Experimental Rigs for Wheel /Rail Contact Research

Juraj Gerlici1, Mykola Gorgunov2, Kateryna Kravchenko1, Alexander Kostyukevich2, Olena Nozhenko1, Tomáš Lack1
1Department of Transport and Handling Machines, Faculty of Mechanical Engineering, University of Žilina, Univerzitná 1, 010 26 Žilina, Slovak Republic. E-mail: juraj.gerlici@fstroj.uniza.sk, kateryna.kravchenko@fstroj.uniza.sk, olena.nozhenko@fstroj.uniza.sk, tomas.lack@fstroj.uniza.sk
2Department of Rail Transport, Institute of Transport and Logistics, Volodymyr Dahl East Ukrainian National University, Central Avenue 59a, 93400 Sewerodonetsk, Ukraine. E-mail: gn0255@mail.ru, a.i.kostyukevich@gmail.com

The article discusses the problem and importance of the study of the parameters of interaction between the wheel and the rail. The analysis of the test rig equipment for conducting research was carried out. Conventionally, the methods of conducting research are divided into 3 groups: physical and mathematical models, full-scale test rigs, field tests. Technical solutions for the modernization of the rig equipment of different types are proposed and the results of experimental studies using some of them are presented. For the approximation of rigid equipment to the real conditions of operation it is proposed to cool the rail rollers through the use of the Ranque-Hilsch tube; to simulate the stiffness of the track on the rig it is effective to use leaf springs. Tests on a friction machine showed the effectiveness of sand electrification when supplying it into the contact of tribosystem.

Keywords: Rolling Rigs, Rail Rollers, Wheelset, Brake System, Adhesion

Acknowledgements

The research was conducted at the Department of Transport and Handling Machines of the Faculty of Mechanical Engineering of the University of Žilina by the National Scholarship Programme of the Slovak Republic for the Support of Mobility of Students, PhD Students, University Teachers, Researchers and Artists. The topic of the research is "Increased reliability and safe operation of trains using the innovative technical solutions in heavily loaded tribological contacts "rail track - rolling stock - contact network".

References


Copyright © 2016. Published by Manufacturing Technology. All rights reserved.