ID: ONT52196 EPA 75 TEST Printed on: Tue 20 April 2021 11:22 * Automotive Testing and Development Services, Inc. * Tue 20 April 2021 10:25 Page 1 of PRE * Single Roll Dyno Configuration Test = EPA 75 Options = CVS Bag Dil Sec ShowTol Methane ModalMethane MethaneRF Test Init Start = 20 April 2021 10:11:17 Test Start = 20 April 2021 10:25:54 Posttest Completed At = 20 April 2021 11:22:11 Test Finish = 20 April 2021 11:06:31 Hot Soak Start Time = 19 April 2021 16:10:00 Personnel Information:: _REDACTED **REDACTED** Driver Operator **REDACTED** Requestor **≖ REDACTED** Supervisor Vehicle Information: = REDACTED VIN Cert Tracking ID = 3029-ECRXT03.05PV-862 = RAM 1500 Vehicle Model Model Year = 2014 Engine Family = ECRXT03.05PV ✓ Eng. Disp. = 3.0LIgnition Status = No Transmission Automatic = 1 Idle RPM Sample Delay Vehicle Conditions: Soak Start Time: = APR 19, 2021 16:10 Ambient Limit Type = OTHER7 Test Specifications: TO-Number = W0110 CVS BulkStream Flow: = 2) 350 scfm TestNet Number = 3029Dynamometer: Inertia = 6000 (1b)Road Load A = 10.38 (1bs) / Road Load B = 0.0313Road Load C = 0.03565Fuel Information: = DIE-DJ1621HW10 ✓ Fuel 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 Calcs Phase Information: Shift Tables Phase 1 AUT0 Phase 2 Con't Phase 3 **AUTO** Response Factors: Bag Methane = 1.05 Pre Test Remarks: TEST #1 AS RECEIVED Post Test Remarks: Non-Critical Information: Begin Odo = 107223Idle RPM Test end Odometer = 107234Driveabil ty = Good = No Problem Engine performance Brakes No Problem Transmission = No Problem Vehicle stalls = None QUALITY ASSURANCE **REDACTED** INSPECTED BY: DATE: COMMENTS:

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SUMMARY REPORT

Test = EPA 75 Test Id = ONT52196 TestNet Number = 3029
Options = CVS Bag Dil Sec ShowTol Methane ModalMethane MethaneRF
Test Init Start = 20 April 2021 10:11:17 Fuel Calculation Type = Diesel/EPA Calcs

Idle RPM = Driver = REDACTED

Phase 1 Bag 1	THC	CO	NOX	C02	CH4	NM - HC	FE
	(ppmC)	(ppm)	(ppm)	(%)	(ppmC)	(wRF)	(mpg)
Range	30.0	500	30.0	2.00	30.0	******	•••••
Sample	24.816	84.84	4.425	1.2096	12.173		
Range	30.0	500	30.0	2.00	30.0		
Ambient	4.805	1.26	0.117	0.0587	2.765		
Net Conc.	20.449	83.70	4.318	1.1562	9.660	10.3354	-
Modal Corr.	0.0035	0.0241	0.0020	5.5117	0.0019	0.0018	
Grams/ph.	0.9236	7.6241	0.5839	1656.0576	0.5047	0.4668	21.9237
Grams/mi	0.2566	2.1179	0.1622	460.0363	0.1402	0.1297	11.5207
Phase 2 Bag 2	THC	со	NOX	C02	CH4	NM-HC	FE
_	(ppmC)	(ppm)	(ppm)	(%)	(ppmC)	(wRF)	(mpg)
Range	30.0	50.0	30.0	2.00	10.0	* * * * * * * * * * * * * * * * * * * *	******
Sample	12.104	1.488	0.112	0.7137	7.135		
Range	30.0	50.0	30.0	2.00	10.0		
Ambient	6.365	0.988	0.095	0.0570	2.841		
Net Conc.	6.078	0.553	0.022	0.6598	4.446	1.4236	
Modal Corr.	0.0031	0.0008	0.0001	5.6610	0.0021	0.0011	
Grams/ph.	0.4720	0.0868	0.0053	1620.6191	0.3989	0.1110	24.1464
Grams/mi	0.1227	0.0226	0.0014	421.4424	0.1037	0.0289	
Phase 3 Bag 3	THC	<u></u>	NOV	000			
riidse s bay s	(ppmC)	(nom)	NOX	CO2	CH4	NM-HC	FE
	(ppmc)	(ppm)	(ppm)	(%)	(ppmC)	(wRF)	(mpg)
Range	30.0	50.0	30.0	2.00	30.0		
Sample	20.252	22.138	0.703	0.9935	9.237		
Range	30.0	50.0	30.0	2.00	30.0		
Ambient	9.036	1.339	-0.066	0.0594	2.666		
Net Conc.	11.889	20.899	0.703	0.9385	6.770	4.8006	-
Modal Corr.	0.0028	0.0057	0.0003	4.5760	0.0015	0.0014	-
Grams/ph.	0.5365	1.8992	0.0949	1341.4329	0.3531	0.2169	27.1132
Grams/mi	0.1497	0.5300	0.0265	374.3353	0.0985	0.0605	
Test Summary	THC	CO	NOX	C02	CH4	NM·HC (wRF)	FE (mpg)
Wtd Results		•••••		• • • • • • • • • • • • • • • • • • • •	•••••		•••••••••••
Grams g/mi	0.1580	0.5977	0.0417	416.5142	0.1099	0 000	24 2300
Grams g/mi	0.158	0.60	0.0417	410.5142		0.0585	24.3182
Phs1&2 gms	1.3956	7.7109	0.5892	3276.6768	0.110	0.059	
Phs1&2 g/mi	0.1874	1.0357	0.0791		0.9035	0.5778	00 010
Phs2&3 gms	1.0085			440.1029	0.1214	0.0776	23-0104
Phs2&3 g/mi		1.9860	0.1002		0.7519	0.3279	
ווושבמט ש/וווו	0.1358	0.2673	0.0135	398.7193	0.1012	0.0441	25.4487

