Operations Quality Manual for High & Heavy Vehicles

VERSION 2, JANUARY 2020

ECG The Association of European Vehicle Logistics

When using the ECG Operations Quality Manual or any other ECG publication (hereinafter the “Publications”), ECG accepts no responsibility for the Publications or for any loss or damage that may arise from your use of the Publications. The Publications are provided "as is" without warranties, conditions, representations or guarantees of any kind, either expressed, implied, statutory or otherwise, including but not limited to, any implied warranties or conditions of satisfactory quality, title, non-infringement or fitness for a particular purpose. ECG gives no guarantee that the Publications are free from errors or mistakes. No oral or written information or advice given by an ECG authorised representative shall create a warranty.

The user of the Publications is solely responsible for evaluating the integrity of the Publications as well as the accuracy and completeness of any information or guidelines contained therein, and the value and authenticity of the Publications.

ECG accepts no liability – in contract or otherwise – for any losses or damages with respect to any (use) of the information and guidelines included in or provided by the Publications.

Table of Contents

Introduction

This Operations Quality Manual is an ECG publication prepared by the ECG High & Heavy Working Group, which was created as a sub-group of the ECG Quality Working Group to respond to the need for expertise in this specific niche of vehicle logistics.

The idea of establishing common quality standards for the whole industry was born from a commitment shared by the logistics service providers and the manufacturers to improve operational efficiencies by reducing duplication of activities due to the lack of harmonisation. Indeed, the standardisation of practices will also lead to a reduction in the damage rates and more rapid and effective handling of the vehicles. The present manual is an additional step on the path towards a broader harmonisation in the sector.

This manual is intended to be used as a management/supervisory guide when training staff on handling procedures. This should ensure a consistent approach. However, each manufacturer retains the right to demand a different treatment for their vehicles. This is why the manual often makes reference to the manufacturer's individual requirements. Such particular conditions have to be clearly defined, understood and adhered to by both parties signing the contract. Moreover, these guidelines do not in any way supersede regulations stipulated by various authorities. Copies of this manual can be downloaded free of charge from www.ecgassociation.eu. While translations into other languages will be available only the English version is official.

You can contact the ECG Secretariat with your comments and inquiries about this manual or the future activities of the High & Heavy Working Group at info@ecgassociation.eu or +32 2 706 82 80.

1. Definitions

AMENDED

For the scope of this Manual, it is envisaged that the units are newly produced machines that have not yet entered service. A different approach may be required to accommodate the different circumstances and condition of used machines.

High & Heavy Vehicles are defined as vehicles belonging to the following categories:

1) Self-propelled Ro-Ro cargo:
    a. With rubber
    b. Steel tracks
    c. With wheels on pneumatic or solid tyres

2) Not self-propelled Ro-Ro cargo

2. General Instructions

2.1. Clothing

- Personnel must wear clean working clothes and gloves at all times (no oil/grease stains).
- Long sleeves and long trousers are obligatory. ¾ trousers covering the knees are allowed during hot months.
- No buttons, exposed zips or belt buckles.
- Wearing boots or shoes closed around the foot is obligatory. The shoes/boots must prevent slipping.
- Rings and other jewellery are not permitted, unless properly covered.
- It is forbidden to carry in one's pockets sharp objects (pens, tools, etc.) that could accidentally damage the vehicles.
- Working gloves must be worn when working on the truck, the wagon, the ship or the compound. However, they must be removed before entering the vehicle.
- Wearing high visibility jackets or clothes with high visibility elements in compounds and the use of safety helmets is subject to local laws, regulations or guidelines.
- If safety helmets are used for operations, they must be removed before entering the vehicle.
- Wearing safety glasses is mandatory when assembling wheels.
- If not specified above please apply the local safety regulations.

2.2. Handling

- Vehicles can only be driven by personnel that have received appropriate training and have read this manual. Subcontractors should also receive training and comply with the instructions of this manual.
- Vehicles can be driven only for the purpose of loading/unloading, parking and for working through the schedule of care measures.
- It is recommended for the manufacturers to provide the logistics service providers with the dimensions and weight of the whole product range beforehand, to guarantee appropriate preparation for the cargo to be transported and avoid safety and liability problems; also recommended to provide the handling/driving manual of each vehicle to ensure safe and appropriate handling.

AMENDED

2.2.1. Use of the vehicle

- Vehicles must be driven at moderate speed in all situations. For an indication of the speed limit particular to a given transport mode, please refer to the corresponding section of this manual.

Vehicles must be driven in such a manner as to minimise the possibility of damage. In particular, it is forbidden to:

- Rev up the engine.

- Let the engine warm at idle speed.
- Set off rapidly with spinning drive wheels.
- Drive on the starter motor.
- Overtake other vehicles.
- Drive with flat tyres.
- Remove the ignition key whilst the vehicle is in motion.
- Drive with windows covered with snow or ice; snow and ice should be removed only with plastic scrapers or de-frost spray and never by letting the engine run for an excessive time to warm the windows.
- Drive with open doors.
- Operate the ancillary machinery.
- Operate machinery without proper training.
- Carry passengers.
- Use wipers on a windscreen covered with ice or snow.

