

**D 6838**  
**M11**  
**High Soot Lubricant Performance Test**

**Version**      M11 VERSION 20040727 BETA

**Conducted For:**  
TSTSPON1  
TSTSPON2

<b>LABVALID</b>	<b>V</b> =Valid; The Reference Oil/Non-Reference Oil Was Evaluated In Accordance With The Test Procedure.
	<b>I</b> = Invalid; The Reference Oil/Non-Reference Oil Was Not Evaluated In Accordance With The Test Procedure.
	<b>N</b> = Not interpretable; The Non-Reference Oil Results Cannot Be Interpreted And Shall Not Be Used For Multiple Test Acceptance.

Stand	STAND	Engine No.	ENGINE	Engine Run No.	RENRU	ENRUN
End Of Test Date	RDTCOMP		DTCOMP	End Of Test Time	REOTIME	EOTIME
Oil Code/CMIR: <sup>A</sup>	CMIR			OILCODE		
Formulation/Stand Code				FORM		
Altcode1	ALTCODE1	Altcode2	ALTCODE2	Altcode3	ALTCODE3	

<p>In my opinion this test    <b>OPVALID</b>    been conducted in a valid manner in accordance with ASTM Test Method D 6838 and the appropriate amendments through the information letter system. The remarks included in this report describe the anomalies associated with this test.</p>
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<sup>A</sup> CMIR or Non-Reference Oil Code

Submitted By: \_\_\_\_\_ **SUBLAB**  
Testing Laboratory

\_\_\_\_\_ **SUBSIGIM**  
Signature

\_\_\_\_\_ **SUBNAME**  
Typed Name

\_\_\_\_\_ **SUBTITLE**  
Title

**D6838**  
**M11 High Soot Lubricant Performance Test**  
**Non-Reference Oil Test Summary**  
**Form 1**

Formulation/Stand Code		FORM		Test Length	TESTLEN
Oil Code No.		OILCODE			
<b>Test Lab</b>	<b>Test Stand No.</b>	<b>Engine Block Serial No.</b>	<b>Engine Run Number</b>		
LAB	STAND	ENGINE	ENGINE		
Date Test Started			DTSTRT		
Start Time			STRTTIME		
Date Test Completed			DTCOMP		
EOT Time			EOTTIME		
Stand Calibration Expiration Date			DTCALEXP		
Total Test Hours On Engine			TOTENHR		
Engine Kit Serial Number			ENKIT		
Laboratory Oil Code			LABOCODE		
SAE Viscosity			SAEVISC		
Total Oil Consumption, kg			TOTOCON		
TGA Soot % At 150 Hours			TGA150		

	<b>Adjusted Average Crosshead Mass Loss, (mg)</b>	<b>+ Filter Plugging Delta P, (kPa)</b>	<b>Average Sludge Rating, (merits)</b>
Original Result	ACWL	OILDP	ASRT
Transformed Result <sup>A</sup>		TRNODP	
Industry Correction Factor <sup>A</sup>	ACWL <sub>CF</sub>	OILDPCF	ASRTC <sub>F</sub>
Corrected Result <sup>A</sup>	ACWL <sub>COR</sub>	OILDPCOR	ASRTCOR
Severity Adjustment (Lab Based) <sup>A</sup>	ACWL <sub>SA</sub>	OILD <sub>SA</sub>	ASRT <sub>SA</sub>
Severity Adjustment Result <sup>A</sup>	TACWLFNL	TODPFNL	TASRTFNL
Final Original Unit Result	ACWLFNL	OILD <sub>PFNL</sub>	ASRTFNL

<sup>A</sup> Filter Plugging Delta P Value in Transformed Units

**D6838**  
**M11 High Soot Lubricant Performance Test**  
**Reference Oil Test Summary**  
**Form 1A**

CMIR Code No. CMIR		Test Length	RTESTLEN
TMC Oil No. IND			
<b>Test Lab</b>	<b>Test Stand No.</b>	<b>Engine Block Serial No.</b>	<b>Engine Run Number</b>
LAB	STAND	ENGINE	RENRUN
Date Test Started			RDTSTRT
Start Time			RSTRTIME
Date Test Completed			RDTCOMP
EOT Time			REOTTIME
Stand Calibration Expiration Date			ENCALEXP
Total Test Hours On Engine			RTOTENHR
Engine Kit Serial Number			RENKIT
Laboratory Oil Code			RLABOCOD
SAE Viscosity			RSAEVISC
Total Oil Consumption, kg			RTOTOCON
TGA Soot % At 150 Hours (4.5 – 5.5)			RTGA150