Dyno Information
Inertia = 6000
Inertia Units = 1b
Dynamometer will be set manually = False
Dyno Coefficient Units = 2
Road Load A = 10.38
Road Load B = 0.0313
Road Load C = 0.03565
Use Augmented Braking System? = False

QUALITY ASSURANCE

INSPECTED BY:

DATE: 4-21-7

COMMENTS: Okay

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SUMMARY REPORT

												- 1:						
MODE MODE	TEST	MODE					CONCENT			§ -			- MODAL	GRAMS-				
NO. TYPE	TIME	TIME	DIST	POINT		CO	NOX	C02	CH4	VOLUME	THC	CO	NOX	C02	CH4	NMHC	F.E.	D/V
	sec	sec	mi		ppmC	ppin	ppm	*	ppmC	ft3 20 C				3		wRF	mpg	
PHASE One	MODAL S	UMMARY												à				
CRANK			0.000	DIL						4.94	0.000	0.00	0.000	0.0	0.000	0.000	0.00	0.0
IDLE			0.001	DIL						513.64	0.105	0.17	0.026	0.74		0.000	0.29	0.0
ACCEL			0.881	DIL						655.89	0.321	2.12	0.132	1. 1	0.206	0.000	25.29	0.0
CRUISE			1.826	DIL						906.70	0.398	4.38	0.394		0.242	0.000	22.77	0.0
DECEL			0.891	DIL						682.55	0.086		0.053		0.077	0.000	22.37	0.0
TOTAL			3.600	DIL				-		2763.71	0.911	7.45	0.606	1638.0	0 596	0.000	22.17	0.0
····		***														0.000		0.0
PHASE Two	MODAL S	UMMARY																
IDLE			0.001	DIL						820.32	0.090	0.01	0.004	139.8	0.106	0.000	0.33	0.0
ACCEL			1.275	DIL						1471.96	0.108		0.004		0.100	0.000	0.33 39.58	0.0
CRUISE			1.812	DIL						1389.62	0.247	0.11	0.006		0.124	0.000	28.05	0.0
DECEL			0.756	DIL						1057.09	0.189	0.01	0.004	3.1	0.177	0.000	15.23	0.0
TOTAL			3.845	DIL					***************************************	4738.99	0.635	0.15	0 020	1628.5	0 652	0.000	24.00	
	······································									47,00.33	0.000	0.13	0.020	1020.3	0.032	0.000	24.00	0.0
PHASE Thre	e MODAI	SUMMARY	ī															
CRANK			0.000	DIL						6.57	0.000	0.00	0.000	0.0	0.000	0.000	0.01	0.0
IDLE			0.001	DIL						512.17	0.053	0.00	0.000		0.045	0.000	0.01	0.0
ACCEL			0.869	DIL						654.10	0.186	0.70	0.001	5-1-	0.103	0.000	33.76	0.0
CRUISE			1.820	DIL						904.38	0.348	1.00	0.054		0.245	0.000	26.84	0.0
DECEL			0.893	DIL						680.58	0.086	0.01	0.016	1 1	0.065	0.000	26.15	0.0
TOTAL			3.584	DIL			*******	*************		2757.79	0.673	1.72	0.094	1344.0	0 459	0.000	27.03	0.0
									***************************************								27.00	0.0
IMODAL EQUI	VALENT E	BAG SUMM									:							
PHASE One			3.600	DIL						2763.71	0.911		0.606	1638.0	0.596	0.000	22.17	0.0
PHASE Two			3.845	DIL						4738.99	0.635	0.15	0.020	1628.5	0.652	0.000	24.00	0.0
PHASE Three			3.584	DIL						2757.79	0.673			1344.0	0.459		27.03	0.0
										***************************************			GRAMS	PER mi-		• • • • •		
WEIGHTED TO	TAL			DIL							0.190	0.58	0.045	416.7	0.157	0.000	24.33	0.0
																		V.V

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CVS Bag report MASS calculated by DF method

