
**Rough-terrain trucks — User
requirements —**

**Part 1:
General requirements**

*Chariots tout-terrain — Exigences pour l'utilisateur —
Partie 1: Exigences générales*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 11525-1 was prepared by Technical Committee ISO/TC 110, *Industrial trucks*, Subcommittee SC 4, *Rough-terrain trucks*.

ISO 11525 consists of the following parts, under the general title *Rough-terrain trucks — User requirements*:

— *Part 1: General requirements*

Slewing trucks and lorry-mounted trucks are to form the subjects of future parts 2 and 3.

Rough-terrain trucks — User requirements —

Part 1: General requirements

1 Scope

This part of ISO 11525 gives general requirements relating to the use of rough-terrain trucks.

It is intended to achieve the following:

- a) the prevention of personal injuries, property damage and accidents;
- b) the establishment of criteria for inspection, maintenance, operation and training.

Specific user requirements for rotating trucks, lorry-mounted trucks, personnel work platforms that can be fitted to rough-terrain trucks, the handling of suspended loads with rough-terrain trucks and agricultural applications are to be covered by the other parts of ISO 11525.

NOTE National or local requirements can apply, which could be more stringent.

2 Normative references

The following reference documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5057, *Industrial trucks — Inspection and repair of fork arms in service on fork-lift trucks*

ISO 10896-1:2012, *Rough-terrain trucks — Safety requirements and verification — Part 1: Variable-reach trucks*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

authorized person

person approved or assigned to perform a specific task or tasks at a specific location or locations at a worksite

3.2

examiner

competent person (3.7) who tests the competency of the *trainee* (3.11)

3.3

maintenance

act of upkeep, including inspection, lubrication, cleaning, adjustment and scheduled parts replacement

3.4

modification

change to the truck that affects its *operation* (3.5), *stability* (3.9), capacity or safety

3.5

operation

performance of functions of a truck within the scope of its specifications and in accordance with the manufacturer's instructions, work rules and applicable governmental regulations

3.6

operator

competent (3.7) and *authorized person* (3.1) who controls the *operation* (3.5) of the truck

3.7

competent person

person who has acquired, through training, qualification, experience or a combination of these, the knowledge and skill enabling that person to correctly perform the required tasks

3.8

attachment bracket

device fitted at the end of the boom to facilitate the quick interchange of attachments

3.9

stability

state of the truck in which it does not overturn, described technically as the state in which the sum of the moments acting to overturn the truck is less than the sum of the moments tending to resist overturning

Note to entry: Conditions that can affect stability include ground and floor conditions, gradient, speed and loading (trucks equipped with attachments behave as partially loaded trucks even when operated without a load on the attachment), dynamic and static forces, incorrect tyre inflation and the judgment exercised by the *operator* (3.6).

3.10

trainer

competent person (3.7) who conducts the training of the truck *operator* (3.6)

3.11

trainee

person who is being trained to become a truck *operator* (3.6)

3.12

user

person or entity responsible for assigning an *operator* (3.6) to operate a truck and specifying the tasks to be performed

Note to entry: Depending on national or other regulations, or local practice, this term can refer to one or more of the following entities: owner, employer, custodian, dealer or entity placing the product on the market.

3.13

responsible entity

person or entity with responsibility for the design, specification, procurement, fabrication, manufacture, assembly, provision of information and testing of a truck

Note to entry: Depending on national or other regulations, or local practice, this term can refer to one or more of the following entities: manufacturer, installer, custodian, dealer, designer or entity placing the product on the market.

4 General safety requirements

4.1 Principles

This part of ISO 11525 shall be supplemented by good management practices, safety controls and application of sound principles of safety, training, inspection, maintenance, application selection and operation. All data available regarding the parameters of intended use and expected environment shall be considered. Those with direct control over the application and operation of the truck shall be responsible for ensuring good safety practices.

NOTE Different operating conditions can require additional safety precautions, training and special safe operating procedures.

The operation of any truck is subject to certain hazards that can be protected against only by the exercise of care and common sense. It is essential to have competent persons trained in the intended use, safe operation, maintenance and service of this equipment.

