Report On
Sequence IVB Evaluation
Version
IVB VERSION 20150630 Beta
Conducted For
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

C	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

CC	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	
CCCCC	CC			CCCCC	
Lab Engine Number	CCCCCCCCCCCCCCCCCCC		Total Runs on Engine	CCCCCC	
Lab Head Number	CCCCCCCCCCCCCCCCCCC		Total Runs on Cyl Head	CCCCC	
Intake Cam Number	CCCCCCCCCCCCCCCCCCC		Test Fuel	CCCCCCCCCCCCCCCCCCC	
Exhaust Cam Number	CCCCCCCCCCCCCCCCCCC		Fuel Batch	CCCCCCCCCC	
EOT Date	YYYYMMDD		EOT Time	HH:MM	
Oil Code	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Formulation/Stand	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Alternate Codes	CCCCCCCCCCCCCCC	CCCCCCCCCCCCCCC		CCCCCCCCCCCCCCC	

In my opinion this test CCCCCCCC 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: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Testing Laboratory

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Signature

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Typed Name

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Title

Sequence IVB
Form 2
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Sequence IVB
Form 3
Summary of Test Method

The Sequence IVB engine valve train wear test is a fired engine dynamometer lubricant test which evaluates the ability of a test lubricant to reduce valve train wear. The test method is a low temperature cyclic test, with a total running duration of 200 hours.

The Sequence IVB uses a Toyota 2NR-FE water cooled, 4 cycle, in-line cylinder, 1.5 liter 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 critical test parts (camshafts, direct acting mechanical bucket lifters) are replaced each test. A 95 minute run-in schedule, followed by a 100 hour aging schedule, for Silicon (Si) pacification, is conducted whenever the long block or cylinder head are replaced with new components.

The Sequence IVB valve train wear test is a flush and run type of lubricant test with one 6 minute engine oil system flush and three 38 minute engine oil system flushes conducted prior to the actual test start. The test sequence is repeated for 24,000 test cycles. Each cycle consists of four stages as outlined in the table below:

Parameter	Units	Ramp to Stage 1	Stage 1	Ramp to Stage 2	Stage 2
Duration	sec	8	7	8	7
Engine Speed	r/min	4300 to 800	800	800 to 4300	4300
Engine Torque	N·m	25	25	25	25
Oil Gallery Temperature	°C	55 to 53	53	53 to 55	55
Coolant In Temperature	°C	49	49	49	49
Intake Air Temperature	°C	32	32	32	32
Intake Air Pressure	kPa	0.07	0.07	0.07	0.07
Intake Air Humidity	g/kg	11.5	11.5	11.5	11.5
Exhaust Back Pressure	kPa-abs	104.5 to 103.5	103.5	103.5 to 104.5	104.5
Differential Coolant Temperature	°C	5 to 2	2	2 to 5	5
Rocker Cover Coolant Outlet Temperature	°C	20	20	20	20

Sequence IVB
Form 4
Test Result Summary

Lab	CC	Oil Code	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Stand	CCCCC	Test No.	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Laboratory Oil Code			CCCCCCCCCCCCCCCCCCC
Formulation Stand Code			CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

Date Started	YYYYMMDD	Engine No.	CCCCCCCCCCCCCCCCCCC
Time Started	HH:MM	Fuel Batch	CCCCCCCCCC
Date Completed	YYYYMMDD	SAE Viscosity	CCCCCCC
Time Completed	HH:MM	Reference Oil	CCCCCC
Hours on Engine	S1234567	Hours on Head	S1234567
Test Length	S1234		

