A5. Report Forms

M11 EGR
LUBRICANT PERFORMANCE TEST

VERSION *M11EGR VERSION 20011030*

METHOD *CCCCCCCC*

CONDUCTED FOR:

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

C	V = VALID; THE REFERENCE OIL/NON-REFERENCE OIL WAS EVALUATED IN ACCORDANCE WITH THE TEST PROCEDURE.
	I = INVALID; THE REFERENCE OIL/NON-REFERENCE OIL WAS NOT EVALUATED IN ACCORDANCE WITH THE TEST PROCEDURE.
	N = NOT INTERPRETABLE; THE NON-REFERENCE OIL RESULTS CANNOT BE INTERPRETED AND SHALL NOT BE USED FOR MULTIPLE TEST ACCEPTANCE.

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

STAND: *CCCCC*	ENGINE NO.: *CCCCCCCC*	ENGINE RUN NO.: *CCCC*
END OF TEST DATE: *YYYYMMDD*	END OF TEST TIME: *HH:MM*	
OIL CODE: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*		
FORMULATION/STAND CODE: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*		
ALTCODE1: *CCCCCCCCCCCCCCC*	ALTCODE2: *CCCCCCCCCCCCCCC*	ALTCODE3:

In my opinion this test 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: _____

Testing Laboratory

_____

Signature

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

Typed Name

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

Typed Name

M11 EGR LUBRICANT PERFORMANCE TEST
Test Results Summary
Form 4

Laboratory: *CC*	EOT Date: *YYYYMMDD*	EOT Time: *HH:MM*
Stand: *CCCCC*	Engine: *CCCCCCCC*	Engine Run No.: *CCCC*
Formulation/Stand Code: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*		
Oil Code: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*	Engine Kit S/N: *CCCCCCCCCCCC*	

DATE TEST STARTED	*YYYYMMDD*
START TIME	*HH:MM*
TEST LENGTH	*S1234*
TMC OIL CODE [A]	*CCCCCC*
LABORATORY OIL CODE	*CCCCCCCCCCCCCCCCCCCC*
SAE VISCOSITY	*CCCCCCC*
TGA SOOT % AT 50 h (2.8 minimum)	*S123.1*
TGA SOOT % AT 250 h (8.0 - 9.5)	*S123.1*
TOTAL OIL CONSUMPTION, kg	*S12.12*

	Adjusted Average Crosshead Mass Loss (mg)	Filter Plugging Delta P (kPa)	Average Sludge Rating (merits)	Avg. Top Ring Weight Loss (mg)
Original Result	*S12.1234*	*S123*	*S1.1*	*S123.1*
Transformed Result [B]	*S12.1234*	*S1.1234*	*S1.1234*	*S1.1234*
Correction Factor [B]	*S12.1234*	*S1.1234*	*S1.1234*	*S1.1234*
Corrected Transformed Result [B]	*S12.1234*	*S1.1234*	*S1.1234*	*S1.1234*
Severity Adjustment [B]	*S12.1234*	*S1.1234*	*S1.1234*	*S1.1234*
Final Transformed Result [B]	*S12.1234*	*S1.1234*	*S1.1234*	*S1.1234*
Final Result	*S123.1*	*S123*	*S1.1*	*S123.1*

LAST STAND REFERENCE RESULTS	
TEST NUMBER: *CCCCC - CCCCCCCC - CCCC*	
OILCODE	*CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*
TEST LENGTH	*S12*
TMC OIL CODE	*CCCCCC*
EOT DATE	*YYYYMMDD*
EOT TIME	*HH:MM*
STAND CALIBRATION EXPIRATION DATE	*YYYYMMDD*
TGA SOOT % AT 50 h (2.8 minimum)	*S123.1*
TGA SOOT % AT 250 h (8.5 - 9.5)	*S123.1*
TOTAL OIL CONSUMPTION, kg	*S12.12*

	Adjusted Average Crosshead Mass Loss (mg)	Filter Plugging Delta P (kPa)	Average Sludge Rating (merits)	Avg. Top Ring Weight Loss (mg)
Original Result	*S12.1234*	*S123*	*S1.1*	*S123.1*
Transformed Result [B]	*S12.1234*	*S1.1234*	*S1.1234*	*S1.1234*
Correction Factor [B]	*S12.1234*	*S1.1234*	*S1.1234*	*S1.1234*
Corrected Transformed Result [B]	*S12.1234*	*S1.1234*	*S1.1234*	*S1.1234*
Final Transformed Result [B]	*S12.1234*	*S1.1234*	*S1.1234*	*S1.1234*
Final Result	*S123.1*	*S123*	*S1.1*	*S123.1*

