Report On
Sequence X
Version

Conducted For

	V = Valid
	I = Invalid
	N = Results cannot be interpreted as representative of oil performance (Non-reference oil) and shall not be used for multiple test acceptance

	NR = Non-reference oil test
	RO = Reference oil test

Test Number		
Test Stand	Number of Tests Since Last Stand Calibration Test	Total Runs on Test Stand

Lab Engine Number		Total Runs on Engine	
Lab Head Number		Chain Number	
Test Fuel		Fuel Batch	
EOT Date		EOT Time	
Oil Code			
Formulation/Stand Code			
Alternate Codes			

In my opinion this test _____ been conducted in a valid manner in accordance with the Test Method, D 8279, and appropriate amendments. The remarks included in the report describe the anomalies associated with this test.

Submitted By: _____
Testing Laboratory

_____
Signature

_____
Typed Name

_____
Title

Sequence X
Form 2
Table of Contents

    [A] ACC Conformance Statement is required for only ACC registered tests

The Chain Wear test is a fired engine dynamometer lubricant test which evaluates the ability of a test lubricant to reduce timing chain wear. The test method is a cyclic test, with a total running duration of 216 hours.

The Sequence X uses a Ford water cooled, 4 cycle, in-line cylinder, 2.0 liter EcoBoost engine as the test apparatus. The engine incorporates a dual overhead cam, four valves per cylinder (2 intake; 2 exhaust), and direct acting mechanical bucket lifter valve train design. The timing chain is replaced each test. An Eight hour break-in schedule is conducted prior to going on test conditions. The Chain is measured prior to installation, after break-in and at the end of test.

The test sequence is repeated for 54 test cycles. Each cycle consists of two stages as outlined in the table below:

Parameter	Units	Stage 1	Stage 2
Duration	min	120	60
Engine Speed	r/min	1550	2500
Engine Torque	N·m	50	128
Oil Gallery Temperature	°C	50	100
Coolant Out Temperature	°C	45	85
Coolant Flow	L/min	40	70
Intake Air Temperature	°C	32	32
Intake Air Pressure	kPa	0.05	0.05
Intake Air Humidity	g/kg	11.4	11.4
Coolant Pressure	kPa	70	70
Air Charge Temperature	°C	30	30
Air-Fuel Ratio	λ	0.78	1
Exhaust Backpressure	kPa	104	107
Blowby Outlet Temperature	°C	23	78

Sequence X
Form 4

Test Result Summary

Lab		Oil Code	
Stand		Test No.	
Laboratory Oil Code			
Formulation Stand Code			

Date Started		Engine No.	
Time Started		Fuel Batch	
Date Completed		SAE Viscosity	
Time Completed		Reference Oil	
Test Length			

Pass/Fail Results

PARAMETER	% Change
End of Test Chain Elongation	
Transformed End of Test Chain Elongation	
End of Test Chain Elongation, Industry Correction Factor	
Transformed Corrected Test Chain Elongation	
End of Test Chain Elongation, Laboratory SA	
Final Transformed Result	
End of Test Chain Elongation, Final Result	

Additional Parameters

PARAMETER	Result
Average Blowby	
Total Oil Consumption	
TGA Soot	

Sequence X
Form 5

Operational Summary

Lab		Oil Code	
Stand		Test No.	
Laboratory Oil Code			
Formulation Stand Code			

	Parameter	Units	QI Threshold	EOT QI	Target Stage 1	Target Stage 2	Average Stage 1	Average Stage 2	Number of Samples	BQD
	Speed	r/min	0.000		1550	2500				
	Torque	N·m	0.000		50	128				
	Oil Gallery	ºC	0.000		50	100				
	Coolant Out	ºC	0.000		45	85				
	Coolant System	kPa	0.000		70	70				
	Blowby Outlet Temperature	ºC			23	78				
	Engine Coolant Flow	L/min	0.000		40	70				
	Intake Air Humidity	g/kg	0.000		11.4	11.4				
	Intake Air Pressure	kPa	0.000		0.05	0.05				
	Exhaust Back Pressure	kPaa	0.000		104	107				
	Intake Air Temperature	ºC	0.000		32	32				
	Air Charge Temperature	ºC	0.000		30	30				
	Lambda	λ	0.000		0.78	1				

Controlled Parameters

Sequence X
Form 5a

Operational Summary

Non- controlled parameters

	Parameter	Units	Average		Number of	
			Stage 1	Stage 2	Samples	BQD
Non-controlled Parameters	Ambient Cell	ºC				
	Fuel Flow	kg/h				
	Ignition Voltage	V				
	Fuel Temperature	ºC				
	Coolant In Temperature	ºC				
	Oil Filter In Temperature	ºC				
	Exhaust Temperature	ºC				
	Manifold Absolute Pressure	kPaa				
	Boost Pressure	kPaa				
	Barometric Pressure	kPaa				
	Oil Gallery Pressure	kPa				
	Oil Head Pressure	kPa				
	Crankcase Pressure	kPa				
	Fuel Pressure	kPa				
	Pre-Intercooler Pressure	kPaa				

Sequence X
Form 6
Used Oil Analysis Results

Lab		Oil Code	
Stand		Test No.	
Laboratory Oil Code			
Formulation Stand Code			

Test Hour										EOT
Aluminum (Al)										
Boron (B)										
Calcium (Ca)										
Chromium (Cr)										
Copper (Cu)										
Iron (Fe)										
Lead (Pb)										
Manganese (Mn)										
Molybdemum (Mo)										
Potassium (K)										
Phosphorus (P)										
Silicon (Si)										
Sodium (Na)										
Tin (Sn)										
Zinc (Zn)										
D6304 Water by Karl Fischer										
D664 Total Acid Number, gkOH/g										
D4739 Total Base Number, gkOH/g										
D3525 Fuel Dilution %										
Viscosity Increase @40°C										
Viscosity Increase @100°C										
TGA Soot, %										

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Sequence X
Form 7
Oil Level and Blowby Results

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Lab		Oil Code	
Stand		Test No.	
Laboratory Oil Code			
Formulation Stand Code			

Cycle	Test Hour	Oil Consumed, g
Total Oil Consumption		

Stage II	
Test Hours	**Blowby, L/min**
Maximum	
Minimum	
Average Blowby, Hours 23 - 119	
Average	

Sequence X
Form 8
Chain Wear Measurements

Lab		Oil Code	
Stand		Test No.	
Laboratory Oil Code			
Formulation Stand Code			

		0 Hour *	**End of Test**
Reference	**1**		
	2		
	3		
	Average		
Test Chain	**1**		
	2		
	3		
	Average		
	% Change		

*Post Break-in

Sequence X
Form 9
Downtime Summary

Lab		Oil Code	
Stand		Test No.	
Laboratory Oil Code			
Formulation Stand Code			

Number of Downtime Occurrences			
Test Hours	**Date**	**Downtime**	**Reasons**
		Total Downtime (hours)	

Sequence X
Form 10
Test Comments

Lab		Oil Code	
Stand		Test No.	
Laboratory Oil Code			
Formulation Stand Code			

Number of Comment Lines		

Sequence X

Form 11
American Chemistry Council Code of Practice
Test Laboratory Conformance Statement

Test Laboratory	
Test Sponsor	
Formulation / Stand Code	
Test Number	

Start Date		Start Time		Time Zone	

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 _____　　No _____ *

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 _____　　No_____ *

　　　　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 _____ *　No_____

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

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

_____　　_____
Signature　　　　　　　　　　　　　　　　　　　　　　　　Date

_____　　_____
Typed Name　　　　　　　　　　　　　　　　　　　　　　　Title