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Motor Vehicles & Motors 2014

VEHICLE AS A SAFETY FACTOR OF THE TRANSPORTATION ACTIVITY

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October 9th - 10th, 2014
Kragujevac, Serbia

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A CONTRIBUTION TO RESEARCH OF SOME PHYSICAL CHARACTERISTICS OF DISC BRAKES IN LABORATORY CONDITIONS

ABSTRACT: It has been proved in literature that there is no generally accepted method for the evaluation of characteristics and output parameters of the disc brake mechanism. This paper presents experimental research of disk brake subsystem with brake fluid pressure in the brake cylinder and disc speed as input quantities and brake torque and brake noise (expressed as sound pressure level) as output quantities. The work of disc brakes during the braking process is defined with physical output parameters: activation force, brake torque, brake noise, thermal load, etc. The aim of this paper was to determine the minimum number of mutually independent physical parameters that represent, with reasonable accuracy, the braking characteristics of disc brakes.

KEYWORDS: disc brakes, physical characteristics, experimental research, data processing

INTRODUCTION

The main task of the brake mechanisms is to achieve the necessary braking torque acting on the wheel of the vehicle, causing its deceleration, and thus braking of the vehicle. Therefore, the braking torque is a fundamental characteristic of every brake, the measuring tool of its functional properties or *performances*.

Calculation methods and testing procedures for disk brake mechanisms, presented in a large number of papers [1,2,3,4], have passed through several stages in their development. Calculation methods have experienced the most intense progress thanks to the development of computer techniques. In this way, numerical methods have become the basic calculation methods, without which, it cannot be possible to imagine the development of many products today in technologically advanced countries. These methods allow rapid analysis of a large number of different combinations and the selection of the optimal solution (optimization). Numerical methods [5,6] are approximate and they require reliable information based on which the boundary conditions are derived. Thus, there is their direct connection with the testing of brake mechanisms that provides information of high precision and quality, thanks to advancement of measurement and processing techniques and analysis of measurement results. In this way, the period needed for the development of new brake's elements is significantly reduced. The large part of the brake system testing is verification of compliance with the requirements of international and national

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