	Adjusted Average Crosshead Mass Loss, (mg)	Filter Plugging Delta P, (kPa)	Average Sludge Rating, -(merits)
Original Result	RACWL	ROILDP	RASRT
Transformed Result <sup>A</sup>		RTRNODP	
Industry Correction Factor <sup>A</sup>	ACWLCF	OILDPCF	ASRTCF
Corrected Result <sup>A</sup>	RACWLCOR	RTODPCOR	RASRTCOR
Final Original Unit Result	RACWLFNL	RFPDPFNL	RASRTFNL

<sup>A</sup> Filter Plugging Delta P Value in Transformed Units

**D 6838 M11 High Soot Lubricant Performance Test  
Form 2**

**Operational Summary**

Laboratory LAB	EOT Date RDTCOMP	DTCOMP	EOT Time	REOTIME	EOTTIME
Stand STAND	Engine ENGINE		Engine Run No. RENRUN ENRUN		
Formulation/Stand Code FORM					
Oil Code/CMIR CMIR					
OILCODE					

Parameter	Units	QI Threshold	EOT QI <sup>A</sup>	Target	Average	Samples <sup>B</sup>	BQD <sup>C</sup>	Over/Under Range <sup>D</sup>
Speed	R/min	0.000	ORPM	1800   1600	ARPM24	NRPM	BRPM	ORPM
Fuel Flow	kg/h	0.000	OFFLO	53	AFFLO	NFFLO	BFFLO	OFFLO
Coolant Out	°C	0.000	OCOLOUT	88	ACOLOUT	NCOLOUT	BCOLOUT	OCOLOUT
Fuel In	°C	0.000	OFUELT	40	AFUELT	NFUELT	BFUELT	OFUELT
Oil Gallery	°C	0.000	OILTEM	115	AOILTEM	NOILTEM	BOILTEM	OILTEM
Intake Manifold	°C	0.000	OINMANT	46	AINMANT	NINMANT	BINMANT	OINMANT
Exhaust	kPa	0.000	OEXHSTP	107	AEXHSTP	NEXHSTP	BEXHSTP	OEXHSTP
<b>Parameter</b>	<b>Units</b>	<b>QI Threshold</b>	<b>EOT QI<sup>A</sup></b>	<b>Target</b>	<b>Average</b>	<b>Samples<sup>B</sup></b>	<b>BQD<sup>C</sup></b>	<b>Over/Under Range<sup>D</sup></b>
<b>Controlled Parameters</b>								
Torque	N-m	1262 – 1360	1505 - 1688	ALOAD13	ALOAD24			
Power	kW	236 – 257	247 - 283	APWR13	APWR24			
Blowby	L/min		73 – 195		ABLOBY			
Coolant In	°C		81 – 87		ACOLIN			
Intake Air	°C		29 – 37		AINAIRT			
Pre-Turbine (F)	°C		536 – 629		APTURFT			
Pre-Turbine (R)	°C		548 – 628		APTURRT			
Tailpipe	°C		406 – 498		ATAILPT			
Fuel	kPa		1048 – 1132		AFPMP			
Oil Gallery	kPa		217 – 300		AOILPRS			
Coolant	kPa		99 – 107		ACOLOUP			
Intake Manifold	kPa		163 – 291		AINMANP			
Crankcase	kPa		0.5 – 3.4		ACCASEP			
Intake Air	kPa		92 – 99		AINAIRR			
<b>Non-controlled Parameters</b>								

<sup>A</sup> QI values above the threshold are acceptable by the Mack Surveillance Panel. QI values below the threshold may not be considered acceptable based on an engineering review. Refer to Annex A5

<sup>B</sup> Total number of data points taken. Minimum acceptable value is 3000

<sup>C</sup> Number of Bad Quality Data points not used in the calculation of the statistical measures.

<sup>D</sup> Number of points clipped by over/under range limits.

<sup>E</sup> Typical values determined from reference oil test database

**D 6838**  
**M11 High Soot Lubricant Performance Test**  
**Form 3**  
**200 h Crosshead Mass Loss Summary**

Laboratory LAB	EOT Date RDTCOMP	DTCOMP	EOT Time	REOTTIM	EOTTIME
<b>Test Number</b>					
Stand STAND	Engine ENGINE	Engine Run No.	RENRUN	ENRUN	
Formulation/Stand Code FORM					
Oil Code/CMIR CMIR					
OILCODE					

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

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

<sup>A</sup> Location Designation. Example: 3E

Overall Summary	As Measured	Outlier Screened	Adjusted to 4.5% Soot
Average Crosshead Mass Loss (mg)	AMACAWL	CAWL	RACWL
Minimum Crosshead Mass Loss (mg)	AMICAWL	ICHDWLE	
Maximum Crosshead Mass Loss (mg)	AMXCAWL	XCHDEWL	
Standard Deviation (mg)	AMSCAWL	SCHDEWL	