PARAMETER	RESULT
Intake Camshaft Average Heel to Toe Wear, µm	S123.1
Intake Camshaft Summation Heel to Toe Wear, µm	S123.1
Exhaust Camshaft Average Heel to Toe Wear, µm	S123.1
Exhaust Camshaft Summation Heel to Toe Wear, µm	S123.1
Intake Bucket Lifters Average z diff, µm	S12.123
Intake Bucket Lifters Summation z diff, µm	S123.12
Intake Bucket Lifters Average Area Loss, μm^2	S123456.12
Intake Bucket Lifters Summation Area Loss, μm^2	S1234567.1
Intake Bucket Lifters Average Mass Loss, mg	S12.1
Intake Bucket Lifters Summation Mass Loss, mg	S123.1
Exhaust Bucket Lifters Average z diff, µm	S12.123
Exhaust Bucket Lifters Summation z diff, µm	S123.12
Exhaust Bucket Lifters Average Area Loss, μm^2	S123456.12
Exhaust Bucket Lifters Summation Area Loss, μm^2	S1234567.1
Exhaust Bucket Lifters Average Mass Loss, mg	S12.1
Exhaust Bucket Lifters Summation Mass Loss, mg	S123.1
Oil Consumption, g	S12345
Fuel Consumption, l	S123.12
Fuel Dilution @ EOT, %	S123.123
40ºC Viscosity @ EOT, cSt	S123.123
Total Acid Number @ EOT, g kOH/g	S123.12
Total Base Number @ EOT, g kOH/g	S123.12
Oxidation by FTIR 5.8 Peak Area @EOT, ABS/cm^2	S123.12
Nitration by FTIR 6.1 Peak Area @EOT, ABS/cm^2	S123.12
Used Oil Iron @EOT, ppm	S12345

Sequence IVB
Form 5
Operational Summary – Phase 1

Lab	CC	Oil Code	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Stand	CCCCC	Test No.	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Laboratory Oil Code		CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
Formulation Stand Code		CCCCCCCCCCCCCCCCCC	

Parameter	Units	Target	Minimum	Maximum	Average	Std. Dev.	CV, %
Engine Speed	r/min	800 ± 25	S1234	S1234	S1234	S1.1234	S123.12
Engine Torque	N-m	25 ± 2	S12.12	S12.12	S12.12	S1.1234	S123.12
Engine Power	kW		S12.12	S12.12	S12.12	S1.1234	S123.12
Brake Mean Effective Power	bar		S12.1	S12.1	S12.1	S1.1234	S123.12
Air Fuel Ratio	afr	14.5 ± .2	S12.12	S12.12	S12.12	S1.1234	S123.12
Fuel Flow Rate	kg/h		S1.12	S1.12	S1.12	S1.1234	S123.12
Coolant Temperature Into Engine	°C	49 ± 3	S12.1	S12.1	S12.1	S1.1234	S123.12
Coolant Temperature Out of Engine	°C		S12.1	S12.1	S12.1	S1.1234	S123.12
Coolant Delta	°C	2 ± 1	S12.1	S12.1	S12.1	S1.1234	S123.12
Engine Oil Sump	°C		S12.1	S12.1	S12.1	S1.1234	S123.12
Engine Oil Gallery	°C	53 ± 3	S12.1	S12.1	S12.1	S1.1234	S123.12
Intake Air Temperature	°C	32 ± 3	S12.1	S12.1	S12.1	S1.1234	S123.12
Exhaust Gas Temperature	°C		S123.1	S123.1	S123.1	S12.1234	S123.12
Fuel Rail Temperature	°C	24 ± 3	S12.1	S12.1	S12.1	S1.1234	S123.12
Test Cell Air Temperature	°C		S12.1	S12.1	S12.1	S1.1234	S123.12
Rocker Cover Coolant In Temperature	°C		S12.1	S12.1	S12.1	S1.1234	S123.12
Rocker Cover Coolant Out Temperature	°C	20 ± 2	S12.1	S12.1	S12.1	S1.1234	S123.12
Oil Gallery Pressure	kPa G		S123.1	S123.1	S123.1	S1.1234	S123.12
Exhaust Pressure	kPa Abs	103.5 ± 1	S1.123	S123.123	S1.123	S1.1234	S123.12
Intake Air Pressure	kPa G	0.07 ± 0.02	S1.123	S123.123	S1.123	S1.1234	S123.12
Fuel Rail Pressure	kPa G	335 ± 5	S123.1	S123.1	S123.1	S1.1234	S123.12
Crankcase Gas Pressure	kPa G		S1.123	S1.123	S1.123	S1.1234	S123.12
Barometric Pressure	kPa Abs		S123.1	S123.1	S123.1	S1.1234	S123.12
Intake Manifold Pressure	kPa Abs		S123.1	S123.1	S123.1	S1.1234	S123.12
Intake Air Humidity	g/kg	11.5 ± 0.5	S12.1	S12.1	S12.1	S1.1234	S123.12
Blowby Flow Rate	sl/min		S12.12	S12.12	S12.12	S1.1234	S123.12

