

A5. Report Forms
M11 EGR
LUBRICANT PERFORMANCE TEST

VERSION 20021031 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 IN ACCORDANCE WITH THE TEST PROCEDURE.
	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>EOTIME</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 this test *OPVALID* been conducted in a valid manner in accordance with the Test Procedure 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

Typed Name

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

The M11 EGR Lubricant Performance Test is an engine-dynamometer test which evaluates the ability of a lubricant to minimize crosshead wear, filter plugging, sludge build-up, and topping weight loss. 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 electronically controlled fuel injection. A two-h break-in is conducted prior to each test since a new engine build is used for each test.

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
Intake CO ₂ %	0.97 - 1.09	0.78 - 0.85
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 absolute	Record	Record
Intake Manifold Pressure, kPa absolute	300 Minimum	320 Minimum
Exhaust Back Pressure, kPa absolute	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**

Laboratory: <i>LAB</i>	EOT Date: <i>DTCOMP</i>	EOT Time: <i>EOTTIME</i>
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>	Engine Kit S/N: <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	<i>TGA050</i>
TGA SOOT % AT 250 h	<i>TGA250</i>
AVERAGE TGA SOOT % 0 - 300 h (>= 4.6)	<i>TGAAVG</i>
TOTAL OIL CONSUMPTION, kg	<i>TOTOCON</i>

	Adjusted Average Crosshead Mass Loss (mg)	Filter Plugging Delta P (kPa)	Average Sludge Rating (merits)	Avg. Top Ring Mass Loss (mg)
Original Result	<i>ACWL</i>	<i>OILD</i>	<i>ASRT</i>	<i>ARWLT</i>
Transformed Result ^B	<i>TRNACWL</i>	<i>TRNODP</i>	<i>TRNASRT</i>	<i>TRNARWLT</i>
Correction Factor ^B	<i>ACWL</i>	<i>OILD</i>	<i>ASRT</i>	<i>ARWLT</i>
Corrected Transformed Result ^B	<i>ACWLCOR</i>	<i>OILD</i>	<i>ASRT</i>	<i>ARWLT</i>
Severity Adjustment ^B	<i>ACWL_SA</i>	<i>OILD_SA</i>	<i>ASRT_SA</i>	<i>ARWLT_SA</i>
Final Transformed Result ^B	<i>TACWLFNL</i>	<i>TODPFNL</i>	<i>TASRTFNL</i>	<i>TARWLT</i>
Final Result	<i>ACWLFNL</i>	<i>OILD</i>	<i>ASRT</i>	<i>ARWLT</i>

LAST STAND REFERENCE RESULTS

TEST NUMBER: <i>STAND</i> - <i>ENGINE</i> - <i>REN</i>	<i>REN</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	<i>RTGA050</i>
TGA SOOT % AT 250 h (8.0 - 9.0)	<i>RTGA250</i>
AVERAGE TGA SOOT % 0 - 300 h (>=4.6)	<i>RTGAAVG</i>
TOTAL OIL CONSUMPTION, kg	<i>RTOTOCON</i>

	Adjusted Average Crosshead Mass Loss (mg)	Filter Plugging Delta P (kPa)	Average Sludge Rating (merits)	Avg. Top Ring Mass Loss (mg)
Original Result	<i>RACWL</i>	<i>ROILD</i>	<i>RASRT</i>	<i>RARWLT</i>
Transformed Result ^B	<i>RTRNACWL</i>	<i>RTRNODP</i>	<i>RTRNASRT</i>	<i>RTRNARWT</i>
Correction Factor ^B	<i>RACWL</i>	<i>ROILD</i>	<i>RASRT</i>	<i>RARWLT</i>
Corrected Transformed Result ^B	<i>RACWLCOR</i>	<i>RTODPCOR</i>	<i>RASRTCOR</i>	<i>RARWTCOR</i>
Final Transformed Result ^B	<i>RTCWLFNL</i>	<i>RTODPFNL</i>	<i>RTSRTFNL</i>	<i>RTARWLT</i>
Final Result	<i>RACWLFNL</i>	<i>RFPDPFNL</i>	<i>RASRTFNL</i>	<i>RARWTFNL</i>

^A Reference Tests Only

^B Filter Plugging Delta P Value in Transformed 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 No.: <i>ENRUN</i>
Formulation/Stand Code: <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>ARPMA</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>QFUELT</i>	40		<i>AFUELT</i>		<i>NFUELT</i>	<i>BFUELT</i>	<i>OFUELT</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>	
Non-controlled Parameters	Parameter	Units	Typical Values ^E		Average						
	Torque	N-m	TBD	TBD	<i>ALOADA</i>		<i>ALOADB</i>				
	Power	kW	TBD	TBD	<i>APWRA</i>		<i>APWRB</i>				
	Intake CO ₂	%	0.97 - 1.09	0.78 - 0.85	<i>AICO2A</i>		<i>AICO2B</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>AFPMPP</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 an engineering review. See the comments section of this report.

