Sequence VG Report Forms

Version VG VERSION 20040210 BETA

Conducted For

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CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

C	V = Valid
	I = Invalid
	N = Results cannot be interpreted as representative of oil performance (Non-Reference Oil) and shall not be used in determining an average test result using multiple test acceptance criteria.

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

Test Number			
Stand: CCCCC	Runs Between Calibration Tests: CCCC		Total Runs on Stand: CCCCC
Date Completed: YYYYMMDD		End of Test Time: HH:MM	
Oil Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation/Stand Code: CC-CCCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC			
Alternate Codes:	CCCCCCCCCCCCCCCC	CCCCCCCCCCCCCCCC	CCCCCCCCCCCCCCCC

In my opinion this test CCCCCCCC has been conducted in a valid manner in accordance with the VG Test Method D 6593 and the appropriate amendments through the Information Letter system. The remarks included in the report describe the anomalies associated with this test.

SUBMITTED BY

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Testing Laboratory

Signature Image
Signature

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Typed Name

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Title

Form 2

Sequence VG

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Sequence VG Sludge and Varnish Deposit Test
Form 3

Summary of Test Method

The Sequence VG engine sludge and varnish deposit test is a fired engine-dynamometer test which evaluates the ability of a lubricant to minimize the formation of sludge and varnish deposits. This test method is a cyclic test, with a total running duration of 216 hours.

The test engine is a Ford 4.6L, spark ignition, four stroke, eight cylinder "V" configuration engine. Features of this engine include dual overhead camshafts, a cross-flow fast burn cylinder head design, two valves per cylinder and electronic port fuel injection. A 90 minute break-in schedule is conducted prior to each test, since a new engine build is used for each test.

The Sequence VG test requires a new engine for each test. Each test is run for 216 hours, consisting of 54 cycles of 4 hours each. Each cycle consists of 3 stages. The stages of the test cycle are set at the following conditions:

Condition	Stage I	Stage II	Stage III
Duration, minutes	120	75	45
Engine Speed, r/min	1200	2900	700
Engine Power, kW	Record	Record	1.10 - 1.50
Manifold Abs Press, kPa (abs)	69	66	Record
Engine Oil In, ^{o}C	68	100	45
Engine Coolant Out, ^{o}C	57	85	45
Engine Coolant Flow, L/min	48	Record	Record
Engine Coolant Pressure, kPa (gauge)	70	70	70
RAC Coolant In, ^{o}C	29	85	29
Rocker Cover Flow, L/min	15	15	15
Intake Air, ^{o}C	30	30	30
Intake Air, Press, kPa (gauge)	0.05	0.05	0.05
Exhaust Gas Analysis, Lambda	1.0	1.0	0.75
Blowby Flow Rate Avg, L/min	Record	60 - 70	-----
Air/Fuel Ratio	Stoichmetric	Stoichmetric	11.5:1
Intake Air Humidity, g/kg	11.4	11.4	11.4
Exhaust Back Pressure, kPa abs	104	107	Record
Fuel Flow, kg/h	Record	Record	Record

Upon test completion, the engine is disassembled and rated for sludge and varnish. Average Engine Sludge and Average Engine Varnish are calculated.

Sequence VG
Form 4
Test Result Summary
Non-Reference & Reference Oil Tests

Laboratory: CC	Stand: CCCCC	Stand Runs: CCCC	Total Runs on Stand: CCCCC
Oilcode: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation/Stand Code: CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC			

Date Started: YYYYMMDD	Time Started: HH:MM	SAE Viscosity: CCCCCCC
Date Complete: YYYYMMDD	Time Complete: HH:MM	Lab Engine Number: CCCCCC
Test Length: S1234		Fuel Batch: CCCCCCCCCCCCCCC
Industry Oil Code: CCCCCC		Nominal Piston Oversize: S1.123

