

AS 3450:2021



# **Earth-moving machinery — Wheeled or high-speed rubber-tracked machines — Performance requirements and test procedures for brake systems (ISO 3450:2011, MOD)**



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- Australian Industry Group
- Better Regulation Division (Fair Trading, Safework NSW, TestSafe)
- Construction and Mining Equipment Industry Group
- Department of Regional NSW
- Department of Resources (QLD)
- Engineers Australia
- Engineers Australia / Mining Electrical and Mining Mechanical Engineering Society
- Institute of Instrumentation, Control & Automation Aust
- Minerals Council of Australia
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# **Earth-moving machinery — Wheeled or high-speed rubber-tracked machines — Performance requirements and test procedures for brake systems (ISO 3450:2011, MOD)**

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## Preface

This Standard was prepared by the Standards Australia Committee ME-063, Earthmoving Equipment, to supersede AS 2958.1:1995, *Earth-moving machinery — Safety, Part 1: Wheeled machines — Brakes*.

The objective of this Standard is to specify the minimum performance requirements and test procedures for the service, secondary and parking brake systems of wheeled and high-speed rubber-tracked earth-moving machines, for the uniform assessment of those brake systems.

It is applicable to the following earth-moving machinery, operating on work sites or in mining, or travelling on public roads:

- (a) Self-propelled, rubber-tyred earth-moving machines, as defined in ISO 6165.
- (b) Self-propelled rollers and landfill compactors, as defined in ISO 6165 and ISO 8811.
- (c) Self-propelled scrapers, as defined in ISO 7133.
- (d) Remote-control machines, as defined in ISO 6165, wheeled or rubber-tracked.
- (e) Derivative earth-moving machines with rubber tyres.
- (f) Earth-moving machines with rubber tracks and a maximum machine speed  $\geq 20$  km/h

It is not applicable to pedestrian-controlled earth-moving machinery (see ISO 17063) or crawler earth-moving machines with steel or rubber tracks that travel at  $< 20$  km/h (see ISO 10265). While purpose-built underground mining machines are not within the scope of this International Standard, its provisions can generally be applied to those machines with some braking performance modifications and additions (see Annex A).

This Standard is an adoption with national modifications, and has been reproduced from, ISO 3450:2011, *Earth-moving machinery — Wheeled or high-speed rubber-tracked machines — Performance requirements and test procedures for brake systems*. The modifications are additional requirements and are set out in [Appendices ZZ](#) and [ZA](#), which have been added at the end of the source text.

[Appendix ZZ](#) lists the variations to ISO 3450:2011 for the application of this Standard in Australia.

[Appendix ZA](#) specifies a procedure for end-users to conduct in-service brake testing and for providers of in-service brake testing equipment.

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

- (i) In the source text “this International Standard” should read “this Australian Standard”.
- (ii) 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 .....	v
Foreword .....	vi
<b>1 Scope .....</b>	<b>1</b>
<b>2 Normative references .....</b>	<b>1</b>
<b>3 Terms and definitions .....</b>	<b>2</b>
<b>4 General requirements .....</b>	<b>5</b>
4.1 Required brake systems .....	5
4.2 Common components .....	6
4.3 Brake control systems .....	6
4.4 Service brake systems .....	7
4.5 Secondary brake systems .....	7
4.6 Parking brake systems .....	7
4.7 Hydrostatic brake systems .....	8
4.8 Systems with combined brake and steer function .....	8
4.9 Performance and warning devices for stored energy sources .....	8
4.10 Braking systems with electronic MCS .....	9
4.11 Machines designed to tow trailers .....	9
4.12 Machine instructions and labels .....	9
4.12.1 General .....	9
4.12.2 Braking system and periodic verification instructions .....	10
4.12.3 Additional instructions for machines designed to tow trailers .....	10
4.13 Estimating brake slope capability .....	10
<b>5 Test conditions .....</b>	<b>11</b>
5.1 Overall test parameters .....	11
5.2 General test conditions .....	11
5.3 Test course .....	12
5.4 Machine test configuration .....	12
<b>6 Performance tests .....</b>	<b>12</b>
6.1 General .....	12
6.2 Braking system controls .....	12
6.3 Stored energy sources .....	13
6.3.1 Service brake system recovery capacity .....	13
6.3.2 Secondary brake system capacity .....	13
6.3.3 Test performance .....	13
6.4 Holding performance .....	13
6.4.1 General .....	13
6.4.2 Service and parking brakes .....	13
6.4.3 Brake holding performance tests .....	14
6.4.4 Durability test of parking brake when used as secondary brake .....	15
6.5 Stopping performance .....	15
6.5.1 General .....	15
6.5.2 Service brake systems .....	15
6.5.3 Secondary brake systems .....	15
6.5.4 Heat fade test for all machines except rigid-frame and articulated-frame dumpers with machine test mass >32 000 kg .....	16
6.5.5 Brake tests for rigid-frame and articulated-frame dumpers with machine test mass >32 000 kg .....	16
6.6 Alternative testing .....	16
6.6.1 Lab testing .....	16
6.6.2 Alternative secondary brake testing for hydrostatic or similar propel drive machines .....	17

