RISSB

RAIL INDUSTRY SAFETY AND STANDARDS BOARD

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Accredited Australian Standards Development Organisation

Guideline
Static Twist Test

23 March 2017

Guideline

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Document Control

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Guideline Change Procedures

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1 General

1.1 Introduction

This guideline documents the process for undertaking static twist testing of rolling stock (locomotives, freight, passenger, and infrastructure track vehicles) as specified within AS 7509 Railway Rolling Stock – Dynamic Behaviour.

Australian Standard AS 7509 Railway Rolling Stock – Dynamic Behaviour describes the minimum requirements for the dynamic performance of both new and modified rolling stock, intended for operation on the railway network.

AS 7509 – Section 6 - Transition Curve Negotiation specifically relates to evaluating whether a vehicle can safely negotiate the exit transition from curves without exceeding an acceptable level of wheel unloading.

Static twist test guidelines do not cover how to conduct a twist test on Road Rail Vehicles. It is recommended that reference is made to AS7502:2015 for the method of conducting the test.

Road rail vehicle requirements are described in AS 7502 and the principles described within this guideline should also be applicable to those vehicle types.

1.2 Purpose

It is incumbent upon any rail operator introducing new or modified rolling stock to assess the wheel unloading performance and underframe behaviour of rolling stock on a simulated track geometry deemed appropriate for the railway networks.

Twist tests are designed to help ensure that any new or substantially modified vehicles are compatible with the track twist induced by the rail network, and that this twist does not cause an unacceptable level of wheel unloading which might in-turn result in a derailment.

The purpose of this document is to detail the preferred process for persons performing static twist testing of new or modified rolling stock as per the performance requirements of AS 7509.

It is intended that this document will contribute to:

- improved rolling stock safety,
- more consistent and reliable test data, and
- increased uniformity of test practices, and test results across the Australian rail industry.

Table A1 of AS 7509 provides the twist test inputs for a number of railway networks. Where Table A1 does not include the twist data for the railway network being considered, the twist test data requirements shall be obtained from the Rail Infrastructure Manager. Guidance on the relationship between track design and maintenance standards and an appropriate twist test are provided in the Appendix to this guideline for reference by Rail Infrastructure Managers.

1.3 Scope

Twist testing is a requirement of registration for each type of rail vehicle intended to operate on specified Australian rail networks.

Twist testing is also a requirement for any vehicle where the torsional stiffness of the vehicle has increased due to any of the following:

- increased suspension spring rates;
- increase in bogie frame torsional stiffness;
- reduction in minimum side bearer clearance;