* Automotive Testing and Development Services, Inc. * Wed 17 June 2020 08:43 Page 1 of PRE * Single Roll Dyno Configuration *

= EPA 75

Options = CVS Bag ShowTol Methane MethaneRF

Test Init Start Posttest Completed At Hot Soak Start Time	= 17 June 2020 08:32:37 = 17 June 2020 09:33:15 = 16 June 2020 15:30:00	Test Start Test Finish	= 17 June 2020 08:43:07 = 17 June 2020 09:23:34
Personnel Information;; Driver Requestor	FREDACTED	Operator Supervisor	= REDACTED
Vehicle Information: VIN Vehicle Model Engine Family Ignition Status Automatic Sample Delay	= FCA RAM = ECRXT03.05PV = No = 1	Cert Tracking ID Model Year Eng. Disp. Transmission Idle RPM	= 2964-ECRXT03.05PV-217 = 2014 = 3.0L =
Vehicle Conditions: Soak Start Time:	= JUNE 16, 2020 15:30	Ambient Limit Type	= OTHER7
Test Specifications: TO-Number TestNet Number	= W0110 = 2964	CVS BulkStream Flow :	= 3) 625 scfm
Dynamometer: Inertia Road Load B	= 6000 (1b) = 0.3209	Road Łoad A Road Load C	= 5.75 (1bs) = 0.03152
Fuel Information: Fuel NHV CWF HWF	= DIE-DJ1621HW10 = 18083.00 = 0.8710 = 0.1290	Specific gravity Fuel R-Factor OWF Fuel Calculation Type	= 0.8520 = 0.60 = 0.0000 = Diesel/EPA Calcs
Phase Information: Phase 1 Phase 2 Phase 3	Shift Tables AUTO Con't AUTO		
Response Factors: Bag Methane	= 1.05		
Pre Test Remarks: TEST #1 AS RECEIVED			
Post Test Remarks:			
Non-Critical Information: Begin Odo Test end Odometer Engine performance Transmission	= 99599 = 99610 ≠ No Problem = No Problem	Idle RPM Driveability Brakes Vehicle stalls	= Good = No Problem = None

Phs2&3 gms

Phs2&3 g/mi

0.6356

0.0854

0.2240

0.0301

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SUMMARY REPORT

Test = EPA 75 Test Id = ONT50891 Te Options = CVS Bag ShowTol Methane MethaneRF Test Init Start = 17 June 2020 08:32:37 Fue TestNet Number = 2964

Driver = **REDACTED** Fuel Calculation Type = Diesel/EPA Calcs Idle RPM =

SS calculated by Phase 1 Bag 1	THC (ppmC)	CO (ppm)	NOX (ppm)	CO2 (%)	CH4 (ppmC)	NM-HC (wRF)	FE (mpg)	Inertia = 6000
Range Sample Range Ambient Net Conc.	30.0 14.913 30.0 3.118 11.969	50.0 39.936 50.0 0.859 39.125	30.0 3.313 30.0 0.119 3.201	1.00 0.7405 1.00 0.0504 0.6929	30.0 5.572 30.0 1.876 3.800	7.9902		Inertia Units = 1b Dynamometer will be set manually = Fa
Grams/ph. Grams/mi	0.9009 0.2503	5.9430 1.6509	0.7585 0.2107	1654.6719 459.6474	0.3308 0.0919	0.6014 0.1671	21.9597	Road Load A = 5.75
Phase 2 Bag 2	THC (ppmC)	CO (ppm)	NOX (ppm)	CO2 (%)	CH4 (ppmC)	NM-HC (wRF)	FE (mpg)	Road Load B = 0.3209 Road Load C = 0.03152
Range Sample Range Ambient Net Conc.	10.0 5.884 10.0 3.379 2.615	50.0 0.799 50.0 0.778 0.047	30.0 0.021 30.0 -0.021 0.021	1.00 0.4385 1.00 0.0503 0.3898	10.0 4.442 10.0 2.433 2.088	0.4290		Use Augmented Braking System? = True
Grams/ph. Grams/mi	0.3377 0.0877	0.0123 0.0032	0.0085 0.0022	1596.7019 414.7851	0.3119 0.0810	0.0554 0.0144	24.5036	
Phase 3 Bag 3	THC (ppmC)	CO (ppm)	NOX (ppm)	CO2 (%)	CH4 (ppmC)	NM-HC (wRF)	FE (mpg)	
Range Sample Range Ambient Net Conc.	10.0 7.060 10.0 3.243 3.966	50.0 2.156 50.0 0.796 1.397	30.0 0.475 30.0 -0.058 0.475	1.00 0.6139 1.00 0.0530 0.5634	10.0 5.488 10.0 2.087 3.497	0.3050		
Grams/ph. Grams/mi	0.2979 0.0829	0.2117 0.0589	0.1101 0.0307	1342.4246 373.7506	0.3038 0.0846	0.0229 0.0064	27.1821	
Test Summary	THC	CO	NOX	C02	CH4	NM-HC (wRF)	FE [
Wtd Results Grams g/mi Grams g/mi Phs1&2 gms Phs1&2 g/mi	0.1202 0.120 1.2386 0.1663	0.3609 0.36 5.9554 0.7994	0.0534 0.05 0.7670 0.1030	413 3251.3738	0.0843 0.084 0.6428 0.0863	0.0439 0.044 0.6568 0.0882	24.5825	

