SLOVENSKI STANDARD
oSIST prEN 1459-1:2015

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Vozila za talni transport - Terenska vozila - Varnostne zahteve in preverjanje - 1. del: Vozila z mehanizmom za dviganje s spremenljivim dosegom

Rough-terrain trucks - Safety requirements and verification - Part 1: Variable-reach trucks

Geländegängige Stapler - Sicherheitstechnische Anforderungen und Verifizierung - Teil 1: Stapler mit veränderlicher Reichweite

Chariots tout-terrain - Exigences de sécurité et vérification - Partie 1: Chariots à portée variable

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English Version

Rough-terrain trucks - Safety requirements and verification - Part 1: Variable-reach trucks

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If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Page

Foreword

This document (prEN 1459-1:2014) has been prepared by Technical Committee CEN/TC 150 “Industrial Trucks - Safety”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1459:1998+A3:2012.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

EN 1459 consists of the following parts, under the general title Rough-terrain trucks — Safety requirements and verification:

Part 1: Variable-reach trucks

Part 2: Slewing variable-reach trucks

Part 3: Additional requirements for variable-reach trucks fitted with work platform

Part 4: Additional requirements for variable-reach trucks handling suspended loads

Part 5: Additional requirements for attachments and attachment interface

Part 6: Application of EN ISO 13849-1 to slewing and non-slewing variable-reach rough-terrain trucks

Introduction

This European Standard covers general safety requirements and the means for verification of these requirements for rough-terrain variable-reach trucks.

For the purpose of this standard, rough-terrain variable-reach trucks are designed to transport, lift, and place loads, and can be driven on unimproved terrain.

Trucks may also be equipped with a variety of attachments (e.g., bale spikes) and interchangeable equipment (e.g. mowers, sweepers).

All quantities are in SI units, and this includes metric units.

Considering the technical improvements to the previous version of EN 1459, a transition period of 12 months is permitted after the date of publication, such that manufacturers can develop their products sufficiently to meet the requirements of this European Standard.

This document is a type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations and hazardous events are covered are indicated in the scope of this document.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard

1 Scope

This European Standard specifies the general safety requirements of self-propelled, variable-reach, rough-terrain trucks (hereafter referred to as trucks), articulated or rigid chassis, intended to handle loads, which are equipped with a telescopic lifting means (pivoted boom), on which a load handling device (e.g., carriage and fork arms) is fitted.

Fork arms are covered by this standard and are considered to be parts of the truck.

This European Standard deals with the significant hazards, hazardous situations and events relevant to the trucks when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer, with the exception of hazards listed in Annex A, 1.3 and 1.4.

This European Standard does not apply to:

— slewing variable reach rough terrain trucks covered by prEN 1459-2;

— industrial variable reach trucks covered by EN ISO 3691-2;

— lorry-mounted variable reach trucks;

— variable reach trucks fitted with tilting or elevating operator position;

— mobile cranes covered by EN 13000;

— machines designed primarily for earth moving, even if their buckets and blades are replaced with forks (see EN 474 series);

— trucks designed primarily with variable length load suspension elements (e.g., chain, ropes) from which the load may swing freely in all directions;

— trucks fitted with personnel/work platforms, designed to move persons to elevated working positions;

— trucks designed primarily for container handling;

— trucks on tracks;

— trucks with articulated chassis;

— attachments (prEN 1459-5).

This European Standard does not address hazards linked to:

— hybrid power systems;

— gas power system;

— trucks equipped with gasoline engine;

— battery power system;

— tractor specific devices (e.g. PTO).

This European Standard does not address hazards which may occur:

a) when handling suspended loads which may swing freely (additional requirements are given in prEN 1459-4);

b) when using trucks on public roads;

c) when operating in potentially explosive atmospheres;

d) when operating underground;

e) when towing trailers;

f) when fitted with a personnel work platform (additional requirements are given in prEN 1459-3).

This document is not applicable to trucks manufactured before the date of its publication.

