

**General Motors GMSPI3 Test
For dexos®
Form 1**

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
	RO = Reference oil

Test Number			
Stand		Stand Run	
Engine ID		Engine Run	
Oil Code			
Formulation Stand Code			
Alternate Codes			
Date Started		Time Started	
Date Completed		Time Completed	
Test Length		Total Downtime	
Ref Oil Code ^A :		Total Combustion Cycles	

^AReference Tests Only

<p>In my opinion this test _____ been conducted in a valid manner in accordance with test procedure GMSPI and appropriate amendments. The remarks included in the report describe the anomalies associated with this test.</p>
--

Submitted By: _____
Testing Laboratory

Signature

Typed Name

Title

**General Motors GMSPI3 Test
Form 2
Table of Contents**

1. Title / Validity Declaration Page	Form 1
2. Table of Contents	Form 2
3. Test Procedure	Form 3
4. Test Results Summary	Form 4
5. Operational Summary - Oil Conditioning Stages	Form 5
6. Operational Summary - Engine Conditioning Stages	Form 6
7. Operational Summary - Low Load Steady Stages	Form 7
8. Operational Summary - High Load Steady Stages	Form 8
9. Operational Summary - Low Load Transient Stages	Form 9
10. Operational Summary - High Load Transient Stages	Form 10
11. Combustion Chamber Analysis - Steady State Iteration 1	Form 11
12. Combustion Chamber Analysis - Steady State Iteration 2	Form 12
13. Combustion Chamber Analysis - Steady State Iteration 3	Form 13
14. Combustion Chamber Analysis - Steady State Iteration 4	Form 14
15. Combustion Chamber Analysis - Steady State Iteration 5	Form 15
16. Combustion Chamber Analysis - Steady State Iteration 6	Form 16
17. Combustion Chamber Analysis - Transient State Iteration 1	Form 17
18. Combustion Chamber Analysis - Transient State Iteration 2	Form 18
19. Combustion Chamber Analysis - Transient State Iteration 3	Form 19
20. Hardware Info	Form 20
21. Engine Health Checks	Form 21
22. Downtime Record	Form 22
23. Comment Record	Form 23

**General Motors dexos® GMSPI3 Test
Form 3
Test Procedure**

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

Parameters	Units	Steady State								
		1	2*	3*	4*	5*	6*	7*	8*	9*
Stage										
Duration	sec	1800	600	300	900	300	900	300	900	300
Engine Speed	r/min	2000	3900	2000	2000	2000	2000	2000	2000	2000
Torque	Nm	100	200	32	350	32	350	32	350	32
Humidity Dew Point	°C	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Equivalence Ratio	λ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Coolant Out Temperature	°C				95.0			95.0		
Oil Sump Temperature	°C				100.0			100.0		
Intake Manifold Post-Intercooler Temperature	°C				32.0			32.0		
Exhaust Back Pressure	kPa				5.0			5.0		

*Stages 2-9 repeated once

Parameters	Units	Transient State***				
		10	11	12**	13**	
Stage						
Duration	sec	600	120	120	120	
Engine Speed	r/min	3900	2000	200	2000	
Torque	Nm	200	32	32	350	
Humidity Dew Point	°C	7.0	7.0	7.0	7.0	
Equivalence Ratio	λ	1.00	1.00	1.00	1.00	

** Stages 12-13 repeated nine times at 5/sec ramp

***The Transient State Iteration is completed twice

**General Motors dexos® GMSPI3 Test
Form 4
Test Results Summary**

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

Test Stage	Count
Total (Peak Pressure) PI Events	
Total (MFB2%) PI Events	
Total (Combined) PI Events	
Steady State Total (Peak Pressure) PI Events	
Steady State Total (MFB2%) PI Events	
Steady State Total (Combined) PI Events	
Transient State Iteration 1 Total (Peak Pressure) PI Events	
Transient State Iteration 1 Total (MFB2%) PI Events	
Transient State Iteration 1 Total (Combined) PI Events	
Transient State Iteration 2 Total (Peak Pressure) PI Events	
Transient State Iteration 2 Total (MFB2%) PI Events	
Transient State Iteration 2 Total (Combined) PI Events	
Transient State Iteration 3 Total (Peak Pressure) PI Events	
Transient State Iteration 3 Total (MFB2%) PI Events	
Transient State Iteration 3 Total (Combined) PI Events	