^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

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

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 Screened	As Measured	Outlier Screened
Average Crosshead Mass Loss (mg)	<i>ACHDWLI</i>	<i>OACHDWLI</i>	<i>ACHDWLE</i>	<i>OACHDWLE</i>
Minimum Crosshead Mass Loss (mg)	<i>ICHDWLI</i>	<i>OICHDWLI</i>	<i>ICHDWLE</i>	<i>OICHDWLE</i>
Maximum Crosshead Mass Loss (mg)	<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

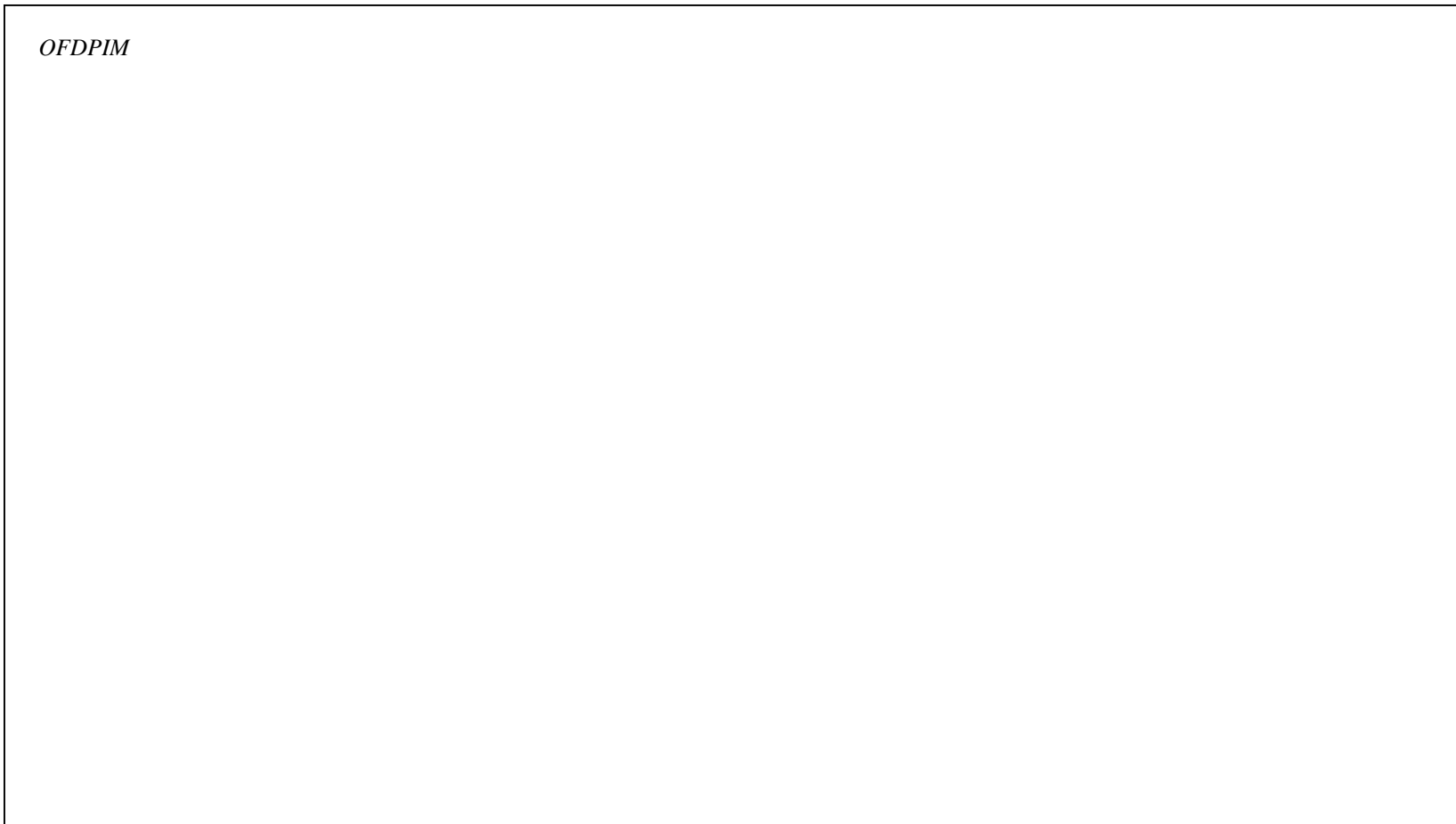
Overall Summary	As Measured	Outlier Screened	Adjusted to X.X% Soot
Average Crosshead Mass Loss (mg)	<i>AMACAWL</i>	<i>CAWL</i>	<i>ACWL</i>
Minimum Crosshead Mass Loss (mg)	<i>AMICAWL</i>	<i>ICHDEWL</i>	
Maximum Crosshead Mass Loss (mg)	<i>AMXCAWL</i>	<i>XCHDEWL</i>	
Standard Deviation (mg)	<i>AMSCAWL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



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 Factor:	<i>RCSEVT</i>	Total Volume Factor:	<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**

