ISB
Lubricant Performance Test

Report Packet Version No.
ISB VERSION 20050707 BETA

Method
METHOD

Conducted For:
TSTSPON1

TSTSPON2

LABVALID	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.

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

Test Number			
Stand: STAND	Stand Run: STRUN	Engine Serial Number: ENGINE	Engine Hours: ENHOURS
End Of Test Date: DTCOMP		End Of Test Time: EOTTIME	
Oil Code: OILCODE			
Formulation / Stand Code: FORM			
Alternate Codes	ALTCODE1	ALTCODE2	ALTCODE3

In my opinion the test OPVALID 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:

SUBLAB
Testing Laboratory

SUBSIGIM
Signature

SUBNAME
Typed Name

SUBTITLE
Title

ISB Lubricant Performance Test
Form 2
Table of Contents

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:	LAB	EOT Date:	DTCOMP	EOT Time:	EOTTIME
Test Number:	TESTNUM				
Formulation/Stand Code:	FORM				
Oil Code:	OILCODE			Engine Kit S/N:	ENKIT

Date Test Started	DTSTRT
Start Time	STRTTIME
Test Length	TESTLEN
TMC Oil Code [A]	IND
Laboratory Oil Code	LABOCODE
SAE Viscosity	SAEVISC
TGA Soot % At 100 h	TGA100

	Average Camshaft Wear (µm)	Average Tappet Mass Loss (mg)	Average Crosshead Mass Loss (mg)	Average Valve Adjusting Screw Mass Loss (mg)
Original Result	ACSW	ATWL	ACWL	VASL
Transformed Result	TRNACSW	TRNATWL	TRNACWL	TRNVASL
Correction Factor	ACSWCF	ATWLCF	ACWLCF	VASLCF
Corrected Transformed Result	ACSWCOR	ATWLCOR	ACWLCOR	VASLCOR
Severity Adjustment	ACSW_SA	ATWL_SA	ACWL_SA	VASL_SA
Final Transformed Result	TACSWFNL	TATWLFNL	TACWLFNL	TVASLFNL
Final Result	ACSWFNL	ATWLFNL	ACWLFNL	VASLFNL

Last Stand Reference Results	
Reference Test Number	RTESTNUM
Oil Code	ROILCODE
Test Length	RTESTLEN
TMC Oil Code	RIND
EOT Date	RDTCOMP
EOT Time	REOTTIME
Stand Calibration Expiration Date	DTCALEXP
TGA Soot % AT 100 h	RTGA100

	Average Camshaft Wear (µm)	Average Tappet Mass Loss (mg)	Average Crosshead Mass Loss (mg)	Average Valve Adjusting Screw Mass Loss (mg)
Final Result	RACSWFNL	RATWLFNL	RACWLFNL	RVASLFNL

[A] Reference Tests Only

ISB Lubricant Performance Test
Form 5
Operational Summary

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		
Formulation/Stand Code: FORM		
Oil Code: OILCODE		

	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	ARPM1	ARPM2	NCYCSTGB	RPMSYSR	
	Fuel Flow	kg/h			20	Varies	AFFLO1	AFFLO2		FFLOSYSR	
	Coolant Out	°C			99	99	ACOLOUT1	ACOLOUT2		COTSYSR	
	Fuel In	°C			40	40	AFUELT1	AFUELT2		FTEMSYSR	
	Oil Sump	°C			110	110	AOILST1	AOILST2		OTEMSYSR	
	Intake Manifold	°C			68	68	AINMANT1	AINMANT2		IMANSYSR	
	Exhaust	kPa			7	varies	AEXHSTP1	AEXHSTP1		EXPRSYSR	

