are labelled;
 - The vessel rotation usually requires that units are stowed by destination and according to their dimensions. Some decks are dedicated to higher models, while others can only host smaller units due to the height of the deck.
 - 2. Mixed stowage: BEVs are stowed together with ICE vehicles.

3.2 Stowing - good practices

- Until a general guideline is issued by the IMO, stowage of BEVs on board of a ship falls under the
 decision of the individual carriers.
- Stow position of BEVs should consider ship design, safety and stability.
- Safety and vessel integrity must never be compromised, irrespective of the nature of the transported cargo (be it ICE, BEV or other).
- Where possible, BEVs should be stowed on specific decks or holds.
- For safety and firefighting purposes, marked walkways should always remain clear during stowing operations.

³ EMSA Guidance on the carriage of AFVs in Ro-Ro spaces, version 1.2 (April 2025) – Chapter 3.2.1 https://www.ecgassociation.eu/publications-and-reports/emsa-guidance-on-alternative-fuel-vehicles/

⁴ Identification of Alternative Fuel Vehicles in the supply chain (September 2020) https://www.ecgassociation.eu/publications-and-reports/labels-for-alternative-fuel-vehicles/

⁵ VIN Labels in the Vehicle Distribution Process, version 1.1 (July 2024) https://www.ecgassociation.eu/publications-and-reports/vin-labels-in-the-vehicle-distribution-process/

4. Risk reduction

4.1 Good practices

- The recommended maximum State of Charge of the High Voltage battery by EMSA is 50%.⁶
- Heat detectors or fixed infrared cameras may be installed on decks for quicker detection of fire incidents.
- Portable infrared camera could be used during normal patrols.
- Retrofitting existing vessels with higher CO₂/foam extinguishing capacity is challenging; such capacity should rather be planned for new builds.
- In case of fire:
 - the unit should be isolated as much as possible from the other units to prevent the fire from spreading.
 - o fire blanket could be used where applicable.

5. Flat batteries

5.1 Good practices

- The recommended minimum State of Charge of the High Voltage battery by EMSA is 20% "to ensure minimum basic driving and operation of the vehicle, covering dwell time at port, vessel load and discharge operations, to First Point of Rest."
- If the high-voltage battery is completely flat, salvage trucks or dollies can be used, although this is challenging on low clearance decks.
- A common problem is the flat 12 V battery. In some cases a booster can be used to 'reactivate' the vehicle and allow removal from the ship.
- Portable/mobile EV chargers can be used to charge the high-voltage battery, provided that:
 - Prior agreement exists with the OEM/shipper or it is explicitly mentioned in their Quality manual.
 - Chargers have all the needed certifications to be used onboard.
 - o A prior risk assessment has been conducted.
- Creation of rescue manual covering specific situations (flat LV or HV batteries, towing, etc.) per model, in agreement with the OEM, could be of help for the shipping line.

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⁶ EMSA Guidance on the carriage of AFVs in Ro-Ro spaces, version 1.2 (April 2025) - Chapter 3.2.3

⁷ idem.



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