Sequence IVB
Form 6
Operational Summary – Phase 2

Lab	CC	Oil Code	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Stand	CCCCC	Test No.	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Laboratory Oil Code		CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
Formulation Stand Code		CCCCCCCCCCCCCCCCCCCC	

Parameter	Units	Target	Minimum	Maximum	Average	Std. Dev.	CV, %
Engine Speed	r/min	4300 ± 25	S1234	S1234	S1234	S1.1234	S123.12
Engine Torque	N-m	25 ± 2	S12.12	S12.12	S12.12	S1.1234	S123.12
Engine Power	kW		S12.12	S12.12	S12.12	S1.1234	S123.12
Brake Mean Effective Power	bar		S12.1	S12.1	S12.1	S1.1234	S123.12
Air Fuel Ratio	afr	14.5 ± .2	S12.12	S12.12	S12.12	S1.1234	S123.12
Fuel Flow Rate	kg/h		S1.12	S1.12	S1.12	S1.1234	S123.12
Coolant Temperature Into Engine	°C	49 ± 3	S12.1	S12.1	S12.1	S1.1234	S123.12
Coolant Temperature Out of Engine	°C		S12.1	S12.1	S12.1	S1.1234	S123.12
Coolant Delta	°C	5 ± 1	S12.1	S12.1	S12.1	S1.1234	S123.12
Engine Oil Sump	°C		S12.1	S12.1	S12.1	S1.1234	S123.12
Engine Oil Gallery	°C	55 ± 3	S12.1	S12.1	S12.1	S1.1234	S123.12
Intake Air Temperature	°C	32 ± 3	S12.1	S12.1	S12.1	S1.1234	S123.12
Exhaust Gas Temperature	°C		S123.1	S123.1	S123.1	S12.1234	S123.12
Fuel Rail Temperature	°C	24 ± 3	S12.1	S12.1	S12.1	S1.1234	S123.12
Test Cell Air Temperature	°C		S12.1	S12.1	S12.1	S1.1234	S123.12
Rocker Cover Coolant In Temperature	°C		S12.1	S12.1	S12.1	S1.1234	S123.12
Rocker Cover Coolant Out Temperature	°C	20 ± 2	S12.1	S12.1	S12.1	S1.1234	S123.12
Oil Gallery Pressure	kPa G		S123.1	S123.1	S123.1	S1.1234	S123.12
Exhaust Pressure	kPa Abs	104.5 ± 1	S1.123	S123.123	S1.123	S1.1234	S123.12
Intake Air Pressure	kPa G	0.07 ± 0.02	S1.123	S1.123	S1.123	S1.1234	S123.12
Fuel Rail Pressure	kPa G	335 ± 5	S123.1	S123.1	S123.1	S1.1234	S123.12
Crankcase Gas Pressure	kPa G		S1.123	S1.123	S1.123	S1.1234	S123.12
Barometric Pressure	kPa Abs		S123.1	S123.1	S123.1	S1.1234	S123.12
Intake Manifold Pressure	kPa Abs		S123.1	S123.1	S123.1	S1.1234	S123.12
Intake Air Humidity	g/kg	11.5 ± 0.5	S12.1	S12.1	S12.1	S1.1234	S123.12
Blowby Flow Rate	sl/min		S12.12	S12.12	S12.12	S1.1234	S123.12

