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VIBRATION SIGNAL MODEL FOR ROLLING BEARING FAULT DIAGNOSIS

Abstract

Bearings are an important part of various types of rotor machinery, and they play a vital role in connecting the rotor and the support. In rotating machinery, the failure rate of bearings reaches seventy percent. To ensure the normal operation of mechanical parts, the detection of bearing failures is extremely important. A thorough understanding of the frequency characteristics of bearing vibration signals is conducive to the diagnosis of bearing faults. Innovatively analogous bearings to planetary gears, considering the amplitude and frequency modulation effects of periodic time-varying operating conditions and establishing a fault diagnosis signal model similar to planetary gears. The calculation formula of bearing fault characteristic frequency is derived by analogy planetary gear system. The theoretical derivations are validated using both experimental and industrial signals. According to the theoretical basis, it provides a new idea for understanding the characteristics of the fault frequency of the bearing.