	Parameter	Units	Typical Values[B]		Average Stage A	Average Stage B	
Non-controlled Parameters	Torque	N-m	TBD	TBD	ALOAD1	ALOAD2	
	Intake Air Temperature	°C	TBD	TBD	AINAIRT1	AINAIRT2	
	Intake Air Restriction	kPa (vac.)	TBD	TBD	AINAIRR1	AINAIRR2	
	Intake Manifold Pressure	kPa abs	TBD	TBD	AINMANP1	AINMANP2	
	Crankcase Pressure	kPa	TBD	TBD	ACCASEP1	ACCASEP2	
	Pre-Turbine Front	°C	TBD	TBD	APTURFT1	APTURFT2	
	Pre-Turbine Rear	°C	TBD	TBD	APTURRT1	APTURRT2	
	Tailpipe	°C	TBD	TBD	ATAILPT1	ATAILPT2	
	Oil Gallery Temperature	°C	TBD	TBD	AOILGT1	AOILGT2	
	Blowby	L/min	TBD	TBD	ABLOBY1	ABLOBY1	
	Coolant Pressure	kPa	99-107	99-107	ACOLOUP1	ACOLOUP2	
	Main Oil Gallery Press.	kPa	TBD	TBD	AOILPRS1	AOILPRS2	
	Fuel Inlet Restriction	kPa	TBD	TBD	AFPMPP1	AFPMPP2	
	Fuel Return Restriction	kPa	TBD	TBD	AFUELRP1	AFUELRP2	

[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: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number:	TESTNUM	
Formulation / Stand Code:	FORM	
Oil Code:	OILCODE	

Tappet Wear			
Location	**Pretest Mass (g)**	**EOT Mass (g)**	**Mass Loss (mg)**
1I	TWPTWW1I	TWEWW1I	TWEWL1I
1E	TWPTWW1E	TWEWW1E	TWEWL1E
2I	TWPTWW2I	TWEWW2I	TWEWL2I
2E	TWPTWW2E	TWEWW2E	TWEWL2E
3I	TWPTWW3I	TWEWW3I	TWEWL3I
3E	TWPTWW3E	TWEWW3E	TWEWL3E
4I	TWPTWW4I	TWEWW4I	TWEWL4I
4E	TWPTWW4E	TWEWW4E	TWEWL4E
5I	TWPTWW5I	TWEWW5I	TWEWL5I
5E	TWPTWW5E	TWEWW5E	TWEWL5E
6I	TWPTWW6I	TWEWW6I	TWEWL6I
6E	TWPTWW6E	TWEWW6E	TWEWL6E

Tappet Mass Loss Intake / Exhaust Summary (mg)	**Intake**		**Exhaust**	
	As Measured	**Outlier Screened**	**As Measured**	**Outlier Screened**
Average	ATWWLI	OATWWLI	ATWWLE	OATWWLE
Minimum	ITWWLI	OITWWLI	ITWWLE	OITWWLE
Maximum	XTWWLI	OXTWWLI	XTWWLE	OXTWWLE
Standard Deviation	STWWLI	OSTWWLI	STWWLE	OSTWWLE
Outlier Locations[A]	TWLOUTI		TWLOUTE	

[A] Location Designation. Example: 3E

Tappet Mass Loss Overall Summary (mg)	**As Measured**	**Outlier Screened**	**Adjusted to X.X% Soot**
Average	AMTWL	TWL	ATWL
Minimum	AMITWL	ITWL	
Maximum	AMXTWL	XTWL	
Standard Deviation	AMSTWL	STWL	

ISB Lubricant Performance Test
Form 7
Crosshead Mass Loss Summary

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		
Formulation / Stand Code: FORM		
Oil Code: OILCODE		

Location	Serial No.	Pretest Mass (g)	EOT Mass (g)	Mass Loss (mg)
1I	CHDSN1I	CHDPTW1I	CHDEW1I	CHDEWL1I
1E	CHDSN1E	CHDPTW1E	CHDEW1E	CHDEWL1E
2I	CHDSN2I	CHDPTW2I	CHDEW2I	CHDEWL2I
2E	CHDSN2E	CHDPTW2E	CHDEW2E	CHDEWL2E
3I	CHDSN3I	CHDPTW3I	CHDEW3I	CHDEWL3I
3E	CHDSN3E	CHDPTW3E	CHDEW3E	CHDEWL3E
4I	CHDSN4I	CHDPTW4I	CHDEW4I	CHDEWL4I
4E	CHDSN4E	CHDPTW4E	CHDEW4E	CHDEWL4E
5I	CHDSN5I	CHDPTW5I	CHDEW5I	CHDEWL5I
5E	CHDSN5E	CHDPTW5E	CHDEW5E	CHDEWL5E
6I	CHDSN6I	CHDPTW6I	CHDEW6I	CHDEWL6I
6E	CHDSN6E	CHDPTW6E	CHDEW6E	CHDEWL6E

