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Noise annoyance fuzzy index in passenger car cabin

Abstract

Vehicle acoustical comfort and vibration in passenger car cabin are the factors which attract buyers to a vehicle, in order to have a comfortable driving environment. The comfort of the driving will affect the driver by influencing their driving performance. Vehicle acoustical comfort index (VACI) has been introduced to represent the level of annoyance in passenger car cabin. This index has been used in the computation related to the acoustics aspect in the car cabin. Noise annoyance is categorised into five states: most annoying, medium annoying, marginal, medium pleasant and most pleasant. In order to improve the VACI index, this study carries out an approach to classify and categorise the aforementioned five states using the fuzzy set theory approach. At the end of several studies, the noise annoyance fuzzy index (NAFI) has been introduced. By using NAFI, automotive researchers will be able to classify and make judgement about the state of annoyance from the exposed noise in the car cabin numerically, where the use of this index is regarded to be more precise and has practically been used in engineering fields especially where the fuzzy logic system is concerned.

Keywords

NAFI; Noise annoyance fuzzy index; Sound quality; VACI; Vehicle acoustical comfort index