

# Caterpillar 1N Engine Test

(ASTM D6750)

## Specifications

- API CJ-4

## Objective

Evaluate the performance of a crankcase lubricant for:

- Piston deposits
- Ring sticking
- Piston scuffing
- Ring scuffing
- Liner scuffing
- Lubricant consumption

## Field Service Simulated

- Piston deposit formation in direct-injection, diesel engines calibrated to meet 1994 U.S. federal exhaust emission requirements for heavy-duty engines operated on fuel containing less than 500 ppm sulfur.

## Test Fixture

- 2.44 L Caterpillar 1Y540 single-cylinder, direct-injection diesel engine with a four-valve arrangement, 5.4-inch bore, 6.5-inch stroke, 14:5:1 compression ratio, keystone top ring and rectangular second ring.

## Test Parameters

Test duration, hr	252
Engine speed, rpm	2100
Power, kW (hp)	52.2 (70)
BMEP, MPa (psi)	12.41 (1800)
Fuel input, kW (Btu/min)	140.5 (7990)
Air/fuel ratio	29:1
Coolant-out temp, °C	107
Inlet air temp, °C	127
Inlet air pressure, kPa	240
Inlet air specific humidity, grains/lb	125

## Test Parts Evaluation

- Pistons, rings, and liner are evaluated at the end of the test.
- The piston is rated by the Coordinating Research Council (CRC) demerit procedure.

## Used Lubricant Analysis

- Viscosity (ASTM D445)
- Total base number (ASTM D4739)
- Wear metals (ASTM D5185)
- Fuel dilution (ASTM D3524)



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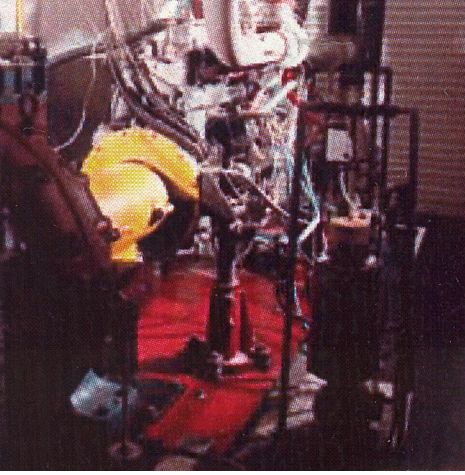


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## Pass/Fail Criteria

Parameter	Pass Limit
Weighted demerits	286.2 / 311.7 / 323.0 maximum
Top groove fill	20 / 23 / 25 maximum
Top land heavy carbon	3 / 4 / 5 maximum
Lubricant consumption	0.5 g/kWh maximum
Piston/ring/liner scuffing	None allowed
Piston ring stick	None allowed





◆ We welcome your inquiries.

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