2 Normative references

The following document, in whole or in part, are normatively referenced in this document, and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

prEN 1459-5, *Rough-terrain trucks - Safety requirements and verification - Part 5: Additional requirements for attachments and attachment interface*

EN 12053, *Safety of industrial trucks — Test methods for measuring noise emissions*

prEN 12895:2013, *Industrial trucks - Electromagnetic compatibility*

EN 13059, *Safety of industrial trucks - Test methods for measuring vibration*

EN 15000:2008, *Safety of industrial trucks – Self-propelled variable reach trucks - Specification, performance and test requirements for longitudinal load moment indicators and longitudinal load moment limiters*

EN 15830, *Rough-terrain variable reach trucks - Visibility - Test methods and verification*

EN 60529:2001+prA2:2013, *Degrees of protection provided by enclosures*

EN ISO 2860, *Earth-moving machinery - Minimum access dimensions (ISO 2860)*

EN ISO 2867:2011, *Earth-moving machinery - Access systems (ISO 2867:2011)*

EN ISO 3164, *Earth-moving machinery - Laboratory evaluations of protective structures - Specifications for deflection-limiting volume (ISO 3164)*

EN ISO 3449:2008, *Earth-moving machinery - Falling-object protective structures - Laboratory tests and performance requirements (ISO 3449:2005)*

EN ISO 3457:2008, *Earth-moving machinery - Guards - Definitions and requirements (ISO 3457:2003)*

EN ISO 3471:2008, *Earth-moving machinery - Roll-over protective structures - Laboratory tests and performance requirements (ISO 3471:2008)*

EN ISO 4413, *Hydraulic fluid power - General rules and safety requirements for systems and their components (ISO 4413)*

EN ISO 5353, *Earth-moving machinery, and tractors and machinery for agriculture and forestry - Seat index point (ISO 5353)*

EN ISO 6682, *Earth-moving machinery - Zones of comfort and reach for controls (ISO 6682:1986, including Amd 1)*

EN ISO 6683, *Earth-moving machinery - Seat belts and seat belt anchorages - Performance requirements and tests (ISO 6683)*

EN ISO 7096:2008, *Earth-moving machinery - Laboratory evaluation of operator seat vibration (ISO 7096:2000)*

EN ISO 12100:2010, *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13732-1:2008, *Ergonomics of the thermal environment - Methods for the assessment of human responses to contact with surfaces - Part 1: Hot surfaces (ISO 13732-1:2006)*

EN ISO 13849-1, *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1)*

EN ISO 13850, *Safety of machinery - Emergency stop - Principles for design (ISO 13850)*

EN ISO 13857, *Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857)*

ISO 3795:1989, *Road vehicles, and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*

ISO/DIS 5053-1:2013, *Powered industrial trucks - Terminology and classification - Part 1: Types of industrial trucks*

ISO 6011:2003, *Earth-moving machinery — Visual display of machine operation*

ISO 6016:2008, *Earth-moving machinery — Methods of measuring the masses of whole machines, their equipment and components*

ISO 6292:2008, *Powered industrial trucks and tractors — Brake performance and component strength*

ISO 7000, *Graphical symbols for use on equipment — Registered symbols*

ISO 9533:2010, *Earth-moving machinery — Machine-mounted audible travel alarms and forward horns — Test methods and performance criteria*

ISO 10263-2:2009, *Earth-moving machinery — Operator enclosure environment — Part 2: Air filter element test method*

ISO 10263-3:2009, *Earth-moving machinery — Operator enclosure environment — Part 3: Pressurization test method*

ISO 10263-4:2009, *Earth-moving machinery — Operator enclosure environment — Part 4: Heating, ventilating and air conditioning (HVAC) test method and performance*

ISO 10532:1995+A1:2004+AC1:2006, *Earth-moving machinery – Machine-mounted retrieval device – Performance requirements*

ISO 11112:1995+A1:2001, *Earth-moving machinery – Operator's seat – Dimensions and requirements*

ISO 12508:1994, *Earth-moving machinery — Operator station and maintenance areas — Bluntness of edges*

ISO 12509:2004, *Earth-moving machinery — Lighting, signalling and marking lights, and reflex-reflector devices*

ISO 13333:1994, *Earth-moving machinery — Dumper body support and operator's cab tilt support devices*

ISO 15817:2012, *Earth-moving machinery — Safety requirements for remote operator control systems*

ISO/DIS 15818:2013, *Earth-moving machinery – Lifting and tying-down attachment points -- Performance requirements*

ISO 15870:2000, *Powered industrial trucks — Safety signs and hazard pictorials — General principles*

ISO 16528-1:2007, *Boilers and pressure vessels — Part 1: Performance requirements*

ISO 16528-2:2007, *Boilers and pressure vessels — Part 2: Procedures for fulfilling the requirements of ISO 16528-1*

ISO 21507:2010, *Earth-moving machinery — Performance requirements for non-metallic fuel tanks*

ISO 22915-10:2008, *Industrial trucks — Verification of stability — Part 10: Additional stability test for trucks operating in the special condition of stacking with load laterally displaced by powered devices*

ISO 22915-14:2010, *Industrial trucks — Verification of stability — Part 14: Rough-terrain variable-reach trucks*

ISO 22915-20:2008, *Industrial trucks — Verification of stability — Part 20: Additional stability test for trucks operating in the special condition of offset load, offset by utilization*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and ISO 5053 series, along with the following, apply.