The user shall ensure that the operator understands that safe operation of the truck is also the operator's responsibility.

The user shall ensure that the operator's mental or physical condition will not impair his/her ability to operate the truck.

4.2 Operator's manual(s)

The user shall ensure that the operator's manual(s) and any additional safety manual provided by the manufacturer with the truck are always available to the operator and maintenance personnel.

4.3 Modifications or alterations

Except as provided below, no modifications or alterations to a truck that may affect its capacity, stability or safe operation shall be made without the prior written approval of the original truck manufacturer or its successor. When the truck manufacturer or its successor approves a modification or alteration, the user shall be responsible, prior to operation, for ensuring that appropriate changes are made to information plate(s), documents, certificates, labels, tags and operator manual(s).

If the truck manufacturer is no longer in business and there is no successor, modifications or alterations to the truck shall be carried out under the following conditions:

- a) the design, testing and implementation of the modification or alteration is made in accordance with the appropriate part of ISO 10896 by a competent person;
- b) a permanent record is kept of the design, tests and implementation of the modification or alteration;
- c) appropriate changes are made to the information plate(s), documents, certificates, labels, tags and operator's manual(s);
- d) a permanent and readily visible label is affixed to the truck stating the manner in which the truck has been modified or altered, together with the date of the modification or alteration, and the name of the person or organization responsible for the design, testing and implementation of the modifications.

4.4 Manufacturer's bulletins

The user shall comply with the applicable bulletins as directed by the responsible entity.

4.5 Operator qualifications

Users shall allow only competent and authorized persons to operate a truck. Truck operators shall be competent to operate the equipment safely, in addition to being trained in accordance with this part of ISO 11525.

4.6 Operator's responsibility for training

Before operating any truck, the operator shall be trained in accordance with 4.7 and shall have read and be familiar with the operator's manual(s) and any other safety information provided by the manufacturer and user on the particular truck being operated, the application and environment in which the truck is to be used and any attachments used.

4.7 Operator training

4.7.1 Operator training programme

Personnel who are not considered competent to operate a truck shall operate the truck only as part of the operator training programme. This training shall be conducted under the direct supervision of a trainer.

The operator training programme shall be based on user policies, industry standards, local regulations and policies, operating conditions and the manufacturer's instructions.

NOTE Information on operator training is available from sources including users, truck manufacturers, government agencies dealing with employee safety, trade organizations of truck users, public and private organizations and safety consultants.

The training programme shall emphasize safe and proper operation that avoids injury to the operator and others and prevents property damage. The training program shall include the following items:

- a) information about the truck(s) the trainee will operate:
- 1) characteristics of the truck(s), including possible variations between the truck and others in the workplace,
 - 2) similarities to, and differences from, other mobile equipment,
 - 3) significance of information plates, load charts, warnings and instructions affixed to the truck,
 - 4) operating and safety instructions in the truck's operator's manual(s),
 - 5) instructions for inspection and maintenance to be performed by the operator,
 - 6) engine operation,
 - 7) type of drive system and its characteristics,
 - 8) methods of steering and manoeuvring,
 - 9) braking methods and characteristics, with and without loads,
 - 10) visibility, with and without loads,
 - 11) load charts, how to read and comprehend them and the limitations of the load chart due to the mass and load centres,
 - 12) explanation of the stability triangle and other stability characteristics affected by speed, acceleration, braking, raising or lowering loads while travelling, operation/manoeuvring without loads, sharp cornering, height, attachments, grade/ramps, centre of gravity of the load and truck, combined load centre of gravity, counterbalance principle, truck stability triangle and trapezoid,
 - 13) controls and instrumentation, including their location, function and method of operation, and the identification of symbols,
 - 14) load-handling capabilities and proper use of forks and other attachments,
 - 15) refuelling and battery charging,
 - 16) guards and protective devices for the specific type of truck,
 - 17) how to use stabilizing devices, chassis levelling and other stability-related functions, and examples of improper operation and the risks associated with them,
 - 18) how to correctly use the operator restraints, e.g. seat belt, and other safety devices,
 - 19) basic steps to be taken in the event of a tip-over, e.g. bracing for impact,
 - 20) wheel loadings when loaded and unloaded in static position,
 - 21) when entering and exiting the operator's station, the need to always maintain three points of contact, i.e. one hand and two feet or two hands and one foot,
 - 22) types of attachments and their applications/limitations, and