<b>7 Test report</b> .....	<b>17</b>
<b>Annex A</b> (informative) <b>Braking for purpose-built underground mining machines</b> .....	<b>19</b>
<b>Annex B</b> (informative) <b>Brake slope capability calculation method</b> .....	<b>24</b>
<b>Bibliography</b> .....	<b>25</b>
<b>Appendix ZZ</b> (normative) <b>Variations to ISO 3450:2011 for Australia</b> .....	<b>26</b>
<b>Appendix ZA</b> (normative) <b>Procedure for in-service brake testing</b> .....	<b>27</b>

## National Foreword

ISO 3540 has been updated a number of times since AS 2958.1:1995 *Earth-moving machinery — Safety Part 1: Wheeled machines — Brakes* was published. There are a number of areas in which the Australian standard is therefore out of date, and does not reflect current global best practice, and in some cases inhibits industry innovation. By way of some specific examples, this has an impact on purchasers of equipment and how they set specification criteria, international equipment designers and local equipment designers using an out of date standard that does not reflect global best practice. It also has an impact on regulators who guide industry to global best practice to improve public health and safety outcomes.

In addition, and importantly, there are also legislative obligations in parts of Australia that may require in-service brake testing of earthmoving machinery. AS 2958.1 had some limited guidance in this area but has largely been overlooked by industry due to its dated nature and lack of detail. The ZZ Appendix covers in-service brake testing procedures to help end users satisfy these regulatory obligations and support the integrity of the earthmoving machinery braking systems on their sites.

In-service brake testing of machines not specifically noted as in-scope should refer to the specific equipment manufacturers' instructions for inspecting and maintaining braking systems.

## 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 3450 was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*, Subcommittee SC 2, *Safety, ergonomics and general requirements*.

This fourth edition cancels and replaces the third edition (ISO 3450:1996), which has been technically revised.



# Australian Standard®

## Earth-moving machinery — Wheeled or high-speed rubber-tracked machines — Performance requirements and test procedures for brake systems (ISO 3450:2011, MOD)

### 1 Scope

This International Standard specifies minimum performance requirements and test procedures for the service, secondary and parking brake systems of wheeled and high-speed rubber-tracked earth-moving machines, for the uniform assessment of those brake systems.

It is applicable to the following earth-moving machinery, operating on work sites or in mining, or travelling on public roads:

- self-propelled, rubber-tyred earth-moving machines, as defined in ISO 6165;
- self-propelled rollers and landfill compactors, as defined in ISO 6165 and ISO 8811;
- self-propelled scrapers, as defined in ISO 7133;
- remote-control machines, as defined in ISO 6165, wheeled or rubber-tracked;
- derivative earth-moving machines with rubber tyres;
- earth-moving machines with rubber tracks and a maximum machine speed  $\geq 20$  km/h.

It is not applicable to pedestrian-controlled earth-moving machinery (see ISO 17063) or crawler earth-moving machines with steel or rubber tracks that travel at  $< 20$  km/h (see ISO 10265). While purpose-built underground mining machines are not within the scope of this International Standard, its provisions can generally be applied to those machines with some braking performance modifications and additions (see [Annex A](#)).

NOTE At the time of publication, no International Standard dedicated to purpose-built underground mining machines had been developed.

### 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 6014, *Earth-moving machinery — Determination of ground speed*

ISO 6016, *Earth-moving machinery — Methods of measuring the masses of whole machines, their equipment and components*

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

ISO 7133, *Earth-moving machinery — Tractor-scrapers — Terminology and commercial specifications*

ISO 8811, *Earth-moving machinery — Rollers and compactors — Terminology and commercial specifications*

ISO 9248, *Earth-moving machinery — Units for dimensions, performance and capacities, and their measurement accuracies*

ISO 10968, *Earth-moving machinery — Operator's controls*

ISO 15998, *Earth-moving machinery — Machine-control systems (MCS) using electronic components — Performance criteria and tests for functional safety*