

Team Results for Clean Snowmobile Challenge 2012

2012 Clean Snowmobile Competition - Lab Emission Event Emission Data Sheet

Test Date : 2012/03/09 15:15:43
 Team Name : Bucky Madison
 Team Number : 2
 Model : Polaris
 Engine : Rush
 Displacement[cc] : 750cc
 100% Speed [rpm] : 6499
 100% Torque [Nm] : 98.7
 No of Strokes : 4
 Fuel : Gasoline H/C: 2.09 O/C: 0.13

ModeNum	:	1	2	3	4	5
Weighting	:	0.12	0.27	0.25	0.31	0.05
Power kW	:	65.3	31.1	19.3	8.4	0.0
HC_m g/hr	:	5.15	1.78	1.22	1.30	0.15
CO_m g/hr	:	643.49	295.81	150.81	114.41	7.62
NOx_m g/hr	:	65.94	10.13	3.97	3.24	0.10
Soot_m mg/hr	:	77.18	9.11	2.67	3.61	0.13
N2O_m mg/hr	:	0.04	0.02	0.01	0.01	0.00
CO2_m g/hr	:	65730.23	36157.85	19626.11	12015.90	1094.81
CH4_m g/hr	:	2.12	1.49	1.07	1.01	0.11
W_HC g/hr	:	0.62	0.48	0.30	0.40	0.01
W_CO g/hr	:	77.22	79.87	37.70	35.47	0.38
W_NOx g/hr	:	7.91	2.74	0.99	1.01	0.01
W_HCNOx g/hr	:	8.53	3.22	1.30	1.41	0.01
W_Soot mg/hr	:	9.26	2.46	0.67	1.12	0.01
W_N2O g/hr	:	0.01	0.01	0.00	0.00	0.00
W_CO2 g/hr	:	7887.63	9762.62	4906.53	3724.93	54.74
W_CH4 g/hr	:	0.25	0.40	0.27	0.31	0.01

Total Weighted Power [kW] 23.651

Weighted Emissions

	HC	CO	NOx	HC+NOx
Total Mass [g/hr]	1.81	230.64	12.65	14.47
Specific Mass [g/kW-hr]	0.08	9.75	0.53	0.61
BSFC [g/kW-hr]	369.0			

Total Soot [mg/hr] 13.52 Specific Soot [mg/kW-hr] 0.57

Not Used for Competition

Total N2O [mg/hr]	0.02	Specific N2O [mg/kW-hr]	0.00
Total CO2 [g/hr]	26336.44	Specific CO2 [g/kW-hr]	1113.55
Total CH4 [g/hr]	1.24	Specific CH4 [g/kW-hr]	0.05

EMISSION TESTS:

	Value	Limit	Result
Power	67.15	<96.94 kW	PASS
Soot	0.57	<100 mg/kW-hr	PASS
CO	9.75	<275 g/kW-hr	PASS
HC + NOX	0.61	<90 g/kW-hr	PASS
E-Score	207.15	>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	593	1194	1200	1200	1153
PtsInMode	points	593	1194	1200	1200	1194
Speed	rpm	6496.88	5997.03	4812.13	4223.30	2021.61
Torque	Nm	95.99	49.58	38.21	18.91	0.00
Power	kW	65.31	31.14	19.26	8.37	0.00
BSFC	g/kw-hr	327.85	377.32	330.90	467.76	**
Fuel	g/hr	21411.66	11748.07	6372.07	3912.92	355.13
T_int	degC	12.61	13.38	11.85	12.13	12.29
RelHumid	%	23.10	17.91	18.19	17.83	18.12
Baro	in Hg	29.33	29.33	29.32	29.32	29.32
Baro	mmHg	744.98	744.92	744.78	744.81	744.76
Pvap_kPa	kPa	0.30	0.24	0.23	0.23	0.23
Pvap_inHg	inHg	0.09	0.07	0.07	0.07	0.07
AbsHumidity	grains/lb	13.30	10.78	10.02	9.99	10.24
SatPres	kPa	99.02	99.07	99.07	99.07	99.06
Hum Factor		0.78	0.77	0.77	0.77	0.77
F_fac		0.97	0.97	0.97	0.97	0.97
K_fac		0.99	0.99	0.99	0.99	0.99
Humidity	g/kg	1.90	1.54	1.43	1.43	1.46
H2		0.07	0.06	0.05	0.07	0.05
WetDry Factor		0.86	0.86	0.86	0.86	0.87

