ATDS Emission Lab Test Report

for Exhaust Emission Test Procedures according

Date:	2022-04-27	**Start Time:**	10:45:15
Test Number:	ONT3_003225	**End Time:**	11:44:10
Test Vehicle:	3182_FCRXT03.05PV-1054		
Test Legislation:	EPA1066		
Test Cycle:	HWFET+HWFET		
Test Purpose:	Certification		
Test Cell:	iGEM-V-TC1		
Order Number:	3182		
Remark:	TEST 1 AS RECEIVED		

QUALITY ASSURANCE

INSPECTED BY: REDACTED

DATE: 2022-04-28

COMMENTS: OK

General Data

Test Number	*ONT3_003225*		
Test Name	*HWFET_HWFET*		
Test Cell	*iGEM-V-TC1*		
Test Type	*HWFET_HWFET*		
Legislation	*EPA1066*		
Requirements (Bag)	*CERTIFICATION*		
Requirements (Modal)	*CERTIFICATION*		
Date	*2022-04-27*	CH_4 Response Factor	*1.186*
Test Start	*10:45:15*	Odometer Position [mi]	*118799*
Start Time Cycle	*2022-04-27 11|13-05-(000)*	Delay Time Method	
Test End	*11:44:10*		
Operator	**REDACTED**	Air Condition	*OFF*
Driver	**REDACTED**	Particle Measurement	USUAL
Shifttable	*Auto*		
Flow Stream	*ModalDirty*		
Calibrated Ranges	*autorange*		
Remark	*TEST 1 AS RECEIVED*		

Vehicle Data *3182_FCRXT03.05PV-1054*

Manufacturer	*1500*	Displacement	*3.0L*
Vehicle Model	**REDACTED**	Engine Family	*FCRXT03.05PV*
Order Number	*3182*	Manufacturer	*Ram*
Test Group	*3182_FCRXT03.05PV-1054*	Transmission	*Automatic*
Evaporative Family		Engine Code	

Dyno Data *3182*

Dyno Type	*SVOR*	Inertia [lb]	*6000.00*
	A [lbf]	B [lbf/mph]	C [lbf/mph2]
Street Load	*50.570*	*0.04400*	*0.038470*
Road Load	*12.400*	*0.21500*	*0.034900*

Fuel Data *Diesel-FL0821BE10*

Fuel Type	*DIESEL*	Fuel Temperature [°C]	*15.00*
Fuel Analyze Date		Fuel Density [kg/l]	*0.8550*
Fuel Manufacturer		Net Heat. Val. [BTU/lb]	*18295*
Fuel Tank Number		Carb. Weight Frac.	*0.8650*
Fuel Charge		HC Ratio	*1.8742*
Remarks:		OC Ratio	*-1.0000*

Weather Limit Data

Temp Min [deg F]	*68.00*	Dew Point Max [deg F]	*100.00*
Temp Max [deg F]	*86.00*	Pressure Min [mbar]	*800.0*
Dew Point Min [deg F]	*15.01*	Pressure Max [mbar]	*1100.0*

Fan Speed Data *RoadSpeed*

F1 [%]	F2 [%/mph]	F3 [%/mph2]
5	0.745999992	0.0031

Test Data	HWFET_HWFET	Operator	REDACTED	Speed Table	Date:	2022-04-27
Test Number	ONT3_003225	Driver	REDACTED	Shift Table Auto	Cold Start	

Vehicle	REDACTED	**Dyno**		**Fuel**		**Test Timing**	
Vehicle #	REDACTED	Inertia [lb]	6000.00	Diesel-FL0821BE10		Start Time	10:45:15
		A [lbf]	12.400	Fuel type	DIESEL	End Time	11:44:10
Model	1500	B [lbf/mph]	0.21500	Density	0.8550		
Year	2015	C [lbf/mph2]	0.034900	NHV	18295	Soak Time	
Displacement:				CWF	0.8650		
Engine Family	FCRXT03.05PV						
Trans	Automatic	Flow Stream	ModalDirty				
Odometer[mile]	118799	Remark	TEST 1 AS RECEIVED				