Moreover, the driver/jockey must immediately stop the engine if an operational fault occurs, if a strange noise is detected or visual/auditory warnings are present (on the dashboard). It is forbidden to operate the vehicle if visual/auditory warnings are present (except safety and reversing alarms).

Vehicles and their equipment must be used only to such an extent and in such a manner that is necessary. The following are strictly forbidden unless the manufacturer has explicitly and in writing authorised it:

- To lean, stand or sit on the vehicles.
- To eat, drink or smoke in/near the vehicles.
- To remain in the vehicle longer than necessary.
- To place foreign objects on/in the vehicles.
- To use any electronic equipment (audio, GPS, telephone, etc.), unless necessary for driving.
- To write upon the vehicles.
- To attach labels or stickers on the vehicle, unless the manufacturer has indicated clearly delimited approved areas.
- To use one vehicle for towing or pushing another one.
- To use vehicles as shuttles or for transporting material.
- To detach/remove protection material (such as seat protection).
- To enter/exit the vehicle by other doors than the driver's.
- To wear headphones and listen to music/radio.
- To use cell phones and transmitters while handling/driving vehicles.

2.2.2. Rules to be respected when leaving the vehicle

Upon leaving the vehicle for storage/transport, it has to be checked whether:

- The doors, windows, roof and cowl are closed.
- Wing mirrors are folded in.
- Parking brake is applied (for long storage in compounds, hand brake must be released).
- If specific conditions require not to apply it, please consult the manufacturer instructions.
- Electric main switches are left in the “off” position.
- Safety locking system is secured (excavators).
- Bucket is lowered to the ground (excavators, wheel loaders, backhoe loaders) and protected to avoid scratches.
- NEW To avoid damages to the running/parking surfaces of compound or ship’s deck from the Steel tracks of the Ro-Ro, rubber carpet or used cables should be used.
- All storage compartments are closed to avoid any power drain on the battery during storage.
- Switches and operating controls are switched to off/neutral position.
- The vehicle is not parked on inflammable materials, such as dry grass or leaves.
- The seat covers and other protection material are in a proper position.
- Remove key from ignition and store according to manufacturer guidelines.

2.2.3. Rules on non-starters

- First check the manufacturer’s instructions.
- If the vehicle doesn’t start because the battery is flat, it must be jump started using an auxiliary battery, never another vehicle. The correct voltage must be applied.
- Only the starter battery may be used for jump starts.
- To connect the cables follow the manufacturer’s instructions.
- Jump starting cables must be handled with caution to prevent damage to the vehicle.
- If the vehicle needs refuelling, add a sufficient amount of the correct fuel type (maximum 25 % of the tank for sea transport).
- If the two previous methods fail, contact the manufacturer of the vehicle or its representatives.
- A vehicle must never be jumpstarted/refuelled by anybody who has not received relevant training. Whenever possible, non-starters should be handled by specialised personnel and not drivers.
- It is recommended to replace a flat battery with a new one before loading the vehicle on a transport means (road transporter, rail wagon, ship or barge). However, this rule must be clearly stated and agreed to by the parties by means of a written contract.

2.3. Inspections

- An inspection of the vehicle has to be performed at each handing over point.
- If the circumstances render the inspection difficult (dirt, snow, etc.), it has to be noted on the inspection documents.

2.4. Exceptional damage reporting

- The central customer must be informed of damages incurred as a result of serious force majeure incidents as soon as they are detected.
    - The following party in the logistics chain should ask the central customer for instruction regarding the forwarding of the damage vehicle.

3. Road Transport

3.1. Equipment

3.1.1. Transporters

- Transporters must be in good condition, painted and rust-free.
- The hydraulic systems must be functioning properly and not leaking.
- The transporters should be equipped with stone guards above the wheels.
- The surface of the decks and ramps must offer a firm hold without sharp edges.
- Loading ramps must be placed at a sufficiently low angle to enable easy access and prevent damage to the under body of the transported vehicles.
- The transporters must respect the local health and safety requirements.
- The loading deck pillars, the ropes and the supports of the safety ropes should be cushioned to secure damage free opening of the vehicle doors.
- Fixed lashing equipment, such as floor chains and eyelets, should be designed and attached in such a way that they do not damage tyres or tracks.
- The manufacturer may require inspecting new transporters and/or transporter types before approving them as suitable for the transport of his vehicles. The details of any such requirement must be clearly stated in the contractual agreement.

3.1.2. Transporter equipment

Special vehicle transporters must be equipped with:

- Ramps of sufficient load capacity.

It is obligatory to comply with the local road and safety regulations and provide the appropriate signalling on roads for units with special dimensions (e.g. pilot cars, orange lights, reflecting panels).

3.2. Loading/Unloading

The rules that follow are specific to the loading/unloading process. The rules on vehicle handling listed in the general section (Section 2.2.) also apply. Personnel must also be trained on these instructions before being allowed to proceed with loading, unloading or other handling.

When loading, ensure the loaded weight, height and length comply with the national requirements and those applicable on the chosen routes.

