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**Iran University of Science and Technology
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Improvement of energy absorption in railway buffers by plastic deformation

**A Thesis Submitted in Partial Fulfillment of the Requirement for the Degree
of Master of Science in Rolling Stocks**

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Abstract:

At the collision time, a lot of energy is generated during a short period that causes large deformations in bodies. One of the most important parts of wagon is railway buffer which absorbs the energy during an impact. The main structure of buffers is composed of thin-walled tubes which can prevent deformation of important structures such as wagons through being deformed at the impact time. The most important modes of energy absorption in plastic mode are the progressive buckling and external inversion. Using these two methods while collision, the value of energy absorption in buffers is several folds of the energy absorbed in elastic mode. But there are some differences between them which are studied in the present research paper. In this paper, the collision in different angles is simulated by LS-DYNA software and the diagrams of force - displacement and energy - displacement are calculated for different angles of collision in progressive buckling and external inversion modes.

Keywords:

Railway Buffer, Thin-Walled Tubes, Progressive Buckling, External Inversion, LS-DYNA