**General Motors dexos® GMSPI3 Test
Form 5
Operational Summary - Oil Conditioning Stages**

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

	Parameter	Engine Data						QI		
		Units	Target	Average	Std Dev	Min	Max	QI	Samples	BQD
Controlled	Engine Speed	r/min	2000							
	Torque	Nm	100							
	Humidity Dew Point	°C	7.0							
	Equivalence Ratio	λ	1.00							
Non-Controlled	Coolant In Temperature	°C	Report							
	Coolant Out Temperature	°C	Report							
	Oil Sump Temperature	°C	Report							
	Oil Gallery Temperature	°C	Report							
	Intake Manifold Post-IC Temperature	°C	Report							
	Fuel Temperature	°C	Report							
	Pre-Turbo Inlet Air Temperature	°C	Report							
	Exhaust Temperature	°C	Report							
	Fuel Pressure	kPa	Report							
	Exhaust Back Pressure	kPa	Report							
	Coolant Pressure	kPa	Report							
	Pre-Turbo Inlet Air Pressure	kPa	Report							
	Post-Turbo Air Pressure	kPa	Report							
	Intake Manifold Pressure	kPaA	Report							
	Barometric Pressure	kPaA	Report							
	Crankcase Pressure	kPa	Report							
	Coolant Flow	L/min	Report							
	Fuel Flow	kg/hr	Report							
Power	kW	Report								

General Motors dexos® GMSPI3 Test

Form 6

Operational Summary - Engine Conditioning Stages: Average of 5 Stages

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

	Parameter	Engine Data						QI		
		Units	Target	Average	Std Dev	Min	Max	QI	Samples	BQD
Controlled	Engine Speed	r/min	3900							
	Torque	Nm	200							
	Humidity Dew Point	°C	7.0							
	Equivalence Ratio	λ	1.00							
Non-Controlled	Coolant In Temperature	°C	Report							
	Coolant Out Temperature	°C	Report							
	Oil Sump Temperature	°C	Report							
	Oil Gallery Temperature	°C	Report							
	Intake Manifold Post-IC Temperature	°C	Report							
	Fuel Temperature	°C	Report							
	Pre-Turbo Inlet Air Temperature	°C	Report							
	Exhaust Temperature	°C	Report							
	Fuel Pressure	kPa	Report							
	Exhaust Back Pressure	kPa	Report							
	Coolant Pressure	kPa	Report							
	Pre-Turbo Inlet Air Pressure	kPa	Report							
	Post-Turbo Air Pressure	kPa	Report							
	Intake Manifold Pressure	kPaA	Report							
	Barometric Pressure	kPaA	Report							
	Crankcase Pressure	kPa	Report							
	Coolant Flow	L/min	Report							
	Fuel Flow	kg/hr	Report							
Power	kW	Report								

General Motors dexos® GMSPI3 Test

Form 7

Operational Summary - Low Load Steady Stages: Average of 8 Stages

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

	Parameter	Engine Data						QI		
		Units	Target	Average	Std Dev	Min	Max	QI	Samples	BQD
Controlled	Engine Speed	r/min	2000							
	Torque	Nm	32							
	Humidity Dew Point	°C	7.0							
	Equivalence Ratio	λ	1.00							
Non-Controlled	Coolant In Temperature	°C	Report							
	Coolant Out Temperature	°C	Report							
	Oil Sump Temperature	°C	Report							
	Oil Gallery Temperature	°C	Report							
	Intake Manifold Post-IC Temperature	°C	Report							
	Fuel Temperature	°C	Report							
	Pre-Turbo Inlet Air Temperature	°C	Report							
	Exhaust Temperature	°C	Report							
	Fuel Pressure	kPa	Report							
	Exhaust Back Pressure	kPa	Report							
	Coolant Pressure	kPa	Report							
	Pre-Turbo Inlet Air Pressure	kPa	Report							
	Post-Turbo Air Pressure	kPa	Report							
	Intake Manifold Pressure	kPaA	Report							
	Barometric Pressure	kPaA	Report							
	Crankcase Pressure	kPa	Report							
	Coolant Flow	L/min	Report							
	Fuel Flow	kg/hr	Report							
Power	kW	Report								

