参考資料２

Safety Manual for Land Transport of International Maritime Container

June 2013

First Revision: April 2018
Second Revision: April 2021

Committee of Safety Land Transport Policy for International Maritime Container

Contents

1. Purpose of the Manual

International maritime container currently occupy a central position in international logistics due to its ability to provide efficient intermodal transportation between land and sea. An international maritime container is also becoming increasingly important in Japan's logistics. However, for inland transportation of international maritime containers, truck accidents, such as overspeed and failure of tightening devices or twist locks. Furthermore, as cargo is transported in sealed containers, it is difficult for drivers to fully grasp the information about the weight, item, and stowage of the cargo inside the containers. Transport workers and truck drivers are required to make decisions on their own, which the decision is typically difficult to reach a consensus among the parties involved regarding on-site responses.

Therefore, to encourage drivers to drive safely, the studies in "International Maritime Container Truck Accident Prevention Promotion Project" were conducted between 2010-2014 based on demonstration experiments to derive guidelines for safe speeds according to road conditions and load weights. Also, a survey was conducted on the methods of reliable information transmission among the organizations involved in the transportation of international maritime containers, procedures for detecting and correcting containers in inappropriate conditions such as overweight, unbalanced loads, and proper stowage methods to avoid unbalanced loads. In addition, based on the output of this project, best practices taken by shippers, shipping companies, terminal operators, intermediary agents, maritime cargo handling companies, freight forwarders, trucking companies, and drivers in cooperation with each other are suggested as case studies.

This manual is intended to encourage the parties involved to build a consensus and cooperative system on specific practices to improve inappropriate conditions for automobile transportation, such as overweight and unbalanced load, using the initiatives compiled in above mentioned project as examples.

This manual is not intended to discuss the Truck Transportation Business Act and other related laws and regulations, but rather to provide safety improvement measures to be implemented voluntarily with the understanding and cooperation of all parties involved. However, one must keep in mind that, not only to follow the measures suggested in this manual; it is also required to thoroughly comply with related laws and regulations as well.

2. How to Read the Manual

In Section 5 of this manual, measures involving safety of the land container transport are suggested in the following sub-section:

5. (1) Safe driving of container truck
5. (2) Container information and declaration
5. (3) Inappropriate containers detection and correction, and
5. (4) Cargo packing

All parties involved are encouraged to go through the following sub-sections and take appropriate action to ensure a safe transport of maritime containers.

① For shippers: 5. (1), (2), (3), and (4)
② For shipping companies: 5. (2) and (3)
③ For intermediary agents, maritime cargo handling companies, freight forwarders: 5. (1), (2), (3), and (4)
④ For terminal operators: 5. (2) and (3)
⑤ For trucking companies and drivers: 5. (1), (2), (3), and (4)

3. Definitions

- Consignee: An entity that receives the international maritime container at its final destination. However, in cases where the said entity does not arrange the land transport of the import container to the final destination, the entity indicated as the consignee in the maritime transportation contract document issued by the shipping company shall play the role of the consignee.
- Consignor: An entity that loads cargo into the international maritime container at the point of departure.
- Shipper: An entity that is described as the shipper in the maritime transportation contract documents.
- Intermediary services: Intermediary services for the transportation of cargo carried out by a freight forwarder under its own name, or consignment of transportation of cargo to a freight forwarder under the name of another entity.
- Intermediary agent: An entity that provides intermediary services.
- Maritime cargo handling company: A business operator that consistently performs coastal cargo handling and barge transportation of individual cargoes at a port under consignment from shippers. The operator must complies with the general port and harbor transportation businesses stipulated in the Port and Harbor Transportation Business Act.
- Freight forwarder: A consigned freight forwarder based on the Consigned Freight Forwarding Business Act and Motor Truck Transportation Business Act.
- Intermediary agent and others: An intermediary agent, maritime cargo handling company,

and freight forwarder.

- Trucking company: A General Motor Truck Transportation Business Operator, or a Special Motor Truck Transportation Business Operator as stipulated in the Motor Truck Transportation Business Act.
- Driver: A person who transports international maritime containers under a trucking company.
- Shipping company: A ship operator based on the Maritime Transportation Act.
- Terminal operator: An entity that operates a port terminal facility for containers handling.
- Inappropriate container: A container in a condition that may interfere with safe transport of the container truck, such as overweight and unbalanced load.
- Overweight: A condition in which the weight of a vehicle or container exceeds the weight limit specified in the relevant laws and regulations (e.g., violation of the Road Traffic Act (overload), violation of the Vehicle Restriction Order, and exceeding the maximum load weight of the container).
- Unbalanced load: A condition in which the center of gravity of the load on the motor truck is deviated from the center.
- Correction: Unloading or reloading cargo an inappropriate containers at an appropriate location.
- B/L and other documents: bill of lading (B/L), waybill, arrival notice (A/N), invoice (I/V), packing list (P/L), or other documents containing information equal to or greater than that contained in the bill of lading.
- Dangerous goods: Dangerous goods specified in the United Nations Recommendations on the Transport of Dangerous Goods (UN Recommendations), including not only hazardous materials under the Fire Service Act, but also poisonous and deleterious substances under the Poisonous and Deleterious Substances Control Act and high-pressure gases under the High Pressure Gas Safety Act.

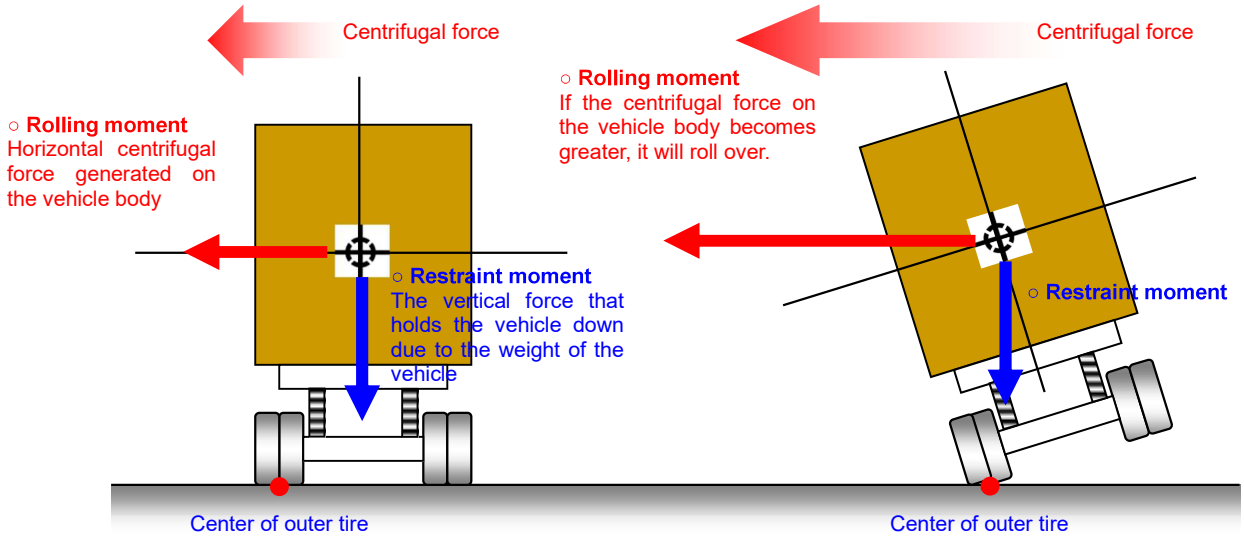
4. Rollover Mechanism of Container Trailers

(1) Principle of container trailer rollover

In the land transportation of international maritime containers, "centrifugal force" is generated when the vehicle negotiates a curve, which pull the vehicle body outward. This centrifugal force increases with a higher speed.

A rollover occurs when the horizontal force (rolling moment) that pushes the vehicle out of the curve is greater than the vertical force (restraint moment) that holds the vehicle to the ground from the weight.

The speed at which this condition is reached (rollover limit speed) varies greatly depending on the radius of the curve and the packing conditions (load weight, position of the center of gravity depending on the staking arrangement, etc.).



○ **A rollover occurs when Rolling moment > Restraint moment:**
○ **For Rolling moment**
- ✓ **Increases with height of center of gravity: Higher risk to roll over.**

○ **For Restraint moment**
- ✓ **Decreases as the center of gravity moves toward outside of the curve: Higher risk to roll over.**

Figure 1 Principle of container trailer rollover

(2) Main causes of rollover

There are various causes of trailer rollovers, which can be broadly classified into "travel speed," "cargo loading conditions," "driving operation," "road geometry," and "natural phenomena," and the main factors for each are as follows.

Table 1 Main causes of rollover

Classification	Main cause	Overview
(1) Travel speed	Overspeed	The risk of rollover increases if the vehicle does not slow down at intersections or does not travel at a speed which appropriate for the curve radius and load conditions.
(2) Cargo loading conditions	① Unbalanced lateral load	The risk of rollover increases if the cargo is unbalance toward the outside of the curve.
	② Unbalanced longitudinal loads	The risk of rollover increases when the center of gravity of the cargo is high in the container.
	③ Load weight	Under the same unbalanced load conditions in (2) ① and ②, the heavier the load on the container, the higher the risk of rollover.
(3) Driving operation	Steering wheel operation	Sudden steering at high speeds increases the risk of rollover.
(4) Road geometry	① Curve radius	With the same speed, negotiating the curve with smaller radius, will result in higher the risk of rollover.
	② Superelevation	If the road is higher on the outside of the curve, the risk of rollover is lower. If the road is lower on the outside, the risk is higher.
(5) Natural phenomena	Gust	When a vehicle is exposed to a strong side wind gust, there is an increased risk of rollover, depending on the condition of the vehicle.

(3) Relationship between cargo loading condition and rollover

The weight and center of gravity of the tractor, trailer, and container are specified by standards. Typically there are no major differences among them except for the type of trailer and size of the container.

As the weight of the cargo increase, the restraint moment described in Section 4. (1) “Principle of container trailer rollover” will increase, making it more difficult to roll over. However, as shown in the example of Figure 2, a large, top-heavy machine tool is loaded, the rolling moment will increase due to the high center of gravity, resulting in higher change of rollover.

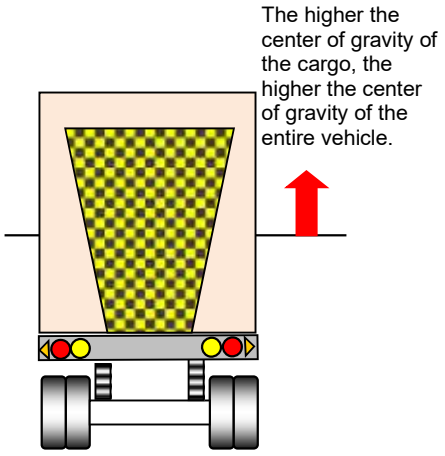


Figure 2 Top-heavy cargo

In addition, if the cargo is loaded with lateral imbalance in the container, the restraint moment will be small, and the container is likely to roll over.

Cases of the cargo with lateral imbalance include cases in which the unbalanced loading of cargo occurred and cases in which cargo such as woods, rolled aluminum coils or pasture grass is improperly stowed or lashed. The packing may shifts or collapses inside the container due to vibration or shock during transportation, resulting in unbalanced loads. Furthermore, the impact of cargo striking the inner wall of the container when traveling around a curve can also contribute to the risk of rollover to the outside of the curve.

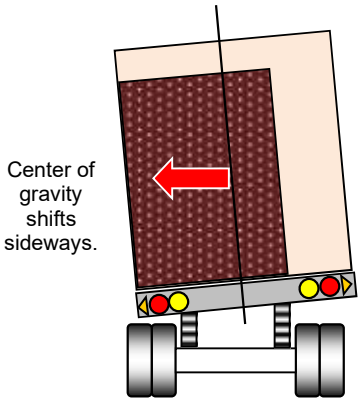


Figure 3 Unbalanced lateral load

As for liquid cargo, even if it is loaded in an appropriate container and properly lashed, centrifugal force will cause the cargo to be unbalanced toward the outside of the curve when the vehicle is traveling on a curve, resulting in a smaller restraint moment and making the vehicle easier to roll over.

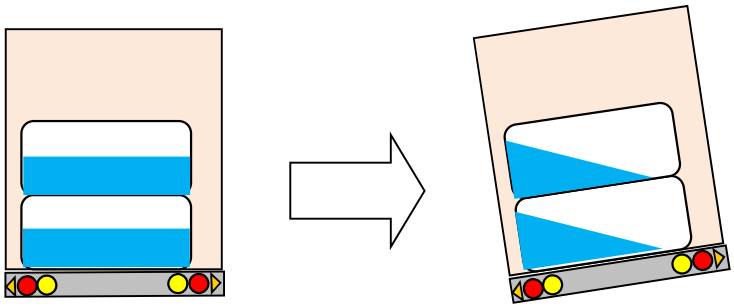


Figure 4 Liquid cargo

5. Efforts to Prevent Container Trailer Rollovers

(1) Safe driving of container trailers

(for trucking companies, drivers, shippers, intermediary agents, maritime cargo handling companies, and freight forwarders)

In order to prevent trailer rollover accidents during land transportation of international marine containers, first of all, it is important to properly lock tightening devices or twist locks and to drive safely at appropriate speeds and with proper driving operation.

Please be sure to tighten tightening devices or twist locks before starting to transport containers. Also, please drive safely as the container cargo is easier to roll over at a lower speed than normal cargo.

This manual describes safety measures based on the specific characteristics of container trailers, but trucking companies and drivers are also encouraged to take other safety measures that should be implemented in truck transportation, such as proper operational management and measures to prevent overworking.

<< Highlight >>

- **Safe driving at safe speeds and with proper driving operation**
  - ➢ Container trailers are heavier than regular trucks and have a higher center of gravity, so drivers should drive at a lower speed than regular trucks. Do slow down at curves and intersections.
  - ➢ Shippers and intermediary agents or the like should understand the dangers of driving container trailers and should provide the transport by considering the extra time needed for transportation. Even if the arrival schedule is delayed, instruct the driver via the trucking company to drive safely without rush.

- **Judgment and response to avoid transporting containers in inappropriate conditions**
  - ✓ Trucking companies should provide the driver with information obtained from the shipper, such as the weight, item, and packing of the containers, so that the driver can identify any overweight or unbalanced containers that may increase the chance of accident. If the container is a fully loaded, or with a high center of gravity, please use a low-floor trailer to transport the container.
    [See Reference Material 13 for examples of stowage and matters that drivers should be aware of by packing style and cargo.]
  - ✓ If the driver feels or senses an unbalanced load, the driver should visually check the condition of the container and, *if necessary, check the balance by measure the height from the ground to the left and right ends of the rear of the vehicle with a tape* before driving out on a public road.
  - ✓ *As a result of the above measurement with a tape measure, if the height difference between the left and right ends of the rear of the vehicle is...*
    - *5 cm or more, contact the shipper and correct it in principle.*
    - *3 cm or more and less than 5 cm, ask the shipper to make a judgment, and make corrections, arrange for a low-floor trailer, or take other measures as necessary depending on the contents of the cargo (item, weight, etc.).*
    - *Less than 3 cm, drive extremely carefully, and slow down when turning at intersections or on sharp curves.*

- **Locking tightening devices / twist locks**
  - ✓ Drivers must be sure to lock four tightening devices at the front, rear, left, and right of the container before starting the truck.

① Driver

Note: When driving on public roads, do comply with laws and regulations.

○ Container trailers are heavier and have a higher center of gravity than regular trucks, so the risk of rollover is much higher than for regular trucks. In particular, if there is a large unbalanced load, the vehicle will roll over at a very low speed, so if you feel the possibility of an unbalanced load, visually check the tilt of the vehicle from the rear of the vehicle before driving. If the vehicle is tilted, use a tape measure to measure the distance from the left and right ends of the rear of the vehicle to the ground, as shown below, and check the difference.

○ As a result of the above measurement with a tape measure, if the height difference between the left and right ends of the rear of the vehicle is approximately:

- 5 cm or more, contact the shipper to make corrections.
- 3 cm or more and less than 5 cm, ask the shipper to consider corrections, arranging a low-floor trailer, or take other measures as necessary depending on the contents of the cargo (item, weight, etc.).
- Less than 3 cm, drive extremely carefully, and slow down when turning at intersections or on sharp curves.

However, the following guidelines do not consider the shape of the road, the weather, and other minor conditions. Therefore, always slow down when turning at intersections, and drive slowly on curves, slopes

Table 2 Estimated degree of danger based on the height difference between the left and right of the rear of the trailer and the turning radius (Note: See Reference Material 1).

Height difference between left and right / Road shape	0cm	1cm	2cm	3cm	4cm	5cm	6cm	7cm	8cm	9cm	10cm
Flat straight roads, very gentle curves											
Intersections, curves, slopes, etc.											

Very dangerous (must be corrected)
Dangerous (should be corrected, if necessary)
Attention required (should drive with extreme caution and slow down if necessary) *
Caution (should slow down depending on curve, road, weather, and other conditions)
* Be sure to slow down when turning at intersections in accordance with the provisions of the Road Traffic Act.

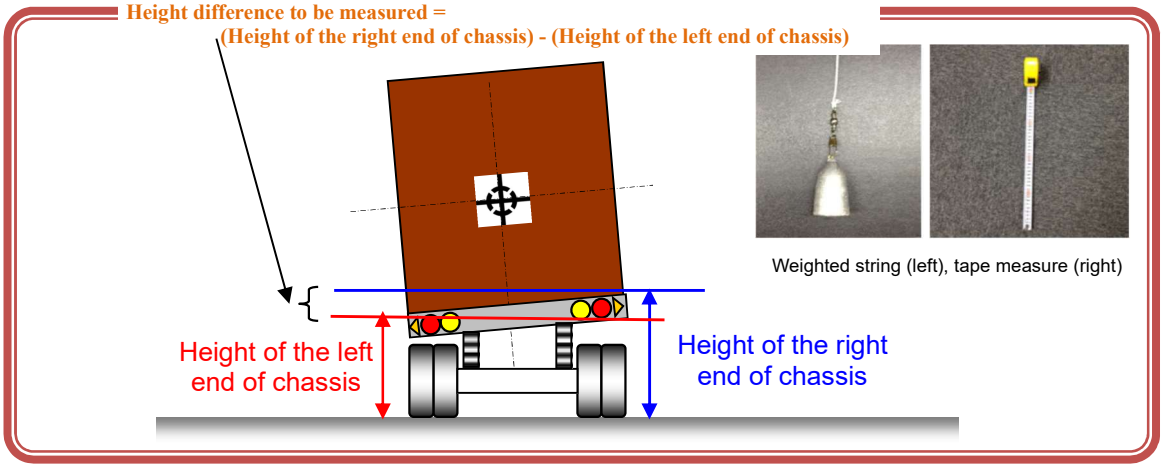
How to measure the difference in height from the road surface between the left and right ends of the rear of the trailer using a tape measure

[Point of measurement]

★ Hold the tape measure perpendicular to the ground to measure the height.

★ Measure on as level a surface as possible.

Note: For example, you can measure the height perpendicular to the ground by hanging a weighted string toward the ground and then measuring the length of the string with a ruler.



Weighted string (left), tape measure (right)

Figure 5 Difference in height from the road surface between the left and right ends of the rear of the trailer

○ The risk of rollover is extremely high when traveling around a curve on a slope, so slow down.
○ Even on flat roads, there is a high risk of rollover on S-curves, so drive slowly.
○ So-called counter-steering, such as steering to the right and then to the left when turning left at an intersection, greatly increases the risk of rollover, so slow down and steer carefully when turning at intersections.
○ Even on flat, straight roads, there is a risk of rollover due to high lateral acceleration when changing lanes, so be careful with the steering.
○ Driving with tightening devices or twist locks released greatly increases the risk of the container falling off. Be sure to lock four tightening devices at the front, rear, left, and right before starting the truck.

Rules to be Complied by Drivers
(Article 71 (iv) of the Road Traffic Act)

Take the necessary measures to prevent persons riding in the vehicle or streetcar from falling from it and to prevent loaded objects from falling or scattering from it, such as closing the doors of the vehicle or streetcar and loading cargo properly onto the vehicle or streetcar.

○ Fine: 7,000 yen (large vehicles)
○ Deduction: 1 point

Figure 6 Rules to be complied by drivers

(2) Trucking companies

○ Make drivers fully aware of the special characteristics of container trailers and train them thoroughly in the safe operation of container trailers.
○ Since container trailers roll over at a much lower speed than regular trucks, give instructions considering the extra time needed for transportation.
○ Based on the information obtained from the consignee or the intermediary agent, arrange a suitable chassis so that the overweight and other laws and regulations will not be violated.
○ If the container is a fully loaded, or with a high center of gravity, please use a low-floor trailer to transport the container.
○ Provide the driver with information obtained from the shipper, such as the weight, item, and packing of the containers, so that the driver can identify any overweight or unbalanced containers that may interfere with safe driving. Also, have the driver carry a tape measure to easily check the unbalanced load of the container.
○ When transporting containers loaded with dangerous goods, confirm in advance compliance with the laws and regulations related to dangerous goods. Have a driver who held the license stated in laws and regulations related to dangerous goods.
○ In addition to the indications required by laws and regulations related to dangerous goods, make sure that the details of the dangerous goods can be identified by external indication, such as the UN number.
○ Have the driver carry the Emergency Contact Card (the Yellow Card) as much as possible.

(3) shippers, intermediary agents, maritime cargo handling companies, and freight forwarders

○ Be aware of the risk of container trailers rolling over at lower than normal speeds, and make a request for transportation considering the extra time needed for transportation, assuming that the trailer will travel at a low speed. Even if the arrival schedule is delayed, instruct the driver via the trucking company to drive safely without rush.

Reference Material 1: Experiment and Simulation for Calculating the Rollover Limit Speed to be Used as a Guideline and Unbalanced Load to be Corrected

In order to collect data for calculating the rollover limit speed by cargo condition and the unbalanced load to be corrected, the Ministry of Land, Infrastructure, Transport and Tourism's "Project for Promotion of Measures to Prevent Accidents Involving International Maritime Container Trucks" collected physical properties of an actual trailer in the event of a rollover on a test course. Simulations were also conducted based on the results obtained from the experiments.

The table on page 7 of this manual was formulated using the results of these experiments and simulations conducted multiple times with different weights, unbalanced loads, and turning radii to see the changes in the rollover limit speed (the critical speed at which a truck making steady turns at a constant radius will roll over).

However, these are only simulation results, and it must be thoroughly remembered that the risk of rollover may be even higher when driving on public roads, where factors related to rollover (see Section 4) may be interrelated.

A 40 ft 3-axle experimental trailer (with outriggers) at the rollover limit.

The trailer tilted more than the tractor. The chassis of trailer was twisted and protruded from the rear wheels of the trailer.

(Driving on a test course)

Figure 7 Trailer at rollover limit

- The smaller the curve radius (turning radius), the lower the rollover speed.
- The more the horizontal center of gravity of the container moves to the outside of the curve, the lower the rollover speed.
- The more the vertical center of gravity of the container moves upward, the lower the rollover speed.
- The closer the container weight is to the maximum load weight, the lower the rollover limit speed.

