

Improving an Automotive Bumper Structure for Pedestrian Protection

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Abstract : In the present study, first, a three-dimensional finite element model of lower legform impactor according to the pedestrian protection regulation EC 78/2009 is carried out. The FE model of lower legform impactor then validated on static and dynamic tests by three main criteria which are bending angle, shear displacement and upper tibia acceleration. At the second step, the validated impactor is employed to evaluate bumper of a B-class automotive based on pedestrian protection criteria defined in EC regulation. Finally, based on some investigations an improved design for the bumper is then represented and compared with the base design. Results show that very good improvement in meeting the pedestrian protection criteria is achieved.

Keywords : pedestrian protection, legform impactor, automotive bumper, finite element method

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