



Deviation from a Railway Group Standard

(In accordance with the Railway Group Standards Code, Issue Four, part 7)

Deviation Number: 14/049/DEV

1. Start and End Date:

From 02/06/2014 to 31/12/2016

2. Details of applicant:

, Major Projects Manager, Stagecoach Supertram, Nunnery Depot, Woodbourn Road, Sheffield, S9 3LS

3. Your reference number:

N/A

4. Status of applicant:

Stagecoach Supertram is in the process of obtaining safety certification to operate Tram Trains on the mainline railway, and therefore can reasonably be expected to have to comply with RGSs in the future.

5. Title of certificate:

Sheffield Tram Train Wheelsets (Mainline Testing).

6a. Details of Railway Group Standard (RGS):

RGS Number:	Issue No:	Issue Date:	Title:
GM/RT2466	Three	February 2010	Railway Wheelsets

6b. RGS clause(s):

Clauses relating to the use of monobloc wheels: 2.3.1, 2.9.1.

Clauses relating to wheel profile: 2.5.2, 2.5.3, 2.6.1, 4.4.1.

6c. RGS clause requirements:

Clauses relating to the use of monobloc wheels:

“2.3.1 New wheelset designs shall use monobloc design wheels.”

“2.9.1 The wheel material shall be selected from approved grades of steel for particular applications as set out in Table 1.

Wheel type	BS 5892, Part 3	BS EN 13262 (only applies to rim chilled wheels)	AAR
Freight, integral brake disc wheel	R7E	X	X
Freight, cheek mounted brake disc wheel	R8E	X	X
Other freight wheels	R7T or R8T	ER7 or ER8	M-107/M-208 class B
All passenger vehicle	R8T or RS8T	ER8	X
Other wheels	R8T	ER8	M-107/M-208 class B

Table 1 Monobloc wheel material

Notes: RS8T is not recommended for use on tread braked wheel applications.

X No approved grades of steel available.”

Clauses relating to wheel profile:

“2.5.2 The radius between the flange tip and the flange back blend, when new, shall not be less than 10 mm.”

“2.5.3 The flange toe radius, when new, shall not be less than 10 mm.”

“2.6.1 The wheel tread profile for new wheelset designs shall be selected from those listed in Appendix A. The tread profile shall be chosen to suit the vehicle and suspension design, taking account of the effect on the wheel / rail interface, vehicle dynamics, and wheel / rail wear and maintenance.”

“4.4.1 The tread, when newly profiled, shall be as defined by the design for the wheelset / vehicle combination and selected only from those listed in Appendix A and applied to each wheel of a wheelset.”

7. Scope of deviation:

This application relates to a total of seven tram trains for test operation on mainline infrastructure between Meadowhall South and Parkgate.

This application does not relate to a project requiring authorisation under the Railways (Interoperability) Regulations 2011. Tram train vehicles are included on the Approved List of Exclusions published by the Department for Transport.

8. Duration of the deviation:

The deviation is required for the duration of mainline testing, envisaged to be complete during 2016. The mainline testing programme will include tests to be developed in conjunction with the Institute of Railway Research at the University of Huddersfield to validate the design process used to develop the new wheel profile.

Mainline testing will be undertaken in accordance with Stagecoach Supertram’s Safety Management System approved under ROGS. The project Safety & Assurance Strategy (previously presented to the RSSB Rolling Stock Standards Committee) includes adopting the European common safety method for managing safety and compatibility.

9. Method of elimination:

This deviation will no longer be required on completion of mainline testing. Mainline testing will be conducted under controlled conditions in accordance with a test plan. One of the objectives of the testing

will be to validate the performance of the proposed wheel profile.

On completion of mainline testing, and if the wheel profile tests are successful, a further deviation application will be made to use the final wheel profile in normal service for the life of the vehicles.

Note that one of the project objectives is to develop a wheel profile that is suitable for inclusion in a future RGS for Tram Train vehicles.

10. Impacts of complying with the current RGS requirement:

Changing the wheelset to a monobloc design would compromise the project objective of using a 'standard' tram train vehicle, and add significant cost for no practical benefit.

The use of a wheel profile permitted by GM/RT2466 Issue 3 Appendix A would result in a fundamental incompatibility with the Sheffield tramway, as flange-tip running is necessary to negotiate switches and crossings on the tramway.

11. Proposed alternative provisions:

The tram train vehicles will utilise resilient wheels fitted with steel tyres. This approach is consistent with other tram train and light rail applications, and the wheelsets will fully comply with the relevant EN standards.

An alternative wheel profile has been developed by Network Rail in conjunction with Institute of Railway Research at the University of Huddersfield. The proposed profile is documented in Appendix B3 of IRR Report 81/95 Issue 2, Tram-Train Wheel Profile Design, dated 27/09/2013 (please refer to page 85).

12. Impacts of the alternative provisions:

The use of resilient wheels fitted with tyres is consistent with Stagecoach Supertram's existing fleet and normal practice for tram vehicles, and is not considered to have a significant impact on any other party.

The use of the revised wheel profile requires existing mainline check rails to be raised by at least 45 mm to ensure compatibility. Network Rail is managing this change to the infrastructure alongside other changes required for tram train operation, and will consider the effect on other rolling stock as part of their engineering change process.

IRR Report 81/95 Issue 2, Tram-Train Wheel Profile Design, dated 27/09/2013, documents the design process followed in developing the proposed wheel profile. Safety against derailment and compatibility are considered in this report as part of determining the optimum tram train wheel profile.

Operation is subject to the completion of infrastructure changes that are essential for compatibility, such as the raising of check rails by at least 45 mm.

The tram train units will use wheelsets that do not meet RGS requirements in two areas:

1. Monobloc wheels will not be used.
2. The wheel profile is not currently permitted, and will not meet the requirements for flange tip/back blend and flange toe radii.

13. What other options have been considered?

No alternative has been considered to the use of the existing resilient wheel design.

An alternative wheel profile is essential for compatibility with tramway infrastructure, and IRR Report 81/95 Issue 2, Tram-Train Wheel Profile Design, dated 27/09/2013 considers a number of options at the level of detailed design.

14. Consultation with affected parties

Network Rail has been fully consulted throughout the design process and is a stakeholder in the Tram Train project. Network Rail commissioned the attached research and development work to develop an alternative wheel profile. Network Rail will carry out a separate consultation and standards compliance exercise for the changes that are necessary to mainline infrastructure.

15. Additional actions/observations:

Upon receipt, the applicant is required to identify affected, interfacing parties and copy this certificate, together with supporting information, to those parties.

The holder of the certificate is responsible for checking that the original assumptions and conclusions contained in the deviation certificate remain valid whenever any material changes occur. If the conditions of the deviation certificate change, the deviation will no longer be valid. In these circumstances, the holder of

the deviation certificate may consider applying for a new deviation.

Time-limited deviations will be closed on the expiry date. However, please let us know if you no longer require your non-time limited deviation certificate so that we may close it also.

Attachments:

- IRR Report 81/95 Issue 2, Tram-Train Wheel Profile Design, dated 27/09/2013.

16. Signature of applicant:

, Major Projects Manager

Date of application:

19/02/2014

17. Lead Standards Committee details:

Name of Committee:

Rolling Stock

Date of meeting

13/03/2014

Minute reference:

14/RST/03/068

Authorised by:

Date of Authorisation:

02/06/2014

Cliff Cork
Head of Delivery, Infrastructure and Rolling Stock