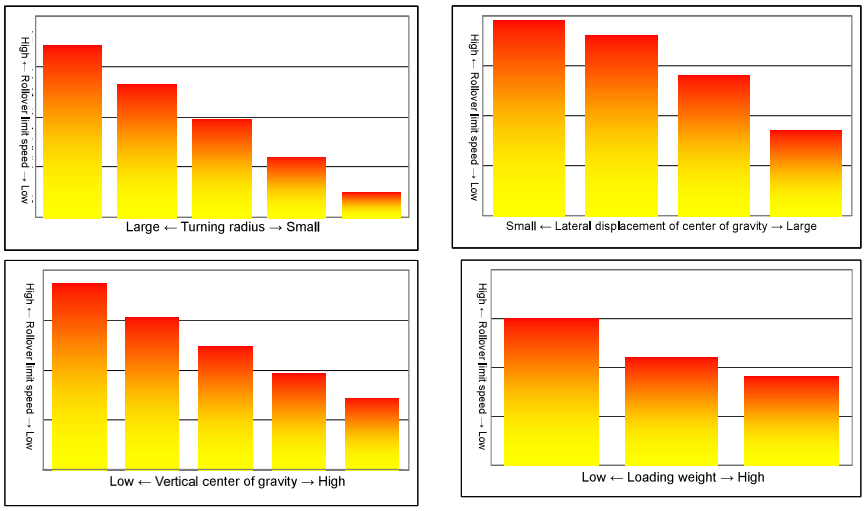


Figure 8 Changes in rollover limit speed of container trailers

Note: Table 2 "Estimated degree of danger based on the height difference between the left and right of the rear of the trailer and the turning radius" is created for 40 ft 3-axle trailers based on the rollover limit speed obtained by the formula based on tests and simulations, assuming that the load weight is the maximum load weight and the vertical center of gravity is at 60% of the container height from the container floor as the most dangerous conditions that could occur with actual containers in circulation. It should also be noted that the air suspension, which currently accounts for approx. 1-2% of the market, do not have the same suspension characteristics as the leaf spring used in this experiment.

Reference material 2: Main Characteristics of Container Trailers

A container truck consists of two parts, a tractor and a trailer, which its operation methods and vehicle behavior characteristics are different from those of general large vehicles with one part.

○ Difference between empty, loaded, and tractor alone

The weight of a trailer varies greatly between loaded and unloaded, causing significant differences in braking, shifting, and other operations. In addition, since the balance of the vehicle varies significantly between when loaded and unloaded due to the change in axle load distribution, please steer and brake properly according to the situation. Furthermore, please be careful when driving the tractor alone as it significantly changes the balance of the vehicle.

○ How trailer behavior is conveyed

Since the behavior of the semi-trailer is mediated by the kingpin at the coupler, it may be more difficult for the driver to perceive its behavior of the trailer. As shown below, unexpected behavior may occur depending on the load conditions and the driving method, so be careful.

One of the characteristics of combination vehicles consisting of a tractor and a trailer is the sway of the trailer. Trailer sway is a phenomenon in which the trailer exhibits the following movements due to sudden steering.

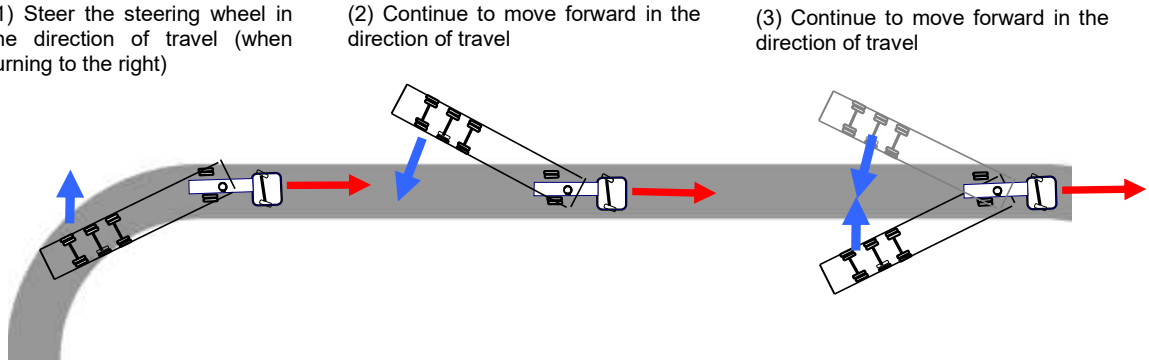


Figure 9 Trailer sway

○ Dead angle

When turning left or right, or when backing up, the body of the trailer bends sharply around the coupler, so the entire left and right sides of the trailer become a large dead angle when turning right and left, respectively.

Blind spot is blocked when only the body of the trailer is reflected in the mirror, making it difficult to check the safety of the surroundings. Therefore, it is necessary to fully check the surrounding conditions before turning left or right or backing up.

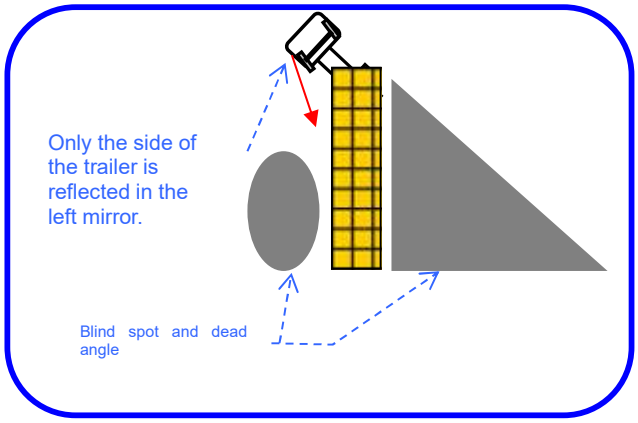
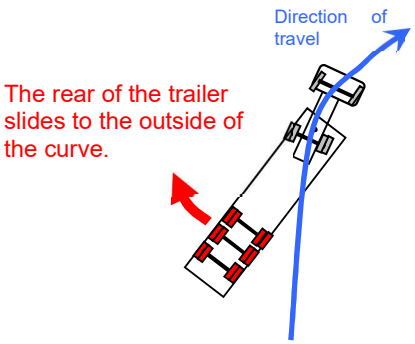
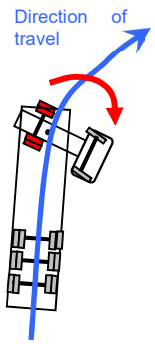
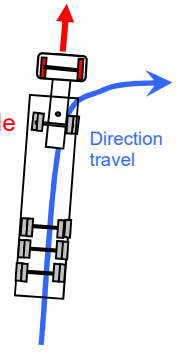


Figure 10 Dead angle (when turning left)

○ Dangerous condition

Dangerous conditions specific to combination vehicles include "trailer swing," "jackknife," and "plow-out". If the trailer slides due to such a phenomenon, it may trip over a curb and roll over, so be careful.

Table 3 Dangerous phenomena specific to combination vehicles

Trailer swing	Jackknife	Plow-out
 The rear of the trailer slides to the outside of the curve.	 The rear of the tractor slides outward into a dogleg.	 The steering wheel does not function, and the entire vehicle goes straight out of the curve.

Reference Material 3: Other Maneuvers to Prevent Container Truck Accidents Other Than Rollover

○ Accelerating and Decelerating

✓ Unlike a regular truck, a container trailer consists of two vehicles: a tractor and a trailer. As a result, there is a big difference in the steering characteristics between when you step on the accelerator pedal to accelerate and when you take your foot off the pedal to decelerate. Also, on long descent slope, it is necessary to properly use not only the foot brake, but also the trailer brake and exhaust brake as well.

○ Negotiating intersections and curves

✓ Be careful when turning, as the inner wheel difference of the semi-trailer is particularly large. Depending on the situation, you may not be able to turn left at an intersection and get stuck, or you may clash into vehicle in the opposite direction.

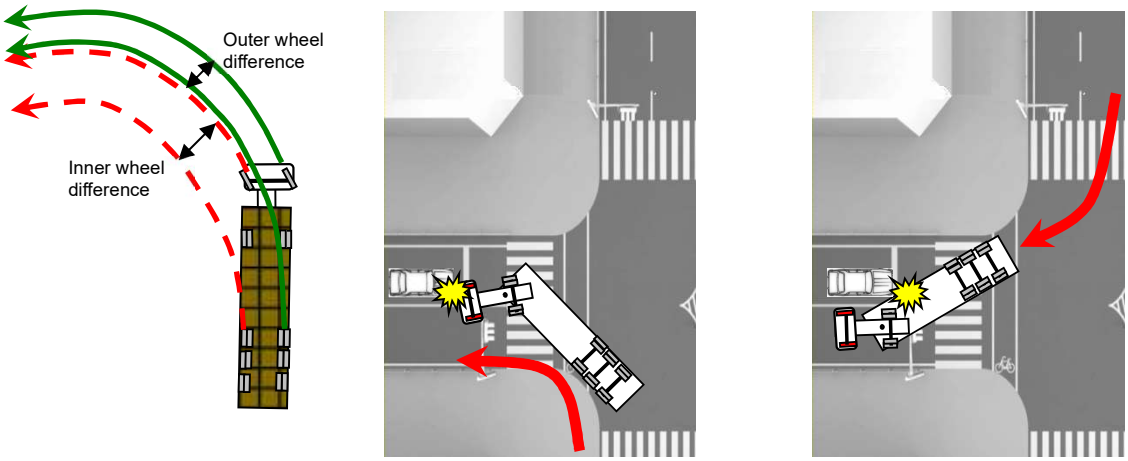


Figure 11 Wheel difference and possible accident at the intersection

○ Overtaking and changing lanes

Due to its long length, trailer requires a lot of time and distance to overtake and change lanes. These maneuvers should be avoided as much as possible. If you have no choice but to overtake, be sure to keep a safe distance away from the overtaken vehicle when returning to the original lane. Also, be aware of road conditions such as ruts when changing lanes and be careful to avoid rollovers due to trailer stumbling onto ruts.

(2) Communicating container information

(for shippers, intermediary agents and others, trucking companies, shipping companies, and terminal operators)

In order to prevent rollover accidents during inland transportation of international maritime containers, it is important to accurately assess the condition of the container and drive the trailer accordingly.
It is also very important to identify overweight and unbalanced loads that are inappropriate for safe driving. Do not transport the containers if such conditions are found.
To this end, the shipper, intermediary agent or the like, trucking company, and other parties involved should work together to ensure that documents and information are exchanged appropriately so that container information is conveyed to the driver.

<< Highlight >>

- ○ *Information about the weight, item, packing, and others of the container that can be obtained from bills of lading or other means should be communicated from the consignor to the consignee in accordance with the transportation contract or agency contract.*
- ○ With the revised SOLAS Convention coming into effect in July 2016, for export containers loaded in or after July 2016, the shipper of the container will be required to provide weight information for each container to the terminal representative and the captain of the vessel. Therefore, *the shipper or the intermediary agent and others who makes a transportation contract with the trucking company should provide the trucking company with weight information for each export container.*
- ○ For import containers from SOLAS Convention member countries, the shipper of the containers is obliged by the revised SOLAS Convention to provide weight information for each container. Therefore, the consignee in Japan should obtain the weight information for each container from trade documents or others.
- ○ For import containers from non-SOLAS Convention member countries, shippers of the containers are not obliged to provide weight information, but if a consignee or the intermediary agent and others in Japan contracts with a consignor from such a country, ask the consignor to provide weight information for each container to ensure safe transportation of the containers. If the consignee or the intermediary agent and others in Japan can only obtain the gross weight of multiple containers when importing containers, divide the gross weight proportionally by the number of containers and convert it to the weight of one container. In this case, provide the weight information to the trucking company with a note that the weight information is "the weight of multiple containers divided proportionally."
- ○ The shipper or the intermediary agent and others that contracts with a trucking company should include columns for weight, item, and packaging type in the contract documents to make sure that information is communicated.
- ○ The trucking company should make sure that information obtained from the shipper or others is provided to the driver.

Table 4 Container information described in trade documents

Name of document and information	Container information		
	Contents of container (item name)	Packing (packing style/loading method)	Weight / dimensions or volume
B/L (Bill of Lading)	A generic name of the product is typically listed.	The packing style (pallet, drum, etc.) is listed.	The weight of the cargo. Typically, the gross weight of multiple containers is listed.
Waybill	Same as B/L information	Same as B/L information	Same as B/L information
A/N (Arrival Notice)	Same as B/L information	Same as B/L information	Same as B/L information
D/O (Delivery Order) (container unloading request)	Same as B/L information	Same as B/L information	Same as B/L information
I/V Invoice (invoice for import)	The type, model name, quantity are typically listed.	Typically not listed.	Not listed.
P/L Packing List (packing statement)	Same as invoice	The packing style is listed as with B/L.	In some cases, the weight per package and the total weight of the cargo in the container are listed.
EIR (Equipment Interchange Receipt)	Contents are not listed (only whether loaded or empty).	Not listed.	In some cases, the gross weight is listed.

(Principles of information communication)

(1) Information that the trucking company must provide to the driver

○ The trucking company should provide the driver with the information obtained in (2) below and provide transportation instructions based on the transportation instruction form that includes the following information.

- Weight information: In principle, the cargo weight of each container (for some imports where only the gross weight of multiple containers is known, it is acceptable to divide the gross weight of multiple containers proportionally by the number of containers) and the tare weight of the container (if it is unknown, provide the approximate tare weight of the container from the table below).
- Item information: Japanese translation of the item information described in the bill of lading (B/L) or the like.
- Packing information: Japanese translation of the packing information (drum, carton, etc.) described in the bill of lading (B/L) or other documents.
- Other information about dangerous goods: Japanese translation of other matters requiring special attention such as dangerous goods, if any. **[See Reference Material 7 for information about dangerous goods.]**

Table 5 Approximate tare weight of containers*

	Approximate tare weight
40 ft dry container	4.5 t
40 ft refrigerated container	5.0 t
20 ft container	2.5 t
20 ft refrigerated container	3.5 t

* The above table is created by extracting the heaviest tare weights of steel containers (including tall containers) announced by major shipping companies.

(2) Information that the shipper and the intermediary agent or the like should communicate at each stage of the transportation contract

○ The person who makes the final transportation request to the trucking company should transcribe the information contained in B/L or other maritime transportation documents on the transportation request form as described in (1) above.

○ In the agency contract from the original consignor to the person who makes a transportation request to the trucking company, information about the weight, item, and packing described in B/L or other documents should be properly communicated by attaching the B/L or other documents as they are or their copies to the agency contract documents. Even in the case of entrusting transportation intermediary services, if B/L or other documents are not attached and the intermediary agent or the like does not have information such as B/L, transcribe the information described in the B/L or other documents on the transportation intermediary service request form.

(3) How to communicate information

○ When requesting land transportation or intermediary services, provide the information listed in (1) above, to the extent possible, by means of documents, e-mail, fax, or other methods that leave a record of the information. If the intermediary agent in the middle of the route of a land transportation contract has already obtained the information in (1) above via NACCS(Note), an in-house system, or others, it shall be deemed that the information has been transmitted to the intermediary agent.

(Note) NACCS: Nippon Automated Cargo Clearance System

- Image of a transcription of information described in the bill of lading (B/L) onto a transportation contract documents by the person who makes the transportation request to the trucking company [See Reference Material 4 for the form.]

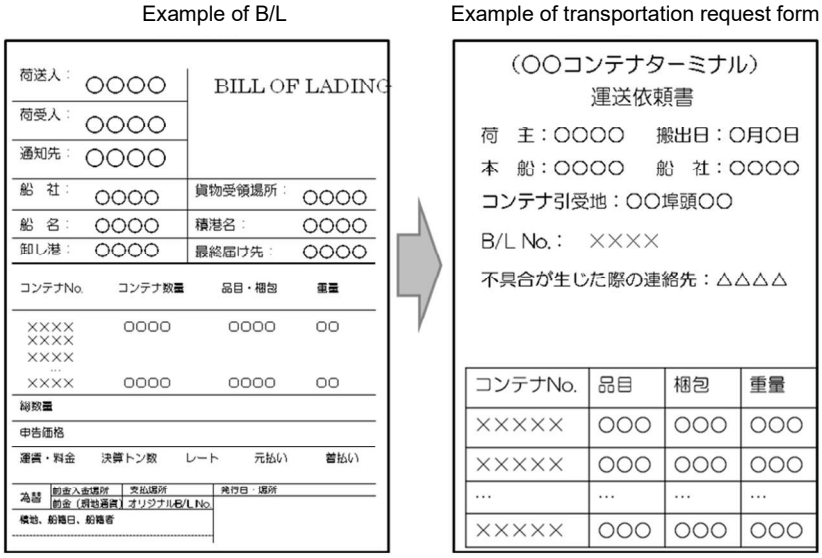
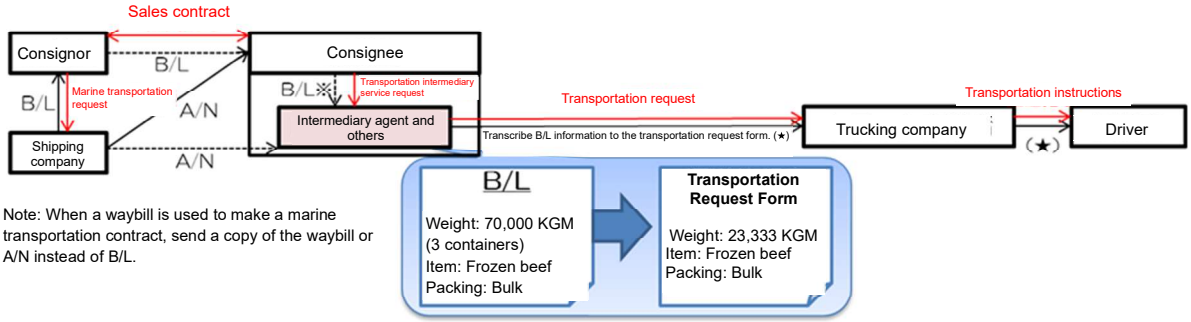


Figure 12 Image of transcription to transportation contract documents

- Typical examples of the flow of information described in B/L, from the original consignor to the Intermediary agents, and to the trucking company [See Reference Material 6 for other examples.]

Example I

When the consignee requests transportation via intermediary agents, and the intermediary agents requests a transport to the trucking company



Note: When a waybill is used to make a marine transportation contract, send a copy of the waybill or A/N instead of B/L.

Example II

When the consignee requests transportation directly to the trucking company

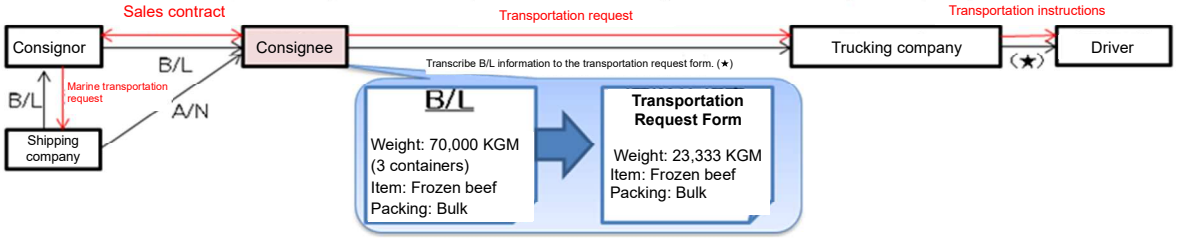


Figure 13 Typical examples of information flow and examples of persons who transcribe information

Note: Although the flow of B/L, A/N, and waybill is shown as examples above, if there is an exchange of documents, such as an invoice (I/V) or packing list (P/L), that contain more detailed information than B/L, it is desirable to communicate information based on these documents instead of B/L.

(Matters to be implemented by each involved party (import))

Note: The following are descriptions of the functions of the parties involved in typical container transportation. However, depending on the type of transportation contract, follow the relationship shown in Reference Material 6.

(1) Consignee

- ○ When entrusting a land transportation contract to an intermediary agent and others, the information about the weight, item, packing, and also about dangerous goods, which is described in B/L or other documents, should be provided to the intermediary agent and others as it is, as well as the contact information in case of any problems during transportation.
- ○ When concluding a land transportation contract directly with a trucking company, the information about the weight, item, packing, and also about dangerous goods, which is described in B/L or other documents, should be transcribed to transportation contract documents (transportation request form, etc.) used with the trucking company. At that time, if the weight on the bill of lading is that of each container, provide that information to the trucking company. Also, provide the trucking company with the contact information of the consignee in case there are any problems during transportation.
- ○ With the revised SOLAS Convention coming into effect in July 2016, for export containers loaded in or after July 2016, the shipper of the container will be required to provide weight information for each container to the terminal representative and the captain of the vessel. For import containers from non-SOLAS Convention member countries, shippers of the containers are not obliged to provide weight information, but if a consignee in Japan contracts with a consignor from such a country, ask the consignor to provide weight information for each container to ensure safe transportation of the containers.
- ○ If only the gross weight of multiple containers is obtained when importing containers, the consignee in Japan should divide the gross weight by the number of containers and convert it to the weight of one container. In this case, provide the weight information to the trucking company with a note that the weight information is "the weight of multiple containers divided proportionally."
- ○ If the weight of one container, which is obtained by dividing the weight information on the bill of landing proportionally by the number of containers and converting it to the weight of one container, is more than 26 tons (for 40ft container), confirm the weight information with the consignor or the shipper.
- ○ If you have received containers in an inappropriate state such as unbalanced load or load collapse from the same consignor in the past, check the stowage condition of the container with the consignor or the shipper.
- ○ When requesting the transportation of containers loaded with dangerous goods, indicate the details of the dangerous goods with the UN number or others as much as possible and prepare a yellow card and provide it to the intermediary agent and others, as well as trucking company.

(2) Intermediary agent and others

- ○ Transcribe the information about the weight, item, packing, and about dangerous goods, which is described in the bill of lading to the transportation contract documents (transportation request form, etc.) used with the trucking company, and describe the contact information in case of any problems during transportation. At that time, if the weight on the bill of lading is that of each container, provide that information to the trucking company.
- ○ If the gross weight of multiple containers is provided, ask the consignee to request the consignor to provide the weight of each container in the future to ensure safe transportation of the containers, even if the consignor is from a non-SOLAS Convention member country.
- ○ If only the gross weight of multiple containers is obtained when importing containers, divide the gross weight by the number of containers and convert it to the weight of one container.

In this case, provide the weight information to the trucking company with a note that the weight information is "the weight of multiple containers divided proportionally."

○ When concluding a transportation contract with a trucking company through two or more stages of transportation intermediary services, provide the above information to the intermediary agents and others, and ask them to provide the information to the trucking company so that the above information is provided sequentially.

○ When acting as an NVOCC(Note), when sending a delivery order (D/O) to the consignee or the intermediary agent and others, provide the information about the weight, item, packing, and also about dangerous goods, which is described in the bill of lading, as it is.

○ When requesting transportation of containers containing dangerous goods:

- If you receive information about a potential disaster due to leakage of dangerous goods or other incidents, notify the shipper and other parties involved immediately.
- Check whether the prescribed indication on the outside of the container and the replacement of the label with the one in accordance with the national laws have been done according to the type of dangerous goods, and if necessary, indicate other information about the details of the dangerous goods.
- Instruct the trucking company to have qualified personnel on board as required by dangerous goods-related laws and regulations, and issue yellow cards as necessary.

(3) Trucking company

○ When receiving a transportation request, make sure that information such as about the weight, item, and packing is complete. If such information is not available, ask the person who made the transportation request for the information.

○ Provide the driver with the information received from the consignee or others.

○ Follow the procedure described in section (3) of this manual, and fully communicate how to deal with inappropriate containers if they are found.

○ When giving instructions to transport the containers with dangerous goods loaded, inform the driver of the details of the dangerous goods and precautions, and have the driver carry a yellow card.

(4) Shipping company

○ When sending an arrival notice (A/N) to the consignee or others, information about the weight, item, packing, and about dangerous goods.