3.1
rough-terrain variable-reach truck
variable-reach truck intended primarily for operation on unimproved natural terrain and on the disturbed terrain of, for example, construction site [ISO/FDIS 5053-1:2013, clause 2.21]

3.2
variable-reach truck
lift truck fitted with one or more articulated arms, telescopic or not, non-slewing or having a slewing movement of not more than 5° either side of the longitudinal axis of the truck used for stacking loads [ISO/FDIS 5053-1:2013 clause 2.20]

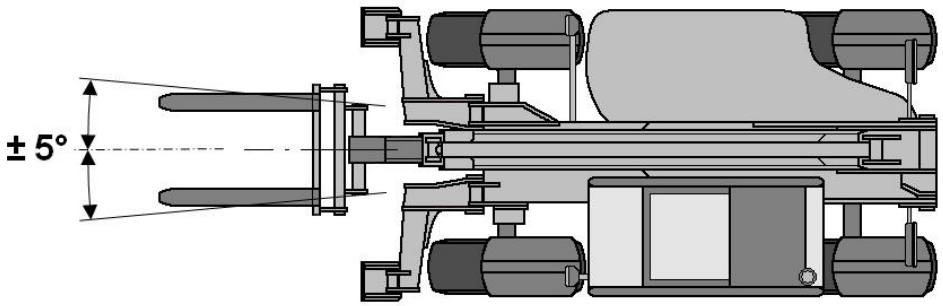


Figure 1 — Variable-reach truck

3.3
compact truck
— truck having a maximum height in normal travel mode of 2150 mm, and:

— a maximum operating mass of 6 000 kg according to ISO 6016:2008

and/or

— a maximum width in normal travel mode of 1 850 mm

Note to entry: These dimensions do not include equipment such as working lights, mirrors, etc.

3.4
actual capacity (Q)
maximum load, established by the manufacturer based on components strength and truck stability, that the truck can carry, lift and stack to a specified height, at a specified standard load centre distance and reach, in normal operating conditions

Note 1 to entry: The actual capacity depends on the configuration of the truck in terms of such variables as:

— lift height;

— reach of the boom;

— standard load centre distance;

— load handling device (fork arms or attachment fitted);

— stabilising devices.

Note 2 to entry: This actual capacity defines the load handling ability of the particular truck as equipped. Additional actual capacity ratings with removable attachments may also be established where permitted by the appropriate stability test or by calculation verified by empirical data.

