ATDS Emission Lab Test Report

for Exhaust Emission Test Procedures according

Date:	10/27/2023	**Start Time:**	8:56:51
Test Number:	ONT3_006033	**End Time:**	10:36:08
Test Vehicle:	3225_ECRXT03.05PV-118		
Test Legislation:	EPA1066		
Test Cycle:	FTP75		
Test Purpose:	Certification		
Test Cell:	iGEM-V-TC1		
Order Number:	3225		
Remark:	CONSENT DECREE		

QUALITY ASSURANCE

INSPECTED BY: REDACTED

DATE: 10/30/2023

COMMENTS: REDACTED

General Data

Test Number	*ONT3_006033*		
Test Name	*FTP75*		
Test Cell	*iGEM-V-TC1*		
Test Type	*FTP75*		
Legislation	*EPA1066*		
Requirements (Bag)	*CERTIFICATION*		
Requirements (Modal)	*CERTIFICATION*		
Date	*10/27/2023*	CH_4 Response Factor	
Test Start	*8:56:51*	Odometer Position [mi]	*115863*
Start Time Cycle	*2023-10-27 09|09-59-(000)*	Delay Time Method	
Test End	*10:36:08*		
Operator	**REDACTED**	Air Condition	*OFF*
Driver	**REDACTED**	Particle Measurement	USUAL
Shifttable	*Auto*		
Flow Stream	*ModalDirty*		
Calibrated Ranges	*autorange*		
Remark	*CONSENT DECREE*		

Vehicle Data — *3225_ECRXT03.05PV-118*

Manufacturer	*CHEROKEE*	Displacement	
Vehicle Model	**REDACTED**	Engine Family	*ECRXT03.05PV*
Order Number	*3225*	Manufacturer	*JEEP*
Test Group	*3225_ECRXT03.05PV-118*	Transmission	*Automatic*
Evaporative Family		Engine Code	
Made Date	*2014*	License Plate	
Tire Manufacturer		Trim Level	
Tire Model		Axle Ratio	*1*
Tire Size		Drive Axle Weight [lbs]	
Tire Pressure [psi]	*0*	Tank Volume [gal]	*0*
Engine Code	*ECRXT03.05PV*	Tank Material	
Number of Cylinders	*6*		

Dyno Data — *3225*

Dyno Type	*SVOR*	Inertia [lb]	*5500.00*
	A [lbf]	B [lbf/mph]	C [lbf/mph2]
Street Load	*60.490*	*-0.01010*	*0.032530*
Road Load	*16.600*	*0.39900*	*0.026200*

Fuel Data — *Diesel-S-000266*

Fuel Type	*DIESEL*	Fuel Temperature [°C]	*15.00*
Fuel Analyze Date		Fuel Density [kg/l]	*0.8540*
Fuel Manufacturer		Net Heat. Val. [BTU/lb]	*18382*
Fuel Tank Number		Carb. Weight Frac.	*0.8700*
Fuel Charge		HC Ratio	*1.7945*
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	FTP75	Operator	**REDACTED**	Speed Table		Date:	10/27/2023
Test Number	ONT3_006033	Driver	**REDACTED**	Shift Table	Auto	Cold Start	

Vehicle		**Dyno**		**Fuel**		**Test Timing**	
Vehicle #	**REDACTED**	Inertia [lb]	5500.00	Diesel-S-000266		Start Time	8:56:51
		A [lbf]	16.600	Fuel type	DIESEL	End Time	10:36:08
Model	CHEROKEE	B [lbf/mph]	0.39900	Density	0.8540		
Year	2014	C [lbf/mph2]	0.026200	NHV	18382	Soak Time	549.3
Displacement:				CWF	0.8700		
Engine Family	ECRXT03.05PV						
Trans	Automatic	Flow Stream	ModalDirty				
Odometer [mile]	115863	Remark	CONSENT DECREE				

