SLOVENSKI STANDARD
SIST-TS CEN/TS 1459-8:2019

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Vozila za talni transport - Terenska vozila - Varnostne zahteve in preverjanje - 8. del: Traktorji z mehanizmom s spremenljivim dosegom

Rough-terrain trucks - Safety requirements and verification - Part 8: Variable-reach tractors

Geländegängige Flurförderzeuge - Sicherheitsanforderungen und Verifizierung - Teil 8: Traktoren mit veränderlicher Reichweite

Chariots tout-terrain - Prescriptions de sécurité et vérification - Partie 8 : Tracteurs à portée variable

Ta slovenski standard je istoveten z: **CEN/TS 1459-8:2018**

ICS:

53.060	Industrijski tovornjaki	Industrial trucks

SIST-TS CEN/TS 1459-8:2019 **en,fr,de**

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Rough-terrain trucks - Safety requirements and verification - Part 8: Variable-reach tractors

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European foreword

This document (CEN/TS 1459-8:2018) has been prepared by Technical Committee CEN/TC 150 “Industrial trucks - Safety”, the secretariat of which is held by BSI.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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: Interface between the variable-reach truck and the 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* (Technical Report)

— *Part 7: Test method and determination of noise emission* (in preparation) *for variable-reach trucks*

— *Part 8: Variable-reach tractors (Technical Specification)*

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Introduction

This document is applicable to rough-terrain variable-reach trucks homologated as tractors according to 167/2013, called rough-terrain variable-reach tractors (RTVR tractors).

This document is also intended to highlight and explain the requirements of the Machinery Directive 2006/42/EC applicable to the permanently mounted equipment on a RTVR tractor.

It is based on EN 1459-1:2017.

The two following regulations apply to those RTVR tractors with permanently mounted equipment:

Tractor regulation 167/2013

Machinery directive 2006/42/CE for the permanently mounted equipment.

As a consequence, the two following documents accompany each piece of equipment:

— COC certificate of conformity

— DOC declaration of conformity for permanently mounted equipment

The permanently mounted equipment bears the CE marking.

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

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 document specifies requirements related to permanent mounted equipment for rough-terrain variable-reach tractors (here-after referred to as “RTVR tractors”) and additional requirements for the combination.

This document does not apply to:

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

— attachments.

This document does not address hazards which may occur

a) when handling suspended loads which may swing freely;

b) when using RTVR tractors 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 EN 1459-3);

g) when using cruise-control.

This document does not provide a method of calculation for fatigue and strength of material.

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

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.

EN 1175-2:1998+A1:2010, *Safety of industrial trucks - Electrical requirements - Part 2: General requirements of internal combustion engine powered trucks*

EN 1459-5, *Rough-terrain trucks - Safety requirements and verification - Part 5: Attachments and attachment interface*[1]

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 15830:2012, *Rough-terrain variable reach trucks - Visibility - Test methods and verification*

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*[2]

[1] Under preparation. Stage at time of publication: prEN 1459-5:2018.

EN 62061, *Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems (IEC 62061)*

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

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

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

EN ISO 4413:2010, *Hydraulic fluid power - General rules and safety requirements for systems and their components (ISO 4413:2010)*

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

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

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 function - 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 5053-1:2015, *Industrial trucks — Terminology and classification — Part 1: Types of industrial trucks*

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

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

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

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

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

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

ISO 13333, *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*

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[2] This European Standard is impacted by the amendments EN 60529:1991/A1:2000 and EN 60529:1991/A2:2013.

ISO 15818, *Earth-moving machinery - Lifting and tying-down attachment points - Performance requirements*

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

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

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

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

ISO 22915-10, *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, *Industrial trucks — Verification of stability — Part 14: Rough-terrain variable-reach trucks*