Phase 1 Bag 1	THC (ppmC)	CO (ppm)	NOX (ppm)	CO2 (%)	CH4 (ppmC)	NM-HC (wRF)	FE (mpg)	Test	Info		Times Info
Range	30.0	500	30.0	2.00	30.0			Baro(inHg)		28.91	Phase Start = 10:25:54
Sample	24.816	84.84	4.425	1.2096	12.173	Water .		Temp(F)	_	75.5	
Range	30.0	500	30.0	2.00	30.0	#: :		Tdew(F)	_	48.5	Phase Finish = 10:34:20
Ambient	4.805	1.26	0.117	0.0587	2.765			Rhum(%)	_	38.4	Analysis End = $10:54:34$
Net Conc.	20.449	83.70	4.318	1.1562	9.660	10.3354		Ahum(gr/1b)	_	52.1	[]d ()
Modal Corr.	0.0035	0.0241	0.0020	5.5117	0.0019	0.0018		NOX Factor		0.9030	Elapsed (sec) = 505.7 Bag Fill (sec) = 506.0
Grams/ph.	0.9236	7.6241	0.5839	1656.0576	0.5047	0.4668	21.9237	Vmix(ft3 20	C) =	2754.77	Bag Anl (sec) = 1214.3 Drv Err (sec) = 0.0
Grams/mi	0.2566	2.1179	0.1622	460.0363	0.1402	0.1297		Dilu. Factor Dist(mi)	=	10.9794	Drv Err (sec) = 0.0 Crank Time = 0.7
Phase 2 Bag 2	THC	CO	NOX	C02	CH4	NM - HC	FE	Test	Info		Times Info
	(ppmC)	(ppm)	(ppm)	(%)	(ppmC)	(wRF)	(mpg)				Times Time
Range	30.0	50.0	30.0	2.00	10.0			Baro(inHg)		28.92	Phase Start = 10:34:20
Sample	12.104	1.488	0.112	0.7137	7.135			Temp(F)	-	75.8	Phase Finish = 10:48:50
Range	30.0	50.0	30.0	2.00	10.0	THE STATE OF THE S		Tdew(F)	_	48.5	Analysis End = 11:11:43
Ambient	6.365	0.988	0.095	0.0570	2.841			Rhum(%)	-	38.1	11.11.40
Net Conc.	6.078	0.553	0.022	0.6598	4.446	1.4236	1	Ahum(gr/lb)	=	52.1	Elapsed (sec) = 869.5
Modal Corr.	0.0031	0.0008	0.0001	5.6610	0.0021	0.0011		NOX Factor	-	0.9030	Bag Fill (sec)= 870.0
Cname /oh	0.4700	0.0000	0.0050	* 600 6101							Bag Anl (sec) = 1373.7
Grams/ph. Grams/mi	0.4720 0.1227	0.0868 0.0226	0.0053 0.0014	1620.6191 421.4424	0.3989 0.1037	0.1110 0.0289	24.1464	Vmix(ft3 20 Dilu. Factor	C) =	4723.68 18.7407	Drv Err (sec) = 0.0 Stop Time = 0.6
						ACTIVATEDORANIAANIAANIAANIAANIAANIAANIAANIAANIAANI					Soak Start = 10:48:50 Soak Finish = 10:58:05
						Andrew Control of the					Soak Start = 10:48:50 Soak Finish = 10:58:05 Elapsed (sec) = 555.7
Phase 3 Bag 3	THC (ppmC)	CO	NOX (ppm)	CO2 (%)	CH4 (ppmC)	NM-HC (wRF)	FE (mpg)	Test	Info		Soak Finish = 10:58:05
Phase 3 Bag 3 Range						1.			Info		Soak Finish = 10:58:05 Elapsed (sec) = 555.7 Times Info
Range	(ppmC)	(ppm)	(ppm)	(%)	(ppmC)	1.		Baro(inHg)	ļ	 28.91 76.1	Soak Finish = 10:58:05 Elapsed (sec) = 555.7 Times Info Phase Start = 10:58:05
Range Sample	(ppmC) 30.0	(ppm) 50.0	(ppm) 30.0	2.00	(ppmC) 30.0	1.		Baro(inHg) Temp(F)		76.1	Soak Finish = 10:58:05 Elapsed (sec) = 555.7 Times Info Phase Start = 10:58:05 Phase Finish = 11:06:31
Range Sample Range	(ppmC) 30.0 20.252	50.0 22.138 50.0 1.339	(ppm) 30.0 0.703	2.00 0.9935	(ppmC) 30.0 9.237	1.		Baro(inHg)	=		Soak Finish = 10:58:05 Elapsed (sec) = 555.7 Times Info Phase Start = 10:58:05
Range Sample Range Ambient Net Conc.	30.0 20.252 30.0 9.036 11.889	50.0 22.138 50.0 1.339 20.899	30.0 0.703 30.0	2.00 0.9935 2.00	(ppmC) 30.0 9.237 30.0	1.		Baro(inHg) Temp(F) Tdew(F)	=	76.1 48.5	Soak Finish = 10:58:05 Elapsed (sec) = 555.7 Times Info Phase Start = 10:58:05 Phase Finish = 11:06:31 Analysis End = 11:19:05
Range Sample Range Ambient Net Conc.	30.0 20.252 30.0 9.036	50.0 22.138 50.0 1.339	30.0 0.703 30.0 -0.066	2.00 0.9935 2.00 0.0594	30.0 9.237 30.0 2.666	(wRF)		Baro(inHg) Temp(F) Tdew(F) Rhum(%)	=	76.1 48.5 37.8	Soak Finish = 10:58:05 Elapsed (sec) = 555.7 Times Info Phase Start = 10:58:05 Phase Finish = 11:06:31 Analysis End = 11:19:05 Elapsed (sec) = 506.0 Bag Fill (sec) = 506.0
Range Sample Range Ambient Net Conc. Modal Corr.	30.0 20.252 30.0 9.036 11.889 0.0028	50.0 22.138 50.0 1.339 20.899	30.0 0.703 30.0 -0.066 0.703	2.00 0.9935 2.00 0.0594 0.9385	30.0 9.237 30.0 2.666 6.770	(wRF) 4.8006		Baro(inHg) Temp(F) Tdew(F) Rhum(*) Ahum(gr/lb) NOX Factor	= =	76.1 48.5 37.8 52.1	Soak Finish = 10:58:05 Elapsed (sec) = 555.7 Times Info Phase Start = 10:58:05 Phase Finish = 11:06:31 Analysis End = 11:19:05 Elapsed (sec) = 506.0 Bag Fill (sec) = 506.0 Bag Anl (sec) = 753.8
