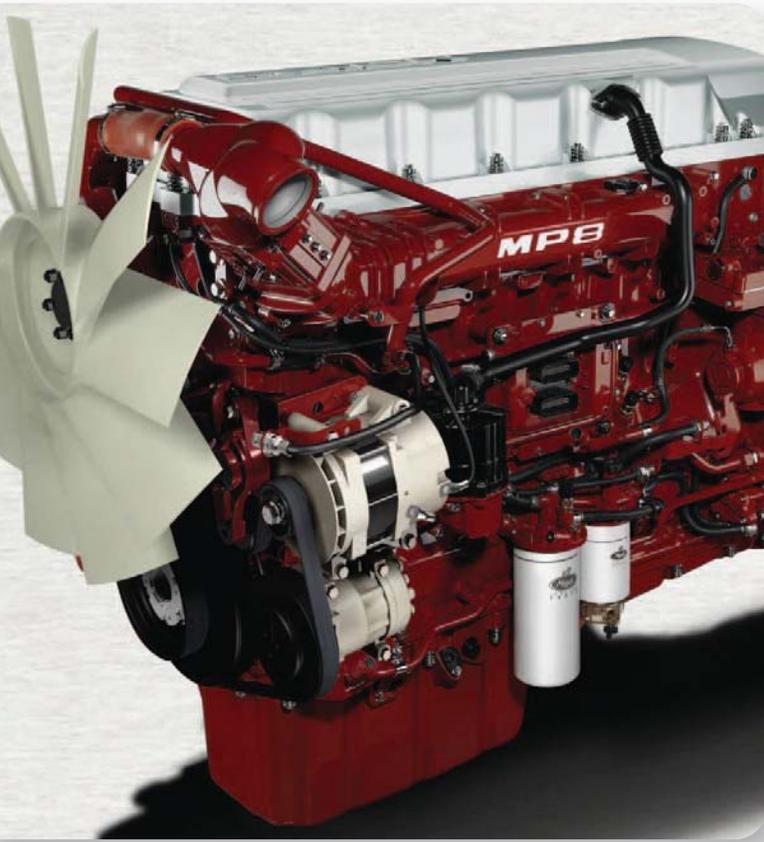


Mack T-13 Engine Lubricant Test (ASTM D8048)



Test Engine

The test uses a 2010 Volvo/Mack D13/MP8, 505BHP, 13L in-line six cylinder diesel engine with electronically controlled fuel injection, with six electronic unit injectors, VGT (variable geometry turbocharger), and cooled EGR (exhaust gas recirculation). The oil filter adapter housing is a modified 2007 housing.

Test Operation

360 hour test at 1500 RPM steady state conditions at a given fuel flow, producing approximately 2200 N·m and 130 DegC oil temperature with 19-20% EGR to evaluate the oxidation stability performance of engine oils at an elevated oil temperature. ULSD (ultra-low sulfur diesel) fuel is used.

Oil Specifications

Mack, Volvo, and Renault:
EOS-4.5, VDS-4.5, & RLD-4

API:
CK-4 and FA-4

Pass/Fail Determination*

Final Test IR Oxidation Peak Height	125 absorbance/cm max.
Viscosity Percent Increase at 40 DegC from 300 hours to 360 hours	75% max.

*As specified by ASTM D4485

For more information,
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Intertek Automotive Research Services
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Engine Test	Mack T-13	
Manufacturer	Volvo Powertrain North America Bore X Stroke, 131.0 mm X 158.0 mm 12.8L, 2010, D13 or MP8 Inline six cylinder Single Piece Steel Monotherm Piston	
Total Piston Height	115.0mm	
Top Crown to Center Pin Bore	76.04mm	
Crownland Configuration	Radial Crownland to liner clearance 0.901mm	
Piston Rings	Type	Groove Widths
Top Ring	Positive Twist Keystone w/ Inside Bevel	3.50mm
Second Ring	Negative Twist Rectangular w/ Inside Bevel	2.66mm
Oil Ring	Rectangular	3.03mm
Land Widths		
Crownland	11.14mm	
Second	3.85mm	
Third	0.95mm	

Parameters	Operating Conditions	Units
Test Duration	360	Hours
Speed	1500	r/min
Torque	2200	Nm
Fuel Flow	68	kg/h
Intake CO ₂	2.01-2.11 range	%
Temperatures		
Intake Manifold	78	DegC
Coolant Out	110	DegC
Intake Air	30	DegC
Fuel In	35	DegC
Oil Gallery	130	DegC
EGR Gas Out	120	DegC
Pressures		
Inlet Air	94	kPaA
Exhaust	115.3	kPaA
Intake Manifold	232 ± 5	kPa
Crankcase	-0.3- 0.3 range	kPa

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