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Rough-terrain trucks — Operator training — Content and methods

Chariots tout-terrain — Formation de l'opérateur — Contenu et méthodes

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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).

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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*.

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.

Rough-terrain trucks — Operator training — Content and methods

1 Scope

This document provides information to prepare training materials and to administer training for operators of rough-terrain trucks (herein referred to as trucks).

It is applicable to trucks, as defined in ISO 10896-1, ISO 10896-2 and ISO 20297-1.

It is applicable to the handling of suspended loads covered in ISO 10896-4 and the use of non-integrated personnel work platforms covered in ISO 18479-1.

This document does not cover authorization or training requirements related to a specific worksite (for example, site rules, emergency procedures, safety systems of work).

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

ISO 10896-2, *Rough-terrain trucks — Safety requirements and verification — Part 2: Slewing trucks*

ISO 10896-4, *Rough-terrain trucks — Safety requirements and verification — Part 4: Additional requirements for variable-reach trucks handling freely suspended loads*

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

ISO 11525-2, *Rough-terrain trucks — Safe use requirements — Part 2: Slewing trucks*

ISO 11525-4, *Rough-terrain trucks — User requirements — Part 4: Additional requirements for variable-reach trucks handling freely suspended loads*

ISO 18479-1, *Rough-terrain trucks — Non-integrated personnel work platforms — Part 1: Design, safety requirements and verification*

ISO 20297-1, *Industrial trucks — Lorry-mounted trucks — Part 1: Safety requirements and verification*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10896-1, ISO 10896-2 ISO 10896-4, ISO 18479-1 and ISO 20297-1 and 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
trainer
competent person (3.8) who conducts the training of the *operator* (3.4)

3.2
trainee
person who is being trained to become an *operator* (3.4)

3.3
user
person or entity responsible for assigning an *operator* (3.4) to operate a truck and specifying the tasks to be performed

[SOURCE: ISO 11525-1:2020, 3.2]

3.4
operator
person who controls the operation of the truck

[SOURCE: ISO 11525-1:2020, 3.3]

3.5
examiner
competent person (3.8) who tests the competency of the *trainee* (3.2)

Note 1 to entry: The *trainer* (3.1) and the *examiner* (3.5) can be the same person.

3.6
familiarization
necessary information provided to the *operator* (3.4) for the specific truck to be used, as equipped, regarding the features, functions, devices, limitations, and operating characteristics as defined by the manufacturer in the operator's manual including the location of the manufacturer's operator's manual

3.7
examination
re-examination
testing of the *operator's* (3.4) proficiency in, and retention of, the subject matter covered in both the theory and operational portions of the training or retraining of the *operator* (3.4)

3.8
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

[SOURCE: ISO 11525-1:2020, 3.4]

4 Safe use of the truck

The requirements on safe use of trucks in ISO 11525-1, ISO 11525-2, ISO 11525-4, as applicable, shall apply.

5 Requirements for training and familiarization of operators

5.1 General

5.1.1 A trainee shall operate the truck only as part of the operator training programme. This training shall be conducted under the direct supervision of a trainer who meets the requirements of 5.2.

5.1.2 Training shall be given on all types of trucks and attachments that the operator is required to operate.

NOTE Operators with some experience in operating trucks or relevant experience in operating similar equipment can need less extensive training than operators with no experience.

5.1.3 The operator training programme shall include the contents of training (see Clause 6) and shall be based on user policies, industry standards 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.

5.2 Selection of trainer

5.2.1 The competency of the trainer shall include instructional techniques and skills' assessment relevant to trucks.

5.2.2 The trainer shall only give instruction on types of trucks and attachments for which they are competent. The trainer shall have experience to enable them to put their instruction in context and knowledge of the working environment in which the trainee is expected to operate.

5.3 Practical (hands-on) training environment

5.3.1 Training shall be given at a venue with an appropriate surface and obstacles representative of the anticipated conditions in which the truck will be used.

5.3.2 Training shall be given with loads (for example, loaded and unloaded pallets, bags, sacks, bales, drums, bulk materials) representative of anticipated loads the operator will be handling.

5.3.3 There shall be appropriate facilities for simulating loading and unloading at various heights.

5.3.4 The practical (hands-on) training environment shall be free from other moving equipment and personnel traffic. Warnings such as flags, roped off areas, barricades, or flashing lights shall be used when appropriate.

5.3.5 The trainer shall verify that a risk assessment has been made for each location where a practical test is to be given.

5.3.6 While training is in progress, access to this area shall be restricted to the trainer and trainees. Trainers and trainees, together with the truck and loads, shall be segregated from normal commercial operations while training is in progress.

5.3.7 Trucks used for training shall be properly maintained per the manufacturer's specifications and suitable for the particular application/environment in which they will be used.

6 Contents of training

6.1 General training requirements

6.1.1 The training shall emphasize safe and proper operation that avoids injury to the operator and others and prevents property damage.

