A new method for analyzing idle shake is discussed. A primary design technique of engine mount systems and vehicle bodies in the early development stage is proposed.

In general, specifications for the engine mount system, which is composed of several insulator rubbers, are determined by certain criteria of transmissibilities of engine excitation forces to the rigid foundation. However, when the transmitted forces are applied to a flexible body, the resultant response of the body depends not only on the transmissibilities of the isolation system, but on vibratory characteristics of the flexible body. Therefore, the body needs to be taken into account for antivibration design as well as the engine mount system. Besides, the engine mount and the body cannot be evaluated by simple criteria due to the several insulator rubbers which feature many transmissibilities and transfer functions.

This paper presents that the body can be evaluated with translational sensitivity and moment sensitivity by regarding a part of the flexible body as approximately rigid. As a result, the total vibration system can be divided into two sub-systems; isolation system and response system. Then the total system and sub-systems can be evaluated with simple criteria by a new method derived from the Building Block Approach. And the new method which we call ‘Principal Vector Approach’ is proved to be effective for tests, analyses, and designs concerning idle shake.

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