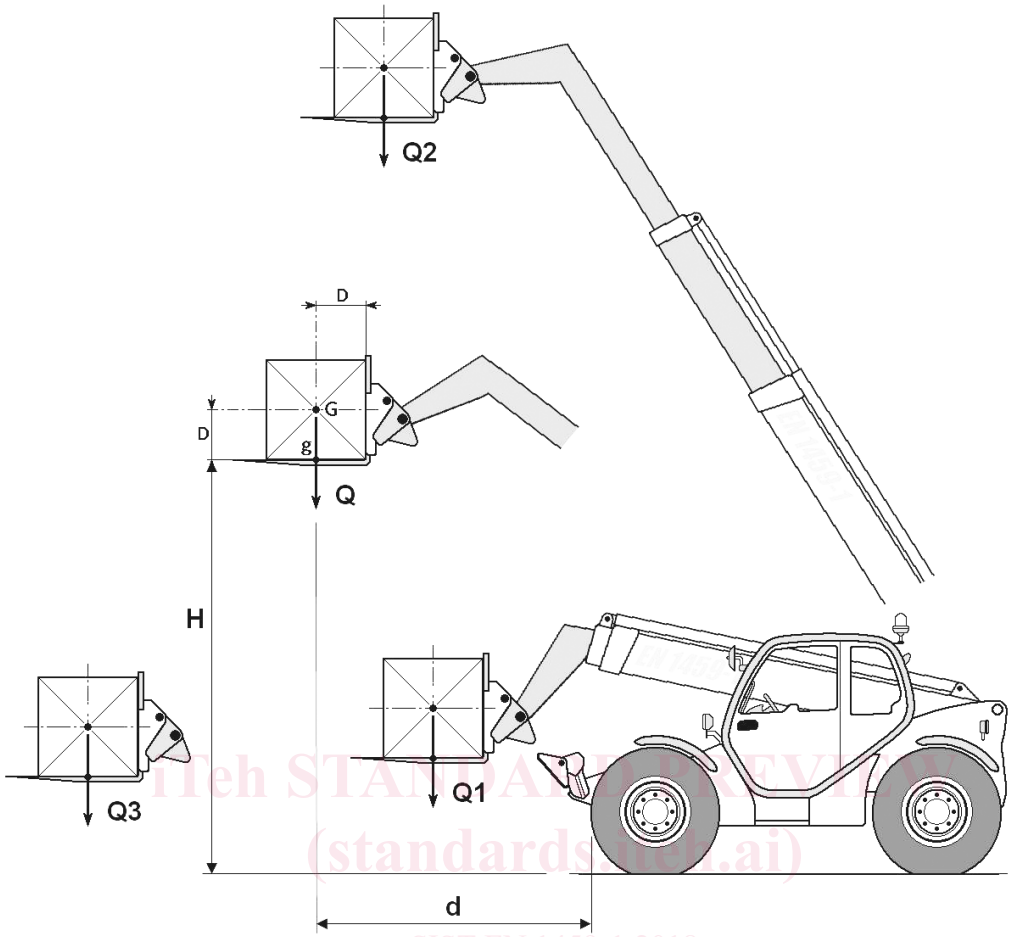
3.5
rated capacity of truck (Q1)
maximum load permitted by the manufacturer at the standard load centre distance (D) that the truck is capable of lifting and transporting on fork arms in normal conditions with the boom fully retracted

3.6
reach (d)
distance between two vertical parallel planes, one plane tangent to the front of the outside diameter of the front tyres, the other plane described by the vertical projection of the centre-of-gravity of the load to the ground

Note 1 to entry: The centre-of-gravity of the load (G) is defined in Table 1

Note 2 to entry: See Figure 2 for examples of reach

Note 3 to entry: For practical matters, d can be measured referring to point g, being g the vertical projection of the centre-of-gravity (G) of the load onto the plane of the top surface of the fork arms.



Key

d reach

D standard load centre distance

G centre of gravity of the load

g the vertical projection of the centre-of-gravity (G) of the load onto the plane of the top surface of the fork arms

Q actual capacity

Q1 rated capacity

Q2 rated capacity at maximum height or elevation

Q3 rated capacity at maximum reach

Figure 2 — Parameters for the designation of the actual capacity of the truck with fork

3.7
lift height (H)
vertical distance between the upper face of the fork arms and the ground

Note to entry: See figure 2.

3.8
standard load centre distance (*D*)
distance from the centre of gravity (G) of the load measured horizontally back to the front of the fork shanks and vertically down to the upper faces of the fork arms, as specified in Table 1.

Note 1 to entry: See Figure 2 for example

Note 2 to entry: Typical standard load centre distances are given in Table 1.

Table 1 — Typical standard load centre distance

Rated capacity Q in kg		Standard load centre distance D in mm				
		400	500	600	900	1 200
0	< 1 000	X				
≥ 1 000	< 5 000		X			
≥ 5 000	≤ 10 000			X		
> 10 000	< 20 000			X	X	X
≥ 20 000	< 25 000				X	X
≥ 25 000						X

Trucks may be rated for special applications with load centres related to those applications.

3.9
axle oscillation lock
mechanism designed to prevent oscillation of an axle to improve truck stability

3.10
stabilising devices
extendable and/or pivoting mechanical supports used to improve stability of a truck when stationary

3.11
lateral levelling
changing the lateral inclination angle between the chassis and the ground to ensure the boom operates in a vertical plane even when the truck is positioned on a side slope

3.12
forks
device comprising two or more solid fork arms, each consisting of a shank (vertical portion) and blade, which is hook- or shaft-mounted, fitted on the carriage and usually adjusted manually

3.13
boom
pivoting support member that permits horizontal and vertical positioning of the load or attachment

3.14
crab steering mode
steering mode where all wheels of the truck steer in the same direction