

A5. Report Forms
M11 EGR
LUBRICANT PERFORMANCE TEST

VERSION 20010328 BETA

METHOD METHOD

CONDUCTED FOR:

TSTSPON1

TSTSPON2

<i>LABVALID</i>	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
	N = NOT INTERPRETABLE; THE NON-REFERENCE OIL RESULTS CANNOT BE INTERPRETED AND SHALL NOT BE USED FOR MULTIPLE TEST ACCEPTANCE.

<i>TSTOIL</i>	NR = Non-Reference Oil Test
	RO = Reference Oil Test

STAND: <i>STAND</i>	ENGINE NO.: <i>ENGINE</i>	ENGINE RUN NO.: <i>ENRUN</i>
END OF TEST DATE: <i>DTCOMP</i>		END OF TEST TIME: <i>EOTTIME</i>
OIL CODE: <i>OILCODE</i>		
FORMULATION/STAND CODE: <i>FORM</i>		
ALTCODE1: <i>ALTCODE1</i>	ALTCODE2: <i>ALTCODE2</i>	ALTCODE3: <i>ALTCODE3</i>

In my opinion *OPVALID* been conducted in a valid manner in accordance with the Test and the appropriate amendments through the information letter system. The remarks included in this report describe

SUBMITTED BY: _____ *SUBLAB*

 Testing Laboratory
 _____ *SUBSIGIM*

 Signature
 _____ *SUBNAME*

 Typed Name
 _____ *SUBTITLE*

 Typed Name

**M11 EGR 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.	Crosshead Mass Loss Summary	Form 6
7.	Oil Filter Delta Pressure Plot	Form 7
8.	Sludge Rating Summary	Form 8
9.	Rod Bearing Mass Loss	Form 9
10.	Piston Rating Summary	Form 10
11.	Piston 1 Deposit Rating	Form 11
12.	Piston 2 Deposit Rating	Form 12
13.	Piston 3 Deposit Rating	Form 13
14.	Piston 4 Deposit Rating	Form 14
15.	Piston 5 Deposit Rating	Form 15
16.	Piston 6 Deposit Rating	Form 16
17.	Ring Mass Loss Summary	Form 17
18.	Oil Analysis Summary	Form 18
19.	Test Fuel Analysis	Form 19
20.	Injector Adjusting Screw Mass Loss	Form 20
21.	Unscheduled Downtime & Maintenance Summary	Form 21
22.	Characteristics of the Data Acquisition System	Form 22
23.	Liner Wear Summary	Form 23

**M11 EGR LUBRICANT PERFORMANCE TEST
FORM 3
SUMMARY OF TEST METHOD**

The M11 EGR Lubricant Performance Test is a fired engine-dynamometer test which evaluates the ability of a lubricant to minimize crosshead wear, filter plugging, and sludge build-up. this test is a two stage, steady state test (constant speed and load). Stage A is 50 h and is run with retarded fuel injection timing to produce elevated soot levels in the oil. Stage B is 50 h and is run under heavy load conditions to induce wear. The stages are run in sequence (Stage A followed by Stage B) three times for a total test length of 300 h.

The test engine is a Cummins M11 diesel engine with EGR. It is an in-line six cylinder, four stroke, turbocharged engine with

M11 EGR TEST CONDITIONS

Parameter	Stage A	Stage B
Time, h	50	50
Injection Timing, °BTDC	16 min	32
Speed, r/min	1800	1600
Fuel Flow, kg/h	58.0	64.4
EGR Rate, %	Record	8.5 - 9.8
Inlet Manifold Temp., °C	80	65.5
Coolant Out Temp., °C	65.5	65.5
Fuel In Temp., °C	40	40
Oil Gallery Temp., °C	115	115
Intake Air Temp., °C	Record	Record
Intake Air Pressure, kPa	Record	Record
Intake Manifold Pressure, kPa	300 Minimum	320 Minimum
Exhaust Back Pressure, kPa	107	107
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 Sump 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

M11 EGR LUBRICANT PERFORMANCE TEST
Test Results Summary
Form 4

Laborator <i>LAB</i>	EOT Date: <i>DTCOMP</i>	EOT Time: <i>EOTTIME</i>
Stand: <i>STAND</i>	Engine <i>ENGINE</i>	Engine Run <i>ENRUN</i>
Formulation/Stand <i>FORM</i>		
Oil <i>OILCODE</i>	Engine Kit <i>ENKIT</i>	

DATE TEST STARTED	<i>DTSTRT</i>
START TIME	<i>STRTIME</i>
TEST LENGTH	<i>TESTLEN</i>
TMC OIL CODE ^A	<i>IND</i>
LABORATORY OIL CODE	<i>LABOCODE</i>
SAE VISCOSITY	<i>SAEVISC</i>
TGA SOOT % AT 50 h (2.8 minimum)	<i>TGA050</i>
TGA SOOT % AT 250 h (8.0 - 9.5)	<i>TGA250</i>
TOTAL OIL CONSUMPTION, kg	<i>TOTOCON</i>

	Adjusted Average Crosshead Mass Loss	Filter Plugging Delta P (kPa)	Average Sludge Rating (merits)
Original Result	<i>ACWL</i>	<i>OILDLP</i>	<i>ASRT</i>
Transformed Result ^B	<i>TRNACWL</i>	<i>TRNODP</i>	<i>TRNASRT</i>
Correction Factor ^B	<i>ACWLCF</i>	<i>OILDPCF</i>	<i>ASRTCFCF</i>
Corrected Transformed Result ^B	<i>ACWLCOR</i>	<i>OILDPCOR</i>	<i>ASRTCOR</i>
Severity Adjustment ^B	<i>ACWL_SA</i>	<i>OILDLP_SA</i>	<i>ASRT_SA</i>
Final Transformed Result ^B	<i>TACWLFNL</i>	<i>TODPFNL</i>	<i>TASRTFNL</i>
Final Result	<i>ACWLFNL</i>	<i>OILDPFNL</i>	<i>ASRTFNL</i>

LAST STAND REFERENCE RESULTS

TEST NUMBER: <i>STAND</i> <i>ENGINE</i> <i>RENRUN</i>
OILCODE <i>ROILCODE</i>
TEST LENGTH <i>RTESTLEN</i>
TMC OIL CODE <i>RIND</i>
EOT DATE <i>RDTCOMP</i>
EOT TIME <i>REOTTIME</i>
STAND CALIBRATION EXPIRATION DATE <i>DTCALEXP</i>
TGA SOOT % AT 50 h (2.8 minimum) <i>RTGA050</i>
TGA SOOT % AT 250 h (8.5 - 9.5) <i>RTGA250</i>
TOTAL OIL CONSUMPTION, kg <i>RTOTOCON</i>

	Adjusted Average Crosshead Mass Loss	Filter Plugging Delta P (kPa)	Average Sludge Rating (merits)
Original Result	<i>RACWL</i>	<i>ROILDLP</i>	<i>RASRT</i>
Transformed Result ^B	<i>RTRNACWL</i>	<i>RTRNODP</i>	<i>RTRNASRT</i>
Correction Factor ^B	<i>RACWLCF</i>	<i>ROILDPCF</i>	<i>RASRTCFCF</i>
Corrected Transformed Result ^B	<i>RACWLCOR</i>	<i>RTODPCOR</i>	<i>RASRTCOR</i>
Final Transformed Result ^B	<i>RTCWLFNL</i>	<i>RTODPFNL</i>	<i>RTSRTFNL</i>
Final Result	<i>RACWLFNL</i>	<i>RFPDPFNL</i>	<i>RASRTFNL</i>

^AReference Tests Only

^BTransformed Units

**M11 EGR LUBRICANT PERFORMANCE TEST
FORM 5
OPERATIONAL SUMMARY**

Laboratory <i>LAB</i>	EOT Date <i>DTCOMP</i>	EOT Time <i>EOTTIME</i>
Test Number Stand: <i>STAND</i>	Engine: <i>ENGINE</i>	Engine Run <i>ENRUN</i>
Formulation/Stand <i>FORM</i>		
Oil Code: <i>OILCODE</i>		

