

Form 2

Sequence VIG

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^A ACC Conformance Statement is required only for ACC registered tests

Sequence VIG

Form 3

Summary of Test Method

The Sequence VIG is an engine dynamometer test that measures a lubricant's ability to improve the fuel economy of passenger cars and light-duty trucks. The method compares the performance of a test lubricant to the performance of a baseline lubricant over six different stages of operation.

A General Motors 3.6L (LY7) V6, 4-cycle engine is used as the test apparatus. The engine incorporates Dual Overhead Camshafts, 4 Valves / Cylinder, Dual Stage Plenum Induction Manifold, 94x85.6mm Bore & Stroke, with 10.2:1 compression ratio.

The Sequence VIG test incorporates a flush and run type procedure. Each test consists of two 6-stage fuel economy measurements on baseline oil (BL), one at the beginning of the test and one at the end. The test oil is evaluated in between the two baseline runs. The test oil is initially aged during 16 hours of engine operation at 2250 r/min and 120°C oil temperature. After the initial aging, a 6-stage fuel economy measurement is taken. The test oil is then aged an additional 109 hours at an engine speed of 2250 r/min and 120°C oil temperature. Following this final aging, the test oil once again goes through a 6-stage fuel economy measurement. The two fuel economy measurements taken on the baseline oil (BL) and a final value for Fuel Economy Improvement is calculated for the test oil.

Below is a summary of the operation conditions for the aging and 6-stage fuel economy portions of the test.

Fuel Economy Measurement and Aging Condition				
FE Stage	Speed (r/min)	Torque (N-m)	Oil Temp. (°C)	Coolant Temp. (°C)
1	2000	105	100	94
2	2000	105	65	65
3	1500	105	100	94
4	695	20	100	94
5	695	20	35	35
6	695	40	100	94

Aging Stage	Speed (r/min)	Torque (N-m)	Oil Temp. (°C)	Coolant Temp. (°C)
1 & 2	2250	110	120	110

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

Lab: CC	Date Completed: YYYYMMDD	Time Completed: HH:MM
Test Number		
Stand: CCCCC	Runs On The Stand: CCCC	Engine No. CCCCC
Oil Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC		Engine Serial Number: CCCCCCCCCC
Number of Full Length Tests Since Stand Calibration ^B S12		
Formulation/Stand Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC		

Test Documentation					
	BL Before 1	BL Before 2	BL Before 3	Test Oil	BL After
Start Date	YYYYMMDD	YYYYMMDD	YYYYMMDD	YYYYMMDD	YYYYMMDD
Start Time	HH:MM	HH:MM	HH:MM	HH:MM	HH:MM
End Date	YYYYMMDD	YYYYMMDD	YYYYMMDD	YYYYMMDD	YYYYMMDD
End Time	HH:MM	HH:MM	HH:MM	HH:MM	HH:MM
Oil Test Length, hhh:mm	HHH:MM	HHH:MM	HHH:MM	HHH:MM	HHH:MM
Calibration Oil Batch	CCCCCCCC				
Flush Oil Batch	CCCCCCCC				
Laboratory Oil Code				CCCCCCCC	
SAE Viscosity Grade				CCCCCCC	
TMC Oil Code (Reference Only)				CCCCCCCC	
New Oil Viscosity @ 40 °C, cSt				S1234.12	
New Oil Viscosity @ 100°C, cSt				S1234.12	
EOT Oil Viscosity @ 40 °C, cSt				S1234.12	
EOT Oil Viscosity @ 100°C, cSt				S1234.12	
Total Test Length, hhh:mm	HHH:MM				
Total Engine Hours @ EOT	CCCCC				
Fuel Batch @ Start of Test	CCCCCCCCC				
Fuel Batch @ End of Test	CCCCCCCCC				
Test Hour During Which Fuel Batch was Changed	HHH:MM				
Has Engine Previously Run an Oil where Vis < 0W-16?	CC				

