

Team Results for Clean Snowmobile Challenge 2012

2012 Clean Snowmobile Competition - Lab Emission Event Emission Data Sheet

Test Date : 2012/03/08 11:05:31
 Team Name : Wisconsin - Platteville
 Team Number : 5
 Model : Skidoo
 Engine : MXZ 600 H.O. ETEC
 Displacement[cc] : 600cc
 100% Speed [rpm] : 8207
 100% Torque [Nm] : 91.1
 No of Strokes : 2
 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	:	78.0	31.6	19.5	9.6	0.0
HC_m g/hr	:	3149.38	130.86	17.94	18.06	18.93
CO_m g/hr	:	36032.16	9387.62	20.26	28.31	4.57
NOx_m g/hr	:	45.59	7.11	119.85	11.08	0.93
Soot_m mg/hr	:	3583.33	674.00	91.80	12.30	8.02
N2O_m mg/hr	:	0.04	0.00	0.02	0.00	0.00
CO2_m g/hr	:	51459.97	26178.56	21139.10	12202.05	1661.61
CH4_m g/hr	:	493.07	57.32	11.83	10.51	0.72
W_HC g/hr	:	377.93	35.33	4.49	5.60	0.95
W_CO g/hr	:	4323.86	2534.66	5.07	8.78	0.23
W_NOx g/hr	:	5.47	1.92	29.96	3.44	0.05
W_HCNOx g/hr	:	383.40	37.25	34.45	9.04	0.99
W_Soot mg/hr	:	430.00	181.98	22.95	3.81	0.40
W_N2O g/hr	:	0.00	0.00	0.00	0.00	0.00
W_CO2 g/hr	:	6175.20	7068.21	5284.77	3782.64	83.08
W_CH4 g/hr	:	59.17	15.48	2.96	3.26	0.04

Total Weighted Power [kW] 25.718

Weighted Emissions

	HC	CO	NOx	HC+NOx
Total Mass [g/hr]	424.29	6872.59	40.84	465.13
Specific Mass [g/kW-hr]	16.50	267.23	1.59	18.09
BSFC [g/kW-hr]	386.6			

Total Soot [mg/hr] 639.14 Specific Soot [mg/kW-hr] 24.85

Not Used for Competition

Total N2O [mg/hr]	0.01	Specific N2O [mg/kW-hr]	0.00
Total CO2 [g/hr]	22393.90	Specific CO2 [g/kW-hr]	870.76
Total CH4 [g/hr]	80.90	Specific CH4 [g/kW-hr]	3.15

EMISSION TESTS:

	Value	Limit	Result
Power	78.34	<96.94 kW	PASS
Soot	24.85	<100 mg/kW-hr	PASS
CO	267.23	<275 g/kW-hr	PASS
HC + NOX	18.09	<90 g/kW-hr	PASS
E-Score	131.13	>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	246	1193	1194	551	1153
PtsInMode	points	298	1200	1200	799	1183
Speed	rpm	8197.11	6974.67	6158.38	5273.57	1206.95
Torque	Nm	90.86	43.20	30.16	17.38	0.00
Power	kW	77.99	31.55	19.45	9.60	0.00
BSFC	g/kw-hr	484.82	420.17	350.03	411.04	**
Fuel	g/hr	37813.07	13258.25	6808.28	3946.00	554.17
T_int	degC	12.10	12.51	12.03	10.76	8.70
RelHumid	%	29.84	26.51	26.59	27.59	28.47
Baro	in Hg	28.82	28.82	28.82	28.82	28.82
Baro	mmHg	732.00	732.01	732.05	732.04	732.07
Pvap_kPa	kPa	0.38	0.34	0.34	0.32	0.30
Pvap_inHg	inHg	0.11	0.10	0.10	0.10	0.09
AbsHumidity	grains/lb	17.00	15.46	15.08	14.53	13.27
SatPres	kPa	97.21	97.25	97.26	97.27	97.30
Hum Factor		1.00	1.00	1.00	1.00	1.00
F_fac		0.99	0.99	0.99	0.98	0.98
K_fac		1.01	1.01	1.01	1.01	1.00
Humidity	g/kg	2.43	2.21	2.15	2.08	1.90
H2		3.95	2.39	0.01	0.02	0.01
WetDry Factor		0.86	0.85	0.87	0.87	0.95

