



# **Rough-terrain trucks — Safety requirements and verification**

## **Part 1: Variable-reach trucks (ISO 10896-1:2012, MOD)**

**STANDARDS**  
Australia



AS 10896.1:2019

This Australian Standard® was prepared by ME-026, Industrial Trucks. It was approved on behalf of the Council of Standards Australia on 5 August 2019.

This Standard was published on 20 August 2019.

The following are represented on Committee ME-026:

- Australian Industrial Truck Association
- Australian Industry Group
- Australian Institute for Health and Safety
- Construction and Mining Equipment Industry Group
- Hire and Rental Industry Association of Australia
- National Road Transport Association
- SafeWork NSW
- Telescopic Handler Association of Australia
- WorkSafe Victoria

This Standard was issued in draft form for comment as DR AS 10869.1:2018.

### **Keeping Standards up-to-date**

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:

[www.standards.org.au](http://www.standards.org.au)

ISBN 978 1 76072 544 0



## **Rough-terrain trucks — Safety requirements and verification**

### **Part 1: Variable-reach trucks (ISO 10896-1:2012, MOD)**

First published as AS 1418.19—2007.  
Revised and redesignated as AS 10896.1:2019.

#### **COPYRIGHT**

© ISO 2019 — All rights reserved  
© Standards Australia Limited 2019

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth).

## Preface

This Standard was prepared by the Standards Australia Committee ME-026, Industrial Trucks to supersede AS 1418.19—2007, *Cranes, hoists and winches, Part 19: Telescopic handlers*.

The objective of this Standard is to provide requirements for rough terrain self-propelled variable reach trucks that are intended to handle loads with forks and different types of attachments.

Variable reach trucks are known by a variety of terms, including “telehandlers”, “multi-purpose handlers” and “telescopic handlers”.

As part of the changes from the previous design standard for variable reach trucks there is a change in terminology. “Maximum capacity” has been changed to “rated capacity” and what was previously known as “rated capacity” will now be known as “actual capacity”.

This Standard is an adoption with national modifications, and has been reproduced from, ISO 10896-1:2012, *Rough-terrain trucks — Safety requirements and verification — Part 1: Variable-reach trucks*. [Appendix ZZ](#) lists the variations to ISO 10896-1:2012 for the application of this Standard in Australia.

Requirements covering some content, for items such as freely suspended loads, are set out in ISO Standards other than ISO 10896-1. Committee ME-026 has determined to provide these requirements in Appendix ZZ.

Committee ME-026 set out to revise AS 1418.19, and in doing so reviewed ISO 10896-1. It was determined that ISO 10896-1 contained many of the necessary requirements to cover the scope of AS 1418.19 and as such it was agreed to adopt ISO 10896-1 to align internationally.

As this document has been reproduced from an International Standard, the following applies:

- (a) In the source text “this part of ISO 10896” should read “this Australian Standard”.
- (b) A full point substitutes for a comma when referring to a decimal marker.

Any clauses in Appendix ZZ of this Standard that are additional to the requirements of ISO 10896-1 are numbered beginning from 101 (except for additional definitions, which begin from 201). For example, additional clauses in Section 4, Requirements, are numbered 4.101, 4.102 etc and additional definitions are numbered 3.201, 3.202 etc.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms “normative” and “informative” are used in Standards to define the application of the appendix or annex to which they apply. A “normative” appendix or annex is an integral part of a Standard, whereas an “informative” appendix or annex is only for information and guidance.

# Contents

Preface .....	ii
Foreword .....	vi
Introduction .....	vii
<b>1 Scope .....</b>	<b>1</b>
<b>2 Normative references .....</b>	<b>1</b>
<b>3 Terms and definitions .....</b>	<b>3</b>
<b>4 Requirements .....</b>	<b>7</b>
4.1 General .....	7
4.1.1 Sharp edges and acute angles .....	7
4.1.2 Stored energy components .....	7
4.2 Starting/moving .....	7
4.2.1 Unauthorized starting .....	7
4.2.2 Unintended movement .....	7
4.2.3 Uncontrolled motion .....	7
4.2.4 Powered travel movement .....	7
4.2.5 Non-activation of the parking brake .....	7
4.2.6 Inching pedal .....	7
4.3 Brakes .....	8
4.3.1 General .....	8
4.3.2 Failure of energy supply .....	8
4.4 Electrical and electronic systems .....	8
4.4.1 General .....	8
4.4.2 Degree of protection .....	8
4.4.3 Electrical connections .....	8
4.4.4 Over-current protective devices .....	9
4.4.5 Batteries .....	9
4.4.6 Battery disconnection .....	9
4.5 Controls .....	9
4.5.1 General .....	9
4.5.2 Differential locking .....	10
4.5.3 Steering controls .....	10
4.5.4 Load-handling controls .....	11
4.5.5 Multi-function controls .....	11
4.5.6 Stabilizing device control .....	11
4.5.7 Sway/levelling control .....	12
4.5.8 Axle oscillation lock control .....	12
4.5.9 Auxiliary hydraulic control .....	12
4.6 Power systems and accessories .....	12
4.6.1 Exhaust systems .....	12
4.6.2 Cooling systems .....	12
4.6.3 Tanks and pressure vessels .....	12
4.7 Stabilizing devices .....	13
4.8 Design requirements for maintenance purposes .....	13
4.8.1 General .....	13
4.8.2 Tilttable cab support device .....	14
4.9 Systems for lifting, tilting and reaching .....	14
4.9.1 Chains and wire ropes .....	14
4.9.2 Hydraulic system .....	15
4.9.3 Maximum load-lowering speed .....	15
4.9.4 Limitation of stroke .....	16
4.9.5 Fork arms, attachments and attachment brackets .....	16
4.10 Operator's station .....	16

