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INFLUENCE OF OPEN/CLOSED VOLUME TYPES ON SENSOR MATRIX DESIGN FOR VIBROACOUSTIC STUDY OF VEHICLES

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Abstract

Environmental protection involves various complexities, like reduction of vibroacoustic pollution generated by motor vehicles. This type of pollution, generated from vehicle operations, presents significant challenges in mitigation efforts. According to this, it results the need to develop a methodology aimed at identifying and analysing the sources of noises and vibrations typical of both normal vehicle functioning and component failures. These sources mainly concentrate within the engine compartment. Thus, the configuration of the sensors to analyze the vehicle noise and vibration behaviour should be adapted to the identified categories of open or closed vibroacoustic volumes. The goal of this study is to demonstrate, by practical experiments, that in case of an open volume, accelerometers should predominate in the sensors array, whereas for a closed vibroacoustic volume, a more balanced distribution with microphones may be appropriate. This classification of vibroacoustic volumes serves as basic criteria for the design of sensors network in vibroacoustic studies of vehicles.

Key words: automotive, diagnostic, noise, pollution, vibration

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