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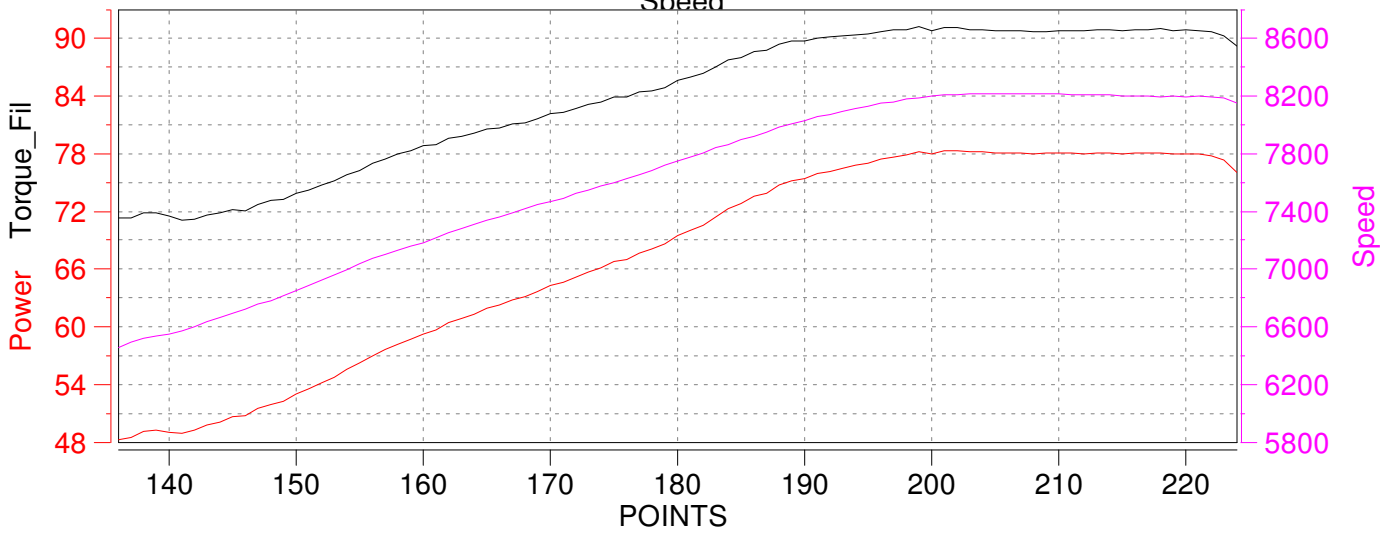
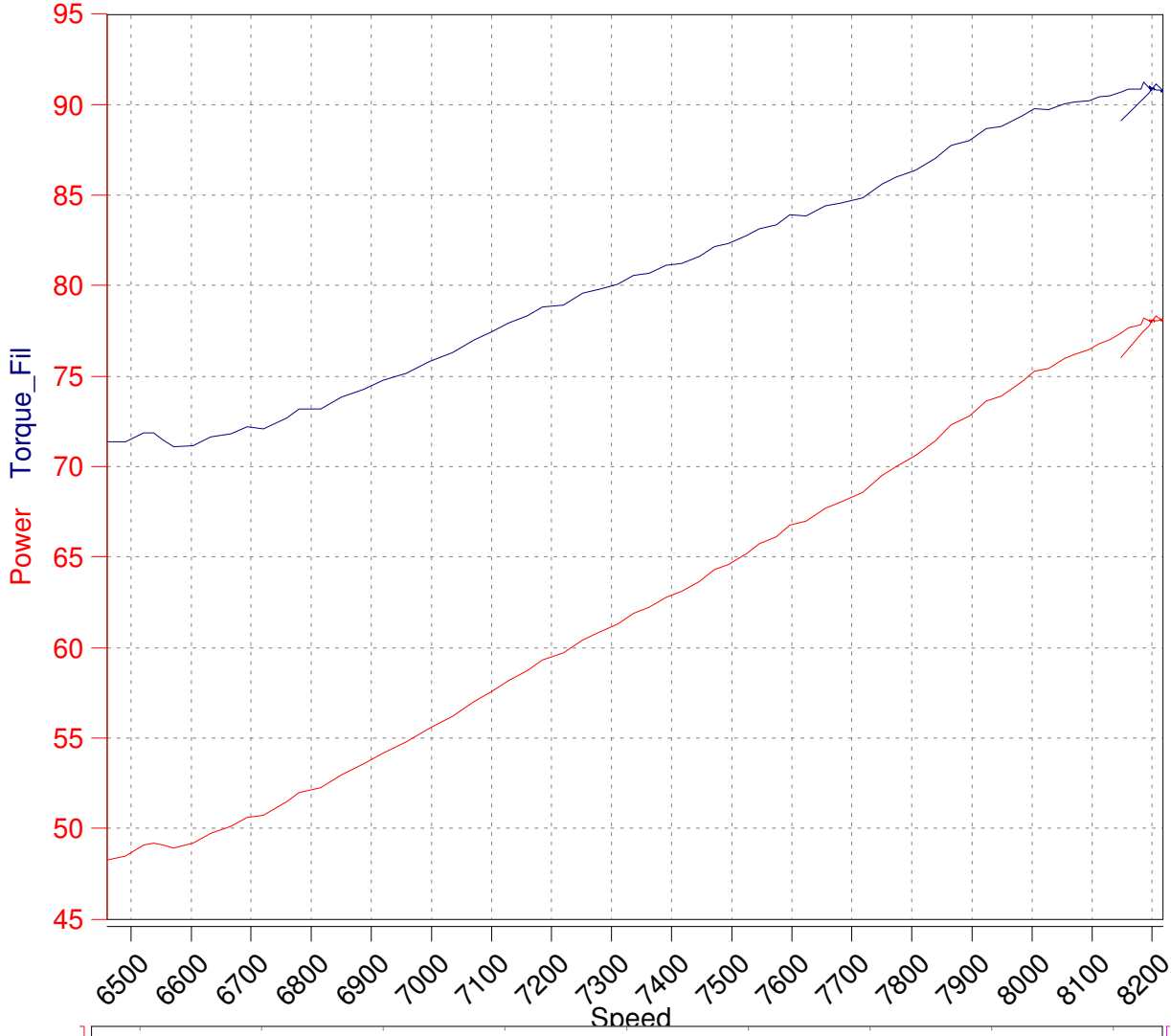
Modal Emissions Concentrations

