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Fuels and Lubricants Research Division

Caterpillar C13 Engine Test (ASTM D7549)

Specifications

- API CJ-4, CK-4 & FA-4

Objective

- Evaluate the performance of a crankcase lubricant with regard to piston deposits and lubricant consumption under accelerated conditions.

Field Service Simulated

- Heavy-duty operating conditions selected to accelerate deposit formation in a turbocharged, intercooled diesel engine equipped with a combustion system that minimizes federally controlled exhaust gas emissions and operates on fuel containing nominally 15 ppm sulfur.

Test Fixture

- In-line, six-cylinder Caterpillar C13 engine with one-piece steel pistons, dual-stage turbocharging and ACERT technology.
- This engine does not use cooled, recirculated exhaust gas (EGR) in the same manner as other competing engines of this class.

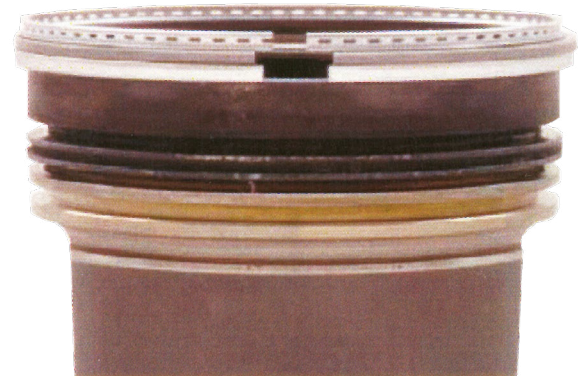
Test Parameters

Test duration, hr	500
Engine speed, rpm	1800
Fuel flow, g/min	1200
Intake manifold temp, °C	40
Coolant-out temp, °C	88
Fuel-in temp, °C	40
Oil gallery temp, °C	98
Inlet manifold pressure, kPa	280

Test Parts Evaluation

- Liner
- Piston
- Top ring
- 2nd ring
- Oil ring

PASS



FAIL

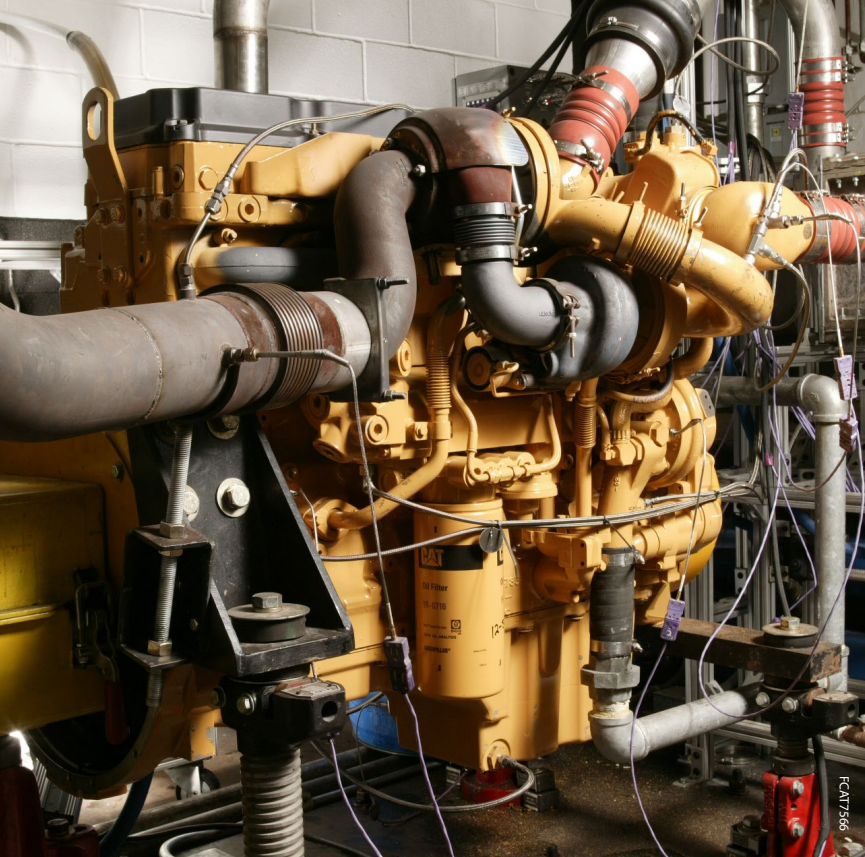


Used Lubricant Analysis

- Viscosity (ASTM D445)
- TAN (ASTM D664)
- TBN (ASTM D4739)
- Wear metals (ASTM D5185)
- Fuel dilution (ASTM D3524)
- Soot by TGA

Pass/Fail Criteria

Parameter	Max	Merit Wt	Anchor	Min
Delta O/C	31	300	25	10
ATLC	35	300	30	15
ATGC	53	300	46	30
R2TCA	33	100	22	5
Merits	1000			



We welcome your inquiries.
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