[A] Reference Tests Only

[B] Filter Plugging Delta P Value in Transformed Units

M11 EGR LUBRICANT PERFORMANCE TEST
FORM 5
OPERATIONAL SUMMARY

Laboratory	*CC*	EOT Date	*YYYYMMDD*	EOT Time	*HH:MM*
Test Number	Stand: *CCCCC*	Engine:	*CCCCCCCC*	Engine Run No.:	*CCCC*
Formulation/Stand Code:	*CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*				
Oil Code:	*CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*				

	Parameter	Units	QI Threshold	EOT QI [A]	Target		Average		Samples [B]	BQD [C]	Over/Under Range [D]
Controlled Parameters	Speed	r/min	0.000	*S12.123*	1800	1600	*S123456*	*S123456*	*S1234*	*S1234*	*S1234*
	Fuel Flow	kg/h	0.000	*S12.123*	58.0	64.4	*S123.1*	*S123.1*	*S1234*	*S1234*	*S1234*
	Coolant Out	˚C	0.000	*S12.123*	65.5		*S123.1*		*S1234*	*S1234*	*S1234*
	Fuel In	˚C	0.000	*S12.123*	40		*S12.1*		*S1234*	*S1234*	*S1234*
	Oil Gallery	˚C	0.000	*S12.123*	115		*S123.1*		*S1234*	*S1234*	*S1234*
	Intake Manifold	˚C	0.000	*S12.123*	80.0	65.5	*S12.1*	*S12.1*	*S1234*	*S1234*	*S1234*
	Exhaust	kPa	0.000	*S12.123*	107		*S123.1*		*S1234*	*S1234*	*S1234*

	Parameter	Units	Typical Values [E]		Average	
Non-controlled Parameters	Torque	N-m	TBD	TBD	*S1234.1*	*S1234.1*
	Power	kW	TBD	TBD	*S123.1*	*S123.1*
	EGR Rate	%	Record	8.5 - 9.8 [F]	*S123.1*	*S123.1*
	Intake CO_2	%	0.97 - 1.09	0.78 - 0.85	*S1.12*	*S1.12*
	Blowby	L/min	TBD		*S12.1*	
	Coolant In	˚C	TBD		*S123.1*	
	Intake Air	˚C	TBD		*S12.1*	
	Pre-Turbine (F)	˚C	TBD		*S123.1*	
	Pre-Turbine (R)	˚C	TBD		*S123.1*	
	Tailpipe	˚C	TBD		*S123.1*	
	Fuel	kPa	TBD		*S1234.1*	
	Oil Gallery	kPa	TBD		*S123.1*	
	Coolant	kPa	99 - 107		*S123.1*	
	Intake Manifold	kPa	TBD		*S123.1*	
	Crankcase	kPa	TBD		*S1.1*	
	Intake Air	kPa	TBD		*S12.12*	

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

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

Laboratory *CC*	EOT Date *YYYYMMDD*	EOT Time *HH:MM*
Test Number		
STAND: *CCCCC*	ENGINE: *CCCCCCCC*	ENGINE RUN NO.: *CCCC*
FORMULATION/STAND CODE: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*		
OIL CODE: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*		

LOCATION	SERIAL NO.	PRETEST MASS (g)	EOT MASS (g)	MASS LOSS (mg)
1E	*CCCCC*	*S123.1234*	*S123.1234*	*S12.1*
1I	*CCCCC*	*S123.1234*	*S123.1234*	*S12.1*
2I	*CCCCC*	*S123.1234*	*S123.1234*	*S12.1*
2E	*CCCCC*	*S123.1234*	*S123.1234*	*S12.1*
3E	*CCCCC*	*S123.1234*	*S123.1234*	*S12.1*
3I	*CCCCC*	*S123.1234*	*S123.1234*	*S12.1*
4I	*CCCCC*	*S123.1234*	*S123.1234*	*S12.1*
4E	*CCCCC*	*S123.1234*	*S123.1234*	*S12.1*
5E	*CCCCC*	*S123.1234*	*S123.1234*	*S12.1*
5I	*CCCCC*	*S123.1234*	*S123.1234*	*S12.1*
6I	*CCCCC*	*S123.1234*	*S123.1234*	*S12.1*
6E	*CCCCC*	*S123.1234*	*S123.1234*	*S12.1*

INTAKE/EXHAUST SUMMARY	INTAKE		EXHAUST	
	As Measured	Outlier Screened	As Measured	Outlier Screened
Average Crosshead Mass Loss (mg)	*S12.12*	*S12.12*	*S12.12*	*S12.12*
Minimum Crosshead Mass Loss (mg)	*S12.1*	*S12.1*	*S12.1*	*S12.1*
Maximum Crosshead Mass Loss (mg)	*S12.1*	*S12.1*	*S12.1*	*S12.1*
Standard Deviation (mg)	*S12.12*	*S12.12*	*S12.12*	*S12.12*
Outlier Crossheads Locations [A]	*CCCCCCCC*		*CCCCCCCC*	

