

AS 7640.1:2012



Rail Management - General



Infrastructure Standard



This Australian Standard® AS 7640.1 Rail Management - General was prepared by a RISSB Development Group consisting of representatives from the following organisations:

ARTC	Brookfield Rail	Queensland Rail
RailCorp	TransAdelaide	PTA
Rio Tinto		

The Standard was approved by the Development Group and the Infrastructure Standing Committee in June, 2012. On 23 August 2012 the RISSB Board approved the Standard for release.

This standard was issued for public consultation and was independently validated before being approved.

Development of the standard was undertaken in accordance with RISSB's accredited process, which includes an independent validation. As part of the approval process, the Standing Committee verified that proper process was followed in developing the standard.

RISSB 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 comment 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.



Kevin Taylor
Chief Executive Officer
Rail Industry Safety and Standards Board

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AS 7640.1:2012 Rail Management - General

Document History

Publication Version	Effective Date	Reason for and Extent of Change(s)
2012	September 21, 2012	

Approval

Name	Date
Rail Industry Safety and Standards Board (RISSB)	21/09/2012

SECTION	CLAUSE	REQUIREMENTS	HAZARD
1		INTRODUCTION	
1.1		DISCLAIMER	
	1	This Rail Industry Safety and Standards Board (RISSB) Australian Infrastructure Standard has been drafted for use by rail operators and the rail industry in Australia.	N/A
	2	RISSB and all persons acting for the RISSB in preparing the standard disclaim any liability or responsibility to any person for any consequences arising directly or indirectly from the use by the rail industry or organisations of the standard in whole or in part, and whether or not in conjunction with, or as a supplement to, the standards which the rail industry already use.	N/A
	3	Users of the standard should be aware that, while using the standard, they must also comply with any relevant Commonwealth, State or Territory legislation relevant to their operations.	N/A
	4	Adherence to the standard does not replace or exclude the application of such legislative requirements.	N/A
	5	Users are responsible for making their own enquiries in relation to the application of legislation, and the framers of the standard accept no responsibility in this regard.	N/A
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	7	Users are responsible for making their own enquiries in relation to compliance with national standards and codes of practice.	N/A
	8	While all reasonable care has been taken in the preparation of this standard, it is provided to rail operators without any legal liability on the part of RISSB and RISSB [publisher, authors, consultants and editors each] takes no responsibility for loss suffered by any person resulting in any way from the use of, or reliance on, this publication.	N/A
	9	Responsibility rests with the rail organisation to ensure that all aspects of the standard are safe.	N/A
	10	© Rail Industry Safety and Standards Board	N/A
1.2		DOCUMENT CONTROL	
	1	Document Title : Railway Infrastructure - Rail Management - General	N/A
	2	Number: AS 7640.1	N/A
	3	Version: 1.0	N/A
	4	Publication Date: 21 September 2012	N/A
1.3		CONTENT	
1.3.1		Table of Contents	
	1	1. INTRODUCTION	N/A
	2	1.1 Disclaimer	N/A
	3	1.2 Document Control	N/A
	4	1.3 Content	N/A
	5	1.4 Purpose	N/A
	6	1.5 Scope	N/A
	7	1.6 Compliance	N/A
	8	1.7 Referenced Documents	N/A
	9	1.8 Definitions	N/A
	10	2. RAIL MANAGEMENT	N/A
	11	2.1 New Rail	N/A

SECTION	CLAUSE	REQUIREMENTS	HAZARD
	12	2.2 Serviceable Rail	N/A
	13	2.3 Rails in Existing Track	N/A
	14	3. CLOSURE RAIL	N/A
	15	3.1 Junction Rail	N/A
	16	3.2 Transition Rail	N/A
	17	4. GUARD RAIL	N/A
	18	5. CHECK RAIL IN PLAIN TRACK	N/A
	19	6. CUTTING AND DRILLING OF RAILS	N/A
	20	6.1 Flame Cutting Rail	N/A
	21	6.2 Flame Cutting Holes	N/A
	22	7. RAIL PROFILE AND GRINDING	N/A
	23	7.1 Rail Profiles	N/A
	24	7.2 Rail Surface finish	N/A
	25	8. RAIL LUBRICATION	N/A
	26	9. RAIL DEFECTS	N/A
	27	9.1 Rail Inspection	N/A
	28	9.2 Management of Rail Defects	N/A
	29	10. DECOMMISSIONING	N/A
1.3.2		Spreadsheet Layout	
	1	The "SECTION" plus "CLAUSE" columns provide a unique identifier for each sentence/row/requirement in the document, e.g. this is sentence Section 1.3.2 Clause 1	N/A
	2	The "REQUIREMENTS" column contains the main body of the document.	N/A
	3	White-coloured cells in the "REQUIREMENTS" column contain the document requirements.	N/A
	4	Green-coloured cells in the "REQUIREMENTS" column contain additional supporting information.	N/A
	5	Grey-coloured cells in the "REQUIREMENTS" column contain the section heading descriptions.	N/A
	6	The "TYPE" column categorises each row into one of supporting information (SUP), a heading (HED), a mandatory requirement (MAN) or a recommended requirement (REC).	N/A
	7	The "HAZARD" column lists the hazard number, taken from the Track and Civil Hazard Trees, for the hazard(s) being controlled by each requirement.	N/A
	8	The "IC" column identifies, by an "X" in the cell, those items that may need to be considered for inclusion in an Interface Coordination Plan.	N/A
	9	The "Background Information" column contains details about the source or rationale of a sentence/row/requirement.	N/A
1.4		PURPOSE	
	1	This Standard describes requirements for rail for design, construction, commissioning, inspection, monitoring, maintenance and decommissioning for of rail track infrastructure in Australia.	N/A
1.5		SCOPE	
	1	This Standard covers management of both new, existing and serviceable rails.	N/A
	2	This Standard applies to the management of rails in the permanent works of existing, upgraded and new main line tracks and branch lines as classified in AS 7630 Track classification.	N/A
	3	This Standard covers tracks as classified in AS 7630 Track Classification.	N/A
	4	Tram tracks, cane railway and monorail networks are not included.	N/A

