

# API CJ-4 / Caterpillar 1N

ASTM D 6750 – 252 Hours, Fuel Sulfur 500 ppm

## SPECIFICATIONS

This procedure is approved for API CJ-4.

## OBJECTIVE

This procedure evaluates the performance of crankcase lubricants with 500 ppm sulfur fuel for:

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

## FIELD SERVICE SIMULATED

High-speed, turbocharged, heavy-duty engine service to 1989 is simulated.

## PROCEDURE FIXTURE

A Caterpillar 1Y540 single-cylinder, direct-injection, diesel test engine with a four-valve arrangement having a 5.4-inch bore and a 6.5-inch stroke resulting in a displacement of 148.8 cubic inches is used. The compression ratio is 14.5:1. Keystone top ring and rectangular second ring are used.

## PROCEDURE PARAMETERS

Procedure parameters are: 2100 rpm, 70 bhp, 1800 bmep, 7990 Btu/min fuel input, 200°F coolant temperature, 225°F, 260°F inlet air temp at 71 inches of mercury, 125 grains/lb, 29:1 air/fuel ratio for 252 hours

## CRITICAL PARTS EVALUATED

At the end of the procedure, pistons, rings, and liner are evaluated. The piston is rated by the Coordinating Research Council (CRC) demerit procedure.

## USED OIL ANALYSIS

Lubricant analysis includes:

- Viscosity
- Total base number (TBN)
- Wear metals
- Fuel dilution

## PASS/FAIL CRITERIA

Weighted demerits, max	286.2 / 311.7/323.0
Top groove fill, max	20/23/25
Top land heavy carbon, max	3/4/5
Oil consumption (0-252 hrs) g/kwh,max	0.5
Piston/ring / liner scuffing	None
Piston ring stick	None

