

**Two-Stroke-Cycle Gasoline Engine Lubricant Evaluation  
D4857 (Y350M2) ASTM TC Sequence I Test Procedure  
Title / Validity Declaration Page  
Form 1**

Version TC1 VERSION 20011211

Conducted

CC  
CC

C	I = Invalid
	V = Valid

CC	RO = Reference Oil Test
	NR = All Other Test

Test Number	
<b>Engine No.:</b> CCCCCCCCCCCCCCC	<b>Engine Run</b> CCC
<b>EOT Time:</b> HH:MM	<b>EOT Date:</b> YYYYMMDD
<b>Reference Oil</b> CCC	<del>CYLINDER</del> S1
<b>Non Reference Oil</b> CCC	<del>CYLINDER</del> S1
<b>Formulation/Stand</b> CC-CCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC	
<b>Alternate Codes:</b>	CC

In my opinion this test CCCCCCC been conducted in accordance with the Test Method D4857 and the appropriate amendments through information letter system. The remarks included in this report describe the anomalies with this test.

Submitted By: CCC

\_\_\_\_\_  
Testing Laboratory  
*Signature Image*  
\_\_\_\_\_  
Signature

CC

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

CC

\_\_\_\_\_  
Title

**Two-Stroke-Cycle Gasoline Engine Lubricant Evaluation  
D4857 (Y350M2) ASTM TC Sequence I Test Procedure  
Table of Contents  
Form 2**

<b>Lab:</b> CC	<b>EOT Date:</b> YYYYMMDD	<b>End Time:</b> HH:MM
<b>Engine No.:</b> CCCCCCCCCC	<b>Run Number:</b> CCC	
<b>Reference Oil</b>	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	Cylinder: CCCCCCS1
<b>Non Reference Oil</b>	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	Cylinder: CCCCCCS1
<b>Formulation / Stand Code:</b> CC-CCCCCCCCC-C-C-CCCCCC-CC-CC-CCCC		

Form No.

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# Two-Stroke-Cycle Gasoline Engine Lubricant Evaluation D4857 (Y350M2) ASTM TC Sequence I Test Procedure

## Test Result Summary

Form 4

<b>Lab:</b> CC	<b>EOT Date:</b> YYYYMMDD	<b>End Time:</b> HH:MM
<b>Engine No.:</b> CCCCCCCCCC	<b>Run Number:</b> CCC	
<b>Reference Oil:</b> CCC	<b>Industry Oil Code:</b> CCCCCC	<b>Cylinder:</b> S1
<b>Non Reference Oil:</b> CCC	<b>Industry Oil Code:</b> CCCCCC	<b>Cylinder:</b> S1
<b>Formulation / Stand Code:</b> CC-CCCCCCCCC-C-C-CCCCC-CC-CC-CCCC		
<b>Date Test</b> YYYYMMDD	<b>Start Time:</b> HH:MM	
<b>Stand No.:</b> CCCCC	<b>Test Length:</b> CCCCC	

Test Information	Cylinder 1	Cylinder 2
Laboratory Oil	CCCCCCCCCCCC	CCCCCCCCCCCC
Fuel Type	CCCCCCCC	CCCCCCCC
Fuel / Oil Ratio	CCCC	CCCC

Engine Inspection	Cylinder 1	Cylinder 2
Piston Varnish	Thrust	S1.1
	Anti-Thrust	S1.1
	Average	S1.1
	Ring Land	S1.1
	Undercrown	S1.1
Wristpin	Varnish	S1.1
	Condition	CCCC
	Bearing Varnish	S1.1
	Bearing Condition	CCCC
Cylinder Liner Varnish		S1.1
Ring Sticking	Top Ring	S12.1
	Second Ring	S1.12
	-1.85 Correction Factor	S1.12
Deposits	Piston Crown	S1.1
	Cylinder Head	S1.1
	Exhaust Port Blocking	S1.1
	Exhaust Port Blocking	S1.1
Piston Scuffing	Thrust	S1.1
	Anti-Thrust	S1.1
Cylinder Liner Wear		S1.1
CRC Demerit Number		S12.123

