ISB
Lubricant Performance Test

Report Packet Version No.
ISB VERSION 20050707 BETA

Method
CCCCCCCC

Conducted For:
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

C	V =	Valid; The reference oil / non-reference oil was evaluated in accordance with the test procedure.
	I =	Invalid; The reference oil / non-reference oil was not evaluated in accordance with the test procedure.
	N =	Results cannot be interpreted as representative of oil performance (non-reference oil) and shall not be used in determining an average test result using multiple test criteria.

CC	NR = Non-Reference Oil Test
	RO = Reference Oil Test

Test Number			
Stand: CCCCC	Stand Run: CCCC	Engine Serial Number: CCCCCCCC	Engine Hours: CCCCCC
End Of Test Date: YYYYMMDD		End Of Test Time: HH:MM	
Oil Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation / Stand Code: CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC			
Alternate Codes	CCCCCCCCCCCCCCC	CCCCCCCCCCCCCCC	CCCCCCCCCCCCCCC

In my opinion the test CCCCCCCC been conducted in a valid manner in accordance with Test Method Dxxxx and the appropriate amendments through the information letter system. The remarks included in this report describe the anomalies associated with this test.

Submitted By: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Testing Laboratory

Signature Image
Signature

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Typed Name

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Title

ISB Lubricant Performance Test
Form 2
Table of Contents

1.	Final Report Cover Sheet	Form 1
2.	Table of Contents	Form 2
3.	Summary of Test Method	Form 3
4.	Test Results Summary	Form 4
5.	Operational Summary	Form 5
6.	Tappet Mass Loss Summary	Form 6
7.	Crosshead Mass Loss Summary	Form 7
8.	Valve Adjusting Screw Mass Loss Summary	Form 8
9.	Rocker Lever Socket Mass Loss Summary	Form 9
10.	Valve Rocker Shaft Mass Loss Summary	Form 10
11.	Valve Push Rod Mass Loss Summary	Form 11
12.	Oil Analysis Summary	Form 12
13.	Unscheduled Downtime & Maintenance Summary	Form 13
14.	Test Fuel Analysis (Last Batch)	Form 14
15.	ACC Conformance Statement	Form 15

ISB Lubricant Performance Test
Form 3
Summary Of Test Method

The ISB Lubricant Performance Test is an engine-dynamometer test which evaluates the ability of a lubricant to minimize valvetrain and camshaft wear. This test is a two-stage test. Stage A is 100 hours, steady state, and is run with retarded fuel injection timing to produce elevated soot levels in the oil. Stage B is 250 hours and is run under quick cyclic speed and load conditions to induce wear. The stages are run in sequence (Stage A followed by Stage B) for a total test length of 350 hours.

The test engine is a Cummins ISB diesel engine with EGR. It is an in-line six cylinder, four-stroke, turbocharged engine with electronically controlled fuel injection. The engine is re-used for multiple tests with new valvetrain parts for each test.

ISB Test Conditions

Parameter	Stage A	Stage B[A]
Time, h	100	250
Injection Timing, °	-14 nominal	Varies
Speed, r/min	1600	Varies
Fuel Flow, kg/h	20	Varies
Inlet Manifold Temp., °C	68	Target 68
Coolant Out Temp., °C	99	Target 99
Fuel In Temp., °C	40	40
Oil Sump Temp., °C	110	Target 110
Intake Air Temp., °C	Record	Record
Intake Air Pressure, kPa (vacuum)	0 – 4	Record
Intake Manifold Pressure, kPa absolute	Record	Record
Exhaust Back Pressure, kPa	7	Wide Open, Varies
Crankcase Pressure, kPa	Record	Record
Coolant System Pressure, kPa	99 - 107	99 - 107
Power, kW	Record	Record
Torque, Nm	Record	Record
Pre-turbine Exhaust Temp., °C	Record	Record
Tailpipe Exhaust Temp., °C	Record	Record
Oil Gallery Temp., °C	Record	Record
Inlet Air Dew Point, °C	Record	Record
Inlet Air Humidity, kg/kg	Record	Record
Oil Gallery Pressure, kPa	Record	Record
Oil Filter Delta P, kPa	Record	Record

[A] Conditions indicated are 5 seconds into the peak power step of the transient cycle.

