

INTERNATIONAL  
STANDARD

**ISO**  
**10658**

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**Industrial trucks operating in special  
conditions of stacking with load laterally  
displaced by powered devices —**

**Additional stability test**  
**(standards.iteh.ai)**

*Chariots de manutention travaillant dans des conditions de gerbage  
spéciales, avec la charge décentrée latéralement par un dispositif  
à moteur — Essai de stabilité supplémentaire*

<https://standards.iteh.ai/moteur/star/a9fa630d6ef1/iso-10658-1996>



Reference number  
ISO 10658:1996(E)

## 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.

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.

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International Standard ISO 10658 was prepared by Technical Committee ISO/TC 110, *Industrial trucks*, Subcommittee SC 2, *Safety of powered industrial trucks*.

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# Industrial trucks operating in special conditions of stacking with load laterally displaced by powered devices — Additional stability test

## 1 Scope

This International Standard specifies an additional test for the stability of a laden truck fitted with a load-handling device, such as a side shift, which can displace the centre of gravity a substantial predetermined amount from the longitudinal centre plane of the truck (see figure 1), and which is to be used in that mode for depositing and retrieving a load with the mast approximately vertical on substantially firm, smooth, level and prepared surfaces.

A substantial displacement is considered to be:

- more than 100 mm, for a truck with a rated capacity up to and including 6 300 kg (13 850 lb);
- more than 150 mm, for a truck with a rated capacity over 6 300 kg (13 850 lb) up to and including 10 000 kg (22 000 lb);
- more than 250 mm, for a truck with a rated capacity over 10 000 kg (22 000 lb) up to and including 20 000 kg (44 000 lb);
- more than 350 mm, for a truck with a rated capacity over 20 000 kg (44 000 lb) up to and including 50 000 kg (110 000 lb).

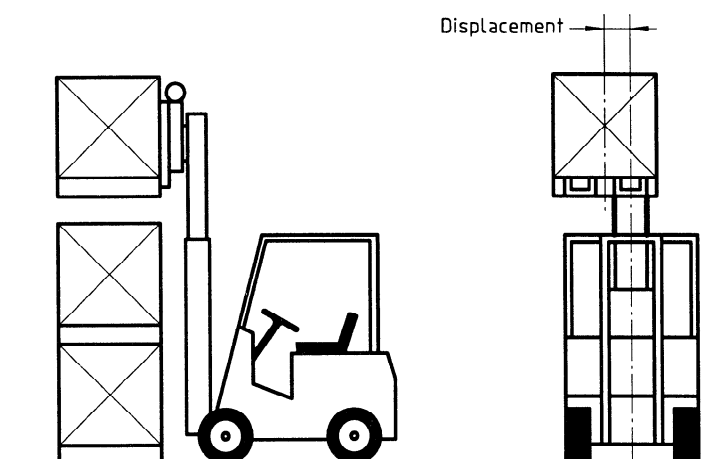


Figure 1 — Special conditions of stacking

This International Standard applies to the following trucks. The method specified is in addition to the stability tests applicable to each type of truck under normal operating conditions.

- a) Counterbalanced fork-lift trucks with tiltable or non-tiltable masts, up to and including 50 000 kg (110 000 lb) manufacturer's rated capacity.
- b) Reach (retractable mast or forks) and straddle fork-lift trucks with tiltable or non-tiltable masts, up to and including 5 000 kg (11 000 lb) manufacturer's rated capacity.
- c) Pallet stackers and high-lift platform trucks, with tiltable or non-tiltable masts, up to and including 5 000 kg (11 000 lb) manufacturer's rated capacity.

NOTE 1 The rated capacities given in pounds above, are not compatible with the US ranges of trucks which have different range breakpoints which may prevail in territories which do not use metric measurements.

This International Standard does not apply to trucks when handling loads which may swing freely.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1074:1991, *Counterbalanced fork-lift trucks — Stability tests*.

ISO 3184:—<sup>1)</sup>, *Reach and straddle fork-lift trucks — Stability tests*.

ISO 3691:1980, *Powered industrial trucks — Safety code*.

ISO 5766:1990, *Pallet stackers and high-lift platform trucks — Stability tests*.

## 3 Stability test

### 3.1 Test requirements

The stability of industrial trucks as specified in clause 1 shall be verified by means of one of the procedures described in 3.2. For trucks with a rated capacity up to and including 10 000 kg, the tilting platform test shall be used to verify stability in the event of a dispute.

### 3.2 Verification procedure

#### 3.2.1 Tilting platform

A test platform shall be used which can be tilted about one side. The truck being tested for stability is placed on the initially horizontal test platform.

For counterbalanced fork-lift trucks, the position of the truck on the test platform shall be as for test number 3 of ISO 1074:1991. The test conditions shall be in accordance with the requirements of ISO 1074.

For reach and straddle fork-lift trucks, pedestrian and rider controlled, the position of the truck on the test platform shall be as for test number 3 of ISO 3184:—. The test conditions shall be in accordance with the requirements of ISO 3184.

For pallet stackers and high-lift platform trucks, pedestrian and rider controlled, the position of the truck on the test platform shall be as for test number 3 of ISO 5766:1990. The test conditions shall be in accordance with ISO 5766.

