Diagnosing Common Faults in Journal Bearings

Diagnosing common faults in journal bearings is of paramount importance for engineers and maintenance professionals to ensure the continued reliability and optimal operation of machinery.

Recognizing the early signs of bearing faults enables timely interventions, preventing catastrophic failures, costly repairs, and extended downtime. Here are the warning signs the experts at Machinery Diagnostics Institute (MDI) look for in detecting these common faults:

Diagnosing Preloads

In diagnosing preloads that may be caused by gravity, fluidic forces, seals, misalignment, and effects of pipe strain on machine, warning signs include:

- Orbit that shows a high eccentricity
- Highly elliptical 1x orbits

Diagnosing Unbalance

Orbit will retain the elliptical shape and tends to be circular.

Diagnosing Misalignment

Orbit will be flatter in shape. The ratio will be greater than 5:1.

Diagnosing Oil Whirl

In the Spectrum Analysis of Oil Whirl, there will be a peak in the range of approximately 0.28x to 0.48x. The height of the peak can become quite high.

Orbit Analysis of Oil Whirl

Oil Whirl generates a characteristic source of vibration in the range of approximately 0.38x to 0.48x. Because it is lower than 0.5x, we will witness two dots in the live orbit.

Diagnosing Shaft Rubs

Oil Whip occurs when the speed of the machine is over twice the critical speed; therefore, the critical speed is close to the oil whirl frequency. The 1x peak may be more than two times the resonant frequency.

Diagnosing Shaft Rub

The Spectrum Analysis of Shaft Rubs may show:

- A large number of 1x harmonics
- Sub-order peaks and harmonics (e.g. 1/2x, 1/4x, etc.)
- The noise floor may lift

The Orbit Analysis of Shaft Rubs may show that the direct orbit will have multiple loops

CTC's PRO Line Proximity Probes (also known as Eddy Current Probes) are the industry's most durable and reliable probes, drivers, and extension cables for measuring shaft position (displacement), vibration, and speed/ phase on your most critical industrial machinery. PRO Line Proximity Probes are a reliable solution for detecting all the common faults in the article and are fully compatible with all major condition monitoring and machine control systems.

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