SEMA Emission Lab Test Report

for Exhaust Emission Test Procedures according

Date:	1/15/2020	**Time:**	16:09:59
Test Legislation:	EPA		
Test Cycle:	SC03+SC03		
Test Purpose:	Certification		
Test Name:	SC03_SC03		
Test Cell:	iGEMV_TC1		
Remark:	SC03 (AC2) Derive Baseline		

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Date: 4/14/20

Accept_____ Reject_____

Signature:

TestInformation

General Data

Test Number	*SC03_SC03_20200115_09_TC1*		
Test Name	*SC03_SC03*		
Test Cell	*iGEMV_TC1*		
Test Type	*SC03_SC03*		
Legislation	*EPA*		
Requirements (Bag)	*CERTIFICATION*		
Date	*1/15/2020*	CH_4 Response Factor	
Test Start	*16:09:59*	Odometer Start[mile]	*78796*
Start Time Cycle	*2020-01-15 16|38-50-(000)*	Delay Time Method	*Default*
Test End	*17:14:12*		
Operator	*Art Herrera*	Air Condition	*YES*
Driver	*Rene Acosta*	Particle Measurement	OFF
Shifttable	Auto		
Flow Stream	*Bag Only Diesel*		
Calibrated Ranges	*autorange*		
Remark :	*SC03 (AC2) Derive Baseline*		

Vehicle Data

Test Group	*Derive F-250*	Transmission	*Automatic*
Manufacturer	*Ford*	Drive Axle Weight[lb]	*0*
Model	*F-250*	Tank Position	
Model Year	*2011*	Tank Material	*Plastic*
VIN	*1FT7W2BT9BEA15523*	Tank Volume[gal]	*26.00*
License Plate	*HJHU73*	Evaporative Family	*N/A*
Order Number		Canister Volume[l]	*0.00*
Engine Family	*BFMXD06.761A*	Canister Working Capacity[g]	*0*
Engine Trim Level	*trimEng*	Tire Manufacturer	*CONTINENTAL*
Engine Code	*codeEng*	Tire Model	*CONTITRAC TR*
Displacement [l]	*6.700*	Tire Size	*275/70/18*
Number of Cylinders	*6*	Tire Pressure [psi]	*65*

Dyno Data

Dyno Type	*SREV*	A [lbf]	*61.4690*
Inertia [lb]	*9500.00*	B [lbf/mph]	*0.14073*
Simulation Coefficient N	*2*	C [lbf/mph2]	*0.049012*

Fuel Data *2007 Certification Diesel HD0521GP10*

Fuel Type	*DIESEL*	Fuel Temperature [°C]	*15.56*
Fuel Analyze Date		Fuel Density [kg/l]	*0.8542*
Fuel Manufacturer		Net Heat. Val. [BTU/lb]	*18325*
Fuel Tank Number		Carb. Weight Frac.	*0.8670*
Fuel Charge		HC Ratio	*1.8282*
Remarks:	*2007 Certification Diesel HD0521GP10*	OC Ratio	*0.0000*

Weather Limit Data

Test Data	SC03_SC03	Operator	Art Herrera	Speed Table		Date:	
Test Number	SC03_SC03_20200115_09_TC1	Driver	Rene Acosta	Shift Table	Auto	Cold Start	

Vehicle		**Dyno**		**Fuel**		**Test Timing**	
VIN	*1FT7W2BT9BEA15523*	Inertia [lb]	*9500.00*	2007 Certification Diesel HD0521GP10		Start Time	*16:09:59*
		A [lbf]	*61.469*	Fuel type	DIESEL	End Time	*17:14:12*
Model	F-250	B [lbf/mph]	*0.14073*	Density	*0.8542*		
Model Year	*2011*	C [lbf/mph2]	*0.049012*	NHV	18325	Soak Time	574.2
Engine Family	BFMXD06.761A			CWF	*0.8670*		
Displacement [l]	*6.700*						
Transmission	*Automatic*						
Odometer Start [mile]	*78796*	Flow Stream	Bag Only Diesel				
Odometer End [mile]	*78803*	Remark	SC03 (AC2) Derive Baseline				