0.1186 2939.1265

394.9784

0.0159

0.6157

0.0827

0.0783

0.0105

25.7409

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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	50.0	30.0	1.00	30.0	************		Baro(inHg) = 28.94	Phase Start = 08:43:07
Sample	14.913	39.936	3.313	0.7405	5.572			Temp(F) = 72.8	Phase Finish = 08:51:32
Range	30.0	50.0	30.0	1.00	30.0			Tdew(F) = 53.7	Analysis End = 08:59:05
Ambient	3.118	0.859	0.119	0.0504	1.876			Rhum(%) = 51.3	7.11d 1 3 5 1 5 2 1 d 5 5 1 5 1 5
Net Conc.	11.969	39.125	3.201	0.6929	3.800	7.9902		Ahum(gr/1b) = 63.6	Elapsed (sec) = 505.7
net oone.	11.505	05.1L5	9.201	0.0525	0.000	7.5502		NOX Factor = 0.9493	Bag Fill (sec)= 506.0
Grams/ph.	0.9009	5.9430	0.7585	1654.6719	0.3308	0.6014	21.9597	110X 1 40001	Bag Anl (sec) = 453.1
Grams/mi	0.2503	1.6509	0.2107	459.6474	0.0919	0.1671	21.5557	Vmix(ft3 20 C) = 4608.45	Drv Err (sec) = 0.0
a. a	0.2300	1.0305	0.2107	433.0474	0.0313	0.1071		Dilu. Factor = 17.9641	Crank Time = 0.7
								Dist(mi) = 3.5999	orana rimo
Phase 2 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	1.00	10.0			Baro(inHg) = 28.94	Phase Start = 08:51:32
Sample	5.884	0.799	0.021	0.4385	4.442			Temp(F) $=$ 72.7	Phase Finish = 09:06:02
Range	10.0	50.0	30.0	1.00	10.0			Tdew(F) = 52.9	Analysis End = 09:12:05
Ambient	3.379	0.778	-0.021	0.0503	2.433			Rhum(%) = 49.8	
Net Conc.	2.615	0.047	0.021	0.3898	2.088	0.4290		Ahum(gr/lb) = 61,6	Elapsed (sec) = 869.6
								NOX Factor = 0.9407	Bag Fill (sec)= 870.0
Grams/ph.	0.3377	0.0123	0.0085	1596.7019	0.3119	0.0554	24.5036		Bag Anl (sec) = 363.6
Grams/mi	0.0877	0.0032	0.0022	414.7851	0.0810	0.0144		Vmix(ft3 20 C) = 7905.63	Drv Err (sec) = 0.0
								Dilu. Factor = 30.5170	Stop Time = 0.7
								Dist(mi) = 3.8495	Soak Start = 09:06:02
									Soak Finish = $09:15:09$ Elapsed (sec) = 546.8
Phase 3 Bag 3	THC (ppmC)	CO (ppm)	NOX (ppm)	CO2 (%)	CH4 (ppmC)	NM-HC (wRF)	FE (mpg)	Test Info	Times Info
	******	********	36043066	**********	*********	*******	*******	***************************************	21.22.22.22.22.22.22.22.22.22.2
Range	10.0	50.0	30.0	1.00	10.0			Baro(inHg) = 28.94	Phase Start = 09:15:09
Sample	7.060	2.156	0.475	0.6139	5.488			Temp(F) = 72.7	Phase Finish = 09:23:34
Range	10.0	50.0	30.0	1.00	10.0			Tdew(F) = 51.8 $Rhum(X) = 48.1$	Analysis End $= 09:29:27$
Ambient	3.243	0.796	-0.058	0.0530	2.087	0.3050		Titlam(11)	Elapsed (sec) = 505.9
Net Conc.	3.966	1.397	0.475	0.5634	3.497	0.3050			Bag Fill (sec) = 506.0
0	0.0070	0.2117	0 1101	1342.4246	0.3038	0.0229	27.1821	NOX Factor $= 0.9311$	Bag Anl (sec) = 353.1
Grams/ph.	0.2979	0.2117	0.1101	373.7506	0.0846	0.0229	27.1021	Vmix(ft3 20 C) = 4598.30	Drv Err (sec) = 0.0
Grams/mi	0.0829	0.0569	0.0307	3/3./500	0.0040	0,0004		Dilu. Factor = 21.7949	Crank Time = 0.9
								Dist(mi) = 3.5918	Grank Time - 015
Took Cumpa	TUC	CO	NOX	C02	CH4	NM-HC	FE	Avg Test Info	
Test Summary	THC				UП4 	(wRF)	(mpg)	Avy rest fillo	
Wtd Results			0.050	440.0175	0.0040	0.0400		Baro(inHg) = 28.94	