Overall Results						
	BL Oil				Test Oil	
	Before 1	Before 2	Before 3	After	Phase I	Phase II
Fuel Consumed, Unweighted, kg	S1.123456	S1.123456	S1.123456	S1.123456	S1.123456	S1.123456
Fuel Consumed, weighted, kg	S1.123456	S1.123456	S1.123456	S1.123456	S1.123456	S1.123456
Shift Delta, % ^A	S123.12	S123.12	S123.12			
Fuel Economy Improvement, %					S12.12	S12.12
FEI Engine Hour Adjustment, %					S12.12	S12.12
FEI Industry Correction Factor, %					S12.12	S12.12
FEI Severity Adjustment, % (non-reference tests only)					S12.12	S12.12
FEI Final Result, %					S12.12	S12.12
FEI Sum, sum of FEI1 and FEI2 final results					S12.12	
Total Oil Consumption, ml					S12345	

^A Calculate Baseline shift % using unweighted fuel consumed values. When a 3rd set of BL Before is used, calculate BL shift after using the BL Before 3 for BL

Lab: CC		Date Completed: YYYYMMDD	Time Completed: HH:MM
Test Number			
Stand: CCCCC	Runs On The Stand: CCCC	Engine No. CCCCC	Runs on Engine: CCCC
Oil Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation/Stand Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			

Computed Averages							
Oil	Stage	BSFC kg/kW-h	BSFC C.V. %	Stage Length h	Nominal Power kW	Weight Factor	Weighted Fuel Consumed kg
BL Before Test Oil 1	1	S1.12345	S1.12	0.5	21.99	0.300	S1.123456
	2	S1.12345	S1.12	0.5	21.99	0.032	S1.123456
	3	S1.12345	S1.12	0.5	16.49	0.310	S1.123456
	4	S1.12345	S1.12	0.5	1.46	0.174	S1.123456
	5	S1.12345	S1.12	0.5	1.46	0.011	S1.123456
	6	S1.12345	S1.12	0.5	2.91	0.172	S1.123456
Total Fuel Consumed							S1.123456

Computed Averages							
Oil	Stage	BSFC kg/kW-h	BSFC C.V. %	Stage Length h	Nominal Power kW	Weight Factor	Weighted Fuel Consumed kg
BL Before Test Oil 2	1	S1.12345	S1.12	0.5	21.99	0.300	S1.123456
	2	S1.12345	S1.12	0.5	21.99	0.032	S1.123456
	3	S1.12345	S1.12	0.5	16.49	0.310	S1.123456
	4	S1.12345	S1.12	0.5	1.46	0.174	S1.123456
	5	S1.12345	S1.12	0.5	1.46	0.011	S1.123456
	6	S1.12345	S1.12	0.5	2.91	0.172	S1.123456
Total Fuel Consumed							S1.123456

Lab: CC		Date Completed: YYYYMMDD	Time Completed: HH:MM
Test Number			
Stand: CCCCC	Runs On The Stand: CCCC	Engine No. CCCCC	Runs on Engine: CCCC
Oil Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation/Stand Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			

Computed Averages							
Oil	Stage	BSFC kg/kW-h	BSFC C.V. %	Stage Length h	Nominal Power kW	Weight Factor	Weighted Fuel Consumed kg
BL Before Test Oil 3	1	S1.12345	S1.12	0.5	21.99	0.300	S1.123456
	2	S1.12345	S1.12	0.5	21.99	0.032	S1.123456
	3	S1.12345	S1.12	0.5	16.49	0.310	S1.123456
	4	S1.12345	S1.12	0.5	1.46	0.174	S1.123456
	5	S1.12345	S1.12	0.5	1.46	0.011	S1.123456
	6	S1.12345	S1.12	0.5	2.91	0.172	S1.123456
Total Fuel Consumed							S1.123456

