

AS 5327:2022



Earth-moving machinery — Access systems (ISO 2867:2011 MOD)



AS 5327:2022

This Australian Standard ® was prepared by ME-063, Earthmoving Equipment. It was approved on behalf of the Council of Standards Australia on 4 March 2022.

This Standard was published on 18 March 2022.

The following are represented on Committee ME-063:

- Australian Industry Group
- Better Regulation Division (Fair Trading, Safework NSW, TestSafe)
- Construction and Mining Equipment Industry Group
- Department of Regional NSW
- Engineers Australia
- Engineers Australia/Mining Electrical and Mining Mechanical Engineering Society
- Institute of Instrumentation, Control and Automation Australia
- Minerals Council of Australia
- Resources Safety and Health Queensland
- The Australian Institute of Mining and Metallurgy
- University of Queensland

This Standard was issued in draft form for comment as DR AS 5327:2021.

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

ISBN 978 1 76113 683 2

Earth-moving machinery — Access systems (ISO 2867:2011 MOD)

Originated as AS 3868—1991.
Revised and redesignated as AS 5327:2019.
Second edition 2022.

COPYRIGHT

© ISO 2022 — All rights reserved
© Standards Australia Limited 2022

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-063, Earthmoving Equipment, to supersede AS 5327:2019.

The objective of this document is to specify criteria for systems that provide access to the operator station and to routine maintenance points on earth-moving machinery as defined in ISO 6165. It is applicable to the access systems (e.g. enclosure openings, platforms, guardrails, handrails and handholds, stairways and steps, ladders) on such machines parked in accordance with the manufacturer's instructions. Its criteria are based on the 5th to 95th percentile operator dimensions as defined in ISO 3411. It deals with the following significant hazards, hazardous situations and events: slip, trip and fall of persons, unhealthy postures and excessive effort.

This edition includes additional guidance for retractable and powered retractable access systems (see Clauses 4.2.1.3 to 4.2.3.8 in [Appendix ZZ](#)) and the order of preference for access systems [see Clause 4.1.2 (d)] and Clause 4.1.2 Note 3).

This document is an adoption with national modifications, and has been reproduced from, ISO 2867:2011, *Earth-moving machinery — Access systems*. The modifications are additional requirements and are set out in [Appendix ZZ](#), which has been added at the end of the source text.

[Appendix ZZ](#) lists the variations to ISO 2867:2011 for the application of this document in Australia.

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

- (a) In the source text “this International Standard” should read “this document”.
- (b) A full point substitutes for a comma when referring to a decimal marker.

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 appendices or annexes 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
National Foreword	iv
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
3.1 General terms and definitions	1
3.2 Access systems	2
3.3 Enclosure openings	3
3.4 Walking and standing areas	3
3.5 Guardrails, handrails and handholds	3
3.6 Stairways and steps	4
3.7 Ladders	4
3.8 Slip and fall	5
4 Requirements for access systems	5
4.1 General	5
4.2 Retractable access systems	7
4.2.1 General	7
4.2.2 Manually retractable access systems	7
4.2.3 Powered retractable access systems	7
4.3 Alternative exit path and opening	7
4.4 Requirements for specific tracked machines with a rotating upper structure	8
5 Requirements for enclosure openings	8
6 Requirements for guardrails, foot barriers, platforms, passageways, walkways and other surfaces used for walking, crawling, climbing, stepping or standing	10
6.1 Surfaces	10
6.2 Platforms, passageways, walkways, guardrails and foot barriers	10
6.3 Maintenance	11
6.4 Boom walkways	11
7 Requirements and recommendations for handrails and handholds	12
8 Requirements for stairways and steps	15
8.1 Stairways	15
8.2 Steps	15
9 Requirements for ladders	18
Annex A (informative) Examples of surfaces considered to be slip-resistant	21
Annex B (normative) Additional requirements for powered retractable access system that transports a person	22
Bibliography	23
Appendix ZZ (normative) Variations to ISO 2867:2011 for Australia	24

National Foreword

This document is the primary source of guidance for designers, manufacturers, importers, suppliers, end-users and maintainers in relation to the design of earthmoving machinery access systems in Australia. This document was prepared to address the issue of conflicting guidance relating to the design of access systems for earth-moving machinery.

A modified text adoption, rather than an identical adoption of ISO 2867:2011, has been chosen in order to provide further clarity and guidance on specific aspects of earthmoving machinery access systems. This is to account for Australian incident history, current practice, as well as Australia's relatively high level of earthmoving machinery health and safety expectations.

The revision of ISO 2867 may, in the future, reflect Australian conditions and health and safety expectations so that this document may be identically adopted rather than modified. If this occurs, this modified adoption will be withdrawn subject to the next revision of ISO 2867.

In addition, this document is intended to be the primary reference in relation to the design of access systems on earthmoving machinery. Formerly, AS 3868:1991, AS 1657 and ISO 14122 were used for access systems on earthmoving machinery.

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 2867 was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*, Subcommittee SC 2, *Safety, ergonomics and general requirements*.

This seventh edition cancels and replaces the sixth edition (ISO 2867:2006), which has been technically revised.

Introduction

The structure of safety standards in the field of machinery is as follows.

- a) Type-A standards (basic standards) give basic concepts, principles for design and general aspects that can be applied to machinery.
- b) Type-B standards (generic safety standards) deal with one safety aspect or one type of safeguard that can be used across a wide range of machinery:
 - type-B1 standards on particular safety aspects (e.g. safety distances, surface temperature, noise);
 - type-B2 standards on safeguards (e.g. two-hand controls, interlocking devices, pressure-sensitive devices, guards).
- c) Type-C standards (machinery safety standards) dealing with detailed safety requirements for a particular machine or group of machines.

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

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 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.

NOTE ISO 14122 is a series of type-B standards that provides general requirements for access to stationary and mobile machines and that can be used as a general reference for the design of access systems for earth-moving machines.

Australian Standard®

Earth-moving machinery — Access systems (ISO 2867:2011 MOD)

1 Scope

This International Standard specifies criteria for systems that provide access to the operator station and to routine maintenance points on earth-moving machinery as defined in ISO 6165. It is applicable to the access systems (e.g. enclosure openings, platforms, guardrails, handrails and handholds, stairways and steps, ladders) on such machines parked in accordance with the manufacturer's instructions. Its criteria are based on the 5th to 95th percentile operator dimensions as defined in ISO 3411. It deals with the following significant hazards, hazardous situations and events: slip, trip and fall of persons, unhealthy postures and excessive effort.

The general principles set out in this International Standard can be used for the selection of fixed and/or portable access systems for repairs, assembly, disassembly and longer interval maintenance.

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 3411, *Earth-moving machinery — Physical dimensions of operators and minimum operator space envelope*

ISO 6165, *Earth-moving machinery — Basic types — Identification and terms and definitions*

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

ISO 14122-1:2001, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means of access between two levels*

ISO 14122-4, *Safety of machinery — Permanent means of access to machinery — Part 4: Fixed ladders*

ISO 14567, *Personal protective equipment for protection against falls from a height — Single-point anchor devices*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 General terms and definitions

3.1.1

target dimension

dimensional value that takes into account ergonomics criteria based on comfort

Note 1 to entry: Acceptable values are within the specified range (from minimum to maximum).

3.1.2

machine repairs

work on a machine that is done as a result of a machine failure

3.1.3

routine maintenance points

locations on a machine that are specified in the periodic maintenance schedule of the operator's manual for performing scheduled daily/weekly/monthly maintenance on the machine