

F2010D023

NON-LINEAR SIMULATION MODELING OF FLEXURAL BENDING FOR BUS AND COACH STRUCTURAL JOINTS.

¹Dr. Alcalá, Enrique (*), ¹Martín, Angel, ¹Grimaldi, Rocio.

¹ INSIA. Technical University of Madrid. SPAIN

KEYWORDS – Regulation 66, Coach, Virtual Testing, Plasticity, bending.

ABSTRACT - International regulations on motor vehicles are undergoing a significant trend towards acceptance of virtual testing as a demonstration tool of the fulfilment of vehicles and components of their technical requirements. Geneva Regulation 66, currently under its revision 1, is one of the first international standards allowing this approach. One of the critical points of the resistance verification process of buses and coaches rollover is the behaviour characterization of their structural joints. The above-mentioned regulation authorizes the technical services to request a verification of this behaviour by physical tests. In this paper, a validated methodology for verifying the flexural behaviour of these joints by applying non-linear finite element models is shown. These detailed models allow the reproduction of local failures (plastic hinges) in the walls of the rectangular hollow section profiles, typical of the structures under study, the location of such failures and the final characterization of the plastic hinge behaviour. This methodology will complete the verification procedure for calculating the strength of these structures in a roll-over test and allows making simplified whole vehicle models that only need to take into account the joints behaviour. Therefore, a significant cost saving is encouraged; first, in the verification process by reducing the number of necessary tests, and second, in the computing time and computing resources needed.