- 23) other characteristics, if any, of the particular truck;
- b) operation and worksite-related topics:
- 1) surface conditions on which the truck is to be operated, loaded and unloaded, e.g. floor and ground conditions, ramps and inclines, trailers;
 - 2) load handling at height and at ground level while picking and placing loads;
 - 3) pedestrian traffic in areas in which the truck is to be used;
 - 4) narrow-aisle and other confined-area operations;
 - 5) potentially hazardous locations where the truck will be operated;
 - 6) ramps and gradients and how the stability of the truck could be affected by them;
 - 7) enclosed environments and other areas where insufficient ventilation could result in a concentration of carbon monoxide gas from the engine exhaust;
 - 8) other unique or potentially hazardous environmental conditions at the worksite that could affect other workers and the safe operation of the truck.

4.7.2 Testing, retraining and enforcement

4.7.2.1 Testing

During training, performance and oral and/or written tests shall be given by the examiner to measure the skill and knowledge of the trainee in meeting the requirements of the operator training programme based on this part of ISO 11525. Examiners shall establish a pass/fail requirement for such tests. The user shall verify that the testing has been satisfactorily performed.

Following the completion of instruction and practice, all trainees shall be evaluated.

The evaluation shall be conducted on the specific work tasks and shall include the following items:

- a) preoperational inspection;
- b) function test;
- c) start-up;
- d) travelling, with and without a load (including pedestrian safety);
- e) load handling;
- f) load selection and security;
- g) load pickup and placement;
- h) stacking/de-stacking;
- i) handling specific to docks, trucks and rail cars;
- j) driving on ramps and grades;
- k) proper use of the truck's safety features;
- l) shutdown;
- m) refuelling/recharging;
- n) operational maintenance.

Records shall be retained in accordance with 4.7.2.4.

4.7.2.2 Retraining

Operators shall be retrained when new equipment is introduced, existing equipment modified, operating conditions change, current training expires or an operator's performance is deemed unsatisfactory by the user.

The user shall determine the extent of the operator retraining, as well as the need for retraining, taking into consideration regional or local requirements.

4.7.2.3 Enforcement

The user shall be responsible for enforcing the safe use of the truck according to the provisions of this part of ISO 11525.

4.7.2.4 Record keeping

Records of the person or persons trained in the operation of the truck shall be retained for at least the period of time for which the training is valid. In addition:

- the successful trainee shall be furnished with proof of training, verifying compliance with the operator training program based on this part of ISO 11525;
- the records shall reflect the period of time when the training has not expired;
- the records shall include the name of the entity providing training or retraining, the name of trainer(s) and examiner(s), clear identification of the truck(s) and attachment(s) covered by training, and the date of training.

4.8 Inspection and maintenance

4.8.1 General

The inspection and maintenance of trucks shall be performed in accordance with the manufacturer's and user's recommendations, national regulations and

- a) a planned system for scheduled inspection, lubrication, maintenance and adjustment (as required), and
- b) that only competent and authorized persons are permitted to maintain, repair, rebuild, adjust and inspect trucks, in accordance with the manufacturer's recommendations.

4.8.2 Preparation for inspection or repair

In preparation for, and prior to, starting the inspection or repair of a truck:

- wheel chocks or other means shall be applied to ensure the truck remains stationary;
- manufacturer-approved methods/devices as outlined in the operator's manual(s) shall be implemented to prevent unintentional movement of the truck/components before working on or around it;
- the possibility of unintentional fuel escape shall be eliminated before any part of the fuel system is disconnected;
- the battery shall be disconnected before working on the electrical system;
- the possibility of an unintentional stored energy release, e.g. from the accumulator or hydraulic system, shall be eliminated.

4.8.3 Performance checks

4.8.3.1 Prior to conducting the performance checks, the user shall ensure that the pre-operation inspection has been performed satisfactorily per the manufacturer's instructions.

