



# API CJ-4 / Mack T11

ASTM D 7146 – 252 Hours, Fuel Sulfur 500 ppm

## SPECIFICATIONS

This procedure is approved for API CJ-4 and Mack EO-O Premium Plus.

## OBJECTIVE

This procedure evaluates the soot handling performance, as measured by viscosity increase, of lubricating oils operating in diesel engines equipped with cooled exhaust gas recirculation.

The evaluation is part of specifications:

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

## FIELD SERVICE SIMULATED

The field service simulated includes:

- Heavy-duty diesel engines
- Stop-and-go operation
- High-soot loading

## PROCEDURE FIXTURE

A Mack E-TECH V-MAC III, electronically controlled fuel injection with six electronic unit pumps, using 2002 low-swirl cylinder heads is used. It is an open-chamber, in-line, six-cylinder, four-stroke, turbocharged, air-cooled compression ignition engine. The bore and stroke are 124 by 165 mm (4-7/8" X 6-1/2"), and the displacement is 12 L (728 in<sup>3</sup>). The engine uses cooled exhaust gas recirculation. A break-in or a pretest oil flush sequence is used unless the engine build life has been exhausted; then the engine is torn down for rebuild.

## PROCEDURE PARAMETERS

Controlled parameters include speed, fuel flow, intake CO<sub>2</sub>, inlet manifold temperature, coolant out temperature, fuel temperature, oil gallery temperature, and intake air temperature.

## CRITICAL PARTS EVALUATED

At the end of the procedure, oil filter plugging is examined. Oil samples are taken every 12 hours and analyzed for soot content and viscosity.

## USED OIL ANALYSIS

Viscosity at 100°, soot, and MRV at -20°C.

## PASS/FAIL CRITERIA

Vis 12 cSts	6.0 TGA Soot Mins
Vis 15 cSts	6.7
Vis 4 cSts	3.5
New oil MRV@-20C	20000 All grades
180-Hr Used MRV	25000, Yield stress <35 D 4684M