

Powertrain analysis



This service monitors transmission, differential and final drive oils for premature wear, contamination and oil condition

Description

Powertrain analysis helps detect gear or transmission problems and lubricant contamination before they can result in costly downtime or repairs. The analysis is applicable to transmission, differential or final drive (gear) components in all types of mobile equipment, and includes testing to help you ensure long equipment life and optimal performance.

Potential benefits

	Improved equipment reliability by identifying potential failures before they occur
	Increased productivity through reduction of unscheduled downtime
	Reduced parts replacement and labor costs
	Minimized lubricant consumption and disposal with optimized drain interval

Analysis options — Powertrain

	Essential ◆	Enhanced ◆◆	Elite ◆◆◆
Metals	✓	✓	✓
Nitration			✓
Oxidation	✓★	✓★	✓★
Particle Count		✓	✓
Particle Quantifier (PQ) Index		✓	✓
Total Acid Number (TAN)	★	★	★
Viscosity* at 40°C or 100°C	✓	✓	
Viscosity at 40°C and 100°C			✓
Viscosity Index			✓
Water Vol % Karl Fischer	✓	✓	✓

Key: ✓ Included test

★ TAN in lieu of oxidation for select synthetic products

*Viscosity reported at 40°C or 100°C, based on oil type or service level. Analysis may vary by laboratory, product supplied or oil condition.

Sample frequency

Sample at OEM recommended frequency or, for general guidance, begin with:

- Off-highway transmission: **500 hours**
- Off-highway final drive: **1,000 hours**
- On-highway transmission: **500 hours, 40,000 km or 25,000 miles**

Adjust frequency based on asset's economic impact, operating environment, machine age, oil age or sample results trend.

MobilSM Lubricant Analysis —

Powertrain analysis

Test	Purpose	Importance of test
Metals	To determine the presence and levels of metallic content in the oil, including contaminants and wear particles	The level of wear metals helps determine if equipment components are wearing or if harmful contamination has entered the oil. The level of metals that are part of the additive chemistry are also reported
Nitration	To measure the amount of nitrogen by-products in the oil	Nitration results from the rapid compression of entrained air. As a result, if unchecked, nitrogen and oxidation precursors might form sticky varnishes.
Oxidation	To determine the level of lubricant oxidation and deterioration	Oxidation can mean: <ul style="list-style-type: none"> • Increased wear and corrosion • Shorter equipment life • Increased viscosity • Excessive deposits and plugging
Particle Count Analysis	To measure the level of particulate contaminants in the oil	<ul style="list-style-type: none"> • Cleanliness is a critical factor in the running of turbine oil systems • Debris can interfere in the fine tolerances of the system's pumps and valves or cause premature bearing wear
Particle Quantifier (PQ) Index	To determine ferrous metal fatigue failures and metal-to-metal contact not usually detectable with some spectrographic analysis	PQ Index can detect at an early stage: <ul style="list-style-type: none"> • Anti-friction bearing wear • Plain bearing wear • Gear wear
Total Acid Number (TAN)	To measure acidic oil oxidation by-products	An elevated Total Acid Number may indicate increased oil acidity resulting from increased oil oxidation
Total Base Number (TBN)	To determine the reserve alkalinity of the oil used to neutralize the formation of acids	A decrease in Total Base Number may be indicative of: <ul style="list-style-type: none"> • Oil degradation caused by rapid acid formation due to changing fuel characteristics or a high rate of oil oxidation • Decreased acid-neutralizing reserve
Viscosity	To determine the oil's resistance to flow	<ul style="list-style-type: none"> • An increase in viscosity may be due to high insoluble content, water contamination, or admixture with higher viscosity fuel or lubricant • A decrease in viscosity may be due to water contamination, or admixture with lower viscosity fuel or lubricant • Both high or low viscosity may result in premature equipment wear
Viscosity Index	To measure the change of viscosity with temperature	Higher VI demonstrates wider operating range. Monitor for cross contamination. Monitor for viscosity shear.
Water	To detect presence of water contamination	Water contamination may cause severe corrosion and subsequent wear, poor oil film thickness or hydrogen embrittlement

MobilSM Lubricant Analysis

When your sample is processed, the laboratory handles each bottle as a unique and important item. Each sample is coded, labeled and tracked through the entire process. By the time test results are available, your equipment sample has directly benefitted from our knowledge of MobilTM lubricants, decades of OEM relationships and a strong heritage of hands-on application expertise. Sample comments are provided, as required, to help identify potential problems, list possible causes and recommend actions for follow-up.



By helping you enhance equipment life and reliability — which minimizes maintenance costs and downtime — our expert services can help you achieve your safety, environmental care and productivity goals.