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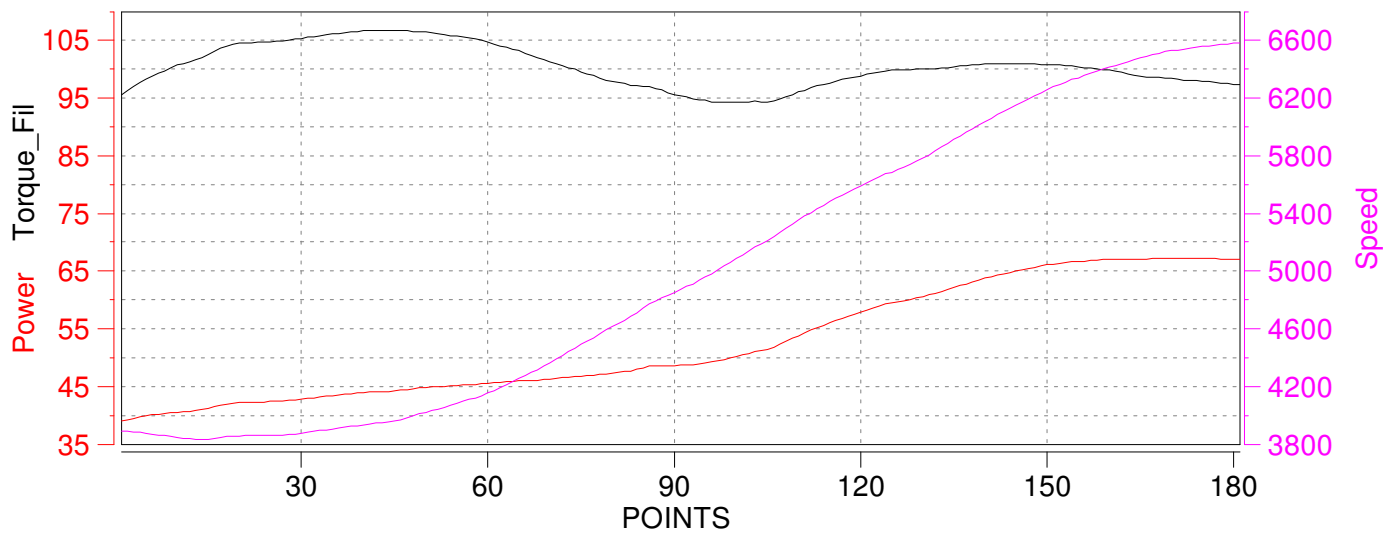
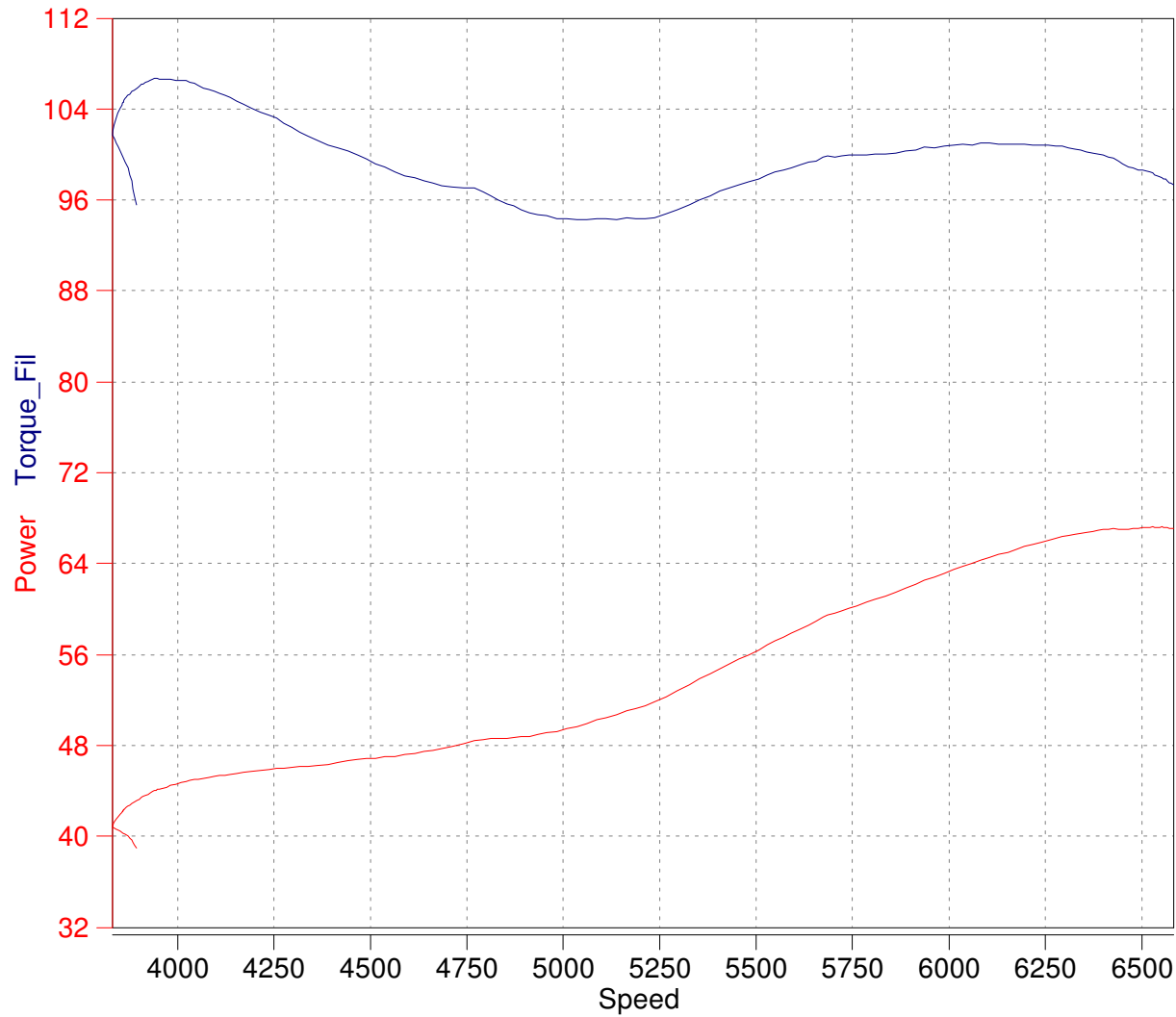
Modal Emissions Concentrations