[A] Location Designation. Example: 3E

Overall Summary	As Measured	Outlier Screened	Adjusted to X.X% Soot
Average Crosshead Mass Loss (mg)	*S12.12*	*S12.12*	*S12.1234*
Minimum Crosshead Mass Loss (mg)	*S12.1*	*S12.1*	
Maximum Crosshead Mass Loss (mg)	*S12.1*	*S12.1*	
Standard Deviation (mg)	*S12.12*	*S12.12*	

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

Laboratory *CC*	EOT Date *YYYYMMDD*	EOT Time *HH:MM*
Test Number		
STAND: *CCCCC*	ENGINE: *CCCCCCCC*	ENGINE RUN NO.: *CCCC*
FORMULATION/STAND CODE: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*		
OIL CODE: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*		

OIL FILTER DELTA PRESSURE vs TEST HOURS

CCCCCCCCCCCCCCCCCCCC

M11 EGR LUBRICANT PERFORMANCE TEST
FORM 8
SLUDGE RATING SUMMARY

Laboratory: *CC*	EOT Date: *YYYYMMDD*	EOT Time: *HH:MM*
TEST NUMBER		
STAND: *CCCCC*	ENGINE: *CCCCCCCC*	ENGINE RUN NO.: *CCCC*
FORMULATION/STAND CODE: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*		
OIL CODE: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*		

SLUDGE RATING SUMMARY

Sludge Depth	Valve Cover % of Area	Valve Cover Volume Factor	Oil Pan % of Area	Oil Pan Volume Factor
1/4A	*S12*	*S1.12*	*S12*	*S1.12*
1/2A	*S12*	*S1.12*	*S12*	*S1.12*
3/4A	*S12*	*S1.12*	*S12*	*S1.12*
A	*S12*	*S1.12*	*S12*	*S1.12*
AB	*S12*	*S1.12*	*S12*	*S1.12*
B	*S12*	*S1.12*	*S12*	*S1.12*
BC	*S12*	*S1.12*	*S12*	*S1.12*
C	*S12*	*S1.12*	*S12*	*S1.12*
D	*S12*	*S1.12*	*S12*	*S1.12*
E	*S12*	*S1.12*	*S12*	*S1.12*
F	*S12*	*S1.12*	*S12*	*S1.12*
G	*S12*	*S1.12*	*S12*	*S1.12*
H	*S12*	*S1.12*	*S12*	*S1.12*
I	*S12*	*S1.12*	*S12*	*S1.12*
J	*S12*	*S1.12*	*S12*	*S1.12*
	Total Volume Factor: *S12.12*		Total Volume Factor: *S12.12*	
	MERIT RATING: *S12.12*		MERIT RATING: *S12.12*	
		Average Sludge Rating: *S1.1*		

M11 EGR LUBRICANT PERFORMANCE TEST
FORM 9
ROD BEARING MASS LOSS

Laboratory *CC*	EOT Date *YYYYMMDD*	EOT Time *HH:MM*
Test Number		
STAND: *CCCCC*	ENGINE: *CCCCCCCC*	ENGINE RUN NO.: *CCCC*
FORMULATION/STAND CODE: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*		
OIL CODE: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*		

CYLINDER NUMBER	BEARING LOCATION	PRE-TEST MASS (g)	POST-TEST MASS (g)	MASS LOSS (mg)
1	UPPER	*S123.1234*	*S123.1234*	*S123.1*
	LOWER	*S123.1234*	*S123.1234*	*S123.1*
2	UPPER	*S123.1234*	*S123.1234*	*S123.1*
	LOWER	*S123.1234*	*S123.1234*	*S123.1*
3	UPPER	*S123.1234*	*S123.1234*	*S123.1*
	LOWER	*S123.1234*	*S123.1234*	*S123.1*
4	UPPER	*S123.1234*	*S123.1234*	*S123.1*
	LOWER	*S123.1234*	*S123.1234*	*S123.1*
5	UPPER	*S123.1234*	*S123.1234*	*S123.1*
	LOWER	*S123.1234*	*S123.1234*	*S123.1*
6	UPPER	*S123.1234*	*S123.1234*	*S123.1*
	LOWER	*S123.1234*	*S123.1234*	*S123.1*