Bag Analysis

PHASE 1	THC [ppmC]	CO [ppm]	CO_2 [%]	NO_X [ppm]	CH_4 [ppm]	NMHC [ppm]				
Range	*200*	*250*	*2.000*	*30*	*60*		Temp. [°F]	76.90	Volume [scf]	8729
Zero Value	*0.00*	*0.2*	*0.0*	*0.0*	*0.0*		Press. [in-Hg]	29.12	D.F.	*20.78*
Span Value	*191.13*	*239.09*	*1.900*	*24.723*	*57.400*		RH [%]	*38.84*	Ph. Start [s]	0.0
Sample	*0.24*	*-0.20*	*0.591*	*5.717*	*0.140*	*0.086*	AH [g/kg]	*7.819*	Ph. End [s]	607.6
Mass.	*0.035*	*0.000*	*2683.336*	*2.476*	*0.023*	*0.012*	Dist. [mi]	*3.59*	Ph. Length [s]	606.3
Mass per Dist.	*0.0097*	*0.0000*	*747.131*	*0.6895*	*0.0064*	*0.0034*	NO_X Corr. F	*0.91*	Bag An. Del	*789*
							Dr. Viola.	*0*	Vio. Durat. [s]	0.0
							Crank [s]	*0.7*	FE [mile/gal]	13.6

SPC Mass Particles [g] — SPC Mass per Dist. [g/mile]

SPC Mass Particles [mg] — SPC Mass per Dist. [mg/mile]

Total Result

actual	THC [g/mile]	CO [g/mile]	CO2 [g/mile]	NOX [g/mile]	CH4 [g/mile]	NMOG [g/mile]	NMHC [g/mile]	NMHC+NO_x [g/mile]	*Fuel Economy*	
Mass per Dist.	0.0097	*0.0000*	*747.13*	*0.6895*	*0.0064*	*0.0038*	*0.0034*	0.693	mile/gal	*13.62*
Mass per Dist. (rounded)	0.0097	*0.0000*	*747.1*	*0.6895*	*0.0064*	*0.004*	*0.0034*	0.693	Dist. [mi]	*3.59*
Mass per Dist. - Particulate SPC										
Mass per Dist. - Parti SPC [mg/mile]										

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CVS Data		Cycle data		Environmental Data	
Dilution Factor (Bag)	20.78	Vio. Dur.[s]	0.0	Rel. Hum.[%]	38.84
Dilution Factor (Modal)		Number	0	Ab. Hum.[g/lbs]	7.82
CVS Volume[scf]	8729.37	Act. Dist.[mi]	3.59	Pressure[inHg]	29.12
CVS Flow[scfm]	863.96			Temp.[°F]	76.90
CVS Inlet Pressure	28.57			Temp. Min.[°F]	74.48
CVS Inlet Temp.[°F]	113.82			Temp. Max.[°F]	80.24
CVS Inlet Temp. Min.[°F]	107.90			NO_X Corr. F	0.91
CVS Inlet Temp. Max.[°F]	125.84				

Particulate

SPC Particulate Results			Avg	Max	Min
Primary Filter Particle Mass [ug]		Temp Air Particlulate Dil [deg F]	92.3444		
Mass Particles [g]		Temp Gas Particulate [deg F]	113.4362	119.0698	111.9130
Massflow Particles [g/h]	1772396.00	Pressure Gas Particulate	0.0339	0.2210	0.0000
Mass per Dist. [g/mile]		Dilution Ratio	1.0000		
Particulate Sampling Time [s]	606.30	Pressure Drop Pri Filter [mbar]	0.1267		
Primary Filter ID	A1				
Filter Diameter [mm]	47				