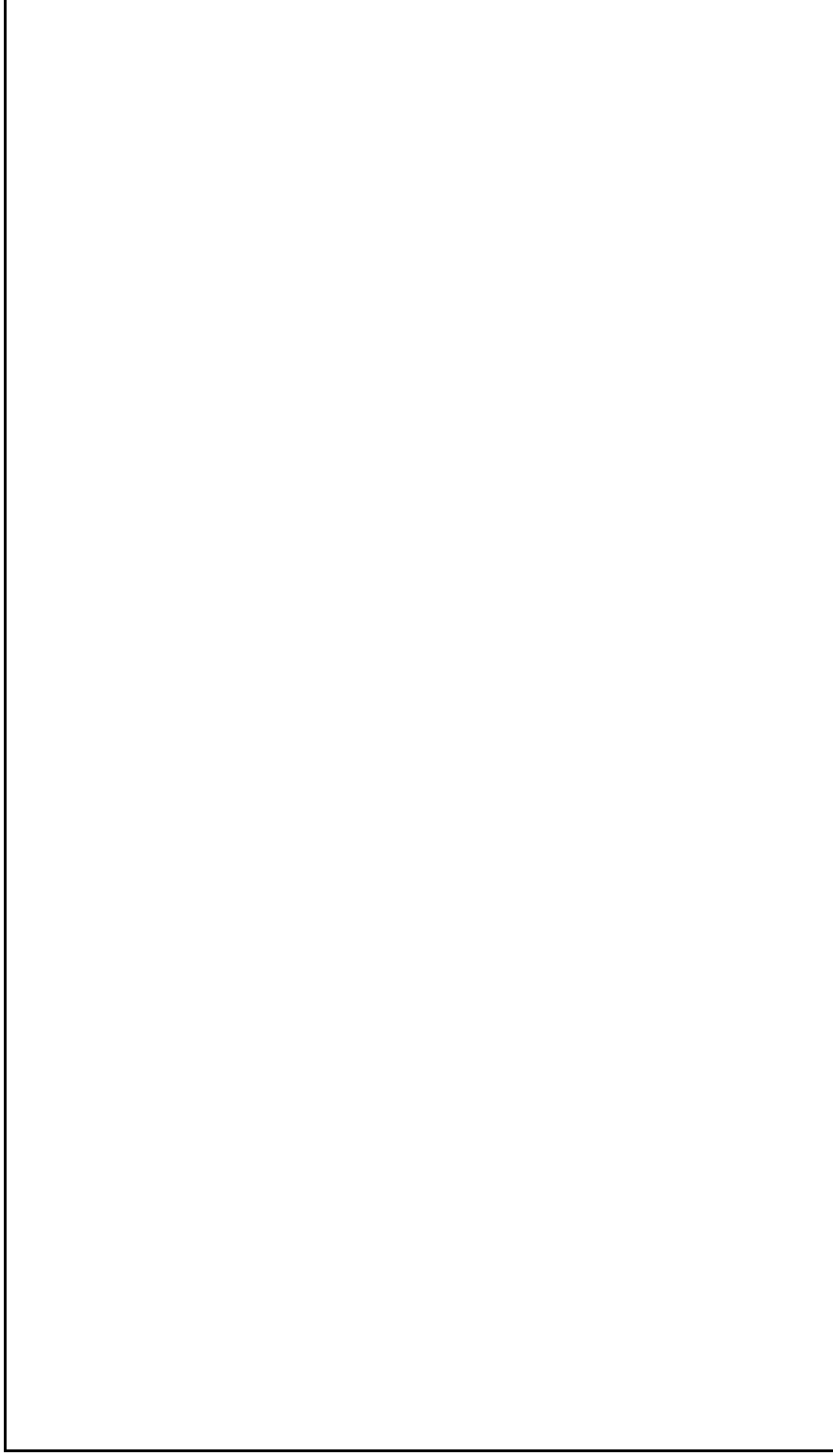
**D6838 M11 High Soot Lubricant Performance Test  
Form 4**

**Oil Filter Delta Pressure Plot**

Laboratory LAB	EOT Date	RDTCOMP	DTCOMP	EOT Time	REOTIME	EOTIME
Stand STAND	Engine ENGINE	Test Number				
Formulation/Stand Code FORM	Engine Run No.	REN RUN	EN RUN	EN RUN	EN RUN	EN RUN
Oil Code/CMIR CMIR	OILCODE					

OFDPIM

**Oil Filter Delta Pressure vs Test Hours**



Oil Filter DeltaP (kPa) □

Test Hours

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**Form 5**  
**Sludge Rating Summary**

Laboratory LAB	EOT Date RDTCOMP	DTCOMP	EOT Time REOTTIME	EOTTIME
<b>Test Number</b>				
Stand STAND	Engine ENGINE	Engine Run No.	REN RUN	EN RUN
Formulation/Stand Code FORM				
Oil Code/CMIR CMIR		OILCODE		