Sequence IVB
Form 7
Used Oil Analysis Results

Lab	CC	Oil Code	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Stand	CCCCC	Test No.	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Laboratory Oil Code			CCCCCCCCCCCCCCCCCCC
Formulation Stand Code			CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

Test Hour	**Flush1**	**Flush2**	**Flush3**	**Flush4**	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC	CCC
D5185 Metals, ppm													
Aluminum (Al)	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345
Chromium (Cr)	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345
Copper (Cu)	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345
Iron (Fe)	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345
Potassium (K)	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345
Nickel (Ni)	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345
Sodium (Na)	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345
Lead (Pb)	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345
Silicon (Si)	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345
Tin (Sn)	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345	S12345
D3525 Fuel Dilution %						S123.123	S123.123	S123.123	S123.123	S123.123	S123.123	S123.123	S123.123
Viscosity 40ºC, cSt					S123.123	S123.123	S123.123	S123.123	S123.123	S123.123	S123.123	S123.123	S123.123
D664 Total Acid Number, gkOH/g					S123.12	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12
D4739 Total Base Number, gkOH/g					S123.12	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12
FTIR 5.8 Peak Area, ABS/cm^2						S123.12	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12
FTIR 6.1 Peak Area, ABS/cm^2						S123.12	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12

Sequence IVB
Form 8

Oil Analyses Trend Plots

Lab	CC	Oil Code	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Stand	CCCCC	Test No.	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Laboratory Oil Code			CCCCCCCCCCCCCCCCCCCC
Formulation Stand Code			CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

Sequence IVB
Form 9
Engine Build Measurements

Lab	CC	Oil Code	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Stand	CCCCC	Test No.	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Laboratory Oil Code		CCCCCCCCCCCCCCCCCCC	
Formulation Stand Code		CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	

Bucket Lifter Size and Identification						
Cylinder	Intake			Exhaust		
	Location	Size	ID	Location	Size	ID
1	Intake 1	S12	CCCCCCCC	Exhaust 1	S12	CCCCCCCC
	Intake 2	S12	CCCCCCCC	Exhaust 2	S12	CCCCCCCC
2	Intake 3	S12	CCCCCCCC	Exhaust 3	S12	CCCCCCCC
	Intake 4	S12	CCCCCCCC	Exhaust 4	S12	CCCCCCCC
3	Intake 5	S12	CCCCCCCC	Exhaust 5	S12	CCCCCCCC
	Intake 6	S12	CCCCCCCC	Exhaust 6	S12	CCCCCCCC
4	Intake 7	S12	CCCCCCCC	Exhaust 7	S12	CCCCCCCC
	Intake 8	S12	CCCCCCCC	Exhaust 8	S12	CCCCCCCC

Camshaft Journal Measurements				
Intake			Exhaust	
Journal Number	Oil Feed Hole Dia., mm	Journal Dia., mm	Oil Feed Hole Dia., mm	Journal Dia., mm
Main Feed	S1.1234	S12.123	S1.1234	S12.123
1	S1.1234	S12.123	S1.1234	S12.123
2	S1.1234	S12.123	S1.1234	S12.123
3	S1.1234	S12.123	S1.1234	S12.123
4	S1.1234	S12.123	S1.1234	S12.123
Run Out, mm		S1.123	Run Out, mm	S1.123

Camshaft Lobe Measurements						
Intake				Exhaust		
Lobe	Heel to Toe, mm	Wt, µm	Ra, µm	Heel to Toe, mm	Wt, µm	Ra, µm
1	S12.123	S1.12	S1.12	S12.123	S1.12	S1.12
2	S12.123	S1.12	S1.12	S12.123	S1.12	S1.12
3	S12.123	S1.12	S1.12	S12.123	S1.12	S1.12
4	S12.123	S1.12	S1.12	S12.123	S1.12	S1.12
5	S12.123	S1.12	S1.12	S12.123	S1.12	S1.12
6	S12.123	S1.12	S1.12	S12.123	S1.12	S1.12
7	S12.123	S1.12	S1.12	S12.123	S1.12	S1.12
8	S12.123	S1.12	S1.12	S12.123	S1.12	S1.12