Range Sample Range Ambient Net Conc. Modal Corr. Grams/ph.	30.0 20.252 30.0 9.036 11.889 0.0028	50.0 22.138 50.0 1.339 20.899 0.0057	30.0 0.703 30.0 -0.066 0.703 0.0003	2.00 0.9935 2.00 0.0594 0.9385 4.5760	30.0 9.237 30.0 2.666 6.770 0.0015	(WRF) 4.8006 0.0014	(mpg)	Baro(inHg) Temp(F) Tdew(F) Rhum(*) Ahum(gr/lb) NOX Factor		76.1 48.5 37.8 52.1 0.9030	Soak Finish = 10:58:05 Elapsed (sec) = 555.7 Times Info Phase Start = 10:58:05 Phase Finish = 11:06:31 Analysis End = 11:19:05 Elapsed (sec) = 506.0 Bag Fill (sec) = 506.0
	30.0 20.252 30.0 9.036 11.889 0.0028	50.0 22.138 50.0 1.339 20.899 0.0057	30.0 0.703 30.0 -0.066 0.703 0.0003	2.00 0.9935 2.00 0.0594 0.9385 4.5760	30.0 9.237 30.0 2.666 6.770 0.0015	4.8006 0.0014	(mpg)	Baro(inHg) Temp(F) Tdew(F) Rhum(*) Ahum(gr/lb) NOX Factor Vmix(ft3 20 Dilu. Factor	C) =	76.1 48.5 37.8 52.1 0.9030 2748.86 13.4306	Soak Finish = 10:58:05 Elapsed (sec) = 555.7 Times Info Times Info Phase Start = 10:58:05 Phase Finish = 11:06:31 Analysis End = 11:19:05 Elapsed (sec) = 506.0 Bag Fill (sec) = 506.0 Bag Anl (sec) = 753.8 Drv Err (sec) = 0.0
Range Sample Range Ambient Net Conc. Modal Corr. Grams/ph.	30.0 20.252 30.0 9.036 11.889 0.0028	50.0 22.138 50.0 1.339 20.899 0.0057	30.0 0.703 30.0 -0.066 0.703 0.0003	2.00 0.9935 2.00 0.0594 0.9385 4.5760	30.0 9.237 30.0 2.666 6.770 0.0015	4.8006 0.0014 0.2169 0.0605	(mpg)	Baro(inHg) Temp(F) Tdew(F) Rhum(*) Ahum(gr/lb) NOX Factor Vmix(ft3 20 Dilu. Factor	C) =	76.1 48.5 37.8 52.1 0.9030 2748.86 13.4306	Soak Finish = 10:58:05 Elapsed (sec) = 555.7 Times Info Times Info Phase Start = 10:58:05 Phase Finish = 11:06:31 Analysis End = 11:19:05 Elapsed (sec) = 506.0 Bag Fill (sec) = 506.0 Bag Anl (sec) = 753.8 Drv Err (sec) = 0.0
Range Sample Range Ambient Net Conc. Modal Corr. Grams/ph. Grams/mi	30.0 20.252 30.0 9.036 11.889 0.0028	50.0 22.138 50.0 1.339 20.899 0.0057 1.8992 0.5300	30.0 0.703 30.0 -0.066 0.703 0.0003	2.00 0.9935 2.00 0.0594 0.9385 4.5760 1.341.4329 374.3353	30.0 9.237 30.0 2.666 6.770 0.0015 0.3531 0.0985	4.8006 0.0014 0.2169 0.0605	(mpg) 27.1132	Baro(inHg) Temp(F) Tdew(F) Rhum(*) Ahum(gr/lb) NOX Factor Vmix(ft3 20 Dilu. Factor Dist(mi)	C) =	76.1 48.5 37.8 52.1 0.9030 2748.86 13.4306	Soak Finish = 10:58:05 Elapsed (sec) = 555.7 Times Info Times Info Phase Start = 10:58:05 Phase Finish = 11:06:31 Analysis End = 11:19:05 Elapsed (sec) = 506.0 Bag Fill (sec) = 506.0 Bag Anl (sec) = 753.8 Drv Err (sec) = 0.0
Range Sample Range Ambient Net Conc. Modal Corr. Grams/ph. Grams/mi	30.0 20.252 30.0 9.036 11.889 0.0028 0.5365 0.1497	(ppm) 50.0 22.138 50.0 1.339 20.899 0.0057 1.8992 0.5300	30.0 0.703 30.0 -0.066 0.703 0.0003	2.00 0.9935 2.00 0.0594 0.9385 4.5760 1.341.4329 374.3353	30.0 9.237 30.0 2.666 6.770 0.0015 0.3531 0.0985	4.8006 0.0014 0.2169 0.0605	(mpg) 27.1132 FE	Baro(inHg) Temp(F) Tdew(F) Rhum(*) Ahum(gr/lb) NOX Factor Vmix(ft3 20 Dilu. Factor Dist(mi)	C) =	76.1 48.5 37.8 52.1 0.9030 2748.86 13.4306	Soak Finish = 10:58:05 Elapsed (sec) = 555.7 Times Info Times Info Phase Start = 10:58:05 Phase Finish = 11:06:31 Analysis End = 11:19:05 Elapsed (sec) = 506.0 Bag Fill (sec) = 506.0 Bag Anl (sec) = 753.8 Drv Err (sec) = 0.0