Bag

Concentrations	THC[ppmC]	CO[ppm]	CO_2[%]	NO_X[ppm]	CH_4[ppm]	NMHC[ppm]
Range	200	250	2.000	30	60	
Sniff	0.000	0.984	0.645	5.789	2.777	
Zero Value	0.005	0.206	-0.001	0.001	0.000	
Zero Offset[%]	0.070	0.054	0.001	0.004	0.010	
Span Value	191.126	239.086	1.900	24.723	57.400	
Span Offset[%]	0.008	-0.001	-0.030	-0.099	-0.677	
Sample	3.725	0.233	0.644	5.882	2.236	1.198
Std. Dev.	0.000	0.005	0.003	0.065	0.000	
Ambient	3.657	0.458	0.056	0.173	2.202	
Std. Dev.	0.007	0.004	0.001	0.016	0.000	
Corrected	0.244	-0.202	0.591	5.717	0.140	0.086
Mass	**THC[g]**	**CO[g]**	**CO_2[g]**	**NO_X[g]**	**CH_4[g]**	**NMHC[g]**
Uncorrected	0.0350	0.0000	2683.336	2.4765	0.0231	0.0123
Corrected	0.0350	0.0000	2683.336	2.4765	0.0231	0.0123
Mass per distance	**THC[g/mile]**	**CO[g/mile]**	**CO_2[g/mile]**	**NO_X[g/mile]**	**CH_4[g/mile]**	**NMHC[g/mile]**
Corrected for Lost Sample Mass	0.0097	0.0000	747.131	0.6895	0.0064	0.0034
Fuel Consumption						
Fuel Consumption[g]	852.657	Fuel Consumption[l/100km]		17.271		
Fuel Consumption[l]	0.998	**Fuel Economy[mile/gal]**		13.619		

Test Data: SC03_SC03 Operator: Art Herrera Date: 1/15/2020
Test Number: SC03_SC03_20200115_09_TC1 Driver: Rene Acosta

Driver Violations

		P	Phase 1
Number of Violations	-	0	0
Duration of Violations	(s)	0.0	0.0

Number	Phase	Violation Begin (s)	Violation End (s)	Violation Duration (s)	Scheduled Speed (mph)	Max Speed Deviation (mph)
No Violations In This Test				0.0		

Test Record #: SC03_SC03_20200115_09_TC1

Phase 1

Analyzer Adjust

	Range Number	Range	Zero Value	Zero Set Value	Zero Offset	Span Value	Span Set Value	Span Offset	ReZero Value
		ppm	ppm	ppm	%	ppm	ppm	%	ppm
CO_2	1	20000	-12.17	0.00	-0.06	19001.40	19010.00	-0.04	0.22
CO	1	250	0.21	0.00	0.08	239.09	239.00	0.03	0.04
NO_X	1	30	0.00	0.00	0.00	24.72	24.70	0.08	0.00
THC (ppmC	2	200	0.00	0.00	0.00	191.13	191.10	0.01	0.22
CH_4	1	60	0.00	0.00	0.00	57.40	57.40	0.00	0.14
N2O				0.00					

Analyzer Check

	Range Number	Range	Zero Value	Zero Set Value	Zero Drift	Span Value	Span Set Value	Span Drift	2% Drift Validation
		ppm	ppm	ppm	%	ppm	ppm	%	
CO_2	1	20000	0.22	0.00	0.00	19004.05	19010.00	0.01	
CO	1	250	0.13	0.00	0.04	239.00	239.00	-0.03	
NO_X	1	30	0.00	0.00	0.00	24.67	24.70	-0.18	
THC (ppmC	2	200	0.14	0.00	-0.04	191.12	191.10	0.00	
CH_4	1	60	0.01	0.00	-0.22	56.99	57.40	-0.68	
N2O				0.00					

Emission Lab Test Report

Drive Cycle Energy Summary

Test Record #: SC03_SC03_20200115_09_TC1

Test Cycle SC03+SC03

Test Legislation EPA

Vehicle ID 1FT7W2BT9BEA15523

DYNO Data

	Road Load	Street Load
Inertia [lb]	*9500.00*	
A [lbf]	*61.469*	*80.650*
B [lbf/mph]	*0.14073*	*1.58910*
C [lbf/mph2]	*0.049012*	*0.038900*

	Phase1	Phase2	Phase3	Weighted
Distance				
Target	5760.60			
Driven	5780.21			
Distance Rating (%)	0.3403			
Cycle Energy (MJ)				
Target	8.09			
Driven	8.03			
Distance per Energy Cycle (m/MJ)				
Target	711.98			711.98
Driven	720.02			720.02
Road Load Work Fraction				
Target	0.3663			
Driven	0.3761			
Inertial Work (MJ)				
Target	5.13			5.13
Driven	5.01			5.01
Inertial Work Fraction				
Target	0.6337			
Driven	0.6239			
Inertial Work Rating	-2.3219			-2.3219
Absolute Speed Change (m/s2)				
Target	253.20			253.20
Driven	248.84			248.84
Absolute Speed Change Rating (%)	-1.7220			-1.7220
Energy Rating	-1.1294			
Energy Economy Rating	-1.1294			-1.1294