(5) Terminal operator

○ If you have information about the weight, item, and packing of the container, and about dangerous goods, provide this information to the driver as much as possible.

○ Follow the procedure described in section (3) of this manual, and fully communicate how to deal with inappropriate containers if they are found.

(Note) NVOCC: Non Vessel Operating Common Carrier. A consigned freight forwarder that does not own a vessel or other means of transportation, but uses services provided by other freight forwarders to transport cargo such as international marine containers.

(Matters to be implemented by each involved party (export))

(1) Consignor

- ○ When entrusting a land transportation contract to an intermediary agent and others, the information about the weight, item, and packing of each container, and also about dangerous goods, should be provided to the intermediary agent and others, as well as the contact information in case of any problems during transportation.
- ○ When concluding a land transportation contract directly with a trucking company, the information about the weight, item, and packing of each container, and also about dangerous goods, as well as the contact information of the consignor in case of any problems during transportation, should be provided to the trucking company or the intermediary agent and others from which transportation intermediary services are requested.
- ○ When requesting the transportation of containers loaded with dangerous goods, indicate the details of the dangerous goods with the UN number or others as much as possible and prepare a yellow card and provide it to the intermediary agent and others, or the trucking company.

(2) Intermediary agents and others

- ○ On the contract documents (transportation request form, etc.) used with the trucking company, provide the information about the weight, item, and packing of each container, dangerous goods, as well as the contact information in case of any problems during transportation, to the trucking company from which transportation is requested or the intermediary agent and others from which transportation intermediary services are requested.
- ○ When concluding a transportation contract with a trucking company through two or more stages of transportation intermediary services, provide the above information to the intermediary agents or the like, and ask them to provide the information to the trucking company so that the above information is provided sequentially.
- ○ When requesting transportation of containers containing dangerous goods:
  - If you receive information about a potential risk due to leakage of dangerous goods or other incidents, notify the shipper and other parties involved immediately.
  - Check whether the prescribed indication on the outside of the container and the replacement of the label with the one in accordance with the national laws have been done according to the type of dangerous goods, and if necessary, indicate other information about the details of the dangerous goods.
  - Instruct the trucking company to have qualified personnel on board as required by dangerous goods-related laws and regulations, and issue yellow cards as necessary.

(3) Trucking company

- ○ When receiving a transportation request, make sure that information such as about the weight, item, and packing is complete. If this information is not available, ask the person who made the transportation request for the information.
- ○ Provide the driver with the information received from the consignor or others.
- ○ When giving instructions to transport containers of dangerous goods, inform the driver of the details of the dangerous goods and precautions, and have the driver carry a yellow card.

Reference Material 4: Transportation Request Form to Trucking Company (Example)

To:

(Prepared by) MM/DD/YYYY
XX, XX Office, XX Co., Ltd.
Person in charge: XX
TEL: XX-XXXX-XXXX

Container Transportation Request (Export/Import)

Class	Export / Import
Shipper	
Vessel name	
Shipping company	
Container acceptance point (Pickup CY)	
Container pickup date	
Free time	
Pickup No.	
B/L No.	
Delivery destination (orderer)	
Delivery date and designated delivery time	
Empty container return destination (import) or Empty container pickup destination (export)	

★ If the B/L or delivery destination is different for each container number, a separate transportation request form should be prepared.

<Container Details>

No.	Container No.	Size/type of container	Container height	Item	Packing	Cargo weight (KGS)	Tare weight of container (KGS)	Details of dangerous goods	Note
1	TYOK3111111	40 ft Dry	9.6 ft	Soybean	Big bag	24,711	3,970		3-axle chassis
2	POPP9111111	20 ft Reefer		Frozen beef	Palette	13,270	3,070		2-axle
3									
4									

Reference Material 5: Operating Instruction Form for Drivers (Import Example)

Driver	

(Prepared by)
MM/DD/YYYY
XX, XX Office, XX Co., Ltd.
Person in charge: XX
TEL: XX-XXXX-XXXX

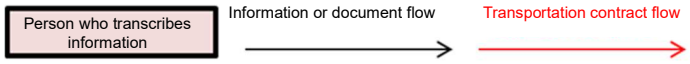
Operation Instruction Form (Directive)

Class	Export / Import		
Shipper	XX Co., Ltd.		
Main ship (vessel)	MOL XX		
Container acceptance point (Pickup CY)	XX wharf BC-0 (Person in charge)		
Possible container pickup date			
Container pickup date and time			
Pickup No.			
B/L No.			
Container No.			
Size/type/height of container	40 ft, Dry, Height: 9.6 ft		
Chassis type	Prepare a 3-axle chassis.		
Item	Furniture (wood products)	Details of dangerous goods	None
Container weight (KGS)	24,700 (Cargo weight: 20,700 Tare weight: 4,000)	Volume (m^2)	
Packing style	Cardboard box		
Other notes			
Delivery destination (orderer)	Address: 1-1-1 XX, XX City Mr./Ms. XX XX Distribution Center TEL: XX-XXXX-XXXX		
Delivery date and designated delivery time	MM/DD/YYYY, HH:mm		
Route		Rest stop	

Note: If necessary, measure the height difference between the left and right ends of the rear of the trailer using a tape measure.

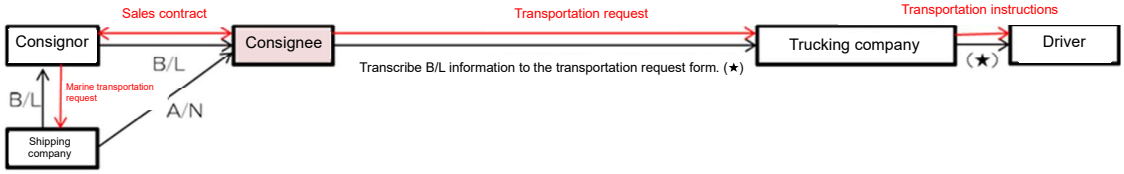
Reference Material 6: Example of Information Transmission Path for Each Type of Transportation Contract

The following is an example of the information transmission path for each typical type of transportation contract. Communicate information referring to these examples of document and information flow. The person who extracts and transcribes the necessary information (dividing the weight proportionally, translating item names and packing styles into Japanese, etc.) from the documents circulating in typical trade practice is shown as [ ]. For each type of transportation contract, transcribe the information and make a transportation request to the trucking company as necessary.

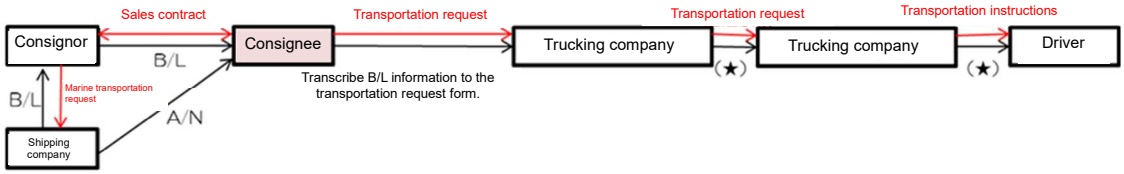


(1) When a bill of lading (B/L) is used as the maritime transportation contract document

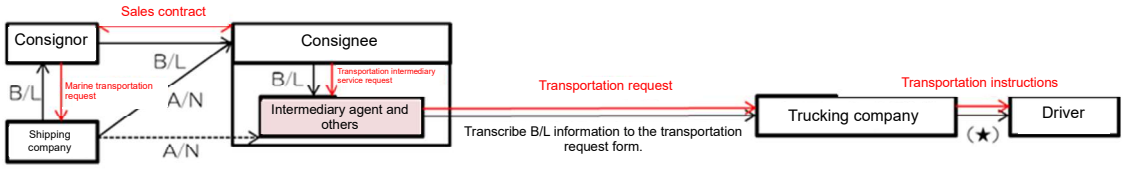
1) When the consignee requests transportation directly from a trucking company



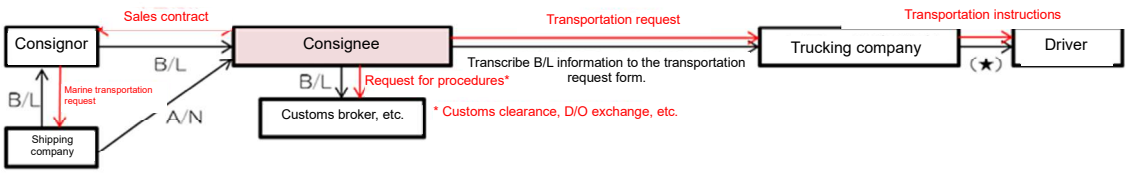
2) When the consignee requests transportation directly from a trucking company and the trucking company requests transportation from a subcontractor



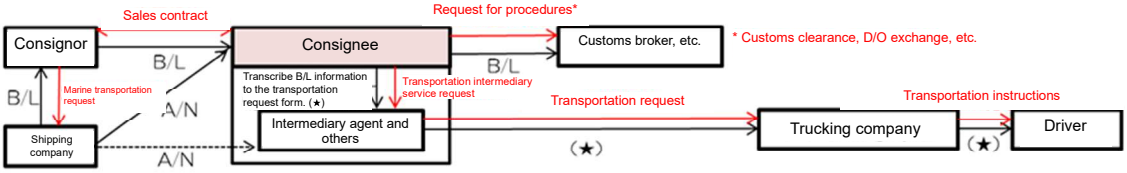
3) When the consignee requests transportation via intermediary agents, and the intermediary agents requests a transport to the trucking company



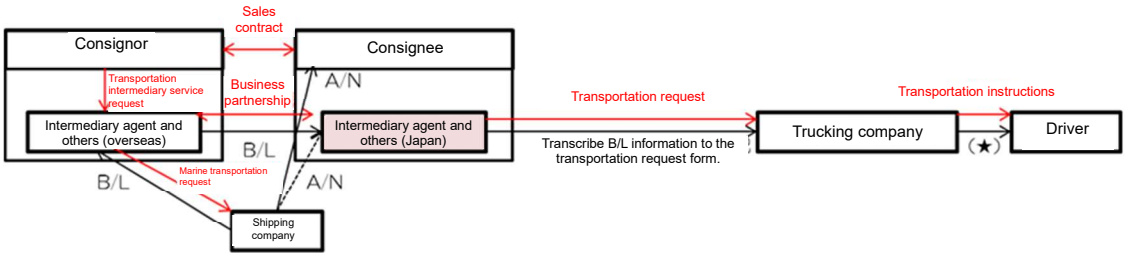
4) When the consignee requests customs clearance and related procedures from a customs broker, and transportation from a trucking company



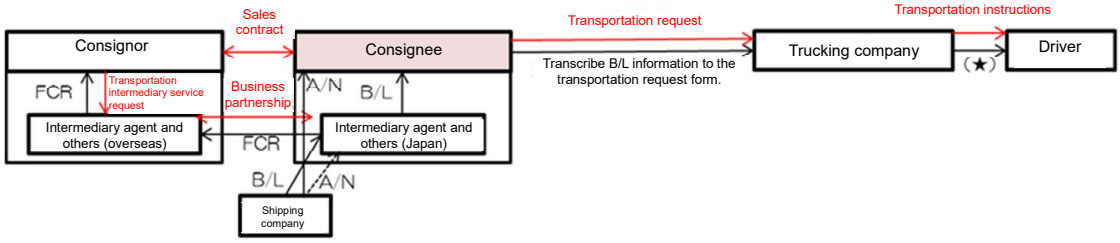
5) When the consignee requests customs clearance and related procedures from a customs broker, and transportation via intermediary agents, and the intermediary agents requests a transport to the trucking company



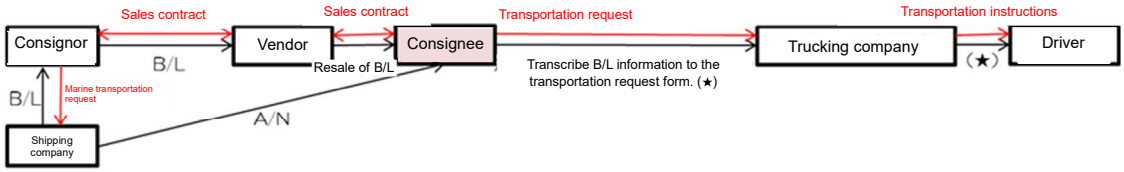
6) When an overseas intermediary agent makes a request for maritime transportation upon request of the consignor, and the intermediary agent in Japan, which is a business partner, requests transportation from a trucking company in Japan



7) When an intermediary agent in Japan makes a request for maritime transportation upon request of the consignee and the transaction is conducted using FCR(Note), and the consignee requests transportation from a trucking company in Japan

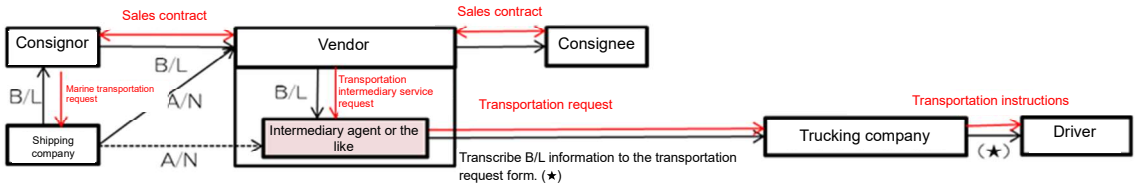


8) When the consignee requests land transportation by itself to a trucking company after the resale of B/L from the vendor.



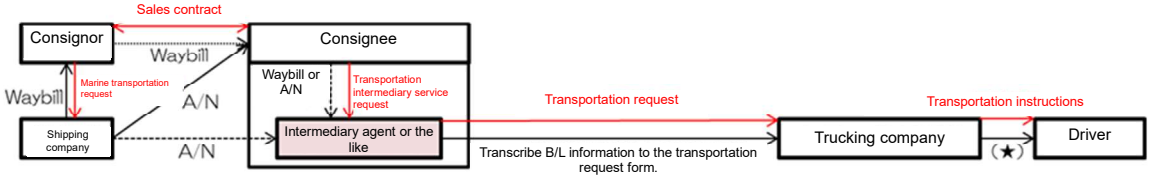
(Note) FCR: Freight forwarder's Cargo Receipt. A document certifying that the freight forwarder has received the cargo on the premise that the freight forwarder entrusts the transportation of the cargo to a marine freight forwarder (NVOCC or shipping company).

9) When the B/L is not resold, but the vendor requests transportation via intermediary agents, and the intermediary agents requests a transport to the trucking company

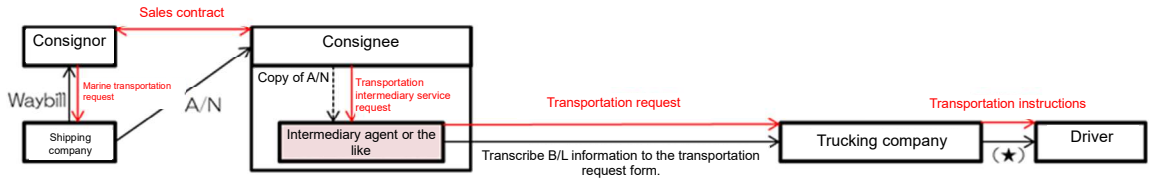


(2) When a maritime transportation contract is concluded by waybill without using a bill of lading (B/L) as a maritime transportation contract document

1) When the consignee receives (a copy of) the waybill and the shipping company issues an A/N to the consignee and the intermediary agent, then the intermediary agent requests transportation from a trucking company



2) When the consignee does not receive (a copy of) the waybill and the shipping company issues an A/N only to the consignee, and the intermediary agent requests transportation from a trucking company



Reference Material 7: Communication of Information about Dangerous Goods

Regarding the transportation of dangerous goods, various standards are stipulated in the laws and regulations related to dangerous goods, including the issuance of documents, the display of signs, the appointment of qualified personnel to handle dangerous goods, the management of dangerous goods, the prohibition of mixing with other dangerous goods, the carrying of tools necessary for emergency response, and the actions to be taken in the event of an accident or other emergency. It is necessary to comply with these laws and regulations. Therefore, the consignee or the intermediary agents and others must provide the following information to the trucking company from which transportation is requested. The following are examples of responses to accidents and initiatives for safer transportation.

[Information about dangerous goods to be provided to trucking companies]

Official product name, IMDG code class, segregation category (applicable to explosives), physical properties, UN number, classification and items of dangerous goods, specific precautions for hazards, toxicity, explosiveness, flammability, and others of dangerous goods, precautions for handling dangerous goods, protective equipment for the same, contents and exterior of the cargo, etc.

(1) Carrying a yellow card

Yellow cards describe the actions to be taken by drivers, firefighters, police, and other parties involved in the event of accidents during the transportation of hazardous and toxic materials regulated by the Fire Service Act, Poisonous and Deleterious Substances Control Act, High Pressure Gas Safety Act, Explosives Control Act, and Road Act.

It is desirable that the consignee or the intermediary agent and others prepare an emergency contact card (yellow card), attach it sequentially in accordance with the transportation contract, and finally have it carried by the driver during transportation. It is especially desirable for the driver to carry the yellow card in the following cases.

- When transporting more than a certain quantity of one product or item
- When transporting an item that generates hazardous gases that affect emergency response when burned or in contact with water or air

For high-pressure gases, with some exceptions, it is mandatory to carry a yellow card or a document with similar information during transportation, even if it is a small amount.

(2) External display of containers

In order to ensure proper handling in the event of an accident or the like, it is desirable to indicate the information about dangerous goods or the UN number on the outside of the container so that the details of the cargo can be identified from the outside, even if the cargo is not subject to indication requirements under laws and regulations related to dangerous goods.

(3) Communication and system for transportation of dangerous goods

- If you receive information about a potential risk due to leakage of dangerous goods or other incidents, notify the consignee and other parties involved immediately.
- When transporting dangerous goods, have hazardous materials engineers, qualified personnel, or substitute drivers, on board as required by laws and regulations related to dangerous goods. To further ensure safe transportation, it is desirable to have qualified personnel who can handle the dangerous goods to be transported on board, regardless of the provisions of the laws and regulations related to dangerous goods.

(3) Measures to detect and correct import containers in inappropriate condition

(for consignees, intermediary agents and others, trucking companies, drivers, shipping companies, and terminal operators)

Since containers are subject to intermodal transportation by sea and land, once they are sealed, they are never opened until they reach their final destination, making it very difficult to identify conditions inside the containers such as overweight or unbalanced loads.

On the other hand, weighing containers with a large distribution volume and checking them one by one for unbalanced loads can cause delays in the distribution, so it is necessary to obtain information on the condition inside the containers efficiently.

To this end, the following two steps, "Document check before entering the port" and "On-site check after entering the port," should be followed. Shippers, intermediary agents and others, terminal operators, trucking companies, and other parties involved should work together to identify inappropriate containers, and if any, take corrective action such as unloading and reloading at an appropriate location.

This manual is not intended to describe how to interpret and apply applicable laws and regulations, but rather to provide safety improvement measures to be implemented voluntarily with the understanding and cooperation of all parties involved. In transportation, it is necessary to implement the measures described in this manual and thoroughly comply with applicable laws and regulations.

<< Highlights >>

I Document check: Document check before entering the port

- ✓ The consignee, the intermediary agent and others, and the trucking company should check the documents for inappropriate conditions such as overweight or unbalanced load. **[See P. 28 to 30 for how to check the documents.]**
- ✓ Based on a result of a document check, *for containers that appear to be overweight or unbalanced*, *the consignee should contact the shipping company and the terminal operator and request their cooperation in correcting the problem* prior to transportation. **[See P. 28 to 30 for judgment criteria.]** *If there is no place to make corrections at the terminal, the consignee should make arrangements for correction at a warehouse or other facility in the port district of the port of unloading prior to transportation.*
- ✓ Based on a result of a document check, *for containers that appear to be inappropriate**, the trucking company should instruct the driver *to conduct* II *"On-site check after entering the port."*

  *** Containers that appear to be inappropriate refer to those that cannot be determined to be overweight or unbalanced but should be confirmed by weighing and simple unbalanced load measurement.**

II On-site check after entering the port

- ✓ *In order to find and correct import containers that are potentially inappropriate after entering the port, the cooperation of the parties involved in the transportation of maritime containers are essential.*
- ✓ *Consult with the parties involved at each portto determine the appropriate measures to be taken in accordance with the facilities and location of the port, using the examples in this manual as a reference.*

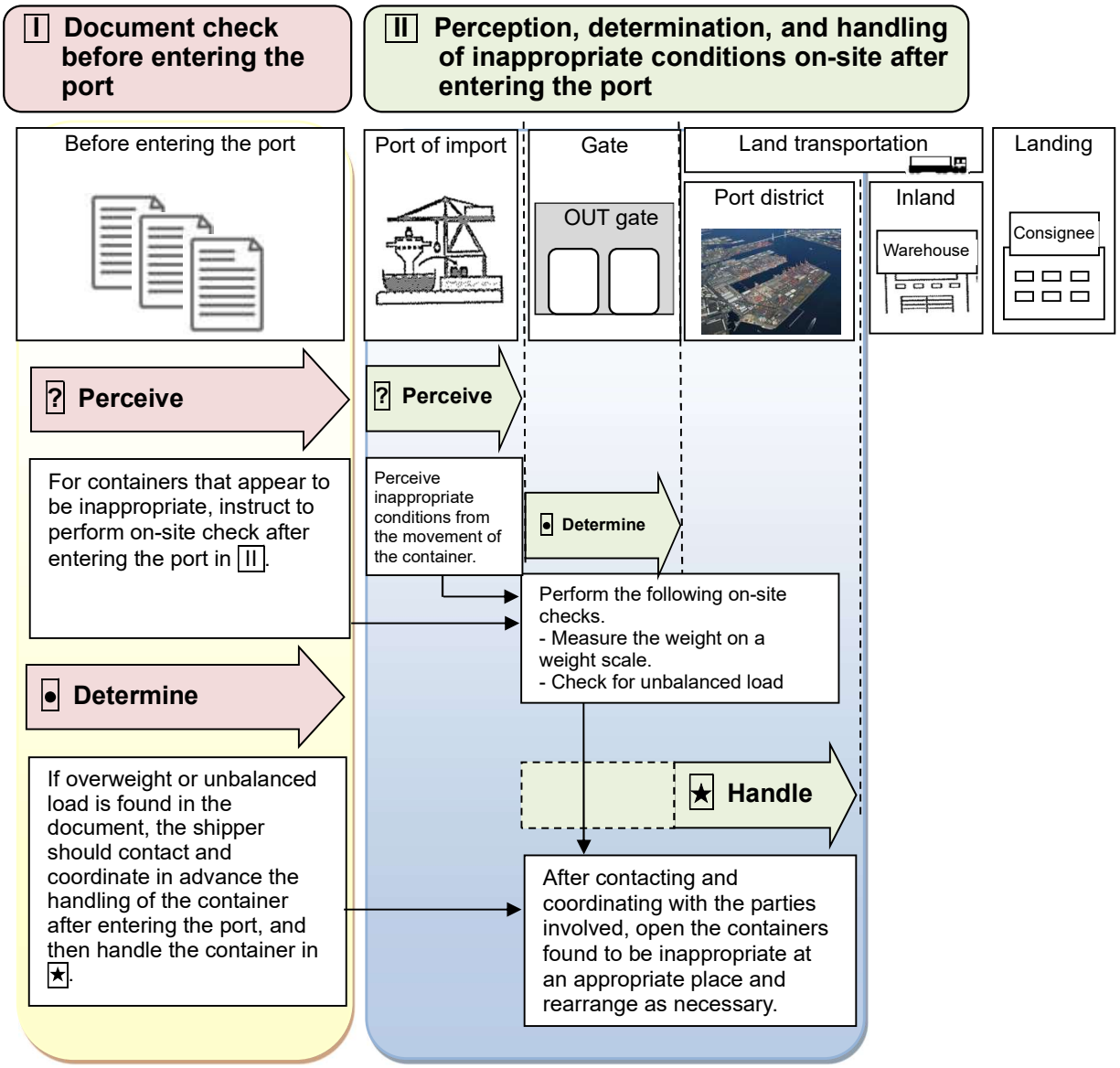


Figure 14 Flow for detecting inappropriate containers and corrective actions

? Perceive: Subjectively identify the possibility of being an inappropriate container, even if it is uncertain whether it is or not.

