SEMA Emission Lab Test Report

for Exhaust Emission Test Procedures according

Date:	6/18/2020	**Time:**	13:44:18
Test Legislation:	EPA		
Test Cycle:	US06+US06		
Test Purpose:	Certification		
Test Name:	US06_US06		
Test Cell:	iGEMV_TC1		
Remark:	US06, With Derive Tune Installed		

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Date: 6/18/20

Accept_____ Reject_____

Signature:

TestInformation

General Data

Test Number	*US06_US06_20200618_04_TC1*		
Test Name	*US06_US06*		
Test Cell	*iGEMV_TC1*		
Test Type	*US06_US06*		
Legislation	*EPA*		
Requirements (Bag)	*CERTIFICATION*		
Date	*6/18/2020*	CH_4 Response Factor	
Test Start	*13:44:18*	Odometer Start[mile]	*83416*
Start Time Cycle	*2020-06-18 14|05-30-(000)*	Delay Time Method	*Default*
Test End	*14:34:42*		
Operator	*Dan Ogden*	Air Condition	*YES*
Driver	*Mario Michel*	Particle Measurement	OFF
Shifttable	Auto		
Flow Stream	*Bag Only Diesel*		
Calibrated Ranges	*autorange*		
Remark :	*US06, With Derive Tune Installed*		

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	US06_US06	Operator	Dan Ogden	Speed Table		Date:	
Test Number	US06_US06_20200618_04_TC1	Driver	Mario Michel	Shift Table	Auto	Cold Start	

Vehicle		**Dyno**		**Fuel**		**Test Timing**	
VIN	*1FT7W2BT9BEA15523*	Inertia [lb]	*9500.00*	2007 Certification Diesel HD0521GP10		Start Time	*13:44:18*
		A [lbf]	*61.469*	Fuel type	DIESEL	End Time	*14:34:42*
Model	F-250	B [lbf/mph]	*0.14073*	Density	*0.8542*		
Model Year	*2011*	C [lbf/mph^2]	*0.049012*	NHV	18325	Soak Time	
Engine Family	BFMXD06.761A			CWF	*0.8670*		
Displacement [l]	*6.700*						
Transmission	*Automatic*						
Odometer Start [mile]	*83416*	Flow Stream	Bag Only Diesel				
Odometer End [mile]	*83432*	Remark	US06, With Derive Tune Installed				

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]	*77.10*	Volume [scf]	*9790*
Zero Value	*0.00*	*0.2*	*0.0*	*0.0*	*0.0*		Press. [in Hg]	*29.09*	D.F.	*12.50*
Span Value	*189.93*	*243.16*	*1.899*	*25.211*	*57.400*		RH [%]	*47.11*	Ph. Start [s]	*0.0*
Sample	*-0.12*	*-0.38*	*1.016*	*3.152*	*0.097*	*-0.226*	AH [g/kg]	*9.581*	Ph. End [s]	*596.6*
Mass.	*0.000*	*0.000*	*5167.336*	*1.616*	*0.018*	*0.000*	Dist. [mi]	*7.93*	Ph. Length [s]	*596.6*
Mass per Dist.	*0.0000*	*0.0000*	*651.421*	*0.2037*	*0.0023*	*0.0000*	NO_x Corr. F	*0.96*	Bag An. Del	*501*
							Dr. Viola.	*0*	Vio. Durat. [s]	0.0
							Crank [s]	*0.0*	FE [mile/gal]	15.6

SPC Mass Particles [g]	0.0043	SPC Mass per Dist. [g/mile]	0.0005
SPC Mass Particles [mg]	4.2596	SPC Mass per Dist. [mg/mile]	0.5370

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.	0.0000	*0.0000*	*651.42*	*0.2037*	*0.0023*	*0.0000*	*0.0000*	0.204	mile/gal	*15.62*
Mass per Dist. (rounded)	0.0000	*0.0000*	*651.4*	*0.2037*	*0.0023*	*0.000*	*0.0000*	0.204	Dist. [mi]	*7.93*
Mass per Dist. - Particulate SPC	0.0005									
Mass per Dist. - Parti SPC [mg/mile]	0.5370									

