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”DYN1#1 - A model-based approach for the NVH performance improvement of Soft Close Actuators for automotive applications”

mardi 11 juillet 2023 14:00 (20)

The aim of this paper is to describe a numerical vibro-acoustic methodology, experimentally assessed, for the estimation of the overall vibratory and acoustic level of a Soft Close Actuator (SCA), for automotive applications. The process is carried out in order to develop a digital twin enable to represent the Noise, Vibration and Harshness (NVH) behaviour of the real mechanism. The vibro-acoustic model is the combination of three sub-models: a multibody (MB) model, a structural finite-element (SFE) model and an acoustical boundary-element (ABE) model. The MB model is used to obtain the reaction forces on the case of the actuator during working conditions. Reaction forces are employed as an input for the further SFE dynamic model to evaluate the dynamic response of the SCA’s case, which is the only meshed part. The dynamic response is exploited to set-up an ABE model which allows to estimate the noise generation in terms of acoustic properties. The numerical simulation results are validated using experimental data acquired on a real SCA. The developed model is a powerful tool for the improvement of NVH performance of the analysed actuator.

Presenter(s) : NATALI CATERINA

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