	BEARING MASS LOSS
AVERAGE (mg)	*S123.1*
MINIMUM (mg)	*S123.1*
MAXIMUM (mg)	*S123.1*
STANDARD DEVIATION (mg)	*S1.12*

M11 EGR LUBRICANT PERFORMANCE TEST
FORM 10
PISTON RATING SUMMARY

Laboratory *CC*	EOT Date *YYYYMMDD*	EOT Time *HH:MM*
TEST NUMBER		
STAND: *CCCCC*	ENGINE: *CCCCCCCC*	ENGINE RUN NO.: *CCCC*
FORMULATION/STAND CODE: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*		
OILCODE: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*		

UNWEIGHTED DEMERITS										
PISTON NUMBER	Lands				Grooves			Under Crown	Oil Cooling Gallery	Total Demerits
	1	2	3	4	1	2	3			
1	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S1.123*	*S123.12*	*S12.123*
2	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S1.123*	*S123.12*	*S12.123*
3	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S1.123*	*S123.12*	*S12.123*
4	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S1.123*	*S123.12*	*S12.123*
5	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S1.123*	*S123.12*	*S12.123*
6	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S1.123*	*S123.12*	*S12.123*
Average Demerits	*S1.123*	*S1.123*	*S1.123*	*S1.123*	*S1.123*	*S1.123*	*S1.123*	*S1.123*	*S1.123*	
					Average Total Unweighted Demerits					*S12.123*

PARAMETER	PISTON NUMBER						AVERAGE
	1	2	3	4	5	6	
TGC	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*
TLC	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*	*S12.12*

M11 EGR LUBRICANT PERFORMANCE TEST
FORM 11
PISTON 1 DEPOSIT RATINGS

Laboratory *CC*	EOT Date *YYYYMMDD*	EOT Time *HH:MM*
TEST NUMBER		
STAND: *CCCCC*	ENGINE: *CCCCCCCC*	ENGINE RUN NO.: *CCCC*
FORMULATION/STAND CODE: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*		
OILCODE: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*		

	GROOVES				LANDS				DEP FACTOR	GROOVES		LANDS				OIL COOLING GALLERY (2)		UNDER CROWN (1)	
DEP.	NO. 1		NO. 2		NO. 1		NO. 2			NO. 3		NO. 3		NO. 4					
FACTOR	A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.		A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.	A, %	DEM.
CARBON																			
HC-1.0	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*		*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*				
MC-0.5	*S12*	*S12.12*								*S12*	*S12.12*								
LC-.25	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*		*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*	*S123*	*S123.12*	*S12*	*S1.123*
TOTAL	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*		*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*	*S123*	*S123.12*	*S12*	*S1.123*
VARNISH																			
8 - 9	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*											
7 - 7.9	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*	7.5	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*	*S123*	*S123.12*	*S12*	*S1.123*
6 - 6.9	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*											
5 - 5.9	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*											
4 - 4.9	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*	4.5	*S12*	*S12.12*	*S12*	*S12.12*	*S12*	*S12.12*	*S123*	*S123.12*		
3 - 3.9																			
2 - 2.9																			
1 - 1.9									1.5										
> 0 - 0.9																			
TOTAL																			
Rating	*S12.12*		*S12.12*		*S12.12*		*S12.12*			*S12.12*		*S12.12*		*S12.12*		*S123.12*		*S1.123*	
TGC %									UNWEIGHTED DEP.			T.L. CARBON				T.L. FLAKED CARBON %			
S12.12									*S12.123*			*S12.12*							

M11 EGR LUBRICANT PERFORMANCE TEST
FORM 12
PISTON 2 DEPOSIT RATINGS

Laboratory *CC*	EOT Date *YYYYMMDD*	EOT Time *HH:MM*
TEST NUMBER		
STAND: *CCCCC*	ENGINE: *CCCCCCCC*	ENGINE RUN NO.: *CCCC*
FORMULATION/STAND CODE: *CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC*		
OILCODE: *CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC*		

	GROOVES				LANDS				DEP FACTOR	GROOVES		LANDS				OIL COOLING GALLERY (2)		UNDER CROWN (1)	
DEP. FACTOR	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																			
MC-0.5																			
LC-.25																			
TOTAL																			
VARNISH																			
8 – 9									7.5										
7 – 7.9																			
6 – 6.9																			
5 – 5.9									4.5										
4 – 4.9																			
3 – 3.9																			
2 – 2.9									1.5										
1 – 1.9																			
>0 – 0.9																			
TOTAL																			
Rating	*S12.12*		*S12.12*		*S12.12*		*S12.12*			*S12.12*		*S12.12*		*S12.12*		*S123.12*		*S1.123*	

TGC %	UNWEIGHTED DEP.	T.L. CARBON	T.L. FLAKED CARBON %
S12.12	*S12.123*	*S12.12*	