6.1.2 The operator shall be trained in the following:

a) information about the truck(s):

1) characteristics of this type of truck, including possible variations between these trucks and other equipment (for example mobile elevating work platforms, cranes) in the workplace;

2) selection of an appropriate truck;

3) significance of information plates, load charts, warnings and instructions affixed to the truck;

4) location of the truck's operator's manual(s), and operating and safety instructions in the truck's operator's manual;

5) instructions for inspection and maintenance to be performed by the operator;

6) identification of the basic construction and main components of the truck, including its principles of operation;

7) safety features (for example, seat belt, emergency stop controls, warning devices);

8) engine operation, if equipped;

9) type of drive system and its characteristics;

10) methods of steering and manoeuvring;

11) braking methods and characteristics, with and without loads;

12) direct visibility, indirect visibility (for example, use of mirrors) and areas with restricted visibility, with and without loads;

13) load charts, how to read and comprehend them and the limitations of the load chart due to the mass and load centres;

14) stability characteristics including:

a) centre of gravity of the load and the truck;

b) combined load centre of gravity;

c) counterbalance principle (for example, boom extension);

d) stability triangle and trapezoid;

e) dynamic effects due to speed, acceleration, braking, raising or lowering loads while travelling, operation/manoeuvring without loads, sharp cornering, and suspended loads;

f) pneumatic tyre pressure, if applicable;

g) attachments;

15) controls and instrumentation, including their location, function and method of operation, and the identification of symbols;

16) load-handling capabilities and proper use of forks and other load bearing or non-load carrying attachments;

17) refuelling/recharging;

18) guards and protective devices for the specific type of truck, including the role of ROPS/FOPS structure;

19) stabilizing devices, chassis levelling and other stability-related functions, if equipped, and examples of improper operation and the risks associated with them;

20) personal protective equipment (PPE);

21) wheel loadings when loaded and unloaded;

22) types of attachments and their applications/limitations;

23) start-up and shut-down procedure, including sequence of operations; and

24) other characteristics, if any, of the particular truck;

b) operation and worksite-related topics:

1) assessment of the risks related to the task to be performed and the worksite where these tasks will be performed, including daily worksite inspections;

2) correct entering and exiting the truck in normal operation and the need to always maintain three points of contact, in other words, one hand and two feet or two hands and one foot;

3) surface conditions on which the truck is to be operated, loaded and unloaded, for example floor and ground conditions, ground pressure, ramps and inclines, trailers;

4) load handling at height and at ground level;

5) levelling of the truck prior to picking and placing loads;

6) traffic hazards (for example, co-workers/bystanders, pedestrians, vehicles, other equipment in areas in which the truck is to be used);

7) confined-area operations;

8) potentially hazardous locations where the truck will be operated;

9) ramps and gradients and how the stability of the truck can be affected by them;

10) enclosed environments and other areas where insufficient ventilation can result in a concentration of carbon monoxide gas from the engine exhaust, if applicable;

11) other unique or potentially hazardous environmental conditions at the worksite that can affect other workers and the safe operation of the truck;

12) load handling in a stationary position;

13) travel of the unladen truck to the appropriate location, stabilization, loading, chassis levelling, slewing, lifting, extending, retracting, lowering;

14) load picking and carrying in accordance with specific manufacturer's instructions;

15) emergency situations (for example, stopping in an emergency, emergency egress);

16) basic steps to be taken in the event of a tip-over (for example, bracing for impact);

17) remote-controlled operations, if applicable;

18) overhead obstacles;

19) parking, shut-down procedures and procedures to prevent unauthorized use; and

20) the effects of driving under the influence of certain substances (for example, drugs, alcohol, medication), and the risks related to the use of devices that can cause a distraction (for example, mobile phone, radio);

c) practice:

1) explanation of the truck components and safety devices;

2) maintenance and daily checks given in the operator's manual and regular periodical inspections;

3) driving of the truck in a designated test area; and

4) operation of the truck to highlight appropriate manoeuvres to be performed with the truck laden and unladen (for example, chassis levelling, load handling in a stationary position).

NOTE Local conditions or manufacturer's instructions can require that other subjects be added.

6.2 Additional training requirements specific to slewing trucks

In addition to the requirements of 6.1, the operator shall be trained in the following information about the truck(s):

a) significance of load charts (maximum and minimum extension of the outriggers, aligned or non-aligned positions, slewing range) affixed to the truck;

b) how handling and travelling with a freely suspended load affects the truck capacity and the significance of the load chart for freely suspended loads applicable to the specific truck and attachment combinations;

c) methods of steering and manoeuvring in aligned position and for slewing angles greater than 90°;

d) load charts, how to read and comprehend them and the limitations of the load chart due to the mass and load centres and slewing positions;

e) explanation of the stability characteristics (combination of longitudinal and lateral configuration) in different conditions affected by load handling (raising, lowering and slewing), stabilizing device configuration and slewing position, operation/manoeuvring without loads, height, attachments, grade/ramps, centre of gravity of the load and centre of gravity of the truck, combined load centre of gravity, counterbalance principle, use of suspension system;

f) controls and instrumentation, including their location, identification, function and method of operation for different slewing configurations (forward aligned or non-aligned positions greater than 90°), and the identification of symbols; and

g) use of upper slewing structure locking pin for transportation.