Critical Parameters						
	Average Engine Sludge, Merits	Rocker Cover Sludge, Merits	Average Engine Varnish, Merits	Average Piston Skirt Varnish, Merits	Oil Screen Sludge, % Area	Number of Hot Stuck Rings
Original Result	S12.12	S12.12	S12.12	S12.12	S123	S1
Transformed Result					S1.1234	
Industry Correction Factor	S12.12	S12.12	S12.12	S12.12	S1.1234	S1
Corrected Transformed Result					S1.1234	
Severity Adjustment	S12.12	S12.12	S12.12	S12.12	S1.1234	S1
Final Transformed Result					S1.1234	
Final Original Unit Result	**S12.12**	**S12.12**	**S12.12**	**S12.12**	**S12.12**	**S12.12**

Clogging Information		**Additional Information**	
Oil Screen Debris, % Area	S123	Number of Cold Stuck Rings	S1
Oil Ring Clogging, % Area	S123	Average Blowby Stage II, L/min	S12.12
PCV Valve @ 25 kPa, %	S12.12	Oil Consumption, grams	S123456
PCV Valve @ 60 kPa, %	S12.12	Avg Follower Pin Wear, Cyl 8, Micrometers	S123.1

Last Reference Oil Test Calibrating Stand Information – Fill Out For Non-reference Oil Tests Only			
Stand: CCCCC		Total Runs on Test Stand CCCCC	
Oilcode: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Industry Oil Code: CCCCCC	Engine Number: CCCCCC	SAE Viscosity: CCCCCCC	Date Completed: YYYYMMDD
Test Length: S1234	Fuel Batch: CCCCCCCCCCCCCCC	Calibration Expiration Date: YYYYMMDD	

Clogging Information		**Additional Information**	
Oil Screen Debris, % Area	S123	Number of Cold Stuck Rings	S1
Oil Ring Clogging, % Area	S123	Average Blowby Stage II, L/min	S12.12
PCV Valve @ 25 kPa, %	S12.12	Oil Consumption, grams	S123456
PCV Valve @ 60 kPa, %	S12.12		

	Average Engine Sludge, Merits	Average Rocker Cover Sludge, Merits	Average Engine Varnish, Merits	Average Piston Skirt Varnish, Merits	Oil Screen Sludge, % Area	Number of Hot Stuck Rings
Final Original Unit Result	S12.12	S12.12	S12.12	S12.12	S123	S1

Sequence VG
Form 5
Test Result Summary
Non-Reference & Reference Oil Tests

Laboratory: CC	Stand: CCCCC	Stand Runs: CCCC	Total Runs on Stand: CCCCC
Oilcode: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation/Stand Code: CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC			

Date Completed: YYYYMMDD		Time Completed : HH:MM	
Camshaft Serial Numbers		Cam, Left: CCCC	Cam, Right: CCCC
Cylinder Head Serial Numbers		Head, Left: CCCCCCCCCCCC	Head, Right: CCCCCCCCCCCC
Number of Runs	Block: S12	Left Head: S12	Right Head: S12

Sludge Deposits	
Area	**Merit**
Rocker Arm Cover, Left	S1.12
Rocker Arm Cover, Right	S1.12
Camshaft Baffle, Left	S1.12
Camshaft Baffle, Right	S1.12
Timing Chain Cover	S1.12
Oil Pan Baffle	S1.12
Oil Pan	S1.12
Valve Deck Area, Left	S1.12
Valve Deck Area, Right	S1.12
Average Engine Sludge	S12.12

Varnish Deposits	
Area	**Merit**
Piston Skirt, Thrust	S12.12
Rocker Arm Cover, Left	S1.12
Rocker Arm Cover, Right	S1.12
Average Engine Varnish	**S12.12**

Wear Measurements		
Ring Wear	**Units**	**Value**
Follower Pin Wear, Cyl #8, Intake	µm	S123.1
Follower Pin Wear, Cyl #8, Exhaust.	µm	S123.1
Ring Gap Increase, Cyl #1 & #8, Max	µm	S123.1
Ring Gap Increase, Cyl #1 & #8, Avg	µm	S123.1