Controlled Parameters	Parameter	Units	QI Threshold	EOT QI ^A	Target		Average		Samples ^B	BQD ^C	Over/Under Range ^D
	Speed	r/min	0.000	<i>QRPM</i>	1800	1600	<i>ARPM</i>	<i>ARPMB</i>	<i>NRPM</i>	<i>BRPM</i>	<i>ORPM</i>
	Fuel Flow	kg/h	0.000	<i>QFFLO</i>	58.0	64.4	<i>AFFLOA</i>	<i>AFFLOB</i>	<i>NFFLO</i>	<i>BFFLO</i>	<i>OFFLO</i>
	Coolant Out	°C	0.000	<i>QCOLOUT</i>	65.5		<i>ACOLOUT</i>		<i>NCOLOUT</i>	<i>BCOLOUT</i>	<i>OCOLOUT</i>
	Fuel In	°C	0.000	<i>QFUEL</i>	40		<i>AFUEL</i>		<i>NFUEL</i>	<i>BFUEL</i>	<i>OFUEL</i>
	Oil Gallery	°C	0.000	<i>QOILTEM</i>	115		<i>AOILTEM</i>		<i>NOILTEM</i>	<i>BOILTEM</i>	<i>OOILTEM</i>
	Intake Manifold	°C	0.000	<i>QINMANT</i>	80.0	65.5	<i>AINMANTA</i>	<i>AINMANTB</i>	<i>NINMANT</i>	<i>BINMANT</i>	<i>OINMANT</i>
	Exhaust	kPa	0.000	<i>QEXHSTP</i>	107		<i>AEXHSTP</i>		<i>NEXHSTP</i>	<i>BEXHSTP</i>	<i>OEXHSTP</i>
	Parameter	Units	Typical Values ^E		Average						
	Torque	N-m	TBD	TBD	<i>ALOAD</i>		<i>ALOADB</i>				
Power	kW	TBD	TBD	<i>APWRA</i>		<i>APWRB</i>					
EGR Rate ^F	%	Record	8.5 - 9.8	<i>EGRA</i>		<i>EGRB</i>					
Blowby	L/min	TBD		<i>ABLOBY</i>							
Coolant In	°C	TBD		<i>ACOLIN</i>							
Intake Air	°C	TBD		<i>AINAIRT</i>							
Pre-Turbine (F)	°C	TBD		<i>APTURFT</i>							
Pre-Turbine (R)	°C	TBD		<i>APTURRT</i>							
Tailpipe	°C	TBD		<i>ATAILPT</i>							
Fuel	kPa	TBD		<i>AFPMP</i>							
Oil Gallery	kPa	TBD		<i>AOILPRS</i>							
Coolant	kPa	99 - 107		<i>ACOLOUP</i>							
Intake Manifold	kPa	TBD		<i>AINMANP</i>							
Crankcase	kPa	TBD		<i>ACCASEP</i>							
Intake Air	kPa	TBD		<i>AINAIRR</i>							

^A QI values above the threshold are acceptable by the M11 Surveillance Panel. QI values below the threshold may not be considered acceptable based on

^B Total number of data points taken

^C Number of Bad Quality Data points not used in the calculation of the statistical measures

^D Number of points clipped by over/under range limits

^E Typical values determined from reference oil test database

^F Stage B EGR Rate shall be within specified range for test to be operationally valid.

**M11 EGR LUBRICANT PERFORMANCE TEST
FORM 6
CROSSHEAD MASS LOSS SUMMARY**

Laborator <i>LAB</i>	EOT Date <i>DTCOMP</i>	EOT Time <i>EOTTIME</i>
Test Number		
STAND: <i>STAND</i>	ENGINE: <i>ENGINE</i>	ENGINE RUN NO.: <i>ENRUN</i>
FORMULATION/STAND CODE: <i>FORM</i>		
OIL CODE: <i>OILCODE</i>		

LOCATION	SERIAL NO.	PRETEST MASS (g)	EOT MASS (g)	MASS LOSS (mg)
1E	<i>CHDSN1E</i>	<i>CHDPTW1E</i>	<i>CHDEW1E</i>	<i>CHDEWL1E</i>
1I	<i>CHDSN1I</i>	<i>CHDPTW1I</i>	<i>CHDEW1I</i>	<i>CHDEWL1I</i>
2I	<i>CHDSN2I</i>	<i>CHDPTW2I</i>	<i>CHDEW2I</i>	<i>CHDEWL2I</i>
2E	<i>CHDSN2E</i>	<i>CHDPTW2E</i>	<i>CHDEW2E</i>	<i>CHDEWL2E</i>
3E	<i>CHDSN3E</i>	<i>CHDPTW3E</i>	<i>CHDEW3E</i>	<i>CHDEWL3E</i>
3I	<i>CHDSN3I</i>	<i>CHDPTW3I</i>	<i>CHDEW3I</i>	<i>CHDEWL3I</i>
4I	<i>CHDSN4I</i>	<i>CHDPTW4I</i>	<i>CHDEW4I</i>	<i>CHDEWL4I</i>
4E	<i>CHDSN4E</i>	<i>CHDPTW4E</i>	<i>CHDEW4E</i>	<i>CHDEWL4E</i>
5E	<i>CHDSN5E</i>	<i>CHDPTW5E</i>	<i>CHDEW5E</i>	<i>CHDEWL5E</i>
5I	<i>CHDSN5I</i>	<i>CHDPTW5I</i>	<i>CHDEW5I</i>	<i>CHDEWL5I</i>
6I	<i>CHDSN6I</i>	<i>CHDPTW6I</i>	<i>CHDEW6I</i>	<i>CHDEWL6I</i>
6E	<i>CHDSN6E</i>	<i>CHDPTW6E</i>	<i>CHDEW6E</i>	<i>CHDEWL6E</i>

INTAKE/EXHAUST SUMMARY	INTAKE		EXHAUST	
	As Measured	Outlier	As Measured	Outlier
Average Crosshead Mass Loss	<i>ACHDWLI</i>	<i>OACHDWLI</i>	<i>ACHDWLE</i>	<i>OACHDWLE</i>
Minimum Crosshead Mass Loss	<i>ICHDWLI</i>	<i>OICHDWLI</i>	<i>ICHDWLE</i>	<i>OICHDWLE</i>
Maximum Crosshead Mass Loss	<i>XCHDWLI</i>	<i>OXCHDWLI</i>	<i>XCHDWLE</i>	<i>OXCHDWLE</i>
Standard Deviation (mg)	<i>SCHDWLI</i>	<i>OSCHDWLI</i>	<i>SCHDWLE</i>	<i>OSCHDWLE</i>
Outlier Crossheads Locations ^A	<i>CHDOUTI</i>		<i>CHDOUTE</i>	

^A Location Designation. Example: 3E

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

M11 EGR LUBRICANT PERFORMANCE TEST
FORM 7
OIL FILTER DELTA PRESSURE PLOT

Laboratory <i>LAB</i>	EOT Date <i>DTCOMP</i>	EOT Time <i>EOTTIME</i>
Test Number		
STAND: <i>STAND</i>	ENGINE: <i>ENGINE</i>	ENGINE RUN NO.: <i>ENRUN</i>
FORMULATION/STAND CODE: <i>FORM</i>		
OIL CODE: <i>OILCODE</i>		

OIL FILTER DELTA PRESSURE vs TEST HOURS

OIL FILTER DELTA P (kPa)

OFDPIM

TEST HOURS

**M11 EGR LUBRICANT PERFORMANCE TEST
FORM 8
SLUDGE RATING SUMMARY**

Laboratory <i>LAB</i>	EOT Date: <i>DTCOMP</i>	EOT Time: <i>EOTTIME</i>
TEST NUMBER		
STAND: <i>STAND</i>	ENGINE: <i>ENGINE</i>	ENGINE RUN NO.: <i>ENRUN</i>
FORMULATION/STAND CODE: <i>FORM</i>		
OIL CODE: <i>OILCODE</i>		

SLUDGE RATING SUMMARY

Sludge Depth	Valve Cover % of Area	Valve Cover Volume Factor	Oil Pan % of Area	Oil Pan Volume Factor
1/4A	<i>RCSEA01</i>	<i>RCSEV01</i>	<i>OILPSA01</i>	<i>OILPSV01</i>
1/2A	<i>RCSEA02</i>	<i>RCSEV02</i>	<i>OILPSA02</i>	<i>OILPSV02</i>
3/4A	<i>RCSEA03</i>	<i>RCSEV03</i>	<i>OILPSA03</i>	<i>OILPSV03</i>
A	<i>RCSEA04</i>	<i>RCSEV04</i>	<i>OILPSA04</i>	<i>OILPSV04</i>
AB	<i>RCSEA05</i>	<i>RCSEV05</i>	<i>OILPSA05</i>	<i>OILPSV05</i>
B	<i>RCSEA06</i>	<i>RCSEV06</i>	<i>OILPSA06</i>	<i>OILPSV06</i>
BC	<i>RCSEA07</i>	<i>RCSEV07</i>	<i>OILPSA07</i>	<i>OILPSV07</i>
C	<i>RCSEA08</i>	<i>RCSEV08</i>	<i>OILPSA08</i>	<i>OILPSV08</i>
D	<i>RCSEA09</i>	<i>RCSEV09</i>	<i>OILPSA09</i>	<i>OILPSV09</i>
E	<i>RCSEA10</i>	<i>RCSEV10</i>	<i>OILPSA10</i>	<i>OILPSV10</i>
F	<i>RCSEA11</i>	<i>RCSEV11</i>	<i>OILPSA11</i>	<i>OILPSV11</i>
G	<i>RCSEA12</i>	<i>RCSEV12</i>	<i>OILPSA12</i>	<i>OILPSV12</i>
H	<i>RCSEA13</i>	<i>RCSEV13</i>	<i>OILPSA13</i>	<i>OILPSV13</i>
I	<i>RCSEA14</i>	<i>RCSEV14</i>	<i>OILPSA14</i>	<i>OILPSV14</i>
J	<i>RCSEA15</i>	<i>RCSEV15</i>	<i>OILPSA15</i>	<i>OILPSV15</i>
	Total Volume	<i>RCSEVT</i>	Total Volume	<i>OILPSVT</i>
	MERIT RATING:	<i>RCSEMRT</i>	MERIT RATING:	<i>OILPSMRT</i>
	Average Sludge Rating:			<i>ASRT</i>