4.8.3.2 The user shall ensure that performance checks are conducted in an authorized area where safe clearances exist.

4.8.3.3 Before starting the performance check, the operator shall

- a) be in the operating position using an operator restraint (e.g. seat belt),
- b) disengage the clutch, if the machine is so equipped,
- c) apply service and parking brakes,
- d) place directional control(s) in neutral, and
- e) start the engine or power system.

4.8.3.4 Check that all control systems and safety devices, e.g. loading handling means, steering, brakes, are functioning.

4.8.3.5 Before exiting the truck, the operator shall

- a) stop the truck,
- b) fully lower the load-handling means,
- c) place directional control(s) in neutral,
- d) apply the parking brake,
- e) shut down the engine or power system, and
- f) remove the key, if so equipped, or, where another means such as a key pad is used to prevent the truck's use by unauthorized personnel, use this means to turn off the power.

4.8.4 Inspection and maintenance precautions

IMPORTANT The following precautions shall be taken by the user when inspection and maintenance is performed:

- Avoid fire hazards and ensure that fire protection equipment is present in the work area. Do not use an open flame to check fluid levels or for leakage of fuel, battery electrolyte or other flammable liquids. Do not use open containers of fuel or flammable cleaning fluids for cleaning parts.
- Properly ventilate the work area, including engine exhaust fumes.
- Keep the work area clean and dry.
- Do not make repairs or adjustments (e.g. welding of structures) unless specifically authorized to do so in accordance with 4.3.
- When refuelling, smoking in the area shall not be permitted, the engine shall be stopped and the operator shall not be in the truck.
- Spillage of oil or fuel shall be cleaned appropriately.
- Replace the oil and fuel tank caps before restarting the engine.

- **Avoid other potential hazards associated with the inspection and maintenance of the truck not addressed in this part of ISO 11525 or the operator's manual(s).**

4.8.5 Inspection and maintenance requirements

The user shall ensure that

- a) brakes, steering mechanisms, control mechanisms, warning devices, guards and safety devices, lift and tilt mechanisms, axle stops, and frame members are carefully inspected and maintained in a safe operating condition in accordance with 4.8.1 a),
- b) if the truck and components are designed and approved for hazardous area operation, they receive special attention so that the maintenance performed achieves the original, approved, safe operating conditions,
- c) fuel systems are inspected for leaks, damage and deterioration,
- d) hydraulic systems are inspected and maintained in conformance with the manufacturer's recommendations, and hydraulic cylinders, valves and other hydraulic system components are checked to ensure that creep or leakage has not developed to the extent that would create a hazard or exceed the values given in ISO 10896-1:2012, 4.9.2.4,
- e) truck safety, capacity, operation and maintenance information plates, tags and labels are maintained in a legible condition,
- f) the truck is kept in a clean condition so as to minimize fire hazards and facilitate detection of loose or damaged parts,
- g) replacement parts, including tyres, are interchangeable with and of a quality at least equal to the original parts, and that such parts are installed using all applicable safety and installation procedures,
- h) if any repairs are necessary, action is taken to prevent use of the truck until repairs have been completed,
- i) industry safety practices are followed when fitting or removing tyres from rims, pneumatic tyres are completely deflated prior to their removal from rims, and a safety cage or restraining device is used while inflating tyres,
- j) approved load-handling attachments are inspected, repaired or replaced in accordance with the manufacturer's instructions, and
- k) forks are inspected, repaired or replaced in accordance with ISO 5057.

4.9 Hazardous environments

The user shall ensure that the truck selected is appropriate for the environment in which it is to be used.

5 Operating safety rules and precautions

5.1 Operator's responsibility for safety

The operator is responsible for the safe operation of the truck.

Before operating any truck, the operator shall have read and be familiar with the operator's manual(s), and any additional safety manual provided by the manufacturer and user, for the particular truck being operated.

The operator shall develop safe working practices and shall be aware of hazardous conditions, utilizing all means, including those provided by the user, to protect himself/herself, other personnel, the truck, the load and the local environment.