Intake / Exhaust Crosshead Mass Loss Summary (mg)	Intake		Exhaust	
	As Measured	Outlier Screened	As Measured	Outlier Screened
Average	ACHDWLI	OACHDWLI	ACHDWLE	OACHDWLE
Minimum	ICHDWLI	OICHDWLI	ICHDWLE	OICHDWLE
Maximum	XCHDWLI	OXCHDWLI	XCHDWLE	OXCHDWLE
Standard Deviation	SCHDWLI	OSCHDWLI	SCHDWLE	OSCHDWLE
Outlier Locations [A]	CHDOUTI		CHDOUTE	

[A] Location Designation. Example: 3E

Crosshead Mass Loss Overall Summary (mg)	As Measured	Outlier Screened	Adjusted to x.x% Soot
Average	AMACAWL	CAWL	ACWL
Minimum	AMICAWL	ICHDEWL	
Maximum	AMXCAWL	XCHDEWL	
Standard Deviation	AMSCAWL	SCHDEWL	

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

Laboratory:	LAB	EOT Date:	DTCOMP	EOT Time:	EOTTIME
Test Number:	TESTNUM				
Formulation / Stand Code:	FORM				
Oil Code:					

Location	Pretest Mass (g)	EOT Mass (g)	Mass Loss (mg)
1I	VASPTW1I	VASEW1I	VASEWL1I
1E	VASPTW1E	VASEW1E	VASEWL1E
2I	VASPTW2I	VASEW2I	VASEWL2I
2E	VASPTW2E	VASEW2E	VASEWL2E
3I	VASPTW3I	VASEW3I	VASEWL3I
3E	VASPTW3E	VASEW3E	VASEWL3E
4I	VASPTW4I	VASEW4I	VASEWL4I
4E	VASPTW4E	VASEW4E	VASEWL4E
5I	VASPTW5I	VASEW5I	VASEWL5I
5E	VASPTW5E	VASEW5E	VASEWL5E
6I	VASPTW6I	VASEW6I	VASEWL6I
6E	VASPTW6E	VASEW6E	VASEWL6E

Valve Adjusting Screw Intake / Exhaust Mass Loss Summary (mg)	Intake		Exhaust	
	As Measured	Outlier Screened	As Measured	Outlier Screened
Average	AVASWLI	OAVASWLI	AVASWLE	OAVASWLE
Minimum	IVASWLI	OIVASWLI	IVASWLE	OIVASWLE
Maximum	XVASWLI	OXVASWLI	XVASWLE	OXVASWLE
Standard Deviation	SVASWLI	OSVASWLI	SVASWLE	OSVASWLE
Outlier Locations [A]	VASOUTI		VASOUTE	

[A] Location Designation. Example: 3E

Valve Adjusting Screw Mass Loss Overall Summary (mg)	As Measured	Outlier Screened	Adjusted to x.x% Soot
Average	AVSWL	OAVSWL	VASL
Minimum	IVSWL	OIVSWL	
Maximum	XVSWL	OXVSWL	
Standard Deviation	SVSWL	OSVSWL	

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

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		
Formulation / Stand Code: FORM		
Oil Code:		