Bag Analysis

PHASE 1	THC [ppmC]	CO [ppm]	CO_2 [%]	NO_X [ppm]	N2O [ppm]	CH_4 [ppm]	NMHC [ppm]				
Range	100	50	4	30		30		Temp. [°F]	77.49	Volume [scf]	3178
Zero Read	0.00	0.0	0.0	0.0		0.0		Press. [inHg]	29.02	D.F.	13.77
Span Read	93.31	46.74	3.722	27.470		27.600		RH [%]	38.22	Ph. Start [s]	0.0
Sample	13.06	39.65	0.935	3.282		3.018	13.064	AH [g/kg]	8.055	Ph. End [s]	506.1
Mass.	0.683	4.184	1549.510	0.524		0.182	0.678	Dist. [mi]	3.58	Ph. Length [s]	507.1
Mass per Dist.	0.1905	1.1671	432.258	0.1461		0.0509	0.1891	NO_X Corr.	0.9208	Bag An. Del	2576
								Dr. Viola.	0	Vio. Durat. [s]	0.0
PSS Massflow Particles [g/h]	0.0221		PSS Mass per Dist. [g/mile]				0.0009	Crank [s]	1.20	FE [mile/gal]	23.4

PHASE 2	THC [ppmC1]	CO [ppm]	CO_2 [%]	NO_X [ppm]	N2O [ppm]	CH_4 [ppm]	NMHC [ppm]				
Range	100	50	1	30		30		Temp. [°F]	76.92	Volume [scf]	4450
Zero Value	0.00	0.1	0.0	0.0		0.0		Press. [inHg]	29.02	D.F.	20.22
Span Value	93.31	46.73	0.930	27.510		27.600		RH [%]	38.73	Ph. Start [s]	508.2
Sample	2.74	-0.13	0.523	0.018		4.738	2.745	AH [g/kg]	7.841	Ph. End [s]	1375.8
Mass.	0.201	0.000	1447.478	0.004		0.401	0.199	Dist. [mi]	3.85	Ph. Length [s]	868.7
Mass per Dist.	0.0523	0.0000	376.149	0.0010		0.1043	0.0518	NO_X Corr.	0.9137	Bag An. Del	2417
								Dr. Viola.	0	Vio. Durat. [s]	0.0
PSS Massflow Particles [g/h]	0.0086		PSS Mass per Dist. [g/mile]				0.0005			FE [mile/gal]	27.0

PHASE 3	THC [ppmC1]	CO [ppm]	CO_2 [%]	NO_X [ppm]	N2O [ppm]	CH_4 [ppm]	NMHC [ppm]				
Range	100	50	1	30		30		Temp. [°F]	78.36	Volume [scf]	3165
Zero Value	0	0.0	0.0	0.0		0.0		Press. [inHg]	29.02	D.F.	16.53
Span Value	93.31	46.72	0.930	27.510		27.590		RH [%]	38.33	Ph. Start [s]	1922.8
Sample	4	3.72	0.773	0.830		5.573	4.263	AH [g/kg]	8.139	Ph. End [s]	2428.8
Mass.	0.223	0.391	1276.182	0.132		0.336	0.221	Dist. [mi]	3.59	Ph. Length [s]	506.3
Mass per Dist.	0.0622	0.1090	355.824	0.0368		0.0936	0.0617	NO_X Corr.	0.9220	Bag An. Del	1967
								Dr. Viola.	0	Vio. Durat. [s]	0.0
PSS Massflow Particles [g/h]	0.0193		PSS Mass per Dist. [g/mile]				0.0008	Crank [s]	1.30	FE [mile/gal]	28.6

Total Result (weighted)

Weighted	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.	0.0837	0.2720	382.20	0.0410		0.0903	0.0830	0.12464	mile/gal 26.58
Mass per Dist. (rounded)	0.0837	0.2720	382.2	0.0410		0.0903	0.0830	0.1246	
Mass per Dist. - Particulate PSS	0.0007								

Test Data: FTP75 Operator: **REDACTED** Date: 10/27/2023
Test Number: ONT3_006033 Driver: **REDACTED**

Driver Violations

		Phase1	Phase2	Phase3
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_006033

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	-0.01	3.72	3.72	0.00	0.00
CO	1	50	-0.01	0.00	-0.01	46.74	46.71	0.06	0.00
NO_X	1	30	0.01	0.00	0.03	27.47	27.51	-0.13	0.01
THC (ppmC1)	2	30	0.00	0.00	0.01	28.41	28.41	0.00	0.07
CH_4	1	30	0.00	0.00	0.00	27.60	27.60	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	50	0.00	0.00	0.02	46.66	46.71	-0.16
NO_X	1	30	0.04	0.00	0.09	27.44	27.51	-0.09
THC (ppmC1)	2	30	0.09	0.00	0.06	28.50	28.41	0.31
CH_4	1	30	0.00	0.00	0.00	27.51	27.60	-0.29