**M11 EGR LUBRICANT PERFORMANCE TEST
FORM 9
ROD BEARING MASS LOSS**

Laboratory <i>LAB</i>	EOT Date <i>DTCOMP</i>	EOT Time <i>EOTTIME</i>
Test Number		
STAND: <i>STAND</i>	ENGINE: <i>ENGINE</i>	ENGINE RUN NO.: <i>ENRUN</i>
FORMULATION/STAND CODE: <i>FORM</i>		
OIL CODE: <i>OILCODE</i>		

CYLINDER NUMBER	BEARING LOCATION	PRE-TEST MASS (g)	POST-TEST MASS (g)	MASS LOSS (mg)
1	UPPER	<i>BWCYL1TP</i>	<i>BWCYL1TE</i>	<i>BWL1T</i>
	LOWER	<i>BWCYL1BP</i>	<i>BWCYL1BE</i>	<i>BWL1B</i>
2	UPPER	<i>BWCYL2TP</i>	<i>BWCYL2TE</i>	<i>BWL2T</i>
	LOWER	<i>BWCYL2BP</i>	<i>BWCYL2BE</i>	<i>BWL2B</i>
3	UPPER	<i>BWCYL3TP</i>	<i>BWCYL3TE</i>	<i>BWL3T</i>
	LOWER	<i>BWCYL3BP</i>	<i>BWCYL3BE</i>	<i>BWL3B</i>
4	UPPER	<i>BWCYL4TP</i>	<i>BWCYL4TE</i>	<i>BWL4T</i>
	LOWER	<i>BWCYL4BP</i>	<i>BWCYL4BE</i>	<i>BWL4B</i>
5	UPPER	<i>BWCYL5TP</i>	<i>BWCYL5TE</i>	<i>BWL5T</i>
	LOWER	<i>BWCYL5BP</i>	<i>BWCYL5BE</i>	<i>BWL5B</i>
6	UPPER	<i>BWCYL6TP</i>	<i>BWCYL6TE</i>	<i>BWL6T</i>
	LOWER	<i>BWCYL6BP</i>	<i>BWCYL6BE</i>	<i>BWL6B</i>

	BEARING MASS LOSS
AVERAGE (mg)	<i>ASBWL</i>
MINIMUM (mg)	<i>ISBWL</i>
MAXIMUM (mg)	<i>XSBWL</i>
STANDARD DEVIATION (mg)	<i>SSBWL</i>

**M11 EGR LUBRICANT PERFORMANCE TEST
FORM 10
PISTON RATING SUMMARY**

Laborator <i>LAB</i>	EOT Date <i>DTCOMP</i>	EOT Time <i>EOTTIME</i>
TEST NUMBER		
STAND: <i>STAND</i>	ENGINE: <i>ENGINE</i>	ENGINE RUN NO.: <i>ENRUN</i>
FORMULATION/STAND CODE: <i>FORM</i>		
OILCODE: <i>OILCODE</i>		

UNWEIGHTED DEMERITS

PISTON NUMBER	Lands				Grooves			Under Crown	Oil Cooling Gallery	Total Demerits
	1	2	3	4	1	2	3			
1	<i>L1UWD1</i>	<i>L2UWD1</i>	<i>L3UWD1</i>	<i>L4UWD1</i>	<i>G1UWD1</i>	<i>G2UWD1</i>	<i>G3UWD1</i>	<i>UCUWD1</i>	<i>OGUWD1</i>	<i>UWD1</i>
2	<i>L1UWD2</i>	<i>L2UWD2</i>	<i>L3UWD2</i>	<i>L4UWD2</i>	<i>G1UWD2</i>	<i>G2UWD2</i>	<i>G3UWD2</i>	<i>UCUWD2</i>	<i>OGUWD2</i>	<i>UWD2</i>
3	<i>L1UWD3</i>	<i>L2UWD3</i>	<i>L3UWD3</i>	<i>L4UWD3</i>	<i>G1UWD3</i>	<i>G2UWD3</i>	<i>G3UWD3</i>	<i>UCUWD3</i>	<i>OGUWD3</i>	<i>UWD3</i>
4	<i>L1UWD4</i>	<i>L2UWD4</i>	<i>L3UWD4</i>	<i>L4UWD4</i>	<i>G1UWD4</i>	<i>G2UWD4</i>	<i>G3UWD4</i>	<i>UCUWD4</i>	<i>OGUWD4</i>	<i>UWD4</i>
5	<i>L1UWD5</i>	<i>L2UWD5</i>	<i>L3UWD5</i>	<i>L4UWD5</i>	<i>G1UWD5</i>	<i>G2UWD5</i>	<i>G3UWD5</i>	<i>UCUWD5</i>	<i>OGUWD5</i>	<i>UWD5</i>
6	<i>L1UWD6</i>	<i>L2UWD6</i>	<i>L3UWD6</i>	<i>L4UWD6</i>	<i>G1UWD6</i>	<i>G2UWD6</i>	<i>G3UWD6</i>	<i>UCUWD6</i>	<i>OGUWD6</i>	<i>UWD6</i>
Average Demerits	<i>AL1UWD</i>	<i>AL2UWD</i>	<i>AL3UWD</i>	<i>AL4UWD</i>	<i>AG1UWD</i>	<i>AG2UWD</i>	<i>AG3UWD</i>	<i>AUCUWD</i>	<i>AOGUWD</i>	
Average Total Unweighted Demerits									<i>TOTUWD</i>	

PARAMETER	PISTON NUMBER						AVERAGE
	1	2	3	4	5	6	
TGC	<i>TGC1</i>	<i>TGC2</i>	<i>TGC3</i>	<i>TGC4</i>	<i>TGC5</i>	<i>TGC6</i>	<i>ATGC</i>
TLC	<i>TLC1</i>	<i>TLC2</i>	<i>TLC3</i>	<i>TLC4</i>	<i>TLC5</i>	<i>TLC6</i>	<i>ATLC</i>

M11 EGR LUBRICANT PERFORMANCE TEST

FORM 11

PISTON 1 DEPOSIT RATINGS

Laboratory <i>LAB</i>	EOT Date <i>DTCOMP</i>	EOT Time <i>EOTTIME</i>
TEST NUMBER		
STAND: <i>STAND</i>	ENGINE: <i>ENGINE</i>	ENGINE RUN NO.: <i>ENRUN</i>
FORMULATION/STAND CODE: <i>FORM</i>		
OILCODE: <i>OILCODE</i>		

DEP. FACTOR	GROOVES				LANDS				DEP FACTOR	GROOVES				LANDS				OIL COOLING GALLERY (2)		UNDER CROWN (1)	
	NO. 1		NO. 2		NO. 1		NO. 2			NO. 3		NO. 3		NO. 4		A, %	DEM.	A, %	DEM.		
	A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.		A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.		
CARBON																					
HC-1.0	G1HCA1	G1HCD1	H2HCA1	G2HCD1	HCA1	L1HCD1	HCA1	L2HCD1		G3HCA1	G3HCD1	HCA1	L3HCD1	HCA1	L4HCD1						
MC-0.5	G1MCA1	G1MCD1								G3MCA1	G3MCD1										
LC-.25	G1LCA1	G1LCD1	L2LCA1	G2LCD1	LCA1	L1LCD1	LCA1	L2LCD1		G3LCA1	G3LCD1	LCA1	L3LCD1	LCA1	L4LCD1	GLCA1	OGLCD1	L1LCA1	U1LCD1		
TOTAL	G1ACTOT1	G1DCTOT1	G2ACTOT1	G2DCTOT1	L1ACTOT1	L1DCTOT1	L2ACTOT1	L2DCTOT1		G3ACTOT1	G3DCTOT1	L3ACTOT1	L3DCTOT1	L4ACTOT1	L4DCTOT1	OGDCTOT1	UGDCTOT1	L1ACTOT1	U1DCTOT1		
VARNISH																					
8 - 9	G1L9A1	G1L9D1	L2L9A1	G2L9D1	L9A1	L1L9D1	L9A1	L2L9D1	7.5												
7 - 7.9	G1L8A1	G1L8D1	L2L8A1	G2L8D1	L8A1	L1L8D1	L8A1	L2L8D1		G3L75A1	G3L75D1	L75A1	L3L75D1	L75A1	L4L75D1	OGV75D1	L75A1	U1L75D1			
6 - 6.9	G1L7A1	G1L7D1	L2L7A1	G2L7D1	L7A1	L1L7D1	L7A1	L2L7D1													
5 - 5.9	G1L6A1	G1L6D1	L2L6A1	G2L6D1	L6A1	L1L6D1	L6A1	L2L6D1	4.5												
4 - 4.9	G1L5A1	G1L5D1	L2L5A1	G2L5D1	L5A1	L1L5D1	L5A1	L2L5D1		G3L45A1	G3L45D1	L45A1	L3L45D1	L45A1	L4L45D1	OGV45D1	L45A1	U1L45D1			
3 - 3.9	G1L4A1	G1L4D1	L2L4A1	G2L4D1	L4A1	L1L4D1	L4A1	L2L4D1													
2 - 2.9	G1L3A1	G1L3D1	L2L3A1	G2L3D1	L3A1	L1L3D1	L3A1	L2L3D1	1.5												
1 - 1.9	G1L2A1	G1L2D1	L2L2A1	G2L2D1	L2A1	L1L2D1	L2A1	L2L2D1		G3L15A1	G3L15D1	L15A1	L3L15D1	L15A1	L4L15D1	OGV15D1	L15A1	U1L15D1			
> 0 - 0.9	G1L1A1	G1L1D1	L2L1A1	G2L1D1	L1A1	L1L1D1	L1A1	L2L1D1													
TOTAL	G1ALTOT1	G1DLTOT1	G2ALTOT1	G2DLTOT1	L1ALTOT1	L1DLTOT1	L2ALTOT1	L2DLTOT1		G3ALTOT1	G3DLTOT1	L3ALTOT1	L3DLTOT1	L4ALTOT1	L4DLTOT1	OGDVTOT1	UGDVTOT1	L1ALTOT1	U1DLTOT1		
Rating	G1UWD1		G2UWD1		L1UWD1		L2UWD1			G3UWD1		L3UWD1		L4UWD1		OGUWD1		UCUWD1			
TGC %									UNWEIGHTED DEP.				T.L. CARBON				T.L. FLAKED CARBON %				
TGC1									UWD1				TLC1				TLFC1				

