
**Industrial trucks — Safety rules
for application, operation and
maintenance**

*Chariots de manutention — Règles de sécurité pour les applications,
l'utilisation et la maintenance*

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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.

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 2, *Safety of powered industrial 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.

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Industrial trucks — Safety rules for application, operation and maintenance

1 Scope

This document gives safety requirements for the application, operation, maintenance, transport, tow, assembly and storage of industrial trucks (hereafter referred to as trucks) as defined in ISO 5053-1.

It applies to the following truck types:

- a) counterbalance lift trucks;
- b) reach trucks (with retractable mast or retractable fork arm carriage);
- c) straddle trucks;
- d) pallet-stacking trucks;
- e) platform trucks;
- f) double stackers;
- g) side-loading trucks (one side only);
- h) lateral-stacking trucks (both sides), and lateral- and front-stacking trucks;
- i) order-picking trucks;
- j) bidirectional and multidirectional trucks;
- k) counterbalance container handlers;
- l) articulated counterbalance lift trucks;
- m) variable-reach trucks;
- n) pallet trucks;
- o) platform and stillage trucks;
- p) tractors with a drawbar pull up to and including 20 000 N;
- q) burden and personnel carriers;
- r) trucks powered by battery, diesel, gasoline or gas (e.g. LPG, CNG, LNG).

Automated functions and driverless variants of the above list of trucks are also considered part of this scope.

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 3691-1, *Industrial trucks — Safety requirements and verification — Part 1: Self-propelled industrial trucks, other than driverless trucks, variable-reach trucks and burden-carrier trucks*

ISO 3691-4, *Industrial trucks — Safety requirements and verification — Part 4: Driverless industrial trucks and their systems*

ISO 5053-1, *Industrial trucks — Terminology and classification — Part 1: Types of industrial trucks*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5053-1 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

user

owner or hirer of trucks

3.2

operator

designated person, appropriately trained and authorized, who is responsible for the movement and load handling of a truck

Note 1 to entry: Depending on the truck type, the operator can be riding on the truck, on foot accompanying the truck (e.g. tiller-, cable-controlled) or remote from the truck (e.g. remote radio-controlled) or initiating automatic/driverless operations.

Note 2 to entry: If a driverless truck, the operator shall be the person appropriately trained and authorized to start automatic operation(s) of the truck.

3.3

hazard zone

danger zone

any space within and/or around machinery in which a person can be exposed to a hazard

Note 1 to entry: The zone which can be reached by goods, operating equipment or load carrying devices in the process of lowering or falling also belongs to hazard zone.

Note 2 to entry: If a driverless truck system is in use, the areas in which the truck(s) operate may be classified as operating, operating hazard or restricted.

[SOURCE: ISO 12100:2010, 3.11, modified — Notes 1 and 2 to entry have been added.]

3.4

trainer

person who conducts the training of the *operator* (3.2)

3.5

narrow aisle

traffic path for trucks where the limited distance between the outer parts of the truck including the load and fixed parts of the environment (e.g. racking) is a hazard

3.6

automated function

movement for transport or positioning of the truck and/or load initiated by the *operator* (3.2) but not requiring continued action by the operator

[SOURCE: ISO 24134:2006, 3.1]

3.7**driverless truck**

powered truck, designed to operate automatically to transport loads

Note 1 to entry: Driverless trucks can have a manual mode where all operations are under the control of an operator (3.2).

[SOURCE: ISO 3691-4:2020, 3.7, modified — In the term, "industrial" has been omitted and Note 1 to entry has been added.]

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]

3.9**unattended**

truck situation where the operator (3.2) is 7 m or more from the normal operating position and the truck remains in the operator's view, or the operator leaves the truck and it is not in the operator's view

4 Basic requirements**4.1 General requirements**

4.1.1 The user shall specify and use the appropriate truck and equipment for the processes and operating environment. The user shall ensure that all information plate(s) (e.g. capacity) and markings are in place and are maintained in a legible condition.

4.1.2 The truck shall be used, operated and maintained in accordance with the manufacturer's instructions.

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4.1.3 Only trucks of types approved for use in potentially explosive atmospheres shall be used in those environments.

4.1.4 If trucks are used in special areas, such as cold storage or public roads, additional requirements can apply.

4.1.5 Additional measures or equipment for fire protection may be requested by the user of the truck according to the environment(s) in which the truck is used.

4.1.6 The user shall ensure trucks used in work environments subject to hazard from static electrical discharge are equipped with anti-static devices.

4.1.7 When damage, or other defects which affect safety on a truck or attachment, is detected, the truck shall be taken out of service immediately. Trucks and attachments which are not safe to operate shall not be put into service until they have been properly repaired.