Piston Varnish Deposits, Thrust Side	
Piston Number	**Merit**
1	S1.12
2	S1.12
3	S1.12
4	S1.12
5	S1.12
6	S1.12
7	S1.12
8	S1.12
Average	**S12.12**

Sequence VG
Form 6
Operational Summary

Laboratory: CC	Stand: CCCCC	Stand Runs: CCCC	Total Runs on Stand: CCCCC
Oilcode: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation/Stand Code: CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC			

	Parameter	Units	QI Threshold	EOT QI	Target			Average			Samples	BQD	Over/Under Range
					Stage 1	Stage 2	Stage 3	Stage 1	Stage 2	Stage 3			
Controlled Parameters	Speed	r/min	**0.000**	S12.123	**1200**	**2900**	**700**	S1234	S1234	S1234	S12345	S12345	S12345
	Manifold Abs Press	kPa	**0.000**	S12.123	**69**	**66**	**Record**	S12.1	S12.1	S12.1	S12345	S12345	S12345
	Engine Oil, In	°C	**0.000**	S12.123	**68**	**100**	**45**	S123.1	S123.1	S123.1	S12345	S12345	S12345
	Engine Coolant, Out	°C	**0.000**	S12.123	**57**	**85**	**45**	S12.1	S12.1	S12.1	S12345	S12345	S12345
	Engine Coolant Flow	L/min	**0.000**	S12.123	**48**	**Record**	**Record**	S123.1	S123.1	S123.1	S12345	S12345	S12345
	Engine Coolant Pressure	kPa	**0.000**	S12.123	**70**	**70**	**70**	S123.1	S123.1	S123.1	S12345	S12345	S12345
	RAC Coolant, In	°C	**0.000**	S12.123	**29**	**85**	**29**	S12.1	S12.1	S12.1	S12345	S12345	S12345
	RAC Flow	L/min	**0.000**	S12.123	**15**	**15**	**15**	S12.1	S12.1	S12.1	S12345	S12345	S12345
	Intake Air	°C	**0.000**	S12.123	**30**	**30**	**30**	S12.1	S12.1	S12.1	S12345	S12345	S12345
	Intake Air Pressure	kPa	**0.000**	S12.123	**0.05**	**0.05**	**0.05**	S1.123	S1.123	S1.123	S12345	S12345	S12345
	Intake Air Humidity	g/kg	**0.000**	S12.123	**11.4**	**11.4**	**11.4**	S12.1	S12.1	S12.1	S12345	S12345	S12345
	Exhaust Backpressure	kPa	**0.000**	S12.123	**104**	**107**	**Record**	S123.1	S123.1	S123.1	S12345	S12345	S12345
Non-controlled	**Parameter**		**Units**		**Specifications**								
	Fuel Flow		kg/h		Record	Record	Record	S12.1	S12.1	S12.1			
	Blowby		L/min		Record	60-70			S12.12				
	Power		kW		Record	Record	1.3 ± 0.2	S12.12	S12.12	S12.12			
	Exhaust Gas												
	Lambda, Left Bank		AFR		1.0	1.0	0.75	S1.12	S1.12	S1.12			
	Lambda, Right Bank		AFR		1.0	1.0	0.75	S1.12	S1.12	S1.12			

Sequence VG
Form 7
Oil Addition Record & Blowby Rates
Non-Reference & Reference Oil Tests

Laboratory: CC	Stand: CCCCC	Stand Runs: CCCC	Total Runs on Stand: CCCCC
Oilcode: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation/Stand Code: CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC			

Cycle	Test Hour	Oil Added, g	Oil Consumed, g
S123	HHH:MM	S1234	S1234
S123	HHH:MM	S1234	S1234
S123	HHH:MM	S1234	S1234
S123	HHH:MM	S1234	S1234
S123	HHH:MM	S1234	S1234
S123	HHH:MM	S1234	S1234
S123	HHH:MM	S1234	S1234
S123	HHH:MM	S1234	S1234
S123	HHH:MM		S1234
Total, g		S123456	S123456