Bag Analysis

PHASE 1	THC[ppmC]	CO[ppm]	CO_2[%]	NO_X[ppm]	N2O[ppm]	CH_4[ppm]	NMHC[ppm]				
Range	100	500	4	30		30		Temp.[°F]	81.98	Volume[scf]	4708
Zero Read	0.00	0.0	0.0	0.0		0.0		Press.[inHg]	28.96	D.F.	11.17
Span Read	93.11	464.90	3.717	28.290		27.650		RH[%]	30.08	Ph. Start[s]	779.3
Sample	-1.32	0.24	1.155	0.017		0.211	-1.575	AH[g/kg]	7.195	Ph. End[s]	1544.2
Mass.	0.000	0.038	2836.135	0.004		0.019	0.000	Dist.[mi]	10.27	Ph. Length[s]	764.0
Mass per Dist.	0.0000	0.0037	276.173	0.0004		0.0018	0.0000	NO_X Corr.	0.8963	Bag An. Del	631
								Dr. Viola.	0	Vio. Durat.[s]	0.0
								Crank [s]	0.00	FE [mile/gal]	36.8
PSS Massflow Particles [g/h]	0.0023		PSS Mass per Dist. [g/mile]				0.0000				

Total Result

actual	THC[g/mile]	CO[g/mile]	CO_2[g/mile]	NO_X[g/mile]	N2O[g/mile]	CH_4[g/mile]	NMHC[g/mile]	$HC+NO_X$[g/mile]	*Fuel Economy*	
Mass per Dist.	0.0000	0.0037	276.17	0.0004		0.0018	0.0000	0.0004	mile/gal	36.85
Mass per Dist. (rounded)	0.0000	0.0037	276.2	0.0004		0.0018	0.0000	0.0004	Dist.[mi]	10.27

Mass per Dist. - Particulate PSS 0.0000

Test Data: HWFET_HWFET Operator: **REDACTED** Date: 2022-04-27
Test Number: ONT3_003225 Driver: **REDACTED**

Driver Violations

		P1	I1	Phase1
Number of Violations	-	0	0	0
Duration of Violations	(s)	0.0	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 #: ONT3_003225

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 (%)	2	4	0.00	0.00	0.00	3.72	3.72	0.00	0.00
CO	1	500	0.00	0.00	0.00	464.90	464.90	0.00	0.01
NO_X	1	30	-0.01	0.00	-0.02	28.29	28.30	-0.03	0.01
THC (ppmC1)	2	30	-0.08	0.00	-0.25	28.00	28.02	-0.07	0.00
CH_4	1	30	0.00	0.00	0.00	27.65	27.65	0.00	0.00

Analyzer Check

	Range Number	Range	Zero Value	Zero Set Value	Zero Drift	Span Value	Span Set Value	Span Drift
		ppm	ppm	ppm	%	ppm	ppm	%
CO_2 (%)	2	4	0.00	0.00	-0.01	3.72	3.72	-0.03
CO	1	500	0.02	0.00	0.00	464.72	464.90	-0.04
NO_X	1	30	0.00	0.00	-0.03	28.22	28.30	-0.23
THC (ppmC1)	2	30	0.00	0.00	0.25	27.85	28.02	-0.49
CH_4	1	30	0.00	0.00	-0.01	27.63	27.65	-0.07

Operator	REDACTED	Driver	REDACTED	Customer :	3182
Test Purpose:	Certification	Legislation:	*EPA1066*	Requirements (Bag)	*CERTIFICATION*
Conditioning:		Emission Standards	Default		

Test Intent: *TEST 1 AS RECEIVED*

VIN REDACTED

DYNO Data

	Road Load	Street Load
Inertia [lb]	*6000.00*	
A [N]	*55.158*	*224.947*
B [N/km/h]	*0.59426*	*0.12162*
C [N/km2/h2]	*0.059940*	*0.066071*