Computed Averages							
Oil	Stage	BSFC kg/kW-h	BSFC C.V. %	Stage Length h	Nominal Power kW	Weight Factor	Weighted Fuel Consumed kg
Test Oil Phase I	1	S1.12345	S1.12	0.5	21.99	0.300	S1.123456
	2	S1.12345	S1.12	0.5	21.99	0.032	S1.123456
	3	S1.12345	S1.12	0.5	16.49	0.310	S1.123456
	4	S1.12345	S1.12	0.5	1.46	0.174	S1.123456
	5	S1.12345	S1.12	0.5	1.46	0.011	S1.123456
	6	S1.12345	S1.12	0.5	2.91	0.172	S1.123456
Total Fuel Consumed							S1.123456

Lab: CC		Date Completed: YYYYMMDD	Time Completed: HH:MM
Test Number			
Stand: CCCCC	Runs On The Stand: CCCC	Engine No. CCCCC	Runs on Engine: CCCC
Oil Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation/Stand Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			

Computed Averages							
Oil	Stage	BSFC kg/kW-h	BSFC C.V. %	Stage Length h	Nominal Power kW	Weight Factor	Weighted Fuel Consumed kg
Test Oil Phase II	1	S1.12345	S1.12	0.5	21.99	0.300	S1.123456
	2	S1.12345	S1.12	0.5	21.99	0.032	S1.123456
	3	S1.12345	S1.12	0.5	16.49	0.310	S1.123456
	4	S1.12345	S1.12	0.5	1.46	0.174	S1.123456
	5	S1.12345	S1.12	0.5	1.46	0.011	S1.123456
	6	S1.12345	S1.12	0.5	2.91	0.172	S1.123456
Total Fuel Consumed							S1.123456

Computed Averages							
Oil	Stage	BSFC kg/kW-h	BSFC C.V. %	Stage Length h	Nominal Power kW	Weight Factor	Weighted Fuel Consumed kg
BL After Test Oil	1	S1.12345	S1.12	0.5	21.99	0.300	S1.123456
	2	S1.12345	S1.12	0.5	21.99	0.032	S1.123456
	3	S1.12345	S1.12	0.5	16.49	0.310	S1.123456
	4	S1.12345	S1.12	0.5	1.46	0.174	S1.123456
	5	S1.12345	S1.12	0.5	1.46	0.011	S1.123456
	6	S1.12345	S1.12	0.5	2.91	0.172	S1.123456
Total Fuel Consumed							S1.123456

Sequence VIG
Form 8
General Parameter Listing

Lab: CC	Date Completed: YYYYMMDD	Time Completed: HH:MM	
Test Number			
Stand: CCCCC	Runs On The Stand: CCCC	Engine No. CCCCC	Runs on Engine: CCCC
Oil Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation/Stand Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			

16 Hour Aging

	Spec	Average	Max	Min
1. Speed, r/min	2250 ±5	S1234.1	S1234.1	S1234.1
2. Torque, N-m	110 ±0.10	S123.12	S123.12	S123.12
3. Oil Gallery Temperature, °C	120 ±2	S123.1	S123.1	S123.1
4. Coolant Inlet Temperature, °C	110 ±2	S123.1	S123.1	S123.1
5. Oil Circulation Temperature, °C	Record	S123.1	S123.1	S123.1
6. Coolant Out Temperature, °C	Record	S123.1	S123.1	S123.1
7. Intake Air Temperature, °C	29 ±2	S123.1	S123.1	S123.1
8. Fuel to Flowmeter Temperature, °C	26 ±2	S123.1	S123.1	S123.1
9. Fuel to Fuel Rail Temperature, °C	22 ±2	S123.1	S123.1	S123.1
10. Load Cell Temperature, °C	Record	S123.1	S123.1	S123.1
11. Oil Heater Temperature, °C	205 max	S123.1	S123.1	S123.1
12. Intake Air Pressure, kPa	0.05 ±0.02	S1.12	S1.12	S1.12
13. Fuel to Flowmeter Pressure, kPa	110±10	S123.1	S123.1	S123.1
14. Fuel to Fuel Rail Pressure, kPa	405±10	S123.1	S123.1	S123.1
15. Intake Manifold Pressure, kPa abs.	Record	S12.1	S12.1	S12.1
16. Exhaust Back Pressure, kPa abs.	105 ±0.20	S123.12	S123.12	S123.12
17. Engine Oil Pressure, kPa	Record	S123.1	S123.1	S123.1
18. Coolant Flow, L/min	80 ±4	S123.1	S123.1	S123.1
19. Fuel Flow, kg/h	Record	S12.123	S12.123	S12.123
20. Intake Air Humidity, grains/kg	11.4±0.8	S12.1	S12.1	S12.1
21. Air/Fuel Ratio	Record	S12.12	S12.12	S12.12
22. Crankcase Pressure, kPa	0.00 ±0.25	S12.12	S12.12	S12.12

