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Rough-terrain trucks - Safety requirements and verification - Part 2: Slewing trucks
(ISO/DIS 10896-2:2024)

Geländegängige Stapler - Sicherheitstechnische Anforderungen und Verifizierung - Teil
2: Schwenkbare Stapler mit veränderlicher Reichweite (ISO/DIS 10896-2:2024)

Chariots tout-terrain - Exigences de sécurité et vérification - Partie 2: Chariots rotatifs
(ISO/DIS 10896-2:2024)

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Rough-terrain trucks — Safety requirements and verification —

Part 2: Slewing trucks

Chariots tout-terrain — Exigences de sécurité et vérifications —

Partie 2: Chariots rotatifs

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European foreword

This document (prEN ISO 10896-2:2024) has been prepared by Technical Committee ISO/TC 110/SC 4 “Rough-terrain trucks” in collaboration with 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 1459-2:2015+A1:2018.

EN ISO 10896-2:2024 includes the following significant technical changes with respect to EN 1459-2:2015+A1:2018:

- autonomous trucks and trucks connected to a communication network excluded from Scope of this document;
- updated normative references;
- adjustments to definitions of actual capacity, rated capacity and fork arms;
- added holding performance for service brakes;
- clarification on emergency stop in case of remote controls;
- added maximum operating force for brake controls;
- specification to test for failure to steering system with technically permissible maximum operating mass and added actuating force in normal conditions;
- added requirements for hand throttle;
- modifications to requirements for demisting and defrosting;
- modifications concerning the boom-side window;
- modifications to requirements for operator's seat;
- revised acronyms for limiting and indicating devices;
- modification to indication of aligned configuration;
- modification to marking requirements for storage position of access systems;
- added ROPS and FOPS requirements for tiltable and/or elevating cabs;
- added requirements if a reverse audible alarm is fitted;
- revised requirements for visibility;
- added requirement for towing;
- added requirements for emission sound power level;
- revised requirements for EMC;
- revised requirement for calculation of dynamic loads;
- added specification on partial safety factors;
- added reference guidance for calculation of hydraulic cylinders;
- updated information for use;
- added [Annex B](#) for attachments;

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- revision of [Annex ZA](#) and inclusion of [Annex ZB](#);
- other minor changes, mainly editorial, on existing requirements.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative [Annex ZA](#) and [Annex ZB](#), which are an integral part of this document.

This document is part of a series which consists of the following parts, under the general title Rough-terrain trucks — Safety requirements and verification:

- EN 1459-1: Variable-reach trucks
- EN ISO 10896-2: Slewing variable-reach trucks
- EN 1459-3: Interface between the variable-reach truck and the work platform
- EN 1459-4: Additional requirements for variable-reach trucks handling suspended loads
- EN 1459-5: Attachment interface
- CEN/TR 1459-6: Application of EN ISO 13849-1 to slewing and non-slewing variable-reach rough-terrain truck (technical report)
- EN 1459-9: Variable-reach trucks equipped with work platforms having a frontguard that can be opened

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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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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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 4, *Rough-terrain trucks*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 150, *Industrial trucks — Safety*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 10896-2:2016), which has been technically revised.

The main changes are as follows:

- autonomous trucks and trucks connected to a communication network excluded from Scope of this document;
- updated normative references;
- adjustments to definitions of actual capacity, rated capacity and fork arms;
- added holding performance for service brakes;
- clarification on emergency stop in case of remote controls;
- added maximum operating force for brake controls;
- specification to test for failure to steering system with technically permissible maximum operating mass and added actuating force in normal conditions;
- added requirements for hand throttle;
- modifications to requirements for demisting and defrosting;
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- modification to indication of aligned configuration;
- modification to marking requirements for storage position of access systems;
- added ROPS and FOPS requirements for tiltable and/or elevating cabs;
- added requirements if a reverse audible alarm is fitted;
- revised requirements for visibility;
- added requirement for towing;
- added requirements for emission sound power level;
- revised requirements for EMC;
- revised requirement for calculation of dynamic loads;
- added specification on partial safety factors;
- added reference guidance for calculation of hydraulic cylinders;
- updated information for use;
- added [Annex B](#) for attachments;
- other minor changes, mainly editorial, on existing requirements.