ModeNum		1	2	3	4	5
THC	ppmC1	31.69	19.95	25.07	43.68	52.43
CO	%	0.20	0.17	0.16	0.19	0.14
N2O	ppm	0.84	0.70	0.67	0.74	0.71
CH4	ppm	11.49	14.73	19.55	29.97	35.15
CO2	%	12.96	12.99	12.98	12.94	12.60
O2	%	0.18	0.15	0.14	0.23	0.83
CNOx	ppm	124.38	34.82	25.12	33.40	11.50
AHC	ppm	0.44	0.00	0.00	0.00	0.04
C2H2	ppm	0.68	0.46	0.38	0.39	0.45
C2H4	ppm	1.37	0.43	0.75	1.54	1.24
C3H6	ppm	0.03	0.20	0.16	0.10	0.26
C4H6	ppm	3.50	3.66	4.18	5.92	2.94
ETOH	ppm	4.28	5.17	6.14	7.33	5.08
H2O	%	13.87	13.73	13.81	13.81	13.43
HCHO	ppm	0.23	0.07	0.15	0.12	0.12
HCN	ppm	1.41	0.63	0.52	0.38	0.39
HNCO	ppm	3.45	2.39	3.69	5.81	1.09
MECHO	ppm	0.44	0.26	0.26	0.25	0.34
NC5	ppm	0.85	0.59	0.45	0.50	0.77
NH3	ppm	65.01	96.16	130.43	197.39	85.85
NO	ppm	160.60	46.07	32.78	43.32	14.98
NO2	ppm	0.01	0.05	0.09	0.24	0.07
Soot	mg/m3	0.27	0.06	0.03	0.07	0.03
AFR	:1	12.47	12.46	12.46	12.50	12.92

Power Run

TeamNumber	2
TeamName	Bucky Madison
Model	Polaris
Engine	Rush

Displacement cc	750cc
RatedSpeed	6499
RatedTorque	98.7



Measurement Accuracy (SAE paper 961804)

H2_XLS %	ModalHC_Dry %	ModalFTIR_H2O %	N2 %	Ar %	AFR :1	Tr_Eff -
0.081	0.004	13.868	83.007	0.959	14.912	0.991
0.068	0.002	13.733	82.576	0.955	14.906	0.992
0.064	0.003	13.812	82.675	0.956	14.903	0.993
0.079	0.005	13.809	82.961	0.959	14.949	0.988
0.056	0.006	13.431	83.006	0.959	15.435	0.958

ModalWHC %	ModalC1 %	ModalC8 %	ModalSUM_HC %	ModalT_Emiss %	ModalError %
5.155	-0.136	-0.017	-0.153	99.401	0.599
1.782	-0.117	-0.015	-0.132	98.897	1.103
1.216	-0.109	-0.014	-0.122	98.983	1.017
1.301	-0.175	-0.022	-0.197	99.314	0.686
0.146	-0.614	-0.077	-0.691	99.009	0.991