

NAFEMS UK Regional Conference 2018 - Abstract Submission

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Please identify the event for which your submitting?	NAFEMS UK Conference 2018
Will you be the presenting author?	Yes
Presentation Title	Force Based Squeak and Rattle assessment in CEVT vehicles interior
Relevant Themes / Keywords	Squeak and Rattle, Noise, Comfort

Abstract (plain text)

Today, conform is considered one of the most important aspects of a modern vehicle. A quiet and durable interior affects, to a big extent, the perception of conform, and as a result, it has become an important goal to reach and exceed during the designing processes of a new vehicle. To achieve this, engineers aim to the elimination of the Squeak and Rattle, and other noises.

A considerably big amount of different tests are performed in laboratories, in order to produce the interior and exterior components that will eliminate the occurrence of such undesirable phenomena. As a result, the need to develop numerical models that explain and predict the behavior of a vehicle in terms of Squeak and Rattle, is inevitable. The implementation of automated tools benefits analysts in setting up efficient and robust processes for accurate and straightforward CAE simulations.

The majority of the Squeak and Rattle simulation approaches are performed based on the evaluation of the relative displacement between two components in the time domain. In the current paper, new practices are also demonstrated which allowed us to move a step further and take into account the force output between the critical interfaces as an additional parameter for exploring these undesirable phenomena.

On the one hand, for rattle an additional pretension simulation needs to be performed. On the other, for Squeak assessment the friction force from the stick-slip/rheometer test is needed. The evaluation of both the relative displacement and the force, in modal transient analysis, makes the study of Squeak and Rattle more complete and consistent.

Based on this approach BETA CAE Systems, in cooperation with CEVT, AF and Volvo Car Corporation has developed a set of special tools. These tools have been used to accurately predict the risk for Squeak and Rattle successfully on a cockpit and a tailgate assembly.

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