

Failure Indication and Monitoring of Spur Gearbox Using Vibration Analysis and Data Acquisition System

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Abstract: Gears are a critical element in a variety of industrial applications such as machine tools and gearboxes. An unexpected failure of the gear may cause significant economic losses. For that reason, fault diagnosis in gears has been the subject of intensive research. Vibration analysis has been used as a predictive maintenance procedure and as a support for machinery maintenance decisions. As a general rule, machines do not break down or fail without some form of warning, which is indicated by an increased vibration level. By measuring and analyzing the machine's vibration, it is possible to determine both the nature and severity of the defect, and hence predict the machine's failure. The vibration signal of a gearbox carries the signature of the fault in the gears, and early fault detection of the gearbox is possible by analyzing the vibration signal using different signal processing techniques. This paper presents analysis of vibration in gears using modal analysis and FFT analysis. It also presents analysis of gears with cracks and gear with missing teeth. It also presents the analysis of Natural frequency in steady as well as running condition.

Keywords: Gears, Gearboxes, Vibration Analysis, FFT Analysis, etc.

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