INTERNATIONAL STANDARD

ISO 11525-2

Second edition
2020-01

Rough-terrain trucks — Safe use requirements —

Part 2: Slewing variable-reach trucks

Chariots tout-terrain — Exigences pour l'utilisation en toute sécurité —

Partie 2: Chariots rotatifs à portée variable

Reference number
ISO 11525-2:2020(E)

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Published in Switzerland

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

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

This second edition cancels and replaces the first edition (ISO 11525-2:2015) which has been technically revised.

The main changes compared to the previous edition are as follows:

— requirements related to training have been moved to ISO 23676[1)];

— operator qualifications and requirements for an operator to be trained have been merged;

— requirements related to refuelling have been added.

A list of all parts in the ISO 11525 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

1) Under preparation. (Stage at the time of publication: ISO/DIS 23676:2019.)

Introduction

Slewing variable-reach trucks (as defined in ISO 10896-2) are known by a variety of terms including "rotating telehandlers" and "multi-purpose rotating handlers".

For unique applications, these trucks can be equipped with a variety of attachments (for example, jibs, winches, jibs with a winch and clamp, mowers and sweepers).

Users need to take into consideration that certain features and characteristics of these trucks are unique and require specific methods for use and training of operators. In addition to general user requirements, these specific methods are also covered in this document.

Rough-terrain trucks — Safe use requirements —

Part 2: Slewing variable-reach trucks

1 Scope

This document specifies requirements for application, inspection, training, maintenance, repair and safe operation (herein referred to as safe use) of slewing variable-reach rough-terrain trucks (herein referred to as trucks), as defined in ISO 10896-2.

It is intended to achieve the following:

— the prevention of personal injuries, property damage and accidents;

— the establishment of criteria for inspection, maintenance and operation;

— the establishment of operator training requirements.

The safe use requirements for non-slewing trucks, the interface between rough-terrain trucks and integrated personnel work platforms that can be fitted to rough-terrain trucks and the handling of freely suspended loads with rough-terrain trucks are covered by the other parts of the ISO 11525 series.

The safe use requirements for non-integrated personnel work platforms are covered in ISO 18479-2.

This document is not applicable to lorry-mounted trucks.

This document is not applicable to mobile cranes.

NOTE National or local requirements can apply.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 10896-2, *Rough-terrain trucks — Safety requirements and verification — Part 2: Slewing trucks*

ISO 11525-1, *Rough-terrain trucks — Safe use requirements — Part 1: Variable-reach trucks*

ISO 23676, *Rough-terrain trucks — Operator training — Content and methods (under development)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10896-2, ISO 11525-1and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
normal access/egress configuration
configuration of the truck on tyres, with its slewing structure in the forward aligned position, with stabilizing devices in transport position and with the boom lowered and fully retracted

4 General requirements

4.1 Principles

4.1.1 This document 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.

4.1.2 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 the truck and any attachment(s).

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

4.1.4 The user shall take reasonable measures to ensure that the operator's mental or physical condition does not impair their ability to operate the truck.

4.1.5 In addition to specific training, application selection and operation of the truck, the user shall take the following characteristics for trucks that slew into consideration:

— these trucks are primarily designed for handling supported loads on forks;

— the slewing movement of the upper structure can reduce the need for frequent repositioning of the truck;

— other attachments can be fitted.

4.1.6 The user shall take reasonable measures to ensure that the safe use requirements are being applied during operation.

4.2 Operator's manual(s)

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

4.2.2 The user, the operator, or both shall refer to the responsible entity if doubt arises on either the use of the truck or the interpretation of the operator's manual.

4.3 Modifications or alterations

4.3.1 Except as provided below, no modifications or alterations to a truck that can 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, operator's manual(s) and any training, if required.

4.3.2 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 ISO 10896-2 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 and training

4.5.1 Users shall allow only competent and authorized persons to operate a truck and are responsible to ensure that the operator has been trained in accordance with ISO 23676.

4.5.2 The operator shall also 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.

4.5.3 The user shall ensure that the operator is familiar with worksite rules and layout, working conditions, handing of load found at the workplace and local emergency procedures.

4.6 Inspection and maintenance

4.6.1 General

4.6.1.1 The inspection and maintenance of trucks shall be performed in accordance with the manufacturer's and user's recommendations. This includes:

a) a planned system for scheduled inspection, lubrication, maintenance and adjustment;

b) verification that only competent and authorized persons are permitted to maintain, repair, rebuild, adjust and inspect trucks, in accordance with the manufacturer's recommendations.

4.6.1.2 The user shall ensure that inspections and maintenance operations are conducted in an authorized area where safe clearances exist.