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

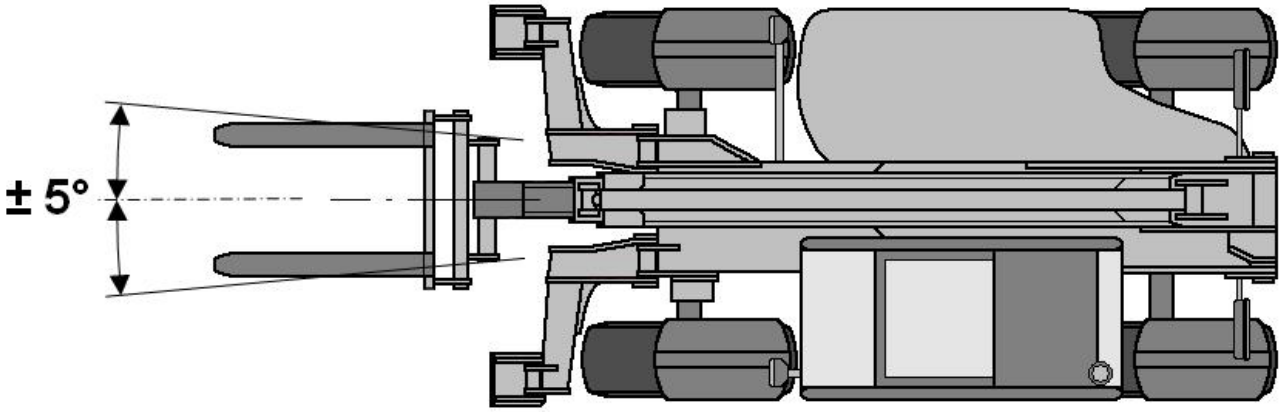
3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010, ISO 5053-1:2015 and the following apply.

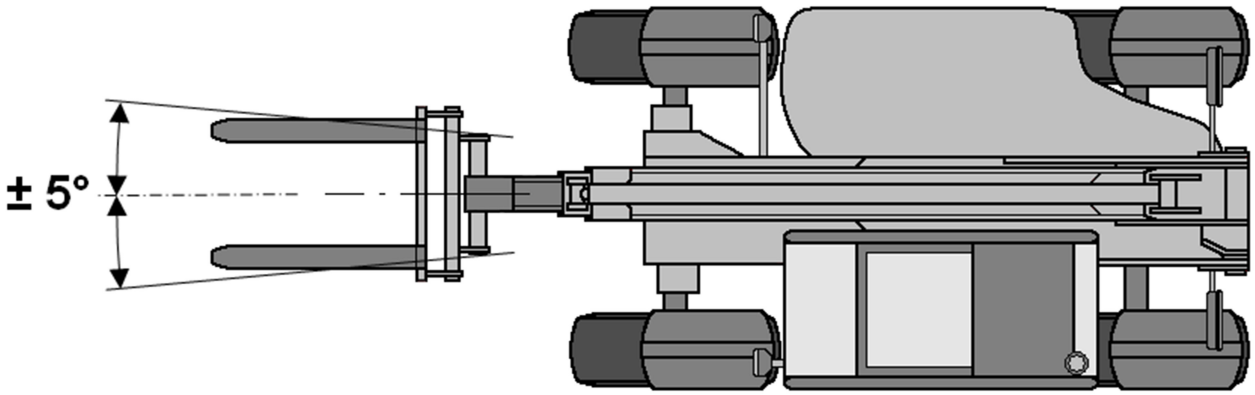
ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
rough-terrain variable-reach tractor
RTVR tractor
tractor with a permanently mounted telescopic material handler non-slewing or having a slewing movement of not more than 5° either side of the longitudinal axis of the tractors used for stacking loads with or without stabilizers



a)



b)

Figure 1 — Rough-terrain variable-reach tractor

3.2
compact rough terrain variable reach tractor
RTVR tractor having

— a maximum height in normal travel mode of 2 150 mm and:

— a maximum operating mass of 6 000 kg;

and/or

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

Note 1 to entry: These dimensions do not include equipment such as working lights, mirrors, etc.

3.3
actual capacity
Q
maximum load, established by the manufacturer based on components strength and RTVR tractor stability, that the RTVR tractor 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 RTVR tractor in terms of such variables as:

— lift height;

— reach of the boom;

— standard load centre distance;

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

— stabilizing devices.

Note 2 to entry: This actual capacity defines the load handling ability of the particular RTVR tractor 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.

