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Study on Impact of Road Loads on Full Vehicle Squeak and Rattle Performance

Authors : R. Praveen, B. R. Chandan Ravi, M. Harikrishna

Abstract : Squeak and rattle noises are the most annoying transient vehicle noises produced due to different terrain conditions. Interpretation and prohibition of squeak and rattle noises are the dominant aspects of a vehicle refinement. This paper describes the computer-aided engineering (CAE) approach to evaluating the full vehicle squeak and rattle performance with the measured road surface profile as enforced excitation at the tire patch points. The E-Line methodology has been used to predict the relative displacement at the interface points and the risk areas were identified. Squeak and rattle performance has been evaluated at different speeds and at different road conditions to understand the vehicle characteristics. The competence of the process in predicting the risk and root cause of the problems showcased us a pleasing conformity between the physical testing and CAE simulation results.

Keywords : e-line, enforced excitation, full vehicle, squeak and rattle, road excitation
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