4.6.2 Preparation for inspection or repair

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

— park the truck on a firm, level surface;

— set the direction control in neutral, apply the parking brake, switch off the engine or power system and remove the device (for example, key, magnetic card) that prevents starting without the use of such a device;

— apply means to ensure the truck remains stationary (for example, wheel chocks and setting of a park brake);

— implement manufacturer-approved methods/devices as outlined in the operator's manual(s) to prevent unintentional movement of the truck/components before working on or around it;

— eliminate the possibility of unintentional fluid escape before any part of that system is disconnected;

— disconnect the battery before working on the electrical system, as directed by the manufacturer;

— eliminate the possibility of an unintentional stored energy release (for example, from the accumulator or hydraulic system);

— use the appropriate personal protective equipment.

4.6.3 Performance checks

4.6.3.1 Prior to conducting the performance checks, the user shall ensure that the pre-operation inspection has been properly performed as per the manufacturer's instructions and a record kept of the check.

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

4.6.3.3 Before starting the performance check, the operator shall:

a) check that no persons are placed at risk;

b) be in the normal operating position using the operator restraint (for example, seat belt);

c) apply service and parking brakes;

d) disengage the clutch, if the truck is so equipped;

e) place directional control(s) in neutral;

f) start the engine or power system.

4.6.3.4 The operator shall check that all control systems (for example, load-handing means, steering and brakes) and safety devices are functioning in accordance with the manufacturer's instructions.

4.6.3.5 Before exiting the truck, the operator shall:

a) stop the truck;

b) fully lower the load-handling means and set the truck in the normal access/egress position;

c) place directional control(s) in neutral;

d) apply the parking brake;

e) shut down the engine or power system;

f) remove the device (for example, key, magnetic card) that prevents starting without the use of such device.

4.6.4 Inspection and maintenance precautions

The user shall ensure that the following precautions are taken when inspection and maintenance is performed.

— Avoid fire hazards and ensure that appropriate 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 (for example, welding of structures) or adjustments 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 up 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 document or the operator's manual.

— Be aware of national and local environmental regulations for managing waste oils, filters or any other source of environmental pollution.

4.6.5 Inspection and maintenance requirements

The user shall ensure that:

a) brakes, steering mechanisms, control mechanisms, warning devices, guards and safety devices, lift, reaching, levelling mechanisms, slewing upper structure brake, axle stops and frame members are carefully inspected and maintained in a safe operating condition;

b) if the truck and components are designed and approved for hazardous area operation, they receive special attention from a competent person 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 corresponding values given in ISO 10896-2:2016, 5.5;

e) truck safety, load chart, 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 approved by the truck manufacturer;

h) if any repairs that could affect the safe use of the truck 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;

k) fork arms are inspected, repaired or replaced in accordance with ISO 5057;

l) all fluids (for example, mechanism lubricant, hydraulic oils and brake fluid) have been checked and are at appropriate level(s);

m) records, including the name of the person responsible and the date of the periodical inspection, and/or maintenance are kept.

NOTE Local regulations can also apply.

4.7 Hazardous environments

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

4.7.2 To operate in the proximity of overhead electric lines, the user shall inform the operator about the minimum safe distance and all the necessary precautions to be taken.

NOTE Specific national or local regulations can apply for operation in potentially explosive atmosphere or underground.

4.8 Refuelling

4.8.1 When refuelling, the operator shall follow the instructions provided by the manufacturer in the operator's manual.

4.8.2 Trucks shall be refuelled in an area specified by the user. This area shall be ventilated to minimize the accumulation of flammable gases.

4.8.3 Care shall be taken to ensure that no fuel is spilled.

4.8.4 The engine shall not be restarted until the fuel-filling equipment has been removed from the truck, the filler cap has been replaced on the tank and any spilled fuel or additives have been disposed of.

5 Operating safety rules and precautions

5.1 Operator's responsibility for safety

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

5.1.2 The operator shall follow safe working practices and shall be aware of hazardous conditions, utilizing all means, including those provided by the user, to protect themself, other personnel in the area, the truck, and the local environment.

5.1.3 The operator shall understand the operation, identification and functions of all controls and instruments for various slewing configurations (for example, forward aligned and non-aligned positions greater than 90°) before operating the truck.

5.1.4 The operator shall understand the load charts, affixed to the truck, for various slewing configurations, on stabilizers/outriggers (maximum and minimum extension) and on tyres. This shall include any attachments that are used.

5.1.5 The operator shall know the mass and the load centre distance of the load before approaching the load.

5.1.6 The operator shall look for of any overhead obstructions (for example, overhead power cables) and maintain a safe distance from them.

