

# Fault diagnosis of mud pump bearings

The mud pump is an important equipment in the drilling engineering. Its function is to input the high pressure mud used to carry the cuttings during drilling. During the drilling process, it is necessary to ensure that the high-pressure mud is pumped smoothly and continuously, otherwise the high-pressure mud will cause the collapse of the well, resulting in the disposal of construction sites and great economic losses. Therefore, [mud pump bearing](#) is very important to master the working condition of the mud pump in real time for the normal operation of the drilling engineering. From the structure, the mud pump is mainly composed of two parts: the hydraulic end and the power end.

The crank-link mechanism of the power end drives the piston movement of the hydraulic end, and the reciprocating motion of the piston changes the pressure in the cylinder sleeve, so that the suction valve and the discharge valve generate a switch to suck the mud from the suction valve, and the pump is pressurized and sent from the discharge line. The function to the bottom of the well. The so-called resonance demodulation technology (or shock pulse technology, envelope detection technology or early fault detection (IPD technology)) is an envelope detection and low-pass filtering or demodulation of a high-frequency common waveform excited by low-frequency shock. A resonance demodulated wave that is amplified and broadened corresponding to the low frequency impact.

[HongKong Baisite Bearing Co., Ltd](#) Traditional techniques only attempt to obtain the spectrum of the shock pulse from the FFT analysis of the direct signal, often because the target spectrum is always obscured by the strong interference spectrum (usually large low-frequency components). Moreover, capturing the shock pulse requires a very high sampling frequency because the shock wave is very narrow and the frequency is high, which is often impossible due to hardware reasons. From the current application point of view, there are two ways to achieve resonance demodulation: one is to process the signal obtained by the sensor through the hardware circuit to obtain the resonance demodulation wave; the other is through software or some algorithm (the Erbert envelope method or another envelope method) is obtained by processing the sensor signal to obtain a resonant demodulation wave. Resonance demodulation technology is widely used in signal processing with impact properties.

Simple diagnosis and precise diagnosis can be performed by analyzing the demodulated wave. Condition monitoring and fault diagnosis of bearings and gears is an important aspect of their application. Due to the high power of the mud pump, the switching frequency of the pump valve is relatively low, and the strong low-frequency vibration wave generated by the pump valve switch will interfere with the vibration generated by the internal bearing of the body. The general signal processing method can not effectively extract the information of the fault signal from the interfered signal, and the resonance demodulation of the signal can effectively solve this problem.