Prof. Dr. Miroslav Demić, mech eng, academician Faculty of Mechanical Engineering Kragujevac, ***Prof. Dr Constantinos Spentszas***,,National Technical University of Athens Greece, ***Assistant Professor Jovanka Lukić***, Ph.D. Faculty of Mechanical Engineering Kragujevac

OPTIMIZATION OF CHARACTERISTICS OF TRUCKS ELASTO-DAMPING ELEMENTS

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Spatial random vibrations of a truck that arise during driving represent an important factor in functioning of a dynamic system: Driver-Truck-Environment. They carry certain information for driver and also cause fatigue of driver.
This is the reason why the tendency is towards the minimization of vibratory loads, what in practice can be achieved by optimization of characteristics of elasto-damping elements of a truck.
In this paper for optimization of elasto-damping elements of a truck we used a complex nonlinear and linear models of a driver and a truck during the straight-line motion of the truck on a rough road. Optimization was performed by application of the Hooke-Jeeves method and by use of outside penalty functions as well as the objective function that enabled simultaneous optimization of vertical vibrations of the driver's seat and vertical and lateral body and axles vibrations, and maximization of normal reactions in the contact surface of the tyre and road. The optimization was performed with application of the computer Pentium /90 MHz on the example of a medium truck.

Key words: truck, damping, suspension

OPTIMIZACIJA ELASTO-PRIGUŠNIH ELEMENATA KAMIONA

Prostorne vibracije kamiona koje se javljaju u procesu vožnje predstavljaju značajan faktor u funkcionisanju dinamičkog sistema: Vozač-Kamion-Okruženje. One sadrže u sebi značajne informacije za vozača, ali dovode i do njegovog zamora. Zbog toga postoji težnja za minimizacijom vibracionih opterećenja, što se može postići u praksi optimizacijom elasto prigušnih elemenata kamiona.
U ovom radu za optimizaciju elasto prigušnih elemenata kamiona koristili smo složene nelinearne i linearne modele vozača i kamiona pri pravolinijskom kretanju po putu. Optimizacija je izvedena primenom metode Hook-Jeeves i korišćenjem spoljašnjih kaznenih funkcija kao i primenom ciljne funkcije koja omogućuje istovremenu minimizaciju vertikalnih vibracija na sedištu vozača i bočnih i vertikalnih vibracija šasije i vibracija osovina i maksimizaciju normalnih reakcija u kontaktu pneumatika i puta. Optimizacija je izvedena na primeru kamiona, korišćenjem računara PC Pentium/90 MHz.

Ključne reči: kamion, prigušenje, elastično oslanjanje