

Safe Vehicle Structures

Vehicle Interface Safety (Buffers, Couplers and Anti-Climbers)

- Philosophy
 - *'Rail vehicle crashworthiness designers aim to ensure that rakes remain upright, connected, in-line and on the ground for as long as possible during a collision or derailment'.*
- Passive Safety Characteristics
 - Torsional rotational restraints between vehicles
 - Strong in both tension and compression
 - Resistant to jack-knifing
 - Resistant to overriding
 - Resistant to vehicle becoming temporarily air borne
- Questions
 - Are there any additional desirable vehicle interface safety characteristics?
 - How well do existing vehicle interface systems meet these characteristics?
 - How well do existing standards control these characteristics?
 - What are the business benefits?



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- Key Issues
 - Side buffers are known to promote override. There is a need to evaluate current risks
 - The coupling system should not 'un-lock' if vehicles overturn or become airborne
 - Standards should control the location, size and shape of serrated front plate anti-climbers
 - Anti-climbers that provide better control of lateral and vertical misalignment should be considered
 - Research is needed to determine the mechanisms by which vehicles can become temporarily air borne during high speed accidents
 - TGV style median (spanning) bogies remove the need for buffers, couplers and anti-climbers
- Question
 - What are the priorities for future research activity?