SECTION	CLAUSE	REQUIREMENTS	HAZARD
1.6		COMPLIANCE	
	1	There are two types of controls contained within the RISSB Australian Infrastructure Standards – 1. mandatory (MAN) requirements and 2. recommended (REC) requirements.	N/A
	2	Both of these types of control address hazards that are deemed to require controls on the basis of existing Australian and international Infrastructure practices and standards.	N/A
	3	A mandatory requirement is a requirement that the standard sees as the only way of treating the hazard.	N/A
	4	A recommended requirement is one where the standard recognises that there are limitations to the universal application of the requirement and that there may be circumstances where the control cannot be applied or that other controls may be appropriate or satisfactory, subject to agreement with the Track Manager.	N/A
	5	Recommended requirements in the RISSB Australian Infrastructure Standards are considered when compliance to the standards is being assessed.	N/A
1.7		REFERENCED DOCUMENTS	
	1	The following documents are referred to in this Standard:	N/A
	1(a)	AS 1085.1 - Railway Track Materials - Steel rails	N/A
	1(b)	AS 1085.20 - Railway Track Materials - Welding of steel rails	N/A
	1(c)	AS 7630 Track Classification	N/A
	1(d)	RDS 7640.2 Welding of Rail Ends and Rail Surface Repairs	N/A
	1(e)	RDS 7640.3 Mechanical Rail Joints	N/A
1.8		DEFINITIONS	
1.8.1		General Terminology	
	1	General railway technical terms extracted from the National Guideline - Glossary of Railway Terminology can be found in Appendix G.	N/A
	2	Track classification are defined in AS 7630 Track classification and specific terms used in this Standard are defined below:	N/A
	3	Foul joint: Misalignment of running edge or top of rail head at a joint	N/A
	4	Junction rail: A manufactured or forged closure rail made from at least two rails of differing size for use to join rails of differing size and should only be used when fully welded into the track.	N/A
	5	Transition rail: A closure rail used to join two rails usually of the same nominal size but with differing wear profiles.	N/A
2		RAIL MANAGEMENT	
2.1		New Rail	
2.1.1		Specifications	
	1	All new rail for use in main lines and yards shall comply with the requirements in AS 1085.1 Railway track materials - Steel rails or equivalent.	5.9, 5.34
	2	Unless approved by the Track Manager, rail should not be drilled except for forming rail joints.	5.9, 5.34
2.1.2		Rail Selection	
	1	New track should be classified in accordance with AS 7630 Track classification and the Track Manager should select rail size by referring to the details in Appendix A.	5.9, 5.34
	2	Other design and performance criteria should include:	N/A
	2(a)	track forces and train handling	N/A

