

Latest innovation in automatic brake noise identification and in correlating dynamometer with vehicle results

Beside the performance of brake systems, the perceived quality of brakes, in specific the noise performance plays a prominent role in the development process of brake systems. Tier 1, and Tier 2 suppliers and vehicle manufacturers spent enormous efforts simulating noise performance on chassis- and inertia type benches to reduce the development cycle time. By all means to find the correct physical parameters like speed, temperature, or deceleration in order to meet a realistic road load, it is as well tremendous important to identify brake noises on inertia-, and chassis type dynamometers in a wide frequency range and to correlate this with the vehicle noise performance. Following disturbances make this to a difficult task, as there are: high carpet noise on low frequencies, different impedances on transfer paths on vehicle and dynamometer, cross talking from brakes on the same axle, different ratings from different drivers.

The following paper is dealing with the implementation of pattern algorithms based on psycho-acoustics to identify low brake noise frequencies. Very often especially these frequencies are disturbed or covered by strong carpet noise. The introduction of transfer path analysis is deployed to identify the squealing brake even by strong cross talking and is used to set up a correlation between dynamometer and vehicle results. This will lead to a more reliable acoustical acceptance curve for test benches. The paper will sum up how to implement these tools to assist a reduction of the development cycle time.