**M11 EGR LUBRICANT PERFORMANCE TEST
FORM 12
PISTON 2 DEPOSIT RATINGS**

Laboratory <i>LAB</i>	EOT Date <i>DTCOMP</i>	EOT Time <i>EOTTIME</i>
TEST NUMBER		
STAND: <i>STAND</i>	ENGINE: <i>ENGINE</i>	ENGINE RUN NO.: <i>ENRUN</i>
FORMULATION/STAND CODE: <i>FORM</i>		
OILCODE: <i>OILCODE</i>		

DEP. FACTOR	GROOVES				LANDS				DEP FACTOR	GROOVES				LANDS				OIL COOLING GALLERY (2)		UNDER CROWN (1)	
	NO. 1		NO. 2		NO. 1		NO. 2			NO. 3		NO. 3		NO. 4		A, %	DEM.	A, %	DEM.		
	A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.		A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.		
CARBON																					
HC-1.0	G1HCA2	G1HCD2	2HCA2	G2HCD2	1HCA2	L1HCD2	2HCA2	L2HCD2		G3HCA2	G3HCD2	3HCA2	L3HCD2	4HCA2	L4HCD2						
MC-0.5	G1MCA2	G1MCD2								G3MCA2	G3MCD2										
LC-.25	G1LCA2	G1LCD2	2LCA2	G2LCD2	1LCA2	L1LCD2	2LCA2	L2LCD2		G3LCA2	G3LCD2	3LCA2	L3LCD2	4LCA2	L4LCD2	GLCA2	OGLCD2	1LCA2	U1LCD2		
TOTAL	G1ACTOT2	G1DCTOT2	G2ACTOT2	G2DCTOT2	L1ACTOT2	L1DCTOT2	L2ACTOT2	L2DCTOT2		G3ACTOT2	G3DCTOT2	L3ACTOT2	L3DCTOT2	L4ACTOT2	L4DCTOT2	OGDCTOT2	UGDCTOT2	U1DCTOT2	U1DCTOT2		
VARNISH																					
8 - 9	G1L9A2	G1L9D2	2L9A2	G2L9D2	1L9A2	L1L9D2	2L9A2	L2L9D2													
7 - 7.9	G1L8A2	G1L8D2	2L8A2	G2L8D2	1L8A2	L1L8D2	2L8A2	L2L8D2	7.5	G3L75A2	G3L75D2	2L75A2	L3L75D2	L75A2	L4L75D2	GV75A2	OGV75D2	L75A2	U1L75D2		
6 - 6.9	G1L7A2	G1L7D2	2L7A2	G2L7D2	1L7A2	L1L7D2	2L7A2	L2L7D2													
5 - 5.9	G1L6A2	G1L6D2	2L6A2	G2L6D2	1L6A2	L1L6D2	2L6A2	L2L6D2													
4 - 4.9	G1L5A2	G1L5D2	2L5A2	G2L5D2	1L5A2	L1L5D2	2L5A2	L2L5D2	4.5	G3L45A2	G3L45D2	2L45A2	L3L45D2	L45A2	L4L45D2	GV45A2	OGV45D2	L45A2	U1L45D2		
3 - 3.9	G1L4A2	G1L4D2	2L4A2	G2L4D2	1L4A2	L1L4D2	2L4A2	L2L4D2													
2 - 2.9	G1L3A2	G1L3D2	2L3A2	G2L3D2	1L3A2	L1L3D2	2L3A2	L2L3D2													
1 - 1.9	G1L2A2	G1L2D2	2L2A2	G2L2D2	1L2A2	L1L2D2	2L2A2	L2L2D2	1.5	G3L15A2	G3L15D2	2L15A2	L3L15D2	L15A2	L4L15D2	GV15A2	OGV15D2	L15A2	U1L15D2		
>0 - 0.9	G1L1A2	G1L1D2	2L1A2	G2L1D2	1L1A2	L1L1D2	2L1A2	L2L1D2													
TOTAL	G1ALTOT2	G1DLTOT2	G2ALTOT2	G2DLTOT2	L1ALTOT2	L1DLTOT2	L2ALTOT2	L2DLTOT2		G3ALTOT2	G3DLTOT2	L3ALTOT2	L3DLTOT2	L4ALTOT2	L4DLTOT2	OGAVTOT2	UGDVTOT2	U1ALTOT2	U1DLTOT2		
Rating	G1UWD2		G2UWD2		L1UWD2		L2UWD2			G3UWD2		L3UWD2		L4UWD2		OGUWD2		UCUWD2			
TGC %									UNWEIGHTED DEP.				T.L. CARBON				T.L. FLAKED CARBON %				
TGC2									UWD2				TLC2				TLFC2				

**M11 EGR LUBRICANT PERFORMANCE TEST
FORM 13
PISTON 3 DEPOSIT RATINGS**

Laboratory <i>LAB</i>	EOT Date <i>DTCOMP</i>	EOT Time <i>EOTTIME</i>
TEST NUMBER		
STAND: <i>STAND</i>	ENGINE: <i>ENGINE</i>	ENGINE RUN NO.: <i>ENRUN</i>
FORMULATION/STAND CODE: <i>FORM</i>		
OILCODE: <i>OILCODE</i>		

DEP. FACTOR	GROOVES				LANDS				DEP FACTOR	GROOVES				LANDS				OIL COOLING GALLERY (2)		UNDER CROWN (1)	
	NO. 1		NO. 2		NO. 1		NO. 2			NO. 3		NO. 3		NO. 4		A, %	DEM.	A, %	DEM.		
	A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.		A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.		
CARBON																					
HC-1.0	G1HCA3	G1HCDE3	2HCA3	G2HCDE3	1HCA3	L1HCDE3	2HCA3	L2HCDE3		G3HCA3	G3HCDE3	3HCA3	L3HCDE3	4HCA3	L4HCDE3						
MC-0.5	G1MCA3	G1MCD3								G3MCA3	G3MCD3										
LC-.25	G1LCA3	G1LCDE3	2LCA3	G2LCDE3	1LCA3	L1LCDE3	2LCA3	L2LCDE3		G3LCA3	G3LCDE3	3LCA3	L3LCDE3	4LCA3	L4LCDE3	OG3LCA3	OG3LCDE3	1LCA3	U1LCDE3		
TOTAL	G1ACTOT3	G1DCTOT3	G2ACTOT3	G2DCTOT3	L1ACTOT3	L1DCTOT3	L2ACTOT3	L2DCTOT3		G3ACTOT3	G3DCTOT3	L3ACTOT3	L3DCTOT3	L4ACTOT3	L4DCTOT3	OGACTOT3	OGDCTOT3	LACTOT3	ULDCTOT3		
VARNISH																					
8 - 9	G1L9A3	G1L9DE3	2L9A3	G2L9DE3	1L9A3	L1L9DE3	2L9A3	L2L9DE3	7.5	G3L75A3	G3L75DE3	3L75A3	L3L75DE3	4L75A3	L4L75DE3	OGV75A3	OGV75DE3	3L75A3	U1L75DE3		
7 - 7.9	G1L8A3	G1L8DE3	2L8A3	G2L8DE3	1L8A3	L1L8DE3	2L8A3	L2L8DE3													
6 - 6.9	G1L7A3	G1L7DE3	2L7A3	G2L7DE3	1L7A3	L1L7DE3	2L7A3	L2L7DE3													
5 - 5.9	G1L6A3	G1L6DE3	2L6A3	G2L6DE3	1L6A3	L1L6DE3	2L6A3	L2L6DE3	4.5	G3L45A3	G3L45DE3	3L45A3	L3L45DE3	4L45A3	L4L45DE3	OGV45A3	OGV45DE3	3L45A3	U1L45DE3		
4 - 4.9	G1L5A3	G1L5DE3	2L5A3	G2L5DE3	1L5A3	L1L5DE3	2L5A3	L2L5DE3													
3 - 3.9	G1L4A3	G1L4DE3	2L4A3	G2L4DE3	1L4A3	L1L4DE3	2L4A3	L2L4DE3													
2 - 2.9	G1L3A3	G1L3DE3	2L3A3	G2L3DE3	1L3A3	L1L3DE3	2L3A3	L2L3DE3	1.5	G3L15A3	G3L15DE3	3L15A3	L3L15DE3	4L15A3	L4L15DE3	OGV15A3	OGV15DE3	3L15A3	U1L15DE3		
1 - 1.9	G1L2A3	G1L2DE3	2L2A3	G2L2DE3	1L2A3	L1L2DE3	2L2A3	L2L2DE3													
>0 - 0.9	G1L1A3	G1L1DE3	2L1A3	G2L1DE3	1L1A3	L1L1DE3	2L1A3	L2L1DE3													
TOTAL	G1ALTOT3	G1DLTOT3	G2ALTOT3	G2DLTOT3	L1ALTOT3	L1DLTOT3	L2ALTOT3	L2DLTOT3		G3ALTOT3	G3DLTOT3	L3ALTOT3	L3DLTOT3	L4ALTOT3	L4DLTOT3	OGAVTOT3	OGDVTOT3	LALTOT3	ULDVTOT3		
Rating	G1UWD3	G2UWD3	L1UWD3	L2UWD3						G3UWD3	L3UWD3	L4UWD3			OGUWD3	UCUWD3					
TGC %										UNWEIGHTED DEP.		T.L. CARBON			T.L. FLAKED CARBON %						
TGC3										UWD3		TLC3			TLFC3						