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SECTION	CLAUSE	REQUIREMENTS	HAZARD
	2(b)	curves	N/A
	2(c)	rail support and fastenings	N/A
	2(d)	anchor types and patterns	N/A
	2(e)	rail cross-section properties	N/A
	2(f)	rail deflection	N/A
	2(g)	bending, web buckling, contact and sub-surface rail stress limits for plastic deformation and fatigue	N/A
	2(h)	maintenance and life cycle cost	N/A
	3	For re-railing using serviceable rails, additional consideration should be given to match the type, size and wear of existing rail.	4.9, 4.26
2.1.3		Head Hardened Rail	
	1	Head hardened rail is recommended for use in Heavy Haul Freight (HHF) track.	5.9, 5.34
	2	Head hardened rail can be used to control wear in sharp curves of radii less than 600 m.	5.9, 5.34
2.1.4		Use of Continuous Welded Rail (CWR)	
	1	Continuously welded rail is recommended to be used for:	5.9, 5.34
	1(a)	Heavy Haul Freight (HHF) lines	5.9, 5.34
	1(b)	High Speed Passenger (HSP) lines	5.9, 5.34
	1(c)	Moderate Speed Passenger (MSP) lines	5.9, 5.34
	1(d)	Main Line Freight (MLF) lines	5.9, 5.34
	2	CWR is usually formed by using long lengths of flash butt welded rails.	5.9, 5.34
2.2		Serviceable Rails	
2.2.1		Equivalent Rail Size	
	1	Rail sizes shall be deemed to be equivalent to the nominal rail sizes as shown in Appendix A2.	4.26
2.2.2		Use of Serviceable Rails	
	1	Serviceable rails may be used in existing mainline tracks, branch lines and new or existing sidings subject to the requirements detailed below and the approval of the Track Manager.	N/A
	2	Rail head wear should not exceed the limits given in Clause Section 2.3.1.	4.9
	3	Gauge face angle should not exceed the limits specified in Section 2.3.3.	4.9, 4.20
	4	Worn rails may be transposed for use in track, with due consideration of rail/wheel contact.	N/A
	5	Prior to reuse, the rail should be ultrasonically tested and have any defects removed or alternatively, have results of previous ultrasonic testing records which indicated that the rail was serviceable.	4.9, 12.8
	6	Rail surface defects (such as wheelburns, flaking, shelling, bruising, faulty machining, corrosion and pitting) should be removed.	4.9, 12.8
	7	All crippled or dipped welds should be removed or corrected.	4.9
	8	Rail should not have excessive rust corrosion.	N/A
	9	Joint bolt holes should be cropped if there is evidence of cracking or elongation of bolt holes in accordance with the requirements in AS 7640.2 Welding of rail ends and rail surface repair.	12.8
	10	Rail end straightness, twist and other rail distortions (battered, crippled or deformed) should meet the requirements for installation of aluminothermic welds or mechanical joints and should be cropped if necessary.	12.8
	11	Where necessary, gauge corner should be reprofiled by removing any lip that has developed.	12.8

SECTION	CLAUSE	REQUIREMENTS	HAZARD
	12	Where it is necessary to grind one rail to match the next wear profile, the maximum allowable rate of change of rail head sections should be 1 in 500 vertically and horizontally.	N/A
2.3		Rails in Existing Track	
2.3.1		Rail Wear	
	1	Rail head wear may be measured using a rail profile device or by taking top and side wear measurements.	N/A
	2	Top and side wear measurements shall be undertaken in accordance with Appendix A3.	4.9
	3	The measured head dimension shall be discounted for any metal flow outside the original rail profile.	4.9
	4	The Track Manager shall be responsible for determining the limits of rail head wear for the respective track classification.	4.9
	5	Rail head wear should not exceed the limits shown in Appendix A4.	N/A
	6	Considerations should be given to the combined effects of rail side wear and track gauge widening in the determination of rail head wear limits.	N/A
	7	The limits should apply to the worst location, and not the average rail wear, for the segment of track being considered (such as a curve).	N/A
	8	Individual limits should not apply to combinations of wear and defects as it may be necessary to adopt a lower limit.	N/A
	9	When approaching the rail wear limits, factors such as defect types, defect density and defect history should be considered.	N/A
	10	Where combined wear and defects occur, detailed assessment by qualified personnel is required.	4.9
	11	Where the prescribed wear limits are exceeded, operating restrictions may need to be imposed.	N/A
	12	Temporary speed restriction can lead to an increase in rail stress in the low leg of curves.	N/A
2.3.2		Alternative Rail Wear Strategy	
	1	Rail wear limits may be determined from the relationship between rail stress and its fatigue stress limit.	N/A
	2	The charts in Appendix B show the relationship between the amount of wear in the rail head and the stress at the rail foot.	N/A
	3	The prescribed wear limits may be reassessed using a risk based approach, if the factors in the table in Appendix C are mitigated.	N/A
2.3.3		Gauge Face Angle	
3	1	To prevent wheel climb, the gauge face angle of rails should not exceed 26° from the line perpendicular to the plane of the track as shown in Appendix A5.	4.14
	2	Where the prescribed gauge face angle limits are exceeded, re-profiling or operational restrictions may be required.	N/A
		CLOSURE RAIL	
	1	The closure rail should conform to the existing rail in head height and width.	N/A
	2	The minimum length of a closure rail shall be 2.2 m except in turnouts. (A longer length of closure should be provided where possible.)	4.26
	3	Closure rails used in turnouts, diamonds and compound crossings, shall comply with the requirements of AS 7642 Points and Crossings.	4.26
	4	Closure rails shall be joined mechanically or welded into tracks.	4.26