**Sludge Rating Summary**

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

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**Form 6**  
**Rod Bearing Mass Loss**

Laboratory LAB	EOT Date RDTCOMP	DTCOMP	EOT Time REOTTIME	EOTTIME
<b>Test Number</b>				
Stand STAND	Engine ENGINE	Engine Run No.	RENRUN	ENRUN
Formulation/Stand Code FORM				
Oil Code/CMIR CMIR		OILCODE		

Cylinder Number	Bearing Location	Pre-Test Mass (g)	Post-Test Mass (g)	Mass Loss (mg)
1	Upper	BWCYL1TP	BWCYL1TE	BWL1T
	Lower	BWCYL1BP	BWCYL1BE	BWL1B
2	Upper	BWCYL2TP	BWCYL2TE	BWL2T
	Lower	BWCYL2BP	BWCYL2BE	BWL2B
3	Upper	BWCYL3TP	BWCYL3TE	BWL3T
	Lower	BWCYL3BP	BWCYL3BE	BWL3B
4	Upper	BWCYL4TP	BWCYL4TE	BWL4T
	Lower	BWCYL4BP	BWCYL4BE	BWL4B
5	Upper	BWCYL5TP	BWCYL5TE	BWL5T
	Lower	BWCYL5BP	BWCYL5BE	BWL5B
6	Upper	BWCYL6TP	BWCYL6TE	BWL6T
	Lower	BWCYL6BP	BWCYL6BE	BWL6B

	Bearing Mass Loss
Average	ASBWL
Minimum	ISBWL
Maximum	XSBWL
Standard Deviation (mg)	SSBWL



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**Form 7**  
**Piston Rating Summary**

Laboratory LAB	EOT Date RDTCOMP	DTCOMP	EOT Time REOTIME	EOTTIME
<b>Test Number</b>				
Stand STAND	Engine ENGINE	Engine Run No.	RENRUN	ENRUN
Formulation/Stand Code FORM				
Oil Code/CMIR CMIR OILCODE				

Unweighted Demerits										
Piston Number	Lands				Grooves			Under Crown	Oil Cooling Gallery	Total Demerits
	1	2	3	4	1	2	3			
1	L1UWD1	L2UWD1	L3UWD1	L4UWD1	G1UWD1	G2UWD1	G3UWD1	UCUWD	OGUWD1	UWD1
2	L1UWD2	L2UWD2	L3UWD2	L4UWD2	G1UWD2	G2UWD2	G3UWD2	UCUWD	OGUWD2	UWD2
3	L1UWD3	L2UWD3	L3UWD3	L4UWD3	G1UWD3	G2UWD3	G3UWD3	UCUWD	OGUWD3	UWD3
4	L1UWD4	L2UWD4	L3UWD4	L4UWD4	G1UWD4	G2UWD4	G3UWD4	UCUWD	OGUWD4	UWD4
5	L1UWD5	L2UWD5	L3UWD5	L4UWD5	G1UWD5	G2UWD5	G3UWD5	UCUWD	OGUWD5	UWD5
6	L1UWD6	L2UWD6	L3UWD6	L4UWD6	G1UWD6	G2UWD6	G3UWD6	UCUWD	OGUWD6	UWD6
Average Demerits	AL1UWD	AL2UWI	AL3UWD	AL4UWI	AG1UWI	AG2UWI	AG3UW	AUCUW	AOGUWE	
Average Total Unweighted Demerits										TOTUWI

Parameter	Piston Number						Average
	1	2	3	4	5	6	
TGC	TGC1	TGC2	TGC3	TGC4	TGC5	TGC6	ATGC
TLC	TLC1	TLC2	TLC3	TLC4	TLC5	TLC6	ATLC



**D 6838 M11 High Soot Lubricant Performance Test  
Form 9**

**Piston 2 Deposit Ratings**

Laboratory LAB	EOT Date	RDTCOMP	DTCOMP	EOT Time	REOTTIM	EOTIME
Stand STAND	Engine ENGINE					
Formulation/Stand Code FORM	Engine Run No. RENRUN ENRUN					
Oil Code/CMIR CMIR	OILCODE					
<b>Test Number</b>						