3.2.1. Before loading or unloading

- The transporter must be parked on level and firm ground.
- Dismounting of parts from vehicles should be allowed only when necessary and after approval from the manufacturer.
- The loading decks must be cleared of all lashings, chocks, tools or other objects. It is forbidden to let lashings hang from the anti-fall guard (safety ropes).
- All gaps in the decks (wheel indents) must be covered with track sections.
- All attachments of the vehicles must be retracted and raised in a free space from the ground, ensuring the attachments won't lower during transit; alternatively attachments may be lowered to the decks and covered by protective material to avoid any possible damage.
- All ramps and loading platforms must be adjusted to fit the measurements of the vehicles.
- It is forbidden to deflate tyres.

3.2.2. During loading or unloading

- Vehicles must be driven onto/off the transporters at walking speed to reduce the probability of causing damage. Speed must be particularly reduced before driving onto or off the ramps.
- Towing the vehicles from the lashing points is prohibited.
- Vehicles must be unloaded only under motor power. It is strictly forbidden to push the vehicles off the transporter, to brake with the hand brake or the clutch!
- It must be checked that the following distances are kept (to be measured with one's hand):
    - Between the vehicles, end to end: two fists (approximately 20 cm);
    - Between overlapping vehicles: a fist (approximately 10 cm);
    - Between the vehicle's under body and the deck: 3 fingers (5 cm absolute minimum).

The driver should always be able to ask for and obtain assistance during operations.

3.2.3. After loading or unloading

- Vehicles must be left with the handbrake (parking brake) applied.
- Bucket or other attachments must be lowered to the ground and a protection should be in place to prevent damage.
- Switches and operating controls must be switched off or in neutral position
- Safety locking system must be secured.
- If the vehicles have been loaded/unloaded during the night or under any other conditions that require the use of headlights, they have to be switched off immediately after loading/unloading.
- Vehicles must be locked during transport. Keys must be secured by the driver.
- Keys must be removed from the ignition and stored according to manufacturer's instructions.
- Vehicles must be lashed for transport according to the lashing procedures detailed in the next section.

3.3. Lashing

AMENDED The general rule is that all machines must be secured correctly on the carrier. The securing must be done by a combination of wheel chocks, direct lashing or tie-down, if applicable.

It is the transporters' responsibility to make sure that they are following the international and respective country's legal regulations and that loaded machines cannot move during transport.

The following rules must also be applied:

NEW 3.3.1. General rules

AMENDED
- Lashings should only be attached to clearly marked and specifically designed lashing points. Where this is not possible, lashings should be connected to an area of the machine which is permanent in character and strong enough for the intended task.
- Lashings should be applied in a way which avoids unnecessary contact with the unit. Where they cannot, lashing protection should be used to prevent scratches or other damage.
- Lashings should be certified and in good condition.

NEW
- Lashing capacity and minimum breaking force should be clearly indicated for any lashings used.

NEW
- Any attachments not locked in position by mechanical means should be secured to the carrier. Hydraulic pressure should not be relied on to hold an attachment in position for transport.

NEW
- Lashings must be handled in a way which avoids damage to other loaded units.

NEW
- As a general guide, machines exceeding 12500kg should be secured by direct lashing with chains.

NEW 3.3.2. Steel Tracked Machines

- The tracks should be positioned against a bulkhead, if one is available and weight distribution allows. If not, they should be positioned against a chock.
- It is not permitted to use nylon webbing or other soft slings to secure steel-tracked machines during transport.

NEW 3.3.3. Rubber Tracked Machines

- The tracks should be positioned against a bulkhead, if one is available and weight distribution allows. If not, they should be positioned against a chock.
- Nylon webbing or other soft slings can be used to secure rubber-tracked machines, dependent on the weight of the unit.

NEW 3.3.4. Wheeled Machines and Plant

- The wheels should be positioned against a bulkhead, if one is available and weight distribution allows. If not, they should be positioned against a chock.
- Chocks must not touch any part of the unit other than the tyres.
- To prevent against the effects of suspension compression or body roll in transit, wheeled machines can be secured using over-wheel lashing, dependent on the weight of the unit.

- Only nylon webbing or other soft slings must be used for over-wheel lashing.
- Chains or other metal components must not contact any part of the tyre.
- When using over-wheel lashing, the lashings must not touch any part of the unit other than the tyre.
- As a general guide, over-wheel lashing should not be used for machines exceeding 12,500kg in weight

4. Rail Transport

4.1. Equipment

4.1.1. Wagons

- Wagons should be in good condition, painted and rust-free. Moreover, they should be regularly cleaned, painted and repaired according to a pre-established maintenance programme.
- The manufacturer has the right to inspect all the wagons put at his disposal and refuse those that do not meet the quality criteria.
- Wagons must not have any structural damage, mechanical deck faults or obstacles on the decks that may hinder loading or unloading.
- Wagons should have protective material applied to surfaces that are more likely to come into contact with the vehicle, particularly its doors and bodywork.
- The profile of the deck must offer a good grip, but may not be sharp-edged.
- Loading ramps, whether fixed or mobile, must be placed at a sufficiently low angle to enable easy access and prevent damage to the under body of the transported vehicles.