4.10.1	General requirements.....	16
4.10.2	Storage of operator's manual.....	16
4.10.3	Hot parts.....	16
4.10.4	Pipes and hoses.....	16
4.10.5	Operator's station equipped with enclosed cab.....	16
4.10.6	Operator's seat.....	18
4.10.7	Control panels and symbols on displays.....	19
4.11	Operator access.....	19
4.11.1	General requirements.....	19
4.11.2	Access to articulated trucks.....	19
4.11.3	Enclosed cab openings.....	20
4.12	Protective measures and devices.....	20
4.12.1	Hot parts.....	20
4.12.2	Protection against crushing, shearing and trapping.....	21
4.12.3	Guards.....	21
4.12.4	Safety signs.....	21
4.12.5	Engine compartment.....	21
4.12.6	Articulated frame lock.....	21
4.12.7	Fenders.....	21
4.12.8	Roll-over protective structures (ROPS) and falling object protective structures (FOPS).....	21
4.12.9	Elevating and/or tiltable operator's station.....	21
4.12.10	Audible warning devices.....	22
4.13	Stability.....	22
4.14	Visibility.....	22
4.15	External lighting devices.....	22
4.16	Fire protection.....	22
4.16.1	Fire resistance.....	22
4.16.2	Fire extinguisher.....	22
4.17	Retrieval, transportation, lifting and towing.....	22
4.17.1	General.....	22
4.17.2	Retrieval.....	22
4.17.3	Tie-down.....	23
4.17.4	Lifting.....	23
4.17.5	Towing.....	23
4.18	Noise.....	23
<b>5</b>	<b>Verification of requirements and safety measures.....</b>	<b>23</b>
5.1	General.....	23
5.2	Functional verification.....	23
5.3	Structural verification.....	24
5.3.1	Test loads.....	24
5.3.2	Static test.....	24
5.3.3	Dynamic testing.....	24
5.4	Maximum load-lowering speed verification.....	25
5.4.1	General.....	25
5.4.2	Test procedure.....	25
<b>6</b>	<b>Information for use.....</b>	<b>25</b>
6.1	General.....	25
6.2	Operator's and maintenance manuals.....	25
6.3	Marking.....	27
6.4	Load charts.....	28
6.4.1	Trucks with load-carrying attachments.....	28
6.4.2	Trucks with non-load-carrying attachments.....	29
<b>Annex A</b>	<b>(informative) List of significant hazards.....</b>	<b>30</b>
<b>Annex B</b>	<b>(normative) Attachments and attachment brackets.....</b>	<b>35</b>
<b>Annex C</b>	<b>(normative) Elevating/tiltable operator's stations.....</b>	<b>38</b>

<b>Annex D</b>	(informative) <b>Consistency of direction of motion for load-handling controls</b> .....	<b>40</b>
<b>Bibliography</b>	.....	<b>41</b>
<b>Appendix ZZ</b>	(normative) <b>Variations to ISO 10896-1:2012 for Australia</b> .....	<b>43</b>

## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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

ISO 10896-1 was prepared by Technical Committee ISO/TC 110, *Industrial trucks, Subcommittee SC 4, Rough-terrain trucks*.

ISO 10896 consists of the following parts, under the general title *Rough-terrain trucks — Safety requirements and verification*:

— *Part 1: Variable-reach trucks*

Slewing trucks, lorry-mounted trucks, freely swinging loads and straight-masted trucks are to form the subjects of future parts 2, 3, 4 and 5.

## Introduction

Variable-reach trucks are known by a variety of terms, including “telehandlers” and “multi-purpose handlers”.

The variable-reach rough-terrain trucks covered by this part of ISO 10896 are designed to transport loads to and place them on elevated work areas and can be driven on unimproved or disturbed terrain.

They can also be equipped with a variety of attachments (e.g. fork arms, bale spikes) and interchangeable equipment (e.g. mowers, sweepers).

# Australian Standard®

## Rough-terrain trucks — Safety requirements and verification

### Part 1: Variable-reach trucks (ISO 10896-1:2012, MOD)

#### 1 Scope

This part of ISO 10896 specifies general safety requirements for non-slewing, variable-reach rough-terrain trucks (hereafter known as “trucks”), with an articulated or 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 and other integrated attachments are considered to be parts of the truck.

Other standards, in addition to the relevant provisions of this part of ISO 10896, can apply to the attachments.

This part of ISO 10896 is not applicable to the following:

- a) industrial variable-reach trucks covered by ISO 3691-2;
- b) machines designed primarily for earth-moving, such as loaders, even if their buckets are replaced by fork arms (see ISO 20474);
- c) trucks designed primarily with variable-length load suspension elements (e.g. chain, ropes) from which the load may swing freely in all directions (mobile cranes)<sup>1)</sup>;
- d) trucks fitted with personnel/work platforms, designed to move persons to elevated working positions<sup>2)</sup>;
- e) trucks designed primarily for container handling.

The significant hazards covered by this part of ISO 10896 are listed in [Annex A](#). This part of ISO 10896 does not address hazards that can occur

- during manufacture,
- when handling suspended loads, which may swing freely,
- when using trucks on public roads,
- when operating in potentially explosive atmospheres, or
- with a battery, LPG or hybrid as the primary power source.

#### 2 Normative references

The following referenced documents are indispensable for the application 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.

ISO 2330, *Fork-lift trucks — Fork arms — Technical characteristics and testing*

ISO 2867:2011, *Earth-moving machinery — Access systems*

ISO 3449, *Earth-moving machinery — Falling-object protective structures — Laboratory tests and performance requirements*

---

1) Additional requirements for trucks intended for freely swinging load applications, their lifting devices and attachments, and personnel/work platform applications on trucks, are being developed by ISO/TC 110/SC4.