



ATDS Emission Lab Test Report

for Exhaust Emission Test Procedures according

Date:	10/25/2023	Start Time:	8:55:04
Test Number:	ONT3_006007	End Time:	10:41:42
Test Vehicle:	3225_GCRXT03.05PV-512		
Test Legislation:	EPA1066		
Test Cycle:	FTP75		
Test Purpose:	Certification		
Test Cell:	iGEM-V-TC1		
Order Number:	3225		
Remark:	CONSENT DECREE		

AD QUALITY ASSURANCE

REDACTED

INSPECTED BY: _____

DATE: 10/30/2023

COMMENTS: REDACTED _____

General Data

Test Number	ONT3_006007	CH ₄ Response Factor	
Test Name	FTP75	Odometer Position ^[mi]	116929
Test Cell	iGEM-V-TC1	Delay Time Method	
Test Type	FTP75	Air Condition	OFF
Legislation	EPA1066	Particle Measurement	USUAL
Requirements (Bag)	CERTIFICATION		
Requirements (Modal)	CERTIFICATION		
Date	10/25/2023		
Test Start	8:55:04		
Start Time Cycle	2023-10-25 09:25-31-(000)		
Test End	10:41:42		
Operator	REDACTED		
Driver	REDACTED		
Shiftable	Auto		
Flow Stream	ModalDirty		
Calibrated Ranges	autorange		
Remark	CONSENT DECREE		

Vehicle Data 3225_GCRXT03.05PV-512

Manufacturer	RAM 1500	Displacement	
Vehicle Model	REDACTED	Engine Family	GCRXT03.05PV
Order Number	3225	Manufacturer	DODGE
Test Group	3225_GCRXT03.05PV-512	Transmission	Automatic
Evaporative Family		Engine Code	
Made Date	2016	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	GCRXT03.05PV	Tank Material	
Number of Cylinders	6		

Dyno Data 3225

Dyno Type	SVOR	Inertia ^[lb]	6000.00
	A ^[lb]	B ^[lb/mph]	C ^[lb/mph²]
Street Load	41.990	0.08760	0.036520
Road Load	5.900	0.42700	0.031900

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: 10/25/2023
 Test Number ONT3_006007 Driver REDACTED Shift Table Auto Cold Start

Vehicle	REDACTED	Dyno	Fuel	Test Timing
Vehicle #	REDACTED	Inertia [lb] 6000.00	Diesel-S-000266	Start Time 8:55:04
Model	RAM 1500	A [kg] 5.900	Fuel type DIESEL	End Time 10:41:42
Year	2016	B [lb/imp] 0.42700	Density 0.8540	
Displacement:		C [lb/imp] 0.031900	NHV 18362	Soak Time 548.3
Engine Family	GCRXT03.05PV		CWF 0.8700	
Trans	Automatic	Flow Stream Modal/Dirty		
Odometer [mi]	116929	Remark CONSENT DECREE		

Bag Analysis

PHASE 1	THC [ppmC]	CO [ppm]	CO ₂ [%]	NO _x [ppm]	N ₂ O [ppm]	CH ₄ [ppm]	NMHC [ppm]	Temp. [F]	Volume [scf]
Range	100	500	4	30		30		75.97	3171
Zero Read	0.00	0.0	0.0	0.0		0.0		28.99	13.88
Span Read	93.30	465.60	3.722	27.490		27.600		45.84	6.0
Sample	20.71	82.20	0.942	3.610		7.764	20.712	9.015	505.8
Mass.	1.081	8.658	1558.309	0.591		0.468	1.073	3.60	506.9
Mass per Dist.	0.3000	2.4039	432.687	0.1642		0.1300	0.2978	0.9472	2593

PSS Massflow Particles [g/h] 0.0207 PSS Mass per Dist. [g/mile] 0.0008

PHASE 2	THC [ppmC]	CO [ppm]	CO ₂ [%]	NO _x [ppm]	N ₂ O [ppm]	CH ₄ [ppm]	NMHC [ppm]	Temp. [F]	Volume [scf]
Range	100	50	1	30		30		76.51	4437
Zero Value	0.00	0.0	0.0	0.0		0.0		29.00	18.28
Span Value	93.30	46.73	0.930	27.540		27.600		49.57	505.9
Sample	2.73	0.06	0.699	0.062		3.509	2.731	9.938	1378.2
Mass.	0.200	0.009	1619.106	0.015		0.296	0.198	3.87	889.4
Mass per Dist.	0.0516	0.0022	418.385	0.0038		0.0766	0.0511	0.9752	2322