● Determine: Determine by objective confirmation that it is an inappropriate container.

★ Handle: Open the container determined to be inappropriate and take corrective actions as necessary.

I Document check: Document check before entering the port

(i) Consignees

? Perceive containers that may be in an inappropriate state based on documents

For containers that are considered to be in an inappropriate condition based on documents by the following procedure, perform the on-site check after entering the port described on P. 31 to 36 **[see "● Determination of inappropriate conditions on-site after entering the port" in II]**.

(1) Containers without information about weight or item

(2) Containers from a consignor from which you have received containers with unbalanced load, load collapse, or unsecured cargo in the past

(3) Containers loaded with timber* and weighing 25 tons or more

* Timber is identified as an item that is considered to be likely to cause rollover accidents from the results of past rollover accident investigations **[see Reference Material 8]**.

● Determination of inappropriate containers based on documents

If the consignee can identify an overweight or unbalanced load based on documents, coordinate in advance with the parties involved to deal with the inappropriate containers as described in ★ below.

(1) Check the weight information on the bill of lading or other documents, and if it is for multiple containers, divide the weight proportionally by the number of containers on the bill of lading to calculate the cargo weight per container. If the sum of the weight obtained by proportional division and the tare weight of the container **[see Table 5 "Approximate tare weight of containers" on P. 16]** exceeds 30.48 tons, the containers should be considered as inappropriate containers.

(2) If you have received containers with unbalanced load, load collapse, or unsecured cargo from the same consignor in the past, contact the consignor and check the packing as possible. Then determine that a container is inappropriate if it has an extremely unbalanced load on either side or if the contents are not secured at all.

★ Action to be taken when overweight or unbalanced load is found as a result of a document check

If a container is determined to be overweight or unbalanced as described above, *the consignee should contact the shipping company and request cooperation in opening and correcting the container prior to land transportation. If there is no place to make corrections at the terminal, the consignee should coordinate with a warehouse or other facility nearby the port district* to open and correct the container. Contact the trucking company and the driver via the intermediary agent and others and instruct them to take these actions appropriately.

(ii) Intermediary agent and others

? Perceive containers that may be in an inappropriate state based on documents

For containers that are considered to be in an inappropriate condition based on documents by the following procedure, perform the on-site check after entering the port described on P. 31 to 36 **[see "● Determination of inappropriate conditions on-site after entering the port" in II]**.

(1) Containers without information about weight or item

(2) Containers from a consignor from which you have received containers with unbalanced load, load collapse, or unsecured cargo in the past

(3) Containers loaded with timber* and weighing 25 tons or more

* Timber is identified as an item that is considered to be likely to cause rollover accidents from the results of past rollover accident investigations **[see Reference Material 8]**.

● Determination of inappropriate containers based on documents

If an overweight or unbalanced load is determined based on documents by the same procedure as described in **"● Determination of inappropriate containers based on documents" in "(i) Consignees,"** contact the consignee and coordinate in advance with the parties involved to deal with the inappropriate container as described in ★ below.

★ Action to be taken when overweight or unbalanced load is found as a result of a document check

If a container is determined to be potentially overweight or unbalanced as described above, contact the shipping company via the consignee, and then the consignee should request the shipping company to cooperate in correcting the problem prior to land transportation. If there is no place to make corrections at the terminal, after coordinating with the consignee, instruct the trucking company to correct the problem at a warehouse or other facility nearby the port district prior to transportation.

(iii) Trucking companies (drivers)

? Perceive containers that may be in an inappropriate state based on documents

For containers that are considered to be in an inappropriate condition based on documents by the following procedure, perform the on-site check after entering the port described on P. 31 to 36 **[see "● Determination of inappropriate conditions on-site after entering the port" in II]**.

(1) Containers without information about weight or item

(2) Containers from a consignor from which you have received containers with unbalanced load, load collapse, or unsecured cargo in the past

(3) Containers loaded with timber* and weighing 25 tons or more

* Timber is identified as an item that is considered to be likely to cause rollover accidents from the results of past rollover accident investigations **[see Reference Material 8]**.

● Determination of inappropriate containers based on documents

If notified by the consignee or the intermediary agent or the like that an overweight or unbalanced load has been detected based on documents, follow their instructions and take the actions described in ★ below.

★ Action to be taken when overweight or unbalanced load is found as a result of a document check

If a container is determined to be potentially overweight or unbalanced as described above, move it slowly to the location designated by the consignee or the intermediary agent and others. After the correction is completed at the specified location, the trucking company should contact the consignee or the intermediary agent and others, and ask for their instructions before transporting the container safely.

Ⅱ Perception, determination, and handling of inappropriate conditions on-site after entering the port

In order to find and correct import containers that are potentially inappropriate on-site after entering the port of unloading, the cooperation of all parties involved in the transportation of maritime containers is essential.

Since the possible responses to inappropriate containers vary depending on the facilities and location of the port, it is very important that the parties involved meet at each port to discuss and determine how to respond to these problems.

Therefore, this manual provides examples of appropriate measures according to the facilities and location of the port, so consult with the parties involved at each port or wharf with reference to this manual, and take the appropriate measures based on the consensus of parties involved. The example of the arrangements are listed in [Example 1] to [Example 4].

Note: If the inappropriate container are not custom cleared and the cargo has been approved for bonded transportation, contact the approved customs office and ask for their instructions.

[Commentary (1)] Communication and coordination when the driver detects an inappropriate condition during unloading

? Perception of inappropriate conditions on-site after entering the port

○ If the driver perceives an inappropriate container when carrying the container out of the terminal from the condition of the loaded truck or by checking documents according to Ⅰ, take the actions described in ●.

● Determination of inappropriate conditions on-site after entering the port

○ If the driver notices an unbalanced load when carrying out an import container, *the driver should communicate and coordinate with terminal workers and terminal operators to check the unbalanced load at an appropriate location* as shown in Figure 15 ***[see Reference Material 9 "Simplified Method of Measuring Unbalanced Load" at the end of this chapter]***.

○ If the driver notices an overweight when carrying out an import container, *contact the consignee, and if a weight scale is available, measure the weight, and if not, ask the consignee for judgment and take appropriate action based on the judgment,* as shown in Figure 16.

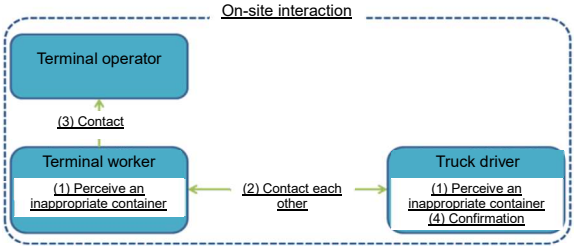


Figure 15 Communication and coordination path when an unbalanced load is detected

★ Action to be taken if inappropriate conditions are found on-site after entering the port

○ As mentioned above, *the driver can check for inappropriate conditions*, but *the act of opening and correcting the container involves certain costs, so the decision cannot be made solely by the driver and terminal operators on site*.

○ Therefore, *ultimately, act according to the instructions of the consignee given through the appropriate communication path* shown in the figure on the right.

○ In addition, when unpacking cargo for bonded transportation, the consignee (the intermediary agent and others) should contact the approved customs office that has approved the bonded transportation and ask for their instructions.

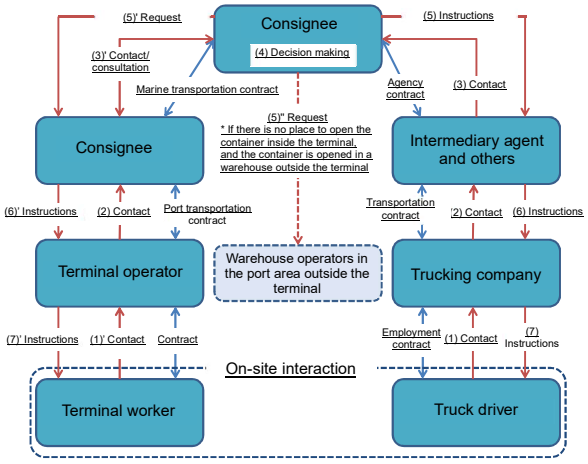


Figure 16 Communication and coordination path between the parties involved

[Commentary (2)] Communication and coordination when a terminal worker detects an inappropriate condition in advance

? Perception of inappropriate conditions on-site after entering the port

○ If a terminal worker detects an inappropriate container on-site before the container is carried out of the terminal, the terminal operator should contact the consignee via the shipping company.

● Determination of inappropriate conditions on-site after entering the port

○ If notified that an inappropriate container has been detected at the terminal, the consignee should consult with the shipping company on how to respond, contact and coordinate with the parties involved on how to check, and give instructions to check overweight (exceeding the maximum load weight of the container) **[and weighing if necessary]** or to check unbalanced load **[see Reference Material 9 " Method of Measuring Unbalanced Load" at the end of this chapter]**.

★ Action to be taken if inappropriate conditions are found on-site after entering the port

○ If a container is determined to be in an inappropriate condition as described above, the consignee should contact the shipping company and request cooperation in opening and correcting the container prior to land transportation. If there is no place to make corrections at the terminal, the consignee should coordinate with a warehouse or other facility nearby the port district to open and correct the container. Contact the trucking company and the driver via the intermediary agent and others, and instruct them to take these actions appropriately.

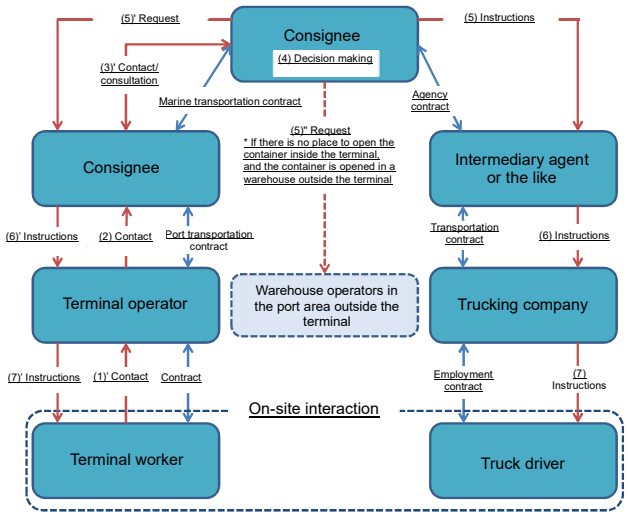
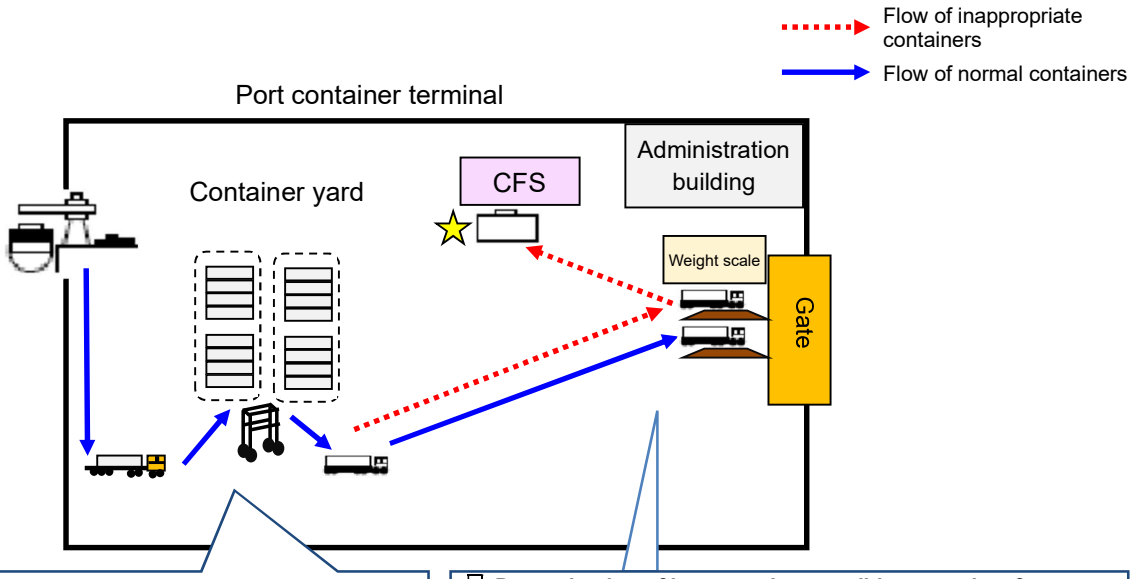


Figure 17 Communication and coordination path between the parties involved

[Example 1] When there is a weight scale at the terminal gate



? Perception of inappropriate conditions on-site after entering the port

Step 1: If a port terminal worker finds an inappropriate container while handling the cargo with the equipment, contact the terminal operator.
The terminal operator contacts the truck driver via workers at the gates of the port terminal.

Note: In addition to the above, see I on page 26 for the document check.

● Determination of inappropriate conditions on-site after entering the port

Step 2: If there is a possibility of overweight
→ Contact the shipper and weigh the cargo on a weight scale at the gate.

Step 2': If there is a possibility of unbalanced load
→ The driver visually checks the tilt of the rear of the trailer at the gate in the terminal.
→ If it is obviously tilted, measure the height difference between the left and right ends of the rear of the container with a tape measure.

Step 3: Overweight is found or the height difference between the left and right needs to be corrected.
→ Determine that the container is inappropriate and follow the steps in ★.

★ Action to be taken if inappropriate conditions are found on-site after entering the port

Step 4: Contact the driver, the trucking company, and the consignee (via the intermediary agent and others). At that time, the terminal worker also notifies the terminal operator, and then follows the instructions, and waits at an appropriate location.

Step 5: The consignee (via the intermediary agent and others) consults with the shipping company, decides how to respond, and contacts the terminal operator via the shipping company. Give instructions to open the container and check the condition of the cargo in the container at CFS in the terminal (depending on the situation, the shipper may decide to transship the container to a low-floor trailer or repair the container for transportation).

Step 6: The terminal operator directs terminal workers to lead the truck driver to CFS, open the container, and check the condition of the cargo inside the container.

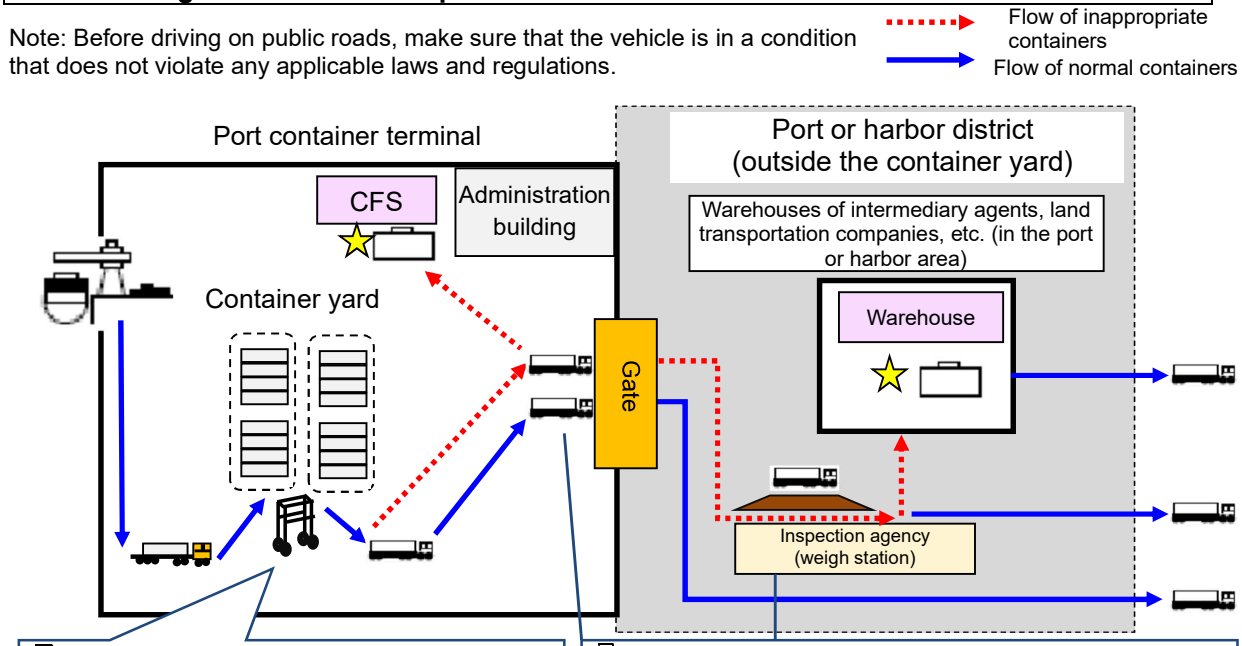
Step 7: The consignee consults with the terminal operator on how to handle the cargo, such as placing part of the cargo at CFS or other cargo handling area and arranging for the consignee (via the intermediary agent and others) to receive the cargo left at the CFS or other cargo handling area.

Step 8: If the cargo in the container is not overweight but in an inappropriate condition, such as collapsed or unsecured, the trucking company reports the condition of the cargo to the consignee (via the intermediary agent and others) and takes action after consulting with the consignee on how to fix the cargo. If the correction is to be made in the presence of the shipper, the terminal operator properly stores the container until the consignee arrives at the CFS.

Figure 18 Procedure for detection and handling when there is a weight scale at the gate and there is a CFS inside the gate

[Example 2] When there is no weight scale at the terminal gate, but there is a weigh station or other weight scales near the port or harbor area

Note: Before driving on public roads, make sure that the vehicle is in a condition that does not violate any applicable laws and regulations.



? Perception of inappropriate conditions on-site after entering the port

Step 1: If a port terminal worker finds an inappropriate container while handling the cargo with the equipment, contact the terminal operator.
The terminal operator contacts the truck driver via workers at gates in the port terminal.

Note: In addition to the above, see I on page 26 for the document check.

● Determination of inappropriate conditions on-site after entering the port

Step 2: If there is a possibility of overweight
→ The trucking company contacts the consignee, and the shipper instructs the trucking company on how to handle the problem. If there is a private weigh station near the terminal, move the container slowly to the weigh station and measure the weight.
→ If an overweight is found, follow the steps in ★1.

Step 2': If there is a possibility of unbalanced load
→ The driver visually checks the tilt of the rear of the trailer at the gate in the terminal.
→ If it is obviously tilted, measure the height difference between the left and right ends of the rear of the container with a tape measure.
→ If an unbalanced load is found, follow the steps in ★2.

★1 Action to be taken if overweight is found on-site after entering the port

Step 3: Contact the driver, the trucking company, and the consignee (via the intermediary agent and others).
Step 4: The consignee (via the intermediary agent and others) contacts a warehouse near the weigh station and obtains approval for acceptance, and then gives appropriate instructions such as opening the container and checking the condition of the cargo inside the container at the warehouse.
Step 5: The person responsible for the warehouse directs workers to lead the truck driver to the warehouse, open the container, and check the condition of the cargo inside the container.
Step 6: The consignee consults with the person responsible for the warehouse on how to handle the cargo, such as placing part of the cargo in the cargo handling area and arranging for the consignee (via the intermediary agent and others) to receive the cargo left in the warehouse.

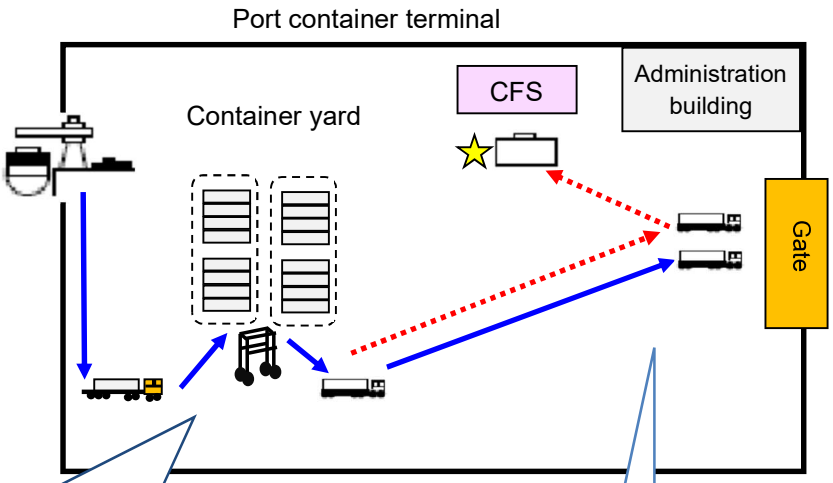
★2 Action to be taken if unbalanced load are found on-site after entering the port

Step 3: Contact the driver, the trucking company, and the consignee (via the intermediary agent and others). At that time, the terminal worker also notifies the terminal operator, and then follows the instructions, and waits at an appropriate location.
Step 4: The consignee (via the intermediary agents and others) consults with the shipping company, decides how to respond, and contacts the terminal operator via the shipping company and gives instructions on how to respond, such as checking the condition of the cargo inside the container (depending on the situation, the shipper may decide to transship the container to a low-floor trailer or repair the container for transportation).
Step 5: The terminal operator directs terminal workers to lead the truck driver to CFS, and checks the condition of the cargo inside the container.
Step 6: If the cargo in the container is not overweight but in an inappropriate condition such as unsecured, the trucking company reports the condition of the cargo to the consignee (via the intermediary agent and others) and takes action after consulting with the consignee on how to fix the cargo.

Figure 19 Procedure for detection and handling when there is no weight scale at the gate

[Example 3] When there is no weight scale near the terminal, port area, or harbor area

Flow of inappropriate containers
Flow of normal containers



? Perception of inappropriate conditions on-site after entering the port

Step 1: If a port terminal worker finds an inappropriate container with cargo handling equipment, etc., contact the terminal operator.
The terminal operator contacts the truck driver via workers at gates, etc. in the port terminal.

Note: In addition to the above, see I on page 26 for document check.

● Determination of inappropriate conditions on-site after entering the port

Step 2: If there is a possibility of overweight
→ The trucking company contacts the consignee. As a result, if an overweight is found, or if the exact weight cannot be ascertained, follow the steps in ★1.

Step 2': If there is a possibility of unbalanced load or other problems
→ The driver visually checks the tilt of the rear of the trailer at the gate, etc. in the terminal.
→ If it is obviously tilted, measure the height difference between the left and right ends of the rear of the container with a tape measure.
→ If an unbalanced load is found by the above, follow the steps in ★2.

★1 Action to be taken when the possibility of overweight is determined on-site after entering the port

Step 3: The consignee (via the intermediary agents or the like) consults with the shipping company, decides how to respond, and contacts the terminal operator via the shipping company. Give instructions to open the container and check the condition of the cargo in the container at CFS in the terminal.
Step 4: The terminal operator directs terminal workers to lead the truck driver to CFS, open the container, and check the condition of the cargo inside the container.
Step 5: The consignee consults with the terminal operator on how to handle the cargo, such as placing part of the cargo at CFS or other cargo handling area and arranging for the consignee (via the intermediary agent or the like) to receive the cargo left at the CFS or other cargo handling area.

