

Tire-road noise analysis using wheel force dynamometers

B. Philippen¹, R. Sottek¹, P. Jahangir², K. Becker²

¹ HEAD acoustics GmbH, 52134 Herzogenrath, Germany, Email: bernd.philippen@head-acoustics.de

² Cologne University of Applied Sciences, 50679 Cologne, Germany, Email: payam.jahangir@fh-koeln.de

Abstract

Nowadays tire-road noise is an important source of vehicle interior noise because in recent years the powertrain noise has been reduced continuously. The contact of the rolling tires with the road surface is a significant factor in the acoustic comfort of a car, especially for driving at constant and moderate speed. Hence tire-road noise is moving more and more into the focus of NVH applications.

A common approach for the analysis of tire-road noise uses on-road measurements and **Operational Transfer Path Analysis (OTPA)**. Usually accelerations measured on the wheel hub carrier are used to characterize the structure-borne sound share of the tire-road noise. These accelerations as well as the sound pressure at the receiver are only an effect and not the cause of the tire-road noise. Wheel force dynamometers used in place of the standard wheels allow a more direct measurement of the cause: the dynamic forces and moments.

The wheel force dynamometers are usually used for vehicle dynamics or durability tests. Their applicability for NVH purposes is investigated in this paper: Are the measured force signals suitable for an OTPA and are they comparable to indirectly determined forces based on inertances?

Find more event abstracts in our >> abstracts archive <<

HEAD acoustics GmbH
Ebertstraße 30a
52134 Herzogenrath, Germany