

RAILTRACK

*Safety & Standards***SAFETY JUSTIFICATION****ISSUE: ONE****PART 1 - DOCUMENT INFORMATION****Document Title:** **Structural Requirements for Doors and Gangways on Railway Vehicles****Document No:** GM/RT2457 **Issue:** One**Primary Subject Committee:** Traction & Rolling Stock**Other Subject Committee input/ involvement:****Proposed Date of Submission to Subject Committee:** 07/01/2000**Submitted by:** R P Smith
Standards Project Manager**Date:**
28/10/1999**Reviewed by:**
Deputy Director, Safety & Standards Directorate**Date:**
08/11/1999**Approved by:**
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12/11/1999**PART 2 - EXECUTIVE SUMMARY**

GM/RT2457 is a new document, which amends and supersedes GM/TT0123. The changes to the current requirements in GM/TT0123 are related to the increased aerodynamic effects that are created with the introduction of higher speed trains onto Railtrack controlled infrastructure. The changes have been limited in scope to those risks that these higher speeds introduce.

This safety justification describes why the aerodynamic loadings on external doors and gangways specified in Group Standard GM/TT0123 are to be revised to take account of train speeds in excess of 200 km/h. The Standard is to be reissued as GM/RT2457.

PART 3 - BACKGROUND**Need for change**

GM/TT0123 currently specifies that external doors and gangways must withstand an aerodynamic pressure loading of 2.5 kPa. It currently makes no mention of pressure-sealed trains.

With the introduction of operations at speeds in excess of 200 km/h, the sustained pressure loading experienced by a forward-facing external door in the open air will be increased. In addition, the introduction of higher speeds is likely to be accompanied by the introduction of vehicles sealed against external pressures. On unsealed vehicles there is a tendency for internal and external pressures to equalise. This is not the case on sealed vehicles. Therefore appropriate account must be taken of the more severe aerodynamic loadings on the external doors and gangways of sealed vehicles.

Proposed changes

- Withdrawal of GM/TT0123 Issue One – Structural Requirements for Doors and Gangways on Railway Vehicles
- Introduction of GM/RT2456 Issue One – Structural Requirements for Doors and Gangways on Railway Vehicles

The document has been re-categorised in accordance with the current document referencing system in use within the Safety and Standards Directorate

In the new document it is proposed to:

- require that for train speeds in excess of 200 km/h the magnitude of the external pressure loading to be withstood by all forward-facing external doors be determined and that the capability of the doors to withstand this loading be demonstrated by tests, calculation or other appropriate means;
- require that external doors withstand the transient pressure loadings caused by wave actions in tunnels, and that the loadings be determined and that the capability of the doors to withstand this loading be demonstrated by tests, calculation or other appropriate means; exclude in the current clause the requirement for crew only direct access external doors to withstand a sustained pressure of 6kN/m^2 over its internal surface;
- add a clause for where it can be demonstrated that for crew only direct access external doors the loading of 6kN/m^2 is inappropriate, then it is permissible to reduce this loading down to a minimum of 3kN/m^2 over its internal surface;
- require that gangways withstand the transient pressure loadings caused by wave actions in tunnels, and that the loadings be determined and that the capability of the gangways to withstand this loading be demonstrated by tests, calculation or other appropriate means.

Controls and their function

These proposals accommodate the greater pressure loading on external doors in the open air at train speeds in excess of 200 km/h and will ensure that external doors and gangways are designed to withstand the pressure differentials which exist across them during transit through tunnels.

Additionally the requirements for crew only direct access external doors have been clarified and address previously accepted non-compliances.

Part 4 - COSTS AND BENEFITS

The proposals will ensure that appropriate account is taken of the pressure loadings on the external doors and gangways of high speed trains and sealed vehicles. The proposals will apply for all new procurement contracts for new vehicles and where it is proposed to operate existing trains at speeds in excess of 200km/h

The latter is likely to be driven by a business led route upgrade to permit higher speed or more intensive use of the network and as such the costs are de facto a component of this upgrade and not an additional cost arising from the introduction of GM/RT2457

A quantitative cost benefit analysis is not required.

Part 5 - CONCLUSION

It is proposed that the aerodynamic loadings on external doors and gangways currently specified in Group Standard GM/TT0123 be revised to take account of train speeds in excess of 200 km/h and to take account of the effects of pressure sealing. The document is to be reissued as GM/RT2457.

Part 6 - REFERENCES

None