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. 4	No. 3		No. 4	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.	
<b>CARBON</b>																				
HC - 1.0	G1HCA2	G1HCD2	G2HCA2	G2HCD2	L1HCA2	L1HCD2	L2HCA2	L2HCD2	G3HCA2	G3HCD2	L3HCA2	L3HCD2	L4HCA2	L4HCD2						
MC - 0.5	G1MCA2	G1MCD2							G3MCA2	G3MCD2										
LC - .25	G1LCA2	G1LCD2	G2LCA2	G2LCD2	L1LCA2	L1LCD2	L2LCA2	L2LCD2	G3LCA2	G3LCD2	L3LCA2	L3LCD2	L4LCA2	L4LCD2	OGLCA2	OGLCD2	U1LCA2	U1LCD2		
<b>Total</b>	G1ACTO	G1DCTO	G2ACTO	G2DCTO	L1ACTO	L1DCTO	L2ACTO	L2DCTO	G3ACTO	G3DCTO	L3ACTO	L3DCTO	L4ACTO	L4DCTO	OGACTC	OGDCTC	UIACTO	UIDCTO	U1DCTOT2	
<b>VARNISH</b>																				
8 - 9	G1L9A2	G1L9D2	G2L9A2	G2L9D2	L1L9A2	L1L9D2	L2L9A2	L2L9D2												
7 - 7.9	G1L8A2	G1L8D2	G2L8A2	G2L8D2	L1L8A2	L1L8D2	L2L8A2	L2L8D2	G3L75A:	G3L75D:	L3L75A2	L3L75D2	L4L75A:	L4L75D2	OGV75A	OGV75D	U1L75A:	U1L75D:		
6 - 6.9	G1L7A2	G1L7D2	G2L7A2	G2L7D2	L1L7A2	L1L7D2	L2L7A2	L2L7D2												
5 - 5.9	G1L6A2	G1L6D2	G2L6A2	G2L6D2	L1L6A2	L1L6D2	L2L6A2	L2L6D2	G3L45A2	G3L45D:	L3L45A2	L3L45D2	L4L45A:	L4L45D2	OGV45A	OGV45D	U1L45A:	U1L45D2		
4 - 4.9	G1L5A2	G1L5D2	G2L5A2	G2L5D2	L1L5A2	L1L5D2	L2L5A2	L2L5D2												
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	G3L15A:	G3L15D2	L3L15A2	L3L15D2	L4L15A2	L4L15D2	OGV15A	OGV15D	U1L15A2	U1L15D2		
>0 - 0.9	G1L1A2	G1L1D2	G2L1A2	G2L1D2	L1L1A2	L1L1D2	L2L1A2	L2L1D2												
<b>Total</b>	G1ALTO	G1DLTO	G2ALTO	G2DLTO	L1ALTO	L1DLTO	L2ALTO	L2DLTO	G3ALTC	G3DLTO	L3ALTO	L3DLTO	L4ALTO	L4DLTO	OGAVTC	OGDVTC	UIALTO	UIDLTO	U1DLTOT2	
<b>Rating</b>	G1UWD2	G2UWD2	L1UWD2	L2UWD2	G3UWD2	L3UWD2	L4UWD2	UCUWD2												
<b>TGC%</b>																				
<b>TGC2</b>																				

Unweighted Dep. UWD2  
T.L. Carbon TLC2  
T.L. Flaked Carbon % TLFC2







**D 6838 M11 High Soot Lubricant Performance Test**  
**Form 13**  
**Piston 6 Deposit Ratings**

Laboratory LAB	EOT Date	RDTCOMP	DTCOMP	EOT Time	REOTTIM	EOTTIME
Stand STAND	Test Number					
Formulation/Stand Code FORM	Engine	ENGINE	Engine Run No.	RENUN	ENRUN	ENRUN
Oil Code/CMIR CMIR	OILCODE					