ISB Lubricant Performance Test
Test Results Summary
Form 4

Laboratory:	CC	EOT Date:	YYYYMMDD	EOT Time:	HH:MM
Test Number:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Formulation/Stand Code:	CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC				
Oil Code:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	Engine Kit S/N:	CCCCCCCCCCCC		

Date Test Started	YYYYMMDD
Start Time	HH:MM
Test Length	S1234
TMC Oil Code [A]	CCCCCC
Laboratory Oil Code	CCCCCCCCCCCCCCCCCCCC
SAE Viscosity	CCCCCCC
TGA Soot % At 100 h	S123.1

	Average Camshaft Wear (µm)	Average Tappet Mass Loss (mg)	Average Crosshead Mass Loss (mg)	Average Valve Adjusting Screw Mass Loss (mg)
Original Result	S123.1	S123.1	S123.1	S123.1
Transformed Result	S12.1234	S12.1234	S12.1234	S12.1234
Correction Factor	S12.1234	S12.1234	S12.1234	S12.1234
Corrected Transformed Result	S12.1234	S12.1234	S12.1234	S12.1234
Severity Adjustment	S12.1234	S12.1234	S12.1234	S12.1234
Final Transformed Result	S12.1234	S12.1234	S12.1234	S12.1234
Final Result	S123.1	S123.1	S123.1	S123.1

Last Stand Reference Results	
Reference Test Number	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Oil Code	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Test Length	S1234
TMC Oil Code	CCCCCC
EOT Date	YYYYMMDD
EOT Time	HH:MM
Stand Calibration Expiration Date	YYYYMMDD
TGA Soot % AT 100 h	S123.1

	Average Camshaft Wear (µm)	Average Tappet Mass Loss (mg)	Average Crosshead Mass Loss (mg)	Average Valve Adjusting Screw Mass Loss (mg)
Final Result	S123.1	S123.1	S123.1	S123.1

[A] Reference Tests Only

ISB Lubricant Performance Test
Form 5
Operational Summary

Laboratory: CC	EOT Date: YYYYMMDD	EOT Time: HH:MM
Test Number:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
Formulation/Stand Code:	CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC	
Oil Code:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	

	Parameter	Units			Stage Target A	Stage Target B	Stage Average A	Stage Average B	Stage B Cycles [A]	System Response[C]	
Controlled Parameters	Speed	r/min			1600	Varies	S123456	S123456	S123456	CCCCCCCC	
	Fuel Flow	kg/h			20	Varies	S123.1	S123.1		CCCCCCCC	
	Coolant Out	°C			99	99	S123.1	S123.1		CCCCCCCC	
	Fuel In	°C			40	40	S12.1	S12.1		CCCCCCCC	
	Oil Sump	°C			110	110	S123.1	S123.1		CCCCCCCC	
	Intake Manifold	°C			68	68	S12.1	S12.1		CCCCCCCC	
	Exhaust	kPa			7	varies	S123.1	S123.1		CCCCCCCC	

	Parameter	Units	Typical Values[B]		Average Stage A	Average Stage B	
Non-controlled Parameters	Torque	N-m	TBD	TBD	S1234.1	S1234.1	
	Intake Air Temperature	°C	TBD	TBD	S12.1	S12.1	
	Intake Air Restriction	kPa (vac.)	TBD	TBD	S12.12	S12.12	
	Intake Manifold Pressure	kPa abs	TBD	TBD	S123.1	S123.1	
	Crankcase Pressure	kPa	TBD	TBD	S1.1	S1.1	
	Pre-Turbine Front	°C	TBD	TBD	S123.1	S123.1	
	Pre-Turbine Rear	°C	TBD	TBD	S123.1	S123.1	
	Tailpipe	°C	TBD	TBD	S123.1	S123.1	
	Oil Gallery Temperature	°C	TBD	TBD	S123.1	S123.1	
	Blowby	L/min	TBD	TBD	S12.1	S12.1	
	Coolant Pressure	kPa	99-107	99-107	S123.1	S123.1	
	Main Oil Gallery Press.	kPa	TBD	TBD	S123.1	S123.1	
	Fuel Inlet Restriction	kPa	TBD	TBD	S1234.1	S1234.1	
	Fuel Return Restriction	kPa	TBD	TBD	S1234.1	S1234.1	

[A] Number of Stage B cycles. A minimum of 32,000 cycles is required.
[B] Typical values determined from reference oil test database
[C] Time for the output to reach 63.2% of final value for step change at input

ISB Lubricant Performance Test
Form 6
Tappet Mass Loss Summary

Laboratory: CC	EOT Date: YYYYMMDD	EOT Time: HH:MM
Test Number:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
Formulation / Stand Code:	CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC	
Oil Code:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	

