

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

Form 1

Version TC1 VERSION 20021108

Conducted

CC  
CC

C	I = Invalid
	V =Valid

CC	RO = Reference Oil Test
	NR = All Other Test

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

In my opinion this test CCCCCCCC 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: CC  
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  
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 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> CCCCCC	<b>Cylinder:</b> S1	
<b>Non Reference Oil</b> CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	<b>Cylinder:</b> CS1	
<b>Formulation / Stand Code:</b> CC-CCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC		

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> CCCCCC	<b>Industry Oil Code:</b> CCCCCC	<b>Cylinder:</b> S1
<b>Non Reference Oil:</b> CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC		<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 Number	S1	S1
Laboratory Oil	CCCCCCCCCCCCC	CCCCCCCCCCCCC
Fuel Type	CCCCCCCCC	CCCCCCCCC
Fuel / Oil Ratio	CCCC	CCCC

Engine Inspection			
Cylinder Number		S1	S1
Piston Varnish	Thrust	S1.1	S1.1
	Anti-Thrust	S1.1	S1.1
	Average	S1.1	S1.1
	Ring Land	S1.1	S1.1
	Undercrown	S1.1	S1.1
Wristpin	Varnish	S1.1	S1.1
	Condition	CCCC	CCCC
	Bearing Varnish	S1.1	S1.1
	Bearing Condition	CCCC	CCCC
Cylinder Liner Varnish		S1.1	S1.1
Ring Sticking	Top Ring	S12.1	S12.1
	Second Ring	S1.12	S1.12
	-2.45 Correction Factor	S1.12	S1.12
Deposits	Piston Crown	S1.1	S1.1
	Cylinder Head	S1.1	S1.1
	Exhaust Port Blocking %	S1.1	S1.1
Piston Scuffing	Thrust	S1.1	S1.1
	Anti-Thrust	S1.1	S1.1
Cylinder Liner Wear		S1.1	S1.1
CRC Demerit Number	Ring Land	S12.123	S12.123

**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> CCCCCC	<b>Industry Oil Code:</b> CCCCCC	<b>Cylinder:</b> S1
<b>Non Reference Oil:</b> CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC		<b>Cylinder:</b> S1
<b>Formulation / Stand Code:</b> CC-CCCCCCCCC-C-C-CCCCC-CC-CC-CCCC		

<b>Ring Lands - Carbon Ratings</b>					
<b>Cylinder Number</b>		S1		S1	
<b>Deposit Type</b>	<b>Deposit Factor</b>	Area %	Demerit	Area %	Demerit
HC	1.000	S123	S12.123	S123	S12.123
MHC	0.750	S123	S12.123	S123	S12.123
MC	0.500	S123	S12.123	S123	S12.123
LC	0.250	S123	S12.123	S123	S12.123
VLC	0.150	S123	S12.123	S123	S12.123
Carbon Rating (demerits)		S12.123		S12.123	

<b>Ring Lands - Lacquer Ratings</b>					
<b>Cylinder Number</b>		S1		S1	
<b>Deposit Type</b>	<b>Deposit Factor</b>	Area %	Demerit	Area %	Demerit
BL	0.100	S123	S12.123	S123	S12.123
DBRN	0.075	S123	S12.123	S123	S12.123
AL	0.050	S123	S12.123	S123	S12.123
LAL	0.025	S123	S12.123	S123	S12.123
VLAL	0.010	S123	S12.123	S123	S12.123
RL	0.001	S123	S12.123	S123	S12.123
Lacquer Rating		S12.123		S12.123	
Clean	0	S123	S12.123	S123	S12.123

<b>Zonal Rating (demerits)</b>	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>Run No.:</b> CCCC	<b>Ring Number:</b> CCC
<b>Reference Oil :</b> CCCCCC	<b>Industry Oil Code:</b> CCCCCC	<b>Cylinder:</b> S1
<b>Non Reference Oil:</b> CCC		<b>Cylinder:</b> S1
<b>Formulation / Stand Code:</b> CC-CCCCCCCCC-C-C-CCCCC-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	S12.12	S1.12	S12.12	S12.12
S1	S1	S12.12	S1.12	S12.12	S12.12
S1	S1	S12.12	S1.12	S12.12	S12.12
S1	S1	S12.12	S1.12	S12.12	S12.12
S1	S1	S12.12	S1.12	S12.12	S12.12
S1	S1	S12.12	S1.12	S12.12	S12.12

<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> CCCCCC	<b>Industry Oil Code:</b> CCCCCC	<b>Cylinder:</b> S1
<b>Non Reference Oil:</b> CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	<b>Cylinder:</b> S1	
<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	S1234	S1234	S1234	S1234	S1234	S1234
Dynamometer Speed, r/min	S1234	S1234	S1234	S1234	S1234	S1234
Observed Load, hp	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
Corrected Load, hp	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
Air / Fuel Ratio - Baseline	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
Air / Fuel Ratio - Test Oil	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
Air Flow lb / h - Baseline	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
Air Flow lb / h - Test Oil	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
Fuel Flow lb / h - Baseline	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12
Fuel Flow lb / h - Test Oil	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12
<b>Pressures</b>						
Fuel Pressure, psi - Baseline	S1.12	S.12	S1.12	S1.12	S1.12	S1.12
Fuel Pressure, psi - Test Oil	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	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
<b>Temperatures, ° F</b>						
Spark Plug - Baseline	S123	S123	S123	S123	S123	S123
Spark Plug - Test Oil	S123	S123	S123	S123	S123	S123
Cylinder Liner - Baseline	S123	S123	S123	S123	S123	S123
Cylinder Liner- Test Oil	S123	S123	S123	S123	S123	S123
Exhaust - Baseline	S1234	S1234	S1234	S1234	S1234	S1234
Exhaust - Test Oil	S1234	S1234	S1234	S1234	S1234	S1234
Fuel - Baseline	S12	S12	S12	S12	S12	S12
Fuel - Test Oil	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> CCCCCCCCC	<b>Rig No.:</b> CCC	
<b>Reference Oil:</b> CCCCCC	<b>Industry Oil Code:</b> CCCCCC	<b>Cylinder:</b> S1
<b>Non Reference Oil:</b> CCC		<b>Cylinder:</b> S1
<b>Formulation / Stand Code:</b> CC-CCCCCCCCC-C-C-CCCCC-CC-CC-CCCC		
<b>Supplier</b> CCCCCCCCCCCCCCCCCCCC	<b>Batch Identifier:</b> CCCCCCCCCCCCCCCC	

Measurement	Specs.	Analysis	Test Method
Gravity, °API		S12.1	
Color		CCCCCCCC	
Doctor Test		CCCCCCCC	
Copper Corrosion, 3h @ 212 °F	1 Maximum	S123	D 130
Reid Vapor Pressure, psig		S1.1	
Research Octane Number		S12.1	
Motor Octane Number		S12.1	
(Research + Motor) / 2		S12.1	
Total Sulfur, % Weight	0.04 - 0.05	S1.1234	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