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Rough-terrain trucks - Safety requirements and verification - Part 5: Attachment interface

Geländegängige Stapler - Sicherheitstechnische Anforderungen und Verifizierung - Teil
5: Zugehörige Schnittstellen

Chariots tout-terrain - Prescriptions de sécurité et vérification - Partie 5 : Interface de
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**Rough-terrain trucks - Safety requirements and
verification - Part 5: Attachment interface**

Chariots tout-terrain - Prescriptions de sécurité et
vérification - Partie 5 : Interface de l'accessoire

Geländegängige Stapler - Sicherheitstechnische
Anforderungen und Verifizierung - Teil 5: Zugehörige
Schnittstellen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 150.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 1459-5:2019) 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 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: Interface between the variable-reach truck and the work platform*
- *Part 4: Additional requirements for variable-reach trucks handling freely suspended loads*
- *Part 5: Additional requirements for attachment interface*
- *Part 6: Application of EN ISO 13849-1 to slewing and non-slewing variable-reach rough-terrain trucks*
- *Part 8: Rough-terrain trucks - Safety requirements and verification - Part 8: Variable-reach tractors*

Introduction

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

The equipment concerned and the extent to which hazards, hazardous situations or hazardous events are covered as indicated in the Scope of this document.

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

All quantities are in metric units.

Tools

Being excluded from interchangeable equipment, according to Directive 2006/42/EC (as amended) Article 2 b), they have to be considered as part of the truck. Characteristics of tools which may be fitted to the machinery can be found in the instructions for use given by the truck manufacturer according to 1.7.4.2 (n) Directive 2006/42/EC.

Interchangeable equipment

An interchangeable equipment is not part of the truck, according to Directive 2006/42/EC (as amended) Article 2 b), because it is assembled with the truck by the operator himself in order to change its function or attribute a new function. The instructions for machinery allow several uses intended by design depending on the equipment used and the instructions for the interchangeable equipment contain the information necessary for safe assembly and use of the basic machinery and the interchangeable equipment that can be fitted (see Directive 2006/42/EC, 3.6.3.2).

The following items should be taken into account:

- a) identification of a specific point on the truck for the installation of the interchangeable equipment, i.e. truck-related side of the interface (hereafter referred to as “interface”): the carriage;
- b) interface safety-related design and coupling performances:
 - 1) avoidance of unintentional displacements: locking (normal operation condition and truck power supply failure condition);
 - 2) strength requirements: calculation and static and dynamic test;
 - 3) controls;
 - 4) information;
- c) interchangeable equipment compatibility in order to be installable on the truck, i.e. choice of approved types of interchangeable equipment, correct usage in combination with the truck, minimum safety requirements.

The guide to application of the Machinery Directive 2006/42/EC states that “The manufacturer of the interchangeable equipment must ensure that the combination of the interchangeable equipment and the basic machinery with which it is intended to be assembled fulfils all the relevant essential health and safety requirements of Annex I and must carry out the appropriate conformity assessment procedure.”.

This standard considers primary function of the truck the load handling, stacking and lifting function, e.g. with forks.

1 Scope

This document specifies requirements for the truck side of the attachment interface of rough-terrain non-slewing and slewing variable reach trucks (hereafter referred to as “trucks”) dealt with in EN 1459-1, EN 1459-2 and prEN 1459-4.

This document covers the interface of the attachments fitted to the telescopic boom carriage or mounted on the forks. This document does not cover:

- interface for interchangeable equipment designed for lifting person(s) (covered by EN 1459-3);
- interface for equipment for container handling (e.g. spreader);
- interface for equipment permanently installed on the machine and not intended to be removed by the user;

NOTE In this case, equipment becomes part of the truck.

This document does not give requirements for the completed assembly of a truck fitted with an attachment. This document does not address risks to parts of the truck other than the interface with the attachment.

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 1459-1, *Rough-terrain trucks — Safety requirements and verification — Part 1: Variable-reach trucks*

EN 1459-2, *Rough-terrain trucks — Safety requirements and verification — Part 2: Slewing variable-reach trucks*

prEN 1459-4, *Rough terrain trucks — Safety requirements and verification — Part 4: Additional requirements for variable reach trucks handling suspended loads*

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

EN ISO 3411:2007, *Earth-moving machinery - Physical dimensions of operators and minimum operator space envelope (ISO 3411:2007)*

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

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

ISO 7000:2014, *Graphical symbols for use on equipment - Registered symbols*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1459-1, EN 1459-2, prEN 1459-4, ISO 5053-1 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

tool

attachment which does not change the primary function of the truck

3.2

interchangeable equipment

device assembled with the truck by the operator which changes the primary function of the truck or attributes a new function to the truck

Note 1 to entry: Interchangeable equipment when assembled does not change the designation of the machinery as variable reach rough terrain truck.

3.3

interface

devices and method to mechanically assemble and, if needed, hydraulically and/or electrically connect the attachment to the truck

3.4

attachment

tool or interchangeable equipment

4 Requirements

NOTE See Annex A for the list of significant hazards.