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. 4	No. 3		No. 4	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.	
<b>CARBON</b>																				
HC - 1.0	G1HCA6	G1HCD6	G2HCA6	G2HCD6	L1HCA6	L1HCD6	L2HCA6	L2HCD6	G3HCA6	G3HCD6	L3HCA6	L3HCD6	L4HCA6	L4HCD6						
MC - 0.5	G1MCA6	G1MCD6							G3MCA6	G3MCD6										
LC - .25	G1LCA6	G1LCD6	G2LCA6	G2LCD6	L1LCA6	L1LCD6	L2LCA6	L2LCD6	G3LCA6	G3LCD6	L3LCA6	L3LCD6	L4LCA6	L4LCD6	OG1CA6	OG1CD6	U1LCA6	U1LCD6		
Total	G1ACTO	G1DCTO	G2ACTO	G2DCTO	L1ACTO	L1DCTO	L2ACTO	L2DCTO	G3ACTO	G3DCTO	L3ACTO	L3DCTO	L4ACTO	L4DCTO	OGACTO	OGDCTO	UIACTO	UIDCTO	TOT6	
<b>VARNISH</b>																				
8 - 9	G1L9A6	G1L9D6	G2L9A6	G2L9D6	L1L9A6	L1L9D6	L2L9A6	L2L9D6												
7 - 7.9	G1L8A6	G1L8D6	G2L8A6	G2L8D6	L1L8A6	L1L8D6	L2L8A6	L2L8D6	G3L75A6	G3L75D6	L3L75A6	L3L75D6	L4L75A6	L4L75D6	OGV75A	OGV75D	U1L75A6	U1L75D6		
6 - 6.9	G1L7A6	G1L7D6	G2L7A6	G2L7D6	L1L7A6	L1L7D6	L2L7A6	L2L7D6												
5 - 5.9	G1L6A6	G1L6D6	G2L6A6	G2L6D6	L1L6A6	L1L6D6	L2L6A6	L2L6D6												
4 - 4.9	G1L5A6	G1L5D6	G2L5A6	G2L5D6	L1L5A6	L1L5D6	L2L5A6	L2L5D6	G3L45A6	G3L45D6	L3L45A6	L3L45D6	L4L45A6	L4L45D6	OGV45A	OGV45D	U1L45A6	U1L45D6		
3 - 3.9	G1L4A6	G1L4D6	G2L4A6	G2L4D6	L1L4A6	L1L4D6	L2L4A6	L2L4D6												
2 - 2.9	G1L3A6	G1L3D6	G2L3A6	G2L3D6	L1L3A6	L1L3D6	L2L3A6	L2L3D6												
1 - 1.9	G1L2A6	G1L2D6	G2L2A6	G2L2D6	L1L2A6	L1L2D6	L2L2A6	L2L2D6	G3L15A6	G3L15D6	L3L15A6	L3L15D6	L4L15A6	L4L15D6	OGV15A	OGV15D	U1L15A6	U1L15D6		
>0 - 0.9	G1L1A6	G1L1D6	G2L1A6	G2L1D6	L1L1A6	L1L1D6	L2L1A6	L2L1D6												
Total	G1ALTO	G1DLTO	G2ALTO	G2DLTO	L1ALTO	L1DLTO	L2ALTO	L2DLTO	G3ALTO	G3DLTO	L3ALTO	L3DLTO	L4ALTO	L4DLTO	OGAVTO	OGDVTO	UIALTO	UIDLTO	TOT6	
Rating	G1UWD6	G2UWD6	G2UWD6	G2UWD6	L1UWD6	L2UWD6	L2UWD6	L2UWD6	G3UWD6	G3UWD6	L3UWD6	L3UWD6	L4UWD6	L4UWD6	OGUWD6	OGUWD6	UCUWD6	UCUWD6		
TGC%									Unweighted Dep.		T.L. Carbon							T.L. Flaked Carbon %		
'ILFC6									'ILC6								'ILFC6			

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**M11 High Soot Lubricant Performance Test**  
**Form 14**  
**Ring Mass Loss Summary**

Laboratory LAB	EOT Date RDTCOMP	DTCOMP	EOT Time REOTTIM	EOTTIM
<b>Test Number</b>				
Stand STAND	Engine ENGINE	Engine Run No.	RENRUN	ENRUN
Formulation/Stand Code FORM				
Oil Code/CMIR CMIR	OILCODE			

<b>Top Ring</b>			
Cylinder No.	Pretest Mass (g)	EOT Mass (g)	Mass Loss (mg)
1	RWCYL1PT	RWCYL1ET	RWLCYL1T
2	RWCYL2PT	RWCYL2ET	RWLCYL2T
3	RWCYL3PT	RWCYL3ET	RWLCYL3T
4	RWCYL4PT	RWCYL4ET	RWLCYL4T
5	RWCYL5PT	RWCYL5ET	RWLCYL5T
6	RWCYL6PT	RWCYL6ET	RWLCYL6T
Average Top Ring Mass Loss			ARWLT
Std. Dev. Top Ring Mass Loss			SRWLT
Maximum Top Ring Mass Loss			XRWLT
Minimum Top Ring Mass Loss			IRWLT

<b>Second Ring</b>			
Cylinder No.	Pretest Mass (g)	EOT Mass (g)	Mass Low (mg)
1	RWCYL1PS	RWCYL1ES	RWLCYL1S
2	RWCYL2PS	RWCYL2ES	RWLCYL2S
3	RWCYL3PS	RWCYL3ES	RWLCYL3S
4	RWCYL4PS	RWCYL4ES	RWLCYL4S
5	RWCYL5PS	RWCYL5ES	RWLCYL5S
6	RWCYL6PS	RWCYL6ES	RWLCYL6S
Average Second Ring Mass Loss			ARWLS
Std. Dev. Second Ring Mass Loss			SRWLS
Maximum Second Ring Mass Loss			XRWLS
Minimum Second Ring Mass Loss			IRWLS



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**M11 High Soot Lubricant Performance Test**  
**Form 15**  
**Oil Analysis Summary**