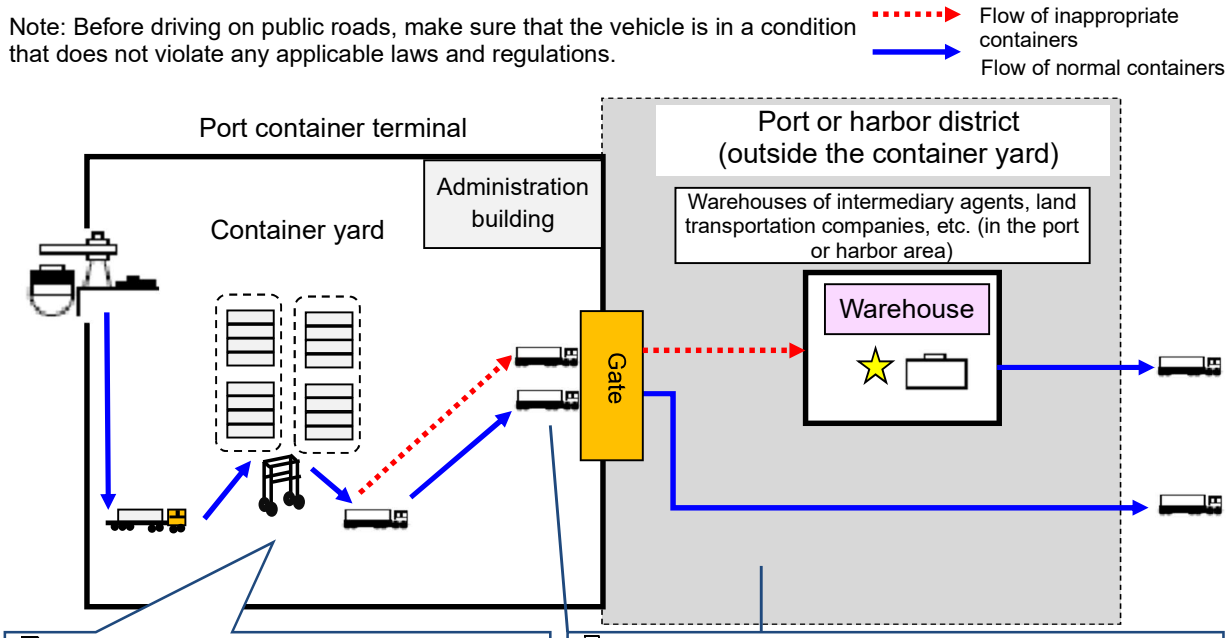
★2 Action to be taken if unbalanced load or other problems are found on-site after entering the port

Step 3: Contact the driver, the trucking company, and the consignee (via the intermediary agent or the like). At that time, the terminal worker also notifies the terminal operator, and then follows the instructions, and waits at an appropriate location.
Step 4: The consignee (via the intermediary agents or the like) consults with the shipping company, decides how to respond, and contacts the terminal operator via the shipping company and gives instructions on how to respond, such as checking the condition of the cargo inside the container (depending on the situation, the shipper may decide to transship the container to a low-floor trailer or repair the container for transportation).
Step 5: The terminal operator directs terminal workers to lead the truck driver to CFS and check the condition of the cargo inside the container.
Step 6: If the cargo in the container is not overweight but in an inappropriate condition, such as unsecured, the trucking company reports the condition of the cargo to the consignee (via the intermediary agent or the like) and takes action after consulting with the consignee on how to fix the cargo.

Figure 20 Procedure for detection and handling when there is no weight scale at the gate

[Example 4] When there is no place to make corrections at the terminal (cases where it is impossible to secure a place to open containers, etc.)

Note: Before driving on public roads, make sure that the vehicle is in a condition that does not violate any applicable laws and regulations.



? Perception of inappropriate conditions on-site after entering the port

Step 1: If a port terminal worker finds an inappropriate container while handling the cargo with the equipment, contact the terminal operator.
The terminal operator contacts the truck driver via workers at gates in the port terminal.

Note: In addition to the above, see I on page 26 for the document check.

● Determination of inappropriate conditions on-site after entering the port

Step 2: If there is a possibility of overweight
→ The trucking company contacts the consignee. If the container weight is measured at the terminal gate and determined to be overweight, or if there is no weight scale and an accurate weight cannot be determined, follow the steps in ★.

Step 2': If there is a possibility of unbalanced load
→ The driver visually checks the tilt of the rear of the trailer at the gate in the terminal.
→ If it is obviously tilted, measure the height difference between the left and right ends of the rear of the container with a tape measure.
→ If an unbalanced load is found by the above, follow the steps in ★.

★ Action to be taken when the possibility of an inappropriate condition is determined on-site after entering the port

Step 3: Contact the driver, the trucking company, and the consignee (via the intermediary agent and others).

Step 4: If the consignee (via the intermediary agent and others) consults with the shipping company and finds that it is difficult to check at the terminal, the consignee contacts a warehouse near the terminal (depending on the situation, the shipper may decide to transship the container to a low-floor trailer or repair the container for transportation). After obtaining approval for acceptance, the consignee gives appropriate instructions such as opening the container and checking the condition of the cargo inside the container at the warehouse.

Step 5: The person responsible for the warehouse directs workers to lead the truck driver to the warehouse, open the container, and check the condition of the cargo inside the container.

Step 6: The consignee consults with the person responsible for the warehouse on how to handle the cargo, such as placing part of the cargo in the cargo handling area and arranging for the consignee (via the intermediary agent and others) to receive the cargo left in the warehouse.

Step 6': If the cargo in the container is not overweight but in an inappropriate condition, such as unsecured, the trucking company reports the condition of the cargo to the consignee (via the intermediary agent and others). After the approval by the consignee on how to fix the cargo, the trucking company takes action.

Figure 21 Procedure for detection and handling when there is no weight scale at the gate

Reference Material 8: Cargo Items that are Likely to be in Inappropriate Conditions

When an operation request is received, it is desirable to first understand the weight and item of the cargo from information such as the operating instructions and to estimate the condition of the cargo prior to operation.

Some items are likely to cause an unbalanced lateral load or an extremely high center of gravity, and some are likely to have a center of gravity slightly higher than the center of the container.

A detailed analysis of rollover accidents involving container trailers reported to the Ministry of Land, Infrastructure, Transport and Tourism between 2006 and the first half of 2012 shows that rollover accidents involving containers carrying 25 tons or more of timber are particularly common. In addition, there have been cases of rollover accidents involving corrugated boxes that can easily collapse or roll-shaped items that are not properly secured, so give due consideration to the following items among the parties involved so that the container can be transported safely.

Table 6 Items loaded in accidents where the condition of the cargo is assumed to be one of the causes of rollover

Import/Export	Cause of accident	Item	Weight	Packing
Import	Unbalanced load	Timber	28.8 t	Bulk
Import	Unbalanced load	Timber	30.0 t	Bulk
Import	Overload	Timber	28.0 t	Unknown
Import	Overload	Timber	29.0 t	Unknown
Import	Unbalanced load, inadequate lock	Timber	23.0 t	Bulk
Import	Overload, overspeed	Timber	30.0 t	Bulk
Import	Unbalanced load, inadequate lock	Aluminum coil	17.0 t	Loaded on a wooden platform without lashing
Import	Overload, overspeed	Steel furniture	25.2 t	Unknown
Import	Overload, overspeed, inadequate lock	Stretch film	25.7 t	Cardboard boxes stacked on a pallet
Import	Overload, overspeed, inadequate lock	Frozen fried chicken	25.0 t	Unknown
Export	Overload, overspeed	Waste plastic	28.0 t	Unknown

Table 7 Amount of loaded items handled when rollover occurs (import/export)

項目コード	Item code	Item	Amount handled (kg)	Note
4412	合板(積層木材)	Plywood (laminated wood)	輸入	Import
4403	木材(粗のもの)	Timber (coarse)	輸入	Import
7606	アルミ板	Aluminum plate	輸入	Import
8302	卑金属の家具等	Base metal furniture	輸入	Import
3904	塩化ビニル等のー	Primary products such as polyvinyl chloride	輸入	Import
207	肉、食用のくず肉	(Meat, edible offal (frozen)	輸入	Import
3915	プラスチックのくず	Plastic waste	輸出	Export

*財務省 普通貿易分類(項単位)
*木材(粗のもの)重量を0.8t/㎥とし

Notes:
- From the Ordinary Trade Statistics, Marine Container Cargo Goods Table, the Ministry of Finance (2011), the value for each item classification is converted to kg units.
- For timber (coarse), the unit of m^3 is taken from the "Summary of Civil Engineering Quantity Calculation" and the unit volume weight of timber was assumed to be 0.8 t/m^3.

Reference Material 9: Method of Measuring Unbalanced Load

Dangerous trailers that are laterally unbalanced can be identified to some extent by visually checking the tilt of the rear of the trailer, which helps prevent rollover accidents.

However, since it is difficult to accurately determine this by visual inspection alone, here is an example of a simple method for detecting an unbalanced load.

a. Measure the difference in height from the road surface between the left and right using a tape measure or other tools

Using a tape measure, measure the height from the ground at the left and right ends of the rear of the trailer, respectively, and calculate the difference. Since it is necessary to hold the tape measure perpendicular to the ground to measure the height, it is effective to hang a weighted string toward the ground and then measure the length of the string and the weight with a ruler.

Weighted string (left), tape measure (right)

Figure 22 Image of measurement and measuring tools

b. Precautions for measurement

- Stop the vehicle on a flat road surface and take measurements.
- Make sure that there is no lateral slope on the road surface.
- In some cases, such as right after driving around a curve, the vehicle may remain tilted to the outside of the curve due to the frictional force of the suspension and coupler. So it may not be possible to accurately measure the tilt angle or height difference.
- Measure perpendicularly to the road surface.

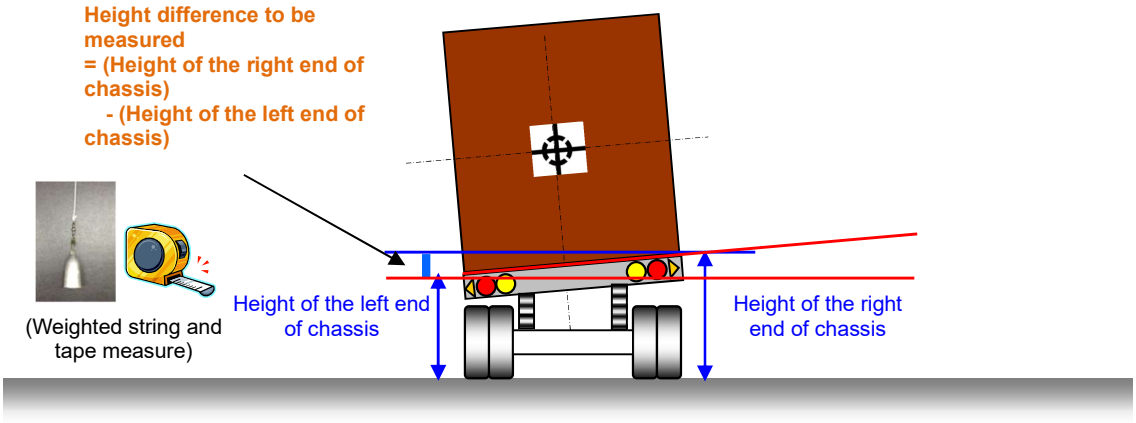


Figure 23 Point of measurement

(4) Cargo packing

International maritime containers may easily roll over depending on how the cargo is packed and secured inside the container. Since proper packing and securing of the cargo is important to prevent accidents involving the container, be sure to load the cargo in the correct position and secure it with appropriate materials according to this manual. This section describes the basic concept of proper packing with reference to the contents of the International Code of Practice (IMO/ILO/UNECE's "Code of Practice for Packing of Cargo Transport Unit").

<< Point >>

- ○ **The consignor must securely pack the export containers according to the following principles.**
  - ✓ Sort the cargo by volume, weight, exterior strength, and nature of the contents.
  - ✓ Cargo with a strong exterior or high weight should be stacked on the bottom, while fragile cargoes should be stacked on the top. Arrange the cargo so that their weight is evenly distributed over the entire floor.
- ○ **For import containers, the consignee must ask the consignor to stow the cargo in accordance with the principles mentioned above. In doing so, it is necessary to request that the weight of each container does not violate the laws and regulations related to land transportation in Japan.**

[See Reference Material 13 for examples of packing and checklist by type of package and type of cargo.]

(1) Appropriate packing

When packing cargo in a container, it is necessary to distribute the load over the container floor and ensure shoring (securing the cargo to prevent it from moving inside the container using timber, square lumber, or other tools) and lashing (securing or fixing the cargo using wire or rope). Carry out proper packing following the Principles of Packing below along with Reference Materials 10 and 11.

<Principles of Packing>
- Sort cargo by volume, weight, exterior strength, and nature of the contents, and when loading into multiple containers, consideration should be given to ensure that the weight is distributed as evenly as possible.
- Stack cargo with a strong exterior or high weight on the bottom, and fragile cargo on top.
- Pack cargo so that the weight is evenly distributed over the entire floor.
- When placing and storing cargo, consider the characteristics of the cargo and the external pressure exerted during transportation.
- Use appropriate fixing materials to secure the cargo so that it does not move.

Notes:

- If the weight of the cargo is not evenly distributed over the floor, the concentrated load will cause the floor to get broken or the floor beams to bend. If the center of gravity of the container is unbalanced, it may cause accidents such as rollover during transportation. If the lateral imbalance is unavoidable, take measures to reduce the imbalance as much as possible. Balance the weight and make efforts to lower the center of gravity.
- It is necessary to distribute the load so that the weight of each container does not violate the laws and regulations related to land transportation in Japan.

The following suggestions on the packing of cargo in containers are compiled with reference to the IMO/ILO/UNECE's "Code of Practice for Packing of Cargo Transport Unit."

1. Packing Plan

○ Plan a packing in advance if necessary.

○ Separate incompatible cargo.

○ Comply with applicable laws and regulations and be sure not to exceed the maximum allowable gross weight.

2. Packing

○ Accurately position the center of gravity to properly distribute the load over the entire container floor. Do not concentrate heavy loads on a small area of the container floor.

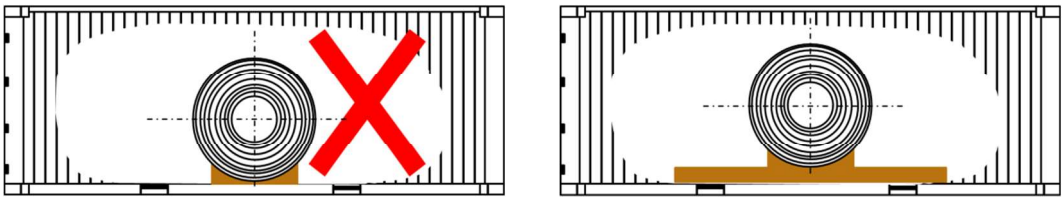


Figure 24-1 Load distribution

○ Avoid loading those results in unbalanced load distribution.

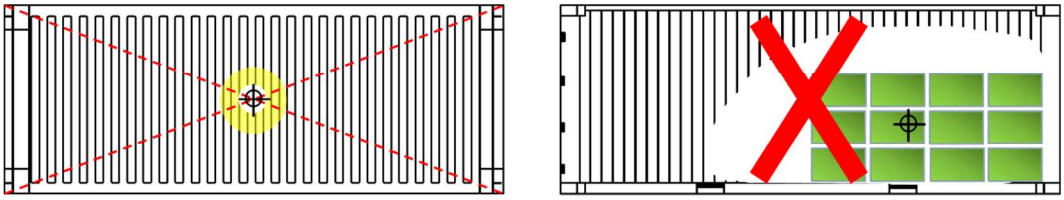


Figure 24-2 Balancing the load

○ Do not stack cargo irregularly unless it is unavoidable.

○ Do not stack heavy cargo on top of light cargo.

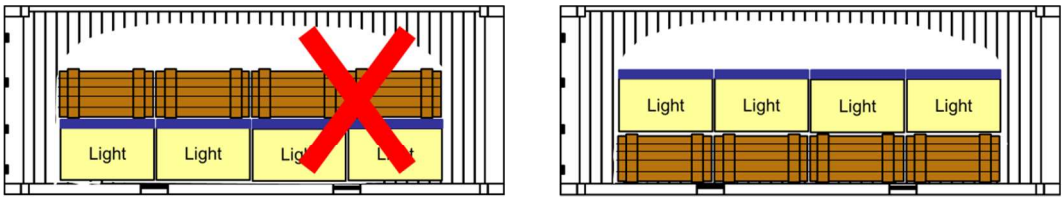


Figure 24-3 Stack heavy cargo on the bottom

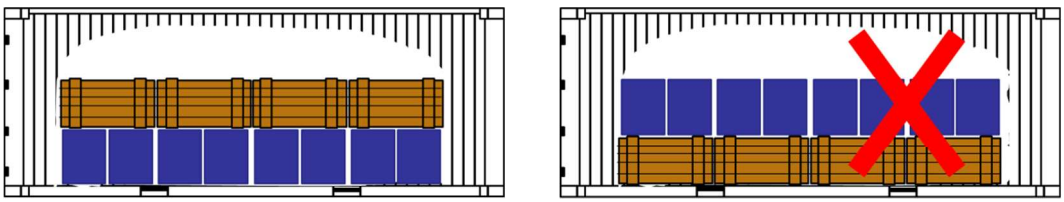


Figure 24-4 Stack dry cargo on top

○ Follow all handling instructions and instruction marks on the package, such as "This Side Up."

3. Lashing

○ Fill any gaps between cargo with cushioning material.

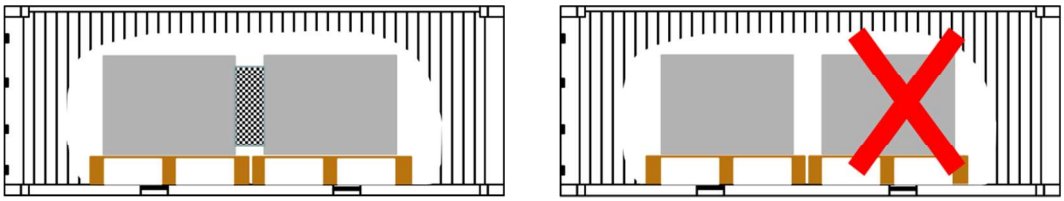


Figure 24-5　Cushioning the gaps

○ Use appropriate lashing materials to prevent cargo from slipping and falling down.

○ Lash the cargo so that the force is distributed.

○ If necessary, lash cargo individually.

○ If necessary, use non-slip material on the surface to prevent cargo from slipping.

○ Do not overload containers, cargo, or lashing devices.

4. Transportation of Liquids by Flexitank

○ When transporting liquid in a flexitank, braking and vibration during transportation may create stress to the tank or container, so pay attention to the following points and load properly.

- Use a flexitank that is confirmed to have sufficient strength and is compatible with the liquid to be transported.
- Before installing the flexitank, clean the interior of the container and check that there are no protrusions such as nails.
- Cover the floor and walls of the container with corrugated cardboard (use plywood for side walls of 40 ft containers). Attach square lumber to the edges on the door side of the container at appropriate spacing and cover with sturdy corrugated cardboard or plywood for added strength.
- Fill liquids at the fill rate specified by the tank manufacturer.
- Place a warning label on the rear left door of the container indicating that a flexitank is loaded.
- Discard flexitanks after use.

Note: Figures 24-1 to 24-5 are created with reference to the figures in IMO/ILO/UNECE's "Guidelines for Packing of Cargo Transport Units (2nd Draft)."

(2) Request for proper packing to the consignor

(i) Ask the consignor to pack the cargo properly based on the Principles of Packing.

<Principles of Packing> (same as shown in page 40)
- Sort cargo by volume, weight, exterior strength, and nature of the contents, and when loading into multiple containers, consideration should be given to ensure that the weight is distributed as evenly as possible.
- Stack cargo with a strong exterior or high weight on the bottom, and fragile cargo on top.
- Pack cargo so that the weight is evenly distributed over the entire floor.
- When placing and storing cargo, consider the characteristics of the cargo and the external pressure exerted during transportation.
- Use appropriate fixing materials to secure the cargo so that it does not move.

(ii) The person who opens the container must inform the consignee if there is an unbalanced load or load collapse, or if the container is not lashed, when the container is opened.

(iii) If you have received a container with unbalanced load, load collapse, or unsecured cargo from the same consignor in the past, remind the consignor of such concerns.

Note: For example, 20 ft container loading vehicles used in Japan have a maximum load capacity of 24. Some consignors do not fully understand the regulations in Japan and load more than 24 tons on 20 ft containers whose maximum load capacity is specified as 30.48 tons by ISO standards. Therefore, it is necessary for consignors and consignees to understand each other's regulations so that appropriate vehicles can be arranged.

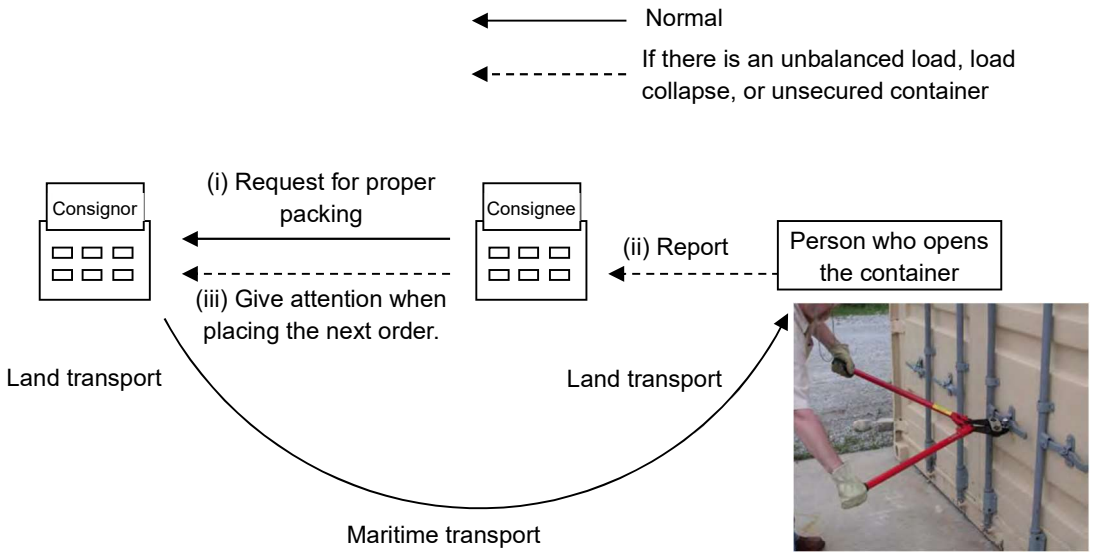


Figure 25 Request for proper packing to the consignor

Reference Material 10: Matters to Note in the Packing Procedure

a. Packing Plan and Allocation

- Prepare a packing plan in advance, considering the segregation of incompatible items*, not exceeding the maximum gross weight specified in ISO standards, and avoiding concentrated or unbalanced loads.

  * Items with different strengths, items which easily react chemically with each other, etc.

- When loading into multiple containers, distribute the weight of the load evenly among the containers.
- The consignor of export containers should distribute cargo appropriately based on the above, and the consignee of import containers should request the consignor to ensure that the import cargo is distributed appropriately.