The operator shall be familiar with the operation and functions of all controls and instruments before operating the truck.

The operator shall understand the load charts affixed to the truck before operating it. This shall include any attachments that are used.

The operator shall know the weight to be lifted and the load centre distance of the load.

5.2 Visual inspection and functional tests

Before its use each day or at the beginning of each shift, the truck shall be given a visual inspection and functional tests, including

- operating and emergency controls,
- safety devices,
- lights (if so equipped),
- brakes,
- lift and tilt systems, load handling means, chains, cables and limit switches,
- personal protective equipment (PPE),
- air, hydraulic and fuel systems,
- cables and wiring,
- loose, damaged or missing parts,
- tyres and wheels,
- instructions, warnings and control markings,
- operator's manual(s),
- structural components, such as stabilizing devices,
- any attachments to be used,
- load charts are visible and legible, and
- other items specified by the manufacturer.

If the truck is found to be in need of repair or is unsafe in any way, or if it contributes to an unsafe condition, the matter shall be reported immediately to the user's designated authority and the truck shall not be operated until it has been restored to a safe operating condition.

Records should be kept of the visual inspection and functional tests.

5.3 General operating instructions

The operator shall

- a) before starting to operate the truck,
 - 1) be in the normal operating position, and using an operator restraint, e.g. seat belt,
 - 2) disengage the clutch, if so equipped,
 - 3) apply service and parking brakes,
 - 4) place directional control in neutral, and

- 5) start the engine or power system;
- b) not start or operate the truck, or any of its functions or attachments, from any place other than the normal operating position (this does not apply to remote-controlled trucks);
- c) never put any part of the body, including hands and feet,
 - 1) outside the operator's compartment,
 - 2) into the load-handling structure,
 - 3) between the load-handling structure, the stabilizers and the truck, or
 - 4) within the reach mechanism or attachments of the truck;
- d) understand the limitations of the truck and always operate the truck in a safe manner;
- e) not drive a truck directly up to anyone;
- f) safeguard pedestrians at all times, and exercise particular care during reversing and other operations during which pedestrians could step into the path of travel of the truck;
- g) not allow anyone to stand or pass under the elevated load-handling structure of the truck, whether empty or loaded;
- h) not permit passengers to ride on the truck, unless a designated passenger seat has been provided by the manufacturer, and, if the passenger seat is occupied, operate the truck in a manner that ensures safety of the passenger, who shall
 - 1) remain seated with seat belt fastened at all times except when entering and exiting,
 - 2) keep all parts of his/her body, including hands and feet, inside the passenger compartment,
 - 3) keep clear of, and make no contact with, the operating controls of the truck, and
 - 4) not exit until the truck is properly shut down;
- i) check clearance carefully before driving under obstructions, e.g. electrical lines, bridges;
- j) check for underground utility services before using ground-engaging attachments;
- k) take reasonable steps to minimize the environmental impact of using the truck;
- l) take into account the effects of weather, e.g. wind, rain and snow, on the safe operation of the truck;
- m) before leaving the operating position,
 - 1) bring the truck to a complete stop,
 - 2) place directional control in neutral,
 - 3) apply the parking brake,
 - 4) fully retract and lower the boom and position forks or other attachments flat on the ground, and
 - 5) in addition, when leaving the truck unattended (see Notes, below), stop the engine and remove the key (if so equipped) or, in the case where another means such as a key pad is used to prevent use of a truck by unauthorized personnel, use this means to turn off the power.
- n) maintain a safe distance from the edge of ramps, platforms and other working surfaces;
- o) in areas classified as potentially hazardous, use only trucks approved for use in those areas;
- p) report all accidents involving personnel, building structures and equipment to the supervisor or as directed;

- q) not block access to fire exits, stairways or fire equipment, or park closer than 1,8 m to a railway line;
- r) maintain the appropriate minimum safe distance from energized power lines as defined by local, federal or national regulations.

NOTE 1 A truck is defined as *attended* when the operator is less than 7 m from the normal operating position, which remains in the operator's view.

NOTE 2 A truck is defined as *unattended* when the operator is 7 m or more from the normal operating position, which remains in the operator's view, or whenever the operator leaves the truck and it is not in the operator's view.

