

# Powertrain analysis



Energy lives here

► 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



Reduced 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	✓	✓	✓

### 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.

# Mobil Serv<sup>SM</sup> Lubricant Analysis – Powertrain analysis

Test	Purpose	Importance of test
<b>Metals</b>	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 is also reported
<b>Nitration</b>	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.
<b>Oxidation</b>	To determine the level of lubricant oxidation and deterioration	Oxidation can mean: <ul style="list-style-type: none"> <li>▪ Increased wear and corrosion</li> <li>▪ Shorter equipment life</li> <li>▪ Increased viscosity</li> <li>▪ Excessive deposits and plugging</li> </ul>
<b>Particle Count Analysis</b>	To measure the level of particulate contaminants in the oil	<ul style="list-style-type: none"> <li>▪ Cleanliness is a critical factor in system performance</li> <li>▪ Debris can interfere in maintaining an adequate oil film throughout the system and can cause premature wear on gear teeth and other lubricated surfaces</li> </ul>
<b>Particle Quantifier (PQ) Index</b>	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"> <li>▪ Anti-friction bearing wear</li> <li>▪ Plain bearing wear</li> <li>▪ Gear wear</li> </ul>
<b>Total Acid Number (TAN)</b>	To measure acidic oil oxidation by-products	An elevated Total Acid Number may indicate increased oil acidity resulting from increased oil oxidation
<b>Viscosity</b>	To determine the oil's resistance to flow	<ul style="list-style-type: none"> <li>▪ An increase in viscosity may be due to high insoluble content, water contamination, or admixture with higher viscosity fuel or lubricant</li> <li>▪ A decrease in viscosity may be due to water contamination, or admixture with lower viscosity fuel or lubricant</li> <li>▪ Both high or low viscosity may result in premature equipment wear</li> </ul>
<b>Viscosity Index</b>	To measure the change of viscosity with temperature	Higher VI demonstrates wider operating range. Monitor for cross contamination. Monitor for viscosity shear.
<b>Water</b>	To detect presence of water contamination	Water contamination may cause severe corrosion and subsequent wear, poor oil film thickness or hydrogen embrittlement

## Mobil Serv<sup>SM</sup> 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 Mobil<sup>TM</sup> 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.

