

Fatigue Life Estimation Using N-Code for Drive Shaft of Passenger Vehicle

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Abstract : The drive shaft of passenger vehicle has its own function such as transmitting the engine torque from the gearbox and differential gears to the wheels. It must also compensate for all variations in angle or length resulting from manoeuvring and deflection for perfect synchronization between joints. Torsional fatigue failures occur frequently at the connection parts of the spline joints in the end of the drive shaft. In this study, the fatigue life of a drive shaft of passenger vehicle was estimated by using the finite element analysis. A commercial software of n-Code was applied under twisting load conditions, i.e. 0~134kgf•m and 0~188kgf•m, in which the shear strain range-fatigue life relationship considering Signed Shear method, Smith-Watson-Topper equation, Neuber-Hoffman Seeger method, size sensitivity factor and surface roughness effect was taken into account. The estimated fatigue life was verified by a twisting load test of the real drive shaft in a test rig. (Human Resource Training Project for Industry Matched R & D, KIAT, N036200004).

Keywords : drive shaft, fatigue life estimation, passenger vehicle, shear strain range-fatigue life relationship, torsional fatigue failure

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