

마이크로 3축 링 자이로스코프의 동역학

최상현* (인하대학교 대학원) · 김창부* (인하대학교 기계공학부)

Dynamics of a Micro Three-Axis Ring Gyroscope

Sang-Hyun Choi, Chang-Boo Kim

Key Words : Ring gyroscope(링 자이로스코프), Three-axis(3축), Rate of turn(선회속도), Cyclic symmetry(순환 대칭), In-plane motion(면내 운동), Out-of-plane motion(면외 운동), Natural mode(고유모드)

Abstract : In this paper, we analyse and present mechanical dynamic characteristics of a micro-machined vibrating silicon ring gyroscope which can measure rates of turn about three orthogonal axes. The ring gyroscope has a ring connected to the gyroscope main body by support-ligaments which are arranged with cyclic symmetry. The natural modes of its vibration can be distinguished into the in-plane motion and the out-of-plane motion which are coupled by the gyro-effect due to the rotation of the gyroscope main body. The equations of motion, the response to rates of turn, and the relationships between the natural modes of vibration are derived and compared with the previous studies for the design of a micro three-axis ring gyroscope.

선박용 4행정 디젤엔진의 과도비틀림진동에 관한 연구

이돈출* (목포해양대) · 유정대*(현대중공업) · 전효중**(한국해양대)

A Study on the Transient Torsional Vibration of 4 Stroke Marine Diesel Engine

D. C. Lee, J. D. Yu and H. J. Jeon

Key Words : Four Stroke Marine Diesel Engine, Transient Torsional Vibration, The Newmark Method, Generator Engine, Propulsion Engine, Unstable Torsional Vibration

Abstract : Theoretical analysis of transient torsional vibration was started from early 1960's for high power synchronous motor application. Especially, its simulation and measuring techniques in marine engineering field have been steadily studied by manufacturers of flexible coupling and designers of four stroke marine diesel engine. In this paper, the simulation method of transient torsional vibration of four stroke marine diesel engine using the Newmark method are introduced. And these are compared to the measuring results of transient torsional vibration on the generator engine and marine propulsion engine with power-take-off system and reduction gear.