Sequence IVB
Form 10
Bucket Lifter Wear Measurements

Lab	CC	Oil Code	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Stand	CCCCC	Test No.	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Laboratory Oil Code		CCCCCCCCCCCCCCCCCC	
Formulation Stand Code		CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	

Lifter	Position	Intake				Exhaust			
		PDI Max z diff., µm	PDI Area Loss, µm ^{2}	Keyence Volume Loss, mm^3	Mass Loss, mg	PDI Max z diff., µm	PDI Area Loss, µm ^{2}	Keyence Volume Loss, mm^3	Mass Loss, mg
1	X	S12.12	S12345.1	S1.12	S12.1	S12.12	S12345.1	S1.12	S12.1
	Y	S12.12	S12345.1			S12.12	S12345.1		
2	X	S12.12	S12345.1	S1.12	S12.1	S12.12	S12345.1	S1.12	S12.1
	Y	S12.12	S12345.1			S12.12	S12345.1		
3	X	S12.12	S12345.1	S1.12	S12.1	S12.12	S12345.1	S1.12	S12.1
	Y	S12.12	S12345.1			S12.12	S12345.1		
4	X	S12.12	S12345.1	S1.12	S12.1	S12.12	S12345.1	S1.12	S12.1
	Y	S12.12	S12345.1			S12.12	S12345.1		
5	X	S12.12	S12345.1	S1.12	S12.1	S12.12	S12345.1	S1.12	S12.1
	Y	S12.12	S12345.1			S12.12	S12345.1		
6	X	S12.12	S12345.1	S1.12	S12.1	S12.12	S12345.1	S1.12	S12.1
	Y	S12.12	S12345.1			S12.12	S12345.1		
7	X	S12.12	S12345.1	S1.12	S12.1	S12.12	S12345.1	S1.12	S12.1
	Y	S12.12	S12345.1			S12.12	S12345.1		
8	X	S12.12	S12345.1	S1.12	S12.1	S12.12	S12345.1	S1.12	S12.1
	Y	S12.12	S12345.1			S12.12	S12345.1		
Sum.		S123.12	S1234567.1	S1.12	S123.1	S123.12	S1234567.1	S1.12	S123.1
Avg.		S12.123	S123456.12	S1.12	S12.1	S12.123	S123456.12	S1.12	S12.1
Min.		S123.12	S1234567.1	S1.12	S12.1	S123.12	S1234567.1	S1.12	S12.1
Max.		S123.12	S1234567.1	S1.12	S12.1	S123.12	S1234567.1	S1.12	S12.1
Std. Dev.		S12.123	S1234567.1	S1.12	S12.1	S12.123	S1234.12	S1.12	S12.1
Avg Wear Rate per Hour of Test Time		z diff., µm	Area Loss, µm ^{2}	Keyence Volume Loss, mm^3	Mass Loss, mg	z diff., µm	Area Loss, µm 2	Keyence Volume Loss, mm^3	Mass Loss, mg
		S1.1234	S1234.1234	S1.12	S1.1234	S1.1234	S1234.1234	S1.12	S1.1234

Sequence IVB
Form 11
Camshaft Lobe Wear Measurements

Lab	CC	Oil Code	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Stand	CCCCC	Test No.	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Laboratory Oil Code			CCCCCCCCCCCCCCCCCCC
Formulation Stand Code			CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