4.1.2. Wagon equipment

- Each wagon should be equipped with a sufficient number of tie down points. As a general rule, there should be 4 tie down points per vehicle.

4.2. Loading/Unloading

The following rules are specific to the loading/unloading process. The rules on handling listed in the general section (Section 2.2.) also apply. Personnel must also be trained on these instructions before being allowed to proceed with loading, unloading or other handling.

4.2.1. Before loading or unloading

- Wagons should be presented at the loading platforms in the right direction, so as to allow loading and unloading forwards. Reversing the vehicles on the wagons should be absolutely avoided.
- A loading plan should be drafted before the loading begins and followed throughout the loading process.
- Wagons must be secured by applying the brakes and by using brake shoes so that they don't roll away during loading/unloading.
- Bridging plates must be in place and fully secured.
- Gaps between wagons or wagon sections must be such that no damage can occur to the vehicles'

tyres. Removable drive-on ramps or track are to be attached when necessary to the fittings provided on the wagon.

- Check that the loading width of the wagon is sufficient for the track of the vehicles being loaded.
- Before loading/unloading, the deck must be freed of any materials that might cause damage to the vehicles to be carried (wire, glass, stones, wheel chocks). If possible, snow and ice should also be removed.

4.2.2. During loading or unloading

- During loading and unloading operations, vehicles must be driven at walking speed, both on the ramps and on the train, to reduce the probability of damage. Speed must be particularly reduced before driving onto or off the ramps.
- Vehicles should be loaded or unloaded only by driving forwards. Reversing them onto/off the wagons could cause damage. By exception, loading by reversing is acceptable for the last vehicle on the deck, but only if loading forwards is impossible.
- It must be checked that the following distances are kept:
    - Between the vehicles, or the vehicle and the end of the loaded wagon: 10 cm;
    - Vehicles between the wagon units: 30 cm;

4.2.3. After loading or unloading

- After loading/unloading, the wagon has to be put in transport mode: bridging plates at both ends of the wagon have to be put in the upward position and secured (in fully enclosed wagons, doors should be closed and secured). Unused chocks should be secured on the wagons to avoid fall down or ejecting on the route.
- If the vehicles have been loaded/unloaded during the night or under any other conditions that require the use of headlights, they have to be switched off immediately after loading/unloading.
- Keys must be removed from the ignition and stored according to manufacturer's instructions.
- Vehicles must be lashed for transport according to the lashing procedures detailed in the next section.

4.3. Lashing

The general rule is that all machines must be secured correctly on the carrier. The securing must be done by a combination of wheel chocks and lashings (or tie-down, if applicable).

It is the transporters' responsibility to make sure they are following the railway company's regulations, the rail infrastructure provider's regulations, the international and respective country's legal regulations and that loaded machines cannot move during transport.

The following rules must also be applied:

- Lashing is only allowed on clearly marked and specifically designed lashing points (for construction machinery).

- Hooks are never to be attached directly to the chassis (for construction machinery), unless explicitly agreed in writing with the manufacturer.
- All transported vehicles must be secured with wheel chocks.
- As a general rule, four wheel chocks per vehicle should be used.
- Wheel chocks are to be placed both behind and in front of two wheels on the same axle.
- The axle to be secured by wheel chocks is the one on which the handbrake and/or gear
- is applied.
- For vehicles placed over short or permanent couplings, the above rule must absolutely be respected. Under no circumstances can a vehicle placed over a coupling be secured with wheel chocks on the two axles!
- On some routes and in some countries (but only for domestic transport), vehicles can be fixed with two chocks on one wheel or a double chock, protecting the wheel from the front and from the back, on one wheel. It must not be forgotten that this rule is an exception. Before applying it, it has to be checked whether the lashing regulations on the selected route allow for such a solution.
- The wheel chocks are to be placed and removed carefully in order not to damage the tyre. If a lever is used to remove the chock, it must be properly protected.
- A gap in accordance with the technical requirements for the chock type used must be left between the chock and the tyre.
- The chock must never touch any other part of the vehicle than the tyre.

5. Water Transport

In general, only Ro-Ro vessels and inland waterway barges can be used for transporting new vehicles. The security and quality rules that follow apply on all this type of vessels.

5.1. Ro-Ro vessels

5.1.1. Equipment

Ships

- Ships used for transport of vehicles must be in good physical condition. The manufacturer has the right to impose stricter conditions and refuse those ships that do not meet them.
- Ships must conform to internationally recognised quality standards.
- The decks and ramps of the ships must be constructed in such a way that there is sufficient distance between inner pillars for easy, damage free loading and unloading.
- Any gaps in the decks or between ramps and decks, as well as any vertical differences in height must be reduced to a minimum to avoid damage to tyres.
- It has to be checked that no pipes or equipment (push-cars, etc.) are leaking oil.
- All elements on/off the decks should be rust free. In no case should rusted elements enter into contact with the transported vehicles.
- The holds in which the vehicles are stored must be clean, odour free and adequately ventilated. All traces of chemical or greasy substances must be removed.
- Decks and ramps must be well lit. All obstacles (obstructions, stanchions, etc.) must be painted or marked in safety colours. The construction elements most likely to be accidentally run into with vehicles must be padded to minimise the possibility of serious damage. Maximum clearance should be clearly indicated.
- All connecting and access ramps must be placed at a sufficiently low angle to enable easy access and prevent damage to the under body of the transported vehicles.
- All connecting and access ramps should offer good grip but may not be sharp edged.
- Additionally, it is recommended to affix anti-slide tapes to driveways in curved areas.