Range Sample Range Ambient Net Conc. Modal Corr. Grams/ph. Grams/mi Test Summary	30.0 20.252 30.0 9.036 11.889 0.0028 0.5365 0.1497	(ppm) 50.0 22.138 50.0 1.339 20.899 0.0057 1.8992 0.5300 C0	(ppm) 30.0 0.703 30.0 -0.066 0.703 0.0003 0.0949 0.0265	2.00 0.9935 2.00 0.0594 0.9385 4.5760 1341.4329 374.3353	30.0 9.237 30.0 2.666 6.770 0.0015 0.3531 0.0985	4.8006 0.0014 0.2169 0.0605	(mpg) 27.1132 FE	Baro(inHg) Temp(F) Tdew(F) Rhum(*) Ahum(gr/lb) NOX Factor Vmix(ft3 20 Dilu. Factor Dist(mi) Avg Test	C) = = =	76.1 48.5 37.8 52.1 0.9030 2748.86 13.4306 3.5835	Soak Finish = 10:58:05 Elapsed (sec) = 555.7 Times Info Phase Start = 10:58:05 Phase Finish = 11:06:31 Analysis End = 11:19:05 Elapsed (sec) = 506.0 Bag Fill (sec) = 506.0 Bag Anl (sec) = 753.8 Drv Err (sec) = 0.0
Range Sample Range Ambient Net Conc. Modal Corr. Grams/ph. Grams/mi Test Summary	30.0 20.252 30.0 9.036 11.889 0.0028 0.5365 0.1497 THC	(ppm) 50.0 22.138 50.0 1.339 20.899 0.0057 1.8992 0.5300 CO 0.5977 0.60	30.0 0.703 30.0 -0.066 0.703 0.0003 0.0003	2.00 0.9935 2.00 0.0594 0.9385 4.5760 1.341.4329 374.3353	0.1099 0.110	4.8006 0.0014 0.2169 0.0605	27.1132 FE (mpg)	Baro(inHg) Temp(F) Tdew(F) Rhum(*) Ahum(gr/lb) NOX Factor Vmix(ft3 20 Dilu. Factor Dist(mi) Avg Test	= = = = = = = = = = = = = = = = = = =	76.1 48.5 37.8 52.1 0.9030 2748.86 13.4306 3.5835	Soak Finish = 10:58:05 Elapsed (sec) = 555.7 Times Info Phase Start = 10:58:05 Phase Finish = 11:06:31 Analysis End = 11:19:05 Elapsed (sec) = 506.0 Bag Fill (sec) = 506.0 Bag Anl (sec) = 753.8 Drv Err (sec) = 0.0
Range Sample Range Ambient Net Conc. Modal Corr. Grams/ph. Grams/mi Test Summary	30.0 20.252 30.0 9.036 11.889 0.0028 0.5365 0.1497 THC	0.05977 0.60 7.7109	(ppm) 30.0 0.703 30.0 -0.066 0.703 0.0003 0.0949 0.0265	2.00 0.9935 2.00 0.0594 0.9385 4.5760 1.341.4329 374.3353	30.0 9.237 30.0 2.666 6.770 0.0015 0.3531 0.0985	4.8006 0.0014 0.2169 0.0605	27.1132 FE (mpg)	Baro(inHg) Temp(F) Tdew(F) Rhum(*) Ahum(gr/lb) NOX Factor Vmix(ft3 20 Dilu. Factor Dist(mi) Avg Test	= = = = = = = = = = = = = = = = = = =	76.1 48.5 37.8 52.1 0.9030 2748.86 13.4306 3.5835	Soak Finish = 10:58:05 Elapsed (sec) = 555.7 Times Info Times Info Phase Start = 10:58:05 Phase Finish = 11:06:31 Analysis End = 11:19:05 Elapsed (sec) = 506.0 Bag Fill (sec) = 506.0 Bag Anl (sec) = 753.8 Drv Err (sec) = 0.0
Range Sample Range Ambient Net Conc. Modal Corr. Grams/ph. Grams/mi Test Summary Wtd Results Grams g/mi Grams g/mi Phsl&2 gms Phsl&2 g/mi	30.0 20.252 30.0 9.036 11.889 0.0028 0.5365 0.1497 THC	(ppm) 50.0 22.138 50.0 1.339 20.899 0.0057 1.8992 0.5300 CO 0.5977 0.60 7.7109 1.0357	30.0 0.703 30.0 -0.066 0.703 0.0003 0.00265 NOX	2.00 0.9935 2.00 0.0594 0.9385 4.5760 1.341.4329 374.3353 CO2 416.5142 417 3276.6768 440.1029	30.0 9.237 30.0 2.666 6.770 0.0015 0.3531 0.0985 CH4	4.8006 0.0014 0.2169 0.0605 NM-HC (wRF)	FE (mpg)	Baro(inHg) Temp(F) Tdew(F) Rhum(%) Ahum(gr/lb) NOX Factor Vmix(ft3 20 Dilu. Factor Dist(mi) Avg Test	C) = = = = = = = = = = = = = = = = = = =	76.1 48.5 37.8 52.1 0.9030 2748.86 13.4306 3.5835	Soak Finish = 10:58:05 Elapsed (sec) = 555.7 Times Info Phase Start = 10:58:05 Phase Finish = 11:06:31 Analysis End = 11:19:05 Elapsed (sec) = 506.0 Bag Fill (sec) = 506.0 Bag Anl (sec) = 753.8 Drv Err (sec) = 0.0
Range Sample Range Ambient Net Conc. Modal Corr. Grams/ph. Grams/mi Test Summary	30.0 20.252 30.0 9.036 11.889 0.0028 0.5365 0.1497 THC	0.05977 0.60 7.7109	30.0 0.703 30.0 -0.066 0.703 0.0003 0.0003	2.00 0.9935 2.00 0.0594 0.9385 4.5760 1341.4329 374.3353 CO2 416.5142 417 3276.6768 440.1029 2962.0520	0.1099 0.110 0.9035	4.8006 0.0014 0.2169 0.0605 NM-HC (wRF) 0.0585 0.059 0.5778	FE (mpg)	Baro(inHg) Temp(F) Tdew(F) Rhum(*) Ahum(gr/lb) NOX Factor Vmix(ft3 20 Dilu. Factor Dist(mi) Avg Test Baro(inHg) Temp(F) Tdew(F) Rhum(*)	= = = = = = = = = = = = = = = = = = =	76.1 48.5 37.8 52.1 0.9030 2748.86 13.4306 3.5835	Soak Finish = 10:58:05 Elapsed (sec) = 555.7 Times Info Times Info Phase Start = 10:58:05 Phase Finish = 11:06:31 Analysis End = 11:19:05 Elapsed (sec) = 506.0 Bag Fill (sec) = 506.0 Bag Anl (sec) = 753.8 Drv Err (sec) = 0.0