Sequence VIG
Form 9
General Parameter Listing

Lab: CC	Date Completed: YYYYMMDD	Time Completed: HH:MM	
Test Number			
Stand: CCCCC	Runs On The Stand: CCCC	Engine No. CCCCC	Runs on Engine: CCCC
Oil Code: CCC			
Formulation/Stand Code: CCC			

109 Hour Aging

	Spec	Average	Max	Min
1. Speed, r/min	2250 ± 5	S1234.1	S1234.1	S1234.1
2. Torque, N-m	110 ±0.10	S123.12	S123.12	S123.12
3. Oil Gallery Temperature, °C	120±2	S123.1	S123.1	S123.1
4. Coolant Inlet Temperature, °C	110 ±2	S123.1	S123.1	S123.1
5. Oil Circulation Temperature, °C	Record	S123.1	S123.1	S123.1
6. Coolant Out Temperature, °C	Record	S123.1	S123.1	S123.1
7. Intake Air Temperature, °C	29 ±2	S123.1	S123.1	S123.1
8. Fuel to Flowmeter Temperature, °C	26 ±2	S123.1	S123.1	S123.1
9. Fuel to Fuel Rail Temperature, °C	22 ±2	S123.1	S123.1	S123.1
10. Load Cell Temperature, °C	Record	S123.1	S123.1	S123.1
11. Oil Heater Temperature, °C	205 max	S123.1	S123.1	S123.1
12. Intake Air Pressure, kPa	0.05 ±0.02	S1.12	S1.12	S1.12
13. Fuel to Flowmeter Pressure, kPa	110±10	S123.1	S123.1	S123.1
14. Fuel to Fuel Rail Pressure, kPa	405±10	S123.1	S123.1	S123.1
15. Intake Manifold Pressure, kPa abs.	Record	S12.1	S12.1	S12.1
16. Exhaust Back Pressure, kPa abs.	105 ± 0.20	S123.12	S123.12	S123.12
17. Engine Oil Pressure, kPa	Record	S123.1	S123.1	S123.1
18. Coolant Flow, L/min	80±4	S123.1	S123.1	S123.1
19. Fuel Flow, kg/h	Record	S12.123	S12.123	S12.123
20. Intake Air Humidity, grains/kg	11.4 ±0.8	S12.1	S12.1	S12.1
21. Air/Fuel Ratio	Record	S12.12	S12.12	S12.12
22. Crankcase Pressure, kPa	0.00 ±0.25	S12.12	S12.12	S12.12

Lab: CC		Date Completed: YYYYMMDD	Time Completed: HH:MM
Test Number			
Stand: CCCCC	Runs On The Stand: CCCC	Engine No. CCCCC	Runs on Engine: CCCC
Oil Code: CC			
Formulation/Stand Code: CC			

General Parameters

A Difference between the maximum stage average reading of the entire test and the individual stage average readings

