



Team Results for Clean Snowmobile Challenge 2013 Team 3



2012 Clean Snowmobile Competition - Lab Emission Event Emission Data Sheet

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Test Date       : 2013/03/09 09:17:58
Team Name      : Platteville
Team Number    : 3
Model         : Rotax
Engine        : DI-ETEC
Displacement[cc] : 600.00
100% Speed    : 7800
100% Torque   : 69.1
No of Strokes : 2
Fuel          : GASOLINE           H/C: 2.50       O/C: 0.28
  
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ModeNum	:	1	2	3	4	5
Weighting	:	0.12	0.27	0.25	0.31	0.05
Power kW	:	49.6	25.0	13.7	8.6	0.0
HC_m g/hr	:	3254.80	5.85	44.42	323.55	29.30
CO_m g/hr	:	24296.02	160.53	288.28	2160.25	11.42
NOx_m g/hr	:	38.43	93.36	20.07	6.55	0.54
Soot_m mg/hr	:	121.99	41.24	48.07	32.07	9.86
N2O_m mg/hr	:	0.00	0.08	0.00	0.00	0.00
CO2_m g/hr	:	45032.91	29723.06	18354.20	14080.27	3428.96
CH4_m g/hr	:	783.21	2.81	16.69	66.30	7.95
W_HC g/hr	:	390.58	1.58	11.11	100.30	1.46
W_CO g/hr	:	2915.52	43.34	72.07	669.68	0.57
W_NOx g/hr	:	4.61	25.21	5.02	2.03	0.03
W_HCNOx g/hr	:	395.19	26.79	16.12	102.33	1.49
W_Soot mg/hr	:	14.64	11.14	12.02	9.94	0.49
W_N2O g/hr	:	0.00	0.02	0.00	0.00	0.00
W_CO2 g/hr	:	5403.95	8025.23	4588.55	4364.88	171.45
W_CH4 g/hr	:	93.99	0.76	4.17	20.55	0.40

Total Weighted Power [kW] 18.797

Weighted Emissions

	HC	CO	NOx	HC+NOx
Total Mass [g/hr]	505.03	3701.18	36.89	541.92
Specific Mass [g/kW-hr]	26.87	196.90	1.96	28.83
BSFC [g/kW-hr]	515.4			

Total Soot [mg/hr] 48.23 Specific Soot [mg/kW-hr] 2.57

Not Used for Competition

Total N2O [mg/hr]	0.02	Specific N2O [mg/kW-hr]	0.00
Total CO2 [g/hr]	22554.06	Specific CO2 [g/kW-hr]	1199.86
Total CH4 [g/hr]	119.87	Specific CH4 [g/kW-hr]	6.38

EMISSION TESTS:

	Value	Limit	Result
Power	56.48	<96.94 kW	PASS
Soot	2.57	<100 mg/kW-hr	PASS
CO	196.90	<275 g/kW-hr	PASS
HC + NOX	28.83	<90 g/kW-hr	PASS
E-Score	141.56	>100	PASS
Valid Data for All 5 Modes			PASS

LAB EMISSION TEST PASS



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Modal Raw Data : Engine / Environmental

ModeNum		1	2	3	4	5
Total Points	points	600	1200	1200	1200	1200
PtsInMode	points	1200	1800	1800	1800	1800
Speed	rpm	7798.40	6630.33	5849.92	5064.84	1915.69
Torque	Nm	60.71	36.03	22.41	16.18	0.00
Power	kW	49.58	25.02	13.73	8.58	0.00
BSFC	g/kw-hr	619.97	395.96	455.69	710.23	**
Fuel	g/hr	30737.33	9906.37	6256.23	6095.19	1167.77
T_int	degC	14.07	12.73	12.57	13.47	13.28
RelHumid	%	23.10	24.59	25.13	24.30	24.28
Baro	in Hg	28.97	28.97	28.97	28.97	28.97
Baro	mmHg	735.74	735.73	735.74	735.89	735.91
Pvap_kPa	kPa	0.33	0.32	0.33	0.33	0.33
Pvap_inHg	inHg	0.10	0.10	0.10	0.10	0.10
AbsHumidity	grains/lb	14.65	14.45	14.63	14.89	14.72
SatPres	kPa	97.76	97.76	97.76	97.78	97.78
Hum Factor		1.00	1.00	1.00	1.00	1.00
F_fac		0.99	0.98	0.98	0.99	0.98
K_fac		1.01	1.01	1.01	1.01	1.01
Humidity	g/kg	2.09	2.06	2.09	2.13	2.10
H2		3.66	0.04	0.12	1.17	0.02
WetDry Factor		0.83	0.85	0.85	0.84	0.90



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Modal Emissions Concentrations

ModeNum		1	2	3	4	5
THC	ppmC1	15719.76	71.99	849.88	7066.44	2094.89
CO	%	6.09	0.10	0.29	2.45	0.04
N2O	ppm	0.00	3.30	0.05	0.01	0.54
CH4	ppm	3436.60	31.37	290.01	1315.54	516.68
CO2	%	7.18	12.08	11.60	10.16	8.10
O2	%	0.21	0.77	1.31	0.63	7.48
CNOx	ppm	58.65	362.98	121.29	45.20	12.19
AHC	ppm	70.41	0.00	3.07	47.47	1.34
C2H2	ppm	26.10	1.81	4.45	33.99	2.04
C2H4	ppm	2983.14	4.54	88.31	956.53	74.67
C3H6	ppm	238.82	0.12	13.67	154.43	13.58
C4H6	ppm	8.60	0.06	1.51	24.63	0.92
ETOH	ppm	123.16	3.47	26.73	238.44	130.87
H2O	%	17.03	15.43	14.98	16.16	10.40
HCHO	ppm	364.61	2.18	46.10	110.80	89.00
HCN	ppm	10.72	1.13	1.21	1.75	0.39
HNCO	ppm	14.56	1.31	1.69	1.97	0.16
MECHO	ppm	444.33	0.46	30.13	193.17	140.42
NC5	ppm	0.93	1.70	11.00	54.34	130.60
NH3	ppm	11.18	0.53	0.87	4.40	0.01
NO	ppm	58.04	359.08	110.00	42.89	6.70
NO2	ppm	0.61	4.70	11.28	2.32	5.50
Soot	mg/m3	0.40	0.29	0.54	0.43	0.41
AFR	:1	5.98	11.25	11.27	8.61	16.19



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Measurement Accuracy (SAE paper 961804)

	H2_XLS %	ModalHC_Dry %	ModalFTIR_H2O %	N2 %	Ar %	AFR :1	Tr_Eff -
1	4.414	1.895	17.029	78.492	0.907	10.952	0.989
2	0.051	0.009	15.429	85.508	0.988	15.978	0.961
3	0.143	0.100	14.980	85.008	0.983	16.214	0.934
4	1.401	0.843	16.165	83.361	0.964	13.826	0.968
5	0.020	0.234	10.401	84.117	0.972	23.514	0.629

	ModalWHC %	ModalC1 %	ModalC8 %	ModalSUM_HC %	ModalT_Emiss %	ModalError %
	3254.798	1.699	0.212	1.911	101.983	1.983
	5.850	-0.549	-0.069	-0.618	101.282	1.282
	44.424	-0.835	-0.104	-0.939	100.731	0.731
	323.548	0.335	0.042	0.376	101.891	1.891
	29.297	-3.227	-0.403	-3.631	98.914	1.086

Power Run

Team 3

TeamNumber	3
TeamName	Platteville
Model	Rotax
Engine	DI-EETEC

Displacement cc	600.00
RatedSpeed	7800
RatedTorque	69.1