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>		

UNWEIGHTED DEMERITS											
PISTON NUMBER	Lands				Grooves			Under Crown	Oil Cooling Gallery	Total Demerits	
	1	2	3	4	1	2	3				
1	<i>LIUWD1</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>LIUWD2</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>LIUWD3</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>LIUWD4</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>LIUWD5</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>LIUWD6</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	<i>G1HCA1</i>	<i>G1HCD1</i>	<i>G2HCA1</i>	<i>G2HCD1</i>	<i>L1HCA1</i>	<i>L1HCD1</i>	<i>L2HCA1</i>	<i>L2HCD1</i>		<i>G3HCA1</i>	<i>G3HCD1</i>	<i>L3HCA1</i>	<i>L3HCD1</i>	<i>L4HCA1</i>	<i>L4HCD1</i>						
MC-0.5	<i>G1MCA1</i>	<i>G1MCD1</i>								<i>G3MCA1</i>	<i>G3MCD1</i>										
LC-.25	<i>G1LCA1</i>	<i>G1LCD1</i>	<i>G2LCA1</i>	<i>G2LCD1</i>	<i>L1LCA1</i>	<i>L1LCD1</i>	<i>L2LCA1</i>	<i>L2LCD1</i>		<i>G3LCA1</i>	<i>G3LCD1</i>	<i>L3LCA1</i>	<i>L3LCD1</i>	<i>L4LCA1</i>	<i>L4LCD1</i>	<i>OG1CA1</i>	<i>OG1CD1</i>	<i>U1LCA1</i>	<i>U1LCD1</i>		
TOTAL	<i>G1ACTOT1</i>	<i>G1DCTOT1</i>	<i>G2ACTOT1</i>	<i>G2DCTOT1</i>	<i>L1ACTOT1</i>	<i>L1DCTOT1</i>	<i>L2ACTOT1</i>	<i>L2DCTOT1</i>		<i>G3ACTOT1</i>	<i>G3DCTOT1</i>	<i>L3ACTOT1</i>	<i>L3DCTOT1</i>	<i>L4ACTOT1</i>	<i>L4DCTOT1</i>	<i>OGACTOT1</i>	<i>OGDCTOT1</i>	<i>U1ACTOT1</i>	<i>U1DCTOT1</i>		
VARNISH																					
8 - 9	<i>G1L9A1</i>	<i>G1L9D1</i>	<i>G2L9A1</i>	<i>G2L9D1</i>	<i>L1L9A1</i>	<i>L1L9D1</i>	<i>L2L9A1</i>	<i>L2L9D1</i>													
7 - 7.9	<i>G1L8A1</i>	<i>G1L8D1</i>	<i>G2L8A1</i>	<i>G2L8D1</i>	<i>L1L8A1</i>	<i>L1L8D1</i>	<i>L2L8A1</i>	<i>L2L8D1</i>	7.5	<i>G3L75A1</i>	<i>G3L75D1</i>	<i>L3L75A1</i>	<i>L3L75D1</i>	<i>L4L75A1</i>	<i>L4L75D1</i>	<i>OGV75A1</i>	<i>OGV75D1</i>	<i>U1L75A1</i>	<i>U1L75D1</i>		
6 - 6.9	<i>G1L7A1</i>	<i>G1L7D1</i>	<i>G2L7A1</i>	<i>G2L7D1</i>	<i>L1L7A1</i>	<i>L1L7D1</i>	<i>L2L7A1</i>	<i>L2L7D1</i>													
5 - 5.9	<i>G1L6A1</i>	<i>G1L6D1</i>	<i>G2L6A1</i>	<i>G2L6D1</i>	<i>L1L6A1</i>	<i>L1L6D1</i>	<i>L2L6A1</i>	<i>L2L6D1</i>													
4 - 4.9	<i>G1L5A1</i>	<i>G1L5D1</i>	<i>G2L5A1</i>	<i>G2L5D1</i>	<i>L1L5A1</i>	<i>L1L5D1</i>	<i>L2L5A1</i>	<i>L2L5D1</i>	4.5	<i>G3L45A1</i>	<i>G3L45D1</i>	<i>L3L45A1</i>	<i>L3L45D1</i>	<i>L4L45A1</i>	<i>L4L45D1</i>	<i>OGV45A1</i>	<i>OGV45D1</i>	<i>U1L45A1</i>	<i>U1L45D1</i>		
3 - 3.9	<i>G1L4A1</i>	<i>G1L4D1</i>	<i>G2L4A1</i>	<i>G2L4D1</i>	<i>L1L4A1</i>	<i>L1L4D1</i>	<i>L2L4A1</i>	<i>L2L4D1</i>													
2 - 2.9	<i>G1L3A1</i>	<i>G1L3D1</i>	<i>G2L3A1</i>	<i>G2L3D1</i>	<i>L1L3A1</i>	<i>L1L3D1</i>	<i>L2L3A1</i>	<i>L2L3D1</i>													
1 - 1.9	<i>G1L2A1</i>	<i>G1L2D1</i>	<i>G2L2A1</i>	<i>G2L2D1</i>	<i>L1L2A1</i>	<i>L1L2D1</i>	<i>L2L2A1</i>	<i>L2L2D1</i>	1.5	<i>G3L15A1</i>	<i>G3L15D1</i>	<i>L3L15A1</i>	<i>L3L15D1</i>	<i>L4L15A1</i>	<i>L4L15D1</i>	<i>OGV15A1</i>	<i>OGV15D1</i>	<i>U1L15A1</i>	<i>U1L15D1</i>		
> 0 - 0.9	<i>G1L1A1</i>	<i>G1L1D1</i>	<i>G2L1A1</i>	<i>G2L1D1</i>	<i>L1L1A1</i>	<i>L1L1D1</i>	<i>L2L1A1</i>	<i>L2L1D1</i>													
TOTAL	<i>G1ALTOT1</i>	<i>G1DLTOT1</i>	<i>G2ALTOT1</i>	<i>G2DLTOT1</i>	<i>L1ALTOT1</i>	<i>L1DLTOT1</i>	<i>L2ALTOT1</i>	<i>L2DLTOT1</i>		<i>G3ALTOT1</i>	<i>G3DLTOT1</i>	<i>L3ALTOT1</i>	<i>L3DLTOT1</i>	<i>L4ALTOT1</i>	<i>L4DLTOT1</i>	<i>OGVAVTOT1</i>	<i>OGVDVTOT1</i>	<i>U1ALTOT1</i>	<i>U1DLTOT1</i>		
Rating	<i>G1UWD1</i>	<i>G2UWD1</i>	<i>L1UWD1</i>	<i>L2UWD1</i>						<i>G3UWD1</i>	<i>L3UWD1</i>	<i>L4UWD1</i>	<i>OGUWD1</i>	<i>UCUWD1</i>							
TGC %										UNWEIGHTED DEP.		T.L. CARBON		T.L. FLAKED CARBON %							
<i>TGC1</i>										<i>UWD1</i>		<i>TLC1</i>		<i>TLFC1</i>							

