Common Guidance on the Presentation and Loading of Vehicles

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Common Guidance on the Presentation and Loading of Vehicles

The following common guidelines and supporting checklist are intended to ensure that the risks associated with the shipment of vehicles, including electric and hybrid vehicles are managed and to promote the safety of terminal and vessel personnel and the protection of property including the vessel itself.

The guidelines and checklist define the information that should be provided and the checks to be carried out at:

- the time of the booking,
- when the vehicles arrive at the terminal,
- during loading and stowing, and
- throughout the voyage.

These guidelines are intended to be used in conjunction with specific procedures from individual vehicle manufacturers, shippers, terminals or carriers in respect of information such as vehicle separation on board the vessel or emergency response.

These guidelines are applicable to the transport of unaccompanied vehicles on board vessels engaged on international voyages. For the purposes of these guidelines a vehicle is considered to be a wheeled or tracked unit capable of being driven or towed.

Booking and Voyage Planning

To ensure loading of the vessel is properly planned, accurate vehicle information must be provided. This includes a description of the unit, whether it is new or used, its condition[1], its dimensions, volume and weight, the number of axles, the type of propulsion system fitted, whether vehicle has low ground clearance, details of lashing points. Should any unit require special handling or have controls that may make handling more difficult, then specific instructions should be provided at this time, these should also be affixed to the unit, and stevedores at load and discharge ports should be advised.

As the hazards, vehicle safety inspection criteria and stowage requirements associated with different vehicle propulsion types can vary, it is critical that the propulsion type is specified at the time of booking.

Consideration should be given to the effect on vessel stability and deck loading as a result of the increased weight of electric vehicles. Load planning should consider whether it is preferable to stow similar models and types of vehicles together in block stows and the challenges this may present with regards to safe access and emergency response. Any specific stow requirements will require cooperation between the vessel and the terminal to ensure these can be achieved efficiently.

Each EV or hybrid manufacturer produces a vehicle and model specific first responders or emergency guide. This guide describes the design and configuration of the vehicle's battery pack and high voltage system and includes procedures to be followed in an emergency or a system failure. It may also contain guidance on activating transport mode if applicable. This guide should be provided during the booking and made available to all parties[2] involved in handling the vehicles.

Confirm requirements regarding activation of transport mode, where applicable, and define party responsible for activating. The process for notifying the responsible party should also be confirmed. Responsible party to confirm with

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1. Vehicle condition, this should include information on whether the vehicle is damaged or not, whether it is driveable or not, whether it is scrap, whether it needs to be towed or loaded by non standard means.
2. Any shore or ship personnel involved in handling the vehicles should have access to a copy of the emergency guide, this ensures familiarity with the vehicles systems and OEM's recommended steps for responding to an incident.

Common Guidance (cont.)

others in transport chain that transport mode has been activated.

Engage with OEM's to determine the safest charge level for transportation taking into account energy density and the effect this will have should thermal runaway occur. 30-40% is considered to be the best balance between ensuring the vehicle has sufficient power for manoeuvring during transportation and safety. Some OEM's typically require higher states of charge to protect the vehicle's systems.

High states of charge create a high energy density within the battery which can prolong incidents and increase the potential likelihood of an incident recurring.

Batteries with a low state of charge can still suffer from thermal runaway. In the event of thermal runaway batteries with a lower state of charge may release significant quantities of highly toxic, flammable (potentially explosive), and corrosive gases. Batteries with a high state of charge can produce flame jets, in addition to the gases, in the event of thermal runaway.

When the battery of an electric vehicle is in thermal runaway, the gases will vent with loud popping or screaming noises followed by black and white clouds of what appears to be smoke.

Presentation at the Terminal

On arrival in the terminal all vehicles should undergo a safety inspection to ensure that the vehicles do not present any undue risk to personnel, other vehicles, the carrying vessel or the environment. The safety inspection will confirm that the vehicles can be safely loaded, that fire risks are minimized and that the vehicle can be safely and effectively stowed and secured on board[3]. In addition to a physical inspection of the vehicle's systems, the vehicle compartments should be unlocked and confirmed as free from any cargo or personal effects, checked to ensure that the state of charge is acceptable, free from battery system alarms[4] and on hybrid vehicles also that the fuel level is acceptable[5], usually between 1/8 and 1/4 of a tank, and may have the declared weight verified.

Any vehicle which is found to be unsafe, damaged[6], overweight, or not as described must be rejected from the load until such time as all issues have been addressed.