If the truck is found to be in a condition that is unsafe in any way, this shall be reported immediately to the user and the truck shall not be operated until it has been restored to safe operating condition by a competent person.

5.4 Travelling

The operator shall

- a) lock together for simultaneous operation the wheel brake pedals on trucks equipped with individual pedals before travel on public roads or when moving between worksites;
- b) not engage the differential lock on trucks so equipped, when driving on roads or at high speeds, or when turning, as, if locked when turning, there could be loss of steering control;
- c) comply with the applicable traffic regulations;
- d) operate the truck under all travel conditions at a speed that will permit it to be brought to a stop in a safe manner;
- e) maintain a safe distance from personnel, vehicles and other equipment;
- f) yield the right-of-way to pedestrians and emergency vehicles such as ambulances and fire trucks;
- g) not pass other equipment or vehicles travelling in the same direction at intersections, blind spots, or at other potentially dangerous locations;
- h) slow down and sound the audible warning device(s) at intersections and locations where vision is obstructed;
- i) keep a clear view of the path of travel and, if the load being carried obstructs forward view, travel with the load trailing and/or the aid of an assistant;
- j) tilt back and raise the load and load-handling means to provide ground clearance and ensure proper visibility;
- k) make starts, stops, turns and direction changes in a smooth manner so as not to shift the load and/or overturn the truck;
- l) not indulge in stunt driving or "horseplay";
- m) drive loaded trucks with the load facing uphill when ascending or descending gradients in excess of 5 %, unless the manufacturer recommends otherwise;
- n) ascend and descend ramps and gradients slowly and cautiously;
- o) travel straight up and down gradients and avoid turning across gradients;
- p) cross railroad tracks slowly and cautiously;
- q) use special care when travelling without a load, as the risk of lateral overturning is greater;
- r) avoid running over loose objects on the roadway surface;
- s) reduce speed to a safe level when negotiating turns, turning the steering wheel in a smooth, sweeping motion and — except when manoeuvring at very low speeds — at a moderate, even rate.

5.5 Picking and placing loads

The operator shall

- a) before starting to pick or place a load,
 - 1) know or determine the weight of the load and the position of its load centre,
 - 2) verify the capacity of the surface before placing a load on it,
 - 3) ensure that the frame is levelled within the manufacturer's requirements before raising the boom or mast, with or without a load, and
 - 4) follow the manufacturer's instructions for operating stabilizer controls, if so equipped, as improper use of these controls could cause the truck to overturn;
- b) when picking or placing a load,
 - 1) never lift a load with one fork,
 - 2) place loads only on level and even surfaces,
 - 3) never manoeuvre the truck while the forks are elevated above the transport position as defined in the operator's manual(s),
 - 4) use a load backrest extension whenever necessary to prevent a load, or part of it, from falling toward the operator,
 - 5) reposition the truck and/or use frame levelling to position an elevated load only after lowering the load,
 - 6) handle only stable and properly arranged loads,
 - 7) operate with extra caution when handling off-centre loads that cannot be centred,
 - 8) handle only loads within the capacity of the truck and attachments, according to the appropriate load chart(s),
 - 9) use special care when manoeuvring after placing a load, because the risk of lateral overturning can be greater,
 - 10) ensure that the fork arms are reasonably horizontal and the truck is on a substantially firm smooth, level and stable surface,
 - 11) when using stabilizing devices, ensure that the landing surface is firm and capable of supporting the truck and the load;
 - 12) completely engage the load with the load engaging means, with a fork length that should be at least two thirds of load length, and
 - 13) not operate the frame levelling feature, if fitted, when the boom is elevated above the position recommended by the manufacturer.

5.6 Using attachments

When attachments are used to handle loads, the operator shall

- a) ensure that the attachment is properly secured and all locking devices are engaged,
- b) use care when securing, manipulating, positioning and transporting the load,
- c) operate a truck equipped with an attachment as a partially loaded truck when not handling a load,
- d) carefully tilt the load rearward to stabilize the load, and use extra caution when tilting high or segmented loads,