

Volvo T-13 Engine Oil Oxidation Test (ASTM 8048)

The Volvo T-13 test was a newly developed test for the CK and FA-4 oil categories, pushing the boundaries of oxidation stability to allow for extended drain intervals and improved bearing protection. SwRI was one of the early development labs for the test and has extensive experience with the method.

Specifications

- API CK-4 and FA-4, Volvo VDS 4.5

Objective

- This test method was developed to evaluate a lubricant's performance to protect against oil oxidation and resulting bearing corrosion.

Field Service Simulated

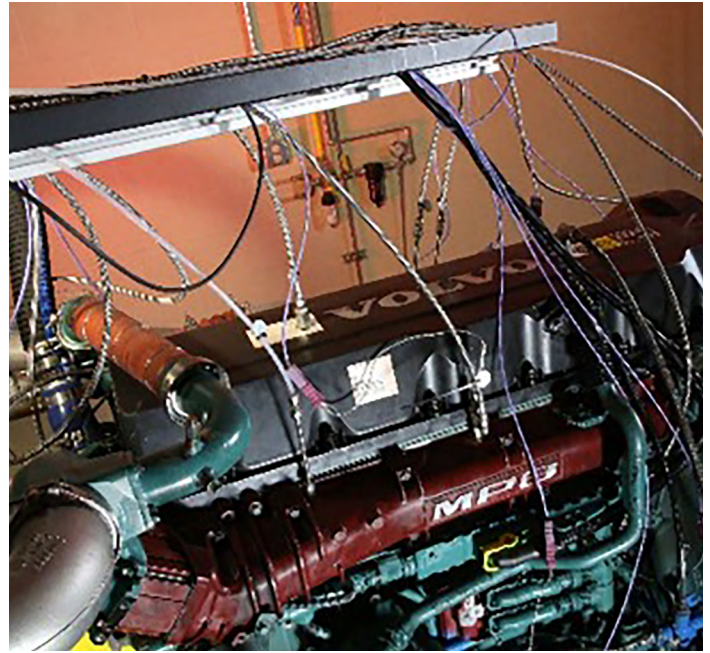
- High-temperature operation of a heavy-duty, turbocharged and intercooled diesel engine running on ultra-low sulfur diesel fuel.

Test Fixture

- Modified Mack MP8 diesel engine with a unit injector fuel system. The test equipment is modified to control oil, coolant, fuel, and intake air temperatures along with engine speed and load.

Test Parameters

- Oxidation peak height as measured by the Mack T12 Oxidation Method
- Increase in kinematic viscosity at 40°C (KV40) from 300 to 360 hours of operation
- Oil consumption average between 48 and 192 hours



Test Parts Evaluation

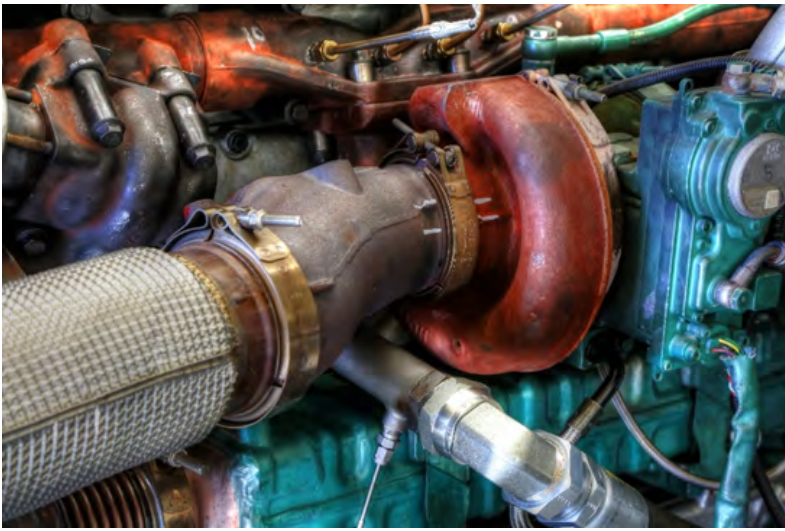
- Measurements taken and reported for bearings, rings, and liners

Used Lubricant Analysis

- Viscosity @ 100°C (ASTM D445)
- Viscosity @ 40°C (ASTM D445)
- TAN (ASTM D664)
- TBN (ASTM D4739)
- Wear Metals (ASTM D5185)
- Oxidation by FTIR
- Soot by TGA

Pass/Fail Criteria

- 360 hour Oxidation Peak Height of 125 abs/cm
- 300-360 Hour KV40 Increase of less than 75%



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