Location	Pretest Mass (g)	EOT Mass (g)	Mass Loss (mg)
1I	RLSPTW1I	RLSEW1I	RLSEWL1I
1E	RLSPTW1E	RLSEW1E	RLSEWL1E
2I	RLSPTW2I	RLSEW2I	RLSEWL2I
2E	RLSPTW2E	RLSEW2E	RLSEWL2E
3I	RLSPTW3I	RLSEW3I	RLSEWL3I
3E	RLSPTW3E	RLSEW3E	RLSEWL3E
4I	RLSPTW4I	RLSEW4I	RLSEWL4I
4E	RLSPTW4E	RLSEW4E	RLSEWL4E
5I	RLSPTW5I	RLSEW5I	RLSEWL5I
5E	RLSPTW5E	RLSEW5E	RLSEWL5E
6I	RLSPTW6I	RLSEW6I	RLSEWL6I
6E	RLSPTW6E	RLSEW6E	RLSEWL6E

Rocker Lever Socket Mass Loss Intake / Exhaust Summary (mg)	Intake		Exhaust	
	As Measured	Outlier Screened	As Measured	Outlier Screened
Average	ARLSHLI	OARLSHLI	ARLSHLE	OARLSHLE
Minimum	IRLSHLI	OIRLSHLI	IRLSHLE	OIRLSHLE
Maximum	XRLSHLI	OXRLSHLI	XRLSHLE	OXRLSHLE
Standard Deviation	SRLSHLI	OSRLSHLI	SRLSHLE	OSRLSHLE
Outlier Locations [A]	RLSOUTI		RLSOUTE	

[A] Location Designation. Example: 3E

Rocker Lever Socket Mass Loss Overall Summary (mg)	As Measured	Outlier Screened	Adjusted to x.x% Soot
Average	ARLSWL	OARLSWL	RLSWL
Minimum	IRLSWL	OIRLSWL	
Maximum	XRLSWL	OXRLSWL	
Standard Deviation	SRLSWL	OSRLSWL	

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

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		
Formulation / Stand Code: FORM		
Oil Code: OILCODE		

Location	Pretest Mass (g)	EOT Mass (g)	Mass Loss (mg)
1I	VRSPTW1I	VRSEW1I	VRSEWL1I
1E	VRSPTW1E	VRSEW1E	VRSEWL1E
2I	VRSPTW2I	VRSEW2I	VRSEWL2I
2E	VRSPTW2E	VRSEW2E	VRSEWL2E
3I	VRSPTW3I	VRSEW3I	VRSEWL3I
3E	VRSPTW3E	VRSEW3E	VRSEWL3E
4I	VRSPTW4I	VRSEW4I	VRSEWL4I
4E	VRSPTW4E	VRSEW4E	VRSEWL4E
5I	VRSPTW5I	VRSEW5I	VRSEWL5I
5E	VRSPTW5E	VRSEW5E	VRSEWL5E
6I	VRSPTW6I	VRSEW6I	VRSEWL6I
6E	VRSPTW6E	VRSEW6E	VRSEWL6E

Valve Rocker Shaft Mass Loss Intake / Exhaust Summary (mg)	Intake		Exhaust	
	As Measured	Outlier Screened	As Measured	Outlier Screened
Average	AVRSHLI	OAVRSHLI	AVRSHLE	OAVRSHLE
Minimum	IVRSHLI	OIVRSHLI	IVRSHLE	OIVRSHLE
Maximum	XVRSHLI	OXVRSHLI	XVRSHLE	OXVRSHLE
Standard Deviation	SVRSHLI	OSVRSHLI	SVRSHLE	OSVRSHLE
Outlier Locations [A]	VRSOUTI		VRSOUTE	

[A] Location Designation. Example: 3E

Valve Rocker Shaft Mass Loss Overall Summary (mg)	As Measured	Outlier Screened	Adjusted to x.x% Soot
Average	AVRSWL	OAVRSWL	VRSWL
Minimum	IVRSWL	OIVRSWL	
Maximum	XVRSWL	OXVRSWL	
Standard Deviation	SVRSWL	OSVRSWL	

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

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		
Formulation / Stand Code: FORM		
Oil Code: OILCODE		

