

Appendix B

Mark 2 LHCS Non-compliance Elements and Proposed Mitigation

1. Introduction

The following section presents the elements of the Mark 2 Loco Hauled Coaching Stock (LHCS) which will not be compliant from 1 January 2020 and the proposed action in mitigation of this non-compliance. This assessment is against the 2009 PRM-TSI.

As noted in Appendix A, work is underway to bring the HST into compliance, but is restricted by limited labour and facility availability. The changes which can be made to the Mark 2 are hence limited by the resource and facilities available within ScotRail. As for the HST fleet, where work can be carried out within a ScotRail depot and with the existing engineering design and installation resource, this work has been planned. Anything which would require the vehicle to be moved to a third-party site has been discounted.

A. Clause 4.2.2.4.1 External Doorways

Non-compliant for:

- droplight forces (droplights require to be dropped before handle is accessed);
- door handle forces;
- door-enabled sounders.

Much like the classic un-refurbished HST, the Mark 2 coaches feature slam doors, secured by a pneumatic bolt controlled by the Central Door Locking (CDL) system. The CDL system includes internal “Door unlocked” indicators but no audible sounders. Doors are opened by passengers using the external door handle, accessed by lowering the droplight window.

The modifications noted in Appendix A to fit internal door handles to classic Unrefurbished HST would not directly apply to the Mark 2 vehicles as the door is of different construction, and further engineering development cost would be required to assess the feasibility.

Changes to the forces of the droplight or door handle would need safety validation to demonstrate that the risk of a door opening in traffic is not increased.

The fitment of door-enabled sounders would require complex integration into the vestibule area and the Central Door Locking (CDL) system and is not practical in the time available or without disproportionate cost.

B. Clause 4.2.2.5 & 4.2.2.12.2

Steps

Non-compliant for:

- Non-compliant for illumination;
- Non-compliant for contrasting band.

As for the classic un-refurbished HSTs, the fitment of step illumination would be an intrusive modification requiring the strip down and re-build of the vestibule to incorporate the step light and would require engineering design and approvals likely to take at least six months before any modification can begin .

The edge of the step is painted yellow, but the width of the step is less than the required height of the contrasting band, and hence the band cannot be extended without redesigning the step and changing the vehicle gauge.



Mark 2 coach step contrasting band

C. Clause 4.2.2.2.1

Seats

Non-compliant for:

- Priority seats in all vehicles.

The Mark 2 vehicles do not currently feature any compliant priority seating, and do not label any seats as priority seats. ScotRail and DRS have considered removing two tables from each vehicle to create eight priority seats, however these would still not meet the PRM requirements for the spacing between seat squabs or provide the movable armrests provided. Removal of the table would also introduce a requirement for crash testing, as this seat configuration is not currently found on these vehicles and the increase in risk to passengers is not known.

On this basis ScotRail do not intend to provide priority seats on these vehicles.

D. Clause 4.2.2.10

Handrails

Non-compliant for:

- Vestibule handrails - (position) and (diameter).

The standards require vertical handrails to be located internally either side of a doorway. The Mark 2 coaches are similar to the classic un-refurbished HST vehicles, with no fixed internal handrails but with one internally on the door. Modifications to or the fitment of additional handrails will be subject to structural assessment and would require the vestibule to be stripped down to allow the invasive structural work to be carried out; and is not possible to be undertaken at a ScotRail or DRS light maintenance depot.



Mark 2 coach slam door with integral grab rail

E. Clause 4.2.2.8.3

Passenger Information

Non-compliant for:

- Display of destination and next stop within each vehicle.

The Mark 2 coaches use a legacy Public Address (PA) system manufactured by Ripper. There is no automatic announcement function, and no internal passenger displays to display the destination and next stop. This information is broadcast manually over the PA by the guard after each station.

Fitment of a compliant automatic announcement system and internal passenger displays requires a complete replacement of the existing PA, including modifications to the roof to fit PIS display housings and installation of new cables along the length of the vehicle roof. This is beyond the scope of what could be carried out within ScotRail or DRS's light maintenance depots and would require a third-party overhauler.

Wabtec's cost for the installation of this aspect of the refurbishment only (exclusive of design and assurance costs) was **£76k** per 4-vehicle train.

ScotRail will bring into use similar fixed labels in the windows of the Mark 2 fleet along similar lines to the HST fleet.



