SIMULATION OF LIGHT-WEIGHT TRUCK LF3070G1'S TIRE DYNAMICS

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Abstract

Accurately analyzing the dynamics of automotive tires is an important task. In this research, a Finite Elements Method (FEM) model of the tire of the light-weight truck LF3070G1 (a common truck operated in Vietnam) is implemented in ANSYS Workbench. The purpose of this research is to analyze the dynamics of the tire in two scenarios. The first scenario is when the tire is statically balanced between supporting the vehicle weight and the internal air pressure. The second scenario includes the dynamically balance while the vehicle is operating at different weight loads.

The analysis includes two parts. In the first part, the mode shapes and the natural frequencies of the tire, which influence the tire's stiffness and damping constant, are experimentally determined. In the second part, numerical simulations are carried out to determine the tire's time-dependent maximum deformation.

Keywords: Tire of truck, Modeling of tire, Mode shape, Deformation.