**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	G2HCA2	G2HCD2	L1HCA2	L1HCD2	L2HCA2	L2HCD2		G3HCA2	G3HCD2	G3HCA2	L3HCD2	L4HCA2	L4HCD2						
MC-0.5	G1MCA2	G1MCD2								G3MCA2	G3MCD2										
LC-.25	G1LCA2	G1LCD2	G2LCA2	G2LCD2	L1LCA2	L1LCD2	L2LCA2	L2LCD2		G3LCA2	G3LCD2	G3LCA2	L3LCD2	L4LCA2	L4LCD2	GLCA2	GLCD2	L1LCA2	U1LCD2		
TOTAL	G1ACTOT2	G1DCTOT2	G2ACTOT2	G2DCTOT2	L1ACTOT2	L1DCTOT2	L2ACTOT2	L2DCTOT2		G3ACTOT2	G3DCTOT2	G3ACTOT2	L3DCTOT2	L4ACTOT2	L4DCTOT2	OGACTOT2	OGDCTOT2	L1ACTOT2	U1DCTOT2		
VARNISH																					
8 - 9	G1L9A2	G1L9D2	G2L9A2	G2L9D2	L1L9A2	L1L9D2	L2L9A2	L2L9D2													
7 - 7.9	G1L8A2	G1L8D2	G2L8A2	G2L8D2	L1L8A2	L1L8D2	L2L8A2	L2L8D2	7.5	G3L75A2	G3L75D2	G3L75A2	L3L75D2	L4L75A2	L4L75D2	GV75A2	GV75D2	L75A2	U1L75D2		
6 - 6.9	G1L7A2	G1L7D2	G2L7A2	G2L7D2	L1L7A2	L1L7D2	L2L7A2	L2L7D2													
5 - 5.9	G1L6A2	G1L6D2	G2L6A2	G2L6D2	L1L6A2	L1L6D2	L2L6A2	L2L6D2													
4 - 4.9	G1L5A2	G1L5D2	G2L5A2	G2L5D2	L1L5A2	L1L5D2	L2L5A2	L2L5D2	4.5	G3L45A2	G3L45D2	G3L45A2	L3L45D2	L4L45A2	L4L45D2	GV45A2	GV45D2	L45A2	U1L45D2		
3 - 3.9	G1L4A2	G1L4D2	G2L4A2	G2L4D2	L1L4A2	L1L4D2	L2L4A2	L2L4D2													
2 - 2.9	G1L3A2	G1L3D2	G2L3A2	G2L3D2	L1L3A2	L1L3D2	L2L3A2	L2L3D2													
1 - 1.9	G1L2A2	G1L2D2	G2L2A2	G2L2D2	L1L2A2	L1L2D2	L2L2A2	L2L2D2	1.5	G3L15A2	G3L15D2	G3L15A2	L3L15D2	L4L15A2	L4L15D2	GV15A2	GV15D2	L15A2	U1L15D2		
>0 - 0.9	G1L1A2	G1L1D2	G2L1A2	G2L1D2	L1L1A2	L1L1D2	L2L1A2	L2L1D2													
TOTAL	G1ALTOT2	G1DLTOT2	G2ALTOT2	G2DLTOT2	L1ALTOT2	L1DLTOT2	L2ALTOT2	L2DLTOT2		G3ALTOT2	G3DLTOT2	G3ALTOT2	L3DLTOT2	L4ALTOT2	L4DLTOT2	OGAVTOT2	OGDVTOT2	L1ALTOT2	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 14
PISTON 4 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	<i>G1HCA4</i>	<i>G1HCD4</i>	<i>G2HCA4</i>	<i>G2HCD4</i>	<i>L1HCA4</i>	<i>L1HCD4</i>	<i>L2HCA4</i>	<i>L2HCD4</i>	7.5	<i>G3HCA4</i>	<i>G3HCD4</i>	<i>L3HCA4</i>	<i>L3HCD4</i>	<i>L4HCA4</i>	<i>L4HCD4</i>				
MC-0.5	<i>G1MCA4</i>	<i>G1MCD4</i>								<i>G3MCA4</i>	<i>G3MCD4</i>								
LC-.25	<i>G1LCA4</i>	<i>G1LCD4</i>	<i>G2LCA4</i>	<i>G2LCD4</i>	<i>L1LCA4</i>	<i>L1LCD4</i>	<i>L2LCA4</i>	<i>L2LCD4</i>	4.5	<i>G3LCA4</i>	<i>G3LCD4</i>	<i>L3LCA4</i>	<i>L3LCD4</i>	<i>L4LCA4</i>	<i>L4LCD4</i>	<i>OG1CA4</i>	<i>OG1CD4</i>	<i>U1LCA4</i>	<i>U1LCD4</i>
TOTAL	<i>G1ACTOT4</i>	<i>G1DCTOT4</i>	<i>G2ACTOT4</i>	<i>G2DCTOT4</i>	<i>L1ACTOT4</i>	<i>L1DCTOT4</i>	<i>L2ACTOT4</i>	<i>L2DCTOT4</i>		<i>G3ACTOT4</i>	<i>G3DCTOT4</i>	<i>L3ACTOT4</i>	<i>L3DCTOT4</i>	<i>L4ACTOT4</i>	<i>L4DCTOT4</i>	<i>OGACTOT4</i>	<i>OGDCTOT4</i>	<i>U1ACTOT4</i>	<i>U1DCTOT4</i>
VARNISH																			
8 - 9	<i>G1L9A4</i>	<i>G1L9D4</i>	<i>G2L9A4</i>	<i>G2L9D4</i>	<i>L1L9A4</i>	<i>L1L9D4</i>	<i>L2L9A4</i>	<i>L2L9D4</i>	7.5	<i>G3L75A4</i>	<i>G3L75D4</i>	<i>L3L75A4</i>	<i>L3L75D4</i>	<i>L4L75A4</i>	<i>L4L75D4</i>	<i>OGV75A4</i>	<i>OGV75D4</i>	<i>U1L75A4</i>	<i>U1L75D4</i>