Phase 2

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	1	0.00	0.00	0.01	0.93	0.93	-0.03	0.00
CO	1	50	0.06	0.00	0.11	46.73	46.71	0.04	0.05
NO_X	1	30	0.02	0.00	0.07	27.51	27.51	0.00	0.03
THC (ppmC1)	2	100	0.00	0.00	0.00	93.30	93.30	0.00	0.01
CH_4	1	30	0.00	0.00	0.00	27.60	27.60	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 (%)	1	1	0.00	0.00	0.01	0.93	0.93	-0.35
CO	1	50	0.04	0.00	-0.01	46.72	46.71	-0.01
NO_X	1	30	0.03	0.00	0.01	27.46	27.51	-0.16
THC (ppmC1)	2	100	0.03	0.00	0.02	93.42	93.30	0.12
CH_4	1	30	0.00	0.00	0.01	27.56	27.60	-0.13

Phase 3

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	1	0.00	0.00	0.01	0.93	0.93	-0.03	0.00
CO	1	50	-0.02	0.00	-0.04	46.72	46.71	0.02	0.00
NO_X	1	30	-0.02	0.00	-0.05	27.51	27.51	0.00	0.01
THC (ppmC1)	2	100	0.02	0.00	0.00	93.30	93.30	0.00	
CH_4	1	30	0.00	0.00	0.00	27.59	27.60	-0.03	0.26

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 (%)	1	1	0.00	0.00	0.01	0.93	0.93	-0.23
CO	1	50	0.01	0.00	0.05	46.70	46.71	-0.04
NO_X	1	30	0.01	0.00	0.01	27.50	27.51	-0.04
THC (ppmC1)	2	100	0.02	0.00		93.30	93.30	
CH_4	1	30	0.02	0.00	-0.81	27.59	27.60	0.00

Operator	REDACTED	Driver	REDACTED	Customer :	3225
Test Purpose:	Certification	Legislation:	*EPA1066*	Requirements (Beg)	*CERTIFICATION*
Conditioning:		Emission Standards	Default		
Test Intent:		*CONSENT DECREE*			
VIN	REDACTED				

DYNO Data

	Road Load	Street Load
Inertia [lb]	*5500.00*	
A [N]	*73.840*	*269.073*
B [N/km/h]	*1.10284*	*-0.02792*
C [N/km2/h2]	*0.044998*	*0.055869*

	Phase1	Phase2	Phase3	Phase4	Weighted
Distance (m)					
Target	5779.15	6210.95	5779.15		17769.25
Driven	5767.98	6192.06	5771.52		17731.56
Distance Rating (%)	-0.1933	-0.3042	-0.1320		-0.2121
Cycle Energy (MJ)					
Target	4.56	4.21	4.56		8.76
Driven	4.53	4.24	4.54		8.78
Distance per Energy Cycle (m/MJ)					
Target	4.56	4.21	4.56		1368.26
Driven	4.53	4.24	4.54		1362.12
Road Load Work Fraction					
Target	0.4536	0.3392	0.4536		0.3986
Driven	0.4661	0.3373	0.4620		0.4027
Inertial Work (MJ)					
Target	2.49	2.78	2.49		5.27
Driven	2.42	2.81	2.44		5.25
Inertial Work Fraction					
Target	0.5464	0.6608	0.5464		0.6014
Driven	0.5339	0.6627	0.5380		0.5973
Inertial Work Rating (%)	-2.8236	1.1500	-1.8159		-0.4558
Absolute Speed Change (m/s)					
Target	204.87	340.91	204.88		545.79
Driven	200.97	343.75	202.50		545.58
Absolute Speed Change Rating (%)	-1.9083	0.8320	-1.1610		-0.0367
Energy Rating (%)	-0.5456	0.8683	-0.2674		-0.0038
Energy Economy Rating (%)	-0.3542	1.1624	-0.1357		0.4486