Example external destination / route display

F. Clause 4.2.2.6.2

Toilets

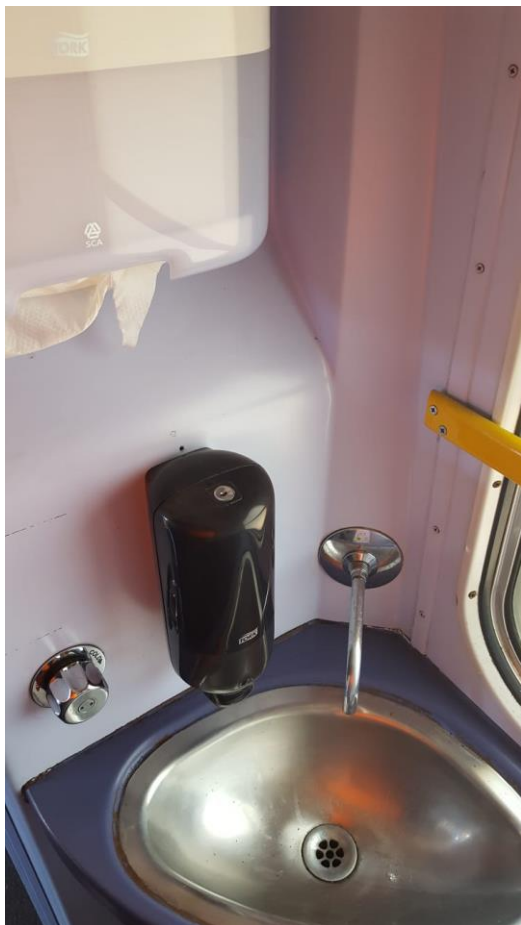
Non-compliant for:

- Door access width;
- soap dispenser operating forces;
- tactile labelling.

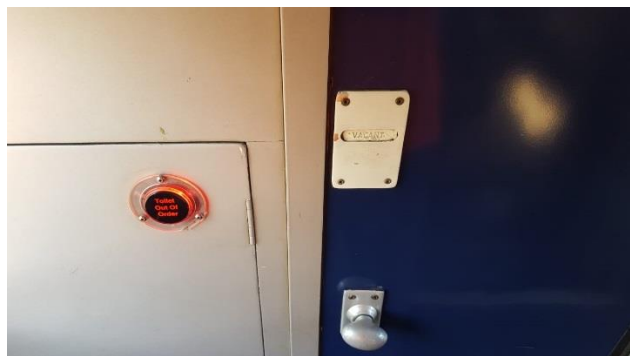
The standard (non-accessible) toilet doorway is only 428mm wide, while the PRM-TSI requires a minimum of 500mm width. This is a fundamental aspect of the construction of the train and cannot be easily improved without changing the vestibule and saloon layout to relocate the door.

The soap dispenser operating forces are above the 20 Newton limit, typically between 42 and 53 Newtons. A soap dispenser with a compliant operating force has been sourced for the refurbished HSTs and ScotRail will retrofit this onto the Mark 2 vehicles.

The labelling currently fitted is not tactile and ScotRail will replace it with tactile labelling.



Interior of Mark 2 Coach toilet



Exterior of Mark 2 Coach toilet door

G. Clause 4.2.2.3

Wheelchair spaces

Non-compliant for:

- Quantity (none provided, 2 required);
- Call for aid equipment.

The Mark 2 coaches do not currently provide wheelchair spaces. ScotRail and DRS have considered removing two tables and eight seats from one vehicle on each train to create a pair of wheelchair spaces either side of the aisle. However there are a number of restrictions which prevent this being a compliant space: this arrangement would not provide a companion seat, and further seats would need to be removed and repositioned to achieve this; there would not be any call-for aid equipment, and there is no practical way to fit this without renewing the existing PA system as discussed above, and the throughway from the vestibule would be limited to 600mm. Increasing this would require major structural work to remove existing hand rails and the vestibule door.

Due to these limitations, Scotrail do not intend to carry out any work to provide a wheelchair space on these vehicles.

H. Clause 4.2.2.6.1 and 4.2.2.6.3

Accessible Toilets

Non-compliant for:

- None provided.

The Mark 2 vehicles do not currently include an accessible toilet on all trains; while one vehicle in the fleet allocated to ScotRail does include an accessible toilet, as a result of the maintenance requirements of the fleet it cannot be guaranteed that either of the two trains in operation each day would include this vehicle.

As noted in Appendix A, provision of an accessible toilet is a complex task usually achieved by fitting an “off-the-shelf” module. This is being carried out on the refurbished HST vehicles at a cost of **£125k** per vehicle. The integration design for this is not trivial, and it is unlikely that installation of first-in-class compliant accessible toilet could be completed in less than 12 months.

ScotRail do not intend to take any action to provide an accessible toilet on the Mark 2 vehicles.

I. Clause 4.2.2.12.3.6

Boarding Devices

Non-compliant for:

- secure fixing to the vehicle.

The Mark 2 coaches are currently operated with a modern friction ramp. As discussed in Appendix A, the refurbished HSTs are supplied with a new ramp with locating pins, and matching locating recesses on the new external door threshold.

The threshold of the slam doors on the Mark 2 coaches is of a different construction, and not parallel with the vehicle side. Fitment of a new threshold with recesses for a ramp would require structural changes to the vestibule floor to securely mount the threshold and is an invasive activity not suitable for completion at a ScotRail or DRS light maintenance depot.

J. Clause 4.2.2.7

Clearways

Non-compliant for:

- clearway width between seats.

The Mark 2 coaches have a 420mm clearway between the seats, greater than the 450/550mm required by the PRM-TSI. This clearway is defined by the construction of the seats and cannot be increased without wholesale replacement of the seats.



Mark 2 saloon showing narrow clearway