



Team Results for Clean Snowmobile Challenge 2011

2011 Clean Snowmobile Competition - Lab Emission Event Emission Data Sheet

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Test Date      :
Team Name     : Univ of Wisconsin - Platteville
Team Number   : 7
Model        : UW-P
Engine       : UW-P
Displacement[cc] : 600cc
100% Speed   : 7950
100% Torque  : 92.0
No of Strokes : 2
Fuel         : Gasoline           H/C: 1.92       O/C: 0.10
  
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ModeNum	:	1	2	3	4	5
Weighting	:	0.12	0.27	0.25	0.31	0.05
Power kW	:	73.4	32.5	19.8	8.7	0.0
HC_m g/hr	:	1639.68	52.67	58.50	234.72	0.65
CO_m g/hr	:	56731.06	3778.66	2859.05	7577.88	0.64
NOx_m g/hr	:	11.46	5.29	1.13	0.06	1.15
Soot_m mg/hr	:	0.00	0.00	0.00	0.00	0.00
N2O_m mg/hr	:	0.20	0.01	0.01	0.02	0.00
CO2_m g/hr	:	76289.55	48340.79	31160.70	14383.33	2687.40
CH4_m g/hr	:	592.58	33.60	27.91	113.10	0.34
W_HC g/hr	:	196.76	14.22	14.63	72.76	0.03
W_CO g/hr	:	6807.73	1020.24	714.76	2349.14	0.03
W_NOx g/hr	:	1.37	1.43	0.28	0.02	0.06
W_HCNOx g/hr	:	198.14	15.65	14.91	72.78	0.09
W_Soot mg/hr	:	0.00	0.00	0.00	0.00	0.00
W_N2O g/hr	:	0.02	0.00	0.00	0.01	0.00
W_CO2 g/hr	:	9154.75	13052.01	7790.18	4458.83	134.37
W_CH4 g/hr	:	71.11	9.07	6.98	35.06	0.02

Total Weighted Power [kW] 25.235

Weighted Emissions

	HC	CO	NOx	HC+NOx
Total Mass [g/hr]	298.40	10891.90	3.16	301.56
Specific Mass [g/kW-hr]	11.83	431.62	0.13	11.95
BSFC [g/kW-hr]	681.0			

Total Soot [mg/hr] 0.00 Specific Soot [mg/kW-hr] 0.00

Not Used for Competition

Total N2O [mg/hr]	0.03	Specific N2O [mg/kW-hr]	0.00
Total CO2 [g/hr]	34590.14	Specific CO2 [g/kW-hr]	1370.74
Total CH4 [g/hr]	122.24	Specific CH4 [g/kW-hr]	4.84

EMISSION TESTS:

	Value	Limit	Result
Power	76.59	<96.94 kW	PASS
Soot	0.00	<100 mg/kW-hr	PASS
CO	431.62	<275 g/kW-hr	FAIL
HC + NOX	11.95	<90 g/kW-hr	PASS
E-Score	94.13	>100	FAIL
Valid Data for All 5 Modes			PASS

LAB EMISSION TEST FAIL



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Modal Raw Data : Engine / Environmental

ModeNum		1	2	3	4	5
Total Points	points	455	1101	1198	1206	1206
PtsInMode	points	456	1116	1201	1206	1206
Speed	rpm	7940.12	6751.50	5952.19	5180.57	1205.42
Torque	Nm	88.30	45.96	31.84	15.99	0.00
Power	kW	73.42	32.50	19.85	8.67	0.00
BSFC	g/kw-hr	736.45	530.98	572.28	987.86	**
Fuel	g/hr	54069.47	17255.32	11358.21	8566.94	852.70
T_int	degC	13.55	15.06	13.57	13.25	12.37
RelHumid	%	28.00	25.46	25.68	25.63	28.10
Baro	in Hg	28.71	28.71	28.70	28.71	28.70
Baro	mmHg	729.19	729.34	729.04	729.13	729.07
Pvap kPa	kPa	0.39	0.38	0.36	0.35	0.36
Pvap inHg	inHg	0.11	0.11	0.11	0.10	0.11
AbsHumidity	grains/lb	17.41	17.25	15.98	15.66	16.32
SatPres	kPa	96.83	96.85	96.84	96.86	96.84
Hum Factor		1.00	1.00	1.00	1.00	1.00
F_fac		1.00	1.00	1.00	0.99	0.99
K_fac		1.02	1.02	1.02	1.02	1.01
Humidity	g/kg	2.49	2.46	2.28	2.24	2.33
H2		4.21	0.52	0.60	3.24	0.00
WetDry Factor		0.86	0.86	0.86	0.87	0.94



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Modal Emissions Concentrations

ModeNum		1	2	3	4	5
THC	ppmC1	4890.34	421.81	710.66	4394.98	40.87
CO	%	8.43	1.51	1.73	7.07	0.00
N2O	ppm	1.88	0.18	0.24	1.39	0.56
CH4	ppm	1540.75	234.57	295.60	1846.18	18.51
CO2	%	7.21	12.27	12.00	8.54	5.39
O2	%	0.04	0.00	0.00	0.03	12.44
CNOx	ppm	10.36	12.85	4.15	0.35	21.97
AHC	ppm	192.71	10.01	16.50	103.31	0.17
C2H2	ppm	16.25	1.25	1.08	3.05	0.26
C2H4	ppm	408.73	15.34	23.46	207.60	2.08
C3H6	ppm	103.20	2.85	10.48	68.63	0.46
C4H6	ppm	16.33	2.58	3.06	8.37	0.12
ETOH	ppm	25.41	2.70	4.58	9.11	1.25
H2O	%	13.84	13.63	14.34	13.16	5.56
HCHO	ppm	22.82	4.34	1.69	3.62	3.30
HCN	ppm	16.12	1.69	1.63	1.63	0.07
HNCO	ppm	11.54	3.92	3.63	24.73	2.35
MECHO	ppm	48.19	1.41	3.86	23.10	0.02
NC5	ppm	17.67	4.97	25.04	113.69	1.88
NH3	ppm	77.46	25.05	31.01	35.07	0.98
NO	ppm	10.02	12.67	4.01	0.12	19.83
NO2	ppm	0.33	0.19	0.18	0.31	2.14
Soot	mg/m3	0.00	0.00	0.00	0.00	0.00
AFR	:1	8.57	12.07	11.90	9.22	33.37



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Measurement Accuracy (SAE paper 961804)

H2_XLS %	ModalHC_Dry %	ModalFTIR_H2O %	N2 %	Ar %	AFR :1	Tr_Eff -
4.889	0.568	13.838	75.234	0.870	10.485	0.998
0.603	0.049	13.626	81.435	0.941	13.897	1.000
0.706	0.083	14.345	82.542	0.954	13.759	1.000
3.734	0.506	13.158	76.314	0.882	11.198	0.998
0.001	0.004	5.558	80.569	0.931	37.453	0.392

ModalWHC %	ModalC1 %	ModalC8 %	ModalSUM_HC %	ModalT_Emiss %	ModalError %
1639.681	0.529	0.066	0.595	99.783	0.217
52.671	0.049	0.006	0.055	98.986	1.014
58.501	0.083	0.010	0.093	100.322	0.322
234.715	0.474	0.059	0.534	99.468	0.532
0.646	-3.468	-0.434	-3.902	96.481	3.519

Power Run

TeamNumber	7
TeamName	Univ of Wisconsin - Platteville
Model	UW-P
Engine	UW-P

Displacement cc	600cc
RatedSpeed	7950
RatedTorque	92.0

