

Maintenance Guidelines for Gears and Enclosed Gearsets

Mechanical gears and enclosed gearsets are key components of many production machines and industrial equipment. This equipment often runs without trouble for extended periods, which can result in necessary recommended preventative maintenance activities being overlooked or significantly delayed.

Periodic maintenance, inspection and testing can help keep this equipment operating at optimal levels and help reduce the potential for costly equipment breakdowns. Our Boiler & Machinery Division has developed maintenance guidelines based on industry-accepted standards and many years of experience working with our clients to investigate equipment breakdowns.

Recommended Protective Devices and Features

- Oil sump level monitor
- Low oil pressure shutdown on units with forced oil circulation
- Oil temperature monitor on units with forced oil circulation
- Emergency oil supply such as a gravity tank or emergency pump for units with forced oil circulation
- Oil high differential temperature alarm on high speed units (>3,000 RPM) with forced oil circulation
- Bearing vibration monitoring on high speed units (>3,000 RPM)

Preventative Maintenance Guidelines:

Preventative maintenance should include the following weekly, monthly, quarterly and annual activities, per the manufacturer's recommended guidelines, actions and benchmarks:

Weekly

- Inspect lubrication system (pumps, filters, piping and valves) for proper operation
- Observe and record bearing temperatures
- Visually check the foundation and gear case for problems, such as wear, cracking or foreign materials

Monthly

- Vibration analysis on high speed gearsets (>3,000 RPM)
- Oil sampling for rolling mill, cement mill or high speed gearsets. These oil samples should include:
 - > Oil condition, including total acid number
 - > Metallic elements analysis
 - > Ferrography

Quarterly

- Oil sampling for critical general industry gearsets. These oil samples should include:
 - > Oil condition, including total acid number
 - > Metallic elements analysis
 - > Ferrography

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Annually

- Calibration of monitoring and protective devices
- External inspection, including:
 - > Foundations, grout, bolting and shims, for deterioration or loosening.
 - > Alignment with connected machines
 - > Couplings
- Internal gearbox inspection should include the following activities:
 - > Gear casing integrity check for distortion, cracks and leaks
 - > Gear shaft parallelism
 - > Measure gear backlash
 - > Gear wear patterns, with photographic record using dyes, if necessary, to check for:
 - Gear misalignment
 - Gear over loading
 - Gear tooth damage, including foreign object damage
 - Cracking, spalling, excessive wear, pitting or scoring



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