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CVS Bag report MASS calculated by DF method

Grams To Total (Bags) (gm/mi)

	Bagl	Bag2	Bag3
THC	0.0533	0.0635	0.0412
CO	0.4403	0.0117	0.1457
NOX	0.0337	0.0007	0.0073
NM-HC (wRF)	0.0270	0.0149	0.0166

Legend

^{*} denotes Unstable Reading (wRF) denotes with Response Factor (woRF) denotes without Response Factor

2 violations.

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DATA VALIDATION

PARAMETER DESCRIPTION	VALUE OF PARAMETER	LIMIT OF PARAMETER
Temperature Barometer Dew Point	VALID VALID VALID	68 - 86 (degF) 26.99 - 33.0001 (inHg) -20 - 200 (degF)
Absolute Humidity Crank Time Restart Attempts Shutdown Time	VALID VALID VALID VALID	0 - 150 (gr/1b) 5 (sec) 1 5 (sec)
Pretest Soak Time Phase Length Distance Test Hold Conditions	VALID VALID VALID	12 - 36 (hr) 2 (%) 2 (%)
Test Hold Conditions Leak Check Bag Analysis Time Bag Fill Time	VALID VALID DETAILS BELOW VALID	60 (sec) 1 1800 1200 (sec) 5 (sec)
Ambient Bag Readings	VALID	CO -0155 - 15 (ppm) NOX -0155 - 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)
Bag Read Sequence	VALID	CH4 -0.55 (ppm) 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/\$ Offset 25 (%) Pre-Bag Zero Drift 1 (%) Post-Bag Z/\$ Drift 2 (%) Stabilization Time (T2) 10 (sec) Integration Time (T3) 3 (sec) Stability Time Out (T4) 30 (sec)
Hot Soak Length Analyzer Overscale	VALID VALID	Stability Chk Tolerance 2 (%) 540 - 660 (sec) 10 (sec)
Venturi Inlet Temperature	VALID	32 - 300 (degF)
Bag Analysis Time		
Limit: 1200 (sec)		
Phase Time Status (sec)		
1 1214.31 (over) OK 2 1373.66 (over) OK 3 753.82 (OK)	:mit 1800 not 1000	

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BAG

CH4

(2)

30.0ppm

0.004

0.01

0.02075

27.744 27.678

-0.22

0.06066

PASS

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* Automotive Testing and Development Services, Inc. * Tue 20 April 2021 10:25 Page 1 of BZS BAG Zero/Span Results

