

## Mack T12 Engine Test

(ASTM D7422)

### Specifications

- API CJ-4
- Mack EO-O Premium Plus

### Objective

- Evaluate the wear performance of an engine lubricant in turbocharged intercooled diesel engines equipped with exhaust gas recirculation (EGR) and operating on ultra-low sulfur diesel fuel.

### Field Service Simulated

- Heavy-duty, on-highway turbocharged and intercooled diesel engines equipped with EGR systems.

### Test Fixture

- Modified Mack E7 E-Tech rated at 343 kW and 1800 rpm, with EGR and 2002 low-swirl with combustion system.

### Test Parameters

- The test engine is operated for 300 hours using 15 ppm sulfur diesel fuel.
- The first 100 hours are conducted at rated speed and power to generate soot.
- The final 200 hours are conducted at peak torque speed while over-fueling to maximize wear rates on the piston rings and cylinder liner.

### Test Parts Evaluation

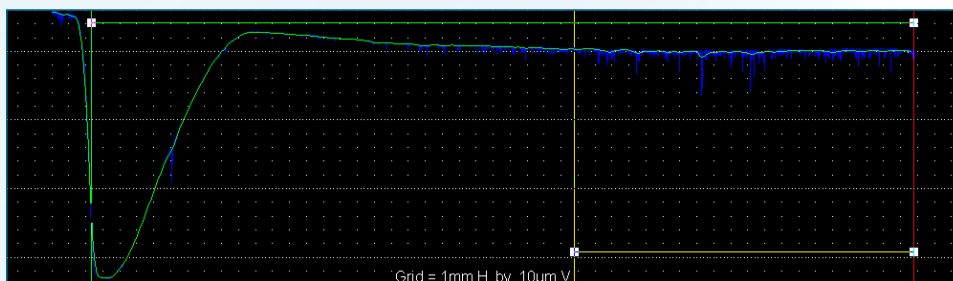
- Piston ring wear
- Cylinder liner wear
- Lead bearing corrosion
- Lubricant consumption
- Lubricant oxidation

### Used Lubricant Analysis

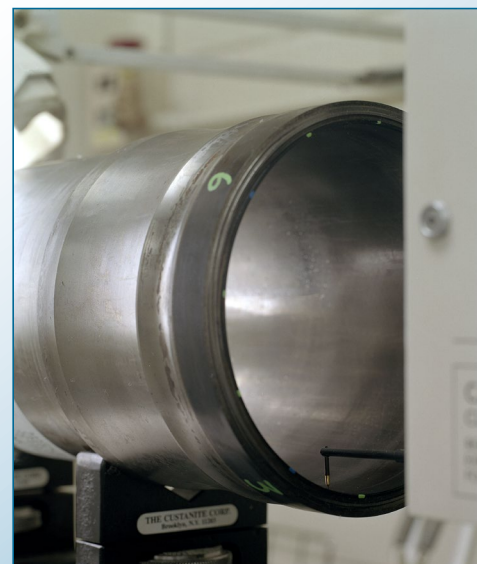
- Viscosity @ 100°C (ASTM D445)
- Viscosity by MRV (ASTM D6896)
- TAN (ASTM D664)
- TBN (ASTM D4739)
- Wear metals (ASTM D5185)
- Oxidation by FTIR
- Soot by TGA

### Pass/Fail Criteria

Parameter	Result Anchor	Result Limit	Anchor Merit	Max Merit
Oil Consumption	65	85	150	300
Top Ring Weight Loss	70	105	200	400
Cylinder Liner Wear Step	24	20	250	500
Delta Lead, 0–300	25	35	200	400
Delta Lead, 250–300	10	15	200	400
API CJ-4 Minimum	1000 Merits			
EO-O+ Minimum	1300 Merits			

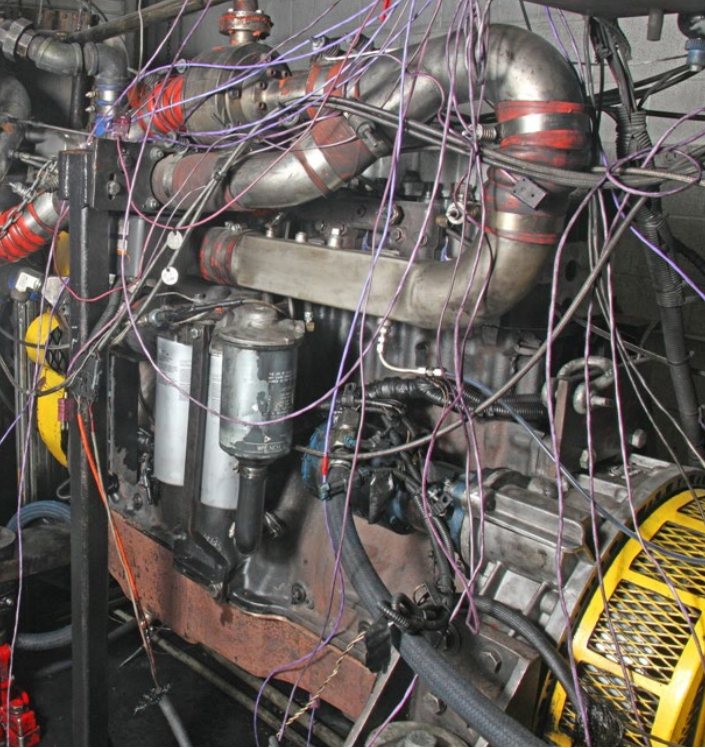


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◆ We welcome your inquiries.

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