The test shall be conducted to the side to which the truck is least stable. The mast shall be retracted and tilted fully rearward where the design permits. The test load (3.3) shall be displaced laterally in the direction of least stability to the fullest extent allowed by the mechanism and raised to the maximum elevation.

The test platform shall be tilted slowly to the slope specified in test number 3 of ISO 1074:1991, ISO 3184:—, or ISO 5766:1990, as appropriate for the type of truck.

The truck is considered stable if it does not overturn under the conditions of the test. For the purposes of this test, the onset of overturning is considered to occur at that test platform slope which, if increased, would cause overturning of the truck.

1) To be published. (Revision of ISO 3184:1974)

### 3.2.2 Fixed slope

Fixed slopes, with inclinations equivalent to the specified test slope shall be used. The slope surface shall be smooth and capable of supporting the truck weight without deformation likely to affect the test results.

Counterbalanced fork-lift trucks under test shall be driven onto the fixed slopes with mast lowered and the truck positioned in accordance with test number 3 of ISO 1074:1991. The test conditions shall be in accordance with the requirements of ISO 1074.

Reach and straddle fork-lift trucks, pedestrian or rider controlled, shall be driven onto the fixed slopes with mast lowered and the truck positioned in accordance with test number 3 of ISO 3184:— . The test conditions shall be in accordance with requirements of ISO 3184.

Pallet stackers and high-lift platform trucks, pedestrian and rider controlled, shall be driven onto the fixed slopes with the mast lowered and the truck positioned in accordance with test number 3 of ISO 5766:1990. The test conditions shall be in accordance with the requirements of ISO 5766.

The test shall be conducted to the side to which the truck is least stable. The mast shall be retracted and tilted fully rearward where the design permits. The test load (3.3) shall be displaced laterally in the direction of least stability to the fullest extent allowed by the mechanism, then elevated slowly and smoothly to the maximum elevation.

The truck is considered stable if it does not overturn under the conditions of the test. For the purposes of this test, the onset of overturning is considered to occur at that mast height which, if increased, would cause overturning of the truck.

### 3.2.3 Calculation

Compliance with the specified values may be determined by calculation.

Such calculated capacities shall allow for manufacturing tolerances and deflections of mast, tyres, etc.

### 3.3 Test load

The test load shall have a mass equivalent to the maximum load,  $Q$ , which the truck can elevate to its maximum lift height for the special conditions of this additional test, acting through the centre of gravity,  $G$ , nominally positioned at the standard load centre distance,  $D$ , as indicated on the information plate of the truck, both horizontally from the front face of the fork-arm shank and vertically from the upper face of the fork-arm blade. See figure 2.

When the mechanism which offsets the load is positioned centrally to the longitudinal centre plane of the truck, the centre of gravity,  $G$ , of the test load shall be on the centre plane between the mast uprights.

When a manufacturer has detailed other ratings on the capacity plate, another test shall be carried out with the maximum load at its corresponding height and also a test at the maximum height with its corresponding load.

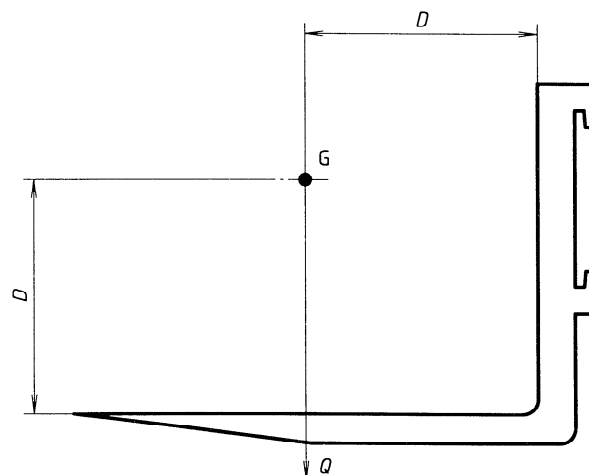


Figure 2 — Application of test load

### 3.4 Safety precautions

Precautions shall be taken to prevent the overturning of the truck or displacement of the test load during the course of the test. If the means for preventing the total overturning of the truck consist of rope lashing or chain, this shall be sufficiently slack to impose no appreciable restriction on the truck until the overturning point is reached.

Displacement of the test load shall be prevented by means such as:

- a) firmly securing the test load to the load carrier or equivalent structure;
- b) suspending the test load near the ground from an appropriate support placed on the fork so that the suspension point is at the point where the centre of gravity, G, of the test load would be if the test load were to be placed on the fork.

### 4 Stability test for trucks fitted with attachments

Trucks fitted with attachments shall be subjected to the stability test specified in clause 3, where appropriate.

The test loads and their positioning shall be as specified on the capacity plates of the truck equipped with the attachment concerned when used under the special conditions in accordance with the manufacturer's instructions.

The lift heights required in the test shall be measured between the surface of the tilting platform and the underside of the load or attachment, whichever is the smaller.

### 5 Marking

The special capacity, as determined by this additional stability test, shall be indicated on a plate as specified in ISO 3691:1980, subclause 5.4.

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