**M11 EGR LUBRICANT PERFORMANCE TEST
FORM 14
PISTON 4 DEPOSIT RATINGS**

Laborato LAB	EOT DTCOMP	EOT EOTTIME
TEST NUMBER		
STAND: STAND	ENGINE ENGINE	ENGINE RUN ENRUN
FORMULATION/STAND	FORM	
OILCODE OILCODE		

DEP. FACTOR	GROOVES				LANDS				DEP FACTOR	GROOVES				LANDS				OIL COOLING		UNDER CROWN (1)	
	NO. 1		NO. 2		NO. 1		NO. 2			NO. 3		NO. 3		NO. 4		A, %	DEM.	A, %	DEM.		
	A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.		A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.		
CARBON																					
HC-1.0	G1HCA4	G1HCD4	G2HCA4	G2HCD4	G1HCA4	L1HCD4	G2HCA4	L2HCD4		G3HCA4	G3HCD4	G3HCA4	L3HCD4	G4HCA4	L4HCD4						
MC-0.5	G1MCA4	G1MCD4								G3MCA4	G3MCD4										
LC-.25	G1LCA4	G1LCD4	G2LCA4	G2LCD4	G1LCA4	L1LCD4	G2LCA4	L2LCD4		G3LCA4	G3LCD4	G3LCA4	L3LCD4	G4LCA4	L4LCD4	OG1LCA4	OG1LCD4	G1LCA4	U1LCD4		
TOTAL	G1ACTOT4	G1DCTOT4	G2ACTOT4	G2DCTOT4	G1ACTOT4	L1DCTOT4	G2ACTOT4	L2DCTOT4		G3ACTOT4	G3DCTOT4	G3ACTOT4	L3DCTOT4	G4ACTOT4	L4DCTOT4	OGDCTOT4	OGDCTOT4	G1ACTOT4	U1DCTOT4		
VARNISH																					
8 - 9	G1L9A4	G1L9D4	G2L9A4	G2L9D4	G1L9A4	L1L9D4	G2L9A4	L2L9D4	7.5	G3L75A4	G3L75D4	G3L75A4	L3L75D4	G4L75A4	L4L75D4	GV75A4	OGV75D4	G3L75A4	U1L75D4		
7 - 7.9	G1L8A4	G1L8D4	G2L8A4	G2L8D4	G1L8A4	L1L8D4	G2L8A4	L2L8D4													
6 - 6.9	G1L7A4	G1L7D4	G2L7A4	G2L7D4	G1L7A4	L1L7D4	G2L7A4	L2L7D4													
5 - 5.9	G1L6A4	G1L6D4	G2L6A4	G2L6D4	G1L6A4	L1L6D4	G2L6A4	L2L6D4	4.5	G3L45A4	G3L45D4	G3L45A4	L3L45D4	G4L45A4	L4L45D4	GV45A4	OGV45D4	G3L45A4	U1L45D4		
4 - 4.9	G1L5A4	G1L5D4	G2L5A4	G2L5D4	G1L5A4	L1L5D4	G2L5A4	L2L5D4													
3 - 3.9	G1L4A4	G1L4D4	G2L4A4	G2L4D4	G1L4A4	L1L4D4	G2L4A4	L2L4D4													
2 - 2.9	G1L3A4	G1L3D4	G2L3A4	G2L3D4	G1L3A4	L1L3D4	G2L3A4	L2L3D4	1.5	G3L15A4	G3L15D4	G3L15A4	L3L15D4	G4L15A4	L4L15D4	GV15A4	OGV15D4	G3L15A4	U1L15D4		
1 - 1.9	G1L2A4	G1L2D4	G2L2A4	G2L2D4	G1L2A4	L1L2D4	G2L2A4	L2L2D4													
>0 -	G1L1A4	G1L1D4	G2L1A4	G2L1D4	G1L1A4	L1L1D4	G2L1A4	L2L1D4													
TOTAL	G1ALTOT4	G1DLTOT4	G2ALTOT4	G2DLTOT4	G1ALTOT4	L1DLTOT4	G2ALTOT4	L2DLTOT4		G3ALTOT4	G3DLTOT4	G3ALTOT4	L3DLTOT4	G4ALTOT4	L4DLTOT4	OGDVTOTAL	OGDVTOTAL	G1ALTOT4	U1DLTOT4		
Rating	G1UWD4	G2UWD4	L1UWD4	L2UWD4						G3UWD4	L3UWD4	L4UWD4	OGUWD4	UCUWD4							
TGC %									UNWEIGHTED DEP.	T.L. CARBON				T.L. FLAKED CARBON							
TGC4									UWD4	TLC4				TLFC4							

**M11 EGR LUBRICANT PERFORMANCE TEST
FORM 15
PISTON 5 DEPOSIT RATINGS**

Laboratory <i>LAB</i>	EOT Date <i>DTCOMP</i>	EOT Time <i>EOTTIME</i>
TEST NUMBER		
STAND: <i>STAND</i>	ENGINE: <i>ENGINE</i>	ENGINE RUN NO.: <i>ENRUN</i>
FORMULATION/STAND CODE: <i>FORM</i>		
OILCODE: <i>OILCODE</i>		

DEP. FACTOR	GROOVES				LANDS				DEP FACTOR	GROOVES				LANDS				OIL COOLING GALLERY (2)		UNDER CROWN (1)	
	NO. 1		NO. 2		NO. 1		NO. 2			NO. 3		NO. 3		NO. 4		A, %	DEM.	A, %	DEM.		
	A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.		A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.		
CARBON																					
HC-1.0	G1HCA5	G1HCD5	G2HCA5	G2HCD5	G1HCA5	L1HCD5	G2HCA5	L2HCD5		G3HCA5	G3HCD5	G3HCA5	L3HCD5	G4HCA5	L4HCD5						
MC-0.5	G1MCA5	G1MCD5								G3MCA5	G3MCD5										
LC-.25	G1LCA5	G1LCD5	G2LCA5	G2LCD5	G1LCA5	L1LCD5	G2LCA5	L2LCD5		G3LCA5	G3LCD5	G3LCA5	L3LCD5	G4LCA5	L4LCD5	OG1LCA5	OGLCD5	G1LCA5	U1LCD5		
TOTAL	G1ACTOT5	G1DCTOT5	G2ACTOT5	G2DCTOT5	L1ACTOT5	L1DCTOT5	L2ACTOT5	L2DCTOT5		G3ACTOT5	G3DCTOT5	L3ACTOT5	L3DCTOT5	L4ACTOT5	L4DCTOT5	OGACTOT5	OGDCTOT5	U1ACTOT5	U1DCTOT5		
VARNISH																					
8 - 9	G1L9A5	G1L9D5	G2L9A5	G2L9D5	G1L9A5	L1L9D5	G2L9A5	L2L9D5	7.5	G3L75A5	G3L75D5	G3L75A5	L3L75D5	G4L75A5	L4L75D5	OGV75D5	G3L75A5	U1L75D5			
7 - 7.9	G1L8A5	G1L8D5	G2L8A5	G2L8D5	G1L8A5	L1L8D5	G2L8A5	L2L8D5													
6 - 6.9	G1L7A5	G1L7D5	G2L7A5	G2L7D5	G1L7A5	L1L7D5	G2L7A5	L2L7D5													
5 - 5.9	G1L6A5	G1L6D5	G2L6A5	G2L6D5	G1L6A5	L1L6D5	G2L6A5	L2L6D5	4.5	G3L45A5	G3L45D5	G3L45A5	L3L45D5	G4L45A5	L4L45D5	OGV45D5	G3L45A5	U1L45D5			
4 - 4.9	G1L5A5	G1L5D5	G2L5A5	G2L5D5	G1L5A5	L1L5D5	G2L5A5	L2L5D5													
3 - 3.9	G1L4A5	G1L4D5	G2L4A5	G2L4D5	G1L4A5	L1L4D5	G2L4A5	L2L4D5													
2 - 2.9	G1L3A5	G1L3D5	G2L3A5	G2L3D5	G1L3A5	L1L3D5	G2L3A5	L2L3D5	1.5	G3L15A5	G3L15D5	G3L15A5	L3L15D5	G4L15A5	L4L15D5	OGV15D5	G3L15A5	U1L15D5			
1 - 1.9	G1L2A5	G1L2D5	G2L2A5	G2L2D5	G1L2A5	L1L2D5	G2L2A5	L2L2D5													
>0 - 0.9	G1L1A5	G1L1D5	G2L1A5	G2L1D5	G1L1A5	L1L1D5	G2L1A5	L2L1D5													
TOTAL	G1ALTOT5	G1DLTOT5	G2ALTOT5	G2DLTOT5	L1DLTOT5	L1DLTOT5	L2DLTOT5	L2DLTOT5		G3ALTOT5	G3DLTOT5	L3DLTOT5	L3DLTOT5	L4DLTOT5	L4DLTOT5	OGAVTOT5	OGDVTOT5	U1DLTOT5	U1DLTOT5		
Rating	G1UWD5	G2UWD5	L1UWD5	L2UWD5						G3UWD5	L3UWD5	L4UWD5		OGUWD5	UCUWD5						
TGC %									UNWEIGHTED DEP.				T.L. CARBON				T.L. FLAKED CARBON %				
TGC5									UWD5				TLC5				TLFC5				