Ship equipment

- Ship and quay operations must maintain adequate stocks of appropriate fuel to enable non-starters to be loaded and unloaded without problem.
- Loose chains must be properly tensioned and not touch the underside of the vehicles.
- The vessels must be equipped with a sufficient number of vehicle lashings and wheel chocks in good technical condition. The lashings must be of sufficient strength including an adequate safety margin, to secure the vehicle being transported.
- Metal parts of the lashings should be protected to prevent damage.

5.1.2. Loading/Unloading

The following rules are specific to the loading/unloading process. The rules on vehicle handling listed in the general section (Section 2.2.) also apply. Personnel must also be trained on these instructions before being allowed to proceed with loading, unloading or other handling.

Before loading or unloading

- Ventilation in the hold should be switched on
- Adequate preparation for the tracked units must be done (e.g. rubber mats)
- It is the responsibility of the stevedore company and/or ships representative to organise a meeting involving the duty officer of the ship and the port captain (or equivalent) to draft a loading/stowage plan. This plan then has to be followed throughout the loading process.
- Before loading, enough driveways and walkways have to be clearly designated and marked, according to the ship's safety requirements.
- The ramps and decks must be set in the proper position for loading/unloading and the internal doors must be opened.
- Decks and ramps must be freed of all loose equipment. Lashings must be secured or stored. Lashings must never be left hanging from the bulkheads/stanchions without being secured.
- Make sure that the vessel is set up appropriately for the cargo.

During loading or unloading

- All loading/unloading operations must be co-ordinated by an experienced supervisor.
- Ramp angle should be observed during loading and unloading (as it may change because of the tide and the change in ballast when vehicles are unloaded).
- Vehicles should preferably be loaded in groups of similar dimensions to facilitate their positioning on the loading deck.
- A safety distance adapted to the speed must be kept between the preceding and following vehicle when driving on the ramps and decks.
- Inside the ship, speed must be limited to such an extent as to prevent damage.
- Moreover, drivers have to comply with the shipping line's imposed speed limits.
- However, ramps should be negotiated at a sufficient speed to prevent wheels from skidding on the wet surface.
- Headlights must be turned on before driving on board the vessel.
- Vehicles with pneumatic/air suspension must be driven in the highest position and stored in the lowest.
- All vehicles stored on the vessels must be protected from water spray. Any exception to this rule must be accepted by the manufacturer by way of a written contract, agreement or instruction.
- The vehicles should be loaded in a way that permits to unload them forward.
- During loading/unloading, vehicles should be driven forwards. Excessive manoeuvring and reversing should be avoided.
- As far as possible, vehicles should be stowed longitudinally. This way the risk of the vehicles being displaced during rolling movements of the ship is minimized. If transverse (athwartships) storage

cannot be avoided for some vehicles, special security (lashing) measures must be undertaken, according to the lashing instructions in section 5.1.3.

- Manufacturer's recommendations on which vehicles can be stored on ramps or transversely must be respected.
- New vehicles must be stored separately from other cargo and/or used vehicles.
- It must be checked that the following distances are kept, unless otherwise agreed with the manufacturer:
    - Between the vehicles, end to end: a minimum of 50 cm;
    - Between the vehicle's end and the ship's superstructure: 50 cm;
    - Between the vehicles' sides: 50 cm;
    - Clearance between the vehicle's roof and the upper deck: 10 cm;
    - Between the vehicle (passenger's side) and the ships superstructure: 15 cm;
    - Between the vehicle (driver's side) and the ship's superstructure: 60 cm;

After loading or unloading

- After loading/unloading, vehicle's headlights must be switched off immediately.
- When leaving the vehicle after loading, it must be checked that it is not standing on any chains, wires, moorings or any other object that could damage the tyres. Wheels must be left in the straight position.
- Vehicles that can't be unloaded under their own power, even after refuelling and/or jump-starting, must be towed by a specialised vehicle and following manufacturer's instructions. Under no circumstances may a broken-down vehicle be towed by another vehicle from the load.
- After loading, vehicles must be lashed according to the procedures defined in the following section.
- Lashings should be inspected and corrected (re-tensioned) in case of necessity at least every day during the first three days and then every third day. If heavy weather is expected, daily checks should be re-established.
- Vehicles must be left with the handbrake (parking brake) applied.

NEW

- The bucket must be lowered to the ground on compound and on ship's deck; rubber carpet or dunnage should be posed underneath to avoid damage. Same precaution applies for steel tracks vehicles
- Switches and operating controls must be switched off or in neutral position
- Safety locking system must be secured.
- Vehicles should be kept unlocked during transport. Keys must be removed from the ignition and stored according to manufacturer's instructions.