Operator	**REDACTED**	Driver	**REDACTED**	Customer :	3225
Test Purpose: Certification		Legislation	*EPA1066*	Requirements (Bag)	*CERTIFICATION*
Conditioning:		Emission	Default		

Overall Status: Passed

Phase 1

Test Record #: ONT3_006033 Vehicle ID: **REDACTED**

		Average	Min	Max	Low Limit	Upper Limit	Status
General							
Cell Temperature	(°C)	25.27	24.80	25.70	20.00	30.00	Passed
Barometer	(mbar)	982.63	982.50	982.70	800.00	1100.00	Passed
Dew Point Temperature	(°C)	10.42	9.70	10.50	-9.44	37.78	Passed
Specific Humidity Test Cell	(gr/lb)	56.67	54.11	57.23	38.50	87.50	Passed
Dilution Air Temperature	(°C)	35.46	35.05	35.85	15.00	52.00	Passed
Weighted Test Dilution Factor	(-)	17.05			7.00	20.00	Passed
Dilution Factor	(-)	13.77			7.00	20.00	Passed
Fuel Economy	(mpg)	23.41			10.00	50.00	Passed
Zero Offset	(%)	-	-0.01	0.03	-2.00	2.00	Passed
Span Offset	(%)	-	-0.13	0.06	-2.00	2.00	Passed
Zero Check Drift	(%)	-	-0.01	0.09	-2.00	2.00	Passed
Span Check Drift	(%)	-	-0.29	0.31	-2.00	2.00	Passed
Bag vs. Modal Validation (CO2)	(%)	n.a.	-	-	-10.00	10.00	Passed
Ambient Concentrations							
HC	(ppm)	7.37			2.00	10.00	Passed
NO_x	(ppm)	0.12			-0.10	10.00	Passed
CO	(ppm)	1.76			0.00	15.00	Passed
CO_2	(ppm)	518.12			300.00	650.00	Passed
CH_4	(ppm)	2.81			1.30	10.00	Passed
N2O	(ppm)				0.20	0.50	
PM Filter Parameters							
Particulate Filter Temperature	(°C)	52.13	43.85	53.85	42.00	60.00	Passed
Filter Face Velocity	(cm/s)	91.02			0.00	100.00	Passed
Particulate Result Validation	(ug)	16.00			1.00	600.00	Passed
Test-Cycle Specific Validations							
Phase Distance	(miles)	3.58			3.52	3.66	Passed
Sample Phase Time	(s)	507.1			504.1	508.1	Passed
Duration Phase 1	(s)	506.10					NA
Crank Time Phase1	(s)	1.20			0	5	Passed
Crank Time Phase3	(s)	1.30			0	5	Passed
Crank Counts		1			0	1	Passed
Shutdown Time Phase 1					0	5	
Shutdown Time Phase 3					0	5	
Hot Soak Time	(s)	549.30			540.00	660.00	Passed
Test Hold Counts		0					Passed
Duration Test Hold	(s)	0.00			0	60	Passed