**M11 EGR LUBRICANT PERFORMANCE TEST
FORM 16
PISTON 6 DEPOSIT RATINGS**

Laboratory <i>LAB</i>	EOT Date <i>DTCOMP</i>	EOT Time <i>EOTTIME</i>
TEST NUMBER		
STAND: <i>STAND</i>	ENGINE: <i>ENGINE</i>	ENGINE RUN NO.: <i>ENRUN</i>
FORMULATION/STAND CODE: <i>FORM</i>		
OILCODE: <i>OILCODE</i>		

DEP. FACTOR	GROOVES				LANDS				DEP FACTOR	GROOVES		GROOVES		OIL COOLING GALLERY (2)		UNDER CROWN (1)				
	NO. 1		NO. 2		NO. 1		NO. 2			NO. 3		NO. 4								
	A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.		A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.			
CARBON																				
HC-1.0	G1HCA6	G1HCD6	G2HCA6	G2HCD6	G1HCA6	L1HCD6	G2HCA6	L2HCD6		G3HCA6	G3HCD6	G3HCA6	L3HCD6	G4HCA6	L4HCD6					
MC-0.5	G1MCA6	G1MCD6								G3MCA6	G3MCD6									
LC-.25	G1LCA6	G1LCD6	G2LCA6	G2LCD6	G1LCA6	L1LCD6	G2LCA6	L2LCD6		G3LCA6	G3LCD6	G3LCA6	L3LCD6	G4LCA6	L4LCD6	OG1LCA6	OGLCD6	G1LCA6	U1LCD6	
TOTAL	G1ACTOT6	G1DCTOT6	G2ACTOT6	G2DCTOT6	G1ACTOT6	L1DCTOT6	G2ACTOT6	L2DCTOT6		G3ACTOT6	G3DCTOT6	G3ACTOT6	L3DCTOT6	G4ACTOT6	L4DCTOT6	OGDCTOT6	OGDCTOT6	G1ACTOT6	U1DCTOT6	
VARNISH																				
8 - 9	G1L9A6	G1L9D6	G2L9A6	G2L9D6	G1L9A6	L1L9D6	G2L9A6	L2L9D6	7.5	G3L75A6	G3L75D6	G3L75A6	L3L75D6	G4L75A6	L4L75D6	GV75A6	OGV75D6	G3L75A6	U1L75D6	
7 - 7.9	G1L8A6	G1L8D6	G2L8A6	G2L8D6	G1L8A6	L1L8D6	G2L8A6	L2L8D6												
6 - 6.9	G1L7A6	G1L7D6	G2L7A6	G2L7D6	G1L7A6	L1L7D6	G2L7A6	L2L7D6												
5 - 5.9	G1L6A6	G1L6D6	G2L6A6	G2L6D6	G1L6A6	L1L6D6	G2L6A6	L2L6D6	4.5	G3L45A6	G3L45D6	G3L45A6	L3L45D6	G4L45A6	L4L45D6	GV45A6	OGV45D6	G3L45A6	U1L45D6	
4 - 4.9	G1L5A6	G1L5D6	G2L5A6	G2L5D6	G1L5A6	L1L5D6	G2L5A6	L2L5D6												
3 - 3.9	G1L4A6	G1L4D6	G2L4A6	G2L4D6	G1L4A6	L1L4D6	G2L4A6	L2L4D6												
2 - 2.9	G1L3A6	G1L3D6	G2L3A6	G2L3D6	G1L3A6	L1L3D6	G2L3A6	L2L3D6	1.5	G3L15A6	G3L15D6	G3L15A6	L3L15D6	G4L15A6	L4L15D6	GV15A6	OGV15D6	G3L15A6	U1L15D6	
1 - 1.9	G1L2A6	G1L2D6	G2L2A6	G2L2D6	G1L2A6	L1L2D6	G2L2A6	L2L2D6												
>0 - 0.9	G1L1A6	G1L1D6	G2L1A6	G2L1D6	G1L1A6	L1L1D6	G2L1A6	L2L1D6												
TOTAL	G1ALTOT6	G1DLTOT6	G2ALTOT6	G2DLTOT6	G1ALTOT6	L1DLTOT6	G2ALTOT6	L2DLTOT6		G3ALTOT6	G3DLTOT6	G3ALTOT6	L3DLTOT6	G4ALTOT6	L4DLTOT6	OGDVTOT6	OGDVTOT6	G1ALTOT6	U1DLTOT6	
Rating	G1UWD6	G2UWD6	L1UWD6	L2UWD6						G3UWD6	L3UWD6	L4UWD6		OGUWD6	UCUWD6					
TGC %									UNWEIGHTED DEP.		T.L. CARBON		T.L. FLAKED CARBON %							
TGC6									UWD6		TLC6		TLFC6							

**M11 EGR LUBRICANT PERFORMANCE TEST
FORM 17**

Laborator <i>LAB</i>	EOT Date <i>DTCOMP</i>	EOT Time <i>EOTTIME</i>
TEST NUMBER		
STAND: <i>STAND</i>	ENGINE: <i>ENGINE</i>	ENGINE RUN NO.: <i>ENRUN</i>
FORMULATION/STAND CODE: <i>FORM</i>		
OILCODE: <i>OILCODE</i>		

CYLINDER	TOP RING			SECOND RING			OIL RING				
	MASS (g)		MASS LOSS (mg)	MASS (g)		MASS LOSS (mg)	MASS (g)		MASS LOSS (mg)		
	PRETEST	EOT		PRETEST	EOT		PRETEST	EOT			
1	<i>RWCYL1PT</i>	<i>RWCYL1ET</i>	<i>RWLCYL1T</i>	<i>RWCYL1PS</i>	<i>RWCYL1ES</i>	<i>RWLCYL1S</i>	<i>RWCYL1PO</i>	<i>RWCYL1EO</i>	<i>RWLCYL1O</i>		
2	<i>RWCYL2PT</i>	<i>RWCYL2ET</i>	<i>RWLCYL2T</i>	<i>RWCYL2PS</i>	<i>RWCYL2ES</i>	<i>RWLCYL2S</i>	<i>RWCYL2PO</i>	<i>RWCYL2EO</i>	<i>RWLCYL2O</i>		
3	<i>RWCYL3PT</i>	<i>RWCYL3ET</i>	<i>RWLCYL3T</i>	<i>RWCYL3PS</i>	<i>RWCYL3ES</i>	<i>RWLCYL3S</i>	<i>RWCYL3PO</i>	<i>RWCYL3EO</i>	<i>RWLCYL3O</i>		
4	<i>RWCYL4PT</i>	<i>RWCYL4ET</i>	<i>RWLCYL4T</i>	<i>RWCYL4PS</i>	<i>RWCYL4ES</i>	<i>RWLCYL4S</i>	<i>RWCYL4PO</i>	<i>RWCYL4EO</i>	<i>RWLCYL4O</i>		
5	<i>RWCYL5PT</i>	<i>RWCYL5ET</i>	<i>RWLCYL5T</i>	<i>RWCYL5PS</i>	<i>RWCYL5ES</i>	<i>RWLCYL5S</i>	<i>RWCYL5PO</i>	<i>RWCYL5EO</i>	<i>RWLCYL5O</i>		
6	<i>RWCYL6PT</i>	<i>RWCYL6ET</i>	<i>RWLCYL6T</i>	<i>RWCYL6PS</i>	<i>RWCYL6ES</i>	<i>RWLCYL6S</i>	<i>RWCYL6PO</i>	<i>RWCYL6EO</i>	<i>RWLCYL6O</i>		
AVERAGE MASS LOSS (mg)			<i>ARWLT</i>				<i>ARWLS</i>				<i>ARWLO</i>
STD. DEV. MASS LOSS (mg)			<i>SRWLT</i>				<i>SRWLS</i>				<i>SRWLO</i>
MAXIMUM MASS LOSS (mg)			<i>XRWLT</i>				<i>XRWLS</i>				<i>XRWLO</i>
MINIMUM MASS LOSS (mg)			<i>IRWLT</i>				<i>IRWLS</i>				<i>IRWLO</i>