PSS Massflow Particles [g/h] 0.0059 PSS Mass per Dist. [g/mile] 0.0004

PHASE 3	THC [ppmC]	CO [ppm]	CO ₂ [%]	NO _x [ppm]	N ₂ O [ppm]	CH ₄ [ppm]	NMHC [ppm]	Temp. [F]	Volume [scf]
Range	100	50	1	30		30		78.34	3158
Zero Value	0	0.0	0.0	0.0		0.0		29.00	15.60
Span Value	93.30	46.68	0.930	27.530		27.600		47.94	1922.2
Sample	7	12.78	0.825	1.213		6.029	6.950	10.215	2428.2
Mass.	0.361	1.341	1360.110	0.206		0.362	0.358	3.59	506.1
Mass per Dist.	0.1005	0.3733	378.700	0.0573		0.1008	0.0998	0.9840	1094

PSS Massflow Particles [g/h] 0.0179 PSS Mass per Dist. [g/mile] 0.0007

Total Result (weighted)

Weighted	THC [g/mile]	CO [g/mile]	CO ₂ [g/mile]	NO _x [g/mile]	N ₂ O [g/mile]	CH ₄ [g/mile]	NMHC [g/mile]	HC+NO _x [g/mile]	Fuel Economy
Mass per Dist.	0.1165	0.6018	410.46	0.0517		0.0943	0.1156	0.16822	mile/gal 24.71
Mass per Dist. (rounded)	0.1165	0.6018	410.5	0.0517		0.0943	0.1156	0.1682	
Mass per Dist. - Particulate PSS	0.0006								

Test Data: FTP75
Test Number: ONT3_006007

Operator: REDACTED
Driver: REDACTED

Date: 10/25/2023

Driver Violations

	<u>Phase1</u>	<u>Phase2</u>	<u>Phase3</u>
Number of Violations	0	0	0
Duration of Violations	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		

**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	2	500	0.01	0.00	0.00	465.60	465.50	0.02	0.02
NO _x	1	30	0.00	0.00	-0.01	27.49	27.51	-0.07	0.00
THC (ppmC1)	2	30	0.00	0.00	0.01	28.41	28.41	0.00	0.22
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	-0.04
CO	2	500	0.04	0.00	0.00	465.23	465.50	-0.07
NO _x	1	30	0.02	0.00	0.06	27.49	27.51	0.00
THC (ppmC1)	2	30	0.22	0.00	0.00	28.75	28.41	1.12
CH ₄	1	30	0.00	0.00	-0.01	27.57	27.60	-0.09

**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	0.00	0.00
CO	1	50	-0.01	0.00	-0.02	46.73	46.71	0.04	0.05
NO _x	1	30	0.03	0.00	0.11	27.54	27.51	0.10	0.04
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	0.00	0.93	0.93	-0.35
CO	1	50	0.09	0.00	0.08	46.68	46.71	-0.10
NO _x	1	30	0.03	0.00	0.00	27.50	27.51	-0.14
THC (ppmC1)	2	100	0.01	0.00	0.00	93.30	93.30	0.00
CH ₄	1	30	0.00	0.00	-0.01	27.51	27.60	-0.28

**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	0.00	0.93	0.93	-0.01	0.00
CO	1	50	0.01	0.00	0.01	46.68	46.71	-0.06	0.00
NO _x	1	30	-0.02	0.00	-0.06	27.53	27.51	0.07	0.01
THC (ppmC1)	2	100	0.02	0.00	0.06	93.30	93.30	0.00	
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	-0.20
CO	1	50	0.01	0.00	0.01	46.66	46.71	-0.03
NO _x	1	30	0.02	0.00	0.03	27.47	27.51	-0.19
THC (ppmC1)	2	100	0.00	0.00		93.30	93.30	
CH ₄	1	30	0.00	0.00	0.01	27.49	27.60	-0.37

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

VIN **REDACTED**

DYNO Data

	Road Load	Street Load
Inertia ^[lb]	6000.00	
A ^[N]	26.244	186.781
B ^[N/km/h]	1.18023	0.24213
C ^[N/km2/h2]	0.054787	0.062722

