Mack T11 Engine Test

(ASTM D7156)

Specifications

- Mack EO-N Premium Plus
- Mack EO-N Premium Plus 03
- API CI-4 Plus
- API CJ-4
- EO-O Premium Plus

Objective

- Evaluate the viscosity increase and soot concentration (loading) performance of an engine lubricant in turbocharged, intercooled diesel engines equipped with exhaust gas recirculation (EGR) systems.

Field Service Simulated

- High-soot loading applications, such as stop-and-go operation of heavy-duty engines equipped with EGR systems.

Test Fixture

- 12 L Mack E-Tech V-MAC III with electronically controlled fuel injection, six electronic unit pumps, 2002 low-swirl cylinder heads, and cooled EGR.
- The engine is an open-chamber, in-line, six-cylinder, turbocharged, air-cooled compression ignition engine. The bore and stroke are 124 mm x 165 mm.

Test Parameters

- The test engine is operated for 252 hours using 500 ppm sulfur diesel fuel with the following controlled parameters:
- Engine speed
- Fuel flow rate
- Intake air temperature
- Intake air CO_2 concentration
- Intake manifold temperature
- Oil gallery temperature

Test Parts Evaluation

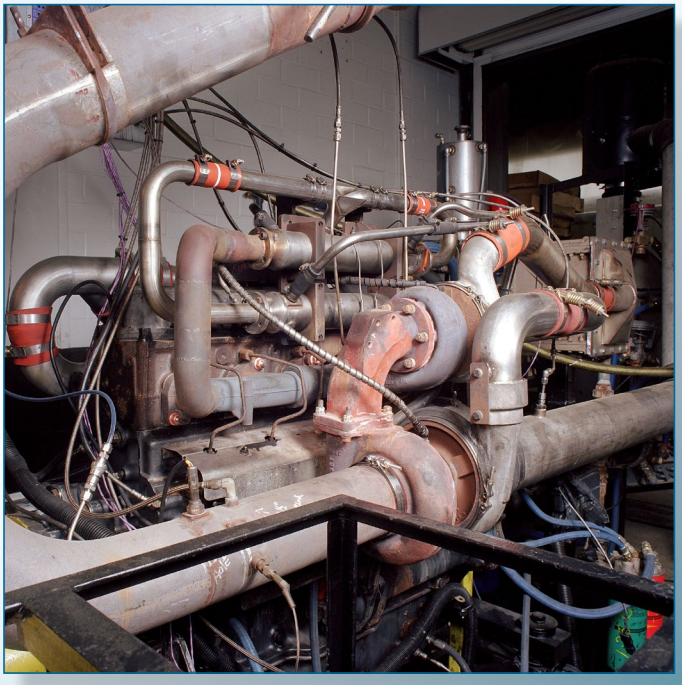
- Oil filter plugging is examined at the end of the test. Oil samples are taken every 12 hours and analyzed for soot content and viscosity.

Used Lubricant Analysis

- Viscosity @ 100°C (ASTM D445)
- Viscosity by MRV (ASTM D6896)
- TAN (ASTM D664)
- TBN (ASTM D4739)
- Fuel dilution (ASTM D3524 modified)
- Shear stability (ASTM D7109)
- Wear metals (ASTM D5185)
- Soot by TGA

Pass/Fail Criteria

Parameter	Pass Limit
4 cSt viscosity increase, % soot	3.5
12 cSt viscosity increase, % sott	6.0
15 cSt viscosity increase, % soot	6.7
180-hr used oil viscosity by MRV, cP	<25,000



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We welcome your inquiries.

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