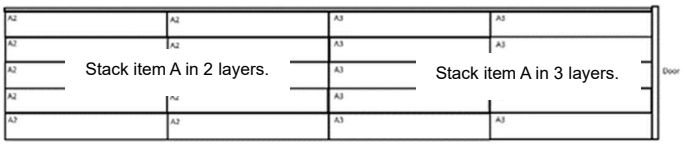
Examples of basic packing plans are shown below.

○ Case 1 (where each item has a different specific weight and multiple containers are required)

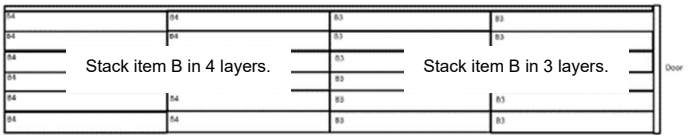
List of transportation items provided by the shipper

Item	Size			Shape	Unit weight (kg)	Quantity (pcs)	Gross weight (kg)
	Length (cm)	Width (cm)	Height (cm)				
A. Lumber (light)	295	46	46	Square lumber	120	100	12000
B. Lumber (heavy)	295	38	38	Square lumber	150	168	25200

Lower part of container (Bird's eye view)



Upper part of container (Bird's eye view)



<Precaution>

- If each item has a different specific weight, the item with the higher specific weight should be stacked at the bottom of the container.
- If multiple containers are required, load each container evenly.

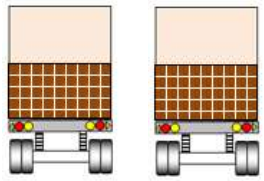


Figure 26 Packing plan for Case 1

○ Case 2 (where each item has a different size)

List of transportation items provided by the shipper

Item	Size			Shape	Unit weight (kg)	Quantity (pcs)	Gross weight (kg)
	Length (cm)	Width (cm)	Height (cm)				
A. Parts (small)	60	59	56	Carton	50	80	4000
B. Home appliance (medium)	110	75	110	Palette	230	16	3680
C. Parts (medium)	55	75	73	Carton	50	48	2400
D. Home appliance (large)	120	118	90	Palette	330	10	3300

<Precaution>

- If each item has a different size, eliminate gaps by combining them.
- Put corrugated cardboard between different cargoes to prevent damage.

Upper part of container (Bird's eye view)

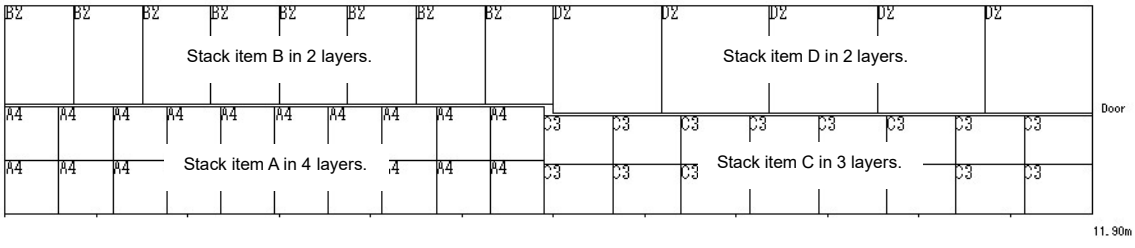
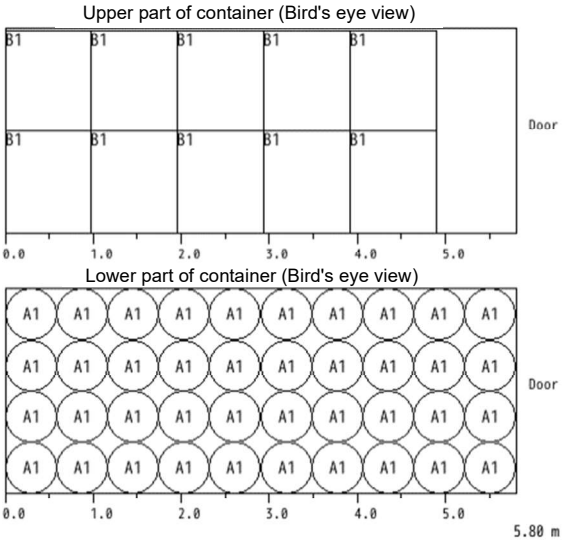


Figure 27 Packing plan for Case 2

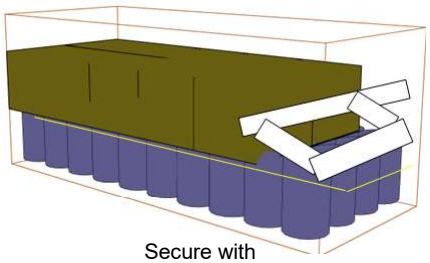
○ Case 3 (combination of incompatible items)

List of transportation items provided by the shipper

Item	Size			Shape	Unit weight (kg)	Quantity (pcs)	Gross weight (kg)
	Length (cm)	Width (cm)	Height (cm)				
1. Detergent		60	90	Drum	250	40	10000
2. Parts	98	115	90	Carton	100	10	1000



<Precaution>
- When packing mix with liquid cargo, stack the liquid cargo at the bottom of the container.
- Place cushioning material in the gaps between the drums, and place plywood on top of the drums to prevent damage to the other cargo.
- If there is a space between the loaded cargo and the container door as shown in the figure, secure the cargo with square lumber or the like.



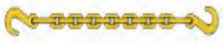
Secure with square lumber.

Figure 28 Packing plan for Case 3

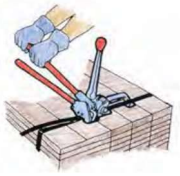
b. Selection of Fixing Tools

- Fixing tools include cord straps, chains, wire ropes, and fabric ropes.
- Use fixing tools that are appropriate for the strength and characteristics of the container and cargo, tools that are strong enough to be used for lashing, and tools that are not damaged or otherwise deformed.

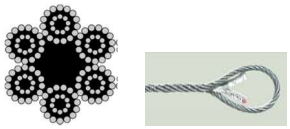
Webbing



Chains



Steal strap



Wire rope

Figure 29 Examples of securing tools

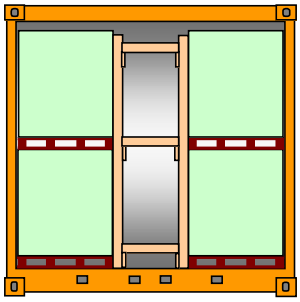
Table 8 Example of maximum securing load of securing tools

Securing Tools	Maximum Securing Load (MSL)
Webbing	2 tons
Chain (diameter: 9 mm, class 8)	5 tons
Wire rope (diameter: 16 mm/144 wires)	9.1 tons

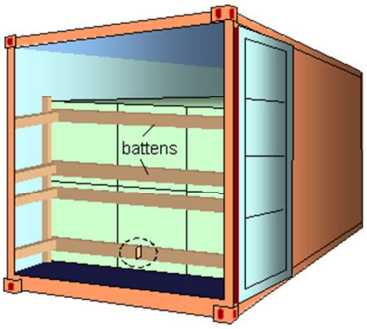
Figure 30 Securing examples using cord straps

c. Selection of Dunnage and Cushioning Material (or Partition Material)

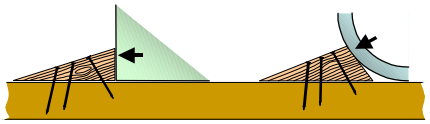
- Dunnage and cushioning materials (or partition materials) include square lumber, boards, and airbags.
- Determine the dunnage and cushioning material (or partitioning material) according to the strength of the packing, then install cushioning material (or partition material) to prevent the cargo stacked at the bottom from being compressed and damaged.
- For heavy cargo, use a dunnage (skid) and secure the cargo firmly using square lumber to prevent concentrated loading.



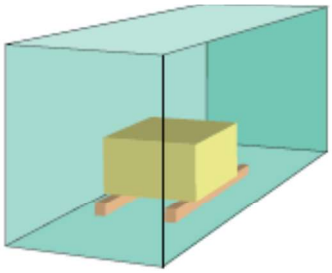
Securing using square lumber

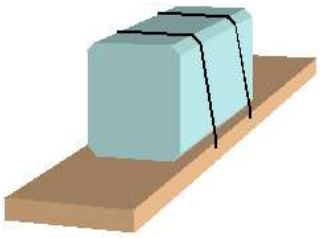


Fixing using boards (braces)



Prevention of rolling using wedges





Distributing the load of heavy cargo using dunnage (skid)

Lashing with a combination of pallets and straps

Securing cargo using airbags for dunnage

Figure 31　Example of use of dunnage and cushioning materials (or partition materials)

d. Lashing

- Be careful not to apply excessive pressure to the edges of tightly packed containers.
- If the mass or volume of the cargo is very large, secure it individually.
- In consideration of the external pressure applied during transportation, secure the cargo with appropriate materials and securing methods. For reference, the following table shows the external pressure generated during container transportation in terms of gravity of Earth.

Table 9 Acceleration coefficient (unit: g)

		Direction of travel		Cross section (lateral)	Vertical (downward)
		Forward	Backward		
Land transportation		0.8	0.5	0.5	1.0
Rail transportation (multimodal transportation)		0.5 [1.0]	0.5 [1.0]	0.5	1.0 [0.7]
Maritime transportation	Sea area A (wave height: 8 m or less)	0.3	0.3	0.5	0.5 [1.0]
	Sea area B (wave height: 8-12 m)	0.3	0.3	0.7	0.3 [1.0]
	Sea area C (wave height: greater than 12 m)	0.4	0.4	0.8	0.2 [1.0]

- ISO containers are equipped with cargo securing hooks (anchor points) on the base frame inside the container to withstand loads of at least one ton or more in any direction, and typically can be two tons or more. When lashing heavy cargo to anchors, use multiple hooks so that the load is not concentrated on one hook.

Note: If you do not know how to properly pack or lash the cargo, you can ask experienced personnel for advice using cargo packing simulation software.

Reference Material 11: Loading Considerations to Prevent Rollover Accidents Due to High Center of Gravity

International maritime containers are typically have a high center of gravity. Even if the center of gravity of the cargo loaded in the container is in the center of the container, it can still be dangerous. Therefore, you must try to keep the center of gravity as low as possible. In particular, in Case 3 shown below where the load is full in both weight and volume, take appropriate measures such as reducing the load and taking care to lower the center of gravity.

○ Case 1: When the loading capacity of the container is determined by the weight of the cargo (e.g., metals with high specific weight), try to eliminate gaps in the lateral direction and lower the center of gravity as much as possible.

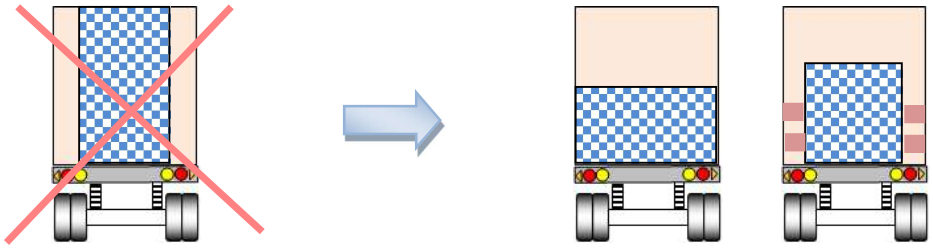


Figure 32　When the loading capacity of the container is determined by the weight of the cargo

○ Case 2: When the loading capacity of the container is determined by the volume of the cargo (e.g., grass, confectionery, and others with light specific weight), or when the cargo is very light, the weight of the chassis will keep the center of gravity relatively low. Therefore, there is no problem even if it is fully loaded. Even though, try to compact the cargo as much as possible to lower the center of gravity.

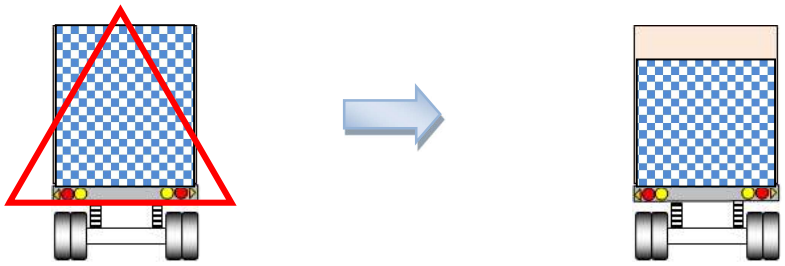


Figure 33　When the loading capacity of the container is determined by the volume of the cargo

○ Case 3: If the load is full in both weight and volume (e.g., cherry lumber), ensure as much safety as possible by distributing the load and taking other measures to avoid a high center of gravity.

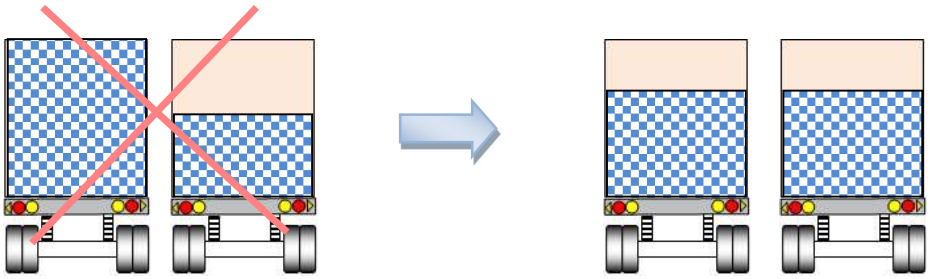


Figure 34　When the load is full in both weight and volume

Reference Material 12: Examples of Inappropriate Containers Detection Equipment

Example 1. Lateral balance monitor (detects load imbalance when loading containers on the trailer and notifies the driver)

a. Advantages

Captures the coupler load change when a container is craned onto a trailer and measures the lateral tilt change of the tractor. The display monitor on the dashboard and an audible voice informs the driver of the measured lateral tilt, allowing the driver to see the unbalanced load in the container prior to transportation.

b. Main Features

- ✓ When a container is loaded onto the container trailer, the lateral tilt angle of the tractor's rear axle and the coupler load are automatically measured and displayed on the dashboard monitor at the driver's seat.
- ✓ If the tilt angle exceeds the set value, the driver is alerted by sound and display.
- ✓ By measuring the tilt angle, unbalanced loads inside the container can be detected prior to transportation, helping to avoid danger.
- ✓ All measurements are automatic and completed in a few seconds, so there is no significant impact on the container loading/unloading process.
- ✓ The weight applied to the coupler can also be measured. Combined with the weight information provided by the shipper or others, it allows the driver to make a rough estimation on the longitudinal unbalanced load.

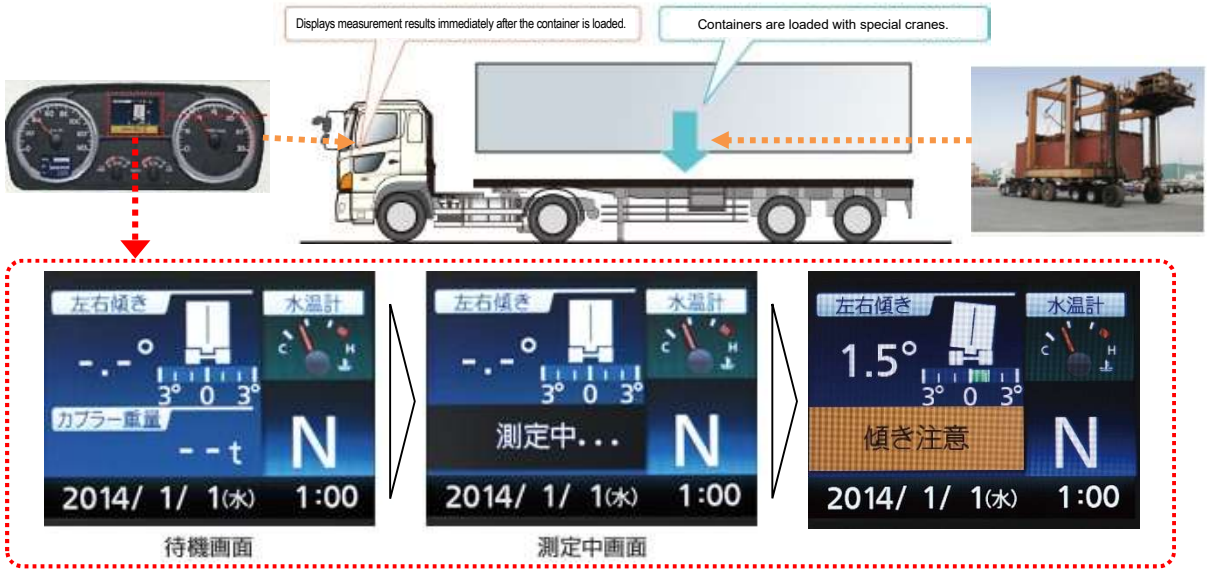
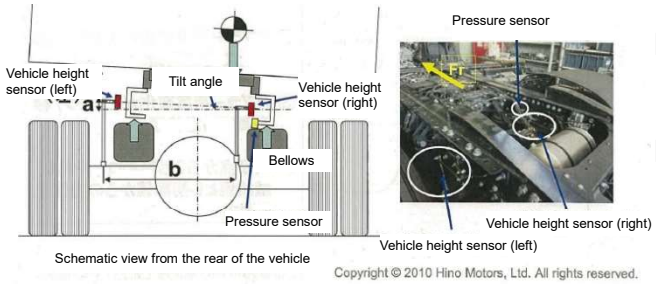


Figure 35 Overview of lateral balance monitor system
(from the Hino Motor website)



[Tilt angle] The height difference a is obtained from the left and right vehicle height sensors to calculate lateral tilt angle = $\tan^{-1}(a/b)$.

[Coupler load] The load is calculated from the bellows pressure, and converted to coupler load.

Figure 36 Principle of lateral tilt detection
(from the Hino Motor documents)

Example 2. Measuring instrument installed on the trailer chassis (unbalanced container warning system: measurement possible while driving)

a. Advantages

The sensor installed on the trailer chassis can measure the partial weight of the container at each segment to detect the longitudinal and lateral tilt. It can also measure the gross weight of the container.

The results measured on the trailer chassis are displayed as a graph on the dashboard monitor at the driver's seat, providing a visual representation (digitalization) of the condition of the cargo inside the container. In addition, when danger is detected, an audible warning is issued, and the driver can monitor the situation inside the container in real time.

b. Main Features

- ✓ With the six weighing units installed on the trailer,
  - (1) Gross weight of the container, including the tare weight of the container and the weight of the cargo,
  - (2) Lateral deviation from the center of the container (displacement of the center of gravity),
  - (3) Risk of rollover due to lateral acceleration detected by acceleration sensors

  can be obtained.
- ✓ All measurements are taken automatically, and weight data, rollover warnings, and more are displayed on the dashboard monitor at the driver's seat, alerting the driver with images, text, and voice.
- ✓ Constant measurement allows for real-time detection of unbalanced loads and the risk of rollover inside the container, which is useful for avoiding danger.

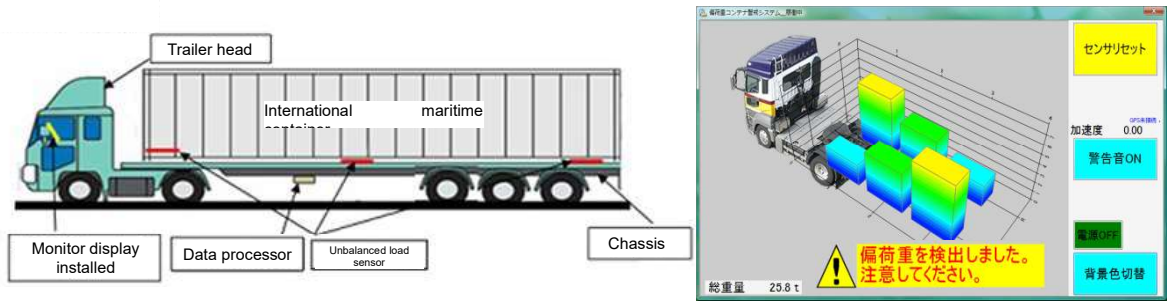


Figure 37　Load measurement positions and display monitor

(from All Nippon Checkers Corporation / Nippon Trex Co., Ltd.)

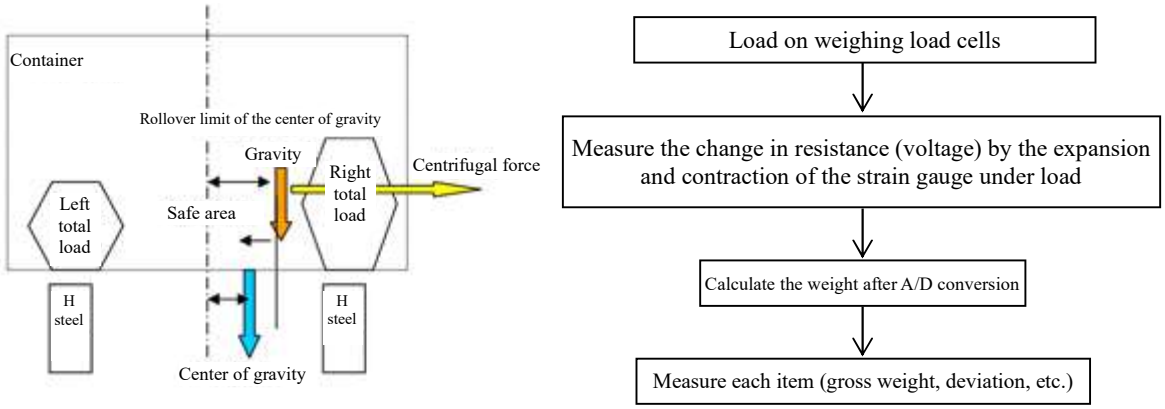


Figure 38　Principle of gross weight and unbalanced load measurement

(from All Nippon Checkers Corporation / Nippon Trex Co., Ltd.)

Example 3. Truck scale with three-dimensional center-of-gravity measurement function (measurement using a tilting table installed on a weight scale)

a. Advantages

In addition to normal weight measurement, this truck scale (weighing scale) can measure the position of the center of gravity of the trailer loaded with containers in three dimensions (lateral, longitudinal, and height). The high-speed measurement has minimal impact on logistics, and the measurement results can be displayed in easy-to-understand illustrations and numerical values.

As of March 2015, this system has been installed and is in operation at the Honmoku Weigh Station and the Daikoku Weigh Station of the Yokohama Kowan Kamotsu Keiryo Kyokai.

b. Main Features

- ✓ Capable of detecting unbalanced loading of containers in three dimensions: lateral, longitudinal, and height.
- ✓ Measurements can be taken by simply getting on the measuring table while the container is still loaded on the trailer.
- ✓ If you only need to detect unbalanced loads, the measurement takes only a few seconds and does not significantly affect the container loading/unloading process.
- ✓ Measurement results are displayed on the PC screen and can also be printed out.

