

POSSIBLE METHODS FOR REDUCTION OF AUTOMOBILE NOISE BY MEANS OF VIBRO-ACOUSTIC MATERIALS

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1. INTRODUCTION

The noise in automobile has a whole spectrum of negative effects. The psychological effects of noise on people can neither be measured nor defined by laws; instead, they are estimated on the basis of the reaction of people who are in contact with the vehicle. It is well known that noise causes monotony, annoyance, fatigue; it decreases the perception abilities and causes a series of other negative effects. In dependence on exposure period, frequency spectrum and noise intensity, the consequences can be temporary or permanent. The noise inside the vehicle has the central character; as a result, it represses the effects of other characteristics, so the good impressions of vehicle are lost when the noise is uncomfortable. Most of the measures applied nowadays round the world increase the competitiveness of the vehicle, and in that way lead to the bigger economical gain. The paths of noise transmission from the source to the passenger space can be classified in two general groups. The first one is transmitted by air, radiation coming directly from the source, while the second one is structural, caused by oscillations of car body parts due to vibrations of drive unit and road stimulus. The appearance of acoustic modes is the consequence of closed capacities which, for automobiles, appear in engine, passenger and luggage space as the consequence of standing waves formation. The problem becomes more complex when superplunging of vibration and acoustic modes of car body occurs. In that case, their detachment is performed, i.e. they are isolated from one another. In order to enable the absorption of acoustic energy and, in this way, disable the creation of standing waves, the absorption materials which will absorb acoustic waves and will not allow their reflection are assembled in the vehicle. Regarding the reduction of vehicle noise, there are approximate standardized points which should be acted upon as well as methods for verification of executed interventions.

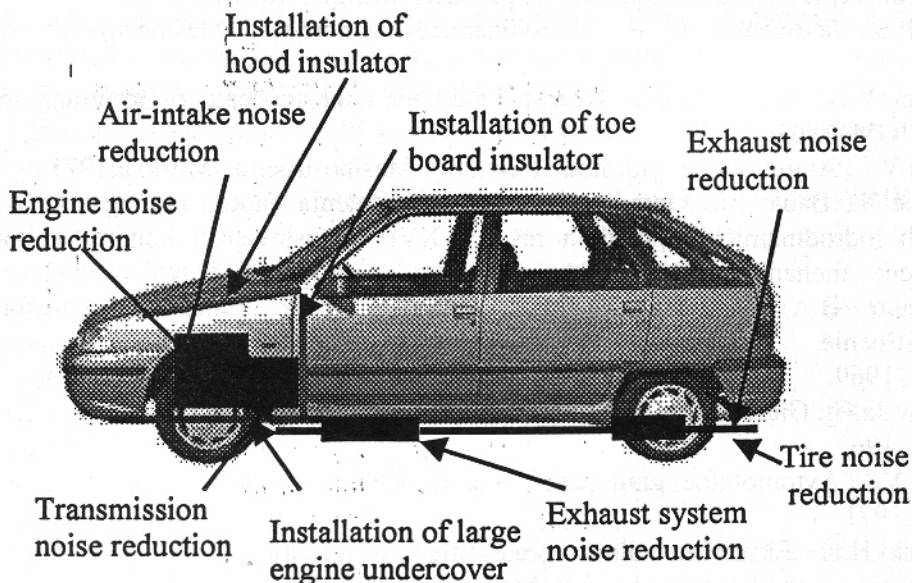


Figure 1. Main items for noise reduction