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EXPERIMENTAL VERIFICATION OF STRESSES AND DEFORMATIONS OF THE 3D FINITE ELEMENT DRUM/DISC MODEL

Stresses and deformations occurring in brakes are very complex and depend on a number of parameters. Along with service loads, the influencing parameters are dimensions of the drum or disc such as drum/disc flange thickness or disc depth, ventilation port width and port wall thickness, drum thickness, etc. By changing loads and geometrical parameters different values of stresses and deformations in the drum and disc are obtained. This paper presents the results of an analysis of effects on drum/disc stresses and deformations caused by changes in some of main geometric parameters, under different thermal and mechanical loads. An experimental investigation is presented also. The measurements of stresses caused by different mechanical and thermal loads have shown a fairly good agreement between theoretical and experimental results.

Key words: finite element analysis, thermal stresses, drum brake, disc brake.

EKSPERIMENTALNA PROVERA NAPONA I DEFORMACIJA TRODIMENZIONALNOG MODELA DOBOŠA/DISKA DOBIJENOG METODOM KONAČNIH ELEMENATA

Naponi i deformacije koji se javljaju kod kočnica su vrlo složeni i zavise od niza parametara. Pored opterećewa značajni uticajni parametri na napone i deformacije su dimenzije doboša/diska kao debljina prirubnice dobos/diska, dubina diska, širina i debljina ventilacionih otvora, debljina doboša itd. Promenom opterećenja i dimenzija doboš/diska se naravno dobijaju različite vrednosti napona i deformacija. Ovaj rad daje prikaz rezultata dobijenih analizom uticaja promene toplotnih i mehanickih opterećewa i dimenzija na napone i deformacije. Priloženi su i rezultati eksperimentalne provere rezultata. Eksperimentalna provera napona i njihovo poređenje sa teorijski dobijenim vrednostima je pokazala veliko poklapanje.

Ključne reči: analiza konačnim elementima, termički naponi, doboš kočnice, disk kočnice.