**M11 EGR LUBRICANT PERFORMANCE TEST
FORM 18
OIL ANALYSIS SUMMARY**

Laboratory: <i>LAB</i>	EOT Date: <i>DTCOMP</i>	EOT Time: <i>EOTTIME</i>
TEST NUMBER		
STAND: <i>STAND</i>	ENGINE: <i>ENGINE</i>	ENGINE RUN NO.: <i>ENRUN</i>
FORMULATION/STAND CODE: <i>FORM</i>		
OIL CODE: <i>OILCODE</i>		

Test Hours	VISCOSITY @ 100°C, cSt	TGA % SOOT	TBN D4739	TAN D664	COPPER (ppm)	IRON (ppm)	LEAD (ppm)	ALUMINUM (ppm)	CHROMIUM (ppm)
NEW	<i>V100NEW</i>	<i>TGANEW</i>	<i>TBNNEW</i>	<i>TANNEW</i>	<i>CUWMNEW</i>	<i>FEWMNEW</i>	<i>PBWNEW</i>	<i>ALWNEW</i>	<i>CRWNEW</i>
<i>TST_H025</i>	<i>V100H025</i>	<i>TGA_H025</i>			<i>CUWMH025</i>	<i>FEWMH025</i>	<i>PBWMH025</i>	<i>ALWMH025</i>	<i>CRWMH025</i>
<i>TST_H050</i>	<i>V100H050</i>	<i>TGA050</i>	<i>TBN_H050</i>	<i>TAN_H050</i>	<i>CUWMH050</i>	<i>FEWMH050</i>	<i>PBWMH050</i>	<i>ALWMH050</i>	<i>CRWMH050</i>
<i>TST_H075</i>	<i>V100H075</i>	<i>TGA_H075</i>			<i>CUWMH075</i>	<i>FEWMH075</i>	<i>PBWMH075</i>	<i>ALWMH075</i>	<i>CRWMH075</i>
<i>TST_H100</i>	<i>V100H100</i>	<i>TGA_H100</i>	<i>TBN_H100</i>	<i>TAN_H100</i>	<i>CUWMH100</i>	<i>FEWMH100</i>	<i>PBWMH100</i>	<i>ALWMH100</i>	<i>CRWMH100</i>
<i>TST_H125</i>	<i>V100H125</i>	<i>TGA_H125</i>	<i>TBN_H125</i>	<i>TAN_H125</i>	<i>CUWMH125</i>	<i>FEWMH125</i>	<i>PBWMH125</i>	<i>ALWMH125</i>	<i>CRWMH125</i>
<i>TST_H150</i>	<i>V100H150</i>	<i>TGA_H150</i>	<i>TBN_H150</i>	<i>TAN_H150</i>	<i>CUWMH150</i>	<i>FEWMH150</i>	<i>PBWMH150</i>	<i>ALWMH150</i>	<i>CRWMH150</i>
<i>TST_H175</i>	<i>V100H175</i>	<i>TGA_H175</i>	<i>TBN_H175</i>	<i>TAN_H175</i>	<i>CUWMH175</i>	<i>FEWMH175</i>	<i>PBWMH175</i>	<i>ALWMH175</i>	<i>CRWMH175</i>
<i>TST_H200</i>	<i>V100H200</i>	<i>TGA_H200</i>	<i>TBN_H200</i>	<i>TAN_H200</i>	<i>CUWMH200</i>	<i>FEWMH200</i>	<i>PBWMH200</i>	<i>ALWMH200</i>	<i>CRWMH200</i>
<i>TST_H225</i>	<i>V100H225</i>	<i>TGA_H225</i>	<i>TBN_H225</i>	<i>TAN_H225</i>	<i>CUWMH225</i>	<i>FEWMH225</i>	<i>PBWMH225</i>	<i>ALWMH225</i>	<i>CRWMH225</i>
<i>TST_H250</i>	<i>V100H250</i>	<i>TGA250</i>	<i>TBN_H250</i>	<i>TAN_H250</i>	<i>CUWMH250</i>	<i>FEWMH250</i>	<i>PBWMH250</i>	<i>ALWMH250</i>	<i>CRWMH250</i>
<i>TST_H275</i>	<i>V100H275</i>	<i>TGA_H275</i>	<i>TBN_H275</i>	<i>TAN_H275</i>	<i>CUWMH275</i>	<i>FEWMH275</i>	<i>PBWMH275</i>	<i>ALWMH275</i>	<i>CRWMH275</i>
<i>TST_H300</i>	<i>V100H300</i>	<i>TGA_H300</i>	<i>TBN_H300</i>	<i>TAN_H300</i>	<i>CUWMH300</i>	<i>FEWMH300</i>	<i>PBWMH300</i>	<i>ALWMH300</i>	<i>CRWMH300</i>

**M11 EGR LUBRICANT PERFORMANCE TEST
FORM 19
TEST FUEL ANALYSIS (LAST BATCH)**

Laborator <i>LAB</i>	EOT Date <i>DTCOMP</i>	EOT Time <i>EOTTIME</i>
TEST NUMBER		
STAND: <i>STAND</i>	ENGINE: <i>ENGINE</i>	ENGINE RUN NO.: <i>ENRUN</i>
FORMULATION/STAND CODE: <i>FORM</i>		
OILCODE: <i>OILCODE</i>		

FUEL SUPPLIER	FUEL BATCH IDENTIFIER
<i>FUELSUP</i>	<i>FUELBTID</i>

Measurement	Specifications	Analysis		Test Method
		NEW	EOT	
Total Sulfur, % Weight	0.04 - 0.05	<i>FUELSNEW</i>	<i>FUELSEOT</i>	D 2662
Gravity, °API	34.5 - 36.5	<i>APIGRNEW</i>	<i>APIGREOT</i>	D 1298
Hydrocarbon Composition				
Aromatics % Volume	28 - 33	<i>FUELAROM</i>		D 1319
Olefin	Report	<i>FUELOLEF</i>		D 1319
Cetane Index	Report	<i>CETANEIN</i>		D 4737
Cetane Number	42 - 48	<i>CETANENO</i>		D 613
Copper Strip Corrosion	1 Maximum	<i>FUELCU</i>		D 130
Flash Point, °C	54 Maximum	<i>FLASHPT</i>		D 93
Pour Point, °C	-18 Maximum	<i>FUELPOUR</i>		D 97
Carbon Residue on 10% Residuum, %	0.35 Maximum	<i>FUELCRES</i>		D 524 (10% Bottoms)
Water & Sediment, % Volume	0.05 Maximum	<i>FUELH2O</i>		D 2709
Viscosity, cSt @ 40 °C	2.4 - 3.0	<i>KINVIS</i>		D 445
Total Acid Number	0.05 Maximum	<i>FUELTAN</i>		D 664
Strong Acid Number	0.00 Maximum	<i>FUELSAN</i>		D 664
Accelerated Stability	tbd	<i>FUELACS</i>		D 2274
Saturates, %	Report	<i>FUELSATU</i>		D 1319
Cloud Point, °C	Report	<i>FUELCLOU</i>		D 2500
Distillation, °C				
IBP	Report	<i>FUELIBP</i>		D 86
10%	Report	<i>FUEL10</i>		D 86
50%	Report	<i>FUEL50</i>		D 86
90%	282 - 338	<i>FUEL90</i>		D 86
EP	Report	<i>FUELEP</i>		D 86

M11 EGR LUBRICANT PERFORMANCE TEST
 FORM 20
 INJECTOR ADJUSTING SCREW MASS LOSS

Laborator <i>LAB</i>	EOT Date <i>DTCOMP</i>	EOT Time <i>EOTTIME</i>
TEST NUMBER		
STAND: <i>STAND</i>	ENGINE: <i>ENGINE</i>	ENGINE RUN NO.: <i>ENRUN</i>
FORMULATION/STAND CODE: <i>FORM</i>		
OILCODE: <i>OILCODE</i>		

SCREW #	PRE-TEST MASS, g	POST-TEST MASS, g	MASS LOSS, mg
1	<i>BOTIAS1</i>	<i>EOTIAS1</i>	<i>IASWL1</i>
2	<i>BOTIAS2</i>	<i>EOTIAS2</i>	<i>IASWL2</i>
3	<i>BOTIAS3</i>	<i>EOTIAS3</i>	<i>IASWL3</i>
4	<i>BOTIAS4</i>	<i>EOTIAS4</i>	<i>IASWL4</i>
5	<i>BOTIAS5</i>	<i>EOTIAS5</i>	<i>IASWL5</i>
6	<i>BOTIAS6</i>	<i>EOTIAS6</i>	<i>IASWL6</i>
		TOTAL	<i>IASWLTOT</i>
		AVERAGE	<i>AVGIAS</i>