ModeNum		1	2	3	4	5
THC	ppmC1	12824.94	1441.08	313.63	554.93	1572.81
CO	%	7.39	5.21	0.02	0.04	0.02
N2O	ppm	0.53	0.10	0.97	0.47	0.93
CH4	ppm	1771.42	556.83	182.40	284.89	53.03
CO2	%	6.72	9.25	11.85	12.02	4.43
O2	%	0.80	0.04	2.01	1.64	13.67
CNOx	ppm	56.97	24.02	642.82	104.48	23.84
AHC	ppm	296.39	29.04	1.76	0.07	0.00
C2H2	ppm	29.71	3.10	0.57	0.27	0.31
C2H4	ppm	1200.43	58.60	25.99	15.87	33.79
C3H6	ppm	415.69	30.22	2.64	4.79	1.42
C4H6	ppm	29.63	5.13	0.01	0.03	0.06
ETOH	ppm	280.04	21.79	2.49	2.29	0.00
H2O	%	14.42	15.02	12.75	12.90	4.89
HCHO	ppm	385.63	15.38	23.78	21.54	126.46
HCN	ppm	52.49	48.97	0.30	0.37	0.05
HNCO	ppm	33.88	11.24	2.93	1.66	1.83
MECHO	ppm	491.96	25.79	1.50	3.48	63.94
NC5	ppm	203.46	19.50	2.92	20.24	209.43
NH3	ppm	29.99	81.79	0.80	1.08	0.12
NO	ppm	51.88	23.81	627.01	96.83	3.20
NO2	ppm	5.09	0.23	15.76	7.60	20.63
Soot	mg/m3	9.74	4.58	0.93	0.22	0.39
AFR	:1	7.49	10.03	13.78	13.39	34.89

Power Run

TeamNumber	5
TeamName	Wisconsin - Platteville
Model	Skidoo
Engine	MXZ 600 H.O. ETEC

Displacement cc	600cc
RatedSpeed	8207
RatedTorque	91.1



Measurement Accuracy (SAE paper 961804)

H2_XLS %	ModalHC_Dry %	ModalFTIR_H2O %	N2 %	Ar %	AFR :1	Tr_Eff -
4.620	1.499	14.419	75.592	0.874	10.678	0.958
2.808	0.170	15.021	80.021	0.925	12.313	0.998
0.007	0.036	12.749	82.971	0.959	16.498	0.899
0.018	0.064	12.904	82.489	0.954	16.112	0.917
0.007	0.165	4.893	79.921	0.924	43.343	0.334

ModalWHC %	ModalC1 %	ModalC8 %	ModalSUM_HC %	ModalT_Emiss %	ModalError %
3149.381	0.750	0.094	0.844	99.364	0.636
130.865	0.130	0.016	0.146	100.967	0.967
17.942	-1.346	-0.168	-1.514	98.400	1.600
18.065	-1.094	-0.137	-1.231	97.983	2.017
18.928	-3.058	-0.382	-3.441	96.460	3.540