Test Summary	THC	CO	NOX	C02	CH4	NM-HC (wRF)	FE (mpg)	Avg Test	Info	
Wtd Results	**********							Baro(inHg)	#	28.94
Grams g/mi	0.1202	0.3609	0.0534	412.8175	0.0843	0.0439	24.5825	Temp(F)	=	72.7
Grams g/mi	0.120	0.36	0.05	413	0.084	0.044		Tdew(F)	=	52.8
Phs1&2 gms	1.2386	5.9554	0.7670	3251.3738	0.6428	0.6568	1	Rhum(%)	=	49.8
Phs1&2 g/mi	0.1663	0.7994	0.1030	436.4647	0.0863	0.0882	23.2440	Ahum(gr/lb)	= 1	61.5
Phs2&3 gms	0.6356	0.2240	0.1186	2939.1265	0.6157	0.0783	(1	NOX Factor	22	0.9404
Phs2&3 g/mi	0.0854	0.0301	0.0159	394.9784	0.0827	0.0105	25.7409			

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CVS Bag report MASS calculated by DF method

Grams To Total (Bags) (gm/mi)

*********		******		•
	Bag1	Bag2	Bag3	
		******	****	
THC	0.0520	0.0454	0.0228	
CO	0.3430	0.0017	0.0162	
NOX	0.0438	0.0011	0.0084	
NM-HC (wRF)	0.0347	0.0074	0.0018	

Legend

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

* Automotive Testing and Development Services, Inc. * Wed 17 June 2020 08:43 Page 1 of VAL * Single Roll Dyno Configuration *

DATA VALIDATION

PARAMETER DESCRIPTION	VALUE OF PARAMETER	LIMIT OF PARAMETER
Temperature	VALID	68 - 86 (degF)
Barometer	VALID	26.99 - 33.0001 (inHq)
Dew Point	VALID	-20 - 200 (degF)
Absolute Humidity	VALID	0 - 150 (gr/lb)
Crank Time	VALID	5 (sec)
Restart Attempts	VALID	1
Shutdown Time	VALID	5 (sec)
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	1 1200 (sec)
Bag Fill Time	VALID	
Ambient Bag Readings	VALID	5 (sec)
Allibretic bag Readitigs	VALID	THC -0.55 - 10 (ppm)
		CO -0.55 - 15 (ppm)
		NOX -0.55 - 2 (ppm)
		CO2 350 - 850 (ppm)
0 1 0 0 1		CH4 -0.55 10 (ppm)
Sample Bag Readings	VALID	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 (%)
Hot Soak Length	VALID	540 - 660 (sec)
Analyzer Overscale	VALID	10 (sec)
Venturi Inlet Temperature	VALID	32 - 300 (degF)
ventual i attroc remperature	MILLO	22 000 (degi)

ID: ONT50891 EPA 75 TEST

Printed on: Wed 17 June 2020 09:34

* Automotive Testing and Development Services, Inc. * Wed 17 June 2020 08:43 Page 1 of BZS BAG Zero/Span Results * Single Roll Dyno Configuration *