Lab CC	Date Completed: YYYYMMDD	Time Completed: HH:MM
Test Number		
Stand: CCCCC	Runs On The Stand: CCCC	Engine No. CCCCC
Runs on Engine: CCCC		
Oil Code: CC		
Formulation/Stand Code: CC		

General Parameters

^A Difference between the maximum stage average reading of the entire test and the individual stage average readings

Lab: CC	Date Completed: YYYYMMDD	Time Completed: HH:MM	
Test Number			
Stand: CCCCC	Runs On The Stand: CCCC	Engine No. CCCCC	Runs on Engine: CCCC
Oil Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation/Stand Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			

General Parameters

^A Difference between the maximum stage average reading of the entire test and the individual stage

Sequence VIG
Form 13
General Parameter Summary

Lab: CC	Date Completed: YYYYMMDD	Time Completed: HH:MM	
Test Number			
Stand: CCCCC	Runs On The Stand: CCCC	Engine No. CCCCC	Runs on Engine: CCCC
Oil Code: CCC			
Formulation/Stand Code: CCC			

Test Oil Phase I
General Parameters

		Stage Average					
	Spec	1	2	3	4	5	6
1. Oil Circulation Temperature, °C	Record	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
2. Coolant Out Temperature, °C	Record	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
3. Fuel to Flowmeter Temp., °C	26±2	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
4. Load Cell Power Supply Temp., °C	Record	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
5. Load Cell Temperature, °C	Record	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
6. Delta Load Cell Temperature, °C ^A	< 12	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
7. Oil Heater Temperature, °C	205 max	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
8. Intake Air Pressure, kPa	0.05 ± .02	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12
9. Fuel to Flowmeter Pressure, kPa	110±10	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
10. Fuel to Fuel Rail Pressure, kP	405±10	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
11. Intake Manifold Pressure, kPa abs.	Record	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
12. Engine Oil Pressure, kPa	Record	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
13. Coolant Flow, L/min	80 ± 4	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
14. Intake Air Humidity, grains/kg	11.4 ± 0.8	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
15. Crankcase Pressure, kPa	0.00 ± 0.25	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
16. Barometric Pressure, kPa	Record	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12

^A Difference between the maximum stage average reading of the entire test and the individual

Sequence VIG
Form 14
General Parameter Summary

Lab: CC	Date Completed: YYYYMMDD	Time Completed: HH:MM	
Test Number			
Stand: CCCCC	Runs On The Stand: CCCC	Engine No. CCCCC	Runs on Engine: CCCC
Oil Code: CCC			
Formulation/Stand Code: CCC			

Test Oil Phase II
General Parameters

		Stage Average					
	Spec	1	2	3	4	5	6
1. Oil Circulation Temperature, °C	Record	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
2. Coolant Out Temperature, °C	Record	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
3. Fuel to Flowmeter Temp., °C	26±2	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
4. Load Cell Power Supply Temp., °C	Record	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
5. Load Cell Temperature, °C	Record	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
6. Delta Load Cell Temperature, °C ^A	≤ 12	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
7. Oil Heater Temperature, °C	205 max	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
8. Intake Air Pressure, kPa	0.05 ± .02	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12
9. Fuel to Flowmeter Pressure, kPa	110±10	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
10. Fuel to Fuel Rail Pressure, kPa	405±10	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
11. Intake Manifold Pressure, kPa abs.	Record	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
12. Engine Oil Pressure, kPa	Record	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
13. Coolant Flow, L/min	80 ± 4	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
14. Intake Air Humidity, grains/kg	11.4 ± 0.8	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
15. Crankcase Pressure, kPa	0.00 ± 0.25	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
16. Barometric Pressure, kPa	Record	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12

^A Difference between the maximum stage average reading of the entire test and the individual

Sequence VIG
Form 15
General Parameter Summary

Lab: CC		Date Completed: YYYYMMDD	Time Completed: HH:MM
Test Number			
Stand: CCCCC	Runs On The Stand: CCCC	Engine No. CCCCC	Runs on Engine: CCCC
Oil Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation/Stand Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			