Each vehicle should be clearly marked on the front and rear windscreen with details of the propulsion type fitted and, where applicable, details of the typical state of charge for that type or class of vehicle, any other information relevant to the safe handling of the vehicle should also be included.

Loading and Securing

When being prepared for loading, all vehicles will undergo another physical safety inspection[7] to ensure that they can be safely driven and do not present a fire risk.

Maintaining a fire watch at all times, particularly if fire detection systems have been disabled during loading, is critical to ensure potential issues are identified at an early stage, in the event of any of these signs being apparent, emergency actions as specified in individual procedures should be taken.

Fire/smoke detection systems and ventilation systems should be operated in accordance with individual company procedures. All emergency escape routes should be confirmed as clear and accessible.

A pre-load meeting should be held between all relevant parties to confirm arrangements and discuss loading plan.

All vehicles should be loaded strictly in accordance with the Cargo Securing Manual and the pre-planned stowage and segregation plan taking into account any requirements regarding vehicle separation. Once in the final stowage position, all vehicles must have the ignition system turned off, keys removed, parking brake set, and transmission placed in park, or for manual vehicles left in gear. Hybrid and electric vehicles should undergo an additional check to confirm that the ignition is off. If the vehicle is fitted with a transport isolation mode limiting the number of active vehicle systems, then this should be activated. This will require consultation with the OEM as some transport modes will also deactivate the handbrake system.

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3. Similar to the inspection currently carried out on vehicles prior to loading with the additional check of confirming that there are no alarms or faults showing in relation to the battery management system. The purpose of the inspection is to try and identify vehicles with potential problems before they are loaded onboard.
4. No BMS related alarms displayed in vehicle.
5. Check of SoC to be carried out during vehicle inspection and recorded on inspection log. SoC should match that agreed in contract with OEM. Defining an acceptable SoC will be by agreement between vessel operators and contractual partners.
6. Damage refers to significant damage to the vehicle structure that can make the vehicle unsafe, not to cosmetic damage such as dents or marks on body panels.
7. This refers to the pre-drive checks done by the stevedores when loading the vehicles.
8. Where temperature monitoring equipment is available, such as portable thermal cameras or infrared thermometers it is recommended that the crew check for changes in temperature during their vehicle deck patrols. It will not be possible to check every vehicle during deck patrols but scanning of vehicles may provide early indication of a potential problem.

Common Guidance (cont.)

It is recommended that vehicles should undergo temperature monitoring during loading and once in the final stowage position. Used light ICE vehicles should have their battery disconnected and isolated, this should be documented, once stowed and high or heavy units will have the battery kill/isolation switch activated.

Any vehicles or equipment with moving parts should be confirmed as locked down and be suitably secured for sea.

All vehicles must be secured in accordance with the vessel's CSM and lashing plan. While the vehicles are being secured further checks should be carried out to ensure that there are no visible fluid leaks. Should any leaks be identified then the vehicle must either be removed from the vessel or properly repaired prior to departure.

During Voyage

All vehicles should be regularly inspected throughout the course of the voyage to ensure that all lashings are secure, where monitoring equipment is available, that no vehicle is showing any increased temperature[8] and to confirm that no fluid leaks have developed.

Where leaks are noted these should be contained and cleaned up promptly. On electric and hybrid vehicles these leaks may be electrolyte from the battery packs which is highly toxic and should only be cleaned up with appropriate PPE. Leaking electrolyte should be taken as major damage to the battery pack and the vehicle should be isolated in a safe manner in accordance with individual vessel emergency response procedures.

Where an increase in temperature is noted this should be dealt with promptly in accordance with individual vessel emergency response procedures.

Fire / smoke detection systems for vehicle decks should be fully operational throughout the voyage.

All but essential work should be avoided. Essential work should only be conducted after the activity has been risk assessed.

Any situation which has the potential to increase the risk of an incident occurring should be reported to owners/operators as a matter of urgency in accordance with individual company procedures.

DEFINITIONS	Light	Cars and small vans of less than 3.5T	High/Heavy	trucks, trailers, buses, large vans, heavy plant, cranes etc.