Operator **REDACTED** Driver **REDACTED** Customer : 3225

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

Conditioning: Emission Default

Phase 2 Overall Status Review

		Average	Min	Max	Low Limit	Upper Limit	Status
General							
Cell Temperature	(°C)	24.96	23.80	25.90	20.00	30.00	Passed
Barometer	(mbar)	982.71	982.70	982.80	800.00	1100.00	Passed
Dew Point Temperature	(°C)	9.93	8.00	11.40	-9.44	37.78	Passed
Specific Humidity Test Cell	(gr/lb)	54.89	48.05	60.50	38.50	87.50	Passed
Dilution Air Temperature	(°C)	35.92	35.55	36.25	15.00	52.00	Passed
Dilution Factor	(-)	20.22			7.00	20.00	Review
Fuel Economy	(mpg)	27.04			10.00	50.00	Passed
Zero Offset	(%)	-	0.00	0.11	-2.00	2.00	Passed
Span Offset	(%)	-	-0.03	0.04	-2.00	2.00	Passed
Zero Check Drift	(%)	-	-0.01	0.02	-2.00	2.00	Passed
Span Check Drift	(%)	-	-0.35	0.12	-2.00	2.00	Passed
Bag vs. Modal Validation (CO2)	(%)	n.a.			-10.00	10.00	Passed
Ambient Concentrations							
HC	(ppm)	8.14			2.00	10.00	Passed
NO_x	(ppm)	0.11			-0.10	10.00	Passed
CO	(ppm)	2.05			0.00	15.00	Passed
CO_2	(ppm)	521.35			300.00	650.00	Passed
CH_4	(ppm)	2.89			1.30	10.00	Passed
N2O	(ppm)				0.20	0.50	
PM Filter Parameters							
Particulate Filter Temperature	(°C)	51.54	43.85	53.85	42.00	60.00	Passed
Filter Face Velocity	(cm/s)	91.02			0.00	100.00	Passed
Particulate Result Validation	(ug)	13.00			2.00	600.00	Passed
Test-Cycle Specific Validations							
Phase Distance	(miles)	3.85			3.78	3.94	Passed
Sample Phase Time	(s)	868.7			867.6	871.6	Passed
Duration Phase 2	(s)	869.60					NA
Crank Time Phase1	(s)	1.2000			0	5	Passed
Crank Time Phase3	(s)	1.30			0	5	Passed
Crank Counts		1			0	1	Passed
Shutdown Time Phase 1					0	5	
Shutdown Time Phase 2					0	5	
Hot Soak Time	(s)	549.30			540.00	660.00	Passed
Test Hold Counts		0					Passed
Duration Test Hold	(s)	0.00			0	60	Passed

OK weighted DF = 17.05

Operator **REDACTED** Driver **REDACTED** Customer : 3225

Test Purpose: Certification Legislation *EPA1066* Requirements (3eg) *CERTIFICATION*

Conditioning: Emission Default

Phase 3 Overall Status Passed

		Average	Min	Max	Low Limit	Upper Limit	Status
General							
Cell Temperature	(°C)	25.75	24.60	26.40	20.00	30.00	Passed
Barometer	(mbar)	982.65	982.50	982.70	800.00	1100.00	Passed
Dew Point Temperature	(°C)	10.47	8.80	11.40	-9.44	37.78	Passed
Specific Humidity Test Cell	(gr/lb)	56.97	50.85	60.46	38.50	87.50	Passed
Dilution Air Temperature	(°C)	35.83	35.05	38.85	15.00	52.00	Passed
Dilution Factor	(-)	16.53			7.00	20.00	Passed
Fuel Economy	(mpg)	28.57			10.00	50.00	Passed
Zero Offset	(%)	-	-0.05	0.01	-2.00	2.00	Passed
Span Offset	(%)	-	-0.03	0.02	-2.00	2.00	Passed
Zero Check Drift	(%)	-	-0.81	0.05	-2.00	2.00	Passed
Span Check Drift	(%)	-	-0.23	0.00	-2.00	2.00	Passed
Bag vs. Modal Validation (CO2)	(%)	n.a.	-	-	-10.00	10.00	Passed
Ambient Concentrations							
HC	(ppm)	7.85			2.00	10.00	Passed
NO_x	(ppm)	0.09			-0.10	10.00	Passed
CO	(ppm)	1.60			0.00	15.00	Passed
CO_2	(ppm)	529.96			300.00	650.00	Passed
CH_4	(ppm)	2.76			1.30	10.00	Passed
N2O	(ppm)				0.20	0.50	
PM Filter Parameters							
Particulate Filter Temperature	(°C)	48.85	43.85	53.85	42.00	60.00	Passed
Filter Face Velocity	(cm/s)	83.45			0.00	100.00	Passed
Particulate Result Validation	(ug)	14.00			2.00	600.00	Passed
Test-Cycle Specific Validations							
Phase Distance	(miles)	3.59			3.52	3.66	Passed
Sample Phase Time	(s)	506.3			504.2	508.2	Passed
Duration Phase 3	(s)	506.20					NA
Crank Time Phase1	(s)	1.2000			0	5	Passed
Crank Time Phase3	(s)	1.30			0	5	Passed
Crank Counts		1			0	1	Passed
Shutdown Time Phase 1					0	5	
Shutdown Time Phase 3					0	5	
Hot Soak Time	(s)	549.30			540.00	660.00	Passed
Test Hold Counts		0					Passed
Duration Test Hold	(s)	0.00			0	60	Passed