Laboratory LAB	EOT Date RDTCOMP	DTCOMP	EOT Time REOTTIME	EOTTIME
<b>Test Number</b>				
Stand STAND	Engine ENGINE	Engine Run No.		REN RUN EN RUN
Formulation/Stand Code FORM				
Oil Code/CMIR CMIR OILCODE				

Test Hours	Viscosity @ 100°C, cSt	TGA % Soot	TBN D4739	TAN D664	Copper (ppm)	Iron (ppm)	Lead (ppm)
NEW	V100NEW	TGA_NEW	TBN_NEW	TAN_NEW	CUWMNEW	FEWMNEW	PBWMNEW
TST_H0	V100H025	TGA_H025			CUWMH025	FEWMH025	PBWMH025
TST_H0	V100H050	TGA_H050	TBN_H050	TAN_H050	CUWMH050	FEWMH050	PBWMH050
TST_H0	V100H075	TGA_H075			CUWMH075	FEWMH075	PBWMH075
TST_H1	V100H100	TGA_H100	TBN_H100	TAN_H100	CUWMH100	FEWMH100	PBWMH100
TST_H1	V100H125	TGA_H125	TBN_H125	TAN_H125	CUWMH125	FEWMH125	PBWMH125
TST_H1	V100H150	RTGA1 TGA150	TBN_H150	TAN_H150	CUWMH150	FEWMH150	PBWMH150
TST_H1	V100H175	TGA_H175	TBN_H175	TAN_H175	CUWMH175	FEWMH175	PBWMH175
TST_H2	V100H200	TGA_H200	TBN_H200	TAN_H200	CUWMH200	FEWMH200	PBWMH200

**D 6838**  
**M11 High Soot Lubricant Performance Test**  
**Form 16**  
**Test Fuel Analysis (Last Batch)**

Laboratory LAB	EOT Date RDTCOMP	DTCOMP	EOT Time REOTTIM	EOTTIME
<b>Test Number</b>				
Stand STAND	Engine ENGINE	Engine Run No.	RENRUN	ENRUN
Formulation/Stand Code	FORM			
Oil Code/CMIR	CMIR	OILCODE		

Fuel Supplier	Fuel Batch Identifier
FUELSUP	FUELBTID

Measurement	Specifications	Analysis		Test Method
		New	EOT	
Total Sulfur, % Weight	0.03 - 0.05	FUELSNEW	FUELSEOT	D 2662
Gravity, °API	32 – 36	APIGRNEW	APIGREOT	D 287 or D 4052
<b>Hydrocarbon Composition</b>				
Aromatics % Volume	28 – 35	FUELAROM		D 1319
Olefin	Report	FUELOLEF		D 1319
Saturates	Report	FUELSATU		D 1319
Cetane Index	Report	CETANEIN		D 4737
Cetane Number	42 – 48	CETANENO		D 613
Copper Strip Corrosion	3 Maximum	FUELUCU		D 130
Flash Point, °C	54 Maximum	FLASHPT		D 93
Cloud Point, °C	-12 Maximum	FUELCLOU		D 2500
Pour Point, °C	-18 Maximum	FUELPOUR		D 97
Carbon Residue on 10% Residuum, %	0.35 Maximum	FUELCREC		D 524 (10% Bottoms)
Water & Sediment, % Volume	0.05 Maximum	FUELH2O		D 2709
Ash, % Weight	0.01 Maximum	FUELASH		D 482
Viscosity, cSt @ 40 °C	2.0 - 3.2	KINVIS		D 445
<b>Distillation, °C</b>				
IBP	177 – 199	FUELIBP		D 86
10%	210 – 232	FUEL10		D 86
50%	249 – 327	FUEL50		D 86
90%	299 – 327	FUEL90		D 86
EP	327 – 360	FUELEP		D 86

**D 6838**  
**M11 High Soot Lubricant Performance Test**  
**Form 17**  
**Unscheduled Downtime & Maintenance Summary**

Laboratory LAB	EOT Date RDTCOMP	DTCOMP	EOT Time REOTIME	EOTTIME
<b>Test Number</b>				
Stand STAND	Engine ENGINE	Engine Run No.	REN RUN	EN RUN
Formulation/Stand Code FORM				
Oil Code/CMIR CMIR OILCODE				

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

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

**D6838**  
**M11 High Soot Lubricant Performance Test**  
**Form 17A**  
**Unscheduled Downtime & Maintenance Summary**

Laboratory LAB	EOT Date RDTCOMP	DTCOMP	EOT Time REOTTIM	EOTTIME
<b>Test Number</b>				
Stand STAND	Engine ENGINE	Engine Run No.	REN RUN	EN RUN
Formulation/Stand Code FORM				
Oil Code/CMIR CMIR		OILCODE		