			Span Concen	trations	(Off	set Limit =	25.0% Rez	Zero Lim	it = 1.0%)				
Samp	Gas	Range	Fullscale	Zero	0ffset	Std Dev	Spec	Span	Offset	Std Dev	Rezero	Drift	Std Dev	Status
BAG BAG	LCO CO2	(1) (1)	50.0ppm 1.00%	0.448	0.90 0.42	0.05059 0.02016	46.352 0.9303	46.347 0.9304	0.01	0.02253 0.06042	-0.010 -0.0002	-0.02	0.02071	PASS
BAG	THC	(2)	30.0ppm	0.0042	0.42	0.02016	28.130	28.298	0.56	0.00042	-0.0002	-0.02 -0.18	0.01478 0.01526	PASS PASS
BAG	NOX	(2)	30.0ppm	0.054	0.18	0.30376	28.000	28.318	1.06	0.23129	0.062	0.21	0.21341	PASS
BAG	CH4	(2)	30.0ppm	-0.024	-0.08	0.11431	27.600	28.079	1.60	0.01935	0.022	0,,07	0.07428	PASS
Bag F	Pair 1	Post	Bag Check	(Drift	: Limit =	2 በ% ነ								
_			Fullscale	Zero	Drift	Std Dev	Spec	Span	Drift	Std Dev	Status			
BAG	LC0	(1)	50.0ppm	0.054	0.11	0.06234	46.352	46.493	0.28	0.03457	PASS			
BAG	CO2	(1)	1.00%	-0.0002	-0.02	0.00939	0.9303	0.9310	0.08	0.03817	PASS			
BAG BAG	THC	(2) (2)	30.0ppm 30.0ppm	0.074 0.063	0.25 0.21	0.00684 0.41824	28.130 28.000	27.800 27.833	-1.10 -0.56	0.01036 0.32120	PASS PASS			
BAG	CH4	(2)	30.0ppm	-0.076	-0.25	0.29230	27.600	27.029	-1.90	0.04225	PASS			
Bag f Samp			Span Concen [.] Fullscale	trations Zero	(Off. Offset	set Limit =				•	D	D-4 64	C+4 D	Chahara
·		_				Std Dev	Spec	Span	0ffset	Std Dev	Rezero	Drift	Std Dev	Status
BAG BAG	LCO CO2	(1) (1)	50.0ppm 1.00%	0.413	0.83 0.39	0.05008 0.01809	46.352 0.9303	46.542	0.38 -0.03	0.11482	0.107	0.21	0.05676	PASS
BAG	THC	(1)	10.0ppm	0.060	0.60	0.01503	9.382	9.382	0.00	0.04740 0.03116	-0.0001 0.011	-0.01 0.11	0.01831 0.02647	PASS PASS
BAG	NOX	(2)	30.0ppm	0.151	0.50	0.11152	28.000	28.036	0.12	0.25859	-0.067	-0.22	0.28848	PASS
BAG	CH4	(1)	10.0ppm	0.037	0.37	0.52540	9.368	9.373	0.05	0.11103	-0.003	-0.03	0.13277	PASS
Bag F	Pair 2	Post I	Bag Check	(Drift	Limit =	2 0%)								
			Fullscale	Zero	Drift	Std Dev	Spec	Span	Drift	Std Dev	Status			
BAG	LCO	(1)	50.0ppm	0.049	0.10	0.07584	46.352	46.326	-0.05	0.06108	PASS			
BAG	C02	(1)	1.00%	0.0006	0.06	0.01683	0.9303	0.9326	0.24	0.04406	PASS			
BAG BAG	THC	(1) (2)	10.0ppm 30.0ppm	0.037 -0.102	0.37 -0.34	0.05089	9.382	9.464	0.82	0.02680	PASS			
BAG	CH4	(1)	10.0ppm	0.090	0.90	0.20314 0.24513	28.000 9.368	27.810 9.251	-0.63 -1.18	0.22603 0.07877	PASS PASS			
_			Span Concent			set Limit =								
Samp	Gas	Range	Fullscale	Zero	Offset	Std Dev	Spec	Span	Offset	Std Dev	Rezero	Drift	Std Dev	Status
BAG	LCO	(1)	50.0ppm	0.362	0.72	0.06258	46.352		0.27	0.05600	0.022	0.04	0.05644	PASS
BAG BAG	CQ2 THC	(1)	1.00%	0.0040	0.40	0.01802	0.9303	0.9297	-0.05	0.03935	0.0000	0.00	0.01277	PASS
BAG	NOX	(1) (2)	10.Оррт 30.Оррт	0.175	0.94 0.58	0.01983 0.12123	9.382 28.000	9.380 28.108	-0.03 0.36	0.14510 0.10920	-0.040 -0.053	-0.40 -0.18	0.02221 0.36119	PASS PASS
BAG	CH4	(1)	10.0ppm	0.194	1.94	0.16642	9.368	9.370	0.02	0.08692	0.027	0.27	0.32738	PASS
n -		D	- Ol 1	/ B + 5:		0.0%								
Bag F Samp			Bag Check Fullscale	(Drift Zero	Limit = Drift		Spec	Span	Drift	Std Dev	Status			
Samp	Gas	Range	Fullscale	Zero	Drift	Std Dev	Spec	Span	Drift -0-15	Std Dev				
Samp BAG	Gas LCO	Range (1)	Fullscale 50.0ppm	Zero 0.126	Drift 0.25	Std Dev 0.06406	46.352	46.275	-0.15	0.03473	PASS			
Samp BAG BAG BAG	Gas	Range	Fullscale	Zero 0.126 0.0004 -0.002	Drift 0.25 0.04 -0.02	Std Dev	,							
Samp BAG BAG	Gas LCO CO2	(1) (1)	Fullscale 50.0ppm 1.00%	Zero 0.126 0.0004	Drift 0.25 0.04	Std Dev 0.06406 0.01126	46.352 0.9303	46.275 0.9335 9.392	-0.15 0.32	0.03473 0.04483	PASS PASS			