Tappet Wear			
Location	**Pretest Mass (g)**	**EOT Mass (g)**	**Mass Loss (mg)**
1I	S123.1234	S123.1234	S12.1
1E	S123.1234	S123.1234	S12.1
2I	S123.1234	S123.1234	S12.1
2E	S123.1234	S123.1234	S12.1
3I	S123.1234	S123.1234	S12.1
3E	S123.1234	S123.1234	S12.1
4I	S123.1234	S123.1234	S12.1
4E	S123.1234	S123.1234	S12.1
5I	S123.1234	S123.1234	S12.1
5E	S123.1234	S123.1234	S12.1
6I	S123.1234	S123.1234	S12.1
6E	S123.1234	S123.1234	S12.1

Tappet Mass Loss Intake / Exhaust Summary (mg)	**Intake**		**Exhaust**	
	As Measured	**Outlier Screened**	**As Measured**	**Outlier Screened**
Average	S12.12	S12.12	S12.12	S12.12
Minimum	S12.12	S12.12	S12.12	S12.12
Maximum	S12.12	S12.12	S12.12	S12.12
Standard Deviation	S12.12	S12.12	S12.12	S12.12
Outlier Locations[A]	CC		CC	

[A] Location Designation. Example: 3E

Tappet Mass Loss Overall Summary (mg)	**As Measured**	**Outlier Screened**	**Adjusted to X.X% Soot**
Average	S12.12	S12.12	S123.1
Minimum	S12.12	S12.12	
Maximum	S12.12	S12.12	
Standard Deviation	S12.12	S12.12	

ISB Lubricant Performance Test
Form 7
Crosshead Mass Loss Summary

Laboratory: CC	EOT Date: YYYYMMDD	EOT Time: HH:MM
Test Number:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
Formulation / Stand Code:	CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC	
Oil Code:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	

Location	Serial No.	Pretest Mass (g)	EOT Mass (g)	Mass Loss (mg)
1I	CCCCC	S123.1234	S123.1234	S12.1
1E	CCCCC	S123.1234	S123.1234	S12.1
2I	CCCCC	S123.1234	S123.1234	S12.1
2E	CCCCC	S123.1234	S123.1234	S12.1
3I	CCCCC	S123.1234	S123.1234	S12.1
3E	CCCCC	S123.1234	S123.1234	S12.1
4I	CCCCC	S123.1234	S123.1234	S12.1
4E	CCCCC	S123.1234	S123.1234	S12.1
5I	CCCCC	S123.1234	S123.1234	S12.1
5E	CCCCC	S123.1234	S123.1234	S12.1
6I	CCCCC	S123.1234	S123.1234	S12.1
6E	CCCCC	S123.1234	S123.1234	S12.1

Intake / Exhaust Crosshead Mass Loss Summary (mg)	Intake		Exhaust	
	As Measured	Outlier Screened	As Measured	Outlier Screened
Average	S12.12	S12.12	S12.12	S12.12
Minimum	S12.1	S12.1	S12.1	S12.1
Maximum	S12.1	S12.1	S12.1	S12.1
Standard Deviation	S12.12	S12.12	S12.12	S12.12
Outlier Locations [A]	CCCCCCCC		CCCCCCCC	

[A] Location Designation. Example: 3E

Crosshead Mass Loss Overall Summary (mg)	As Measured	Outlier Screened	Adjusted to x.x% Soot
Average	S12.12	S12.12	S123.1
Minimum	S12.1	S12.1	
Maximum	S12.1	S12.1	
Standard Deviation	S12.12	S12.12	

ISB Lubricant Performance Test
Form 8
Valve Adjusting Screw Mass Loss Summary

Laboratory: CC	EOT Date: YYYYMMDD	EOT Time: HH:MM
Test Number:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
Formulation / Stand Code:	CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC	
Oil Code:		

Location	Pretest Mass (g)	EOT Mass (g)	Mass Loss (mg)
1I	S123.1234	S123.1234	S12.1
1E	S123.1234	S123.1234	S12.1
2I	S123.1234	S123.1234	S12.1
2E	S123.1234	S123.1234	S12.1
3I	S123.1234	S123.1234	S12.1
3E	S123.1234	S123.1234	S12.1
4I	S123.1234	S123.1234	S12.1
4E	S123.1234	S123.1234	S12.1
5I	S123.1234	S123.1234	S12.1
5E	S123.1234	S123.1234	S12.1
6I	S123.1234	S123.1234	S12.1
6E	S123.1234	S123.1234	S12.1

