

Railway Group Standard

GE/RT8006

Issue Two

Date September 2010

Assessment of Compatibility of Rail Vehicle Weights and Underline Bridges

Synopsis

This document mandates specific requirements for the assessment of compatibility between the static load characteristics of rail vehicles and the capacity of underline bridges to carry the vertical static and dynamic loads imposed by the rail vehicles.

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Railway Group Standard**GE/RT8006****Issue** Two**Date** September 2010**Assessment of Compatibility
of Rail Vehicle Weights and
Underline Bridges****Issue record**

Issue	Date	Comments
One	December 2000	Original document, but replaced GC/TT0138 Route Availability System
Two	4 September 2010	Replaces issue one Document recast to align with the processes set out in GE/RT8270 Assessment of Compatibility of Rolling Stock and Infrastructure. Title amended accordingly.

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Superseded documents

The following Railway Group documents are superseded, either in whole or in part as indicated:

Superseded documents	Sections superseded	Date when sections are superseded
GE/RT8006 issue one December 2000 Interface between Rail Vehicle Weights and Underline Bridges	All	4 December 2010

GE/RT8006 issue one ceases to be in force and is withdrawn as of 4 December 2010.

Supply

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Part 1 Purpose and Introduction

1.1 Purpose

- 1.1.1 Before any new or changed infrastructure or rolling stock is brought into use, it is essential that the change is assessed to ensure that compatibility between assets is maintained.
- 1.1.2 GE/RT8270 mandates requirements and responsibilities for the assessment of compatibility between infrastructure and rolling stock, the arrangements by which the assessment of compatibility is undertaken and identifies those responsible for managing that assessment.
- 1.1.3 This document, GE/RT8006, mandates specific requirements for the assessment of compatibility between the static load characteristics of rail vehicles and the capacity of underline bridges to carry the vertical static and dynamic loads imposed by the rail vehicles.

1.2 Introduction

1.2.1 Background

- 1.2.1.1 The Route Availability (RA) system provides a consistent and simple method for undertaking an assessment of the compatibility of the weight (that is, the static load characteristics) of rail vehicles with the capacity of underline bridges.
- 1.2.1.2 In the RA system, a vehicle's weight is expressed as a RA number, based on the vehicle's axle loads and axle spacings.
- 1.2.1.3 Similarly, the capacity (load carrying capability) of an underline bridge is expressed as a RA number, based on the application of a generic vehicle load model and taking into account the dynamic effects of such loading. A route is then assigned a RA number, based on the lowest RA number of any bridge on the route.
- 1.2.1.4 At its simplest, if the highest RA number of any rail vehicle in the train is less than or equal to the RA number of the route at the proposed speed of operation, then the weight of the train is compatible with the capacity of the underline bridges on that route. The simple comparison of RA numbers is referred to as a first stage compatibility assessment (see 4.2).
- 1.2.1.5 However, if this condition is not satisfied, it is still possible to show that the train is compatible with the capacity of the underline bridges on the route by undertaking a more detailed assessment which identifies any limitations, restrictions or requirements on which the compatibility depends. This more detailed assessment is referred to as a second stage compatibility assessment (see 4.3).

1.2.2 Limits of validity for the RA system

- 1.2.2.1 The RA system is only valid for bridges with spans of up to 50 m. Bridges with spans greater than 50 m are referred to as 'long span underline bridges'.

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- 1.2.2.2 The RA system is valid for maximum speeds up to and including:
- a) 60 mph for any vehicle with a RA number of RA9 or higher.
 - b) 75 mph for freight vehicles.
 - c) 100 mph for rail vehicles other than freight vehicles, but including non-passenger carrying coaching stock (for example vehicles used for carrying parcels or mail).
 - d) 100 mph for two coupled locomotives.
 - e) 75 mph for three, four or five coupled locomotives.
- 1.2.2.3 On-track machines and other non-standard vehicles should be treated as freight vehicles, locomotives or non-passenger carrying coaching stock depending on their characteristics.
- 1.2.2.4 A first stage compatibility assessment is not always sufficient to assess compatibility in circumstances that fall outside the limits of validity for the RA system. A second stage compatibility assessment is therefore required in these circumstances. This could require the application of loads from real trains, rather than the application of a generic vehicle load model.
- 1.2.3 Defined terms**
- 1.2.3.1 This document relies on the use of a number of specific defined terms, particularly terms relating to axle load and speed. It is therefore more than usually important to refer to the 'Definitions' section of this document to ensure its correct application.
- 1.2.4 Related requirements in other documents**
- 1.2.4.1 GE/RT8270 sets out requirements and responsibilities for the assessment of compatibility between infrastructure and rolling stock, the arrangements by which the assessment of compatibility is undertaken and identifies those responsible for managing that assessment.
- 1.2.4.2 Using the process set out in GE/RT8270, assessment of compatibility is undertaken by the party proposing a change. Therefore it would be for a railway undertaking to assess the compatibility between the rail vehicles it proposes to run and the capacity of underline bridges.
- 1.2.4.3 However, where the compatibility assessment requires more than a simple comparison of RA numbers (that is, where a second stage compatibility assessment is required), this document (GE/RT8006) requires the compatibility assessment to be undertaken by the infrastructure manager, in accordance with established practice, recognising that competencies and data required to undertake the assessment lie with the infrastructure manager.
- 1.2.4.4 GO/RT3407 sets out the process for producing and issuing exceptional load conditions of travel documentation for freight train operation. In particular, it sets out the requirements for the infrastructure manager to determine route availability conditions and, on request, supply railway undertakings with details of conditions of travel to be applied to proposed traffic flows.

