

Compilation of Load Spectrum of Loader Drive Axle

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Abstract : In order to study the preparation method of gear fatigue load spectrum for loaders, the load signal of four typical working conditions of loader is collected. The signal that reflects the law of load change is obtained by preprocessing the original signal. The torque of the drive axle is calculated by using the rain flow counting method. According to the operating time ratio of each working condition, the two-dimensional load spectrum based on the real working conditions of the drive axle of loader is established by the cycle extrapolation and synthesis method. The two-dimensional load spectrum is converted into one-dimensional load spectrum by means of the mean of torque equal damage method. Torque amplification includes the maximum load torque of the main reduction gear. Based on the theory of equal damage, the accelerated cycles are calculated. In this way, the load spectrum of the loading condition of the drive axle is prepared to reflect loading condition of the loader. The load spectrum can provide reference for fatigue life test and life prediction of loader drive axle.

Keywords : load spectrum, axle, torque, rain-flow counting method, extrapolation

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