

A PRO-FORMA DESIGN FOR CAR-CARRIERS: LOW-SPEED PERFORMANCE-BASED STANDARDS

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ABSTRACT

The Australian performance-based standards (PBS) scheme is being evaluated in South Africa as an alternative means of regulating heavy vehicles, allowing for a relaxation of length and mass limits. This has proven to provide economic benefits while improving vehicle safety and emissions. Within the PBS scheme, the vehicle is assessed using twelve performance standards which can be grouped together as low-speed directional, high-speed directional, stability and longitudinal performance measures. Compliance with these standards requires expensive and time-intensive computer simulations; a hurdle to the car-carrier industry in particular. We propose a pro-forma car-carrier design in which limits on the most important car-carrier parameters are defined to ensure compliance with the low-speed PBS. It is proposed that new car-carrier designs complying with this semi-prescriptive pro-forma design be exempted from full PBS assessment in the South African PBS project. In this paper the parametric sensitivity of the low-speed performance standards was assessed, and suitable limits on these parameters were found. Tests were carried out on hypothetical designs within these limits. It was found that each of the 10 000 vehicle configurations generated within the constraints of the pro-forma design met the Level 1 requirements of the low-speed PBS. Future work will ensure compliance with the full set of twelve performance standards. It is estimated that the pro-forma approach as compared to doing full assessments would save the South African car-carrier industry an estimated R1,200,000 in one year.