General Motors dexos® GMSPI3 Test

Form 8

Operational Summary - High Load Steady Stages: Average of 6 Stages

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

	Parameter	Engine Data						QI		
		Units	Target	Average	Std Dev	Min	Max	QI	Samples	BQD
Controlled	Engine Speed	r/min	2000							
	Torque	Nm	350							
	Humidity Dew Point	°C	7.0							
	Equivalence Ratio	λ	1.00							
	Coolant Out Temperature	°C	95.0							
	Oil Sump Temperature	°C	100.0							
	Intake Manifold Post-IC Temperature	°C	32.0							
	Exhaust Back Pressure	kPa	5.0							
Non-Controlled	Coolant In Temperature	°C	Report							
	Oil Gallery Temperature	°C	Report							
	Fuel Temperature	°C	Report							
	Pre-Turbo Inlet Air Temperature	°C	Report							
	Exhaust Temperature	°C	Report							
	Fuel Pressure	kPa	Report							
	Coolant Pressure	kPa	Report							
	Pre-Turbo Inlet Air Pressure	kPa	Report							
	Post-Turbo Air Pressure	kPa	Report							
	Intake Manifold Pressure	kPaA	Report							
	Barometric Pressure	kPaA	Report							
	Crankcase Pressure	kPa	Report							
	Coolant Flow	L/min	Report							
	Fuel Flow	kg/hr	Report							
	Power	kW	Report							
Spark Ignition Timing	°BTDC	Report								

General Motors dexos® GMSPI3 Test

Form 9

Operational Summary - Low Load Transient Stages: Average of 33 Stages

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

	Parameter	Engine Data						QI		
		Units	Target	Average	Std Dev	Min	Max	QI	Samples	BQD
Controlled	Engine Speed	r/min	2000							
	Torque	Nm	32							
	Humidity Dew Point	°C	7.0							
	Equivalence Ratio	λ	1.00							
Non-Controlled	Coolant In Temperature	°C	Report							
	Coolant Out Temperature	°C	Report							
	Oil Sump Temperature	°C	Report							
	Oil Gallery Temperature	°C	Report							
	Intake Manifold Post-IC Temperature	°C	Report							
	Fuel Temperature	°C	Report							
	Pre-Turbo Inlet Air Temperature	°C	Report							
	Exhaust Temperature	°C	Report							
	Fuel Pressure	kPa	Report							
	Exhaust Back Pressure	kPa	Report							
	Coolant Pressure	kPa	Report							
	Pre-Turbo Inlet Air Pressure	kPa	Report							
	Post-Turbo Air Pressure	kPa	Report							
	Intake Manifold Pressure	kPaA	Report							
	Barometric Pressure	kPaA	Report							
	Crankcase Pressure	kPa	Report							
	Coolant Flow	L/min	Report							
	Fuel Flow	kg/hr	Report							
Power	kW	Report								

