Report On
Chain Wear Evaluation
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 XXXX, and appropriate amendments. The remarks included in the report describe the anomalies associated with this test.

Submitted By: _____
Testing Laboratory

_____
Signature

_____
Typed Name

_____
Title

Chain Wear Test
Form 2
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Chain Wear Test
Form 3
Summary of Test Method

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 Chain Wear Test uses a Ford water cooled, 4 cycle, in-line cylinder, 2.0 liter EccoTech 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	20	85

Chain Wear
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 Stretch	
End of Test Chain Stretch, Industry Correction Factor	
End of Test Chain Stretch, Laboratory SA	
End of Test Chain Stretch**,** Final Result	

Additional Parameters

PARAMETER	Result
Average Blowby	
Total Oil Consumption	
TGA Soot	

Chain Wear Test
Form 5

Operational Summary

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

	Parameter	Units	QI Threshold	EOT QI	Target		Average		Number of	
					Stage 1	Stage 2	Stage 1	Stage 2	Samples	BQD
Controlled Parameters	Speed	r/min	0.000		1550	2500				
	Torque	N·m	0.000		50	128				
	Oil Gallery	°C	0.000		50	100				
	Coolant Out	°C	0.000		45	85				
	Coolant System	kPa	0.000		70	70				
	Blowby Outlet Temperature	°C			20	85				
	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	kPa	0.000		104	107				
	Intake Air Temperature	°C	0.000		32	32				
	Air Charge Temperature	°C	0.000		30	30				
	Lambda	λ	0.000		0.78	1				

	Parameter	Units	Target		Average		Number of	
			Stage 1	Stage 2	Stage 1	Stage 2	Samples	BQD
Non-controlled Parameters	Ambient Cell	°C	27	27				
	Fuel Flow	kg/h	Record	Record				
	Ignition Voltage	V	13	13				

Chain Wear
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)										
Pentane Insolubles										
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, %										

Chain Wear
Form 7
Oil Level and Blowby Results

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	

Chain Wear

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**

Chain Wear
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)

Chain Wear
Form 10
Test Comments

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

Number of Comment Lines		

Chain Wear

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