BL After Test Oil Phase

General Parameters

		Stage Average					
	Spec	1	2	3	4	5	6
1. Oil Circulation Temperature, °C	Record	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
2. Coolant Out Temperature, °C	Record	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
3. Fuel to Flowmeter Temp., °C	26±2	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
4. Load Cell Power Supply Temp., °C	Record	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
5. Load Cell Temperature, °C	Record	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
6. Delta Load Cell Temperature, °C ^A	<u>≤ 12</u>	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
7. Oil Heater Temperature, °C	205 max	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
8. Intake Air Pressure, kPa	0.05 ± .02	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12
9. Fuel to Flowmeter Pressure, kPa	110±10	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
10. Fuel to Fuel Rail Pressure, kPa	405±10	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
11. Intake Manifold Pressure, kPa abs.	Record	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
12. Engine Oil Pressure, kPa	Record	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
13. Coolant Flow, L/min	80 ± 4	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
14. Intake Air Humidity, grains/kg	11.4 ± 0.8	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
15. Crankcase Pressure, kPa	0.00 ± 0.25	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
16. Barometric Pressure, kPa	Record	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12

^A Difference between the maximum stage average reading of the entire test and the individual

Sequence VIG
Form 16
Critical Parameter Summary

Lab: CC		Date Completed: YYYYMMDD	Time Completed: HH:MM
Test Number			
Stand: CCCCC	Runs On The Stand: CCCC	Engine No. CCCCC	Runs on Engine: CCCC
Oil Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation/Stand Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			

Stage 1 Average

	Spec	BL Before Test Oil 1	BL Before Test Oil 2	BL Before Test Oil 3	Test Oil Phase I	Test Oil Phase II	BL After Test Oil
Speed, r/min	2000±5	S1234.1	S1234.1	S1234.1	S1234.1	S1234.1	S1234.1
Torque, N-m	105±0.10	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12
Oil Gallery Temperature, °C	100±2	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
Coolant Inlet Temperature, °C	94±2	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
Intake Air Temperature, °C	29±2	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
Fuel to Fuel Rail Temperature, °C	22±2	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
Exhaust Back Pressure, kPa abs.	105±0.17	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12
Fuel Flow, kg/h	Record	S12.123	S12.123	S12.123	S12.123	S12.123	S12.123
Air/Fuel Ratio	14.00–15.00	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
Delta AFR ^A	≤ .50	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
BSFC, kg/Kw-h	Record	S1.12345	S1.12345	S1.12345	S1.12345	S1.12345	S1.12345
BSFC, Standard Deviation	Record	S1.1234	S1.1234	S1.1234	S1.1234	S1.1234	S1.1234
BSFC C.V., %	Record	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12

Stage 2 Average

	Spec	BL Before Test Oil 1	BL Before Test Oil 2	BL Before Test Oil 3	Test Oil Phase I	Test Oil Phase II	BL After Test Oil
Speed, r/min	2000±5	S1234.1	S1234.1	S1234.1	S1234.1	S1234.1	S1234.1
Torque, N-m	105±0.10	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12
Oil Gallery Temperature, °C	65±2	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
Coolant Inlet Temperature, °C	65±2	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
Intake Air Temperature, °C	29±2	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
Fuel to Fuel Rail Temperature, °C	22±2	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
Exhaust Back Pressure, kPa abs.	105±0.17	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12
Fuel Flow, kg/h	Record	S12.123	S12.123	S12.123	S12.123	S12.123	S12.123
Air/Fuel Ratio	14.00–15.00	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
Delta AFR ^A	≤.50	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
BSFC, kg/Kw-h	Record	S1.12345	S1.12345	S1.12345	S1.12345	S1.12345	S1.12345
BSFC, Standard Deviation	Record	S1.1234	S1.1234	S1.1234	S1.1234	S1.1234	S1.1234
BSFC C.V., %	Record	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12

^A Difference between the maximum stage average reading of the entire test and the individual stage average readings.