* Single Roll Dyno Configuration

Bag Pair 1 Zero/Span Concentrations (Offset Limit = 25.0% ReZero Limit = 1.0%) Samp Gas Range Fullscale 7ero Offset Std Dev Spec Span Offset Std Dev Rezero Drift Std Dev Status BAG LC0 (3)500ppm 0.66 0.13 0.00800 464.28 464.56 0.06 0.02426 0109 0.02 0.00672 PASS 2.00% BAG C02 (2) 0.0018 0.09 0.01510 1.8733 1.8735 0.01 0.04454 0.0005 0.03 0.01008 PASS BAG THC (2) 30.0ppm 0.182 0.61 0.01088 27.975 27.935 -0.130.01470 -0.030 -0.10 0.00978 PASS BAG NOX 30.0ppm (2) 0.569 1.90 0.22782 28.153 27.856 -0.99 0.25703 0.187 0.62 0.18231 PASS BAG CH4 (2) 30.0ppm 0.195 0.65 0.01391 27.744 27.707 -0.12 0.04220 0.007 0.02 0.06707 **PASS** Bag Pair 1 Post Bag Check (Drift Limit = 2.0%) Samp Gas Range Fullscale Zero Drift Std Dev Spec Span Drift Std Dev Status BAG 1.00 (3) 500ppm 0.07 0.01 0.00285 464.28 464.22 -0.01 0.02221 PASS BAG C02 (2) 2.00% 0.0007 0.04 1.8733 1.8751 0.01373 0.09 0.04083 PASS BAG THC -0.016 (2) 30.0ppm -0.05 0.00632 27.975 28.104 0.43 0.02182 PASS BAG NOX (2) 30.0ppm -0.031 -0.10 0.20790 28.153 28.262 0.35182 0.36 PASS BAG CH4 (2) 30.0ppm -0.006 -0.02 0.02169 27.744 27.707 -0.120.04686 PASS 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 RAG LCO 0.333 (1)50.0ppm 0.67 0.05931 47.235 47.307 0.05036 0.14 0.034 0.07 0.08882 PASS BAG C02 (2) 2.00% 0.0025 0.13 0.01024 1.8733 1.8728 -0.02 0.04712 -0.0003 0.00938 -0.02PASS 30.0ppm BAG THC (2) 0.180 0.60 0.00878 27,975 27.935 -0.140.04001 -0.028 -0.09 0.01127 PASS BAG NOX (2) 30.0ppm 0.523 1.74 0.36049 28.153 28.015 -0.46 0.38748 0.001 0.00 0.17931 **PASS** BAG CH4 (1)10.0ppm 0.136 1.36 0.08565 9.219 9.227 0.06316 0.07 -0.010 -0.10 0.07684 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 0.103 0.21 0.04655 47.235 47.245 0.02 0.06152 PASS BAG C02 (2) 2.00% -0.0002 -0.01 0.00628 1.8733 0.04686 1.8747 0.07 PASS BAG THC (2) 30.0ppm -0.010-0.03 0.01443 27.975 27.970 -0.02 0.02876 PASS BAG NOX (2) 30.0ppm 0.056 0.19 0.14021 28.153 28.087 -0.22 0.20234 PASS BAG CH4 10.0ppm -0.007 (1)-0.070.09016 9.219 9.230 0.10 0.05685 PASS Bag Pair 3 Zero/Span Concentrations (Offset Limit = 25.0% ReZero Limit = 1.0%) Samp Gas Range Fullscale Zero Offset Std Dev Offset Spec Span Std Dev Rezero Drift Std Dev Status BAG LC0 (1)50.0ppm 0.324 0.65 0.03061 47.235 47.219 -0.03 0.06881 0.042 0.08 0.05578 PASS BAG C02 2.00% 0.0030 (2) 0.15 0.01304 1.8749 0.08 1.8733 0.04374 0.0000 0.00 0.00870 **PASS** BAG THC (2) 30.0ppm 0.154 0.51 0.00818 27.975 27.834 -0.47 0.04407 -0.013-0.04 0.01267 PASS BAG NOX (2) 30.0ppm 0.660 2.20 0.22337 0.33321 28.153 28.048 -0.35 -0.026 -0.09 0.23491 **PASS** BAG CH4 0.092 30.0ppm 0.01498 0.03488 (2) 0.31 27.744 27.726 -0.06 0.002 0.01 0.03948 **PASS** Bag Pair 3 Post Bag Check (Drift Limit = 2.0%) Samp Gas Range Fullscale Zero Drift Std Dev Std Dev Status Spec Span Drift BAG LC0 (1) 50.0ppm 0.023 0.05 0.05380 47.235 47.252 0.05323 0.03 PASS 0.00881 BAG C02 (2) 2.00% -0.0001 0.00 1.8733 1.8744 0.05 0.05236 PASS BAG THC (2) 30.0ppm 0.003 0.01 0.00833 27.975 28.095 0.40 0.02868 PASS BAG NOX (2) 30.0ppm -0.083 -0.28 0.20572 28.265 28.153 0.37 0.21797 PASS

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* Automotive Testing and Development Services, Inc. * Tue 20 April 2021 10:25 Page 1 of BZS BAG Zero/Span Results * Single Roll Dyno Configuration *

