

Test = HWFET with Warmup  
 Options = CVS Bag Dil Sec ShowTo1 Methane ModalMethane MethaneRF

Test Init Start = 21 April 2021 11:11:24 Test Start = 21 April 2021 11:26:26  
 Posttest Completed At = 21 April 2021 12:01:17 Test Finish = 21 April 2021 11:52:11  
 Hot Soak Start Time = 20 April 2021 16:25:00

Personnel Information:  
 Driver = REDACTED Operator = REDACTED  
 Requestor = REDACTED Supervisor = REDACTED

Vehicle Information:  
 VIN = REDACTED / Cert Tracking ID = 3029ECRXT03.05PV-693  
 Vehicle Model = JEEP GRAND CHEROKEE Model Year = 2014  
 Engine Family = ECRXT03.05PV / Eng. Disp. = 3.0L  
 Ignition Status = No Transmission =  
 Automatic = 1 Idle RPM =  
 Sample Delay =

Vehicle Conditions:  
 Soak Start Time: = APR 20, 2021 16:25 Ambient Limit Type = OTHER7

Test Specifications:  
 TO-Number = W0110 CVS BulkStream Flow : = 2) 350 scfm  
 TestNet Number = 3029

Dynamometer:  
 Inertia = 5500 (lb) / Road Load A = 22.24 (lbs) /  
 Road Load B = 0.172 / Road Load C = 0.02793 /

Fuel Information:  
 Fuel = DIE-DJ1621HW10 / Specific gravity = 0.8520  
 NHV = 18083.00 Fuel R-Factor = 0.60  
 CWF = 0.8710 OWF = 0.0000  
 HWF = 0.1290 Fuel Calculation Type = Diesel/EPA Calc

Phase Information:  
 Shift Tables  
 Phase 1 N/A  
 Phase 2 N/A

Response Factors:  
 Bag Methane = 1.05

Pre Test Remarks:  
 TEST #1 AS RECEIVED

Post Test Remarks:

Non-Critical Information:  
 Begin Odo = 79985 Idle RPM =  
 Test end Odometer = 80005 Driveability = Good  
 Engine performance = No Problem Brakes = No Problem  
 Transmission = No Problem Vehicle stalls = None

**AD QUALITY ASSURANCE**

REDACTED

INSPECTED BY: \_\_\_\_\_

DATE: 4-22-21

COMMENTS: Okay

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SUMMARY REPORT

Test = HWFET with Warmup Test Id = ONT52208 TestNet Number = 3029  
 Options = CVS Bag Dil Sec ShowTol Methane ModalMethane MethaneRF  
 Test Init Start = 21 April 2021 11:11:24 Fuel Calculation Type = Diesel/EPA Calcs Idle RPM = Driver = **REDACTED**

MASS calculated by DF method

Phase 1	Bag 2	THC (ppmC)	CO (ppm)	NOX (ppm)	CO2 (%)	CH4 (ppmC)	NM-HC (wRF)	FE (mpg)
Range		10.0	50.0	30.0	2.00	10.0		
Sample		3.750	-0.023	0.049	1.4235	2.037		
Range		10.0	50.0	30.0	2.00	10.0		
Ambient		3.949	0.319	0.000	0.0636	2.064		
Net Conc.		0.221	0.000	0.049	1.3666	0.192	0.0199	
Modal Corr.		0.0008	0.0000	0.0001	9.7568	0.0005	0.0004	
Grams/ph.		0.0157	0.0000	0.0100	2935.6453	0.0155	0.0017	35.5790
Grams/mi		0.0015	0.0000	0.0010	286.2143	0.0015	0.0002	

----- Dyno Information -----

Inertia = 5500  
 Inertia Units = lb  
 Dynamometer will be set manually = False  
 Dyno Coefficient Units = 2  
 Road Load A = 22.24  
 Road Load B = 0.172  
 Road Load C = 0.02793  
 Use Augmented Braking System? = False

MODE NO.	MODE TYPE	TEST TIME sec	MODE TIME sec	DIST mi	SAMPLE POINT	-----DILUTE CONCENTRATIONS-----					CVS VOLUME ft3 20 C	-----MODAL GRAMS-----					F.E. mpg	D/V	
						THC ppmC	CO ppm	NOX ppm	CO2 %	CH4 ppmC		THC	CO	NOX	CO2	CH4			NMHC wRF
<u>[PHASE One MODAL SUMMARY]</u>																			
				2.341	DIL						1067.92	0.015	-0.01	0.003	616.8	0.043	0.000	38.62	0.0
				6.159	DIL						2324.41	0.028	-0.02	0.007	1793.5	0.088	0.000	34.95	0.0
				1.756	DIL						752.86	0.010	-0.01	0.002	493.0	0.030	0.000	36.25	0.0
				10.257	DIL						4145.19	0.053	-0.03	0.011	2903.3	0.161	0.000	35.95	0.0

**AD QUALITY ASSURANCE**

REDACTED

INSPECTED BY: \_\_\_\_\_

DATE: 4-22-21

COMMENTS: Okay

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CVS Bag report  
 MASS calculated by DF method