7 - 7.9	<i>G1L8A4</i>	<i>G1L8D4</i>	<i>G2L8A4</i>	<i>G2L8D4</i>	<i>L1L8A4</i>	<i>L1L8D4</i>	<i>L2L8A4</i>	<i>L2L8D4</i>		<i>G3L75A4</i>	<i>G3L75D4</i>	<i>L3L75A4</i>	<i>L3L75D4</i>	<i>L4L75A4</i>	<i>L4L75D4</i>	<i>OGV75A4</i>	<i>OGV75D4</i>	<i>U1L75A4</i>	<i>U1L75D4</i>
6 - 6.9	<i>G1L7A4</i>	<i>G1L7D4</i>	<i>G2L7A4</i>	<i>G2L7D4</i>	<i>L1L7A4</i>	<i>L1L7D4</i>	<i>L2L7A4</i>	<i>L2L7D4</i>		<i>G3L75A4</i>	<i>G3L75D4</i>	<i>L3L75A4</i>	<i>L3L75D4</i>	<i>L4L75A4</i>	<i>L4L75D4</i>	<i>OGV75A4</i>	<i>OGV75D4</i>	<i>U1L75A4</i>	<i>U1L75D4</i>
5 - 5.9	<i>G1L6A4</i>	<i>G1L6D4</i>	<i>G2L6A4</i>	<i>G2L6D4</i>	<i>L1L6A4</i>	<i>L1L6D4</i>	<i>L2L6A4</i>	<i>L2L6D4</i>	4.5	<i>G3L45A4</i>	<i>G3L45D4</i>	<i>L3L45A4</i>	<i>L3L45D4</i>	<i>L4L45A4</i>	<i>L4L45D4</i>	<i>OGV45A4</i>	<i>OGV45D4</i>	<i>U1L45A4</i>	<i>U1L45D4</i>
4 - 4.9	<i>G1L5A4</i>	<i>G1L5D4</i>	<i>G2L5A4</i>	<i>G2L5D4</i>	<i>L1L5A4</i>	<i>L1L5D4</i>	<i>L2L5A4</i>	<i>L2L5D4</i>		<i>G3L45A4</i>	<i>G3L45D4</i>	<i>L3L45A4</i>	<i>L3L45D4</i>	<i>L4L45A4</i>	<i>L4L45D4</i>	<i>OGV45A4</i>	<i>OGV45D4</i>	<i>U1L45A4</i>	<i>U1L45D4</i>
3 - 3.9	<i>G1L4A4</i>	<i>G1L4D4</i>	<i>G2L4A4</i>	<i>G2L4D4</i>	<i>L1L4A4</i>	<i>L1L4D4</i>	<i>L2L4A4</i>	<i>L2L4D4</i>		<i>G3L45A4</i>	<i>G3L45D4</i>	<i>L3L45A4</i>	<i>L3L45D4</i>	<i>L4L45A4</i>	<i>L4L45D4</i>	<i>OGV45A4</i>	<i>OGV45D4</i>	<i>U1L45A4</i>	<i>U1L45D4</i>
2 - 2.9	<i>G1L3A4</i>	<i>G1L3D4</i>	<i>G2L3A4</i>	<i>G2L3D4</i>	<i>L1L3A4</i>	<i>L1L3D4</i>	<i>L2L3A4</i>	<i>L2L3D4</i>	1.5	<i>G3L15A4</i>	<i>G3L15D4</i>	<i>L3L15A4</i>	<i>L3L15D4</i>	<i>L4L15A4</i>	<i>L4L15D4</i>	<i>OGV15A4</i>	<i>OGV15D4</i>	<i>U1L15A4</i>	<i>U1L15D4</i>
1 - 1.9	<i>G1L2A4</i>	<i>G1L2D4</i>	<i>G2L2A4</i>	<i>G2L2D4</i>	<i>L1L2A4</i>	<i>L1L2D4</i>	<i>L2L2A4</i>	<i>L2L2D4</i>		<i>G3L15A4</i>	<i>G3L15D4</i>	<i>L3L15A4</i>	<i>L3L15D4</i>	<i>L4L15A4</i>	<i>L4L15D4</i>	<i>OGV15A4</i>	<i>OGV15D4</i>	<i>U1L15A4</i>	<i>U1L15D4</i>
>0 - 0.9	<i>G1L1A4</i>	<i>G1L1D4</i>	<i>G2L1A4</i>	<i>G2L1D4</i>	<i>L1L1A4</i>	<i>L1L1D4</i>	<i>L2L1A4</i>	<i>L2L1D4</i>		<i>G3L15A4</i>	<i>G3L15D4</i>	<i>L3L15A4</i>	<i>L3L15D4</i>	<i>L4L15A4</i>	<i>L4L15D4</i>	<i>OGV15A4</i>	<i>OGV15D4</i>	<i>U1L15A4</i>	<i>U1L15D4</i>
TOTAL	<i>G1ALTOT4</i>	<i>G1DLTOT4</i>	<i>G2ALTOT4</i>	<i>G2DLTOT4</i>	<i>L1ALTOT4</i>	<i>L1DLTOT4</i>	<i>L2ALTOT4</i>	<i>L2DLTOT4</i>	<i>G3ALTOT4</i>	<i>G3DLTOT4</i>	<i>L3ALTOT4</i>	<i>L3DLTOT4</i>	<i>L4ALTOT4</i>	<i>L4DLTOT4</i>	<i>OGAVTOT4</i>	<i>OGDVTOT4</i>	<i>U1ALTOT4</i>	<i>U1DLTOT4</i>	
Rating	<i>G1UWD4</i>	<i>G2UWD4</i>	<i>L1UWD4</i>	<i>L2UWD4</i>					<i>G3UWD4</i>	<i>L3UWD4</i>	<i>L4UWD4</i>	<i>OGUWD4</i>	<i>UCUWD4</i>						
TGC %									UNWEIGHTED DEP.		T.L. CARBON		T.L. FLAKED CARBON %						
<i>TGC4</i>									<i>UWD4</i>		<i>TLC4</i>		<i>TLFC4</i>						