NOTE It is considered good practice to place temporary warnings to trucks indicating they are not safe to operate.

4.1.8 The user shall assess noise emissions to operator and other persons.

4.1.9 Except as in [Clause 9](#), no person shall be permitted to stand or pass under the elevated part of any truck, regardless of whether the truck is laden or unladen.

4.1.10 Except as in [Clause 9](#), no person shall allow any part of their body, such as arms, legs or head, to be put between working parts of the truck (e.g. mast).

4.1.11 The user shall provide monitoring and controls of the operating environment to ensure the safety of persons around the truck and the safe operation of truck (see [Annex A](#)).

4.1.12 The operator shall be trained in the operation of the truck including any attachments and any automated functions, and shall operate according to the manufacturer's operating instructions.

4.1.13 The operator shall be trained regarding their obligations and be familiar with all the safety information including operating instructions of the truck.

4.1.14 The user shall designate the person(s) responsible for supervising truck operator(s). The person(s) responsible for supervising powered truck operator(s) shall be trained in how to apply actions that:

- reinforce operator safety rules and practices; and
- correct unsafe operator behaviour or performance that does not conform to the requirements in [4.2](#).

4.1.15 The user shall not allow unauthorized persons to use the truck and shall take measures to prevent this (e.g. instruction for the operator on how to leave the truck).

4.2 General requirements for the operator

4.2.1 The operator shall pay attention to the operating environment, including other persons, and fixed or movable objects in the vicinity of the truck and truck travel path.

4.2.2 If the operator's compartment floor height is 300 mm or higher, the operator shall use 3-point contact, such as maintaining contact with one hand and two feet or two hands and one foot at all times, when mounting or dismounting a truck. Keep hands free of items (e.g. food, beverage, tools, phones).

4.2.3 The operator shall always face the truck when getting on or off the truck.

4.2.4 The operator shall wear the protective equipment necessary for the specific type and operating conditions of the truck (e.g. safety footwear).

4.2.5 When leaving the truck, except pedestrian-propelled trucks, the operator shall secure it against unauthorized use.

4.2.6 Self-propelled trucks shall not be used to transport passengers unless they are specially equipped for this purpose and the number of permissible passengers on the truck shall not be exceeded.

4.2.7 Before starting the truck, the operator shall ensure that there are no persons in the hazard zone. When operating the truck, a warning signal shall be given if persons are in danger. The operator shall stop operating the truck immediately if persons do not leave the hazard zone despite an appropriate warning.

4.3 Training program

4.3.1 Personnel who have not been trained to operate powered trucks may operate a truck for the purposes of training only, and only under the direct supervision of the trainer. This training should be conducted in an area away from other trucks, obstacles, and pedestrians.

4.3.2 The training program shall emphasize safe and proper operation to avoid injury to the operator and others and prevent property damage, and shall cover the following areas:

- a) fundamentals of the powered truck(s) the trainee will operate, including:
 - characteristics of the powered truck(s) and attachments, including variations between trucks in the workplace;
 - differences between automobiles and trucks;
 - significance of nameplate data, including rated capacity, warnings, and the instructions affixed to the truck;
 - operating instructions and warnings in the manufacturer's instruction handbook for the truck, and instructions for inspection and maintenance to be performed by the operator;
 - type of motive power and its traction characteristics;
 - method of steering;
 - braking method and characteristics, with and without load;
 - visibility, with and without load, forward and reverse;
 - load handling capacity, weight and load centre;
 - stability characteristics with and without load, with and without attachments;
 - controls – location, function, method of operation, identification of symbols;
 - load handling capabilities, forks, attachments;
 - hazards due to production of carbon monoxide by internal combustion engines and common initial symptoms of exposure;
 - refuelling and battery charging;
 - guards and protective devices for the specific type of truck;
 - other characteristics of the specific truck;
 - what to do in an emergency (e.g. tip-over, off-dock);
 - where installed, automated functions and their characteristics and basic operating principles;
 - the procedure and sequence of operation for start-up and shut-down of the truck;
- b) operating environment and its effect on truck operation including, as appropriate:
 - floor or ground conditions including temporary conditions;
 - ramps and inclines, with and without load;
 - trailers, railcars and dockboards (including the use of wheel chocks, jacks, and other securing devices);
 - refuelling and battery charging facilities;
 - the use of “classified” trucks in areas classified as hazardous due to risk of fire or explosion, as appropriate;
 - narrow aisles, doorways, overhead wires and piping, and other areas of limited clearance;
 - areas where the truck may be operated near other powered trucks, other vehicles, or pedestrians;