

나선 이론을 이용한 엔진 마운트의 설계 및 분석

이준호[†](연세대 원) · 최용제^{*}(연세대)Design and Analysis of Engine Mounting System
via Screw Theory

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Key Words: screw theory(나선이론), reciprocity(역관계), vibration axis(진동축), the plane of symmetry(대칭면)

Abstract : The vibrational phenomena of an automotive engine mainly depends on its mass distribution, and the position and stiffness of each of engine mounts. The objective of this paper is to decouple the physical modes such as three translation modes and three rotation modes and to eliminate undesired modes when an engine idles. In order to achieve this goal, the external forces are viewed from the standpoint of the screw theory. Utilizing the concept of the plane of symmetry, the physical modes are partially decoupled and the vibration responses of the engine at lower frequencies are attenuated by making the undesired vibration axes and wrenches be reciprocal in the plane of symmetry. The proposed design method is compared with existing methods, which is verified by a numerical simulation.

미분변환법에 의한 진동 해석시 급수중심의 수렴성에 대한 영향

윤종학[†](안동대 원) · 신영재^{*}(안동대)Effect of the center of the series on convergence in solving vibration
problems by Differential Transformation Method(DTM)

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Key Words: center of the series (급수 중심), differential transformation method(미분변환법), axial force(축하중)

Abstract : This paper presents the effect of the center of the series on convergence in solving vibration problems by Differential Transformation Method(DTM) to the transverse vibration of the Euler-Bernoulli beam under varying axial force. The governing differential equation of the transverse vibration of the Euler-Bernoulli beam under varying axial force is derived and verified. The concepts of DTM were briefly introduced. Numerical calculations are carried out and compared with previous published results. The effect of the center of the series on convergence in solving the problem by DTM is discussed.