

Certificate of Derogation from a Notified National Technical Rule

(in accordance with part 6 of the Railway Group Standards Code)

1. Type of deviation

Deviation Number: 13/067/DGN

Derogation from Notified National Technical Rule

2. Details of applicant:

, Southern Chief Engineer, Southern Railway Limited, Selhurst Traincare Depot, Selhurst Road, London, SE25 6LJ

3. Your reference number:

NC 33

4. Status of applicant:

Railway Undertaking, RSSB Member

5. Title of certificate:

APC Gauging.

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

RGS Number:	Issue No:	Issue Date:	Title:
GM/RT2149	Three	February 2003	Requirements for Defining and Maintaining Rail Vehicles

6b. RGS clause(s):

B10.3

6c. RGS clause requirements:

"B10.3 Automatic Power Control receivers

Automatic Power Control (APC) receivers, provided to interrupt and re-establish the supply of AC current from pantographs before and after neutral sections respectively, shall be contained within the swept gauge prescribed in Appendix C of this document, with due regard to lateral curve overthrow and vertical static displacements."

7. Scope of deviation:

Class 377/2, Class 377/6 (if converted for DV operation) and Class 377/7 fleets. (It should be noted that the design of the APC receiver is the same as that fitted to Class 377/5, Class 378 and Class 379 units).

8. Impacts of complying with the current RGS requirement:

The APC receiver originally used on the Class 377/2 Electrostar vehicles are now obsolete, thus requiring a new APC receiver to be installed. Unipart rail have designed a replacement for the existing APC receiver which is to be dimensionally set-up in exactly the same way as the now obsolete version.

This replacement APC receiver is fitted on the Class 377/5, Class 378 and Class 379 fleets, and derogations against GM/RT2149 are already in place for these fleets.

In replacing any failed Class 377/2 APC receivers, and in the design of the APC receiver for the new Class 377/6 and Class 377/7 fleets, there has been an intention to maintain commonality with the Class 377/5 design, simplifying stores and maintenance activities.

Whilst the Class 377/6 vehicles are currently being built for DC operation only, the capability to operate under 25Kv OLE has been considered in the design from the start, and this includes the gauging provision for all associated equipment, based on the Class 377/5 design.

Having undertaken analysis of the in-service conditions (static primary suspension conditions of tare to crush, spring creep, wheel wear, and set up tolerances), an infringement to the APC Gauge (Appendix C) defined in GM/RT2149 occurs, hence a request for a deviation.

The APC receiver top plate infringes the side of the additional vehicle swept gauge for accommodation of the APC receiver (APC gauge) by a maximum of 17.25 mm, and the APC receiver infringes the bottom of the gauge by 24 mm (178 - 154) in the crush condition as depicted in drawing Ref. 100173029.

The manufacturer will not guarantee the functionality of the APC receiver if it was set to be contained within the APC gauge, the set-up height of the new APC receiver on the Class 377/2, Class 377/6 and Class 377/7 is already 13 mm higher than the normal set-up height as defined on the manufacturers drawing Ref. NRSAPC0006.

This request mirrors that requested (and granted) for Class 377/5, 378 and 379 fleets.

9. Proposed alternative actions:

It is proposed that the APC receiver is allowed to be fitted to the new Class 377/6 and Class 377/7 vehicles, and Class 377/2 when necessary, with the infringements as detailed in this document.

10. Impacts of the alternative actions:

This APC receiver has been designed to be dimensionally set-up in exactly the same way as the now obsolete version. This set-up is in-line with the manufacturer's recommendations, and adjusting this set-up height may introduce the risk of the receiver not functioning correctly. When the in-service conditions of the bogie (and subsequently APC receiver) are analysed for gauging purposes and compared to the APC gauge as defined in Appendix C of GM/RT2149, both a lateral infringement of 17.25 mm and a vertical infringement of 24 mm to the gauge line is experienced.

Lateral Infringement:

GE/GN8573 Guidance on Gauging, Part E, defines a lower sector vehicle gauge that can be used by vehicle manufacturers to ensure compliance with the relevant Railway Group Standards.

After considering all appropriate static and dynamic movements (including tolerances and vehicle maintenance), if the vehicle and components on it are within the limits defined in Part E of GE/GN8573, compliance has been demonstrated.

When the lateral movements of the Class 377/2, Class 377/6 and Class 377/7 APC receiver are superimposed against the Lower Sector Vehicle Gauge as shown in Drawing Ref. 100173029, it can be seen that there is no lateral infringement, and hence the lateral infringement of 17.25 mm against GM/RT2149, Clause B10.3 is considered acceptable.

Vertical Infringement:

Undertaking the same analysis for vertical movements as for lateral movements it can be seen that a vertical infringement of 22 mm (160 - 138) as depicted in Drawing Ref. 100173029 occurs.

This gaugeline includes a 50 mm clearance, so the APC receiver is still 28 mm clear of the Lower Sector Structure Gauge. It should be noted that this area is reserved for items that are intended to come into close proximity to trains (e.g. APC magnets) and is not available for fixed infrastructure. It is likely that the tolerances of this equipment are fairly well controlled in order for it to work correctly, so the reduced clearance presents a lower risk than for general infrastructure.

A similar calculation has been undertaken for the Class 313, Class 319 and Class 365. This is presented in 3EER400011-4080. This calculation concludes that the minimum static height of the APC receivers on the Class 313, Class 319 and Class 365 are lower than that of the Class 377/6, and the minimum dynamic height of the APC receiver on the Class 313, Class 319 and Class 365 is the same or lower than the Class 377/2, Class 377/6 and Class 377/7.

11. What other options have been considered?

Setting up the new APC receiver to not interfere with the gauge has been considered. However, the size of adjustment required (an increase of 21 mm ARL) will mean it is outside of the manufacturer's recommendations (Drawing Ref. NRSAPC006) and, as such, this would not provide a reliable solution and may introduce a risk of the component not functioning correctly.

12. Consultation with affected parties

Network Rail has been consulted on this issue as part of the gauge clearance exercise for the fleet. No issues have been identified during this process.

Porterbrook, the vehicle owners, have been consulted and support this derogation.

13. 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.

Attachment:

• Network Rail's support email dated26/06/2013.

14. Method of elimination:

N/A

15. Start and end date:

N/A

16. Signature of applicant:	Date of application:	
, Southern Chief Engineer		02/05/2013
17. Lead Standards Committee details:		
Name of Committee:	Date of meeting	Minute reference:
Rolling Stock	24/05/2013	13/RST/05/142
Authorised by:		Date of Authorisation:
Signed by Cliff Cork on 19/07/2013	19/07/2013	

Cliff Cork Head of Delivery, Infrastructure and Rolling Stock