Lubricants Testing Services

AGAT Laboratories

Diesel Engine

Equipment Reliability and Lubricants Testing Services

Diesel engines require high quality lubricants with base numbers that reflect effective additive packages depending upon the engines use in transportation, heavy equipment, locomotive or marine use. These base numbers may range from as low as 8 to as high as 15 for some marine engines and this depends upon the particular application or operating condition.

Viscosity is an extremely important physical property of diesel engine lubricants and severe viscosity changes can potentially damage a diesel engine. In general a working viscosity operating range is +20% to -10% (or not more than a 20% increase in oil “thickening” over the specified viscosity and not less than 10% in oil ”thinning” of the specified grade).

Severe decreases in viscosity of multi-grade diesel engine lubricants may be due to a condition called “shear instability” whereby the viscosity index improvers may become ineffective. These decreases will appear as reduced viscosity levels at 100 degrees, while the levels may be normal at 40 degrees.

A lubricant testing program that should be part of a regularly scheduled condition based monitoring program for diesel engines should include the following:

- Kinematic Viscosity
- Spectrographic Analysis, including wear metals, additives and contaminants
- Water and Glycol Contamination
- Base Number
- Oxidation/Carboxylate/Sulphation/Soot Percentage by FTIR
- Recommended Lubricant Testing Package 30-401

A Note on Diesel Engine Operating Conditions

Operating conditions that will affect the efficiency of diesel engines, include excessive idling, soot loading caused by incomplete combustion, ineffective filtration and over extended oil drain intervals. Over extended oil drains will reduce the effective base number and increase combustion by-products such as carboxylic acids.