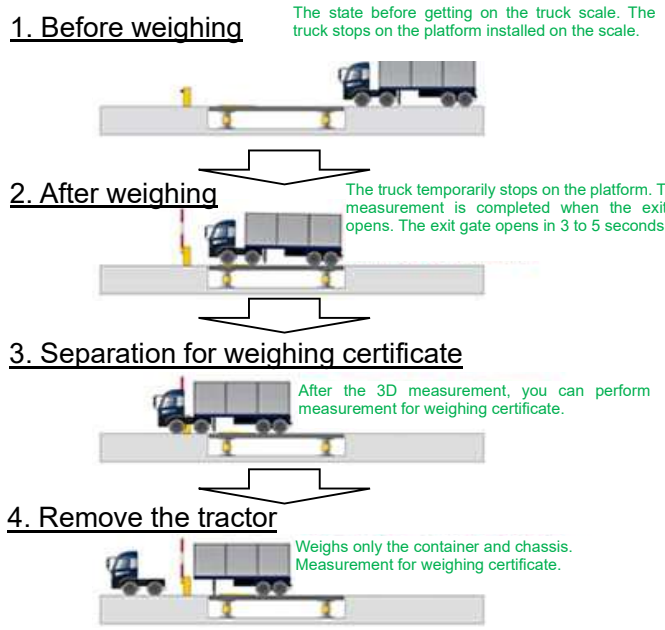


Figure 39 Measuring method
(Prepared based on the Kamacho Scale Co., Ltd. website)

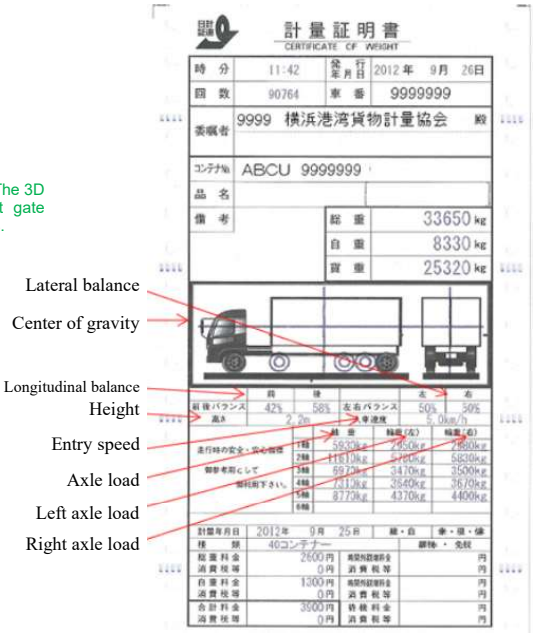
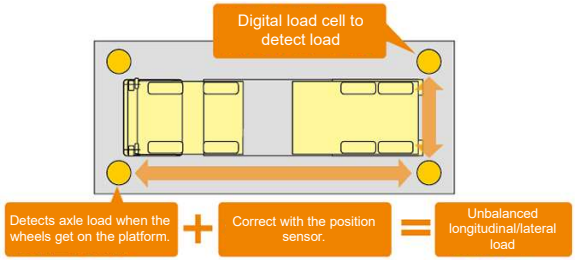
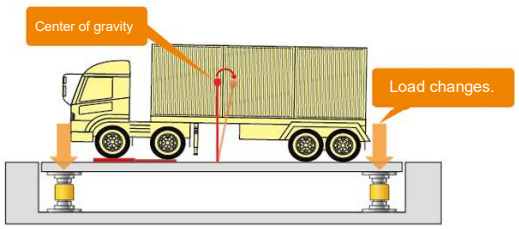


Figure 40 Example of output results
(Prepared based on the Yokohama Harbor Freight Measurement Institute website)





By solving the inverse problem of an inverted pendulum, the center of gravity can be obtained from the load cell reading.

Figure 41 Unbalanced load detection system
(left: longitudinal and lateral directions, right: height direction)
(from Kamacho Scale Co., Ltd. website)

Example 4. Container gravity center position detection system (measurement using lateral force (lateral vibration))

a. Advantages

Using a truck scale for weighing container cargo which enables 3D measurement of the center of gravity position, the wheel and axle loads are measured to derive the longitudinal and lateral load ratios. Since the wheel load can be accurately measured regardless of the vehicle's position on the platform, it can be measured at high speed and does not significantly affect logistics.

As of March 2015, this system has been installed and is in operation at the Oi Weigh Station and the Kobe Port Port-Island Weigh Station of the Nippon Kaiji Kentei Kyokai.

b. Main Features

- ✓ Capable of 3D measurement in the longitudinal, lateral, and height directions, enabling detection of unbalanced loads and more.
- ✓ The wheel load can be accurately measured regardless of the vehicle's position on the platform, and it can be measured in approx. 10 seconds from the start of center-of-gravity measurement, so there is no significant impact on the container loading/unloading process.
- ✓ Measurement results can be printed out, allowing visual confirmation.
- ✓ Accurate measurement is possible with a measurement accuracy of within ±10% of the true value, including the measurement of the height of the center of gravity.

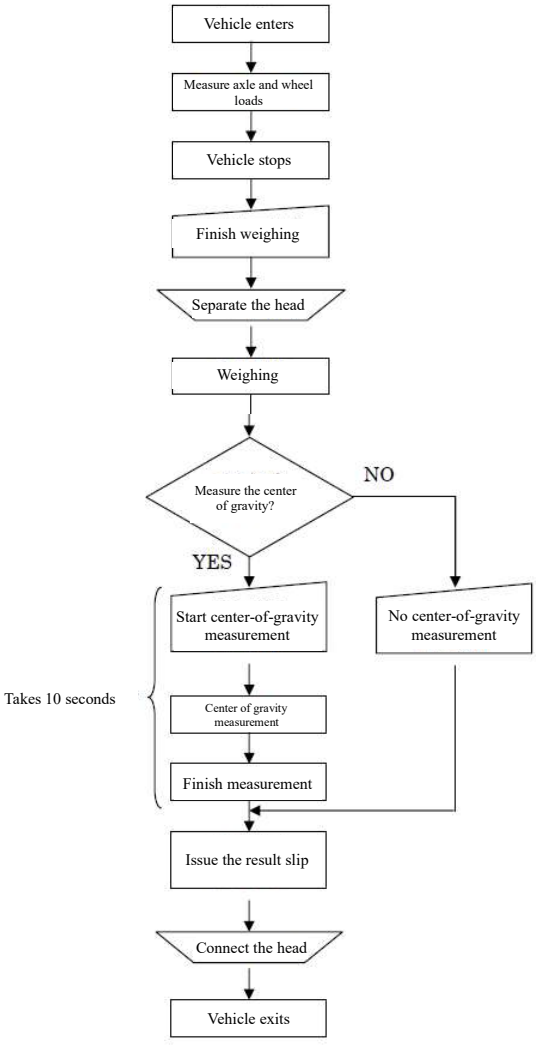


Figure 42 Measurement procedure
(based on the Nippon Kaiji Kentei Kyokai website)

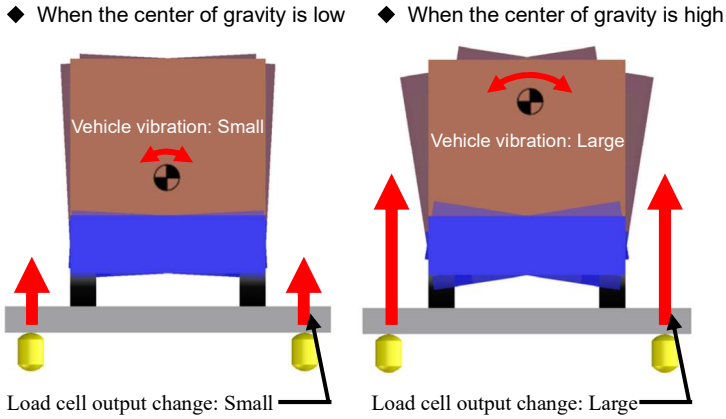


Figure 43 Principle of measuring the height of the center of gravity
(from the Nippon Kaiji Kentei Kyokai website)

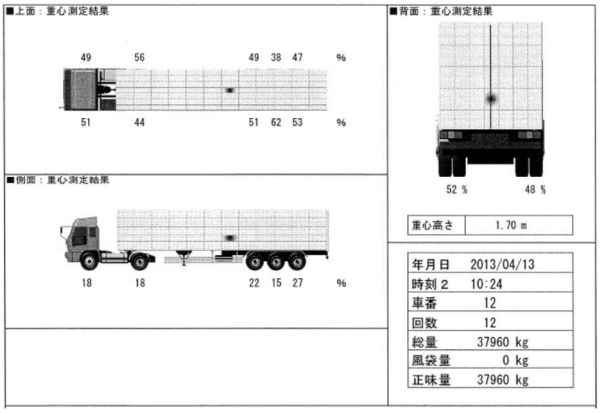


Figure 44 Example of output results
(from the Nippon Kaiji Kentei Kyokai website)

Example 5. Measuring instrument installed on the road pavement (unbalanced container warning system)

a. Advantages

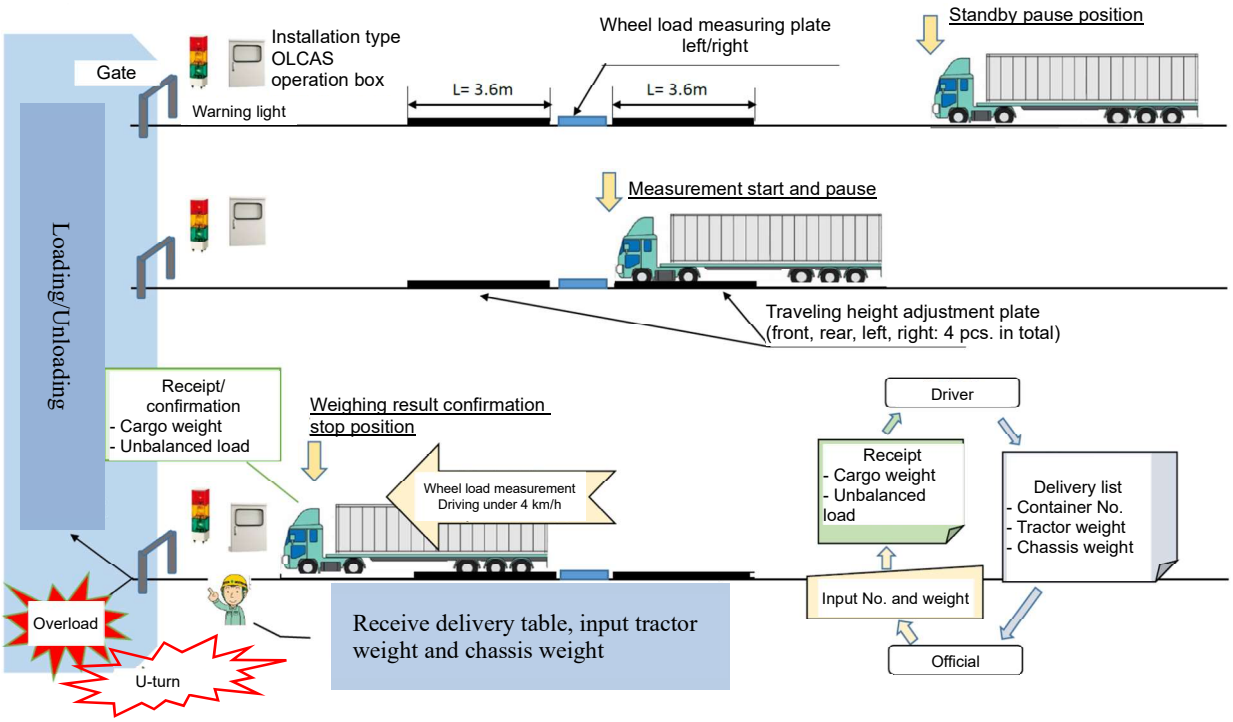
A weigh-in-motion (axle load scale) that measures gross weight and axle load and detects unbalanced loads without stopping containers or dump trucks.

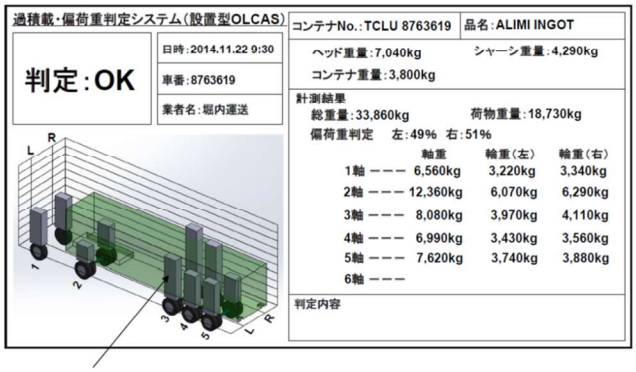
The measurement results are calculated for each axle load, and the ratio of the load on each axle is represented numerically and with illustrations.

The tractor head and chassis do not need to be separated at the time of measurement, minimizing disruption to transportation and logistics flow, and measurement results can be processed and stored as data, and transferred to other related systems.

b. Main Features

- ✓ Measures the gross weight and axle load and detects unbalanced loads by simply driving the truck through the detector at a speed of 4 km/h or less.
- ✓ It can also be used for separate measurements, allowing various measurement methods depending on the operation.
- ✓ Installation is easy, and foundation, paving, and exterior work are simple.
- ✓ Automatic measurement enables delivery of measurement results in writing and data.





- Vertical bar graphs are displayed with a gradation of measured load values as in OLCAS.

Figure 45 Image of road-mounted measuring instrument
(from All Nippon Checkers Corporation / Mitsubishi Nagasaki Machinery Mfg. Co., Ltd.)

Reference Material 13: Examples of Packing and Matters to Note by Packing Style and Cargo

To prevent accidents involving international maritime containers, cargo must be properly packed in containers. The consignor of export containers should pack the cargo properly, and the consignee of import containers should request the consignor to pack the cargo properly.

In addition, trucking companies and drivers are expected to accurately grasp the information (such as item, weight, and packing style) of the cargo stored in containers from the operating instructions or similar information and to transport the containers inferring the condition of the cargo.

For each major items transported in international maritime containers by packing style and cargo type, packing examples, what drivers should be aware of, points of vanning and devanning, load collapse examples, and many more are listed below.

[By packing style]

Bag
Bale (B/L)
Bulk (BLK), Bulk Liner
Bundle (BDL)
Carton (C/T, C/N)
Case (C/S)
Coil (CIL)
Crate (C/R)
Cylinder CYL)
Drum (D/M), Can
Flexible Container Bag, Ton Bag
Flexitank, Flexible Bag
Ingot (IGT)
Package PKG)
Pallet (P/T)
Piece (P'C)
Pressed (PRS)
Rack (RAC)
Reel (REL)
Roll (ROL)
Skid (SKD)
Unit (UNT)

[By Cargo] (Selected from the items to which international maritime container rollover accidents occurred from 2015 to 2019)

Auto parts, fresh food, frozen food, used machinery and used electrical appliances,
grass, scrap, clothing, lumber and timber, metal ingots,
wastepaper, large ceramics (toilet bowl, etc.)

By Packing Style

Packing Style	Bag
Cargo	Grains, coffee beans, powdered mineral raw materials (cement, dyes, etc.), solid chemical products (fertilizers, drugs, etc.), powdered chemical products (drugs, etc.), plastic raw materials, nuts and bolts, powdered food products, solid mineral raw materials (coal, etc.), etc.
Stowage example	 <Example of chemicals>  <Example of powdered food products> 2019/06/26
	○ Many of these are approx. 100 cm in height. ○ Although it depends on the item, 20-30 kg per item is common. ○ For coffee beans, it would be approx. 45-70 kg depending on the exporting country.
To drivers	✓ If you sense any driving discomfort, such as imbalance, stop the truck immediately and report it to the operation manager and ask for instructions.
Vanning/devanning information	☝ Stack without gaps and level the cargo height. ☝ Unbalanced loads should be wrapped or secured with rope. ☝ Paper bags are easily torn, so it is better to stack them on pallets than in bulk to prevent damage.
Load collapse example(s)	☆Cargo stacked on a stair-step near the door, causing a collapse.  Source: Nippon Kaiji Kentei Kyokai Example of the bottom of the stack gets wet from flooding, causing a collapse.

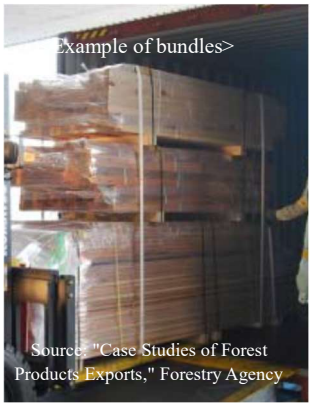
By Packing Style

Packing Style	Bale (B/L)
Cargo	Paper and paper products, wastepaper, textile products (clothing, clothing scraps, etc.), grass, wastepaper, plastics, etc.
Stowage example	  
	○ Weights are often over 100 kg, depending on the item. ○ The size is compressed to fit the container. The number of package is adjusted according to the exporting country. <Example of grass> ○ 55 cm tall, 40 cm long, 60 cm wide, approx. 600 kg per wrap bale (example above) <Example of waste plastics> ○ Approx. 770 kg per wrap bale (example above)
To drivers	✓ If you sense any driving discomfort, such as imbalance, stop the truck immediately and report it to the operation manager and ask for instructions. ✓ Since the cargo is compressed and packed, be aware that the band may break.
Vanning/devanning information	☝ Load orderly with no gaps in the longitudinal, lateral, or horizontal directions. ☝ Since the size is adjusted to fit the container, lashing is not normally performed. ☝ Lash with a band in the longitudinal and lateral directions. ☝ Either clamp the cargo directly with the bale clamp and load it or place a supporting frame at the rear of the container and load the cargo directly into the container.
Load collapse example(s)	☆ Since the size is suitable for the container, the cargo will not collapse easily. However, if the compressed packages are further tied, the belt may break, so be careful.

By Packing Style

Packing Style	Bulk (BLK), Bulk Liner
Cargo	Grains, coffee beans, grass, coal, scrap, etc.
Stowage example	<Example of scrap iron> 
	○ For 20 ft containers: 24,000 kg max. Weight limits are based on the regulations of each country. ○ For 40 ft containers: 30,000 kg max. Weight limits are based on the regulations of each country. ○ Bulk cargo is loaded in its original form, and are different from bulk liners (which use bags).
To drivers	✓ This packing style tends to cause unbalanced lateral loads, so be careful when driving.
Vanning/devanning information	☝ Check for protrusions inside the container, deterioration of hooks, and so on. ☝ Attach square lumber to the edges on the door side at appropriate spacing and cover with sturdy corrugated cardboard or plywood for added strength. ☝ When unloading containers, tilt the container according to the instruction of the plant or facility. <Reference: Example of filling bulk liners (using a bag)>  Unfolded state inside the container being filled Mounting square pipes Filling cargo
Load collapse example(s)	☆ Although the cargo is packed so as not to collapse easily, unbalanced loads may occur due to driving.

By Packing Style

Packing Style	Bundle (BDL)
Cargo	Lumber (pillar-shaped), metal pipes (steel pipes, etc.), metal products (ingots, etc.), etc.
Stowage example	 
	○ The weight of metal products exceeds 1,000 kg per bundle. ○ Lumber (pillar-shaped) 250 × 110 × 110 cm. Some weigh more than 3,000 kg.
To drivers	✓ Since each bundle is a heavy load, be especially careful when driving, and if you sense an unbalanced load, stop immediately and contact the operation manager for instructions. ✓ Many loads are prone to collapse if you drive around curves without braking or slowing down, so take sufficient care when driving.
Vanning/devanning information	☝ Load without gaps. ☝ If there are gaps, fill them with square lumber or other cushions. It is more stable to fix not only longitudinally but also laterally. ☝ Load so that the weight is evenly distributed both longitudinally and laterally. ☝ Use wires, iron belts, cloth belts, PP bands, or similar material for lashing.
Load collapse example(s)	 Example of no lashing, and gaps on both sides.

By Packing Style

Packing Style	Carton (C/T, C/N)
Cargo	Livestock products (beef, pork, etc.), fishery products, fruits and vegetables, powdered food products, solid food products (butter, lard, etc.), frozen food, plastics, paper and paper products, large ceramic products (toilet bowls, washstands, etc.), small ceramic products, textile products (clothing, clothing scraps, etc.), nuts and bolts, others (miscellaneous goods, etc.), etc.
Stowage example	 <Example of furniture>  <Example of beverages> ○ Cargo come in a variety of sizes and weights.
To drivers	✓ If you sense any driving discomfort, such as imbalance, stop the truck immediately and report it to the operation manager and ask for instructions.
Vanning/devanning information	☝ Load orderly without gaps. ☝ Use plywood to prevent taller stacks from collapsing toward the door. ☝ If the amount to be loaded is small, secure the load with square lumber after applying plywood.
Load collapse example(s)	☆ The cargo in this packing style will not collapse easily as long as it is lightweight and the packing method is correct. The lower levels of the stack got wet from flooding, causing collapse.  Source: Nippon Kaiji Kentei Kyokai Load collapse due to the presence of space to move  Source: Nippon Kaiji Kentei Kyokai

By Packing Style

Packing Style	Case (C/S)
Cargo	Large ceramic products (toilet bowls, washstands, etc.), small ceramic products (tableware, etc.), metal pipes (steel pipes, etc.), building materials (assemblies), machinery (excluding used products), electrical appliances (excluding used products), used machinery, used electrical appliances, auto parts, precision instruments, etc.
Stowage example	 <Example of metal pipes> By courtesy of Nissho Astec Co., Ltd.
	○ Weights are approx. 1,000-2,000 kg. ○ Make wooden crates to fit the container.
To drivers	✓ If you sense any driving discomfort, such as imbalance, stop the truck immediately and report it to the operation manager and ask for instructions.
Vanning/devanning information	☝ Attaching a reinforcing material to the lid will increase the strength. ☝ Lashing is not required if stoppers are used. ☝ If there are gaps, fill them with square lumber or other cushions. ☝ Evenly distribute the weight both longitudinally and laterally. ☝ Placing personnel to give signals in front, back, left, and right ensures safe and efficient vanning. ☝ When stacking multiple tiers, attach or fix posts across the top and bottom to prevent the stacking from collapsing.
Load collapse example(s)	☆ Since wooden cases are made to fit the container, they are unlikely to cause load collapse if properly secured, but if the cargo is not properly secured in the case package, it may move freely and cause load collapse.

By Packing Style

Packing Style	Coil (CIL)
Cargo	Metal wires (steel wires, etc.), metal plates (steel plates, etc.), etc.
Stowage example	 
	○ 100 × 100 × 100 cm 7,500 kg (example above) ○ Some weigh more than 10 tons.
To drivers	✓ Note that many of these are heavy per unit and increase the lateral sway while driving. ✓ Coils are prone to cause "concentrated load" and "load collapse" among heavy cargo, so pay special attention.
Vanning/devanning information	☝ Avoid direct contact with the floor. ☝ Secure the coil with square lumber, styrene foam, or other material to distribute the weight evenly both longitudinally and laterally. ☝ Since the load is heavy, reinforce the lashing with square lumber, styrene foam, airbags, or the like. ☝ Be careful not to concentrate loads in a small area.
Load collapse example(s)	 Example of a simple foot support without inadequate locking and no lashing.

By Packing Style

Packing Style	Crate (C/R)
Cargo	Large ceramic products (toilet bowls, washstands, etc.), building materials (assemblies), machinery, electrical appliances, auto parts, precision instruments, etc.
Stowage example	 
	○ Make wooden crates to fit the size of the container. ○ Prepare the size of the wooden crate such that fits to the depth of the container. For example, four wooden crates with the depth of 5ft can fit the 20ft container.
To drivers	✓ If you sense any driving discomfort, such as imbalance, stop the truck immediately and report it to the operation manager and ask for instructions.
Vanning/devanning information	☝ Use planks and lumber that can withstand the weight of the goods. ☝ You can prevent the wooden frame from collapsing by attaching diagonal braces to the frame. ☝ If there is space above the load, use lashing belts. ☝ When stacking multiple tiers, attach or fix posts across the top and bottom to prevent the tiers from coming off. ☝ If there is a gap in the front or back, drive braces into the floor of the container to prevent it from moving. ☝ Take measures to prevent load collapse inside the wooden crate as well by using stretch film or square lumber.
Load collapse example(s)	☆ Since wooden cases are made to fit the container, they are unlikely to cause load collapse if properly secured, but if the cargo is not properly secured in the case package, it may move freely and cause load collapse.