Engine Specifications	Cylinder 1	Cylinder 2
Piston Batch	CCC	CCC
Cylinder Liner Batch	CCC	CCC
Ring Gap Increase, in.	Top Ring	CCC
	Second Ring	CCC
Ring Weight Loss, mg.	Top Ring	CCC
	Second Ring	CCC

**Two-Stroke-Cycle Gasoline Engine Lubricant Evaluation  
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**Ring Land Ratings**

Form 5

<b>Lab:</b> CC	<b>EOT Date:</b> YYYYMMDD	<b>End Time:</b> HH:MM
<b>Engine No.:</b> CCCCCCCCCC	<b>Run Number:</b> CCC	
<b>Reference Oil</b> CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	<b>Cylinder:</b> C	<b>CCGCCCS1</b>
<b>Non Reference Oil</b> CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	<b>Cylinder:</b> C	<b>CCGCCCS1</b>
<b>Formulation / Stand Code:</b> CC-CCCCCCCCC-C-C-CCCCC-CC-CC-CCCC		

<b>Ring Lands - Carbon Ratings</b>					
<b>Deposit Type</b>	<b>Deposit Factor</b>	<b>Cylinder 1</b>		<b>Cylinder 2</b>	
		Area %	Demerit	Area %	Demerit
HC	1.000	S12	S12.123	S12	S12.123
MHC	0.750	S12	S12.123	S12	S12.123
MC	0.500	S12	S12.123	S12	S12.123
LC	0.250	S12	S12.123	S12	S12.123
VLC	0.150	S12	S12.123	S12	S12.123
Carbon Rating (demerits)		S12.123		S12.123	

<b>Ring Lands - Lacquer Ratings</b>					
<b>Deposit Type</b>	<b>Deposit Factor</b>	<b>Cylinder 1</b>		<b>Cylinder 2</b>	
		Area %	Demerit	Area %	Demerit
BL	0.100	S12	S12.123	S12	S12.123
DBRN	0.075	S12	S12.123	S12	S12.123
AL	0.050	S12	S12.123	S12	S12.123
LAL	0.025	S12	S12.123	S12	S12.123
VLAL	0.010	S12	S12.123	S12	S12.123
RL	0.001	S12	S12.123	S12	S12.123
Lacquer Rating		S12.123		S12.123	
Clean	0	S12	S12.123	S12	S12.123

Zonal Rating (demerits)	S12.123	S12.123
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**Two-Stroke-Cycle Gasoline Engine Lubricant Evaluation  
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**Ring Ratings**

Form 6

<b>Lab:</b> CC	<b>EOT Date:</b> YYYYMMDD	<b>End Time:</b> HH:MM
<b>Engine No.:</b> CCCCCCCCC	<b>Ring Number:</b> CCC	
<b>Reference Oil</b>	CC	Cylinder: CCS1
<b>Non Reference Oil</b>	CC	Cylinder: CCS1
<b>Formulation / Stand Code:</b> CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCC		

Cylinder Number	Ring Number	NMMA Rating	-1.85 Correction Factor <sup>A</sup>	Visual Rating	Adjusted Rating <sup>B</sup>
S1	S1	S1.12	S1.12	S1.1	S1.1
S1	S1	S1.12	S1.12	S1.1	S1.1
S1	S1	S1.12	S1.12	S1.1	S1.1
S1	S1	S1.12	S1.12	S1.1	S1.1
S1	S1	S1.12	S1.12	S1.1	S1.1
S1	S1	S1.12	S1.12	S1.1	S1.1

<sup>A</sup> A correction factor of -1.85 merits is applied to the benchmark reference oil (TMC 606) second ring sticking results, when run with the non-reference oil.

<sup>B</sup> The adjusted ring rating is calculated by averaging the NMMA ring rating and the visual ring rating. The visual ring rating is calculated by assessing the total number of degrees the ring visually appears to be stuck in the groove. The normal NMMA ring ratings are then applied as though the ring is firmly stuck over the area, even though in most cases rings in this condition can be forced to move through the application of varying amounts of pressure.