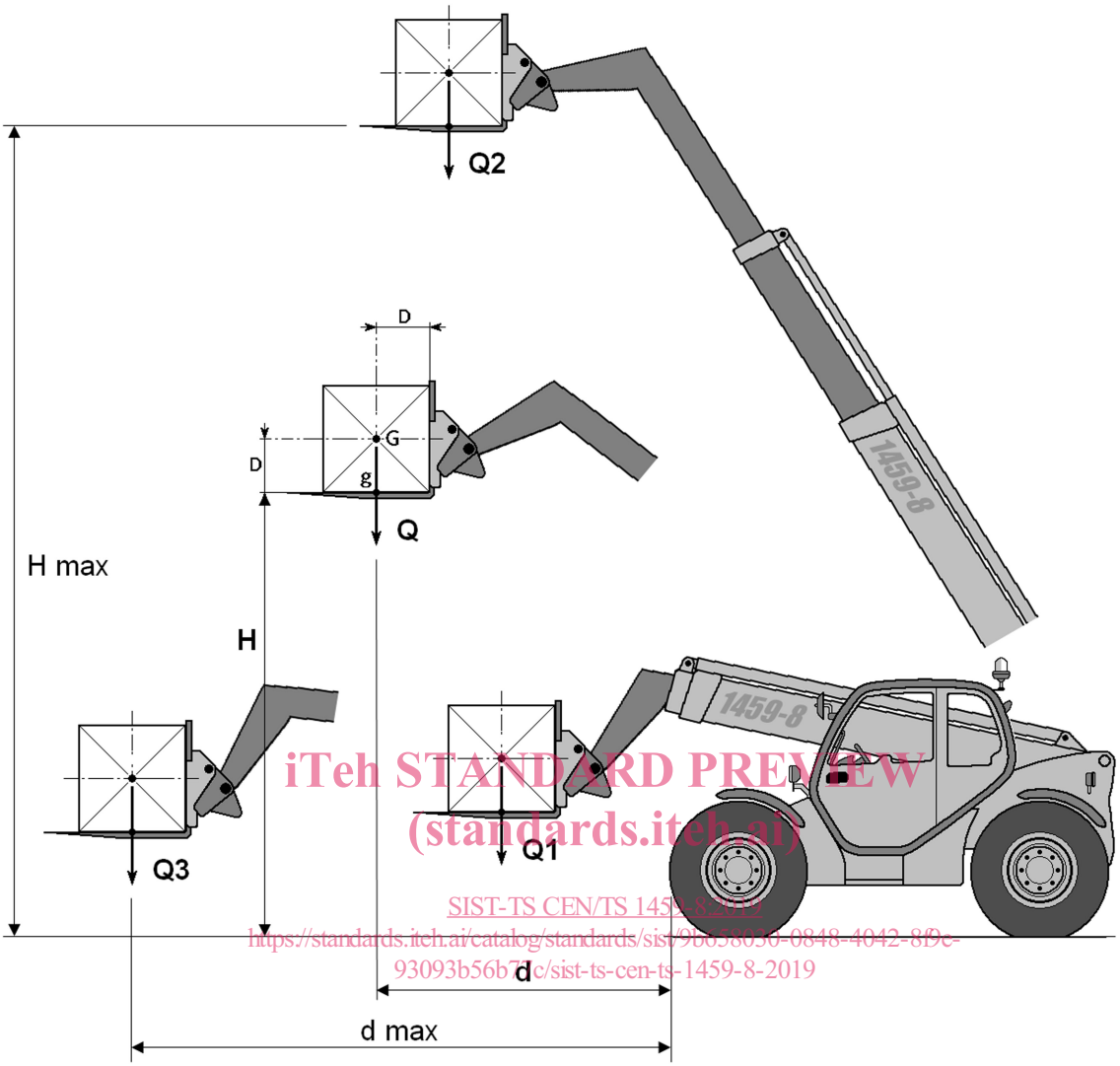
3.4
rated capacity of RTVR tractor
Q1
maximum load permitted by the manufacturer at the standard load centre distance (D) that the RTVR tractor is capable of lifting and transporting on fork arms in normal conditions with the boom fully retracted

3.5
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	vertical projection of the centre-of-gravity (G) of the load onto the plane of the top surface of the fork arms
H	lift height
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 RTVR tractor with fork

3.6
lift height
H
vertical distance between the upper face of the fork arms and the ground

Note 1 to entry: See Figure 2.