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- 1.2.4.5 GO/RT3215 mandates requirements for the production of information related to local operating instructions, including the Sectional Appendix. It also details the contents of the Sectional Appendix. These are to include route clearance tables for multiple-unit trains, locomotives, locomotive-hauled passenger or parcels trains and freight vehicles.
- 1.2.4.6 GM/RT2149 sets out requirements for recording rail vehicle data. The requirements for recording rail vehicle data set out in 3.5 of this document (GE/RT8006) should be read in conjunction with the requirements set out in GM/RT2149.
- 1.2.4.7 The limits on validity for the RA system set out in 1.2.2.2 e) are reflected in module TW1 of the Rule Book.

1.2.5 Supporting documents

- 1.2.5.1 There are no Railway Group documents supporting this Railway Group Standard.

1.2.6 BS EN 15528:2008 Railway applications – Line categories for managing the interface between load limits of vehicles and infrastructure

- 1.2.6.1 BS EN 15528:2008 defines a line classification system for infrastructure managers and railway undertakings to manage the interface between load limits for railway vehicles and payload limits for freight wagons and the vertical load carrying capacity of a line.
- 1.2.6.2 BS EN 15528:2008 Annex C (informative) states that, *'In Great Britain all lines and vehicles are categorised by a Route Availability (RA) number in accordance with the classification system called the RA (Route Availability) system. As part of placing a vehicle into service, each vehicle is required to be categorised under the RA system. The RA system (including the methodology for calculating the RA number of a vehicle) is defined in Railway Group Standard GE/RT8006.'*
- 1.2.6.3 Annex C also gives an indicative table of correspondence between RA number and the 'Line Categories' derived in accordance with BS EN 15528:2008.

1.3 Approval and authorisation of this document

- 1.3.1 The content of this document was approved by Infrastructure Standards Committee on 12 May 2010.
- 1.3.2 This document was authorised by RSSB on 23 July 2010.

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Part 2 Requirements for Capacity of Underline Bridges and Routes

2.1 Derivation of RA numbers of underline bridges

- 2.1.1 For each underline bridge (other than long span underline bridges) the infrastructure manager shall determine the RA number of the bridge at the standard permissible speed, based on its assessed capacity, taking into account dynamic effects.
- 2.1.2 In addition, the infrastructure manager shall determine the relationship between speed and RA number relevant to the differential speeds over the bridge.
- 2.1.3 Appendix A sets out the method for deriving the RA number of an underline bridge.
- 2.1.4 Alternatively, it is permissible for the infrastructure manager to assign a RA number to an underline bridge based on current knowledge of its condition, use and behaviour.

2.2 Derivation of RA numbers of routes

- 2.2.1 For each route the infrastructure manager shall determine the RA number for the route at the standard permissible speed.
- 2.2.2 The RA number of the route at the standard permissible speed shall be the minimum RA number of any underline bridge on the route at the standard permissible speed.
- 2.2.3 In addition, the infrastructure manager shall determine the relationship between speed and RA number relevant to the differential speeds on the route.
- 2.2.4 The RA number of the route at other speeds shall be the minimum RA number of all underline bridges on the route at the speed being considered.

2.3 Provision of data for assessment of compatibility

- 2.3.1 GE/RT8270 requires railway undertakings and infrastructure managers to maintain, update and make freely available to relevant parties the available data that describes asset characteristics relevant to compatibility.
- 2.3.2 The RA numbers determined in accordance with 2.2 describe asset characteristics that are relevant to compatibility.
- 2.3.3 The following data also describes asset characteristics that are relevant to compatibility:
 - a) The presence of a long span underline bridge in a route.
 - b) The standard permissible speed, differential speeds and enhanced permissible speeds on a route.