Valve Adjusting Screw Intake / Exhaust Mass Loss Summary (mg)	Intake		Exhaust	
	As Measured	Outlier Screened	As Measured	Outlier Screened
Average	S12.12	S12.12	S12.12	S12.12
Minimum	S12.1	S12.1	S12.1	S12.1
Maximum	S12.1	S12.1	S12.1	S12.1
Standard Deviation	S12.12	S12.12	S12.12	S12.12
Outlier Locations [A]	CCCCCCCC		CCCCCCCC	

[A] Location Designation. Example: 3E

Valve Adjusting Screw Mass Loss Overall Summary (mg)	As Measured	Outlier Screened	Adjusted to x.x% Soot
Average	S12.12	S12.12	S123.1
Minimum	S12.1	S12.1	
Maximum	S12.1	S12.1	
Standard Deviation	S12.12	S12.12	

ISB Lubricant Performance Test
Form 9
Rocker Lever Socket Mass Loss Summary

Laboratory: CC	EOT Date: YYYYMMDD	EOT Time: HH:MM
Test Number:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
Formulation / Stand Code:	CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC	
Oil Code:		

Location	Pretest Mass (g)	EOT Mass (g)	Mass Loss (mg)
1I	S123.1234	S123.1234	S12.1
1E	S123.1234	S123.1234	S12.1
2I	S123.1234	S123.1234	S12.1
2E	S123.1234	S123.1234	S12.1
3I	S123.1234	S123.1234	S12.1
3E	S123.1234	S123.1234	S12.1
4I	S123.1234	S123.1234	S12.1
4E	S123.1234	S123.1234	S12.1
5I	S123.1234	S123.1234	S12.1
5E	S123.1234	S123.1234	S12.1
6I	S123.1234	S123.1234	S12.1
6E	S123.1234	S123.1234	S12.1

Rocker Lever Socket Mass Loss Intake / Exhaust Summary (mg)	Intake		Exhaust	
	As Measured	Outlier Screened	As Measured	Outlier Screened
Average	S12.12	S12.12	S12.12	S12.12
Minimum	S12.12	S12.12	S12.12	S12.12
Maximum	S12.12	S12.12	S12.12	S12.12
Standard Deviation	S12.12	S12.12	S12.12	S12.12
Outlier Locations [A]	CCCCCCCC		CCCCCCCC	

[A] Location Designation. Example: 3E

Rocker Lever Socket Mass Loss Overall Summary (mg)	As Measured	Outlier Screened	Adjusted to x.x% Soot
Average	S12.12	S12.12	S12.12
Minimum	S12.12	S12.12	
Maximum	S12.12	S12.12	
Standard Deviation	S12.12	S12.12	

ISB Lubricant Performance Test
Form 10
Valve Rocker Shaft Mass Loss Summary

Laboratory: CC	EOT Date: YYYYMMDD	EOT Time: HH:MM
Test Number:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
Formulation / Stand Code:	CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC	
Oil Code:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	

Location	Pretest Mass (g)	EOT Mass (g)	Mass Loss (mg)
1I	S123.1234	S123.1234	S12.1
1E	S123.1234	S123.1234	S12.1
2I	S123.1234	S123.1234	S12.1
2E	S123.1234	S123.1234	S12.1
3I	S123.1234	S123.1234	S12.1
3E	S123.1234	S123.1234	S12.1
4I	S123.1234	S123.1234	S12.1
4E	S123.1234	S123.1234	S12.1
5I	S123.1234	S123.1234	S12.1
5E	S123.1234	S123.1234	S12.1
6I	S123.1234	S123.1234	S12.1
6E	S123.1234	S123.1234	S12.1

Valve Rocker Shaft Mass Loss Intake / Exhaust Summary (mg)	Intake		Exhaust	
	As Measured	Outlier Screened	As Measured	Outlier Screened
Average	S12.12	S12.12	S12.12	S12.12
Minimum	S12.12	S12.12	S12.12	S12.12
Maximum	S12.12	S12.12	S12.12	S12.12
Standard Deviation	S12.12	S12.12	S12.12	S12.12
Outlier Locations [A]	CCCCCCCC		CCCCCCCC	

[A] Location Designation. Example: 3E

Valve Rocker Shaft Mass Loss Overall Summary (mg)	As Measured	Outlier Screened	Adjusted to x.x% Soot
Average	S12.12	S12.12	S12.12
Minimum	S12.12	S12.12	
Maximum	S12.12	S12.12	
Standard Deviation	S12.12	S12.12	

