ARiSO

AUSTRALIAN RAIL INDUSTRY STANDARDS ORGANISATION

AS 7508

Track Forces and Stresses

STANDARDS

Australian STANDARD

Advancing safety and productivity

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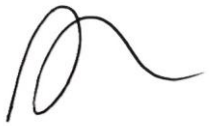
Development of this Standard was prepared by an Australian Rail Industry Standards Organisation (ARISO) Development Group consisting of representatives from the following organisations:

ARC Infrastructure, ARTC, Aurizon, Jacobs, Monash Institute of Railway Technology, Queensland Rail, Rail Confidence, Transport for NSW, UGL Rail, Watson Consulting Pty Ltd

The Rolling Stock Standing Committee verified that ARISO's accredited process was followed in developing the product, before the ARISO Board approved the document for publication.

ARISO wishes to acknowledge the positive contribution of subject matter experts in the development of this Standard. Their efforts ranged from membership of the Development Group through to individuals providing comments on a draft of the Standard during the open review.

I commend this Standard to the Australasian rail industry as it represents industry good practice and has been developed through a rigorous process.



Alan Fedda
Chief Executive Officer
Australian Rail Industry Standards Organisation

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Document history

Publication Version	Effective Date	Reason for and Extent of Change(s)
2026	18 June 2026	This document has been reviewed to ensure it remains relevant and applicable. The latest review assessed the content, confirming that while updates were made to align with current industry practices, technologies, and regulatory requirements, the original authorship and copyright have been acknowledged as required.

Approval

Name	Date
Australian Rail Industry Standards Organisation Board	18 June 2026

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Preface

This standard was prepared by the Track Forces and Stresses Development Group, overseen by the ARISO Rolling Stock Standing Committee.

The major changes in this edition are as follows:

(a) Alignment with AS 7630 Track Classification.

(b) Review and update of equations and diagrams.

(c) Strengthening the requirements and recommendations.

Objective

The objective of this Standard is to describe the requirements to limit the forces and contact stresses exerted on the track by rolling stock and to align with AS 7630, *Track Classification*.

The main purpose of the requirements is to reduce the likelihood of accelerated degradation of the infrastructure and reduce the risk of derailment.

Compliance

There are four types of provisions contained within Australian Standards developed by ARISO:

(a) Requirements.

(b) Recommendations.

(c) Permissions.

(d) Constraints.

Requirements – it is mandatory to follow all requirements to claim full compliance with the Standard. Requirements are identified within the text by the term ‘shall’.

Recommendations – do not mention or exclude other possibilities but do offer the one that is preferred. Recommendations are identified within the text by the term ‘should’.

For compliance purposes, where a recommended control is not applied as written in the standard it could be incumbent on the adopter of the standard to demonstrate their actual method of controlling the risk as part of their WHS or Rail Safety National Law obligations. Similarly, it could also be incumbent on an adopter of the standard to demonstrate their method of controlling the risk to contracting entities or interfacing organisations where the risk may be shared. Recommendations recognize that there could be limitations to the universal application of the control, i.e. the identified control is not able to be applied or other controls are more appropriate or better.

Permissions – conveys consent by providing an allowable option. Permissions are identified within the text by the term ‘may’.

Constraints – provided by an external source such as legislation. Constraints are identified within the text by the term ‘must’.

ARISO Standards identify known hazards relevant to the railway industry. Appendix A provides a non-exhaustive list of hazards relevant to the scope of this Standard.

Appendices in ARISO Standards may be designated either “normative” or “informative”. A "normative" appendix is an integral part of a Standard and compliance with it is a requirement, whereas an "informative" appendix is only for information and guidance.

Commentary

Commentary *C Preface*

This Standard includes a commentary on some of the clauses. The commentary directly follows the relevant clause, is designated by 'C' preceding the clause number and is printed in italics in a box. The commentary is for information and guidance and does not form part of the Standard.

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Section 1 Scope and general

1.1 Scope

This document applies to the following types of new and modified rolling stock, or existing rolling stock previously captive to a particular operation which is to be operated in a new area:

(a) Locomotive rolling stock;

(b) Freight rolling stock;

(c) Passenger rolling stock; and

(d) Infrastructure maintenance rolling stock.

This document covers the design, construction and maintenance of rolling stock.

This document includes single axle, independent rotating wheeled vehicles and single axle infrastructure maintenance vehicles.

This document does not apply to rolling stock operating on light rail corridors, high-speed rail corridors, cane railways or monorail networks.

This document does not specifically cover isolated heritage and tourist railways, but items from this document may be applied to such systems and/or rolling stock as deemed appropriate by the relevant rail transport operator.

Operation of rolling stock is not covered.

1.2 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:

- Australian Government 2009, National Trade Measurement Regulations 2009 (Cth).
- Transport for NSW Technical Procedure, TS 04232:2022, *Static Vehicle Weigh Test*

NOTE:

Documents for informative purposes are listed in a Bibliography at the back of the Standard.

1.3 Defined terms and abbreviations

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

1.3.1
high speed railway
railway that is capable of accommodating rolling stock which can travel at speeds of greater than 160 km/h

1.3.2
lateral
direction across the track, perpendicular to the track centreline and parallel to the line joining the top of the rail heads

1.3.3
moment arm
force times distance