**M11 EGR LUBRICANT PERFORMANCE TEST
FORM 21
UNSCHEDULED DOWNTIME & MAINTENANCE SUMMARY**

Laborator <i>LAB</i>	EOT Date <i>DTCOMP</i>	EOT Time <i>EOTTIME</i>
TEST NUMBER		
STAND: <i>STAND</i>	ENGINE: <i>ENGINE</i>	ENGINE RUN NO.: <i>ENRUN</i>
FORMULATION/STAND CODE: <i>FORM</i>		
OILCODE: <i>OILCODE</i>		

Number of Downtime			<i>DWNOCR</i>
Test Hours	Date	Downtime	Reasons
DOWNR001	DDATR001	DTIMR001	DREAR001
TOTLDOWN		Total Downtime (hours)	

Other Comments		
Number of Comment Lines	<i>TOTCOM</i>	
OCOMR001		

**M11 EGR LUBRICANT PERFORMANCE TEST
FORM 22
CHARACTERISTICS OF THE DATA ACQUISITION SYSTEM**

Laboratory <i>LAB</i>	EOT Date <i>DTCOMP</i>	EOT Time <i>EOTTIME</i>
TEST NUMBER		
STAND: <i>STAND</i>	ENGINE: <i>ENGINE</i>	ENGINE RUN NO.: <i>ENRUN</i>
FORMULATION/STAND CODE: <i>FORM</i>		
OIL CODE: <i>OILCODE</i>		

PARAMETER (1)	SENSING DEVICE (2)	CALIBRATION FREQUENCY (3)	RECORD DEVICE (4)	OBSERVATION FREQUENCY (5)	RECORD FREQUENCY (6)	LOG FREQUENCY (7)	SYSTEM RESPONSE (8)
Temperature							
Oil	<i>OTEMSENS</i>	<i>OTEMCALF</i>	<i>OTEMRECD</i>	<i>OTEMOBSF</i>	<i>OTEMRECF</i>	<i>OTEMLOGF</i>	<i>OTEMSYSR</i>
Fuel In	<i>FTEMSENS</i>	<i>FTEMCALF</i>	<i>FTEMRECD</i>	<i>FTEMOBSF</i>	<i>FTEMRECF</i>	<i>FTEMLOGF</i>	<i>FTEMSYSR</i>
Intake	<i>AITSENS</i>	<i>AITCALF</i>	<i>AITRECD</i>	<i>AITOBSF</i>	<i>AITRECF</i>	<i>AITLOGF</i>	<i>AITSYSR</i>
Intake	<i>IMANSENS</i>	<i>IMANCALF</i>	<i>IMANRECD</i>	<i>IMANOBSF</i>	<i>IMANRECF</i>	<i>IMANLOGF</i>	<i>IMANSYSR</i>
Pre-Turb.	<i>PTURSENS</i>	<i>PTURCALF</i>	<i>PTURRECD</i>	<i>PTUROBSF</i>	<i>PTURRECF</i>	<i>PTURLOGF</i>	<i>PTURSYSR</i>
Cool. Out	<i>COTSENS</i>	<i>COTCALF</i>	<i>COTRECD</i>	<i>COTOBSF</i>	<i>COTRECF</i>	<i>COTLOGF</i>	<i>COTSYSR</i>
Pressure							
Inlet Air	<i>INRESENS</i>	<i>INRECALF</i>	<i>INRERECD</i>	<i>INREOBSF</i>	<i>INRERECF</i>	<i>INRELOGF</i>	<i>INRESYSR</i>
Exhaust	<i>EXPRSENS</i>	<i>EXPRCALF</i>	<i>EXPRECD</i>	<i>EXPROBSF</i>	<i>EXPRECF</i>	<i>EXPRLOGF</i>	<i>EXPRSYSR</i>
Oil	<i>OILGSENS</i>	<i>OILGCALF</i>	<i>OILGRECD</i>	<i>OILGOBSF</i>	<i>OILGRECF</i>	<i>OILGLOGF</i>	<i>OILGSYSR</i>
Other							
Fuel Flow	<i>FFLOSENS</i>	<i>FFLOCALF</i>	<i>FFLORECD</i>	<i>FFLOBSF</i>	<i>FFLORECF</i>	<i>FFLOLOGF</i>	<i>FFLOSYSR</i>
Speed	<i>RPMSENS</i>	<i>RPMCALF</i>	<i>RPMRECD</i>	<i>RPMOBSF</i>	<i>RPMRECF</i>	<i>RPMLOGF</i>	<i>RPMSYSR</i>
Load	<i>LOADSENS</i>	<i>LOADCALF</i>	<i>LOADRECD</i>	<i>LOADOBSF</i>	<i>LOADRECF</i>	<i>LOADLOGF</i>	<i>LOADSYSR</i>

LEGEND:

- (1) OPERATING PARAMETER
- (2) THE TYPE OF DEVICE USED TO MEASURE TEMPERATURE, PRESSURE OR FLOW
- (3) FREQUENCY AT WHICH THE MEASUREMENT SYSTEM IS CALIBRATED
- (4) THE TYPE OF DEVICE
DL - AUTOMATIC DATA LOGGER
C/D - COMPUTER, USING DIRECT I/O ENTRY
- (5) DATA ARE OBSERVED BUT ONLY IF RECORDED OFF SPEC.
- (6) DATA ARE RECORDED BUT ARE NOT RETAINED AT EOT
- (7) DATA ARE LOGGED AS PERMANENT RECORD, NOTE SPECIFY IF:
SS - SNAPSHOT TAKEN AT SPECIFIED FREQUENCY
AG/X AVERAGE OF X DATA POINTS AT SPECIFIED FREQUENCY
- (8) TIME IN SECONDS FOR THE OUTPUT TO REACH 63.2% OF FINAL VALUE FOR STEP CHANGE AT INPUT

M11 EGR LUBRICANT PERFORMANCE TEST
Liner Wear Summary
Form 23

Laboratory <i>LAB</i>	EOT <i>DTCOMP</i>	EOT Time <i>EOTTIME</i>
Stand: <i>STAND</i>	Engine: <i>ENGINE</i>	Engine Run <i>ENRUN</i>
Oil <i>OILCODE</i>		
Formulation/Stand <i>FORM</i>		

POSITION	WEAR STEP (μm)					
	Cylinder Number					
	1	2	3	4	5	6
1:00	<i>C1LW1</i>	<i>C2LW1</i>	<i>C3LW1</i>	<i>C4LW1</i>	<i>C5LW1</i>	<i>C6LW1</i>
2:00	<i>C1LW2</i>	<i>C2LW2</i>	<i>C3LW2</i>	<i>C4LW2</i>	<i>C5LW2</i>	<i>C6LW2</i>
3:00 (Thrust)	<i>C1LW3</i>	<i>C2LW3</i>	<i>C3LW3</i>	<i>C4LW3</i>	<i>C5LW3</i>	<i>C6LW3</i>
4:00	<i>C1LW4</i>	<i>C2LW4</i>	<i>C3LW4</i>	<i>C4LW4</i>	<i>C5LW4</i>	<i>C6LW4</i>
5:00	<i>C1LW5</i>	<i>C2LW5</i>	<i>C3LW5</i>	<i>C4LW5</i>	<i>C5LW5</i>	<i>C6LW5</i>
6:00 (Rear)	<i>C1LW6</i>	<i>C2LW6</i>	<i>C3LW6</i>	<i>C4LW6</i>	<i>C5LW6</i>	<i>C6LW6</i>
7:00	<i>C1LW7</i>	<i>C2LW7</i>	<i>C3LW7</i>	<i>C4LW7</i>	<i>C5LW7</i>	<i>C6LW7</i>
8:00	<i>C1LW8</i>	<i>C2LW8</i>	<i>C3LW8</i>	<i>C4LW8</i>	<i>C5LW8</i>	<i>C6LW8</i>
9:00	<i>C1LW9</i>	<i>C2LW9</i>	<i>C3LW9</i>	<i>C4LW9</i>	<i>C5LW9</i>	<i>C6LW9</i>
10:00	<i>C1LW10</i>	<i>C2LW10</i>	<i>C3LW10</i>	<i>C4LW10</i>	<i>C5LW10</i>	<i>C6LW10</i>
11:00	<i>C1LW11</i>	<i>C2LW11</i>	<i>C3LW11</i>	<i>C4LW11</i>	<i>C5LW11</i>	<i>C6LW11</i>
12:00 (Front)	<i>C1LW12</i>	<i>C2LW12</i>	<i>C3LW12</i>	<i>C4LW12</i>	<i>C5LW12</i>	<i>C6LW12</i>
Average	<i>C1ALW</i>	<i>C2ALW</i>	<i>C3ALW</i>	<i>C4ALW</i>	<i>C5ALW</i>	<i>C6ALW</i>

Summary	As Measured	Outlier	Adjusted to X.XX%
Average, μm	<i>AMACLW</i>	<i>ACLW</i>	<i>ALW</i>
Std. Dev., μm	<i>AMSCLW</i>	<i>SCLW</i>	
Minimum, μm	<i>AMICLW</i>	<i>ICLW</i>	
Maximum, μm	<i>AMXCLW</i>	<i>XCLW</i>	
Ring Flaked Liners	<i>FLKLIN</i>		
Outlier Liners	<i>OUTLIN</i>		