Sequence VIG
Form 17
Critical Parameter Summary

Lab:CC	Date Completed:YYYYMMDD	Time Completed:HH:MM	
Test Number			
Stand:CCCCC	Runs On The Stand:CCCC	Engine No. CCCCC	Runs on Engine:CCCC
Oil Code:CC			
Formulation/Stand Code:CC			

Stage 3 Average

	Spec	BL Before Test Oil 1	BL Before Test Oil 2	BL Before Test Oil 3	Test Oil Phase I	Test Oil Phase II	BL After Test Oil
Speed, r/min	1500±5	S1234.1	S1234.1	S1234.1	S1234.1	S1234.1	S1234.1
Torque, N-m	105±0.10	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12
Oil Gallery Temperature, °C	100±2	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
Coolant Inlet Temperature, °C	94±2	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
Intake Air Temperature, °C	29±2	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
Fuel to Fuel Rail Temperature, °C	22±2	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
Exhaust Back Pressure, kPa abs.	105±0.17	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12
Fuel Flow, kg/h	Record	S12.123	S12.123	S12.123	S12.123	S12.123	S12.123
Air/Fuel Ratio	14.00–15.00	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
Delta AFR ^A	≤ .50	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
BSFC, kg/Kw-h	Record	S1.12345	S1.12345	S1.12345	S1.12345	S1.12345	S1.12345
BSFC, Standard Deviation	Record	S1.1234	S1.1234	S1.1234	S1.1234	S1.1234	S1.1234
BSFC C.V., %	Record	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12

Stage 4 Average

	Spec	BL Before Test Oil 1	BL Before Test Oil 2	BL Before Test Oil 3	Test Oil Phase I	Test Oil Phase II	BL After Test Oil
Speed, r/min	695±5	S1234.1	S1234.1	S1234.1	S1234.1	S1234.1	S1234.1
Torque, N-m	20±0.10	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12
Oil Gallery Temperature, °C	100±2	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
Coolant Inlet Temperature, °C	94±2	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
Intake Air Temperature, °C	29±2	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
Fuel to Fuel Rail Temperature, °C	22±2	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
Exhaust Back Pressure, kPa abs.	104±0.17	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12
Fuel Flow, kg/h	Record	S12.123	S12.123	S12.123	S12.123	S12.123	S12.123
Air/Fuel Ratio	14.00–15.00	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
Delta AFR ^A	≤ .50	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
BSFC, kg/Kw-h	Record	S1.12345	S1.12345	S1.12345	S1.12345	S1.12345	S1.12345
BSFC, Standard Deviation	Record	S1.1234	S1.1234	S1.1234	S1.1234	S1.1234	S1.1234
BSFC C.V., %	Record	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12

^A Difference between the maximum stage average reading of the entire test and the individual stage average readings.

**Sequence VIG
Form 18
Critical Parameter Summary**

Lab: CC		Date Completed: YYYYMMDD	Time Completed: HH:MM
Test Number			
Stand: CCCCC	Runs On The Stand: CCCC	Engine No. CCCCC	Runs on Engine: CCCC
Oil Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			
Formulation/Stand Code: CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			