4.1 Manual connection/disconnection

The position to perform any manual connection/disconnection of the attachment to the truck shall:

- be so that any manual connection/disconnection can be performed with the truck switched off;
- be so that any manual connection/disconnection is within the reach of the operator in a standing position on the ground according to EN ISO 3411 or be provided with means of access complying with EN ISO 2867;
- be described in the information for use (see Clause 6).

Verification by visual examination and design check.

4.2 Unintentional detachment

The interface shall be designed such that unintentional detachment of the attachment is prevented, according to 4.7.

Verification by design check.

The interface shall be provided with means to prevent the separation of the attachment in the event of malfunctions in the truck power supply.

Verification by design check.

4.3 Unintended movement of the attachment

Interface shall be designed such that any movement of the attachment shall not occur when the relevant control devices on the truck are in the neutral position.

Verification by design check.

4.4 Load-clamping attachment interface

The interface shall allow load-clamping attachment to reach its nominal clamping force and to maintain it when the relevant control devices on the truck are in their neutral position.

To prevent unintentional release of the load, the opening movement of a load-carrying clamp operated from the truck shall:

- a) be possible only with a two-action control or positioned and/or guarded in order to avoid inadvertent activation, and
- b) not be automatically activated when the truck is switched on.

Verification by design check.

In case of failure of power supply or engine shut down, the interface shall allow the rated load of the load-clamping attachment to remain clamped.

Verification by design check.

4.5 Interface hydraulic system

If the interface has a hydraulic system, it shall comply with the relevant requirements of EN 1459-1 and EN 1459-2.

4.6 Design

The attachment interface of the truck shall be designed for the most severe forces deriving from truck configuration and load combination expected for the intended use of the truck.

NOTE EN 13001-3-1 provides guidance for calculation.

Verification by design check and calculation.

4.7 Mechanical connection of the attachment to the carriage

4.7.1 General

Means shall be provided to pick-up, fasten and lock the attachment to the structural part of the interface which the attachment is mechanically assembled to.

NOTE Fastening and locking may be obtained by just one device, depending on its design.

Verification by type test.

prEN 1459-5:2019 (E)**4.7.2 Fastening and locking**

The means according to 4.7.1 shall meet the following requirements:

- The fastening system and the locking system shall hold the attachment in the working position described in the information for use of the truck.

Verification by type test.

- The locking system shall prevent unintended unfastening of the attachment:
 - in the case of a fastener put in place manually, the fastener should be locked mechanically (e.g. a pin);
 - in the case of a powered fastener operated through a control at the operator station, the fastener shall be held in the position which ensures the permanent linkage between the attachment and the carriage including the case of energy failure.

Verification by type test.

- It shall be possible to verify (e.g. by automatic sensing, visual indication in the cab, direct vision) from the primary operator's position that the system is fastened and locked to retain the attachment in its working position.

Verification by design check and visual examination.

4.7.3 Control for powered release of the fastening

Control for powered release of fastening shall be protected against inadvertent activation or be of the hold-to-run type.

Release of the fastening shall not make the attachment separate from the truck until a further deliberate action is made by the operator (for example lowering to the ground).

Verification by design check and visual examination.

4.8 Fixing of the attachment on the forks

If fork-mounted attachments are allowed by the truck manufacturer, the interface on truck side shall be so designed to allow fork-mounted attachments to be fastened and locked by mechanical means so that the attachment on the forks is retained in its working position during the tilt and the dump of the carriage and shall not rely on friction.

Mechanical means shall comply with 4.6.

It shall be possible to verify (e.g. by automatic sensing, visual indication, direct vision, testing) from the primary operator's position that the system is fastened and locked to retain the attachment in its working position.

5 Verification of requirements and safety measures

Verification shall be carried out on each type of interface.

6 Information for use

6.1 General

Information for use shall comply with EN ISO 12100:2010, 6.4.

6.2 Instruction handbook

6.2.1 General

The manufacturer shall draw up an instructions handbook complying with 6.4.5 of EN ISO 12100:2010

The instructions handbook shall be made up of at least:

- Operating and maintenance instructions;
- Service instructions.

Operating and maintenance instructions shall be intended for the operator or other non-specialized personnel and shall be combined. They shall:

- a) accompany the truck and intended to stay with it;
- b) be written in the official community language(s) of the country in which the truck is placed on the market;
- c) be either 'Original instructions' or a 'Translation of the original instructions', in which case the translation shall be accompanied by the original instructions;
- d) be supplied in paper format.

NOTE 1 They can in addition be supplied in electronic format.

NOTE 2 They can be combined with the instruction handbook of the truck (see EN 1459-1 and EN 1459-2) and/or of the work platform.

Service instructions shall be intended only for specialist maintenance personnel and shall be separated from the operating and maintenance instructions.

6.2.2 Operating and maintenance instructions

Operating and maintenance instructions shall include the following as a minimum.

- a) Information on operating the interface such as:
 - 1) Assembling / mounting and detachment:
 - i) Information on fitting of the attachment to the truck;
 - ii) Information on required hydraulic and/or electric connections;
 - iii) Information on detaching the attachment from the truck.
- b) Information on what forks are allowed to receive fork-mounted attachments.

Information on routine maintenance of the mechanical, hydraulic, and/or electric interface shall be given.