

Carbody Design

Maximum design impact to develop safe and sustainable trains

BACKGROUND AND CHALLENGE

The client was struggling to maximize interior occupant space and build a carbody profile to suit multiple platforms. Other challenges included higher stress concentration around exterior doorway mounting area, effect of HAZ softening and tolerance variation due to welding and manufacturing, and designing for manufacturability, repeatability, and repairability.

SCOPE OF WORK

- Design carbody shell, including roof, underframe, and body side
- Design cab structure
- Integrate obstacle deflector
- Design structural partition
- Design and integrate coupler longitude

IMPACT

- Maximised interior occupant space
- Reduced build issues
- Reduced cost by using lighter material
- Used knockdown/modular principle with rapid vehicle assembly and easy repair and replacement
- Reduced component failure during product life

SOLUTION

- Optimized extrusion profile developed and incorporated CKD principle.
- Developed carbody profile as a part of platform solution across multiple projects
- Undercut door corner solution to reduce high-stress indoor fittings
- Used lighter material - aluminum for main tubes and structural steel for key areas/interfaces
- Used locally thickened weld joints to incorporate strength loss due to HAZ softening
- Provided slip joints at the interfaces of the floor, sidewalls, and ceiling to control accuracy