	Phase1	Phase2	Phase3	Phase4	Weighted
Distance (m)					
Target	16506.54				16506.54
Driven	16523.58				16523.58
Distance Rating (%)	0.1032				0.1032
Cycle Energy (MJ)					
Target	12.37				12.37
Driven	12.25				12.25
Distance per Energy Cycle (m/MJ)					
Target	12.37				1333.93
Driven	12.25				1348.52
Road Load Work Fraction					
Target	0.7412				0.7412
Driven	0.7540				0.7540
Inertial Work (MJ)					
Target	3.20				3.20
Driven	3.01				3.01
Inertial Work Fraction					
Target	0.2588				0.2588
Driven	0.2460				0.2460
Inertial Work Rating (%)	-5.8478				-5.8478
Absolute Speed Change (m/s)					
Target	130.69				130.69
Driven	124.27				124.27
Absolute Speed Change Rating (%)	-4.9119				-4.9119
Energy Rating (%)	-0.9799				-0.9799
Energy Economy Rating (%)	-1.0938				-1.0938

Operator REDACTED | Driver REDACTED | Customer : | 3182

Test Purpose: Certification | Legislation EPA1066 | Requirements (Bag) | CERTIFICATION

Conditioning: | Emission : Default

Overall Status: Passed

Phase 1

Test Record #: ONT3_003225 | Vehicle ID: REDACTED

		Average	Min	Max	Low Limit	Upper Limit	Status
General							
Cell Temperature	(°C)	27.76	26.70	28.50	20.00	30.00	Passed
Barometer	(mbar)	980.60	980.50	980.60	800.00	1100.00	Passed
Dew Point Temperature	(°C)	8.65	8.20	8.90	-9.44	37.78	Passed
Specific Humidity Test Cell	(gr/lb)	50.36	48.75	51.18	38.50	87.50	Passed
Dilution Air Temperature	(°C)	36.36	36.05	36.55	15.00	52.00	Passed
Weighted Test Dilution Factor	(-)	11.17			7.00	20.00	Passed
Dilution Factor	(-)	11.17			7.00	20.00	Passed
Fuel Economy	(mpg)	36.85			10.00	50.00	Passed
Zero Offset	(%)	-	-0.25	0.00	-2.00	2.00	Passed
Span Offset	(%)	-	-0.07	0.00	-2.00	2.00	Passed
Zero Check Drift	(%)	-	-0.03	0.25	-2.00	2.00	Passed
Span Check Drift	(%)	-	-0.49	-0.03	-2.00	2.00	Passed
Bag vs. Modal Validation (CO2)	(%)	n.a.	-	-	-10.00	10.00	Passed
Ambient Concentrations							
HC	(ppm)	6.86			2.00	10.00	Passed
NO_x	(ppm)	0.07			-0.10	10.00	Passed
CO	(ppm)	0.64			0.00	15.00	Passed
CO_2	(ppm)	495.31			300.00	650.00	Passed
CH_4	(ppm)	2.20			1.30	10.00	Passed
N2O	(ppm)				0.20	0.50	
PM Filter Parameters							
Particulate Filter Temperature	(°C)	50.05	46.55	51.95	42.00	60.00	Passed
Filter Face Velocity	(cm/s)	90.08			0.00	100.00	Passed
Particulate Result Validation	(ug)	2.50			1.00	600.00	Passed
Test-Cycle Specific Validations							
Phase Distance	(miles)	10.27			10.05	10.46	Passed
Sample Phase Time	(s)	764.0			762.9	766.9	Passed
Duration Phase 1	(s)	764.90					NA
Crank Time Phase1	(s)	0.00			0	5	Passed
Crank Time Phase3	(s)				0	5	
Crank Counts		0			0	1	Passed
Shutdown Time Phase 1					0	5	
Shutdown Time Phase 3					0	5	
Hot Soak Time	(s)				540.00	660.00	
Test Hold Counts		0					Passed
Duration Test Hold	(s)	0.00			0	60	Passed