Stage 5 Average

	Spec	BL Before Test Oil 1	BL Before Test Oil 2	BL Before Test Oil 3	Test Oil Phase I	Test Oil Phase II	BL After Test Oil
Speed, r/min	695±5	S1234.1	S1234.1	S1234.1	S1234.1	S1234.1	S1234.1
Torque, N-m	20±0.10	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12
Oil Gallery Temperature, °C	35±2	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
Coolant Inlet Temperature, °C	35±2	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
Intake Air Temperature, °C	29±2	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
Fuel to Fuel Rail Temperature, °C	22±2	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
Exhaust Back Pressure, kPa abs.	104±0.17	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12
Fuel Flow, kg/h	Record	S12.123	S12.123	S12.123	S12.123	S12.123	S12.123
Air/Fuel Ratio	14.00–15.00	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
Delta AFR ^A	≤ .50	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
BSFC, kg/Kw-h	Record	S1.12345	S1.12345	S1.12345	S1.12345	S1.12345	S1.12345
BSFC, Standard Deviation	Record	S1.1234	S1.1234	S1.1234	S1.1234	S1.1234	S1.1234
BSFC C.V., %	Record	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12

Stage 6 Average

	Spec	BL Before Test Oil 1	BL Before Test Oil 2	BL Before Test Oil 3	Test Oil Phase I	Test Oil Phase II	BL After Test Oil
Speed, r/min	695±5	S1234.1	S1234.1	S1234.1	S1234.1	S1234.1	S1234.1
Torque, N-m	40±0.10	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12
Oil Gallery Temperature, °C	100±2	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
Coolant Inlet Temperature, °C	94±2	S123.1	S123.1	S123.1	S123.1	S123.1	S123.1
Intake Air Temperature, °C	29±2	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
Fuel to Fuel Rail Temperature, °C	22±2	S12.1	S12.1	S12.1	S12.1	S12.1	S12.1
Exhaust Back Pressure, kPa abs.	104±0.17	S123.12	S123.12	S123.12	S123.12	S123.12	S123.12
Fuel Flow, kg/h	Record	S12.123	S12.123	S12.123	S12.123	S12.123	S12.123
Air/Fuel Ratio	14.00–15.00	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
Delta AFR ^A	≤ .50	S12.12	S12.12	S12.12	S12.12	S12.12	S12.12
BSFC, kg/Kw-h	Record	S1.12345	S1.12345	S1.12345	S1.12345	S1.12345	S1.12345
BSFC, Standard Deviation	Record	S1.1234	S1.1234	S1.1234	S1.1234	S1.1234	S1.1234
BSFC C.V., %	Record	S1.12	S1.12	S1.12	S1.12	S1.12	S1.12

^A Difference between the maximum stage average reading of the entire test and the individual stage average readings.

Downtime And Other Comments

[illegible]

Total Downtime	HH:MM:SS
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[illegible]

Downtime and Other Comments

Lab:CC	Date Completed:YYYYMMDD	Time Completed:HH:MM
Test Number		
Stand:CCCC	Runs On The Stand:CCCC	Engine No.CCCCC
Runs on Engine:CCCC		
Oil Code:CC		
Formulation/Stand Code:CC		

Number of Downtime Occurrences			S12	
Test Hours	Date	Downtime	Reasons	
HHH:MM	YYYYMMDD	HH:MM		
HHH:MM	YYYYMMDD	HH:MM		
HHH:MM	YYYYMMDD	HH:MM		
HHH:MM	YYYYMMDD	HH:MM		
HHH:MM	YYYYMMDD	HH:MM		
HHH:MM	YYYYMMDD	HH:MM		
HHH:MM	YYYYMMDD	HH:MM		
HHH:MM	YYYYMMDD	HH:MM		
HHH:MM	YYYYMMDD	HH:MM		
HHH:MM	YYYYMMDD	HH:MM		
HHH:MM	YYYYMMDD	HH:MM		
HHH:MM	YYYYMMDD	HH:MM		
HHH:MM	YYYYMMDD	HH:MM		
HHH:MM	YYYYMMDD	HH:MM		
Total Downtime		HHH:MM		

[illegible]

Downtime And Other Comments

[illegible]

Total DownTime	
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Test Laboratory		CC			
Test Sponsor		CC			
Formulation / Stand Code		CC			
Test Number		CC			
Start Date	YYYYMMDD	Start Time	HH:MM	Time Zone	CCC

Title