3.7
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

RTVR tractors may be rated for special applications with load centres related to those applications which may be different from those listed in Table 1.

3.8
axle oscillation lock
mechanism designed to prevent oscillation of an axle to improve RTVR tractor stability

3.9
stabilising device
extendable and/or pivoting mechanical support used to improve stability of a RTVR tractor when stationary

3.10
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 RTVR tractor is positioned on a side slope

3.11
fork
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

3.12
boom
pivoting support member that permits horizontal and vertical positioning of the load or attachment

3.13
crab steering mode
steering mode where all wheels of the RTVR tractor steer in the same direction

3.14
normal operating position
position specified by the manufacturer in which the operator is able to control the RTVR tractor operations, including load handling functions

Note 1 to entry: Other positions may be necessary if it is not possible to control all the functions of the RTVR tractor from a single position.

[SOURCE: ISO 10896-1:2012, 3.16, 3.16, modified – Truck was replaced with RTVR tractor]

3.15
quick coupler
device fitted at the end of the boom to mount interchangeable attachments to facilitate quick interchange of attachment

Note 1 to entry: Quick coupler was previously called attachment bracket in EN 1459-1.

3.16
boom float
control mode that uses gravity to allow an attachment at the end of the boom to follow a contour (e.g. the ground)

3.17
maximum working pressure
maximum pressure in the hydraulic circuit during normal operation

Note 1 to entry: Source ISO 10972-3:2003, 3.2, modified.

3.18
level ground
ground with a gradient of (0 ± 2)%

3.19
permanently mounted equipment
PME
part of the RTVR tractor not covered by the tractor regulation, intended to handle loads, equipped with a telescopic lifting means (pivoted boom) not intended to be removed during normal use, on which a load handling device (e.g., carriage and fork arms) is fitted

Note 1 to entry: PME includes for example: boom, control of the boom, stabilizer, lighting...

4 Safety requirements and/or protective measures

4.1 General

4.1.1 Introduction

RTVR tractors shall comply with the safety requirements and/or protective measures of this clause. In addition, the RTVR tractor shall be designed according to the principles of EN ISO 12100 for relevant but not significant hazards, which are not dealt with by this standard.

4.1.2 Sharp edges and acute angles

Not covered by this document.

NOTE Dealt with in Interior fittingsDelegated Act 2015/208 Annex XIII (interior fittings), and in Delegated Act 1322/2014 Annex XXIV (protection mechanical hazards)

4.1.3 Stored energy components

Components that store energy and can cause a risk of injury during removal or disassembly, e.g. hydraulic accumulators and spring-applied brakes, shall be provided with a means to release the energy before removal or disassembly and shall be marked according to 6.2.8.

Verification by type-test.

4.2 Starting/moving

4.2.1 Unauthorised starting

Not covered by this document.

NOTE Dealt with in Delegated Act 2015/208 Annex XVIII

4.2.2 Stopping system

Not covered by this document.

NOTE Dealt with in Delegated Act 1322/2014 Annex XXIII par. 4

4.2.3 Unintended movement

RTVR tractors shall be fitted with a device that prevents the engine being started while the drive-system is engaged. When the drive system direction control is in neutral, provisions shall be made to locate and maintain it in its neutral position. This device shall comply with Table 2.

Verification by functional test.

NOTE Delegated Act 1322/2014 Annex XXIII par. 3 - > equivalent

4.2.4 Uncontrolled motion

Means shall be provided to prevent the RTVR tractor from moving from rest on level ground until the drive system has been engaged. These means shall comply with Table 2.

Verification by functional test.

4.2.5 Powered travel movement

Means shall be provided to prevent powered travel when the operator is not at the normal operator's position. Powered travel shall not occur automatically when the operator returns to the normal operator's position without an additional operation, e.g. by requiring resetting the direction control.

Application of the parking brake shall engage transmission in neutral, except on RTVR tractors with hydro-static transmission.

The release of parking brake shall not engage the transmission automatically

NOTE On RTVR tractors with hydro-static transmission, the transmission system achieves the same objective.

Verification by functional test.

Means to fulfil these requirements shall comply with Table 2.