ISB Lubricant Performance Test
Form 11
Valve Push Rods Mass Loss Summary

Laboratory: CC	EOT Date: YYYYMMDD	EOT Time: HH:MM
Test Number:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
Formulation / Stand Code:	CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC	
Oil Code:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	

Location	Pretest Mass (g)	EOT Mass (g)	Mass Loss (mg)
1I	S123.1234	S123.1234	S12.1
1E	S123.1234	S123.1234	S12.1
2I	S123.1234	S123.1234	S12.1
2E	S123.1234	S123.1234	S12.1
3I	S123.1234	S123.1234	S12.1
3E	S123.1234	S123.1234	S12.1
4I	S123.1234	S123.1234	S12.1
4E	S123.1234	S123.1234	S12.1
5I	S123.1234	S123.1234	S12.1
5E	S123.1234	S123.1234	S12.1
6I	S123.1234	S123.1234	S12.1
6E	S123.1234	S123.1234	S12.1

Valve Push Rods Mass Loss Intake / Exhaust Summary (mg)	Intake		Exhaust	
	As Measured	Outlier Screened	As Measured	Outlier Screened
Average	S12.12	S12.12	S12.12	S12.12
Minimum	S12.12	S12.12	S12.12	S12.12
Maximum	S12.12	S12.12	S12.12	S12.12
Standard Deviation	S12.12	S12.12	S12.12	S12.12
Outlier Locations [A]	CCCCCCCC		CCCCCCCC	

[A] Location Designation. Example: 3E

Valve Push Rods Mass Loss Overall Summary (mg)	As Measured	Outlier Screened	Adjusted to x.x% Soot
Average	S12.12	S12.12	S12.12
Minimum	S12.12	S12.12	
Maximum	S12.12	S12.12	
Standard Deviation	S12.12	S12.12	

ISB Lubricant Performance Test
Form 12
Oil Analysis Summary

Laboratory:	CC	EOT Date:	YYYYMMDD	EOT Time:	HH:MM
Test Number:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Formulation / Stand Code:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Oil Code:	CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC				

Test Hours	Viscosity @ 100°C, cSt	TGA % Soot	TBN D4739	TAN D664	Copper (ppm)	Iron (ppm)	Lead (ppm)	Aluminum (ppm)	Chromium (ppm)
NEW	S123.12	S123.1	S123.12	S123.12	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
CCC	S123.12	S123.1	S123.12	S123.12	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
CCC	S123.12	S123.1	S123.12	S123.12	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
CCC	S123.12	S123.1	S123.12	S123.12	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
CCC	S123.12	S123.1	S123.12	S123.12	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
CCC	S123.12	S123.1	S123.12	S123.12	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
CCC	S123.12	S123.1	S123.12	S123.12	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
CCC	S123.12	S123.1	S123.12	S123.12	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
CCC	S123.12	S123.1	S123.12	S123.12	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA
CCC	S123.12	S123.1	S123.12	S123.12	AAAAAA	AAAAAA	AAAAAA	AAAAAA	AAAAAA

ISB Lubricant Performance Test
Form 13
Unscheduled Downtime & Maintenance Summary

Laboratory:	CC	EOT Date:	YYYYMMDD	EOT Time:	HH:MM
Test Number:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Formulation / Stand Code:	CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC				
Oil Code:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				

Number of Downtime Occurrences		S12	
Test Hours	**Date**	**Downtime**	**Reasons**
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
		HHH:MM	Total Downtime (hours)

Other Comments	
Number of Comment Lines	S12
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	

ISB Lubricant Performance Test
Form 13a
Unscheduled Downtime & Maintenance Summary

Laboratory:	CC	EOT Date:	YYYYMMDD	EOT Time:	HH:MM
Test Number:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Formulation / Stand Code:	CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC				
Oil Code:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				

Number of Downtime Occurrences			S12
Test Hours	**Date**	**Downtime**	**Reasons**
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
		HHH:MM	Total Downtime (hours)

Other Comments	
Number of Comment Lines	S12
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	

ISB Lubricant Performance Test
Form 13b
Unscheduled Downtime & Maintenance Summary

Laboratory:	CC	EOT Date:	YYYYMMDD	EOT Time:	HH:MM
Test Number:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Formulation / Stand Code:	CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC				
Oil Code:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				

