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Guidance on Axlebox Condition Monitoring – Hot Axlebox Detection
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Documents

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Guidance on Axlebox Condition Monitoring – Hot Axlebox Detection

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One	04 June 2011	Original document Supersedes GE/RC8514

Superseded documents

The following Railway Group documents are superseded, either in whole or in part as indicated:

Superseded documents	Sections superseded	Date when sections are superseded
GE/RC8514 issue one June 2001 Approved Code of Practice : Hot Axle Bearing Detection	All	03 September 2011

GE/RC8514 ceases to be in force and is withdrawn as of 03 September 2011.

Supply

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Guidance on Axlebox Condition Monitoring – Hot Axlebox Detection

Part 1 Introduction

1.1 Purpose of this document

- 1.1.1 This document gives guidance on interpreting the requirements of Railway Group Standard GE/RT8014. It does not constitute a recommended method of meeting any set of mandatory requirements.
- 1.1.2 All requirements in GE/RT8014 are reproduced in the sections that follow. Guidance is provided as a series of sequentially numbered clauses prefixed 'GN' immediately below the text to which it relates. Where there is no guidance given, this is stated.
- 1.1.3 Specific responsibilities and compliance requirements are laid down in the Railway Group Standard itself.

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1.3 Approval and authorisation of this document

- 1.3.1 The content of this document was approved by Rolling Stock Standards Committee on 21 January 2011.
- 1.3.2 This document was authorised by RSSB on 15 March 2011.

Part 2 Guidance on Hot Axlebox Detection

2.1 Objectives and background

2.1.1 Objectives

2.1.1.1 Within the scope of Railway Group Standards the objectives of the requirements in Parts 2, 3 and 4 of GE/RT8014 for axlebox condition monitoring using trackside hot axlebox detectors (HABDs) (or the onboard axle bearing monitoring system where applicable) are, as far as reasonably practicable, to:

- a) Identify an unacceptable in-service condition of an axle journal bearing.
- b) Reduce the risk of an in-service failure of an axle journal bearing leading to a hazard for other users of the infrastructure.

2.1.2 Background

- 2.1.2.1 An in-service failure of an axle journal bearing would create a hazard to the safe operation of the railway. One indication that the condition of an in-service axle journal bearing is deteriorating is a rise in the heat it generates which in turn raises the temperature of the axlebox. Thus, one way of managing the risk of an in-service failure of axle journal bearings is to monitor the in-service temperature of axleboxes.
- 2.1.2.2 The most commonly used system to monitor the in-service temperature of axleboxes is trackside HABDs. Present designs use infrared sensors to monitor the axleboxes of rolling stock fitted with outboard axle journal bearings and GE/RT8014 sets out the interface requirements for these types of trackside HABDs.
- 2.1.2.3 Rolling stock that does not comply with the requirements for compatibility with trackside HABDs should be fitted with an onboard axle bearing monitoring system. Established onboard systems monitor the in-service temperature of axle journal bearings.
- 2.1.2.4 The fitting of an onboard axle bearing monitoring system is a specific requirement of the High Speed Rolling Stock Technical Specification of Interoperability (HS RST TSI) for Class One high speed trains (that is trains that have an operating speed above 250 km/h).
- 2.1.2.5 Across Europe there is a variety of trackside HABD designs in use with varying interfaces to rolling stock. The European Directive for railways initiated the development of requirements to harmonise interfaces, including the interfaces between rolling stock and trackside HABDs. The relevant parts of BS EN 15437-1:2009 that are appropriate for GB are incorporated within this document.
- 2.1.2.6 This document gives guidance that is specific to the requirements for the monitoring of axle bearings by temperature measurement. However, another method of monitoring the in-service condition of outboard axle journal bearings from the trackside is by measurement and analysis of the acoustic emissions emitted from axleboxes. This methodology is capable of providing early warning of deterioration of the condition of an axle journal bearing and as such, offers an alternative strategy for managing the risk of an in-service failure of an axle journal bearing. They are an alternative monitoring solution when considering the replacement of existing trackside HABDs.