5.1.3. Lashing

The general rule is that all machines must be secured correctly on the carrier. The securing must be done by a combination of wheel chocks and lashings (or tie-down, if applicable).

It is the transporters responsibility to make sure that they are following the international and respective country's legal regulations and that loaded machines cannot move during transport.

The following rules must also be applied:

- Lashing is only allowed on clearly marked and specifically designed lashing points (for construction machinery).
- Hooks are never to be attached directly to the chassis (for construction machinery), unless explicitly agreed in writing with the manufacturer.
- All vehicles transported on a ship must be properly lashed.
- AMENDED Only certified lashing devices as per ship's cargo securing manual to be used for securing heavy vehicles.
- Each vehicle must be secured using a minimum of 4 lashings; lashing devices (as per Ship's Cargo Securing Manual) must be applied to the designed lashing points of the vehicle that must have the same SWL otherwise additional safer and appropriate lashing point around of the vehicle should be used to ensure appropriate distribution of lashing forces (wheel chocks and increased lashing to be used when it is not positioned longitudinally). NEW
- Lashings must be handled in a way to avoid any damage to the transported vehicles.
- The lashings used to secure a vehicle must not touch any other part of the vehicle than the lashing point or any other vehicle after they have been properly tied.
- A vehicle must be lashed immediately after it has been parked for storage and unlashed only after reaching the port of arrival.
- Lashings should be tensioned enough to prevent the vehicle from moving but shouldn't tighten the vehicle down on its suspensions.

5.1.4. Containerised cargo

From 1 January 2012 vehicles in containers are classified as Dangerous Goods, see IMDG Code UN 3166 and its Special Provisions.

Lashing procedures inside a container

The general rule is that all machines must be secured correctly on the carrier. The securing must be done by a combination of wheel chocks and lashings (or tie-down, if applicable).
It is the transporters responsibility to make sure that they are following the international and respective country's legal regulations and that loaded machines cannot move during transport.

The following rules must also be applied:

- Vehicles should be secured using wooden chocks nailed to the base of the container. The chocks should be of an adequate size to prevent scratches on the tyres (recommended dimensions: L x H= 25 x 20 cm).
- Each wheel must be blocked separately.

- Vehicles should be fastened to the container walls using an appropriate number of lashings to ensure that no movement backward and forwards is possible during transport.

5.2. Ro-Ro river barges

5.2.1. Barges

- Barge decks and loading/connecting platforms must be in good physical condition, clean and rust-free.
- Loading platforms must offer good grip but not be sharp edged.

5.2.2. Loading/Unloading

Before loading or unloading

- Loading platforms must be placed at a sufficiently low angle to enable easy access and prevent damage to the under body of the transported vehicles.
- Before loading starts, the leader of the stevedoring shift and the captain must check whether among the vehicles to be loaded any are leaking oil that could damage the vehicles stored on lower decks.
- Loading or unloading can start only after the captain has given his explicit permission.

During loading or unloading

- All loading and unloading operations must be co-ordinated by an experienced supervisor.
- As far as possible, vehicles should be stored longitudinally. If transverse storage cannot be avoided for some vehicles, they must be secured with wheel chocks.
- Vehicles must be loaded and unloaded at walking pace. They must be manoeuvred carefully in order to avoid damage.

- The slope of the loading ramp must be observed and corrected during loading/unloading, so that the ramp doesn't become too steep because of the change in ballast and risk damage to the under body of vehicles.
- Vehicles must be loaded in such a way and in such an order that each vehicle, when parked for transport or entered for unloading, can be accessed through the driver's door without any risk of touching neighbouring vehicles. Vehicles can only be entered/exited through the driver's door, never through other doors or the window!
- It must be checked that the following distances are kept, unless otherwise agreed with the manufacturer:
    - Between the vehicles, end to end: 50 cm;
    - Between the vehicle's end and the ship's superstructure: 50 cm;
    - Between the vehicles' sides: 50 cm;
    - Clearance between the vehicle's roof and the upper deck: 10 cm;
    - Between the vehicle (passenger's side) and the ship's superstructure: 15 cm;
    - Between the vehicle (driver's side) and the ship's superstructure: 60 cm;

After loading

- Windows and doors must be kept closed but not locked. Keys must be removed from the ignition and stored according to manufacturer's instructions.
- Vehicles must be left with the hand-brake on and the first gear engaged. Vehicles with automatic transmission must be left in "P" position.
- Vehicles stored on ramps must be effectively secured with wheel chocks to prevent their slipping.