Number of Downtime Occurrences	S12		
Test Hours	**Date**	**Downtime**	**Reasons**
CCCCCC	CCCCCCCC	CCCCCC	cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
CCCCCC	CCCCCCCC	CCCCCC	cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
CCCCCC	CCCCCCCC	CCCCCC	cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
CCCCCC	CCCCCCCC	CCCCCC	cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
CCCCCC	CCCCCCCC	CCCCCC	cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
CCCCCC	CCCCCCCC	CCCCCC	cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
CCCCCC	CCCCCCCC	CCCCCC	cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
CCCCCC	CCCCCCCC	CCCCCC	cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
CCCCCC	CCCCCCCC	CCCCCC	cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
CCCCCC	CCCCCCCC	CCCCCC	cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
CCCCCC	CCCCCCCC	CCCCCC	cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
CCCCCC	CCCCCCCC	CCCCCC	cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
CCCCCC	CCCCCCCC	CCCCCC	cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
CCCCCC	CCCCCCCC	CCCCCC	cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
CCCCCC	CCCCCCCC	CCCCCC	cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc
		HHH:MM	Total Downtime (hours)

Other Comments	
Number of Comment Lines	S12
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	

ISB Lubricant Performance Test
Form 14
Test Fuel Analysis (Last Batch)

Laboratory:	CC	EOT Date:	YYYYMMDD	EOT Time:	HH:MM
Test Number:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Formulation / Stand Code:	CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC				
Oil Code:	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				

Fuel Supplier	**Fuel Batch Identifier**

Measurement	**Specs.**	**Analysis**		**Test Method**
		New	**EOT**	
Total Sulfur, ppm	**7 – 15**	S12.12	S12.12	**D 5453**
Gravity, °API	**34 – 37**	S12.1	S12.1	**D 4052**
Hydrocarbon Composition				
Aromatics % Wt.	**26 – 31.5**	S12.1		**D 5186**
Olefins % Vol.	**Report**	S12.1		**D 1319**
Cetane Index	**Report**	S12.1		**D 976**
Cetane No.	**43 – 47**	S12.1		**D 613**
Copper Strip Corrosion	**1 Maximum**	CCCC		**D 130**
Flash Point, °C	**54 Minimum**	S123		**D 93**
Pour Point, °C	**-18 Maximum**	S123		**D 97**
Carbon Residue on 10% Residuum, %	**0.35 Maximum**	S12.12		**D 524 (10% Bottoms)**
Water & Sediment, % Vol.	**0.05 Maximum**	AAAAAA		**D 2709**
Viscosity, cSt @ 40°C	**2.0 – 2.6**	S12.1		**D 445**
Total Acid Number	**0.05 Maximum**	S1.12		**D 664**
Strong Acid Number	**0.00 Maximum**	S1.12		**D 664**
Accelerated Stability	**1.5 max**	S12.1		**D 2274**
Ash, % Wt.	**0.005 max**	S123.123		**D 482**
SLBOCLE, g	**3100 min**[A]	S1234567		**D 6078**[A]
90% Distillation, °C	**293 - 332**	S1234		**D 86**

[A] ***May be altered to be consistent with CARB or ASTM diesel fuel specifications.***

ISB Lubricant Performance Test
Form 15
American Chemistry Council Code of Practice
Test Laboratory Conformance Statement

Test Laboratory	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Test Sponsor	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Formulation / Stand Code	CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC				
Test Number	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Start Date	YYYYMMDD	Start Time	HH:MM	Time Zone	CCC

Declarations

No. 1 All requirements of the ACC Code of Practice for which the test laboratory is responsible were met in the conduct of this test. Yes ___C___ No___C___ *

No. 2 The laboratory ran this test for the full duration following all procedural requirements; and all operational validity requirements of the latest version of the applicable test procedure (ASTM or other), including all updates issued by the organization responsible for the test, were met. Yes ___C___ No___C___*

If the response to this Declaration is “No”, does the test engineer consider the deviations from operational validity requirements that occurred to be beyond the control of the laboratory? Yes ___C___* No___C___

No. 3 A deviation occurred for one of the test parameters identified by the organization responsible for the test as being a special case. Yes ___C___* No___C___ *(This currently applies only to specific deviations identified in the ASTM Information Letter System)*

Check the Appropriate Conclusion

C	Operational review of this test indicates that the results should be included in the Multiple Test Acceptance Criteria calculations.
C	*Operational review of this test indicates that the results should not be included in the Multiple Test Acceptance Criteria calculations.

Note: *Supporting comments are required for all responses identified with an asterisk.*

Comments
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

Signature Image
Signature

YYYYMMDD
Date

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Typed Name

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Title