# Two-Stroke-Cycle Gasoline Engine Lubricant Evaluation D4857 (Y350M2) ASTM TC Sequence I Test Procedure

## Operational Summary

Form 7

<b>Lab:</b> CC	<b>EOT Date:</b> YYYYMMDD	<b>End Time:</b> HH:MM
<b>Engine No.:</b> CCCCCCCCCC	<b>Run Number:</b> CCC	
<b>Reference Oil</b>	CCCCCCCCCCCCCCCCCCCCCCCCCCS1	
<b>Non Reference Oil</b>	CCCCCCCCCCCCCCCCCCCCCCCCCCS1	
<b>Formulation / Stand Code:</b> CC-CCCCCCCCC-C-C-CCCCC-CC-CC-CCCC		

Parameters	Phase I			Phase II		
	Maximum	Minimum	Average	Maximum	Minimum	Average
Engine Speed, r/min	S123	S123	S123	S123	S123	S123
Dynamometer Speed, r/min	S123	S123	S123	S123	S123	S123
Observed Load, hp	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12
Corrected Load, hp	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12
Air / Fuel Ratio #1	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12
Air / Fuel Ratio #2	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12
Air Flow #1 lb / h	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12
Air Flow #2 lb / h	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12
Fuel Flow #1 lb / h	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12
Fuel Flow #2 lb / h	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12
<b>Pressures</b>						
Fuel Pressure #1, psi	S1.12	S.12	S1.12	S1.12	S1.12	S1.12
Fuel Pressure #2, psi	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12
Intake Air Pressure, in. H <sub>2</sub> O	S1.123	S1.123	S1.123	S1.123	S1.123	S1.123
Barometric Pressure, in. Hg	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12
<b>Temperatures, ° F</b>						
Spark Plug #1	S12	S12	S12	S12	S12	S12
Spark Plug #2	S12	S12	S12	S12	S12	S12
Cylinder Liner #1	S12	S12	S12	S12	S12	S12
Cylinder Liner #2	S12	S12	S12	S12	S12	S12
Exhaust #1	S123	S123	S123	S123	S123	S123
Exhaust #2	S123	S123	S123	S123	S123	S123
Fuel #1	S12	S12	S12	S12	S12	S12
Fuel #2	S12	S12	S12	S12	S12	S12
Intake Air, Carburetor	S12	S12	S12	S12	S12	S12
Intake Air Dew Point	S12	S12	S12	S12	S12	S12
Ambient	S12	S12	S12	S12	S12	S12









**Two-Stroke-Cycle Gasoline Engine Lubricant Evaluation  
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**Test Fuel Analysis (Last Batch)**

Form 11

<b>Lab:</b> CC	<b>EOT Date:</b> YYYYMMDD	<b>End Time:</b> HH:MM
<b>Engine No.:</b> CCCCCCCCCC	<b>Run Number:</b> CCC	
<b>Reference Oil</b> CCC1	<b>Cylinder:</b>	
<b>Non Reference Oil</b> CCC1	<b>Cylinder:</b>	
<b>Formulation / Stand Code:</b> CC-CCCCCCCCC-C-C-CCCCC-CC-CC-CCCC		
<b>Supplier</b> CCCCCCCCCCCCCCCCCC	<b>Batch Identifier:</b>	CCCCCCCCCCCCCCCC

Measurement	Specs.	Analysis	Test Method
Gravity, °API		S1.1	
Color		CCCCCCC	
Doctor Test		CCCCCCC	
Copper Corrosion, 3h @ 212 °F	1 Maximum	S123	D 130
Reid Vapor Pressure, psig		S1.1	
Research Octane Number		S1.1	
Motor Octane Number		S1.1	
(Research + Motor) / 2		S1.1	
Total Sulfur, % Weight	0.04 - 0.05	S1.12	D 2622
Gum, mg/100 mL		S1.1	
Oxidation Stability, min		S1234	
Lead, g/gal		S1.123	
<b>Distillation, °C</b>			
IBP	Report	S1234	D 86
10%	Report	S1234	D 86
50%	Report	S1234	D 86
90%	282 - 338	S1234	D 86
EP	Report	S1234	D 86
Recovery, %		S12.1	
<b>Pona, % vol</b>			
Paraffins + Napthenes		S12.1	
Olefin	Report	S12.1	D 1319
Aromatics % Vol.	28 - 33	S12.1	D 1319