5.2 Visual inspection and functional tests

5.2.1 Before its use each day or at the beginning of each shift, the operator shall ensure that the truck is subjected to a visual inspection and functional tests, including:

— operating and emergency controls, if fitted;

— safety devices;

— seat assembly and seat belt;

— lights (if so equipped);

— brakes;

— lift and levelling systems, load-handling means, chains, wire ropes and limit switches;

— personal protective equipment (PPE);

— fork arms and the attachment means;

— 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;

— hydraulic oil and other fluids level;

— optional equipment (for example, remote control);

— other items specified by the manufacturer.

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

5.2.3 The operator shall report the results of the visual inspection and functional tests to the user.

5.3 General operating instructions

5.3.1 The operator shall enter and exit the normal operating position with the truck in normal access/egress configuration by using the appropriate means of access providing three points of contact.

5.3.2 The operator shall:

a) before starting to operate the truck:

   1) be in the normal operating position-using the operator restraint (for example, seat belt);

   2) apply service and parking brakes;

   3) disengage the clutch, if so equipped;

   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 part of the truck (for example, the lower chassis upper surface) or any place other than the normal operating position or the remote-control position (if equipped);

c) never put any part of the body, including hands and feet:

   1) outside the operator's compartment except when entering or exiting;

   2) into the load-handling structure;

   3) between the load-handling structure, the stabilizers, the slewing upper structure and the truck; and

   4) within the reach mechanism or attachments of the truck;

d) understand the fundamental characteristics (see 4.1) and the limitations of the truck;

e) not drive a truck directly up to anyone;

f) not use attachments differently from those purposes specified in the manufacturer's instructions;

g) safeguard co-workers/bystanders at all times and exercise particular care during reversing and other operations (especially when not in the travel position) during which they can step into the path of travel of the truck;

h) not allow anyone to stand or pass under the elevated load-handling structure of the truck, whether empty or loaded;

i) not permit anyone to stand in, sit or ride on any part of the truck (for example, the lower chassis upper surface), 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 their 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;

j) check clearance carefully before driving under obstructions, (for example, electrical lines and bridges);

k) check for underground utility services before using ground-engaging attachments;

l) take reasonable steps to minimize the environmental impact of using the truck;

m) take into account the effects of weather (for example, wind, rain and snow) on the safe operation of the truck;

n) before leaving the normal operating position:

   1) bring the truck (see 5.4) to a complete stop;

   2) place directional control in neutral;

   3) apply the parking brake;

   4) bring the truck to normal access/egress position for exiting and entering and position forks or other attachments flat on the ground; and

   5) in addition, when leaving the truck unattended (see NOTE), stop the engine or other power source and remove the device (for example, key, magnetic card) that prevents starting without the use of such device;

o) maintain a safe distance from the edge of ramps, platforms and other working surfaces;

p) in areas classified as potentially hazardous, use only trucks approved for use in those areas;

q) report all accidents involving personnel, building structures and equipment to the supervisor or as directed;

r) not block access to fire exits, stairways or fire equipment, or park closer than 1,8 m to a railway line and maintain safe distances from drop-offs (for example, excavations and ditches);

s) maintain the appropriate minimum safe distance from energized power lines.

NOTE A truck is unattended when the operator is 7,6 m or more from the normal operating position or whenever the normal operating position is not in the operator's view.

5.3.3 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 operator shall immediately report the matter to the user's designated authority. The truck shall not be operated until it has been restored to a safe operating condition.

5.4 Travelling

The operator shall:

a) set the truck in the forward aligned position, with only forward-axle steering and apply boom and slewing control devices disabling the upper structure locking system before travel on public roads or when moving between worksites;

b) not engage the differential lock on trucks so equipped to avoid loss of steering control when driving on roads at high speeds or when turning;

c) be aware of 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 co-workers/bystanders 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 or the aid of an assistant and always make sure that the reverse path is clear of personnel and obstructions before travelling;

j) tilt back and raise the load and load-handling means to the manufacturer's specified travel position 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 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) on a side slope, never rotate the upper structure;

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;

t) before travelling on public roads, set the truck in the forward aligned position and lock the rotating upper structure with the appropriate locking means;

u) travel with the rotating upper structure at a slewing angle not greater than 90° from either side of the longitudinal axis of the truck;

v) ensure that the stabilizers are secured in the stowed position.

5.5 Picking and placing loads

The operator shall:

a) before starting to pick or place a load:

   1) know or determine the mass 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 both longitudinally and laterally within the manufacturer’s requirements, (for example by using stabilizing devices, frame levelling or both) before raising the boom or rotating the upper structure, with or without a load;

   4) follow the manufacturer’s instructions for operating stabilizer controls, if so equipped, as improper use of these controls can cause the truck to overturn;

   5) when using stabilizing devices, ensure that the supporting surface is firm and capable of supporting the truck and the load;

