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GASTOPS CAN HELP PREVENT BEARING FAILURES

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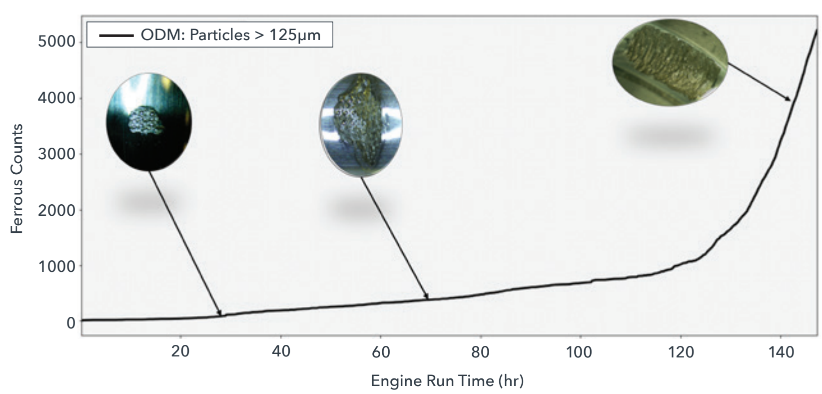
The bearing serves as a core component of rotating equipment, and its failure can have severe consequences for the entire engine.

Bearing damage manifests due to various factors, ranging from oil debris contamination, misalignment, and environmental shocks, all of which can culminate in its failure. Given the pivotal role bearings play in machinery, such failures can result in **costly unplanned downtime, unscheduled maintenance, secondary damage to adjacent components, and substantial repair expenses**.

Nevertheless, there is a silver lining – bearing health monitoring programs can detect these failures well before they become critical. These indicators serve as invaluable clues, enabling you to pinpoint the underlying cause, prescribe corrective actions, and deploy preventive measures to avert future occurrences. Condition-based maintenance programs, leveraging online wear debris monitoring tools such as Gastops **MetalSCAN**, streamline the bearing maintenance process through diagnostic and prognostic modeling of their degradation and failures.

One of the most common bearing failure modes is rolling contact fatigue, known as spalling. In this process, surface damage propagates along the raceway, leading to a decline in bearing performance and, ultimately, the potential for catastrophic seizure.

ODM and Visual Inspection of Spall Growth Evolution Through Single Test



Numerous studies have delved into the origins of spalling, exploring factors such as lubrication effects, contamination, environmental influences, and subsurface crack migration. However, there remains a significant gap in understanding the progression of spalling from its initial stages to the point where maintenance intervention becomes necessary, often occurring thousands of hours later.

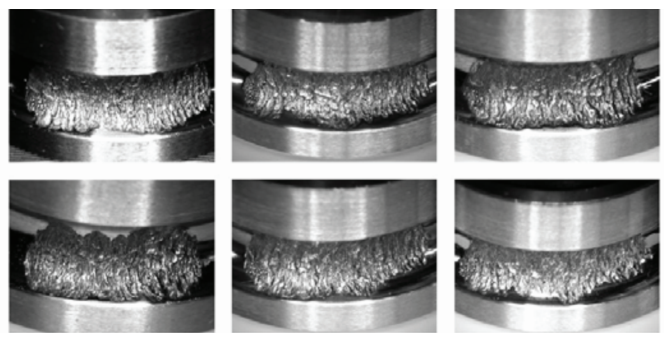
The Bearing Test Rig at Gastops research facilities in Ottawa is dedicated to investigating and comprehending the bearing degradation process and its underlying physics, spanning from the initiation of spalling to advanced stages where bearing seizure becomes imminent. This facility utilizes a combination of continuous monitoring data, periodic inspections, and analysis of oil samples and filters to develop diagnostic and prognostic models for the growth of spalls in rolling element bearings.

Explore our case studies for more information:

Senvion MM92 2MW Wind Turbine Case Study   GE LM6000-1B Bearing Failure Case Study

Translating laboratory-level research into field applications is particularly challenging for rolling element bearings, which can vary widely in raceway materials, roller materials, mission load profiles, rotational speeds, lubrication conditions, geometries, and bearing types. To bridge these knowledge gaps, extensive testing is essential to develop scaling tools. This ensures that diagnostic and prognostic models can be effectively extended to bearings in diverse applications, ranging from wind turbine gearboxes to aircraft gas turbines and beyond.

Subset of Bearing Spall Test Final Damage Levels



To address this challenge, the research team at Gastops is dedicated to building an extensive test database. They conduct tests on bearings of various types, materials, and loading conditions, from spall initiation to failure necessitating immediate maintenance action.

Leveraging our expertise in bearings and practical experience, we are committed to addressing your bearing concerns quickly and efficiently while keeping costs to a minimum.

Contact us at sales@gastops.com to discover more about Gastops tailored services and solutions for bearing failure.

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