A list of all parts in the ISO 10896 series can be found on the ISO website.

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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Introduction

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

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

- machine manufacturers (small, medium and large enterprises);
- health and safety bodies (regulators, accident prevention organisations, market surveillance etc.)

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

- machine users/employers (small, medium and large enterprises);
- machine users/employees (e.g. trade unions, organizations for people with special needs);
- service providers, e. g. for maintenance (small, medium and large enterprises);
- consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are 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 type-B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

This document has been developed in order to align as far as possible requirements of regional standards EN 1459-2 for EU, B56.6 for USA (also referenced to in CAN/CSA-B335 for Canada) and AS 10896.1 for Australia and New Zealand. Also requirements from ISO 10896-1 have been considered for non-specific aspects.

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Rough-terrain trucks — Safety requirements and verification —

Part 2: Slewing trucks

1 Scope

This document specifies general safety requirements for slewing rough-terrain variable-reach trucks (referred to as trucks), with rigid chassis and equipped with a telescopic lifting means (pivoting boom) on which a load-handling device such as a carriage with fork arms is typically fitted. Fork arms are considered to be parts of the truck.

NOTE These trucks are also known as slewing telehandlers, or slewing telescopic handlers.

For the purpose of this document, trucks are designed to transport, lift and place loads and can be driven on unimproved terrain. They can also be equipped with a variety of attachments other than fork arms, for example which can be both load-carrying and non-load-carrying.

Other standards, in addition to the relevant provisions of this document, can apply to the attachments.

This document is not applicable to the following:

- a) rough terrain variable-reach trucks (covered by ISO 10896-1, EN 1459-1 and AS 10896.1);
- b) industrial variable-reach trucks covered by ISO 3691-2;
- c) machines designed primarily for earth moving, such as loaders, even if their buckets are replaced by fork arms (see ISO 20474 and EN 474 series);
- d) trucks with articulated chassis;
- e) machines designed primarily with variable-length load suspension elements (for example chain, ropes) from which the load can swing freely in all directions (mobile cranes);
- f) trucks designed primarily for container handling.

This document deals with all 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 (see [Annex A](#)).

The significant hazards covered by this document are listed in [Annex A](#). This document does not address hazards that can occur:

- during manufacture;
- when handling suspended loads, which can swing freely (see ISO 10896-4 and EN 1459-4);
- when using trucks on public roads;
- when operating in potentially explosive atmospheres;
- with a battery, LPG or hybrid as the primary power source;
- when operating underground;

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- when fitted with a personnel work platform (additional requirements are given in ISO 10896-5 and EN 1459-3).

This document does not address hazards specifically related to:

- trucks designed to operate with varying levels of autonomy (autonomous trucks) or when truck has embedded safety-systems with fully or partially self-evolving behaviour or logic using machine learning approaches;
- trucks with communication network connection;
- when the restraint system is not used;
- contact with live overhead power lines.

This document is not applicable to trucks 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 1459-5:2020, *Rough-terrain trucks — Safety requirements and verification — Part 5: Attachment interface*

EN 1459-5:2020/A1:2024, *Rough-terrain trucks — Safety requirements and verification — Part 5: Attachment interface*

EN 12053:2001+A1:2008, *Safety of industrial trucks — Test methods for measuring noise emissions*

EN 12895:2015+A1:2019, *Industrial trucks — Electromagnetic compatibility*

EN 13059:2002+A1:2008, *Safety of industrial trucks - Test methods for measuring vibration*

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

EN 60529:1991/A1:2000, *Degrees of protection provided by enclosures (IP Code)*

EN 60529:1991/A2:2013, *Degrees of protection provided by enclosures (IP Code)* EN IEC 62061:2021, *Safety of machinery — Functional safety of safety-related electrical, electronic and programmable electronic control systems (IEC 62061:2021)*

EN ISO 2860:2008, *Earth-moving machinery - Minimum access dimensions (ISO 2860:1992)*

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

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

EN ISO 6682:2008, *Earth-moving machinery - Zones of comfort and reach for controls (ISO 6682:1986, including Amd 1:1989)*

EN ISO 7096:2020, *Earth-moving machinery - Laboratory evaluation of operator seat vibration (ISO 7096:2020)*