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Effect of Compressibility of Brake Friction Materials on Vibration Occurrence

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Abstract : Brakes are one of the most important safety and performance components in automobiles and airplanes. Development of brakes has mainly focused on increasing braking power and stability. Nowadays, brake noise, vibration and harshness (NVH) together with brake dust emission and pad life are very important to vehicle drivers. The main objective of this research is to define the relationship between compressibility of friction materials and their tendency to generate vibration. An experimental study of the friction-induced vibration obtained by the disc brake system of a passenger car is conducted. Three commercial brake pad materials from different manufacturers are tested and evaluated under various brake conditions against cast iron disc brake. First of all, compressibility test for the brake friction material are measured for each pad. Then, brake dynamometer is used to simulate and reproduce actual vehicle braking conditions. Finally, a comparison between the three pad specimens is conducted. The results showed that compressibility have a very significant effect on reduction the vibration occurrence.

Keywords : automotive brake, friction material, brake dynamometer, compressibility test
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