

Effects of Humidity and Silica Sand Particles on Vibration Generation by Friction Materials of Automotive Brake System

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Abstract : This paper presents the experimental study of vibration generated by friction materials of an automotive disc brake system using brake test rig. Effects of silica sand particles which are available on the road surface as an environmental condition with a size varied from 150 μm to 600 μm are evaluated. Also, the vibration of the brake disc is examined against the friction material in humidity environment conditions under variable rotational speed. The experimental results showed that the silica sand particles have significant contribution on the value of vibration amplitude which enhances with increasing the size of silica sand particles at different speed conditions. Also, it is noticed that the friction material is sensitive to humidity and the vibration magnitude increases under wet testing conditions. Moreover, it can be reported that with increasing the applied pressure and rotational speed of the braking system, the vibration amplitudes decrease for all cases.

Keywords : disc brake vibration, friction-induced vibration, silica sand particles, brake operational and environmental conditions

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