By Packing Style

Packing Style	Cylinder (CYL)
Cargo	Various gases, drugs, oxygen, etc.
Stowage example	     <Examples of various gases>
	○ 500-7,000 L, approx. 6-60 kg ○ The color of the cylinder is determined by the High-Pressure Gas Safety Act. Black: Oxygen gas, Red: Hydrogen gas, Green: Liquefied carbon dioxide gas, White: Liquefied ammonia, Yellow: Chlorine gas, Brown: Acetylene gas, Gray: Nitrogen gas and air gas (other high-pressure gases)
To drivers	✓ If you sense any driving discomfort, such as imbalance, stop the truck immediately and report it to the operation manager and ask for instructions.
Vanning/devanning information	☝ Fill gaps with square lumber or other cushions. ☝ Evenly distribute the weight both longitudinally and laterally. ☝ The basics of lashing are to prevent initial movement. Be sure to secure the skid with root stoppers and also prevent it from tipping over or moving up and down and secure it firmly.

By Packing Style

Packing Style	Drum (D/M), Can
Cargo	Liquid food products (oil, liquor, etc.), solid food products (butter, lard, etc.), solid mineral raw materials (coal, etc.), powdered mineral raw materials (cement, dye, etc.), liquid mineral raw materials (mineral oil, etc.), solid chemical products (fertilizer, drugs, etc.) powdered chemical products (drugs, etc.), liquid chemical products (drugs, etc.), etc.
Stowage example	 <Example of liquid chemical>  <Example of liquid chemical> ○ Drum: 60 cm in length and width, 90 cm in height, weighs approx. 100-250 kg ○ Can: 20 × 20 × 30 cm, weight: approx. 5-15 kg
To drivers	✓ If you sense any driving discomfort, such as imbalance, stop the truck immediately and report it to the operation manager and ask for instructions.
Vanning/devanning information	☝ Secure the loads near the door. ☝ Load orderly starting from the back without gaps. ☝ Check for tilting due to dents in the drum. ☝ If you are not sure whether the load is secured or not, be careful when opening the door.

By Packing Style

Packing Style	Flexible Container Bag, Ton Bag
Cargo	Grains, coffee beans, grass, powdered food products, solid food products (butter, lard, etc.), powdered mineral raw materials (cement, dye, etc.), solid chemical products (fertilizers, drugs, etc.), powdered chemical products (drugs, etc.), liquid chemical products (drugs, etc.), plastic raw materials, waste plastic, metal scrap, etc.
Stowage example	
	○ Many of these are approx. 100 cm in length, width, and height. ○ Weight: Although it depends on the item, 500-1,000 kg per item is common.
To drivers	✓ If you sense any driving discomfort, such as imbalance, stop the truck immediately and report it to the operation manager and ask for instructions.
Vanning/devanning information	☝ When stacking, check that the upper stack is not tilted. ☝ The "4-Panel" style bag can be stacked relatively stable in two or three layers when stacked on a pallet. ☝ Load orderly starting from the back without gaps and hold down from the door side. ☝ The technique for stacking loads so that they do not collapse is important.
Load collapse example(s)	☆ The "Circular" style bag easily collapses when there is dead space. ☆ Below packing style is most likely to cause load collapse if not stacked properly.  Example of case where there is a space to move, and not lashed firmly.

By Packing Style

Packing Style	Flexitank, Flexible Bag
Cargo	Liquid food products (oil, liquor, juice, etc.), liquid mineral raw materials (mineral oil, etc.), non-dangerous chemicals, etc.
Stowage example	Image inside the container    There are two types of extraction ports: upper and lower. ○ Mainly 20ft containers, 24 kL max. Weight limits are based on the regulations of each country.
To drivers	✓ Note that braking and vibration during transportation may cause the tank or container to be loaded due to its contents. ✓ Check if there is a warning label on the rear left door of the container indicating that a flexitank is loaded. ✓ In the event of a leakage accident, stop the operation immediately and contact the operation manager for instructions.
Vanning/devanning information	☝ Use a flexitank that is confirmed to have sufficient strength and is compatible with the liquid to be transported. ☝ Make sure there are no protruding objects such as nails before installing the flexitank. ☝ Use corrugated cardboard to cover the floor and walls of the container. ☝ Fill liquids at the fill rate specified by the tank manufacturer. ☝ Attach square lumber to the edges on the door side at appropriate spacing and cover with sturdy corrugated cardboard or plywood for added strength. ☝ Opening the door may be dangerous, so open only the door on the right and be careful. ☝ Flexitanks are used only once and incinerated as industrial waste after used. ☝ Flexitanks in Japan are mostly multi-layered, making them both durable and flexible. <Example of flexitank structure>  Exterior: Polypropylene cloth Interior: Polyethylene 3-layer example
Load collapse example(s)	☆ Although this packing style will not easily cause load collapse, "sudden" driving operation may damage the tank, so consideration must be given to secondary disasters.

By Packing Style

Packing Style	Ingot (IGT)
Cargo	Metal pillar materials (steel materials, etc.), metal products, etc.
Stowage example	 <Example of metal products>  <Example of metal products> (unfastened) ○ Aluminum ingots: approx. 500 kg per package in most cases
To drivers	✓ Be especially careful when driving around curves as they are heavy.
Vanning/devanning information	☝ Fill gaps with plywood to prevent load collapse. ☝ Load orderly and evenly.
Load collapse example(s)	☆ The band iron on the ingot may break. ☆ The cargo in this packing style is usually heavy and the bottom part is not stable, so it easily collapses if there is a space to move.  Collapse due to poor packing and defects in cloth bags

By Packing Style

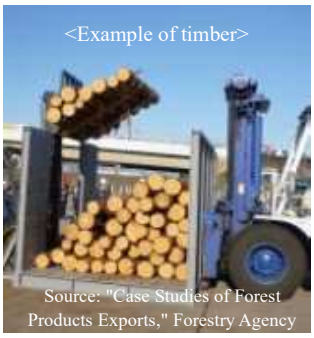
Packing Style	Package (PKG)
Cargo	Metal wires (steel wires, etc.), metal plates (steel plates, etc.), etc.
Stowage example	 <Example of chemicals>  <Example of dangerous goods>  <Example of chemicals>
	○ A generic term for cargo that are packed or packaged. It has a broad meaning, which could also be used for cargo of unknown or unidentified packing styles. ○ A unit used to collectively indicate the number of boxes, bags, and various other packages of various sizes and weights.
To drivers	✓ Pay attention to the driving speed as well during transportation, as there are chemicals, dangerous goods, etc.
Vanning/devanning information	☝ Secure the cargo firmly to the container.

By Packing Style

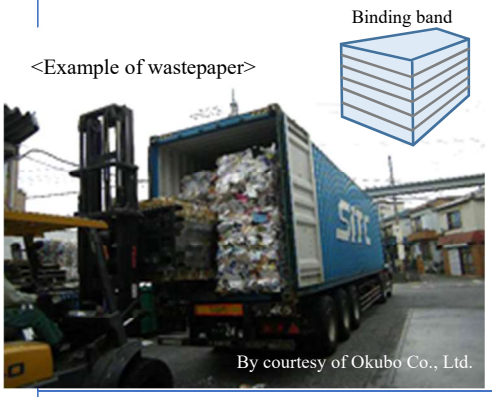
<table>
<tr><th>Packing Style</th><th>Pallet (P/T)</th></tr>
<tr><td>Cargo</td><td>Ceramic products, building materials, machinery, electrical appliances, used machinery, auto parts, precision instruments, fresh food, processed food, etc.</td></tr>
<tr><td>Stowage example</td><td>


○ Cargo come in a variety of sizes, weights, and items.
<Reference: International Standard ISO 6780 Flat Pallets>
<table>
<tr><th>Pallet Size Standards</th><th>Dimensions (mm)</th><th>Allowable deviation (mm)</th></tr>
<tr><td>For ISO international shipping container series 1</td><td>1140 × 1140</td><td>-40</td></tr>
<tr><td>Those based on the ISO's basic packaging dimensions of 600 × 400 mm</td><td>1200 × 1000</td><td>-40</td></tr>
<tr><td>Those based on the ISO's basic packaging dimensions of 600 × 400 mm</td><td>1200 × 800</td><td>-40</td></tr>
<tr><td>For countries using inches</td><td>1219 × 1016 (48” x 40”)</td><td>-40</td></tr>
</table>
</td></tr>
<tr><td>To drivers</td><td>✓ If you sense any driving discomfort, such as imbalance, stop the truck immediately and report it to the operation manager and ask for instructions.</td></tr>
<tr><td>Vanning/devanning information</td><td>☝ For heavy loads, secure those placed near the door.
☝ Check the weight and others to see whether it is possible to stack in two level.
☝ Use pallets that can withstand the weight of the cargo.
☝ If there are gaps, fill them with plywood or airbags.
☝ Wrap unstable loads to prevent load collapse.</td></tr>
<tr><td>Load collapse example(s)</td><td>No lashing, gaps on both sides
 
Mixed loading, with gaps
  </td></tr>
</table>

By Packing Style

Packing Style	Piece (P'C)
Cargo	Timber, raw lumber, pipes, metal pillars, etc.
Stowage example	  ○ Raw lumber: 4 m long, approx. 300 kg per log
To drivers	✓ If you sense any driving discomfort, such as imbalance, stop the truck immediately and report it to the operation manager and ask for instructions.
Vanning/devanning information	☝ Load orderly in the lateral directions without gaps. ☝ When loading steel materials, fill the gaps with square lumber or other cushions. ☝ Keep weight balance in mind when loading. ☝ Raw lumber hardly moves in the container and therefore does not require lashing or filling gaps with square lumber. However, other easily moving cargo must be secured firmly.

By Packing Style

Packing Style	Pressed (PRS)
Cargo	Wastepaper, waste plastic, scrap, etc.
Stowage example	<Example of wastepaper>  Binding band <Example of scrap>  ○ Wastepaper: approx. 100 × 180 × 110 cm, wastepaper: 1,100 kg, corrugated cardboard: approx. 950 kg ○ Scrap: 60 × 60 × 80 cm, approx. 350-400 kg (example images above)
To drivers	✓ If you sense any driving discomfort, such as imbalance, stop the truck immediately and report it to the operation manager and ask for instructions.
Vanning/devanning information	<Wastepaper> ☝ Load orderly in the longitudinal, lateral, and horizontal directions. ☝ Since the size of the pressed is adjusted to fit the container, lashing is usually not required. ☝ Secure with (four or five) iron wires. <Scrap> ☝ Place cushioning material around the cargo to prevent damage to the inside of the container. ☝ Check the weight per unit and load to ensure even weight distribution. ☝ Tie and lash loads. ☝ Secure loads near the door with plywood. <For all pressed cargo> ☝ Load orderly without gaps. ☝ Either clamp the cargo directly with the bale clamp and load it or place a supporting frame at the rear of the container and load the cargo directly into the container.
Load collapse example(s)	☆ Since the cargo is pressed to fit the container, it will not collapse easily, but in the case of wastepaper, the binding band may break, so be careful.

By Packing Style

Packing Style	Rack (RAC)
Cargo	Motorcycles, golf carts, machinery, etc.
Stowage example	<Example of motorcycles> 
	○ Motorcycle: 40 ft container, 100-400 cc, approx. 50-70 units
To drivers	✓ If you sense any driving discomfort, such as imbalance, stop the truck immediately and report it to the operation manager and ask for instructions.
Vanning/devanning information	☝ Motorcycles must be wrapped to prevent damage from contact between the motorcycles. ☝ Secure each motorcycle individually and firmly. ☝ Make a rack to fit the container.

By Packing Style

Packing Style	Reel (REL)
Cargo	Metal wires (steel wires, etc.)
Stowage example	Example of electric wire packing     By courtesy of the Japanese Electric Wire & Cable Makers' Association  ○ Wound around a steel or wooden core ○ Bare reel, staved reel, etc.
To drivers	✓ Note that many of these are heavy per unit which will increase the lateral sway while driving.
Vanning/devanning information	☝ Evenly distribute the weight both longitudinally and laterally. ☝ Since the load is heavy, reinforce the lashing with skids, lumber, or other materials. ☝ Load electric wires upright (do not lay them down on their sides).

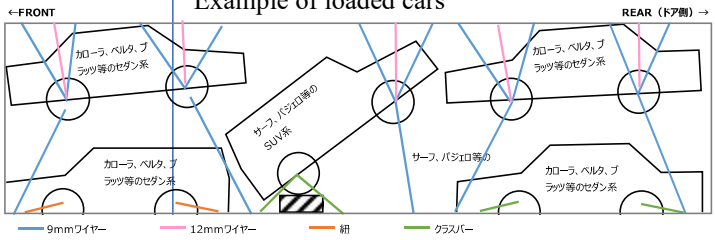
By Packing Style

Packing Style	Roll (ROL)
Cargo	Paper and paper products, metal plates, etc.
Stowage example	
	○ Cargo comes in a variety of sizes and weights. ○ Rolls are loaded upright or laid down, depending on the item.
To drivers	✓ If you sense any driving discomfort, such as imbalance, stop the truck immediately and report it to the operation manager and ask for instructions.
Vanning/devanning information	☝ Rolls are loaded upright or flat, depending on the size and weight. ☝ Load orderly without gaps, keeping weight balance in mind. ☝ If there is space in the container, lash the load. ☝ When loading upright, place plywood on the door side. ☝ If the load is stacked sideways and fully loaded, it does not need to be secured, but if it is unstable, it should be lashed down with plywood, belts, or other materials.

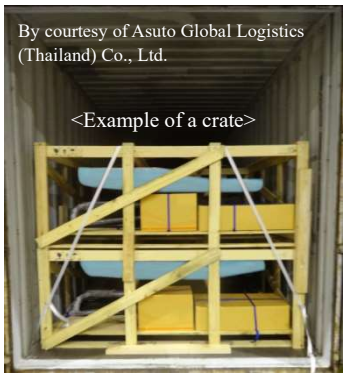
By Packing Style

Packing Style	Skid (SKD)
Cargo	Metal wires, metal plates, etc.
Stowage example	    ○ Cargo comes in a variety of sizes, weights, and items.
To drivers	✓ If you sense any driving discomfort, such as imbalance, stop the truck immediately and report it to the operation manager and ask for instructions.
Vanning/devanning information	☝ If the base of the cargo is wide, check the weight of each piece. ☝ If the base of the cargo is narrow and the weight is concentrated in one point, expand the base with a wooden crate or the like to distribute the weight inside the container. ☝ Typically, skid packing has the same strength as case packing. ☝ If there are gaps, fill them with square lumber or other materials. ☝ Hold down unstable cargo with square lumber or other materials and secure it with a lashing belt or other materials. ☝ Use container hooks for lashing.

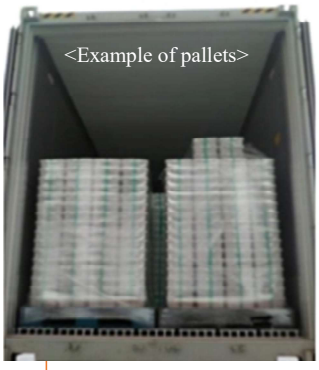
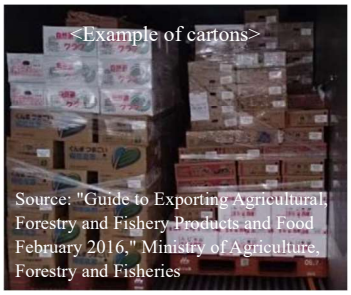
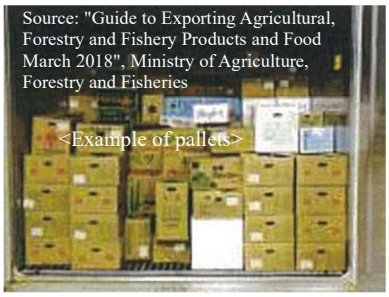
By Packing Style

Packing Style	Unit (UNT)
Cargo	Building materials (assemblies), machinery (excluding used products), used machinery, automobiles, precision instruments, etc.
Stowage example	   Example of loaded cars   ○ Four to seven cars can be loaded depending on the combination of sizes. ○ Breaking strength: 9 mm wire: 4,000 kg, 12 mm wire: 7,000 kg
To drivers	✓ If you sense any driving discomfort, such as imbalance, stop the truck immediately and report it to the operation manager and ask for instructions.
Vanning/devanning information	☝ Empty the fuel tank. ☝ Disconnect the battery connections. ☝ When hanging a car in the air, stretch wires at the top, bottom, front, back, left, and right. ☝ Stretch wires to prevent the car from moving up and down and back and forth. Also, secure it at the foot with square lumber to prevent it from swinging back and forth and left and right.
Load collapse example(s)	☆ Although the wire will not easily break, the container hooks of the container may not be able to bear the weight due to rust or deterioration and may break off, causing the vehicle to fall.

By Cargo

Cargo	Auto Parts
Packing style	Case, crate, carton, pallet, skid, unit, bear, piece, carton, etc.
Stowage example	 <Example of cartons>  By courtesy of Asuto Global Logistics (Thailand) Co., Ltd. <Example of a crate>
	○ Auto parts are mainly packed in cases, crates, and cartons depending on the weight and size.
To drivers	✓ Rollover accidents have occurred during transportation of auto parts. ✓ Be careful as the cargo may not be shored or lashed (loaded as they are and not secured).
Load collapse example(s)	Load collapse due to the presence of space to move  Load collapse due to rainwater or seawater flooding 

By Cargo

Cargo	Fresh Food
Packing style	Pallet, carton, etc.
Stowage example	   ○ Fresh foods are mainly packed in cartons, and in some cases, pallets are used.
To drivers	✓ Rollover accidents have occurred during transportation of fresh foods.
Load collapse example(s)	☆ Cartons may condense due to temperature differences, or the bottom part may collapse due to rainwater or seawater, so be careful.

By Cargo

Cargo	Frozen Food
Packing style	Carton, etc.
Stowage example	
	○ Frozen foods are mainly packed in cartons, and in some cases, pallets are used.
To drivers	✓ Rollover accidents have occurred during transportation of frozen foods. ✓ Failure to control the temperature due to a malfunction or other break downs may cause frost, resulting in an accident. ✓ The notation of the cargo name starts with "Frozen."
Load collapse example(s)	- Load collapse caused by outside air entering the container 

By Cargo

Cargo	Used Machinery, Used Electrical Appliances
Packing style	Case, crate, pallet, skid, unit, etc.
Stowage example	   ○ Since used machinery and used electrical appliances are in various shapes, cargo will be packed in different style and are often heavy.
To drivers	✓ Rollover accidents have occurred during transportation of used machinery and used electrical appliances. ✓ Be careful as the cargo may not be shored or lashed, or are loaded without being secured firmly. ✓ Note that large machines can rollover instantly by the slightest vibration. ✓ Note that used electrical appliances may be stacked in multiple layers with only cushioning material without being secured.
Load collapse example(s)	- Example of the inside of an rolled over container 

By Cargo

Cargo	Grass
Packing style	Flexible container bag, roll, bale, bulk, etc.
Stowage example	  ○ The size and weight vary depending on the packing style. Flexible container bags and bales are mainly used.
To drivers	✓ The largest number of the reported rollover accidents have occurred during transportation of grass. Many rollover and run-off-road accidents are especially caused by insufficient deceleration in curves. ✓ If "Hay..." or "Straw..." is indicated on the container, be especially careful.

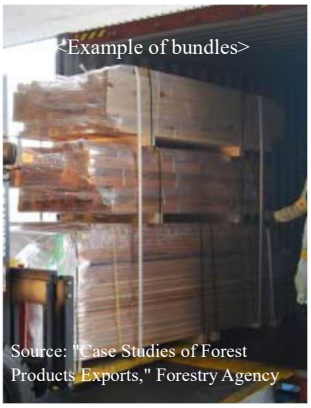
By Cargo

Cargo	Scrap
Packing style	Bulk, flexible container bag, pressed, bale, etc.
Stowage example	 <Example of a bulk>
	○ Iron and other metal chips, steel scraps, scrap iron, plastics, and others with various weights.
To drivers	✓ Rollover accidents have occurred during transportation of scraps (crushed materials).
Load collapse example(s)	☆ Although the cargo is packed so as not to collapse easily, unbalanced loads may occur due to driving.

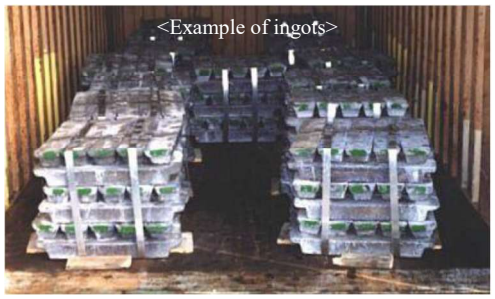
By Cargo

Cargo	Clothing
Packing style	Bale, carton, etc.
Stowage example	 
	○ Old clothes are mainly packed in bales, and weigh over 100 kg per bale. ○ New clothes are mainly packed in cases of 80 × 60 × 70 cm, and weigh approx. 15-30 kg per case, and are wrapped with a bale in units of 2 or 4 cases. Pallets are used in some cases.
To drivers	✓ Rollover accidents have occurred during transportation of clothing.
Load collapse example(s)	☆ Be careful with bale packing, as the band may break, and the bale may expand.

By Cargo

Cargo	Lumber and Timber
Packing style	Pallet, bundle, package, piece, etc.
Stowage example	 <Example of bundles> Source: "Case Studies of Forest Products Exports," Forestry Agency  <Example of pieces> By courtesy of Kohjitsu Co., Ltd. ○ There are many types of lumber.
To drivers	✓ Rollover accidents have occurred during transportation of lumber and timber. ✓ When lumber is loaded in bulk, the center of gravity is expected to be almost in the center of the container. However, unbalanced lateral loads are likely to occur, so be careful when driving. ✓ Note that in some cases, cargo is stacked all the way to the top of the container.
Load collapse example(s)	- Timber stacked in bulk in a container  - No lashing, gaps on both sides 

By Cargo

Cargo	Metal Ingots
Packing style	Bundle, ingot, etc.
Stowage example	 <Example of ingots>  <Example of ingots> ○ Metal ingots are heavy.
To drivers	✓ Rollover accidents have occurred during transportation of metal ingots. ✓ Be careful when driving around curves as they are heavy.
Load collapse example(s)	☆ The band iron on the ingot may break. ☆ The cargo in this packing style is usually heavy and the bottom part is not stable, so it easily collapses if there is a space to move.  Collapse due to poor packing and defects in cloth bags

By Cargo

Cargo	Wastepaper
Packing style	Pressed, bale, etc.
Stowage example	<Example of pressed>  Lashing image
	○ Approx. 100 × 180 × 110 cm, wastepaper: 1,100 kg, corrugated cardboard: approx. 950 kg
To drivers	✓ Rollover accidents have occurred during transportation of wastepaper. ✓ The notation of the cargo name is "Wastepaper."
Load collapse example(s)	☆ Since the cargo is pressed to fit the container, it will not collapse easily, but the binding band may break, so be careful.

By Cargo

Cargo	Large Ceramics (Toilet Bowls, etc.)
Packing style	Carton, pallet, case, crate, etc.
Stowage example	 ○ Sturdy cartons (corrugated cardboard), cases, and crates are mainly used.
To drivers	✓ Rollover accidents have occurred during transportation of large ceramics. ✓ If you sense any discomfort, such as imbalance, stop the truck immediately and report it to the operation manager and ask for instructions.

Ministry of Land, Infrastructure, Transport and Tourism

[Contact]

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