Stage II	
Test Hours	**Blowby, L/min**
CCCCCCCC	S12.12
HHH:MM	S12.12
HHH:MM	S12.12
HHH:MM	S12.12
HHH:MM	S12.12
HHH:MM	S12.12
HHH:MM	S12.12
HHH:MM	S12.12
HHH:MM	S12.12
HHH:MM	S12.12
Maximum	S12.12
Minimum	S12.12
Average Blowby, Hours 23 - 119	S12.12
Average	S12.12

Sequence VG
Form 8
Analysis of Oil

Laboratory: CC	Stand: CCCCC	Stand Runs: CCCC	Total Runs on Stand: CCCCC
Oilcode: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation/Stand Code: CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC			

Test Hours	Ag, ppm	Al, ppm	Cr, ppm	Cu, ppm	Fe, ppm	Pb, Ppm	Si, ppm	Sn, ppm	Fuel Dilution by GC, Wt.% D3525	Pentane Insolubles, Wt.% D893B[A]	TBN D4739[A]	Vis. @ 40°C, cSt D445	Vis. @ 100°C, cSt D445[A]
CCC	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA			AAAA	S123.1	S123.12
CCC	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	S12.1		AAAA	S123.1	S123.12
CCC	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	S12.1	S1.12	AAAA	S123.1	S123.12
CCC	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	S12.1		AAAA	S123.1	S123.12
CCC	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	S12.1	S1.12	AAAA	S123.1	S123.12
CCC	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	S12.1		AAAA	S123.1	S123.12
CCC	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	S12.1	S1.12	AAAA	S123.1	S123.12
CCC	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	S12.1		AAAA	S123.1	S123.12
CCC	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	S12.1	S1.12	AAAA	S123.1	S123.12
CCC	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA	S12.1	S1.12	AAAA	S123.1	S123.12

[A] Analyses not required by Test Method

Sequence VG
Form 9
Downtime Occurrences and Other Comments

Laboratory: CC	Stand: CCCCC	Stand Runs: CCCC	Total Runs on Stand: CCCCC
Oilcode: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation/Stand Code: CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC			

Number of Downtime Occurrences		S1	
Test Hours	Date	Downtime	Reasons
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCC

Sequence VG

Form 9A
Downtime Occurrences and Other Comments

Laboratory: CC	Stand: CCCCC	Stand Runs: CCCC	Total Runs on Stand: CCCCC
Oilcode: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation/Stand Code: CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC			

Number of Downtime Occurrences		S1	
Test Hours	Date	Downtime	Reasons
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCC

Sequence VG
Form 9B
Downtime Occurrences and Other Comments

Laboratory: CC	Stand: CCCCC	Stand Runs: CCCC	Total Runs on Stand: CCCCC
Oilcode: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation/Stand Code: CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC			

Number of Downtime Occurrences		S1	
Test Hours	Date	Downtime	Reasons
CCCCCC	CCCCCCCC	CCCCCC	CCCCCCCCCCCCCCCCCCCC

Sequence VG
Form 10
American Chemistry Council Code Of Practice
Test Laboratory Conformance Statement

Test Laboratory	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Test Sponsor	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Formulation / Stand Code	CC-CCCCCCCCCC-C-C-CCCCCC-CC-CC-CCCCC				
Test Number	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Start Date	YYYYMMDD	Start Time	HH:MM	Time Zone	CCC

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 ___C___ No___C___ *

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 ___C___ No___C___*

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 ___C___* No___C___

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 ___C___* No___C___ *(This currently applies only to specific deviations identified in the ASTM Information Letter System)*

Check the Appropriate Conclusion

C	Operational review of this test indicates that the results should be included in the Multiple Test Acceptance Criteria calculations.
C	*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.***

Comments
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Signature Image
Signature

YYYYMMDD
Date

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Typed Name

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Title