	Phase1	Phase2	Phase3	Phase4	Weighted
Distance (m)					
Target	5779.15	6210.96	5779.15		17769.26
Driven	5795.25	6226.77	5779.33		17801.36
Distance Rating (%)	0.2786	0.2547	0.0032		0.1807
Cycle Energy (MJ)					
Target	4.61	4.17	4.61		8.78
Driven	4.61	4.24	4.59		8.84
Distance per Energy Cycle (m/MJ)					
Target	4.61	4.17	4.61		1365.41
Driven	4.61	4.24	4.59		1359.65
Road Load Work Fraction					
Target	0.4105	0.2735	0.4105		0.3453
Driven	0.4108	0.2687	0.4108		0.3427
Inertial Work (MJ)					
Target	2.72	3.03	2.72		5.75
Driven	2.72	3.10	2.70		5.81
Inertial Work Fraction					
Target	0.5895	0.7265	0.5895		0.6547
Driven	0.5892	0.7313	0.5892		0.6573
Inertial Work Rating (%)	-0.0090	2.1987	-0.4838		1.0279
Absolute Speed Change (m/s)					
Target	204.88	340.90	204.87		545.78
Driven	204.15	346.16	204.24		550.36
Absolute Speed Change Rating (%)	-0.3533	1.5404	-0.3113		0.8386
Energy Rating (%)	0.0478	1.5385	-0.4256		0.3497
Energy Economy Rating (%)	-0.2307	1.2644	-0.4307		0.4217

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_006007

Vehicle ID: **REDACTED**

	<u>Average</u>	<u>Min</u>	<u>Max</u>	<u>Low Limit</u>	<u>Upper Limit</u>	<u>Status</u>
General						
Cell Temperature (°C)	24.43	23.60	25.20	20.00	30.00	Passed
Barometer (mbar)	981.82	981.70	981.90	800.00	1100.00	Passed
Dew Point Temperature (°C)	12.00	10.60	13.50	-9.44	37.78	Passed
Specific Humidity Test Cell (gr/lb)	63.10	57.38	69.76	38.50	87.50	Passed
Dilution Air Temperature (°C)	35.88	35.55	36.15	15.00	52.00	Passed
Weighted Test Dilution Factor (-)	16.08			7.00	20.00	Passed
Dilution Factor (-)	13.68			7.00	20.00	Passed
Fuel Economy (mpg)	23.26			10.00	50.00	Passed
Zero Offset (%)	-	-0.01	0.01	-2.00	2.00	Passed
Span Offset (%)	-	-0.07	0.02	-2.00	2.00	Passed
Zero Check Drift (%)	-	-0.01	0.06	-2.00	2.00	Passed
Span Check Drift (%)	-	-0.09	1.12	-2.00	2.00	Passed
Bag vs. Modal Validation (CO2) (%)	n.a.	-	-	-10.00	10.00	Passed
Ambient Concentrations						
HC (ppm)	5.64			2.00	10.00	Passed
NO _x (ppm)	0.03			-0.10	10.00	Passed
CO (ppm)	4.99			0.00	15.00	Passed
CO ₂ (ppm)	461.25			300.00	650.00	Passed
CH ₄ (ppm)	2.15			1.30	10.00	Passed
N ₂ O (ppm)				0.20	0.50	
PM Filter Parameters						
Particulate Filter Temperature (°C)	51.93	42.75	53.65	42.00	60.00	Passed
Filter Face Velocity (cm/s)	91.07			0.00	100.00	Passed
Particulate Result Validation (ug)	15.00			1.00	600.00	Passed
Test-Cycle Specific Validations						
Phase Distance (miles)	3.60			3.52	3.66	Passed
Sample Phase Time (s)	506.9			503.8	507.8	Passed
Duration Phase 1 (s)	505.84					NA
Crank Time Phase1 (s)	1.00			0	5	Passed
Crank Time Phase3 (s)	1.10			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)	548.30			540.00	660.00	Passed
Test Hold Counts	0					Passed
Duration Test Hold (s)	0.00			0	60	Passed