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Bag			Span Concer	ntrations	(Off	set Limit =	= 25.0% Re	Zero Limi	t = 1.0%)				
Sam	p Gas	Range	Fullscale	Zero	Offset	Std Dev	Spec	Span	Offset	Std Dev	Rezero	Drift	Std Dev	Status
BAG		(3)	500ppm	0.66	0.13	0.00800	464.28	464.56	0.06	0.02426	0.09	0.02	0.00672	PASS
BAG	C02	(2)	2.00%	0.0018	0.09	0.01510	1.8733		0.01	0.04454	0.0005	0.02	0.01008	PASS
BAG	THC	(2)	30.0ppm	0.182	0.61	0.01088	27.975		-0.13	0.01470	-0.030	-0.10	0.01008	PASS
BAG	NOX	(2)	30.0ppm	0.569	1.90	0.22782	28.153		-0.99	0.25703	0.187	0.62	0.18231	PASS
BAG	CH4	(2)	30.0ppm	0.195	0.65	0.01391	27.744		-0.12	0.04220	0.007	0.02	0.16231	
								27.707	0.12	0.07220	0.007	0.02	0.00/0/	PASS
			Bag Check	(Drift	t Limit =	2.0%)					1			
Sam	p Gas	Range	Fullscale	Zero	Drift	Std Dev	Spec	Span	Drift	Std Dev	Status			
								•						
BAG		(3)	500ppm	0.07	0.01	0.00285	464.28	464.22	-0.01	0.02221	PASS			
BAG		(2)	2.00%	0.0007	0.04	0.01373	1.8733	1.8751	0.09	0.04083	PASS			
BAG		(2)	30.0ppm	-0.016	-0.05	0.00632	27.975	28.104	0.43	0.02182	PASS			
BAG		(2)	30.0ppm	-0.031	-0.10	0.20790	28.153	28.262	0.36	0.35182	PASS			
BAG	CH4	(2)	30.0ppm	-0.006	-0.02	0.02169	27.744	27.707	-0.12	0.04686	PASS			
Rag	Dain 3	70no/	Span Concen		(066		05 04: 5 =				0.0			
	Gas	Pango	Fullscale	Zero	Offset	set Limit =								
Juni	o dus	Range	Turrscare	Zero	Uliset	Std Dev	Spec	Span	Offset	Std Dev	Rezero	Drift	Std Dev	Status
BAG	LCO	(1)	50.0ppm	0.333	0.67	0.05931	47.235	47.307	0.14	0.05025	0 004	0.07		
BAG	C02	(2)	2.00%	0.0025	0.13	0.01024	1.8733	1.8728	0.14	0.05036	0.034	0.07	0.08882	PASS
BAG	THC	(2)	30.0ppm	0.180	0.60	0.00878	27.975	27.935	-0.14	0.04712 0.04001	-0.0003 -0.028	-0.02	0.00938	PASS
BAG	NOX	(2)	30.0ppm	0.523	1.74	0.36049	28.153	28.015	-0.46	0.38748	0.001	-0.09 0.00	0.01127	PASS
BAG	CH4	(1)	10.0ppm	0.136	1.36	0.08565	9.219	9.227	0.40	0.06316	-0.010	-0.10	0.17931 0.07684	PASS
							31223	J.LL,	0.07	0.00510	-0.010	-0.10	0.07004	PASS
									ĺ.					
_			Bag Check	(Drift	: Limit =	2.0%)								
Samp	Gas	Range	Fullscale	Zero	Drift	Std Dev	Spec	Span	Drift	Std Dev	Status			
240														
BAG	LC0	(1)	50.0ppm	0.103	0.21	0.04655	47.235	47.245	0.02	0.06152	PASS			
BAG	C02	(2)	2.00%	-0.0002	-0.01	0.00628	1.8733	1.8747	0.07	0.04686	PASS			
BAG	THC	(2)	30.0ppm	-0.010	-0.03	0.01443	27.975	27.970	-0.02	0.02876	PASS			
BAG	NOX	(2)	30.0ppm	0.056	0.19	0.14021	28.153	28.087	-0.22	0.20234	PASS			
BAG	CH4	(1)	10.0ppm	-0.007	-0.07	0.09016	9.219	9.230	0.10	0.05685	PASS			
Bag	Pair 3	7ero/9	Span Concen	trations	(Off	set Limit =	25 08 D-7	(2	1 00.					
Samr	Gas	Range	Fullscale	Zero	Offset	Std Dev	Spec					5		
00		Manage	rariscare	2010	011361	Jua Dev	Spec	Span	Offset	Std Dev	Rezero	Drift	Std Dev	Status
BAG	LC0	(1)	50.0ppm	0.324	0.65	0.03061	47.235	47.219	-0.03	0.06881	0.042	0.00	0 05570	DACC
BAG	C02	(2)	2.00%	0.0030	0.15	0.01304	1.8733	1.8749	0.08	0.00001	0.0000	0.08	0.05578	PASS
BAG	THC	(2)	30.0ppm	0.154	0.51	0.00818	27.975	27.834	-0.47	0.04374	-0.013	0.00	0.00870	PASS
BAG	NOX	(2)	30.0ppm	0.660	2.20	0.22337	28.153	28.048	-0.35	0.33321	-0.013	-0.04	0.01267 0.23491	PASS
BAG	CH4	(2)	30.0ppm	0.092	0.31	0.01498	27.744		-0.06	0.03488	0.020	0.01	0.23491	PASS PASS
							2,,,,,	27.720	0.00	0.03400	0.002	0.01	0.03946	PA33
			Bag Check	(Drift	Limit =	2.0%)								
Samp	Gas	Range	Fullscale	Zero	Drift	Std Dev	Spec	Span	Drift	Std Dev	Status			
	,				_	3		·						
BAG	LC0	(1)	50.0ppm	0.023	0.05		47.235	47.252	0.03	0.05323	PASS			
BAG	C02	(2)	2.00%	-0.0001	0.00	0.00881	1.8733		0.05	0.05236	PASS			
BAG	THC	(2)	30.0ppm	0.003	0.01	0.00833	27.975		0.40	0.02868	PASS			
BAG	NOX	(2)	30.0ppm	-0.083	-0.28	0.20572	28.153		0.37	0.21797	PASS			
BAG	CH4	(2)	30.0ppm	0.004	0.01	0.02075	27.744	27.678	-0.22	0.06066	PASS			
												1		