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

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

C	I = Invalid
	V =Valid

CC	RO = Reference Oil Test
	NR = All Other Test

Test Number			
Engine No.: CCCCCCCCCCCCCCC		**Engine Run** CCC	
EOT Time: HH:MM		**EOT Date:** YYYYMMDD	
Reference Oil CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC		**CYLINDER:** S1	
Non Reference Oil CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC		**CYLINDER:** S1	
Formulation/Stand CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC			
Alternate Codes:	CCCCCCCCCCCCCCC	CCCCCCCCCCCCCCC	CCCCCCCCCCCCCCC

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: **CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC**

Testing Laboratory

Signature Image

Signature

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

Typed Name

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

Title

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

Lab: CC	**EOT Date:** YYYYMMDD	**End Time:** HH:MM
Engine No.: CCCCCCCCCCCCCCC	**Run Number:** CCC	
Reference Oil CCCCCCCCCCCCCC

Two-Stroke-Cycle Gasoline Engine Lubricant Evaluation
D4857 (Y350M2) ASTM TC Sequence I Test Procedure
Test Result Summary
Form 4

Lab: CC	**EOT Date:** YYYYMMDD	**End Time:** HH:MM
Engine No.: CCCCCCCCCC	**Run Number:** CCC	
Reference Oil : CCCCCCCCCCCCCCCC	**Industry Oil Code:** CCCCCC	**Cylinder:** S1
Non Reference Oil: CCCCCCCCCCCCCC	**Industry Oil Code:** CCCCCC	**Cylinder:** S1
Formulation / Stand Code: CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC		

Date Test	YYYYMMDD	**Start Time:**	HH:MM
Stand No.:	CCCCC	**Test Length:**	CCCCC

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

Engine Inspection		**Cylinder 1**	**Cylinder 2**
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
	-1.85 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
	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		S12.123	S12.123

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

Two-Stroke-Cycle Gasoline Engine Lubricant Evaluation
D4857 (Y350M2) ASTM TC Sequence I Test Procedure
Ring Land Ratings
Form 5

Lab: CC	**EOT Date:** YYYYMMDD	**End Time:** HH:MM
Engine No.: CCCCCCCCCCCCCCC	**Run Number:** CCC	
Reference Oil CCCCCCCCCCCCCC

Two-Stroke-Cycle Gasoline Engine Lubricant Evaluation
D4857 (Y350M2) ASTM TC Sequence I Test Procedure
Ring Ratings
Form 6

Lab: CC	**EOT Date:** YYYYMMDD	**End Time:** HH:MM
Engine No.: CCCCCCCCCCCCCC	**Run Number:** CCC	
Reference Oil CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC		**Cylinder:** S1
Non Reference Oil CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC		**Cylinder:** S1
Formulation / Stand Code: CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC		

Cylinder Number	Ring Number	NMMA Rating	-1.85 Correction Factor [A]	Visual Rating	Adjusted Rating [B]
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

[A] *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.*

[B] *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 throught 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

Lab: CC	**EOT Date:** YYYYMMDD	**End Time:** HH:MM
Engine No.: CCCCCCCCCCCCCCC	**Run Number:** CCC	
Reference Oil CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	**Cylinder:** S1	
Non Reference Oil CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	**Cylinder:** S1	
Formulation / Stand Code: CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC		

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
Pressures						
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_2O	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
Temperatures, ° F						
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
D4857 (Y350M2) ASTM TC Sequence I Test Procedure
Remarks and Deviations
Form 8

Lab: CC	**EOT Date:** YYYYMMDD	**End Time:** HH:MM
Engine No.: CCCCCCCCCC	**Run Number:** CCC	
Reference Oil CCCCCCCCC

Two-Stroke-Cycle Gasoline Engine Lubricant Evaluation
D4857 (Y350M2) ASTM TC Sequence I Test Procedure
Phase II Air Fuel Ratio Plots

Form 9

Lab: CC	**EOT Date:** YYYYMMDD	**End Time:** HH:MM
Engine No.: CCCCCCCCCC	**Run Number:** CCC	
Reference Oil CCCCCCCCC

Two-Stroke-Cycle Gasoline Engine Lubricant Evaluation
D4857 (Y350M2) ASTM TC Sequence I Test Procedure
Phase II Spark Plug Plots
Form 10

Lab: CC	**EOT Date:** YYYYMMDD	**End Time:** HH:MM
Engine No.: CCCCCCCCCCCCCCC	**Run Number:** CCC	
Reference Oil CCCCCCCCCCCCCC

Two-Stroke-Cycle Gasoline Engine Lubricant Evaluation
D4857 (Y350M2) ASTM TC Sequence I Test Procedure
Test Fuel Analysis (Last Batch)

Form 11

Lab: CC	**EOT Date:** YYYYMMDD	**End Time:** HH:MM
Engine No.: CCCCCCCCCCCCCC	**Run Number:** CCC	
Reference Oil CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	**Cylinder:**	S1
Non Reference Oil CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	**Cylinder:**	S1
Formulation / Stand Code: CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC		
Supplier: CCCCCCCCCCCCCCCCCCCC	**Batch Identifier:** CCCCCCCCCCCCCCCC	

Measurement	Specs.	Analysis	Test Method
Gravity, ˚API		S1.1	
Color		CCCCCCCC	
Doctor Test		CCCCCCCC	
Copper Corrosion, 3h @ 212 ˚F	1 Maximum	S123	D 130
Reid Vapor Pressure, psig		S1.1	
Research Octane Number		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	
Distillation, ˚C			
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	
Pona, % vol			
Paraffins + Napthenes		S12.1	
Olefin	Report	S12.1	D 1319
Aromatics % Vol.	28 - 33	S12.1	D 1319