SECTION	CLAUSE	REQUIREMENTS	HAZARD
	5	Any rail ends which have been left in track and battered by traffic should be re-cut prior to welding, removing a minimum of 25 mm.	12.8
	6	Rail ends or aluminothermic welds may not be located closer than 1.2 m from the centre of a factory assembled glued insulated joint.	N/A
	7	Where it is necessary to grind the closure to match the existing rail, the maximum allowable rate of change of rail head sections should be 1 in 500 vertically and horizontally.	N/A
	8	For curves of 500 m radius or less, the closure may be bent to the radius of the track curve.	N/A
3.1		Junction Rail	
	1	Junction rail can be formed by either:	N/A
	1(a)	a step (junction) weld near the centre of the closure, where approved welding materials are available for the purpose; or	N/A
	1(b)	the heavier size rail is upset, usually in a forge, to suit the height of the lower size rail and welded together with the gauge face aligned.	N/A
	2	The ends of the junction rail must be of the same size as the rail into which it is being welded.	4.26
	3	When a junction weld is not available to weld the differing rails together, the junction rail may be made up of three rails of differing sizes, using an intermediate rail size for the centre section.	N/A
3.2		Transition Rail	
4	1	A transition rail is used when two rails of differing head wear are required to be joined and direct welding will cause the track to have a significant difference in gauge each side of the proposed weld or cause a foul 'joint' to result.	N/A
	2	The rail can be new or serviceable and each end should be machined so that it matches as closely as possible to the rail end onto which it is being welded.	N/A
	3	The rail between shall be machined to obtain a gradual transition between the ends.	4.26
		GUARD RAIL	
	1	The function of guard rails is to constrain the path of a derailed train after the wheels leave the rails especially on curves, bridges, tunnels, near infrastructure, etc.	N/A
	2	The back of the wheel flange should not contact the guard rails during normal running as the flangeway gap can be up to 250 mm wide.	N/A
	3	The use of guard rails should be considered for the following situations:	N/A
	3(a)	rail bridges;	N/A
	3(b)	over-line or adjacent structures with unprotected supports;	N/A
	3(c)	other infrastructure at risk of being struck by derailed rollingstock; or	N/A
	3(d)	in curves of tight radii where they should be provided on the inside of one or both rails to prevent derailment.	N/A
	4	Guard rails may also be used through level crossings to assist in providing the flangeway and act as formwork for asphalt or concrete paving.	N/A
	5	When used through level crossings, they should preferably be installed at the same height as the running rail.	N/A
	6	In situations where guard rails are proposed, the following functional requirements should be considered:	N/A

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SECTION	CLAUSE	REQUIREMENTS	HAZARD
5	6(a)	The guard rails should be equal to or less than the weight of the running rails, shall be serviceable and may be of AS 41kg/m equivalent or heavier sections.	N/A
	6(b)	Both sides of the track should be protected, unless the identified hazard is only on one side of the track where a single guard rail may be installed for protection from that hazard.	N/A
	6(c)	The top of the guard rail should be at the level of the adjacent running rail surface, or below it by no more than 50mm.	N/A
	6(d)	The guard rail should be positioned such that the face of the guard rail head would provide restraint to the back of a derailed wheel to keep the opposite wheel on the sleeper.	N/A
	6(e)	Guard rails should be fastened securely at least to every second sleeper and preferably to every sleeper.	N/A
	6(f)	Guard rail lengths may be joined by using a pair of four-hole fishplates or their equivalent as a minimum.	N/A
	6(g)	Guard rails should commence prior to the start of a structure or other hazard being protected and finish beyond the structure.	N/A
	6(h)	The ends of the guard rails should be splayed at 30° to the track centreline.	N/A
	6(i)	Where there is a guard rail on each side of the track, the splayed ends should be extended to form a vee near the track centreline.	N/A
	6(j)	The splayed ends of the guard rails should be fastened securely to every sleeper.	N/A
	6(k)	The ends of the guard rail shall be cut at approx 45° to horizontal to avoid catching the end of lashings, tow lines or dragging loads.	N/A
6		CHECK RAILS IN PLAIN TRACK	
	1	Check rails, used in turnouts, diamonds and compound crossings, shall comply with the requirements of AS 7642 Points and Crossings.	4.26
	2	Check rails may also be used in sharp curves.	N/A
	3	The purpose of check rails in plain track is to restrain wheels from climbing the rail in very tight curves.	N/A
	4	New or serviceable rails, of the same sections, may be used as check rails.	N/A
	5	It is desirable that the top of the check rail should be at the same level as the adjacent running rail surface.	4.13
	6	At the ends of the check rails, a flangeway flared entry should be provided to enable a gradual lateral displacement of the wheels before entering the check rail flangeway.	4.13
	7	Check rails and entry flare should be fastened securely to every sleeper.	4.13
	8	The entry flares should have bevel ends to avoid catching the end of lashings, tow lines or dragging loads..	4.13
		CUTTING AND DRILLING OF RAILS	
	1	For all permanent installations, rails shall be cut by rail saws and holes shall be drilled.	12.8
	2	Rail ends shall be cut square to the following tolerances:	12.8
	2(a)	Vertical - ≤1 mm variation in the height of the rail	12.8
	2(b)	Horizontal - ≤0.5 mm variation in the width of the rail	12.8
	3	All holes must be drilled to the proper template for each rail size.	12.8
	4	Holes shall be drilled square to the web.	12.8