6. Compounds

6.1. Technical requirements

6.1.1. Yard design

- All staging areas of the compound must be hard standing surfaced to prevent damage unless otherwise agreed with the manufacture.
- The surface of the compound where the units are handled must have a sufficient ground bearing pressure capacity.
- Compound surfaces must be pot hole free.
- Compound yards must be properly drained.
- All compound areas must be clean. Removal of loose objects/debris from the ground must be performed at regular intervals.
- Compounds must be sufficiently lit. Lighting posts and other obstacles must be cushioned and marked in their lower parts for damage prevention.
- In the case of long stay vehicles in port terminals, the cargo should be protected from saltwater spray.
- All vegetation must be systematically removed from the compounds and their immediate surroundings. Parking vehicles under trees is strictly forbidden as resin and leaves can seriously damage vehicle paint.
- Compounds must be divided into separate areas dedicated to:
    - Vehicle storage;
    - Truck loading/unloading;
    - Truck rest (if trucks are to be parked for longer time on the compound);
- Port compounds must additionally contain a large enough area dedicated to load forming and bulk dispatch.
- Personal car parking must be separate from the rest of the compound.
- Vehicle parking (storage) bays must be designed according to the parking instructions presented in section 6.2.2. and clearly identified on the ground. Moreover, each parking bay must be fully identifiable by a clearly indicated, easy to follow system of numbering and lettering.
- Internal ramps and slopes must be sufficiently flat to prevent damage to the under body of the vehicles.
- Protection against natural sources of damage is recommended. In any case, compound operators should have action plans for all adverse weather events.

6.1.2. Yard equipment

- The compound must be equipped with a sufficient number of hydrants and fire extinguishers according to the fire protection regulations of each country.
- There must be a sufficient quantity of jumpstarting equipment in good condition.
- Portable tyre pressure checking equipment must be available on site.

- There must be a sufficient reserve of fuel on the compound.
- Additionally, vehicle identification systems must be available on-site for fluid stock management.
- Other yard equipment elements (battery testing equipment, compressors, machine wash) may be required by the manufacturer and must be available on site if the contract so stipulates.

6.1.3. Safety measures

- Compounds must be surrounded by a fence of at least 2 metres in height. It is recommended that the fence be topped with barbed wire.
- Natural (steep hills, dense vegetation) or artificial (concrete/stone base) obstacles should complement the fence in anti-theft protection.
- The compound entrance must be equipped with a gate barrier and must be guarded.
- The whole compound area must be under constant camera supervision or a similarly effective surveillance system. Moreover, it must be patrolled by security personnel.
- Access to the compounds must be restricted to the personnel. Visitors' access to the compound must be subject to individual authorisation.

6.2. Storage

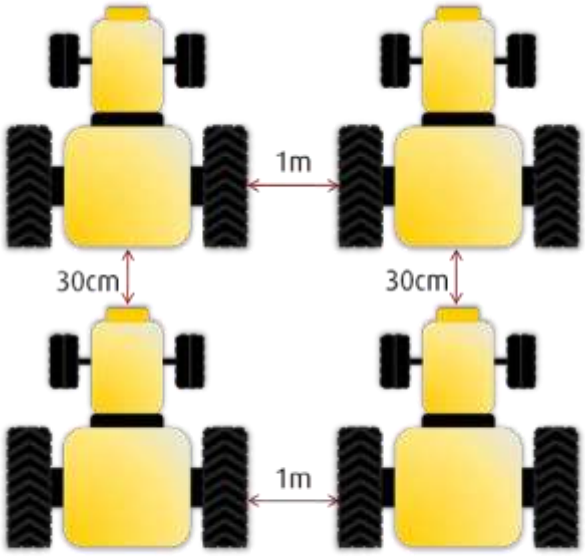
The rules in this section concern specifically vehicle handling in compounds. The rules on vehicle handling listed in the general section (Section 2.2.) also apply. Personnel must also be trained on these instructions before being allowed to proceed with vehicle handling.

6.2.1. General storage rules

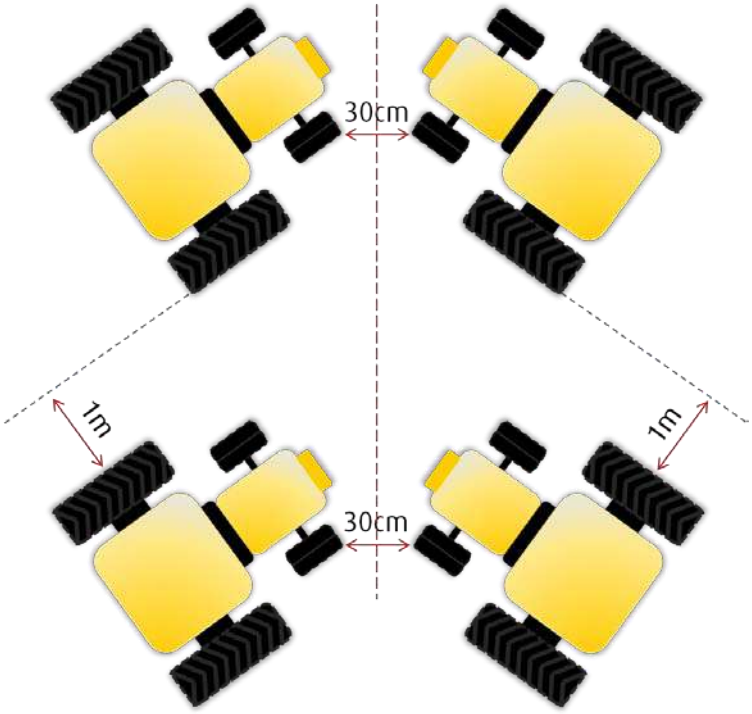
- Vehicles with manual transmission must be secured by engaging first gear.
- Vehicles with automatic transmission must have the transmission selector lever in "P" position.
- The handbrake must be released for long term storage.
- Ventilation traps should be left open.
- Writing on the windscreen and/or windows is forbidden. Easily removable stickers can be used if allowed by the manufacturer and only in specifically indicated areas.
- Vehicles left for storage must have their keys removed from the ignition. Keys must be managed according to the manufacturer's requirements.
- It is forbidden to change the original folded position of the exterior mirrors.
- For longer storage, the battery should be disconnected.
- When vehicles are accompanied by boxes with tools/auxiliaries, these should be stored in sheds/covered storage.