**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	<i>G1HCA5</i>	<i>G1HCDS5</i>	<i>G2HCA5</i>	<i>G2HCDS5</i>	<i>L1HCA5</i>	<i>L1HCDS5</i>	<i>L2HCA5</i>	<i>L2HCDS5</i>		<i>G3HCA5</i>	<i>G3HCDS5</i>	<i>L3HCA5</i>	<i>L3HCDS5</i>	<i>L4HCA5</i>	<i>L4HCDS5</i>						
MC-0.5	<i>G1MCA5</i>	<i>G1MCD5</i>								<i>G3MCA5</i>	<i>G3MCD5</i>										
LC-.25	<i>G1LCA5</i>	<i>G1LCD5</i>	<i>G2LCA5</i>	<i>G2LCD5</i>	<i>L1LCA5</i>	<i>L1LCD5</i>	<i>L2LCA5</i>	<i>L2LCD5</i>		<i>G3LCA5</i>	<i>G3LCD5</i>	<i>L3LCA5</i>	<i>L3LCD5</i>	<i>L4LCA5</i>	<i>L4LCD5</i>	<i>UGLCA5</i>	<i>UGLCD5</i>	<i>ULCA5</i>	<i>ULCD5</i>		
TOTAL	<i>G1ACTO5</i>	<i>G1DCTO5</i>	<i>G2ACTO5</i>	<i>G2DCTO5</i>	<i>L1ACTO5</i>	<i>L1DCTO5</i>	<i>L2ACTO5</i>	<i>L2DCTO5</i>		<i>G3ACTO5</i>	<i>G3DCTO5</i>	<i>L3ACTO5</i>	<i>L3DCTO5</i>	<i>L4ACTO5</i>	<i>L4DCTO5</i>	<i>OGACTO5</i>	<i>OGDCTO5</i>	<i>UIACTO5</i>	<i>UIDCTO5</i>		
VARNISH																					
8 - 9	<i>G1L9A5</i>	<i>G1L9D5</i>	<i>G2L9A5</i>	<i>G2L9D5</i>	<i>L1L9A5</i>	<i>L1L9D5</i>	<i>L2L9A5</i>	<i>L2L9D5</i>													
7 - 7.9	<i>G1L8A5</i>	<i>G1L8D5</i>	<i>G2L8A5</i>	<i>G2L8D5</i>	<i>L1L8A5</i>	<i>L1L8D5</i>	<i>L2L8A5</i>	<i>L2L8D5</i>	7.5	<i>G3L75A5</i>	<i>G3L75D5</i>	<i>L3L75A5</i>	<i>L3L75D5</i>	<i>L4L75A5</i>	<i>L4L75D5</i>	<i>UGV75A5</i>	<i>UGV75D5</i>	<i>UL75A5</i>	<i>UL75D5</i>		
6 - 6.9	<i>G1L7A5</i>	<i>G1L7D5</i>	<i>G2L7A5</i>	<i>G2L7D5</i>	<i>L1L7A5</i>	<i>L1L7D5</i>	<i>L2L7A5</i>	<i>L2L7D5</i>													
5 - 5.9	<i>G1L6A5</i>	<i>G1L6D5</i>	<i>G2L6A5</i>	<i>G2L6D5</i>	<i>L1L6A5</i>	<i>L1L6D5</i>	<i>L2L6A5</i>	<i>L2L6D5</i>													
4 - 4.9	<i>G1L5A5</i>	<i>G1L5D5</i>	<i>G2L5A5</i>	<i>G2L5D5</i>	<i>L1L5A5</i>	<i>L1L5D5</i>	<i>L2L5A5</i>	<i>L2L5D5</i>	4.5	<i>G3L45A5</i>	<i>G3L45D5</i>	<i>L3L45A5</i>	<i>L3L45D5</i>	<i>L4L45A5</i>	<i>L4L45D5</i>	<i>UGV45A5</i>	<i>UGV45D5</i>	<i>UL45A5</i>	<i>UL45D5</i>		
3 - 3.9	<i>G1L4A5</i>	<i>G1L4D5</i>	<i>G2L4A5</i>	<i>G2L4D5</i>	<i>L1L4A5</i>	<i>L1L4D5</i>	<i>L2L4A5</i>	<i>L2L4D5</i>													
2 - 2.9	<i>G1L3A5</i>	<i>G1L3D5</i>	<i>G2L3A5</i>	<i>G2L3D5</i>	<i>L1L3A5</i>	<i>L1L3D5</i>	<i>L2L3A5</i>	<i>L2L3D5</i>													
1 - 1.9	<i>G1L2A5</i>	<i>G1L2D5</i>	<i>G2L2A5</i>	<i>G2L2D5</i>	<i>L1L2A5</i>	<i>L1L2D5</i>	<i>L2L2A5</i>	<i>L2L2D5</i>	1.5	<i>G3L15A5</i>	<i>G3L15D5</i>	<i>L3L15A5</i>	<i>L3L15D5</i>	<i>L4L15A5</i>	<i>L4L15D5</i>	<i>UGV15A5</i>	<i>UGV15D5</i>	<i>UL15A5</i>	<i>UL15D5</i>		
>0 - 0.9	<i>G1L1A5</i>	<i>G1L1D5</i>	<i>G2L1A5</i>	<i>G2L1D5</i>	<i>L1L1A5</i>	<i>L1L1D5</i>	<i>L2L1A5</i>	<i>L2L1D5</i>													
TOTAL	<i>G1ALTOT5</i>	<i>G1DLTOT5</i>	<i>G2ALTOT5</i>	<i>G2DLTOT5</i>	<i>L1ALTOT5</i>	<i>L1DLTOT5</i>	<i>L2ALTOT5</i>	<i>L2DLTOT5</i>		<i>G3ALTOT5</i>	<i>G3DLTOT5</i>	<i>L3ALTOT5</i>	<i>L3DLTOT5</i>	<i>L4ALTOT5</i>	<i>L4DLTOT5</i>	<i>UGVTOT5</i>	<i>UGDVTOT5</i>	<i>UITOT5</i>	<i>UIDTOT5</i>		
Rating	<i>G1UWD5</i>	<i>G2UWD5</i>	<i>L1UWD5</i>	<i>L2UWD5</i>		<i>G3UWD5</i>	<i>L3UWD5</i>	<i>L4UWD5</i>		<i>OGUWD5</i>	<i>UCUWD5</i>										
TGC %						UNWEIGHTED DEP.					T.L. CARBON				T.L. FLAKED CARBON %						
<i>TGC5</i>						<i>UWD5</i>					<i>TLC5</i>				<i>TLFC5</i>						

