NUMERICAL ANALYSIS OF SCREW JOINT TURN TABLE AND CHASSIS OF LOW-FLOOR ARTICULATED BUS IK218N

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Abstract

Rapid growth and development of modern technologies led to increased application of innovative solutions in conceptual design and modelling in all fields of engineering. In order to answer to the increased requirements for more efficient means of transport, it is necessary to pay special attention to public transport (meant for a large number of passengers) which is essential in large cities. Since daily frequency amounts to several thousands of passengers, appropriate maintenance and inspection of the most loaded parts have to be conducted regularly.

Low-floor articulated bus IK218N was analysed here. Prototype was completely developed and produced in the Factory of buses and special vehicles – IKARBUS. After years of exploitation in extreme working conditions in Belgrade, a systematic error in the form of screw joint failure at the connecting point between articulated joint and chassis rear part was established. Extreme working conditions imply overloaded vehicles, inadequate, damaged and bumpy roads as well as irregular maintenance. The whole bus was initially modelled in CATIA, which was followed by the numerical simulation of the connecting screw joint by finite element method in ANSYS. The results of structural analysis showed that the screw joints were the most loaded parts which led to their failure. The screws serve to connect the mount and the articulated joint itself. The following conclusion was made: during exploitation, the mount beam lost its initial mechanical characteristics, its deformations reached plasticity which reduced locking forces and led to additional shear load on the screw and its final failure. Consequently, the screw joint had to be redesigned and modified. New solution was applied to low-floor articulated bus IK218N.

Keywords

Low-floor articulated bus, Screw joint, Failure, FEM, Redesign.

Acknowledgement

The research work is funded by the Ministry of Education, Science, and Technological Development of Republic of Serbia through contract no. 451-03-68/2020-14/200105.