Mobil Serv℠
Lubricant Analysis

Engine analysis

Energy lives here™

This service monitors engine and lubricant conditions to detect premature wear and contamination

Description

Monitoring engine and lubricant conditions helps you detect problems and contamination before they result in excessive wear and failure. This analysis is applicable to spark or compression engines in virtually all types of mobile and stationary equipment, and helps to support an Optimized Drain Interval (ODI) program.

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 — Engine

	Essential ◆	Enhanced ◆◆	Elite ◆◆◆
Coolant Indicator	✓	✓	✓
Fuel Dilution	C	C	✓
Metals	✓	✓	✓
Nitration			✓
Oxidation	✓ ★	✓ ★	✓ ★
Particle Quantifier (PQ) Index		✓	✓
Soot	✓	✓	✓
Total Acid Number (TAN)	★	★	★
Total Base Number (TBN)		✓	✓
Viscosity* at 40°C or 100°C	✓	✓	
Viscosity at 40°C and 100°C			✓
Viscosity Index			✓
Water Vol % Fourier transform infrared spectroscopy (FTIR)	✓	✓	✓

Key

- ✓ Included test
- ★ TAN in lieu of oxidation for select synthetic products
- C Conditional test

*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 diesel engine: **250 hours**
- On-highway diesel engine: **25,000 km or 15,000 miles**

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

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Test	Purpose	Importance of test
Coolant Indicator	To determine the level of sodium, potassium and boron in the engine oil	Indicative of a coolant leak into the engine via a worn head gasket, cracked block or head
Fuel Dilution	To measure the amount of unburned fuel that goes to the crankcase	The presence of fuel in the crankcase reduces oil viscosity and weakens detergency. Excessive amounts may indicate potential mechanical problems
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 is 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, which may lead to valve sticking.
Oxidation	To determine the level of lubricant oxidation and deterioration	Oxidation can mean: ▪ Increased wear and corrosion ▪ Shorter equipment life ▪ Increased viscosity ▪ Excessive deposits and plugging
Particle Quantifier (PQ) Index	To determine ferrous metal fatigue failures and metal-to-metal contact not usually detectable with current spectrographic analysis	PQ Index can detect at an early stage: ▪ Anti-friction bearing wear ▪ Plain bearing wear ▪ Early indications of piston scuffing ▪ Gear wear
Soot	To determine the soot content in an oil by percentage weight	Excessive soot contamination may mean: ▪ Decreased engine performance ▪ Reduced fuel economy ▪ Excessive deposits and sludge ▪ Shorter oil life ▪ High blow-by
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: ▪ 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	▪ An increase in viscosity may be due to high soot or 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

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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™ 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.