General Motors dexos® GMSPI3 Test

Form 10

Operational Summary - High Load Transient Stages: Average of 30 Stages

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

	Parameter	Engine Data						QI		
		Units	Target	Average	Std Dev	Min	Max	QI	Samples	BQD
Controlled	Engine Speed	r/min	2000							
	Torque	Nm	350							
	Humidity Dew Point	°C	7.0							
	Equivalence Ratio	λ	1.00							
Non-Controlled	Coolant In Temperature	°C	Report							
	Coolant Out Temperature	°C	Report							
	Oil Sump Temperature	°C	Report							
	Oil Gallery Temperature	°C	Report							
	Intake Manifold Post-IC Temperature	°C	Report							
	Fuel Temperature	°C	Report							
	Pre-Turbo Inlet Air Temperature	°C	Report							
	Exhaust Temperature	°C	Report							
	Fuel Pressure	kPa	Report							
	Exhaust Back Pressure	kPa	Report							
	Coolant Pressure	kPa	Report							
	Pre-Turbo Inlet Air Pressure	kPa	Report							
	Post-Turbo Air Pressure	kPa	Report							
	Intake Manifold Pressure	kPaA	Report							
	Barometric Pressure	kPaA	Report							
	Crankcase Pressure	kPa	Report							
	Coolant Flow	L/min	Report							
	Fuel Flow	kg/hr	Report							
	Power	kW	Report							
	Spark Ignition Timing	°BTDC	Report							

**General Motors dexos® GMSPI3 Test
Form 20
Hardware Info**

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

Fuel Batch		Oil Weight at SOT (kg)	
Engine ID		Oil Weight at EOT (kg)	
Cylinder Head ID		Fuel Dilution % at EOT ^A	
Turbocharger ID		Engine Hours	
Pressure Transducer 1 ID		Engine Hours Since Rebuild	
Pressure Transducer 2 ID		Engine Rebuild Count	
Pressure Transducer 3 ID		Cylinder Head Hours	
Pressure Transducer 4 ID		Turbocharger Hours	
Pressure Transducer 1 Cycle Count		Pressure Transducer 3 Cycle Count	
Pressure Transducer 2 Cycle Count		Pressure Transducer 4 Cycle Count	

^A Fuel Dilution % is a calculated value based on the weight of oil at start and end of test.

**General Motors dexos® GMSPI3 Test
Form 21
Engine Health Checks**

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

	Parameter	Units	Average	Parameter	Units	Average
Firing Parameters	Cell Temperature	°C		Fuel Flow	kg/hr	
	Intake Air Temperature	°C		Humidity Dew Point	°C	
	Intake Manifold Pressure	kPaA				
	Cylinder 1 IMEP	kPa		Cylinder 1 Polytropic Compression Constant		
	Cylinder 2 IMEP	kPa		Cylinder 2 Polytropic Compression Constant		
	Cylinder 3 IMEP	kPa		Cylinder 3 Polytropic Compression Constant		
	Cylinder 4 IMEP	kPa		Cylinder 4 Polytropic Compression Constant		
	Cylinder 1 50% Mass Fraction Burned			Cylinder 1 Polytropic Expansion Constant		
	Cylinder 2 50% Mass Fraction Burned			Cylinder 2 Polytropic Expansion Constant		
	Cylinder 3 50% Mass Fraction Burned			Cylinder 3 Polytropic Expansion Constant		
	Cylinder 4 50% Mass Fraction Burned			Cylinder 4 Polytropic Expansion Constant		
Motoring Parameters	Motoring Torque	Nm		Fuel Flow	kg/hr	
	Cylinder 1 IMEP	kPa		Cylinder 3 IMEP	kPa	
	Cylinder 2 IMEP	kPa		Cylinder 4 IMEP	kPa	
	Cylinder 1 Peak Pressure	kPa		Cylinder 1 Polytropic Compression Constant		
	Cylinder 2 Peak Pressure	kPa		Cylinder 2 Polytropic Compression Constant		
	Cylinder 3 Peak Pressure	kPa		Cylinder 3 Polytropic Compression Constant		
	Cylinder 4 Peak Pressure	kPa		Cylinder 4 Polytropic Compression Constant		
	Crank Angle of Cylinder 1 Peak Pressure	deg		Cylinder 1 Polytropic Expansion Constant		
	Crank Angle of Cylinder 2 Peak Pressure	deg		Cylinder 2 Polytropic Expansion Constant		
	Crank Angle of Cylinder 3 Peak Pressure	deg		Cylinder 3 Polytropic Expansion Constant		
	Crank Angle of Cylinder 4 Peak Pressure	deg		Cylinder 4 Polytropic Expansion Constant		
Engine Off Torque	Nm					

