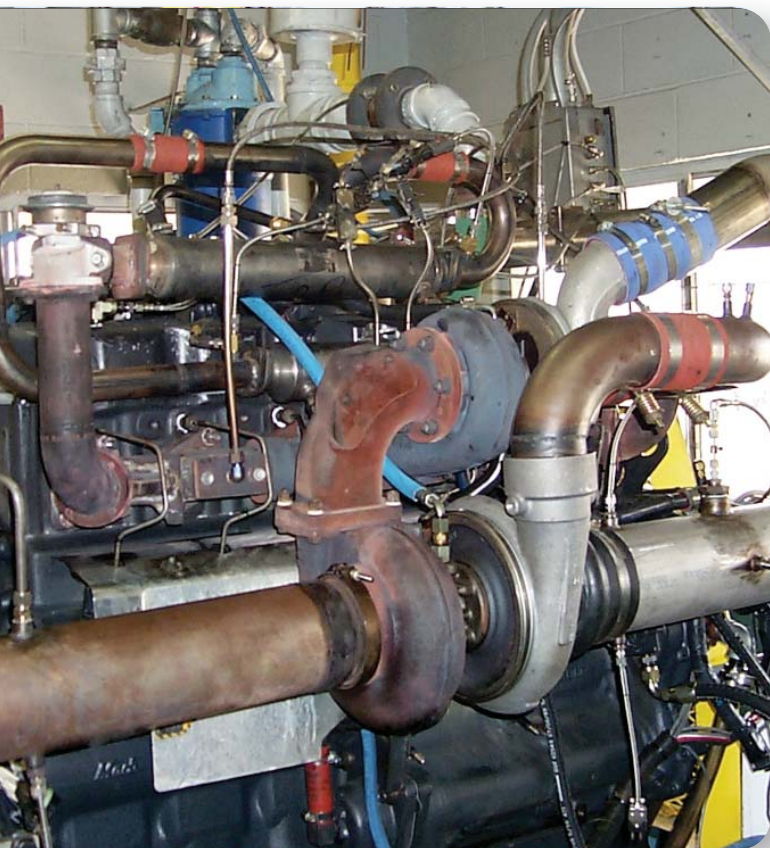


Mack T-11 Engine Lubricant Test (ASTM D7156)



Test Engine

The test uses a Mack E-Tech in-line six cylinder 12L engine with electronically controlled fuel injection, 2002 low-swirl cylinder heads, two modified configured dual fitted turbochargers in series, and cooled EGR.

Test Operation

252 hour test to evaluate the viscosity increase and soot concentration in a turbocharged, intercooled engine equipped with EGR (exhaust gas recirculation). Specified PC-9 HS test fuel is 0.04% mass fuel sulfur is used.

Oil Specifications

Mack, Volvo, Renault:

EO-N, EO-O Premium Plus, VDS-3, VDS-4, VDS-4.5, EOS-4.5, RLD-2, RLD-3, & RLD-4

API:

CI-4 (optional), CI-4 Plus, CJ-4, CK-4, and FA-4

ACEA:

E9

Pass/Fail Determination*

4 cSt viscosity increase minimum at 3.5 % soot
12 cSt viscosity increase minimum at 6.0 % soot (CI-4 Plus Limit)
15 cSt viscosity increase minimum 6.7 % soot

*As specified by ASTM D4485, T-11A - 180 hour oil viscosity by MRV, 25,000 maximum cP, and less than 35 Pa yield stress

**For more information,
please contact:**

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Mack T-11 Engine Lubricant Test (ASTM D7156)



Engine Test	Mack T-11	
Manufacturer	Mack Truck Co. part of Volvo Group Bore X Stroke, 124.0 mm X 165.0 mm 12.0L, 2002 Inline six cylinder Two Piece (Articulated) Steel Piston with Aluminum Skirt	
Total Piston Height	141.80mm	
Top Crown to Center Pin Bore	94.03mm	
Crownland Configuration	Radial Crownland to liner clearance 0.405mm	
Piston Rings	Type	Groove Widths
Top Ring	Keystone	3.12mm
Second Ring	Positive Twist Rectangular w/ Inside Bevel	2.44mm
Oil Ring	Rectangular	4.78mm
Land Widths		
Crownland	9.05mm	
Second	6.86mm	
Third	4.64mm	

Parameters	Operating Conditions		Units
Test Duration	252		Hours
Injection Timing	Variable		BTDC
Speed	1800		r/min
Fuel Flow	53.5		kg/h
Power	~257		kW
Intake CO ₂	1.5 ± 0.05		%
Temperatures			
Intake Manifold	70		DegC
Coolant Out	66		DegC
Intake Air	25		DegC
Fuel In	40		DegC
Oil Gallery	88		DegC
Pressures			
Crankcase	0.5 ± 0.25		kPa
Inlet Air	3.5-4.0 range		kPa
Exhaust	2.7-3.5 range		kPa
Intake Manifold	140 min.		kPa
Oil Filter Delta*	207 max.		kPa

* If the oil Filter delta P exceeds 207 kPa, change the two full flow filters

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