Location	Pretest Mass (g)	EOT Mass (g)	Mass Loss (mg)
1I	VPRPTW1I	VPREW1I	VPREWL1I
1E	VPRPTW1E	VPREW1E	VPREWL1E
2I	VPRPTW2I	VPREW2I	VPREWL2I
2E	VPRPTW2E	VPREW2E	VPREWL2E
3I	VPRPTW3I	VPREW3I	VPREWL3I
3E	VPRPTW3E	VPREW3E	VPREWL3E
4I	VPRPTW4I	VPREW4I	VPREWL4I
4E	VPRPTW4E	VPREW4E	VPREWL4E
5I	VPRPTW5I	VPREW5I	VPREWL5I
5E	VPRPTW5E	VPREW5E	VPREWL5E
6I	VPRPTW6I	VPREW6I	VPREWL6I
6E	VPRPTW6E	VPREW6E	VPREWL6E

Valve Push Rods Mass Loss Intake / Exhaust Summary (mg)	Intake		Exhaust	
	As Measured	Outlier Screened	As Measured	Outlier Screened
Average	AVPRMLI	OAVPRMLI	AVPRMLE	OAVPRMLE
Minimum	IVPRMLI	OIVPRMLI	IVPRMLE	OIVPRMLE
Maximum	XVPRMLI	OXVPRMLI	XVPRMLE	OXVPRMLE
Standard Deviation	SVPRMLI	OSVPRMLI	SVPRMLE	OSVPRMLE
Outlier Locations [A]	VPROUTI		VPROUTE	

[A] Location Designation. Example: 3E

Valve Push Rods Mass Loss Overall Summary (mg)	As Measured	Outlier Screened	Adjusted to x.x% Soot
Average	AVPRWL	OAVPRWL	VPRWL
Minimum	IVPRWL	OIVPRWL	
Maximum	XVPRWL	OXVPRWL	
Standard Deviation	SVPRWL	OSVPRWL	

ISB Lubricant Performance Test
Form 12
Oil Analysis Summary

Laboratory:	LAB	EOT Date:	DTCOMP	EOT Time:	EOTTIME
Test Number:	TESTNUM				
Formulation / Stand Code:	OILCODE				
Oil Code:	FORM				

Test Hours	Viscosity @ 100°C, cSt	TGA % Soot	TBN D4739	TAN D664	Copper (ppm)	Iron (ppm)	Lead (ppm)	Aluminum (ppm)	Chromium (ppm)
NEW	V100NEW	TGANEW	TBNNEW	TANNEW	CUWMNEW	FEWMNEW	PBWNEW	ALWNEW	CRWNEW
TST_H025	V100H025	TGA_H025	TBN_H025	TAN_H025	CUWMH025	FEWMH025	PBWMH025	ALWMH025	CRWMH025
TST_H050	V100H050	TGA_H050	TBN_H050	TAN_H050	CUWMH050	FEWMH050	PBWMH050	ALWMH050	CRWMH050
TST_H075	V100H075	TGA_H075	TBN_H075	TAN_H075	CUWMH075	FEWMH075	PBWMH075	ALWMH075	CRWMH075
TST_H100	V100H100	TGA100	TBN_H100	TAN_H100	CUWMH100	FEWMH100	PBWMH100	ALWMH100	CRWMH100
TST_H150	V100H150	TGA_H150	TBN_H150	TAN_H150	CUWMH150	FEWMH150	PBWMH150	ALWMH150	CRWMH150
TST_H200	V100H200	TGA_H200	TBN_H200	TAN_H200	CUWMH200	FEWMH200	PBWMH200	ALWMH200	CRWMH200
TST_H250	V100H250	TGA_H250	TBN_H250	TAN_H250	CUWMH250	FEWMH250	PBWMH250	ALWMH250	CRWMH250
TST_H300	V100H300	TGA_H300	TBN_H300	TAN_H300	CUWMH300	FEWMH300	PBWMH300	ALWMH300	CRWMH300
TST_H350	V100H350	TGA_H350	TBN_H350	TAN_H350	CUWMH350	FEWMH350	PBWMH350	ALWMH350	CRWMH350

