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Frequency Domain Technique for Characterizing Spur Gears Defect Pattern

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**Abstract:**

This paper presents information of detecting the gear using frequency domain technique in vibration analysis. In this study, vibration signal is very crucial in determining signal from defective gear. The quality of the signal displayed in the frequency spectrum are depends on the number of sampling frequency taken into account during acquiring the data. Insufficient number of samples may acquire poor signal in contrast with sufficient number of samples. The objective of this research emphasizes the various frequency resolution and centroid shifting frequency location to characterize the normal and defective gear. The development of test rig with a constant speed of 1493 RPM is designed and consist of simple pinion and gear. The DAQ (NI) with algorithm block diagram developed using LabVIEW is used to acquire the frequency domain data. It is found that by varying the number of samples will affect the resolution of the signal and subsequently tune the shifting centroid of frequency. By calculating the centroid shifting frequency have indicate that the amplitude of normal gear is 0.0128g, defect gear (broken tooth) is 0.052 g and defect gear (broken tooth 90°) is 0.0938g. The amplitude of normal gear, defect gear (broken tooth) and defect gear (broken tooth 90°) are located at frequency 745.829Hz, 746.757Hz and 746.2Hz respectively.