

Cummins ISB Engine Lubricant Test (ASTM D7484)



Test Engine

The test uses a Cummins 2004 ISB engine, VGT (Variable Geometry Turbocharger), and cooled EGR. This in-line six cylinder 5.9L engine equipped with high pressure common fuel rail and electronic injector nozzles.

Test Operation

Operate engine for 350 hours at two test conditions with ULSD (ultra-low sulfur diesel). The first 100 hours at 1600 RPM with retarded injection timing to generate 3.0 – 3.5% soot at 100 hours. The test transitions to 28 second cyclic test conditions for 250 hours to promote and evaluate wear on the camshaft, flat tappets, and crossheads.

Oil Specifications

API: CJ-4, CK-4, and FA-4

Cummins

CES-20081

Pass/Fail Determination*

- Outlier Screened Avg Cam Wear is 55 max.
- Soot Adjusted Avg Tappet Weight Loss is 100 max.

*As specified by ASTM D4485

For more information,
please contact:
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Engine Test	ISB	
Manufacturer	Cummins Bore X Stroke, 102.0 mm x 120.0 mm 5.9L, 2004 Inline six Cylinder Aluminum Piston	
Total Piston Height	105.23 mm	
Top Crown to Center Pin Bore	71.53 mm	
Crownland Configuration	Radial Crownland to Liner Clearance 0.715 mm	
Piston Rings	Type	Groove Widths
Top Ring	Keystone	2.90mm
Second Ring	Negative Twist Rectangular w/ Inside Bevel	2.55mm
Oil Ring	Rectangular	4.04mm
Land Widths		
Crownland	8.08mm	
Second	14.74mm	
Third	4.02mm	

Parameters	Operating Conditions		Units
	Stage A	Stage B	
Test Duration	100	250*	Hours
Speed	1600 ± 10	Varies	r/min
Fuel Flow	20 ± 0.3	Varies	kg/h
Temperatures			
Coolant Out	99 ± 3	99 ± 3	DegC
Intake Manifold	68 ± 2	68 ± 5	DegC
Oil Pan	110 ± 2	110 ± 2	DegC
Inlet Air	30 ± 5	30 ± 5	DegC
Fuel In	40 ± 2	40 ± 2	DegC
Pressures			
Coolant System	103 ± 4	103 ± 4	kPa
Inlet Air	2 ± 1	2 ± 2	kPa
Exhaust	7 ± 1	4 max.	kPa

* Stage B requires a minimum of 32,000 cycles completed within the 250 hours.

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