ISB Lubricant Performance Test
Form 13
Unscheduled Downtime & Maintenance Summary

Laboratory: LAB	EOT Date: DTCOMP	EOT Time: EOTTIME
Test Number: TESTNUM		
Formulation / Stand Code: FORM		
Oil Code: OILCODE		

Number of Downtime Occurrences		DWNOCR	
Test Hours	**Date**	**Downtime**	**Reasons**
DOWNR001	DDATR001	DTIMR001	DREAR001
DOWNR002	DDATR002	DTIMR002	DREAR002
DOWNR003	DDATR003	DTIMR003	DREAR003
DOWNR004	DDATR004	DTIMR004	DREAR004
DOWNR005	DDATR005	DTIMR005	DREAR005
DOWNR006	DDATR006	DTIMR006	DREAR006
DOWNR007	DDATR007	DTIMR007	DREAR007
DOWNR008	DDATR008	DTIMR008	DREAR008
DOWNR009	DDATR009	DTIMR009	DREAR009
DOWNR010	DDATR010	DTIMR010	DREAR010
DOWNR011	DDATR011	DTIMR011	DREAR011
DOWNR012	DDATR012	DTIMR012	DREAR012
DOWNR013	DDATR013	DTIMR013	DREAR013
DOWNR014	DDATR014	DTIMR014	DREAR014
DOWNR015	DDATR015	DTIMR015	DREAR015
		TOTLDOWN	Total Downtime (hours)

Other Comments		
Number of Comment Lines	TOTCOM	
OCOMR001		
OCOMR002		
OCOMR003		
OCOMR004		
OCOMR005		
OCOMR006		
OCOMR007		
OCOMR008		
OCOMR009		
OCOMR010		
OCOMR011		
OCOMR012		
OCOMR013		
OCOMR014		
OCOMR015		

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

Laboratory:	LAB	EOT Date:	DTCOMP	EOT Time:	EOTTIME
Test Number:	TESTNUM				
Formulation / Stand Code:	FORM				
Oil Code:	OILCODE				

Number of Downtime Occurrences		DWNOCR	
Test Hours	**Date**	**Downtime**	**Reasons**
DOWNR016	DDATR016	DTIMR016	DREAR016
DOWNR017	DDATR017	DTIMR017	DREAR017
DOWNR018	DDATR018	DTIMR018	DREAR018
DOWNR019	DDATR019	DTIMR019	DREAR019
DOWNR020	DDATR020	DTIMR020	DREAR020
DOWNR021	DDATR021	DTIMR021	DREAR021
DOWNR022	DDATR022	DTIMR022	DREAR022
DOWNR023	DDATR023	DTIMR023	DREAR023
DOWNR024	DDATR024	DTIMR024	DREAR024
DOWNR025	DDATR025	DTIMR025	DREAR025
DOWNR026	DDATR026	DTIMR026	DREAR026
DOWNR027	DDATR027	DTIMR027	DREAR027
DOWNR028	DDATR028	DTIMR028	DREAR028
DOWNR029	DDATR029	DTIMR029	DREAR029
DOWNR030	DDATR030	DTIMR030	DREAR030
		TOTLDOWN	Total Downtime (hours)

Other Comments		
Number of Comment Lines	TOTCOM	
OCOMR016		
OCOMR017		
OCOMR018		
OCOMR019		
OCOMR020		
OCOMR021		
OCOMR022		
OCOMR023		
OCOMR024		
OCOMR025		
OCOMR026		
OCOMR027		
OCOMR028		
OCOMR029		
OCOMR030		

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

Laboratory:	LAB	EOT Date:	DTCOMP	EOT Time:	EOTTIME
Test Number:	TESTNUM				
Formulation / Stand Code:	FORM				
Oil Code:	OILCODE				