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

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

**D 6838**  
**M11 High Soot Lubricant Performance Test**  
**Form 17B**  
**Unscheduled Downtime & Maintenance Summary**

Laboratory LAB	EOT Date RDTCOMP	DTCOMP	EOT Time	REOTTIME	EOTTIME
<b>Test Number</b>					
Stand STAND	Engine ENGINE	Engine Run No.	REN RUN	EN RUN	
Formulation/Stand Code FORM					
Oil Code/CMIR CMIR					
OILCODE					

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

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

**D 6838**  
**M11 High Soot Lubricant Performance Test**  
**Form 18**  
**Characteristics Of The Data Acquisition System**

Laboratory LAB	EOT Date RDTCOMP	DTCOMP	EOT Time	REOTIME EOTTIME
<b>Test Number</b>				
Stand STAND	Engine ENGINE	Engine Run No.	RENRUN	ENRUN
Formulation/Stand Code	FORM			
Oil Code/CMIR CMIR	OILCODE			

Parameter (1)	Sensing Device (2)	Calibration Frequency (3)	Record Device (4)	Observation Frequency (5)	Record Frequency (6)	Log Frequency (7)	System Response (8)
<b>Temperatures</b>							
Oil Gallery	OTEMSENS	OTEMCALF	OTEMF	OTEMOBSF	OTEMRECF	OTEMLOGF	OTEMSYSR
Fuel In.	FTEMSSENS	FTEMCALF	FTEMR	FTEMOBSF	FTEMRECF	FTEMLOGF	FTEMSYSR
Intake Air	AITSENS	AITCALF	AITRE	AITOBSF	AITRECF	AITLOGF	AITSYSR
Intake Man.	IMANSENS	IMANCALF	IMANR	IMANOBSF	IMANRECF	IMANLOGF	IMANSYSR
Pre-Turb.	PTURSENS	PTURCALF	PTURR	PTUROBSF	PTURRECF	PTURLOGF	PTURSYSR
Cool. Out	COTSENS	COTCALF	COTRE	COTOBSF	COTRECF	COTLOGF	COTSYSR
<b>Pressure</b>							
Inlet Air	INRESENS	INRECALF	INRERI	INREOBSF	INRERECF	INRELOGF	INRESYSR
Exhaust	EXPRSENS	EXPRCALF	EXPRR	EXPROBSF	EXPRRECF	EXPRLOGF	EXPRSYSR
Oil Gallery	OILGSENS	OILGCALF	OILGR	OILGOBSF	OILGRECF	OILGLOGF	OILGSYSR
<b>Other</b>							
Fuel Flow	FFLOSENS	FFLOCALF	FFLOR	FFLOOBSF	FFLORECF	FFLOLOGF	FFLOSYSR
Speed	RPMSENS	RPMCALF	RPMRE	RPMOBSF	RPMRECF	RPMLOGF	RPMSYSR
Load	LOADSENS	LOADCALF	LOADR	LOADOBSF	LOADRECF	LOADLOGF	LOADSYSR

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 Where Data Is Recorded  
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 For The Output To Reach 63.2% Of Final Value For Step Change At Input

**D 6838**  
**M11 High Soot Lubricant Performance Test**  
**Form 19**  
**American Chemistry Council Code of Practice**  
**Test Laboratory Conformance Statement**

Test Laboratory	SUBLAB				
Test Sponsor	TSTSPON1				
Formulation / Stand Code	FORM				
Test Number	TESTNUM				
Start Date	DTSTRT	Start Time	STRTTIME	Time Zone	TZONE

***Declarations***

- No. 1 All requirements of the ACC Code of Practice for which the test laboratory is responsible were met in the conduct of this test. Yes ESROME No OROME\*
- No. 2 The laboratory ran this test for the full duration following all procedural requirements; and all operational validity requirements of the latest version of the applicable test procedure (ASTM or other), including all updates issued by the organization responsible for the test, were met.  
 Yes YESFULI No NOFULI \*
- If the response to this Declaration is “No”, does the test engineer consider the deviations from operational validity requirements that occurred to be beyond the control of the laboratory? Yes ESNODE\* No NONODEC
- No 3. A deviation occurred for one of the test parameters identified by the organization responsible for the test as being a special case. Yes ESDEV\* No NODEV  
*(This currently applies only to specific deviations identified in the ASTM Information Letter System)*

***Check The Appropriate Conclusion***

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

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

<b>Comments</b>	
ACCCOMM1	
ACCCOMM2	
ACCCOMM3	
ACCCOMM4	

SUBSIGIM \_\_\_\_\_  
 Signature

SUBDATE \_\_\_\_\_  
 Date

SUBNAME \_\_\_\_\_  
 Typed Name

SUBTITLE \_\_\_\_\_  
 Title