6.2.2. Parking

- Vehicles must be parked in a consistent manner.
- Vehicles should be parked in the compound according to one of the following patterns:
    - Herringbone;
    - 90 degrees - head to head;
- The design of the storage area must take into account the following minimum measures between the vehicles illustrated in the following diagrams:

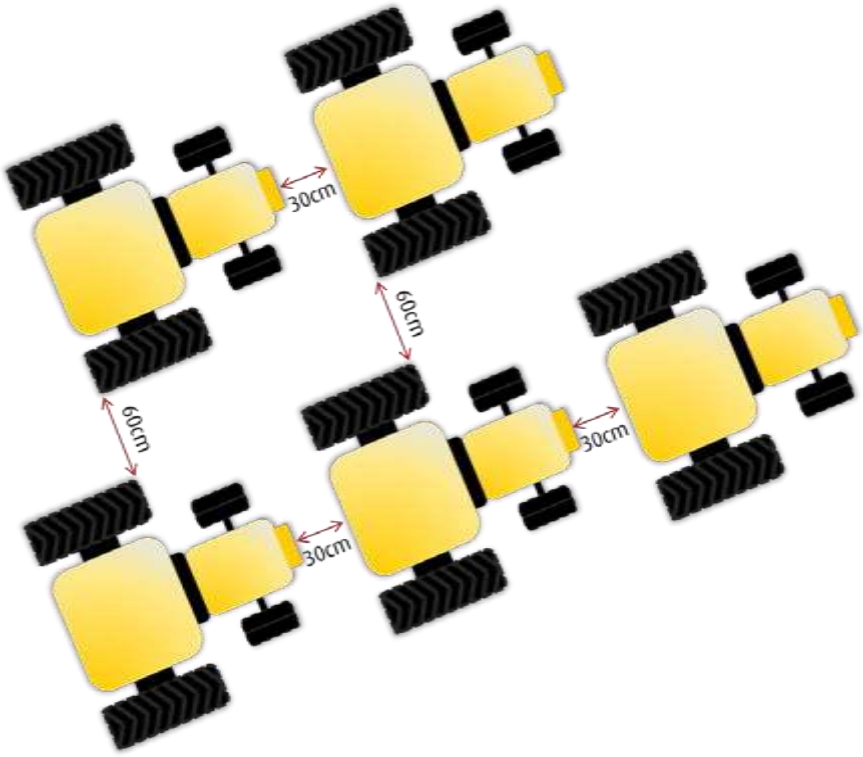


Head to head



Herringbone

- In the storage, direct shipping and loading zones:
    - Between the vehicles, end to end: 30 cm;
    - Between the vehicles, side to side (excluding mirrors): 60 cm;


30cm
60cm
60cm
30cm
30cm

- For block shipping:
    - Between the vehicles, end to end: 20 cm;
    - Between the vehicles, side to side: 30 cm;
- If vehicles are going to be inspected before loading or employees need to pass between the vehicles intended for block shipping, the side separation must be a minimum of 60 cm.

6.2.3. Maintenance and workshop services

The standards of workshop services and maintenance of vehicles in storage are subject to the contractual agreement with the logistics service provider. However, the handling rules listed in the general section (section 2) must always be respected.

6.3. Training

- The compound operator is entirely responsible for the implementation of the quality standards as defined in this manual.
- In order to achieve the best quality results, the compound operator must regularly train his staff with regard to the quality standards expressed in this manual.
- In port compounds, the compound operator must make sure that the stevedore company complies with the quality standards.
- It is recommended that the compound operator designates a quality manager responsible for the implementation of the quality standards on the compound and staying in contact with the manufacturer.

Amendment proposal THE FORM CAN BE SENT BY E-MAIL TO info@ecgassociation.eu

NAME OF THE DOCUMENT

VERSION DATE

Amendment proposed by :

NAME / POSITION

COMPANY ADDRESS

TELEPHONE

E-MAIL

Current wording/page number

Proposed version

Signature Date

ECG
BluePoint Brussels
Boulevard A. Reyers 80
1030 Brussels I Belgium

Tel: +32 2 706 82 80

info@ecgassociation.eu
ecgassociation.eu