Number of Downtime Occurrences		DWNOCR	
Test Hours	**Date**	**Downtime**	**Reasons**
DOWNR031	DDATR031	DTIMR031	DREAR031
DOWNR032	DDATR032	DTIMR032	DREAR032
DOWNR033	DDATR033	DTIMR033	DREAR033
DOWNR034	DDATR034	DTIMR034	DREAR034
DOWNR035	DDATR035	DTIMR035	DREAR035
DOWNR036	DDATR036	DTIMR036	DREAR036
DOWNR037	DDATR037	DTIMR037	DREAR037
DOWNR038	DDATR038	DTIMR038	DREAR038
DOWNR039	DDATR039	DTIMR039	DREAR039
DOWNR040	DDATR040	DTIMR040	DREAR040
DOWNR041	DDATR041	DTIMR041	DREAR041
DOWNR042	DDATR042	DTIMR042	DREAR042
DOWNR043	DDATR043	DTIMR043	DREAR043
DOWNR044	DDATR044	DTIMR044	DREAR044
DOWNR045	DDATR045	DTIMR045	DREAR045
		TOTLDOWN	Total Downtime (hours)

Other Comments		
Number of Comment Lines	TOTCOM	
OCOMR031		
OCOMR032		
OCOMR033		
OCOMR034		
OCOMR035		
OCOMR036		
OCOMR037		
OCOMR038		
OCOMR039		
OCOMR040		
OCOMR041		
OCOMR042		
OCOMR043		
OCOMR044		
OCOMR045		

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

Laboratory:	LAB	EOT Date:	DTCOMP	EOT Time:	EOTTIME
Test Number:	TESTNUM				
Formulation / Stand Code:	FORM				
Oil Code:	OILCODE				

Fuel Supplier	Fuel Batch Identifier

Measurement	Specs.	Analysis		Test Method
		New	EOT	
Total Sulfur, ppm	**7 – 15**	FUELSNEW	FUELSEOT	**D 5453**
Gravity, °API	**34 – 37**	APIGRNEW	APIGREOT	**D 4052**
Hydrocarbon Composition				
Aromatics % Wt.	**26 – 31.5**	FUELAROM		**D 5186**
Olefins % Vol.	**Report**	FUELOLEF		**D 1319**
Cetane Index	**Report**	CETANEIN		**D 976**
Cetane No.	**43 – 47**	CETANENO		**D 613**
Copper Strip Corrosion	**1 Maximum**	FUELCU		**D 130**
Flash Point, °C	**54 Minimum**	FLASHPT		**D 93**
Pour Point, °C	**-18 Maximum**	FUELPOUR		**D 97**
Carbon Residue on 10% Residuum, %	**0.35 Maximum**	FUELCRES		**D 524 (10% Bottoms)**
Water & Sediment, % Vol.	**0.05 Maximum**	FUELH2O		**D 2709**
Viscosity, cSt @ 40°C	**2.0 – 2.6**	KINVIS		**D 445**
Total Acid Number	**0.05 Maximum**	FUELTAN		**D 664**
Strong Acid Number	**0.00 Maximum**	FUELSAN		**D 664**
Accelerated Stability	**1.5 max**	FUELACS		**D 2274**
Ash, % Wt.	**0.005 max**	FUELASH		**D 482**
SLBOCLE, g	**3100 min[A]**	SLBOCLE		**D 6078[A]**
90% Distillation, °C	**293 - 332**	FUEL90		**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	SUBLAB				
Test Sponsor	TSTSPON1				
Formulation / Stand Code	FORM				
Test Number	TESTNUM				
Start Date	DTSTRT	Start Time	STRTTIME	Time Zone	TZONE

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 ESRQME No ORQME *

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 YESFULL No NOFULL *

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 ESNODE * No IONODE

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 YESDEV * No NODEV *(This currently applies only to specific deviations identified in the ASTM Information Letter System)*

Check the Appropriate Conclusion

INCLUDE	Operational review of this test indicates that the results should be included in the Multiple Test Acceptance Criteria calculations.
DONOTINC	*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
ACCCOMM1
ACCCOMM2
ACCCOMM3
ACCCOMM4

SUBSIGIM _____ SUBDATE _____

Signature Date

SUBNAME _____ SUBTITLE _____

Typed Name Title