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Date: 6/30/20

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CVS Data		Cycle data		Environmental Data	
Dilution Factor (Bag)	12.50	Vio. Dur.[s]	0.0	Rel. Hum.[%]	47.11
Dilution Factor (Modal)		Number	0	Ab. Hum.[g/lbs]	9.58
CVS Volume[scf]	9789.65	Act. Dist.[mi]	7.93	Pressure[inHg]	29.09
CVS Flow[scfm]	984.65			Temp.[°F]	77.10
CVS Inlet Pressure	28.40			Temp. Min.[°F]	74.48
CVS Inlet Temp.[°F]	120.46			Temp. Max.[°F]	80.06
CVS Inlet Temp. Min.[°F]	110.54			NO_X Corr. F	0.96
CVS Inlet Temp. Max.[°F]	138.72				

Particulate

SPC Particulate Results			Avg	Max	Min
Primary Filter Particle Mass [ug]	8.921875	Temp Air Particlulate Dil [deg F]	90.6875		
Mass Particles [g]	0.00	Temp Gas Particulate [deg F]	112.4350	117.6552	110.4040
Massflow Particles [g/h]	2019243.00	Pressure Gas Particulate	0.0350	0.3573	0.0000
Mass per Dist. [g/mile]	0.0005	Dilution Ratio	1.0000		
Particulate Sampling Time [s]	596.60	Pressure Drop Pri Filter [mbar]	0.1024		
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	0.504	1.072	3.479	2.486	
Zero Value	0.004	0.220	-0.001	-0.001	0.000	
Zero Offset[%]	0.069	0.003	-0.001	-0.014	-0.028	
Span Value	189.930	243.160	1.899	25.211	57.400	
Span Offset[%]	-0.259	-0.015	-0.027	-0.175	-0.558	
Sample	2.755	-0.402	1.072	3.395	1.910	0.597
Std. Dev.	0.000	0.003	0.007	0.039	0.000	
Ambient	3.121	-0.021	0.061	0.264	1.970	
Std. Dev.	0.004	0.005	0.002	0.014	0.000	
Corrected	-0.116	-0.383	1.016	3.152	0.097	-0.226
Mass	**THC[g]**	**CO[g]**	**CO_2[g]**	**NO_X[g]**	**CH_4[g]**	**NMHC[g]**
Uncorrected	0.0000	0.0000	5167.336	1.6161	0.0181	0.0000
Corrected	0.0000	0.0000	5167.336	1.6161	0.0181	0.0000
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	0.0000	0.0000	651.421	0.2037	0.0023	0.0000

Fuel Consumption

Fuel Consumption[g]	1641.906	Fuel Consumption[l/100km]	15.058
Fuel Consumption[l]	1.922	**Fuel Economy[mile/gal]**	15.620

Test Data: US06_US06 Operator: Dan Ogden Date: 6/18/2020
Test Number: US06_US06_20200618_04_TC1 Driver: Mario Michel

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 #: US06_US06_20200618_04_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	-8.68	0.00	-0.04	18991.20	19010.00	-0.09	-0.43
CO	1	250	0.22	0.00	0.09	243.16	243.00	0.06	-0.08
NO_X	1	30	0.00	0.00	0.00	25.21	25.20	0.04	0.00
THC (ppmC	2	200	0.00	0.00	0.00	189.93	189.90	0.01	0.31
CH_4	1	60	0.00	0.00	0.00	57.40	57.40	0.00	0.13
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	-0.14	0.00	0.00	19004.50	19010.00	0.07	
CO	1	250	0.01	0.00	0.04	242.96	243.00	-0.08	
NO_X	1	30	0.00	0.00	-0.01	25.15	25.20	-0.21	
THC (ppmC	2	200	0.14	0.00	-0.09	189.38	189.90	-0.27	
CH_4	1	60	-0.02	0.00	-0.24	57.06	57.40	-0.56	
N2O				0.00					

Emission Lab Test Report

Drive Cycle Energy Summary

Test Record #: US06_US06_20200618_04_TC1

Test Cycle US06+US06
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	12886.91			
Driven	12767.02			
Distance Rating (%)	-0.9304			
Cycle Energy (MJ)				
Target	25.28			
Driven	23.85			
Distance per Energy Cycle (m/MJ)				
Target	509.84			509.84
Driven	535.30			535.30
Road Load Work Fraction				
Target	0.5500			
Driven	0.6335			
Inertial Work (MJ)				
Target	11.37			11.37
Driven	8.74			8.74
Inertial Work Fraction				
Target	0.4500			
Driven	0.3665			
Inertial Work Rating	-23.1583			-23.1583
Absolute Speed Change (m/s2)				
Target	359.93			359.93
Driven	309.72			309.72
Absolute Speed Change Rating (%)	-13.9505			-13.9505
Energy Rating	-4.9937			
Energy Economy Rating	-4.9937			-4.9937