SECTION	CLAUSE	REQUIREMENTS	HAZARD
	5	When rails are being cut with a hacksaw type machine or drilled, the rails should be cooled and lubricated by the use of an appropriate cutting compound.	12.8
6.1		Flame Cutting Rail	
	1	Rail shall not be flame cut except in emergency or in preparation for welding.	12.8
	2	Flame cutting is not permitted to prepare rail ends for the permanent installation of a mechanical rail joint.	12.8
	3	When rails are flame cut in preparation for welding, the rail ends shall be welded in the same shift or within 4 hours for head hardened rails.	12.8
	4	In emergencies such as temporary repair of track after a derailment, flame cut rail ends may be permitted in track under which a low speed restriction of 20 km/h or less is imposed.	12.8
	5	The flame cut rail ends must be replaced prior to lifting the speed restriction by replacing the affected section with a new saw cut and drilled rail.	12.8
	6	It is not acceptable to leave flame cut rail ends or holes in track and should be removed as soon as possible.	12.8
6.2		Flame Cut Holes	
	1	Flame cut bolt holes may be used in an emergency to effect temporary repairs.	N/A
	2	A speed restriction of 10 km/h shall be placed on the section and the track shall be continuously monitored until the flame cut bolt hole is removed.	12.8
	3	Rail clamps are preferred over flame cut holes to clamp fishplates to create a temporary joint.	12.8
7		RAIL PROFILE AND GRINDING	
	1	The main objectives of rail grinding are to:	N/A
	1(a)	Establish rail profiles that improve the wheel/rail interaction characteristics.	N/A
	1(b)	Rectify or control existing rail surface defects to enable efficient and effective ultrasonic testing of rail and hence reduce the risk of rail failures and track deterioration.	N/A
7.1		Rail Profiles	
	1	The rail profiles should be determined for tangent and curved track (including high and low rails) up to the last of the canted sleeper plates before and after turnouts.	N/A
	2	The same basic profiles should be applied to all rail sizes and types.	N/A
	3	The main rail profiles should be designed to suit current wheel profiles in both the new and acceptable worn conditions.	4.9, 4.26
	4	Rail profiles should be compatible with the traffic travelling over them.	4.9, 4.26
7.2		Rail Surface Finish	
	1	The grinding process may remove longitudinal rail surface defects such as corrugations, dipped or peaked welds, wheel burns, flaking, shelling and bruising, etc.	N/A
	2	Depending on the severity, some larger defects may not be removed by grinding.	N/A
	3	There should be no sharp ridges especially at the corners of the head of the rail.	N/A
	4	There should be no excessive gouging on the rail surface or sharp grinding marks.	N/A

SECTION	CLAUSE	REQUIREMENTS	HAZARD
8	5	There should be no indentations in the running surface or the running edge of the rail.	N/A
	6	There should be no continuous indication of overheating (bluing) of the rail surface.	N/A
	7	The ground rail surface should be no rougher than an average of 10 μm R_A within 5 km of any dwelling and 15 μm R_A elsewhere.	N/A
	8	Short pitch surface irregularities (30-150 mm in wavelength) should be removed.	N/A
		RAIL LUBRICATION	
	1	Rail lubrication should be considered at locations where there is potential for significant wear and/or flanging noise is a problem.	N/A
	2	The requirements and use of rail lubrication are described in Appendix D.	N/A
		RAIL DEFECTS	
9		Rail Inspection	
9.1		Rail Inspection	
	1	The inspection of rail shall commence when the track is commissioned and continue throughout its operational life.	6.8, 6.17, 6.23
	2	The Track Manager shall determine the inspection frequency based on the track classification as defined in AS 7630 Track Classification.	6.8, 6.17, 6.23
	3	All inspections shall be carried out by competent personnel in accordance with the requirements of AS 4292.1	6.8, 6.17, 6.24
	4	Rail defects may be identified through one or a combination of inspections.	N/A
9.1.1		Patrol Inspection	
	1	Inspections may be carried out from an on-track vehicle travelling at a speed consistent with the scope of the inspection, or by walking.	N/A
	2	Track inspectors should keep a lookout for rail defects and conditions (i.e. indicators of a defect) that may affect the integrity of the track structure.	N/A
9.1.2		General inspection	
	1	A general visual inspection should be carried out:	N/A
	1(a)	for all new welds and new mechanical joints; or	N/A
	1(b)	where the response following detection of a rail or weld defect is noted for further observation.	N/A
9.1.3		Detailed inspection	
	1	Detailed inspection includes the following:	N/A
	1(a)	Continuous ultrasonic testing	N/A
	1(b)	Manual ultrasonic testing	N/A
	2	Identification of defects should be carried out via continuous ultrasonic testing at a regular frequency during the service life of the rail.	N/A
	3	The Track Manager should monitor defect growth history and adjust the inspection frequency as required.	6.8, 6.17, 6.18, 6.19
	4	Identification of defects should be carried out via manual ultrasonic testing in the following situations:	N/A
	4(a)	At new aluminothermic and flashbutt welds.	N/A
	4(b)	To confirm suspected defects indicated as part of the continuous ultrasonic inspection.	N/A
	4(c)	Where there are suspected defects found by visual inspection.	N/A
	4(d)	When known defects are due to be reinspected and reassessed.	N/A
9.2		Management of Rail Defects	