6.3 Additional training requirements specific to lorry-mounted trucks

In addition to the requirements of 6.1, the operator shall be trained in the following mounting and dismounting techniques and practices with the carry vehicle:

a) use of the mounting kit including mounting and dismounting;

b) electrical connections between the lorry-mounted truck and carry vehicle; and

c) use of truck to mounting kit securing devices.

6.4 Additional training requirements specific to handling freely suspended loads

In addition to the requirements of 6.1, the operator shall be trained in the following information about the truck(s):

a) how handling and traveling with a freely suspended load affects the truck's stability (for example, operation on slopes, fast and sudden movements);

b) how handling and travelling with a freely suspended load affects the truck capacity and the significance of the load chart for suspended loads applicable to specific truck and attachment combinations;

c) how to minimize the hazards associated with the movement of the freely suspended load during handling and traveling (for example, tethering, boom position, gradual boom movements, slow travel speed);

d) potential hazards around a freely suspended load (for example, collisions, crushing, falling objects);

e) unapproved applications for freely suspended loads (for example, lifting of personnel);

f) additional training requirements outlined by the truck manufacturer (for example, signalling, rigging/slinging); and

g) selection of an appropriate approved attachment.

6.5 Additional training requirements specific to using a non-integrated personnel work platform (PWP)

In addition to the requirements of 6.1, the operator shall be trained in the following:

a) information about the non-integrated PWP:

   1) confirmation that the non-integrated PWP has been approved for use with the truck;

   2) significance of information plates, load charts, warnings and instructions affixed to the non-integrated PWP;

   3) guards and protective devices specific to the non-integrated PWP;

   4) how to correctly use personal protective equipment (PPE) and operator restraints and other safety devices specific to the non-integrated PWP;

   5) correct entering and exiting the non-integrated PWP; and

   6) other characteristics, if any, of the particular non-integrated PWP;

b) information about the coupling/decoupling of a non-integrated PWP to a truck:

   1) specific operating and safety instructions in the truck's operator's manual; and

   2) specific inspections and maintenance that may need to be performed by the operator;

c) operation and worksite-related topics:

   1) restrictions on the use of a non-integrated PWP;

   2) all components of the interface, including the quick coupling device, if fitted, need to be in place and operating properly in accordance with the manufacturer's instructions;

   3) the non-integrated PWP needs to be securely attached to the truck prior to use;

   4) the non-integrated PWP engagement system needs to be securely in place at all attaching points;

5) the locking system needs to be in place and the engagement system needs to be retained;

6) prior to uncoupling the interface from the truck;

   a) there are no occupants in the non-integrated PWP;

   b) the non-integrated PWP is on the ground;

   c) there is sufficient clearance around the truck and non-integrated PWP;

7) recovery in the event of an incident or failure;

8) restrictions on manoeuvring while carrying persons in a non-integrated PWP;

9) requirements for person(s) being lifted on the non-integrated PWP [for example, training, authorization, use of personnel protective equipment (PPE)];

10) system of communication used between the operator and person(s) on the non-integrated PWP; and

11) any restrictions and guidance on the use of non-integrated PWP.

6.6 Additional training requirements specific to using a remote control

In addition to the requirements of 6.1, the operator shall be trained in the following:

a) information about the remote control:

   1) significance of information plates, warnings and instructions affixed to the remote control; and

   2) controls (including emergency controls), indicator lights and instrumentation specific to the remote control, including their function and method of operation, and the identification of symbols;

b) operation and worksite-related topics:

   1) assessment of the specific risks related to the use of a remote control;

   2) simultaneous use of a remote control and normal operator controls is not possible;

   3) the maximum distance from which the remote-control operator can control the truck;

   4) maintaining line of sight when using a remote control;

   5) maintaining a safe distance from the truck during remote operation (for uses that present a hazard to the remote-control operator when direct vision is used); and

   6) specific start-up and shut-down procedures and safe practice when using the remote control.

6.7 Familiarization

Before operating a particular truck make or model, a competent person shall familiarize the operator in:

a) the location of the operator's manual(s) on the truck;

b) the manufacturer's specific warnings and instructions;

c) the control functions specific to the particular truck;

d) the function of each safety feature specific to the particular truck;

e) the operating characteristics specific to the particular truck; and

f) inspection and maintenance to be performed by the operator specific to the particular truck.