Report On
Sequence IIIGVS 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		Stand Test		Lab Test	
Oil Code					
Formulation/Stand					
Alternate Codes					
EOT Date		EOT Time			

In my opinion this test been conducted in a valid manner in accordance with ASTM Test Method D 7320 and the appropriate amendments through the information letter system. The remarks included in the report describe the anomalies associated with this test.

Submitted By: _____
Testing Laboratory

_____
Signature

_____
Typed Name

_____
Title

Sequence IIIGVS
Form 2

Table of Contents

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

Sequence IIIGVS
Form 3

Summary of Test Method

The Sequence IIIGVS test is a fired-engine, dynamometer lubricant test for evaluating automotive engine oils for certain high-temperature performance characteristics, including oil thickening and oil consumption. Such oils include both single viscosity grade and multi-viscosity grade oils that are used in spark-ignition, gasoline-fueled engines, as well as diesel engines. The Sequence IIIGVS test utilizes a 1996 General Motors Powertrain 3800 Series II, water-cooled, 4 cycle, V-6 engine as the test apparatus. The Sequence IIIGVS test engine is an overhead valve design (OHV) and uses a single camshaft operating both intake and exhaust valves via pushrods and hydraulic valve lifters in a sliding-follower arrangement. The engine uses one intake and one exhaust valve per cylinder. Induction is handled by a modified GM port fuel injection system setting the Air-to-Fuel ratio at 15:1. The test engine is overhauled prior to each test, during which critical engine dimensions are measured (pistons, camshaft, valve lifters, etc.) and replaced.

The Sequence IIIGVS test consists of a 10-minute operational check, followed by 100 hours of engine operation at moderately high speed, load, and temperature conditions. The 100-hour segment is broken down into five 20-hour test segments. Following each 20-hour segment, and the 10-minute operational check, oil samples are drawn from the engine. The kinematic viscosities of the 20-hour segment samples are compared to the viscosity of the 10-minute sample to determine the viscosity increase of the test oil.

The Sequence IIIGVS test is operated at the following test states during the 100-hour portion of the test:

Parameter	Set Point
Engine Speed	3600 r/min
Engine Load	250 N-m
Oil Filter Block Temperature	150 ^{o}C
Coolant Outlet Temperature	115 ^{o}C
Fuel Pressure	377.5 kPa
Intake Air Temperature	35 ^{o}C
Intake Air Pressure	0.05 kPa
Intake Air Dew Point	16.1 ^{o}C
Exhaust Back Pressure	6 kPa
Engine Coolant Flow	160 L/min
Breather Tube Coolant Flow	10 L/min
Air-to-Fuel Ratio	15.0:1
Condenser Coolant Outlet Temperature	40 ^{o}C

Sequence IIIGVS
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		TMC Oil Code[A]	
Test Length			

	Viscosity Increase (%)
Original Units	
Transformed Results[B]	
Industry Correction Factor	
Corrected Transformed Result	
Severity Adjustment	
Final Transformed Result	
Final Original Unit Result	

Additional Results			
Oil Consumption Hours, h [C]		Oil Consumption, L	

[A]Reference Oil Tests Only
[B]Viscosity Increase uses LN(PVIS).
[C]Test Hours at which Oil Consumption was calculated

Sequence IIIGVS
Form 5
Operational Summary

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

	Parameter	Units	QI Threshold	EOT QI	Target	Average	Standard Deviation	Number of Samples[A]	Number of BQD[B]
Controlled Parameters	Speed	r/min	0.000		3600				
	Load	Nm	0.000		250				
	Oil Filter Block	^{o}C	0.000		150.0				
	Engine Coolant Out	^{o}C	0.000		115.0				
	Condenser Coolant Out	^{o}C	0.000		40.0				
	Left Air-to-Fuel		0.000		15.0				
	Right Air-to-Fuel		0.000		15.0				
	Left Exhaust Back Pressure	kPa	0.000		6.0				
	Right Exhaust Back Pressure	kPa	0.000		6.0				
	Intake Air	kPa	0.000		0.05				
	Engine Coolant Flow	L/min	0.000		160.0				

	Parameter	Units	Average	Standard Deviation	Number of Samples[A]	Number of BQD[B]
Non-controlled Parameters	Oil Sump	^{o}C				
	Pump Outlet Pressure	kPa				
	Gallery Pressure	kPa				
	Engine Coolant In	^{o}C				
	Fuel Inlet	^{o}C				
	Intake Air	^{o}C				
	Intake Air Dew Point	^{o}C				
	Intake Vacuum	kPa				
	Crankcase	kPa				
	Fuel Pressure	kPa				

Oil Consumption Data						
Hours	Initial Run-in					
Level (ml) low						
Total Oil Consumed (L)						

NO_x Measurement			
Hours			
$NO_{x,}$ ppm			

[A] Total number of data points taken as determined from test length and procedural specified sampling rate.
[B] Number of Bad Quality Data points not used in the calculation of the statistical measures.

Sequence IIIGVS
Form 6
Used Oil Analysis Results

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

Viscosity Increase Data (cSt at 40°C)			
Hours	Viscosity[A]	Change	Percent
New Oil			
Initial[B]			

Results of ICP Analysis of Used Oil			
Hours	Iron	Copper	Lead
Initial			

[A] 8000 cSt is maximum allowable viscosity
[B] At end of leveling run

Sequence IIIGVS
Form 7
Blowby Values & Plot

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

Blowby Plot

Test Hours										
Blowby, L/min.										
Test Hours										
Blowby, L/min.										
Test Hours		Average								
Blowby, L/min.										

Sequence IIIGVS
Form 8
Viscosity Increase Plot

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

Sequence IIIGVS
Form 9
Hardware Information

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

FIFO	Piston Ring Batch Code		Build Completion Date	
FIFO	Oil Control (OC) Batch Code		Piston Size (Grade)	
FIFO	Expander Ring (EXP) Batch Code		Block Serial Number	
FIFO	Oil Filter Batch Code		Crankshaft Serial Number	
FIFO	Camshaft Pour Code		Camshaft Serial Number	
FIFO	Oil Cooler Batch Code		Camshaft Phosphate Batch Code	
FIFO	Valve Springs Batch Code		Cylinder Head Serial Number, Left	
FIFO	Intake Valve Seals Batch Code		Cylinder Head Serial Number, Right	
FIFO	Exhaust Valve Seals Batch Code		Top Ring Gap, mils	
FIFO	Main Bearings (M) Batch Code		Bottom Ring Gap, mils	
FIFO	Connecting Rod Bearings (CR) Batch Code		Bearing Kit Serial Number	
FIFO	Camshaft Bushing (CB) Batch Code			
FIFO	Rocker Arm Batch Code			
FIFO	Piston Batch (Code)			

Sequence IIIGVS
Form 10
Downtime & Outlier Report Form

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

Number of Downtime Occurrences			
Test Hours	Date	Downtime	Reasons
			Total Downtime (hours) – Maximum allowable downtime: 24 hours

Other Comments		
Number of Comment Lines		

Sequence IIIGVS
Form 10A
Downtime & Outlier Report Form

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

Number of Downtime Occurrences			
Test Hours	Date	Downtime	Reasons
			Total Downtime (hours) – Maximum allowable downtime: 24 hours

Other Comments		
Number of Comment Lines		

Sequence IIIGVS

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