**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. 3		NO. 4					
	A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.		A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.
CARBON																			
HC-1.0	<i>G1HCA6</i>	<i>G1HCD6</i>	<i>G2HCA6</i>	<i>G2HCD6</i>	<i>L1HCA6</i>	<i>L1HCD6</i>	<i>L2HCA6</i>	<i>L2HCD6</i>		<i>G3HCA6</i>	<i>G3HCD6</i>	<i>L3HCA6</i>	<i>L3HCD6</i>	<i>L4HCA6</i>	<i>L4HCD6</i>				
MC-0.5	<i>G1MCA6</i>	<i>G1MCD6</i>								<i>G3MCA6</i>	<i>G3MCD6</i>								
LC-.25	<i>G1LCA6</i>	<i>G1LCD6</i>	<i>G2LCA6</i>	<i>G2LCD6</i>	<i>L1LCA6</i>	<i>L1LCD6</i>	<i>L2LCA6</i>	<i>L2LCD6</i>		<i>G3LCA6</i>	<i>G3LCD6</i>	<i>L3LCA6</i>	<i>L3LCD6</i>	<i>L4LCA6</i>	<i>L4LCD6</i>	<i>GLCA6</i>	<i>OGLCD6</i>	<i>ULCA6</i>	<i>ULLCD6</i>
TOTAL	<i>G1ACTOT6</i>	<i>G1DCTOT6</i>	<i>G2ACTOT6</i>	<i>G2DCTOT6</i>	<i>L1ACTOT6</i>	<i>L1DCTOT6</i>	<i>L2ACTOT6</i>	<i>L2DCTOT6</i>		<i>G3ACTOT6</i>	<i>G3DCTOT6</i>	<i>L3ACTOT6</i>	<i>L3DCTOT6</i>	<i>L4ACTOT6</i>	<i>L4DCTOT6</i>	<i>GDCTOT6</i>	<i>ODCTOT6</i>	<i>UDCTOT6</i>	<i>ULDCTOT6</i>
VARNISH																			
8 - 9	<i>G1L9A6</i>	<i>G1L9D6</i>	<i>G2L9A6</i>	<i>G2L9D6</i>	<i>L1L9A6</i>	<i>L1L9D6</i>	<i>L2L9A6</i>	<i>L2L9D6</i>											
7 - 7.9	<i>G1L8A6</i>	<i>G1L8D6</i>	<i>G2L8A6</i>	<i>G2L8D6</i>	<i>L1L8A6</i>	<i>L1L8D6</i>	<i>L2L8A6</i>	<i>L2L8D6</i>	7.5	<i>G3L75A6</i>	<i>G3L75D6</i>	<i>L3L75A6</i>	<i>L3L75D6</i>	<i>L4L75A6</i>	<i>L4L75D6</i>	<i>GV75A6</i>	<i>OGV75D6</i>	<i>UL75A6</i>	<i>UL75D6</i>
6 - 6.9	<i>G1L7A6</i>	<i>G1L7D6</i>	<i>G2L7A6</i>	<i>G2L7D6</i>	<i>L1L7A6</i>	<i>L1L7D6</i>	<i>L2L7A6</i>	<i>L2L7D6</i>											
5 - 5.9	<i>G1L6A6</i>	<i>G1L6D6</i>	<i>G2L6A6</i>	<i>G2L6D6</i>	<i>L1L6A6</i>	<i>L1L6D6</i>	<i>L2L6A6</i>	<i>L2L6D6</i>											
4 - 4.9	<i>G1L5A6</i>	<i>G1L5D6</i>	<i>G2L5A6</i>	<i>G2L5D6</i>	<i>L1L5A6</i>	<i>L1L5D6</i>	<i>L2L5A6</i>	<i>L2L5D6</i>	4.5	<i>G3L45A6</i>	<i>G3L45D6</i>	<i>L3L45A6</i>	<i>L3L45D6</i>	<i>L4L45A6</i>	<i>L4L45D6</i>	<i>GV45A6</i>	<i>OGV45D6</i>	<i>UL45A6</i>	<i>UL45D6</i>
3 - 3.9	<i>G1L4A6</i>	<i>G1L4D6</i>	<i>G2L4A6</i>	<i>G2L4D6</i>	<i>L1L4A6</i>	<i>L1L4D6</i>	<i>L2L4A6</i>	<i>L2L4D6</i>											
2 - 2.9	<i>G1L3A6</i>	<i>G1L3D6</i>	<i>G2L3A6</i>	<i>G2L3D6</i>	<i>L1L3A6</i>	<i>L1L3D6</i>	<i>L2L3A6</i>	<i>L2L3D6</i>											
1 - 1.9	<i>G1L2A6</i>	<i>G1L2D6</i>	<i>G2L2A6</i>	<i>G2L2D6</i>	<i>L1L2A6</i>	<i>L1L2D6</i>	<i>L2L2A6</i>	<i>L2L2D6</i>	1.5	<i>G3L15A6</i>	<i>G3L15D6</i>	<i>L3L15A6</i>	<i>L3L15D6</i>	<i>L4L15A6</i>	<i>L4L15D6</i>	<i>GV15A6</i>	<i>OGV15D6</i>	<i>UL15A6</i>	<i>UL15D6</i>
>0 - 0.9	<i>G1L1A6</i>	<i>G1L1D6</i>	<i>G2L1A6</i>	<i>G2L1D6</i>	<i>L1L1A6</i>	<i>L1L1D6</i>	<i>L2L1A6</i>	<i>L2L1D6</i>											
TOTAL	<i>G1ALTOT6</i>	<i>G1DLTOT6</i>	<i>G2ALTOT6</i>	<i>G2DLTOT6</i>	<i>L1ALTOT6</i>	<i>L1DLTOT6</i>	<i>L2ALTOT6</i>	<i>L2DLTOT6</i>		<i>G3ALTOT6</i>	<i>G3DLTOT6</i>	<i>L3ALTOT6</i>	<i>L3DLTOT6</i>	<i>L4ALTOT6</i>	<i>L4DLTOT6</i>	<i>AVTOT6</i>	<i>ODVTOT6</i>	<i>UALTOT6</i>	<i>ULDVTOT6</i>
Rating	<i>G1UWD6</i>	<i>G2UWD6</i>	<i>L1UWD6</i>	<i>L2UWD6</i>		<i>G3UWD6</i>	<i>L3UWD6</i>	<i>L4UWD6</i>		<i>OGUWD6</i>	<i>UCUWD6</i>								
TGC %						UNWEIGHTED DEP.				T.L. CARBON			T.L. FLAKED CARBON %						
<i>TGC6</i>						<i>UWD6</i>				<i>TLC6</i>			<i>TLFC6</i>						

