Modern advancements in passive and active noise and vibration control technology in automobiles

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The purpose of this paper is to introduce recent topics on passive and active control of noise and vibration in automobiles. First, the environment surrounding the automotive industry is reviewed. Toward reducing carbon dioxide, reducing weight and improving fuel economy continues to be important year after year. On the other hand, from the viewpoint of the vehicle development process, the development period is shortening and the quantity of prototype vehicles is decreasing. In automotive development, passive control is still mainly used, but the number of companies applying active control to mass production is increasing. Simulation technology is reviewed as one example of passive control. In addition, educating noise and vibration engineers is a common issue faced by each automotive company as vehicle development changes and the use of simulation increases. This issue is briefly described. In the latter of this paper, active control technology is introduced. The history of active control is briefly reviewed. Examples of applying Active Noise Control (ANC) and Active Control Engine Mount (ACM) to mass production vehicles are described. Recently, ANC with sound control is applied to mass production vehicles. Finally, the future direction of active control technology is considered.

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