

¹ EXPERIMENTAL RESEARCH OF DYNAMIC STRESSES OF MOTORCYCLE'S FRAME

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Abstract

In this paper are presented the results of all three acceleration components of motorcycle's frame. For the experiment a motorcycle HONDA MTX 125R was used and B&K vibration analyzer, model 4447 measuring equipment. During the ride, the speeds were constant with variable intensity in the range of 30 km/h till 130 km/h. The experiment was performed on the straight and smooth asphalt road. The quality of the road is same as the quality of most of the main roads in Serbia. The length of the pathway was 1100m. On the other hand, a simple dynamic model of motorcycle was created, which allows the calculation of dynamic reactions of the ground by means of acceleration components measured on the frame. The goal of this paper was to identify dependence of vertical ground reactions on front and rear wheel for different constant speeds. Measurements have shown that even during the straight ride by motorcycle with constant speeds there is a considerable ratio of lateral acceleration component, which is not the case during the ride by car, for instance. The purpose of this paper is to indicate to risks of the ride with speeds over those identified on the Serbian roads, by means of experimental identification of the speed, which in some sense, for certain road quality, is the critical speed.

Key words: acceleration measurement, motorcycle's frame, dynamic model.

EKSPERIMENTALNA ISTRAŽIVANJA DINAMIČKIH NAPREZANJA RAMA MOTOCIKLA

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Rezime: U radu su prezentirani rezultati merenja sve tri komponente ubrzanja na ramu motocikla. Motocikl je Honda MTX 125R, a korišćena merna oprema je analizator vibracija B&K, model 4447. Vožnja je bila konstantnim brzinama različitog intenziteta i to od 30km/h do 130km/h. Eksperiment je izveden na deonici asfaltnog puta koji je ravan i prav. Kvalitet puta odgovara kvalitetu većine magistralnih puteva u Srbiji. Dužina deonice je bila 1100 m.

S druge strane, postavljen je jednostavan dinamički model motocikla koji omogućava izračunavanje dinamičkih reakcija tla korišćenjem izmerenih komponenti ubrzanja na

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ramu. Cilj rada je bio da se identifikuje zavisnost vertikalnih reakcija tla prednjeg i zadnjeg točka za različite konstantne brzine. Merenja su pokazala da i pri pravolinijskom kretanju motocikla konstantnom brzinom postoji značajan udeo bočne komponente ubrzanja, što, na primer, kod automobile nije slučaj.

U radu se, eksperimentalnom identifikacijom brzine koja je u neku ruku za zadati kvalitet puta kritična, želelo da ukaže na rizik brze vožnje brzinama većim od identifikovane na putevima Srbije.

Ključne reči: merenje ubrzanja, ram motocikla, dinamički model.