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

3225
 CERTIFICATION

Phase 2

Overall Status **Passed**

	<u>Average</u>	<u>Min</u>	<u>Max</u>	<u>Low Limit</u>	<u>Upper Limit</u>	<u>Status</u>
General						
Cell Temperature (°C)	24.73	23.70	25.70	20.00	30.00	Passed
Barometer (mbar)	981.93	981.90	982.00	800.00	1100.00	Passed
Dew Point Temperature (°C)	13.40	10.30	15.30	-9.44	37.78	Passed
Specific Humidity Test Cell (gr/lb)	69.57	56.19	78.33	38.50	87.50	Passed
Dilution Air Temperature (°C)	36.41	35.85	36.75	15.00	52.00	Passed
Dilution Factor (-)	18.28			7.00	20.00	Passed
Fuel Economy (mpg)	24.31			10.00	50.00	Passed
Zero Offset (%)	-	-0.02	0.11	-2.00	2.00	Passed
Span Offset (%)	-	0.00	0.10	-2.00	2.00	Passed
Zero Check Drift (%)	-	-0.01	0.08	-2.00	2.00	Passed
Span Check Drift (%)	-	-0.35	0.00	-2.00	2.00	Passed
Bag vs. Modal Validation (CO2) (%)	n.a.			-10.00	10.00	Passed
Ambient Concentrations						
HC (ppm)	6.21			2.00	10.00	Passed
NO _x (ppm)	0.05			-0.10	10.00	Passed
CO (ppm)	4.58			0.00	15.00	Passed
CO ₂ (ppm)	475.16			300.00	650.00	Passed
CH ₄ (ppm)	2.15			1.30	10.00	Passed
N ₂ O (ppm)				0.20	0.50	Passed
PM Filter Parameters						
Particulate Filter Temperature (°C)	51.49	42.75	53.65	42.00	60.00	Passed
Filter Face Velocity (cm/s)	90.82			0.00	100.00	Passed
Particulate Result Validation (ug)	9.00			2.00	600.00	Passed
Test-Cycle Specific Validations						
Phase Distance (miles)	3.87			3.78	3.94	Passed
Sample Phase Time (s)	869.4			868.3	872.3	Passed
Duration Phase 2 (s)	870.30					NA
Crank Time Phase1 (s)	1.0000			0	5	Passed
Crank Time Phase3 (s)	1.10			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)	548.30			540.00	660.00	Passed
Test Hold Counts	0					Passed
Duration Test Hold (s)	0.00			0	60	Passed

Operator
 Test Purpose:
 Conditioning:

REDACTED
 Certification

Driver **REDACTED**
 Legislation: EPA1066
 Emission Default

Customer:
 Requirements (Bag)

3225
 CERTIFICATION

		Phase 3				Overall Status	Passed
		Average	Min	Max	Low Limit	Upper Limit	Status
General							
Cell Temperature	(°C)	25.74	24.20	26.90	20.00	30.00	Passed
Barometer	(mbar)	981.99	981.90	982.10	800.00	1100.00	Passed
Dew Point Temperature	(°C)	13.77	11.30	15.50	-9.44	37.78	Passed
Specific Humidity Test Cell	(g/m³)	71.50	60.04	79.51	38.50	87.50	Passed
Dilution Air Temperature	(°C)	36.39	35.65	39.65	15.00	52.00	Passed
Dilution Factor	(-)	15.60			7.00	20.00	Passed
Fuel Economy	(mpg)	26.81			10.00	50.00	Passed
Zero Offset	(%)	-	-0.06	0.06	-2.00	2.00	Passed
Span Offset	(%)	-	-0.06	0.07	-2.00	2.00	Passed
Zero Check Drift	(%)	-	0.01	0.03	-2.00	2.00	Passed
Span Check Drift	(%)	-	-0.37	-0.03	-2.00	2.00	Passed
Bag vs. Modal Validation (CO2)	(%)	n.a.	-	-	-10.00	10.00	Passed
Ambient Concentrations							
HC	(ppm)	5.98			2.00	10.00	Passed
NO _x	(ppm)	0.01			-0.10	10.00	Passed
CO	(ppm)	3.63			0.00	15.00	Passed
CO ₂	(ppm)	476.66			300.00	650.00	Passed
CH ₄	(ppm)	2.16			1.30	10.00	Passed
N ₂ O	(ppm)				0.20	0.50	
PM Filter Parameters							
Particulate Filter Temperature	(°C)	48.20	42.75	53.65	42.00	60.00	Passed
Filter Face Velocity	(cm/s)	83.42			0.00	100.00	Passed
Particulate Result Validation	(ug)	13.00			2.00	600.00	Passed
Test-Cycle Specific Validations							
Phase Distance	(miles)	3.59			3.52	3.66	Passed
Sample Phase Time	(s)	506.1			504.0	508.0	Passed
Duration Phase 3	(s)	506.00					NA
Crank Time Phase1	(s)	1.0000			0	5	Passed
Crank Time Phase3	(s)	1.10			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)	548.30			540.00	660.00	Passed
Test Hold Counts		0					Passed
Duration Test Hold	(s)	0.00			0	60	Passed