

Nondestructive Evaluation Using the Dipole Model and the Scan Type Magnetic Camera

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다이폴모델과 스캔형 자기카메라를 이용한 비파괴평가

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Abstract : It is important to estimate the distribution of intensity of a magnetic field for application of magnetic method to industrial nondestructive evaluation. Magnetic camera provides the distribution of a quantitative magnetic field with homogeneous lift-off and same spatial resolution. And it is possible to interpret the distribution of the magnetic field when the dipole model is introduced. This study introduces the numerical and experimental considering of the quantitative nondestructive evaluation of several size and shapes of the cracks using the magnetic field images of the scan type magnetic camera, which is used to overcome spatial limitation due to the sensor size. Furthermore, the effectiveness of the study and possibility of inverse analysis are discussed.

FEM과 Striation을 이용한 로커 암 축의 파손응력 추정

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Prediction of Failure Stress of Rocker Arm Shaft using FEM and Striation

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Key Words: Rocker arm shaft(로커 암 축), Failure stress(파손응력), ANOVA(분산분석)

Abstract : As a result of vehicle maintenance of rocker arm shaft for 4-cylinder SOHC engine, failure stress analysis of rocker arm shaft is needed. Because more than 30% of vehicles investigated have been fractured. Failure stress analysis is classified into an naked eyes, microscope, striation and X-ray fractography etc. Failure stress analysis by using striation is already established technology as means for seeking cause of fracture. But, although it is well known that striation spacing corresponds to the crack growth rate da/dN , it is not possible to determine σ_{max} and σ_{min} under service loading only from striation spacing. This is because the value of striation spacing is influenced not only by ΔK but also by the stress ratio R .

In the present paper, we determine the stress ratio using orthogonal array and ANOVA, and propose a prediction method of failure stress which is combined with FEM and striation.