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Crash testing and evaluation of W-beam guardrail using finite elements method

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Abstract

On public roads, the guardrails represent the most used passive protection devices in the case of road accidents. Their role is to absorb the car impact energy. This paper presents and analyses tests of a W-beam guardrail type placed on the roadside using the finite element method. The introduction of the paper presents the state of the art, the requirements and the standards used for guardrails testing and crash test methods. In the second part of the paper is achieved the CAD model of the parapet and the impactor used to create the crash test. In the third part of this study, the boundary conditions of the guardrail structure and impactor are created for two cases of speed (80 and 110 km/h) at 20 degrees angles of impact, according to the SR EN 1317 standard. The fourth part proposes a new guardrail model changed by adding a new shock-absorber element and the distance between the poles is increased after visualization and interpretation of the obtained results of the guardrail structure. The new guardrail structure is tested at the same boundary condition as the base structure. The conclusions are highlighted in the last part of the study.

Keywords: guardrails, public roads, road accidents, roadsides , crash tests

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