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Guidance on the Braking Requirements for Hauling Unbraked Multiple Units in Freight Trains

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Guidance on the Braking Requirements for Hauling Unbraked Multiple Units in Freight Trains

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Supply

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Part 1 Introduction

1.1 Purpose of this document

This document gives guidance on the braking requirements for hauling unbraked multiple units in a freight train. This guidance is intended to assist railway undertakings in understanding their responsibilities in relation to the braking and formation requirements for the freight train used to undertake the hauling of multiple units with their brakes isolated. Hauling a multiple unit of up to three vehicles coupled together with their brakes isolated is permitted by GE/RT8000 Module TW3 and GO/RT3056/B.

This document provides additional guidance where a multiple unit, consisting of four or more vehicles, is to be moved in its dedicated freight train and that they will not be marshalled into a longer general freight train formation.

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1.3 Approval and authorisation of this document

The content of this document was approved by:

Rolling Stock Standards Committee on 28 May 2010.

This document was authorised by RSSB on 22 June 2010.

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Part 2 Hauling Multiple Units in Freight Trains

2.1 Introduction

- 2.1.1 Multiple units in operation in Great Britain (GB) are generally fitted with electrical / electronic brake control systems that are not compatible with the automatic air brake systems used in freight train formations. The hauling of multiple units in freight trains can be achieved by:
- a) The use of translator vehicles to permit the multiple unit to be moved with operational brakes.
 - b) The use of a through brake pipe with additional brake force vehicles with the service brakes on the multiple unit isolated.
- 2.1.2 Whilst the braking guidance set out in this document is applicable to hauling unbraked multiple units in all freight train formations, it is recommended that unbraked multiple units are hauled in a dedicated train formation only. In addition to the braking requirements of 2.1.1, hauling multiple units in a freight train requires other factors to be assessed by those planning the movements. These other factors are outside the scope of this document however the assessments should as a minimum consider:
- a) The capability of the couplers on the multiple unit and those on the adaptor vehicles to withstand the longitudinal forces generated within the freight train.
 - b) The adaptor vehicles having sufficient mass or additional load, to counter the increased risk of derailment. For example a 20 t loaded container could be used to reduce the risk of derailment when a container flat wagon is used as an adaptor vehicle.

2.2 Use of translator vehicles

- 2.2.1 Translator vehicles allow the service brakes on a hauled multiple unit to operate when being moved in a freight train. The translator vehicles are fitted with control equipment that convert automatic air brake demand signals into electrical brake control signals that are compatible with the brake system on the multiple unit being moved.
- 2.2.2 Translator vehicles work in pairs and are marshalled at each end of the multiple unit. The translator vehicles are fitted with couplings that are mechanically and electrically compatible with the multiple unit being hauled.
- 2.2.3 The translator vehicles require the hauling locomotive to provide an electric train supply to power the translator vehicle and the brake system of the multiple unit being moved. A main reservoir air pressure supply is also needed to supply the air system on the multiple unit being hauled.
- 2.2.4 The translator vehicles are fitted with an air brake distributor and an additional brake control that can respond to the electric brake control signals used by the multiple unit. This ensures that the service brakes of the rear translator vehicles are operational.
- 2.2.5 This document does not provide any further information concerning the design or use of translator vehicles as the multiple units are braked when hauled.

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2.3 Use of a temporary through brake pipe with additional brake force vehicles

- 2.3.1 Hauling an unbraked multiple unit in a dedicated freight train requires the use of a temporary through brake pipe. This is generally a continuous flexible pipe between the vehicles marshalled in the front and to the rear of the multiple unit in the freight train. When using a temporary through brake pipe the service brakes will be isolated on the multiple unit being hauled. The main reservoir pipe of the multiple unit could also be used as the temporary through brake pipe, see Part 7.
- 2.3.2 Hauling an unbraked multiple unit will have a significant impact on the braking characteristics of the freight train. The length of the temporary through brake pipe along the multiple unit can influence the control of the brakes on the vehicles marshalled to the rear of the train formation.
- 2.3.3 This document provides information on the hauling of an unbraked multiple unit. This document is suitable only when the vehicles are coupled together using adaptor / brake force vehicles with a hauling locomotive using air brake pipe control. It gives guidance on the braking characteristics of the train formation and addresses the following areas:
- a) The composition and marshalling of the freight train.
 - b) Determining the available brake performance.
 - c) Gradient restrictions on train formations.
 - d) The possibility of the train division and the impact on braking performance.
 - e) Length of the temporary through brake pipe and impact on the propagation of brake demand signals.
 - f) Static brake tests, to confirm the correct operation of the automatic air brake system along the train formation.

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Part 3 Composition and Marshalling of the Freight Train

3.1 Composition of the freight train

- 3.1.1 Several factors determine the composition of the freight train used to haul the unbraked multiple unit and the number and positioning of the vehicles required to have operational automatic air brake systems. These factors include:
- a) The number of unbraked vehicles in the freight train, see Part 4.
 - b) The gradients that the freight train will operate over, see Part 5.
 - c) Whether the freight train will need to reverse during its journey.
 - d) Whether there are any train length restrictions along the route.

3.2 Marshalling of the freight train

- 3.2.1 There should be a minimum of three air braked vehicles (generally wagons) marshalled behind the unbraked multiple unit at the rear of the freight train. These vehicles should be fitted with individual air brake distributors. One of these vehicles could be the adaptor vehicle that is coupled directly to the rear of the multiple unit being hauled.
- 3.2.2 To achieve the required brake force in the freight train, additional vehicles may be required, see Part 4 and Part 5 for further guidance. Checks should be made to ensure that sufficient brake force is available for both portions of the train formation in the event of the train dividing whilst being moved, see Part 6.
- 3.2.3 The air brake distributors on the locomotive and all the adaptor and brake force vehicles should be set to operate with passenger vehicle brake timings. Goods only vehicles should not be used when hauling multiple units in freight trains because of their slower brake response times.
- 3.2.4 Freight trains that need to reverse during the journey should have a minimum of three braked vehicles at the front and rear of the multiple unit being moved. This avoids the need to carry out any shunting move of the brake force vehicles.
- 3.2.5 Where restrictions exist on the overall length of the train, it may be necessary to substitute a brake force vehicle with a locomotive at the rear of the train formation. A locomotive fitted with two air brake distributors (one for each bogie) can be considered as providing two independently controlled automatic air brakes therefore, could replace two brake force vehicles for the purpose of hauling the multiple unit. Locomotives that were originally built for dual-brake operation (hauling air or vacuum braked trains) were fitted with a single distributor and can only be used as a single brake force vehicle.

Note: TOPS will generate a 'warning' message when a locomotive fitted with two air brake distributors is used to replace two braked vehicles at the rear of the train.