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SECTION	CLAUSE	REQUIREMENTS	HAZARD
10	1	A catalogue of rail defects is shown in Appendix E.	N/A
	2	A typical rail defect management regime is shown in Appendix F.	
	3	The Track Manager shall determine the defects monitoring and treatment based on the track classification as defined in AS 7630 Track Classification.	6.8, 6.17, 6.18, 6.19
	4	Corrective actions and priorities shall be set based on the severity of the defect, the time to planned repair completion, whether and under what circumstances trains can operate over the defect and what arrangements for regular retesting and increased surveillance are to be made.	6.8, 6.17, 6.18, 6.19
		DECOMMISSIONING	
	1	Where rails are deemed unserviceable, the rail should be clearly identified as unserviceable or rendered unserviceable by the Track Manager.	4.9

APPENDIX A

Table A.1 New Rail Selection Chart

Speed Limit Axle Load (tonnes)	10	20	25	30	40	50	60	70	80	90	100	110	115	120	130	140	150	160
<11		31																
12																		
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40																		

Figure 1 New Rail Selection Chart

Note: Figure 1 should be read in conjunction with AS7630 Track classification.

Table A.2 Equivalent Rail Sizes in Australia

Nominal Rail Size	Actual Rail Size
20 kg/m	41½ lb/yd
	42 lb/yd
	20 kg/m
	45 lb/yd
	46½ lb/yd
31 kg/m	58 lb/yd
	60 lb/yd
	61 lb/yd
	63 lb/yd
	31 kg/m
	66 lb/yd
	70 lb/yd
	71½ lb/yd
	75 lb/yd
	78 lb/yd
41 kg/m	80 lb/yd
	83 lb/yd
	41 kg/m
	DKA 42 kg/m
50 kg/m	90 lb/yd
	94 lb/yd
	47 kg/m
	50 kg/m
	100 lb/yd
60 kg/m	103 lb/yd
	107 lb/yd
	53 kg/m
	110 lb/yd
	119 lb/yd (AREA)
	60 kg/m
	66 kg/m (AREA)
68 kg/m	68 kg/m
	136RE or 136RE-10 (AREAMA)
71 kg/m	141RE OR 141AB (AREAMA)

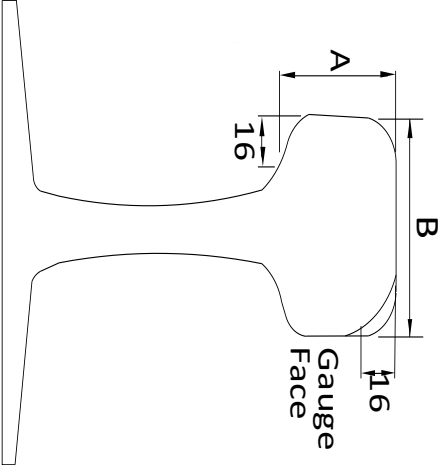
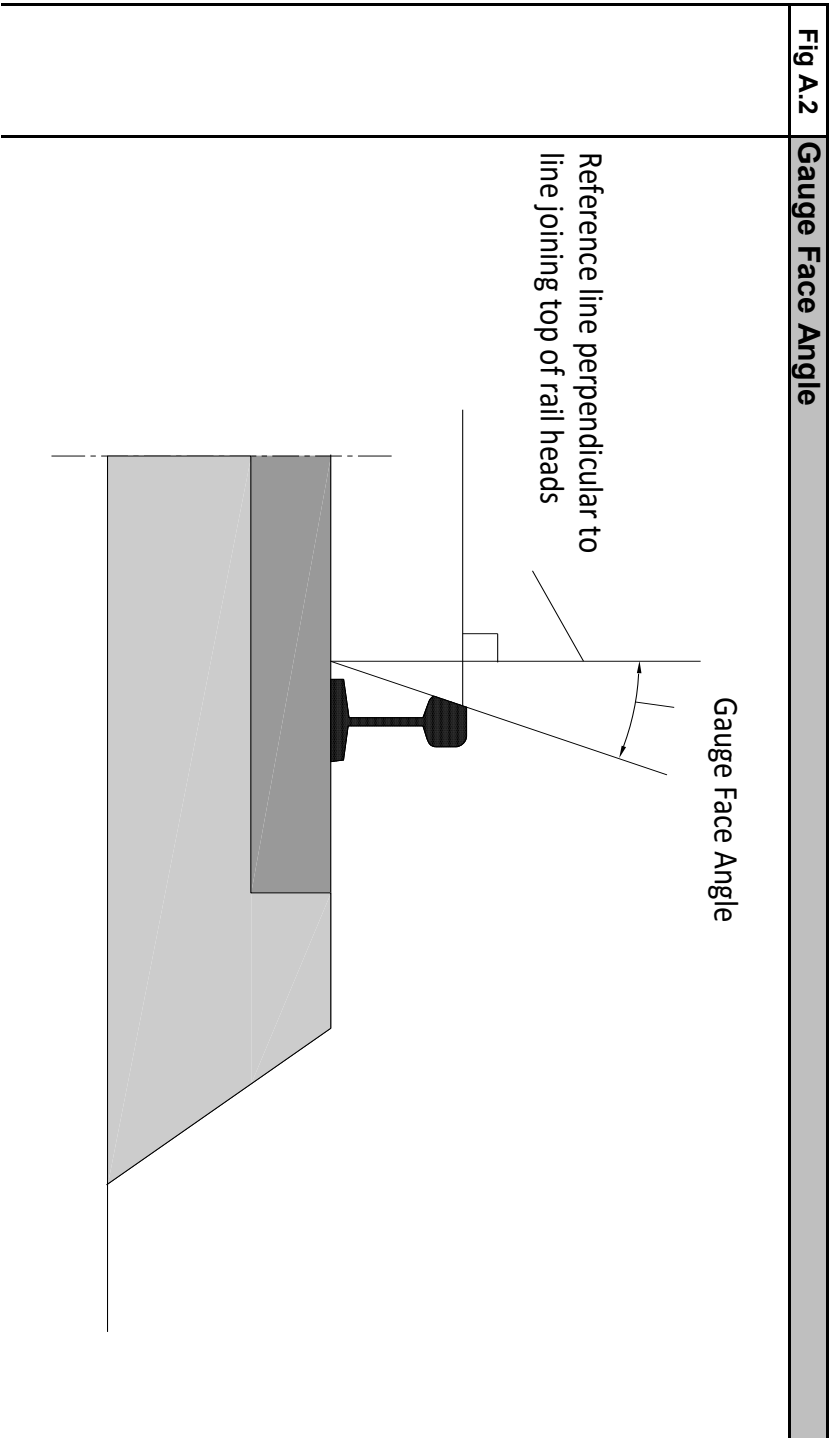
Fig A.1	Rail Wear Measurements
	