Phase 1	Bag 2	THC (ppmC)	CO (ppm)	NOX (ppm)	CO2 (%)	CH4 (ppmC)	NM-HC (wRF)	FE (mpg)	Test Info	Times Info
Range		10.0	50.0	30.0	2.00	10.0			Baro(inHg) = 28.89	Phase Start = 11:39:26
Sample		3.750	-0.023	0.049	1.4235	2.037			Temp( F) = 75.2	Phase Finish = 11:52:11
Range		10.0	50.0	30.0	2.00	10.0			Tdew( F) = 48.6	Analysis End = 11:57:41
Ambient		3.949	0.319	0.000	0.0636	2.064			Rhum(%) = 39.1	
Net Conc.		0.221	0.000	0.049	1.3666	0.192	0.0199		Ahum(gr/lb) = 52.4	Elapsed (sec) = 765.0
Modal Corr.		0.0008	0.0000	0.0001	9.7568	0.0005	0.0004		NOX Factor = 0.9041	Bag Fill (sec)= 765.0
Grams/ph.		0.0157	0.0000	0.0100	2935.6453	0.0155	0.0017	35.5790	Vmix(ft3 20 C) = 4131.67	Bag Anl (sec) = 329.8
Grams/mi		0.0015	0.0000	0.0010	286.2143	0.0015	0.0002		Dilu. Factor = 9.4113	Drv Err (sec) = 0.0
									Dist(mi) = 10.2568	

Legend  
 \* denotes Unstable Reading  
 (wRF) denotes with Response Factor  
 (woRF) denotes without Response Factor

DATA VALIDATION

PARAMETER DESCRIPTION	VALUE OF PARAMETER	LIMIT OF PARAMETER
Temperature	VALID	68 - 86 (degF)
Barometer	VALID	26.99 - 33.0001 (inHg)
Dew Point	VALID	-20 - 200 (degF)
Absolute Humidity	VALID	0 - 150 (gr/lb)
Pretest Soak Time	VALID	12 - 36 (hr)
Phase Length	VALID	2 (%)
Distance	VALID	2 (%)
Test Hold Conditions	VALID	60 (sec)
Leak Check	VALID	1
Bag Analysis Time	VALID	1200 (sec)
Bag Fill Time	VALID	5 (sec)
Ambient Bag Readings	VALID	THC -0.55 - 10 (ppm) CO -0.55 - 15 (ppm) NOX -0.55 - 2 (ppm) CO2 350 - 850 (ppm)
Sample Bag Readings	VALID	CH4 -0.55 - 10 (ppm) THC -0.55 (ppm) CO -0.55 (ppm) NOX -0.55 (ppm) CO2 350 (ppm) CH4 -0.55 (ppm)
Bag Read Sequence	VALID	Stabilization Time (T2) 10 (sec) Integration Time (T3) 3 (sec) Stability Time Out (T4) 30 (sec) Stability Chk Tolerance 2 (%)
Bag Zero/Span Sequence	VALID	Pre-Bag Z/S Offset 25 (%) Pre-Bag Zero Drift 1 (%) Post-Bag Z/S Drift 2 (%) Stabilization Time (T2) 10 (sec) Integration Time (T3) 3 (sec) Stability Time Out (T4) 30 (sec) Stability Chk Tolerance 2 (%)
Analyzer Overscale	VALID	10 (sec)
Venturi Inlet Temperature	VALID	32 - 300 (degF)

BAG Zero/Span Results

Bag Pair 2 Zero/Span Concentrations ( Offset Limit = 25.0% ReZero Limit = 1.0% )

Samp	Gas	Range	Fullscale	Zero	Offset	Std Dev	Spec	Span	Offset	Std Dev	Rezero	Drift	Std Dev	Status
BAG	LCO	(1)	50.0ppm	0.125	0.25	0.06212	47.235	47.305	0.14	0.01582	-0.012	-0.02	0.04090	PASS
BAG	CO2	(2)	2.00%	0.0036	0.18	0.00779	1.8733	1.8675	-0.29	0.04876	0.0016	0.08	0.01166	PASS
BAG	THC	(1)	10.0ppm	0.090	0.90	0.03097	9.355	9.357	0.02	0.06115	-0.017	-0.17	0.03100	PASS
BAG	NOX	(2)	30.0ppm	0.343	1.14	0.17562	28.153	28.157	0.01	0.31106	-0.029	-0.10	0.22293	PASS
BAG	CH4	(1)	10.0ppm	0.146	1.46	0.06225	9.219	9.209	-0.11	0.07670	0.013	0.13	0.09889	PASS

Bag Pair 2 Post Bag Check ( Drift Limit = 2.0% )

Samp	Gas	Range	Fullscale	Zero	Drift	Std Dev	Spec	Span	Drift	Std Dev	Status
BAG	LCO	(1)	50.0ppm	0.079	0.16	0.06628	47.235	47.249	0.03	0.04042	PASS
BAG	CO2	(2)	2.00%	0.0020	0.10	0.00654	1.8733	1.8814	0.41	0.04565	PASS
BAG	THC	(1)	10.0ppm	-0.013	-0.13	0.02776	9.355	9.336	-0.19	0.06114	PASS
BAG	NOX	(2)	30.0ppm	-0.031	-0.10	0.22062	28.153	28.031	-0.41	0.43301	PASS
BAG	CH4	(1)	10.0ppm	-0.006	-0.06	0.06749	9.219	9.213	-0.06	0.04214	PASS