

Parameter Optimization of the Locomotive Running Gear

Оптимізація параметрів ходової частини локомотива

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I. Klimenko¹, J. Kalivoda², L. Neduzha³

¹Dnipropetrovsk National University of Railway Transport named after Academician V. Lazaryan, Dep. «Advanced Mathematics», Lazaryan St. 2, 49010, Dnipro, Ukraine, E-mail: irklmn@i.ua

²Czech Technical University in Prague, Faculty of Mechanical Engineering; Technická 4, 166 07 Praha 6 Czech Republic, E-mail: jan.kalivoda@fs.cvut.cz

³Dnipropetrovsk National University of Railway Transport named after Academician V. Lazaryan, Dep. «Theoretical and Structural Mechanics», Lazaryan St. 2, 49010, Dnipro, Ukraine, E-mail: nlorhen@i.ua

Abstract

In principle all railway vehicles exhibit lateral oscillations, also called a hunting motion. Stability of hunting motion usually decreases with increasing running velocity and the speed at which hunting motion becomes unstable limits the maximal permissible speed of railway vehicle. When designing a new rolling stock, it is necessary to tune the parameters of a vehicle suspension so that the critical velocity is higher than the maximum operational vehicle speed. In the paper the Nelder-Mead optimization is proposed as the method useful for finding the optimal vehicle parameters at which the maximum critical velocity is reached. This optimization method was applied to the locomotive DS3. The results are presented and discussed in the paper.

KEY WORDS: railway vehicle, stability, high speed, optimization

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