**M11 EGR LUBRICANT PERFORMANCE TEST
FORM 17
RING MASS LOSS 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>		
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>
AS MEASURED									
AVERAGE MASS LOSS (mg)			<i>AMARWLT</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>
OUTLIER RING (cylinder number)			<i>RINGOUT</i>						
OUTLIER SCREENED									
AVERAGE MASS LOSS (mg)			<i>ARWLT</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)**

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>		

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>FUELUCU</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**

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>		

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**

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>		

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

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

**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 Gallery	<i>OTEMSENS</i>	<i>OTEMCALF</i>	<i>OTEMRECD</i>	<i>OTEMOBSF</i>	<i>OTEMRECF</i>	<i>OTEMLOGF</i>	<i>OTEMSYSR</i>
Fuel In	<i>FTEMSSENS</i>	<i>FTEMCALF</i>	<i>FTEMRECD</i>	<i>FTEMOBSF</i>	<i>FTEMRECF</i>	<i>FTEMLOGF</i>	<i>FTEMSYSR</i>
Intake Air	<i>AITSENS</i>	<i>AITCALF</i>	<i>AITRECD</i>	<i>AITOBSF</i>	<i>AITRECF</i>	<i>AITLOGF</i>	<i>AITSYSR</i>
Intake Man.	<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 Gallery	<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>FFLOOBSF</i>	<i>FFLORECF</i>	<i>FFLOLOGF</i>	<i>FFLOSYSR</i>
Speed	<i>RPMSSENS</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