Analysis of Contact Stresses of Theoretical and Worn Profile by Using Computer Simulation

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The wear of rails and rail wheels is important problem in rail traffic. The change of the shape of the wheel profile has not only a great influence on the dynamic properties of the vehicle (like stability, safety by passing curved tracks, etc.), but also affects the ride comfort of passengers and environmental insults. In extreme cases it can cause rail derailment, which is unwanted status. For these and other reasons, great effort is brought to create a software, which would be capable to compute the wear of a rail wheel profile. The presented article demonstrates how the change of the rail profile influences the resulting contact stresses. The wheel and rail geometries were created by using the CAD software CATIA. For the creation of the rail profile, the PYTHON programming language was used, because the imported .step file caused inaccuracies during import. The contact stresses were computed by using the commercial FEM software ABAQUS, and the results were compared with other methods which are used to calculate contact stresses.

Keywords: contact stress, wheel and rail wear, computer simulation

Acknowledgement

This paper was created during the processing of the project "RAILBCOT - RAIL Vehicles Brake Components Test Stand", ITMS Code 26220220011 based on the support of Research and Development Operational Program financed by European Fund of a Regional Development. The work was also supported by the project No. APVV-0842-11: "Equivalent railway operation load simulator on the roller rig".

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Paper number: M2017105