1 BOOKING	New Light	Used Light	Caravans /Mobile Homes	New High /Heavy	Used High /Heavy	Mafi/ Trailer Cargo	Responsible party
Make, Model, Year	✓	✓	✓	✓	✓	✓	Shipper/Booking Agent
Vehicle Weight	✓	✓	✓	✓	✓	✓	Shipper/Booking Agent
VIN Number	✓	✓	✓	✓	✓		Shipper/Booking Agent
Vehicle dimensions including details of vehicles with low ground clearance	✓	✓	✓	✓	✓	✓	Shipper/Booking Agent
No of Axles	✓	✓	✓	✓	✓	✓	Shipper/Booking Agent
Propulsion type (ICE, BEV, PHEV, HEV, FEV)	✓	✓	✓	✓	✓		Shipper/Booking Agent
OEM required State of Charge	✓		✓	✓			Shipper/Booking Agent
OEM specific carriage instructions	✓		✓	✓		✓	Shipper/Booking Agent
Vehicle specific OEM first responders or emergency guide	✓	✓	✓	✓			Shipper/Booking Agent
Lashing type (point or rim)	✓	✓	✓	✓	✓	✓	Shipper/Booking Agent

Common Guidance (cont.)

2 PRESENTATION	New Light	Used Light	Caravans /Mobile Homes	New High /Heavy	Used High /Heavy	Mafi/ Trailer Cargo	Responsible party
Weight Verified – where scales are available		Random Sample	✓	✓	✓	✓	Terminal
Units Measured			✓	✓	✓	✓	Terminal
All compartments unlocked and accessible for inspection	Note 1	✓	✓	Note 1	✓		Shipper/Booking Agent Terminal
Vehicle free of personal items and DG's, only equipment supplied by the OEM can be included in vehicle – Packing list provided	✓	✓	✓	✓	✓		Shipper/Booking Agent
Marker placard on front and rear windscreen specifying propulsion type	✓	✓	✓	✓	Note 4	Note 4	Terminal/Shipper
State of charge verified and recorded	✓	✓	✓	✓	Note 4	Note 4	Terminal
Staged separately in terminal by port of discharge and propulsion type	✓	✓	✓	✓	✓	✓	Terminal
Vehicle Safety inspection to confirm that the following are all in order, if any points are failed vehicle to be rejected until corrective actions taken	✓	✓	✓	✓	✓	✓	Terminal/Surveyor/ Shipper - As applicable
Steering							
Brakes including emergency brakes							
Battery pack, electrical system and drivetrain. Note: This is not expected to be a physical check of the electrical system but a check to confirm that the vehicle is not showing any electrical system faults							
No major damage to vehicle body, particularly in way of battery pack							
No visible fluid leaks	Note 3	Note 3					
Tyres							
Windows intact/clear							
Vehicle clean							
Keys present							
Properly marked lashing points	Note 2	Note 2	Note 2	Note 2	Note 2	✓	Shipper
Operating instructions provided for any units with specific driving requirements				✓	✓		Shipper

Note 1 - Compartments may not be accessible as vehicle may be in transport mode or be fitted with a full body cover.

Note 2 - Lashing to be performed in accordance with requirements of CSM and OEM instructions.

Note 3 - Leaks may be electrolyte from battery pack which is HIGHLY TOXIC, appropriate PPE must be worn. Leaking electrolyte should be considered as major damage to battery requiring vehicle to be isolated.

Note 4 - Where applicable, placards should be fitted specifying propulsion type and the state of charge should be verified and recorded.

Common Guidance (cont.)

3 LOADING AND SECURING	New Light	Used Light	Caravans /Mobile Homes	New High /Heavy	Used High /Heavy	Mafi/ Trailer Cargo	Responsible party
Vehicle safety checks as above, confirm ignition off and key must be removed from ignition and stored in vehicle cabin	✓	✓	✓	✓	✓	✓	Stevedores
Moving parts on equipment suitably secured for sea transport			✓	✓	✓	✓	Stevedores
Battery disconnected once loaded and stowed on board		✓	✓				Stevedores
Battery isolation/kill switch activated - OEM advice on isolation/kill switch functionality			✓	✓	✓		Stevedores
Where fitted to EV and hybrid vehicles, ensure that transport mode is engaged in accordance with OEM instructions	✓	✓	✓	✓			Stevedores
Loading carried out in accordance with agreed loading plan	✓	✓	✓	✓	✓	✓	Stevedores/Crew

4 DURING VOYAGE	New Light	Used Light	Caravans /Mobile Homes	New High /Heavy	Used High /Heavy	Mafi/ Trailer Cargo	Responsible party
Vehicle Deck Inspection	✓	✓	✓	✓	✓	✓	Crew
Temperature monitoring - where appropriate equipment is available							
Leak Check	Note 3	Note 3	Note 3	Note 3			
Lashing Check							

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