Camshaft Lobe Measurements						
Lobe	Intake Camshaft			Exhaust Camshaft		
	Start of Test Heel to Toe, mm	End of Test Heel to Toe, mm	Wear, µm	Start of Test Heel to Toe, mm	End of Test Heel to Toe, mm	Wear, µm
1	S12.123	S12.123	S12.12	S12.123	S12.123	S12.12
2	S12.123	S12.123	S12.12	S12.123	S12.123	S12.12
3	S12.123	S12.123	S12.12	S12.123	S12.123	S12.12
4	S12.123	S12.123	S12.12	S12.123	S12.123	S12.12
5	S12.123	S12.123	S12.12	S12.123	S12.123	S12.12
6	S12.123	S12.123	S12.12	S12.123	S12.123	S12.12
7	S12.123	S12.123	S12.12	S12.123	S12.123	S12.12
8	S12.123	S12.123	S12.12	S12.123	S12.123	S12.12
		Sum of Wear	S123.1		Sum of Wear	S123.1
		Average	S123.1		Average	S123.1
		Minimum	S12.123		Minimum	S12.123
		Maximum	S12.123		Maximum	S12.123
		Std. Dev.	S12.123		Std. Dev.	S12.123

Sequence IVB
Form 12
Miscellaneous Information

Lab	CC	Oil Code	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Stand	CCCCC	Test No.	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Laboratory Oil Code			CCCCCCCCCCCCCCCCCCC
Formulation Stand Code			CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

Hardware Information			
		Intake	Exhaust
Camshaft		CCCCCCCCCCCCCCCC	CCCCCCCCCCCCCCCC
Bucket Lifter Position	1	CCCCCCCCCCCCCCCC	CCCCCCCCCCCCCCCC
	2	CCCCCCCCCCCCCCCC	CCCCCCCCCCCCCCCC
	3	CCCCCCCCCCCCCCCC	CCCCCCCCCCCCCCCC
	4	CCCCCCCCCCCCCCCC	CCCCCCCCCCCCCCCC
	5	CCCCCCCCCCCCCCCC	CCCCCCCCCCCCCCCC
	6	CCCCCCCCCCCCCCCC	CCCCCCCCCCCCCCCC
	7	CCCCCCCCCCCCCCCC	CCCCCCCCCCCCCCCC
	8	CCCCCCCCCCCCCCCC	CCCCCCCCCCCCCCCC

Engine	CCCCCCCCCCCCCCCC
Cylinder Head	CCCCCCCCCCCCCCCC
Oil Filter	CCCCCCCCCCCCCCCC
Spark Plug	CCCCCCCCCCCCCCCC
Number of Runs on Cylinder Head	CCCCC
Number of Runs on Engine	CCCCCC

Compression and Cylinder Leak Down					
Cylinder	Compression, kpa			Cylinder Leak Down, %	
	Pre-test	Post test	Delta, %	Pre-test	Post test
1	S12345	S12345	S123.12	S123.12	S123.12
2	S12345	S12345	S123.12	S123.12	S123.12
3	S12345	S12345	S123.12	S123.12	S123.12
4	S12345	S12345	S123.12	S123.12	S123.12

Sequence IVB
Form 13
Downtime Summary

Lab	CC	Oil Code	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Stand	CCCCC	Test No.	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Laboratory Oil Code			CCCCCCCCCCCCCCCCCCCC
Formulation Stand Code			CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

Number of Downtime Occurrences			S1
Test Hours	**Date**	**Downtime**	**Reasons**
HHH:MM	YYYYMMDD	HHH:MM	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
HHH:MM	YYYYMMDD	HHH:MM	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
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		HHH:MM	**Total Downtime (hours)**

Sequence IVB
Form 14
Test Comments

Lab	CC	Oil Code	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Stand	CCCCC	Test No.	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Laboratory Oil Code			CCCCCCCCCCCCCCCCCCCC
Formulation Stand Code			CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

Number of Comment Lines	S1	
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Sequence IVB
Form 15
American Chemistry Council Code of Practice
Test Laboratory Conformance Statement

Test Laboratory	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Test Sponsor	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Formulation / Stand Code	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Test Number	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				
Start Date	YYYYMMDD	Start Time	HH:MM	Time Zone	CCC

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 ___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)

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

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Date

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Typed Name

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Title