Table A.3 Rail Wear Limits

Rail Size kg/m	New Rail Head height mm	New Rail Head Width mm	Max. Head Loss Limit	
			R<600	R≥600
31	30	64	20%	38%
41	35	64	29%	46%
47	37	70	33%	50%
50	40	70	35%	53%
53	40	70	34%	51%
60SC	44	70	38%	51%
60HH	44	70	39%	54%
68	44	74	35%	45%
71	47	76	35%	45%

Figure 4 Rail Wear Limits

Note: Figure 4 shows a table of suggested rail wear limits. The Track Manager should make assessment for determining the appropriate wear limits for the respective track classification.



APPENDIX B RAIL FOOT STRESS VS COMBINED HEAD WEAR

Chart B.1 31 Kg/m rail

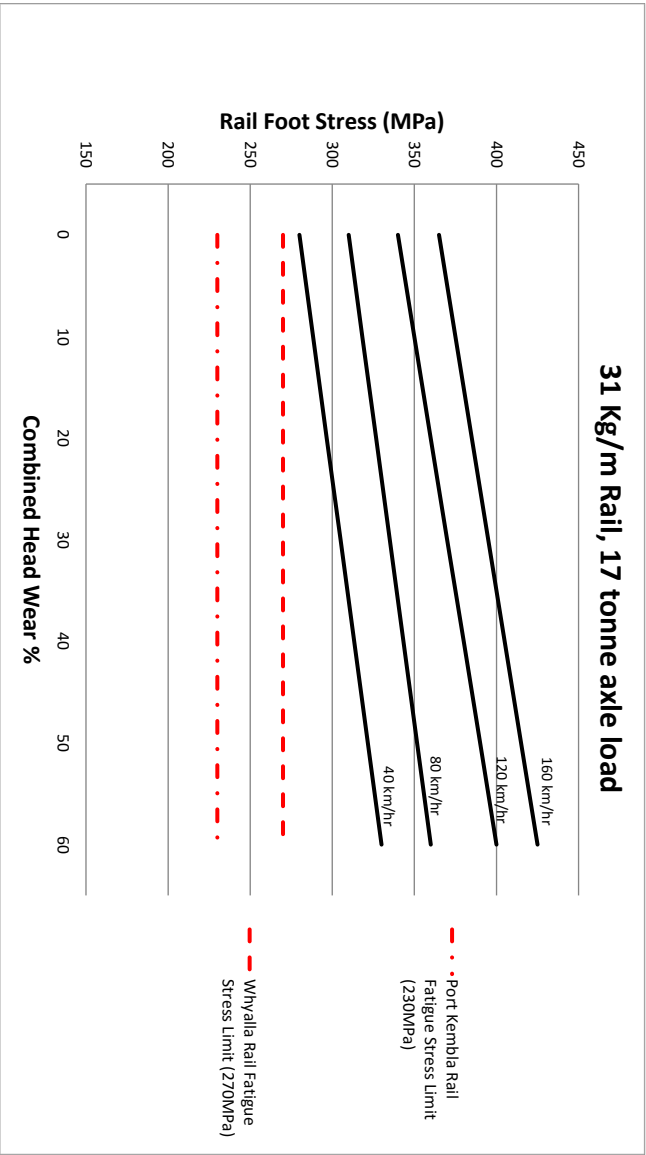


Chart B.2 41 Kg/m rail

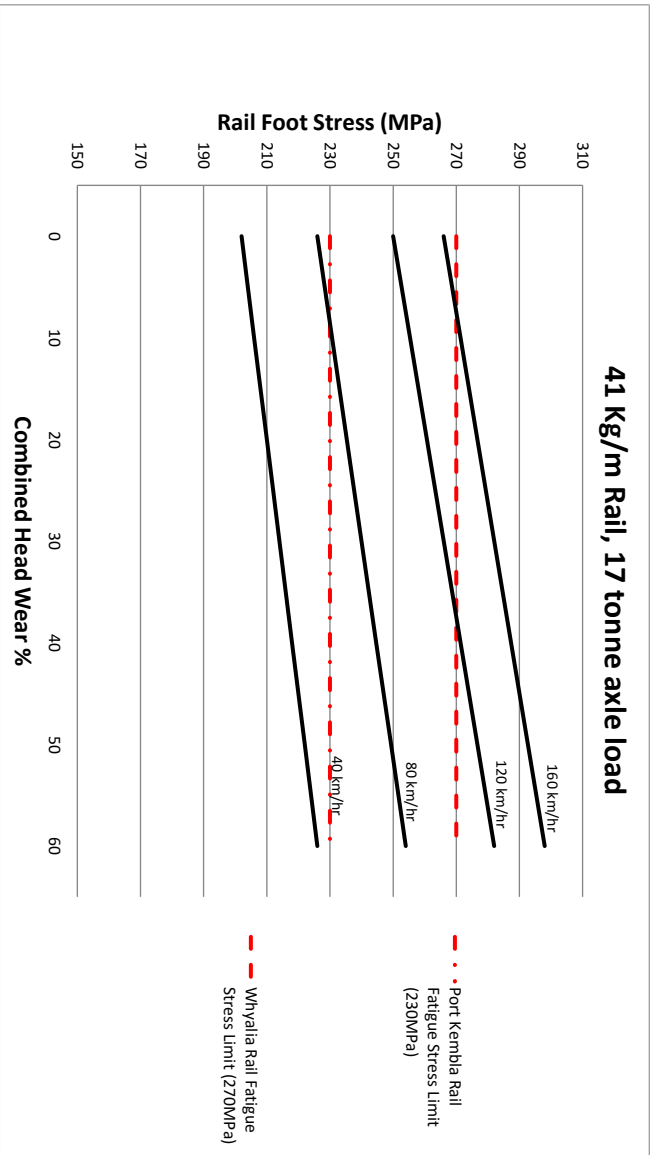


Chart B.3 41 Kg/m rail

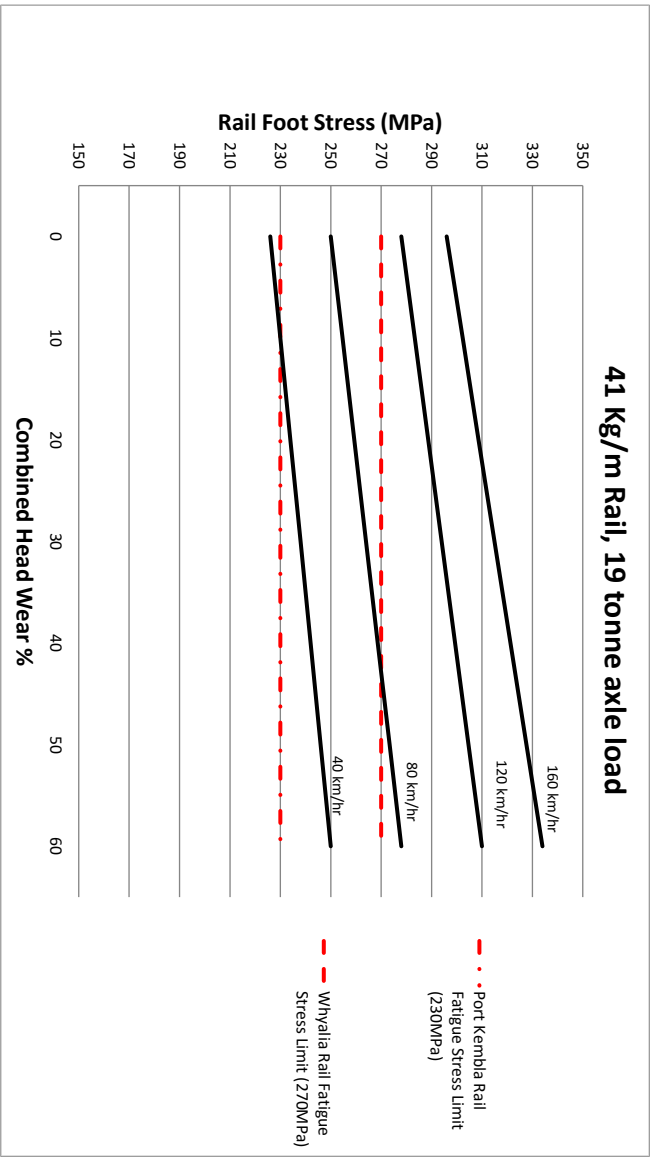


Chart B.4 41 Kg/m rail

