

Railway Group Standard
GMRT2461
Issue: Two
Date: June 2016

Sanding Equipment

Synopsis

This document sets out requirements for sanding systems fitted to trains, along with guidance and good practice.

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Published by RSSB

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Issue Record

Issue	Date	Comments
One	04/08/2001	Original document.
Two	04/06/2016	Replaces issue one. Standard update in line with issue four of the RGS Code, and also to reflect the findings of RSSB research projects T796, T797 and T1046.

Revisions have not been marked by a vertical black line in this issue because the document has been revised throughout.

Superseded Documents

The following Railway Group documents are superseded, either in whole or in part as indicated:

Superseded documents	Sections superseded	Date when sections are superseded
GMRT2461 issue one Sanding Equipment Fitted to Multiple Units and On-Track Machines	All	03/09/2016

GMRT2461 issue one Sanding Equipment Fitted to Multiple Units and On-Track Machines, ceases to be in force and is withdrawn as of 03 September 2016.

Supply

The authoritative version of this document is available at www.rssb.co.uk/railway-group-standards. Enquiries on this document can be forwarded to enquirydesk@rssb.co.uk.

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Sanding Equipment

Part 1 Purpose and Introduction

1.1 Purpose

1.1.1 This document sets out requirements for vehicle mounted sanding equipment that can be used to mitigate low rail head adhesion conditions, the specification of sand for use in that sanding equipment and guidance on the design and operational use of sanding equipment.

1.2 Introduction

Background

1.2.1 GMRT2045 Compatibility Requirements for Braking Systems of Rail Vehicles defines the performance of the braking systems fitted to rail vehicles. The performance is expressed as required stopping distances.

1.2.2 GMRT2045 explains that: 'The existing rail system is predominantly signalled by lineside signals with established signal spacing, and the braking performance of vehicles when operating in train formations needs to be sufficient to ensure they can stop within such signal spacing. The braking performance requirements mandated by this standard are intended to achieve the compatibility between the signal spacing and the braking performance of rail vehicles when operating in train formations.'

1.2.3 Clause 4.2.4.6.1 of the Locomotive and Passenger Technical Specification for Interoperability (LOC & PAS TSI) sets out applicable adhesion values that are considered realistic maximum available adhesion values when designing the braking systems that utilise wheel rail adhesion. In some circumstances and locations, real adhesion levels can be significantly lower than these values (adhesion levels as low as 0.01 have been measured on the Great Britain (GB) mainline network).

1.2.4 To reduce the likelihood that trains do not stop within established signal spacings when low adhesion conditions are encountered, additional control measures are required. Sanding equipment provides a means of locally improving adhesion levels, so reducing the likelihood of a signal overrun as a result of low adhesion.

1.2.5 However, the use of sand to improve adhesion levels, if not adequately controlled, can interfere with the ability of track circuits to detect a train.

1.2.6 Sections 2.2 and 2.3 of this document therefore set out established GB specifications for sand and Appendix B sets out established GB practice for the design of sanding equipment. These have demonstrated compatibility with track circuits currently used on the GB mainline network.

1.2.7 Consistent and effective use of sanding equipment depends on the adoption of appropriate operational practices. Guidance to support the operational use of sanders is provided in Appendix C.

1.2.8 Control-Command and Signalling TSI (CCS TSI) Index 77 clause 3.1.4.1 specifies reference values on sand laying rates from sanding equipment which are to be assumed when designing train detection systems; however, as stated in clause 4.2.3.3.1 of the ERA Guide for the application of TSI LOC & PAS, sanding systems are permitted to differ from the specification in Index 77 provided compatibility with train detection can be demonstrated.

Principles

1.2.9 The requirements of this document are based on the following principles.

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1.2.10 This document sets out National Technical Rules (NTRs) for the mainline railway in GB. Compliance with NTRs is required under the Railways Interoperability Regulations 2011 (as amended).

1.2.11 The NTRs in this document are used for the following purposes:

- a) Sections 2.1 to 2.3 close the open point in clause 3.1.4.2 (sand characteristics) of index 77 of the CCS TSI.
- b) Section 2.4 sets out a requirement to maintain technical compatibility between the rolling stock subsystem and CCS subsystem.

Structure of this document

1.2.12 This document sets out a series of requirements that are sequentially numbered.

1.2.13 This document also sets out the rationale for the requirement. The rationale explains why the requirement is needed and its purpose. Where relevant, guidance supporting the requirement is also set out in this document.

1.2.14 The national rules relating to relevant TSI parameters have been identified together with the relevant clause from the TSI.

Related requirements in other documents

1.2.15 There are no related requirements in other documents.

Supporting documents

1.2.16 There are no Rail Industry Guidance Notes, Rail Industry Standards or Rail Industry Approved Codes of Practice supporting this Railway Group Standard.

1.3 Approval and authorisation of this document

1.3.1 The content of this document was approved by Rolling Stock Standards Committee on 15 April 2016.

1.3.2 This document was authorised by RSSB on 11 May 2016.

Part 2 Requirements for Sanding and Train Detection

2.1 General requirements for sand type

2.1.1 Only the sand types specified in Appendix D or Appendix E shall be used in vehicle mounted sanding equipment.

Rationale

G 2.1.2 These requirements close the open point in CCS TSI index 77 clause 3.1.4.2.

Guidance

G 2.1.3 Use of these sand types in sanders complying with the guidance in 2.4 is existing GB practice to avoid interference with track circuits.

2.2 Requirements for sand types used in braking sanders

2.2.1 The type of sand used in braking sanders on locomotives or units made up of permanently coupled vehicles containing braking only sanders shall comply with the specification in Appendix D.

Rationale

G 2.2.2 Operational experience has shown the type of coarse / medium grain size sand specified in Appendix D is more suitable for use in braking sanders (compared to the fine sand specified in Appendix E). This is because the grain size tends to be larger than the rail contaminant layer; this grain size penetrates the contaminant layer providing a mechanical link between the wheels and rails.

Guidance

G 2.2.3 For multiple units containing both traction and braking sanders the sand defined in Appendix D can be used in both the traction and braking sanders. This can simplify the operating requirements.

2.3 Requirements for sand type used in traction sanders

2.3.1 The type of sand used in traction sanders on locomotives or units made up of permanently coupled vehicles containing traction only sanders shall comply with the specification in Appendix E.

Rationale

G 2.3.2 Operational experience has shown the type of fine grain size sand specified in Appendix E is more suitable for use in traction sanders (compared to the coarse / medium sand specified in Appendix D). The fine grain sand tends to form a paste between the wheel and rail, which is more effective at allowing the transmission of tractive effort between the wheels and rails.

Guidance

G 2.3.3 The sand specification in Appendix E is derived from the British Rail specification, BR 600.