

## Team Results for Clean Snowmobile Challenge 2012

### 2012 Clean Snowmobile Competition - Lab Emission Event Emission Data Sheet

Test Date : 2012/03/08 16:49:07  
 Team Name : ETS  
 Team Number : 7  
 Model : BRP  
 Engine : MXZ TNT 600 E-Tec  
 Displacement[cc] : 600cc  
 100% Speed [rpm] : 8222  
 100% Torque [Nm] : 98.8  
 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	:	76.2	36.1	21.1	10.4	0.0
HC_m g/hr	:	5076.02	2015.01	1260.63	626.64	393.71
CO_m g/hr	:	24406.57	14414.68	9295.87	2968.79	102.47
NOx_m g/hr	:	167.07	31.38	10.64	5.21	11.59
Soot_m mg/hr	:	2370.93	1042.48	224.06	56.79	344.01
N2O_m mg/hr	:	0.00	0.03	0.01	0.00	0.00
CO2_m g/hr	:	55245.01	27074.73	17504.27	9975.87	1574.91
CH4_m g/hr	:	376.76	164.02	87.72	18.07	1.21
W_HC g/hr	:	609.12	544.05	315.16	194.26	19.69
W_CO g/hr	:	2928.79	3891.96	2323.97	920.32	5.12
W_NOx g/hr	:	20.05	8.47	2.66	1.62	0.58
W_HCNOx g/hr	:	629.17	552.53	317.82	195.87	20.27
W_Soot mg/hr	:	284.51	281.47	56.02	17.61	17.20
W_N2O g/hr	:	0.00	0.01	0.00	0.00	0.00
W_CO2 g/hr	:	6629.40	7310.18	4376.07	3092.52	78.75
W_CH4 g/hr	:	45.21	44.28	21.93	5.60	0.06

Total Weighted Power [kW] 27.368

#### Weighted Emissions

	HC	CO	NOx	HC+NOx
Total Mass [g/hr]	1682.28	10070.17	33.38	1715.65
Specific Mass [g/kW-hr]	61.47	367.95	1.22	62.69
BSFC [g/kW-hr]	485.8			

Total Soot [mg/hr] 656.80 Specific Soot [mg/kW-hr] 24.00

#### Not Used for Competition

Total N2O [mg/hr]	0.01	Specific N2O [mg/kW-hr]	0.00
Total CO2 [g/hr]	21486.91	Specific CO2 [g/kW-hr]	785.10
Total CH4 [g/hr]	117.09	Specific CH4 [g/kW-hr]	4.28

#### EMISSION TESTS:

	Value	Limit	Result
Power	85.03	<96.94 kW	PASS
Soot	24.00	<100 mg/kW-hr	PASS
CO	367.95	<275 g/kW-hr	FAIL
HC + NOX	62.69	<90 g/kW-hr	PASS
E-Score	76.22	>100	FAIL
Valid Data for All 5 Modes			PASS

LAB EMISSION TEST FAIL

## Team Results for Clean Snowmobile Challenge 2012

### Modal Raw Data : Engine / Environmental

ModeNum		1	2	3	4	5
Total Points	points	147	985	1155	1179	1189
PtsInMode	points	723	1656	1789	1789	1793
Speed	rpm	8202.28	6990.66	6166.48	5191.68	1268.31
Torque	Nm	88.66	49.25	32.71	19.07	0.00
Power	kW	76.15	36.05	21.12	10.37	0.00
BSFC	g/kw-hr	460.84	498.24	547.22	513.30	**
Fuel	g/hr	35094.97	17963.23	11559.60	5322.41	950.49
T_int	degC	7.73	6.13	6.16	6.69	6.57
RelHumid	%	32.34	35.89	36.17	35.40	33.51
Baro	in Hg	28.77	28.78	28.78	28.78	28.78
Baro	mmHg	730.85	730.90	730.99	731.05	731.03
Pvap_kPa	kPa	0.32	0.32	0.32	0.33	0.31
Pvap_inHg	inHg	0.09	0.09	0.10	0.10	0.09
AbsHumidity	grains/lb	14.26	14.37	14.50	14.65	13.77
SatPres	kPa	97.12	97.12	97.13	97.14	97.16
Hum Factor		1.00	1.00	1.00	1.00	1.00
F_fac		0.98	0.97	0.97	0.98	0.97
K_fac		1.00	1.00	1.00	1.00	1.00
Humidity	g/kg	2.04	2.05	2.07	2.09	1.97
H2		2.49	2.88	2.85	1.66	0.17
WetDry Factor		0.88	0.89	0.89	0.89	0.95

## Team Results for Clean Snowmobile Challenge 2012

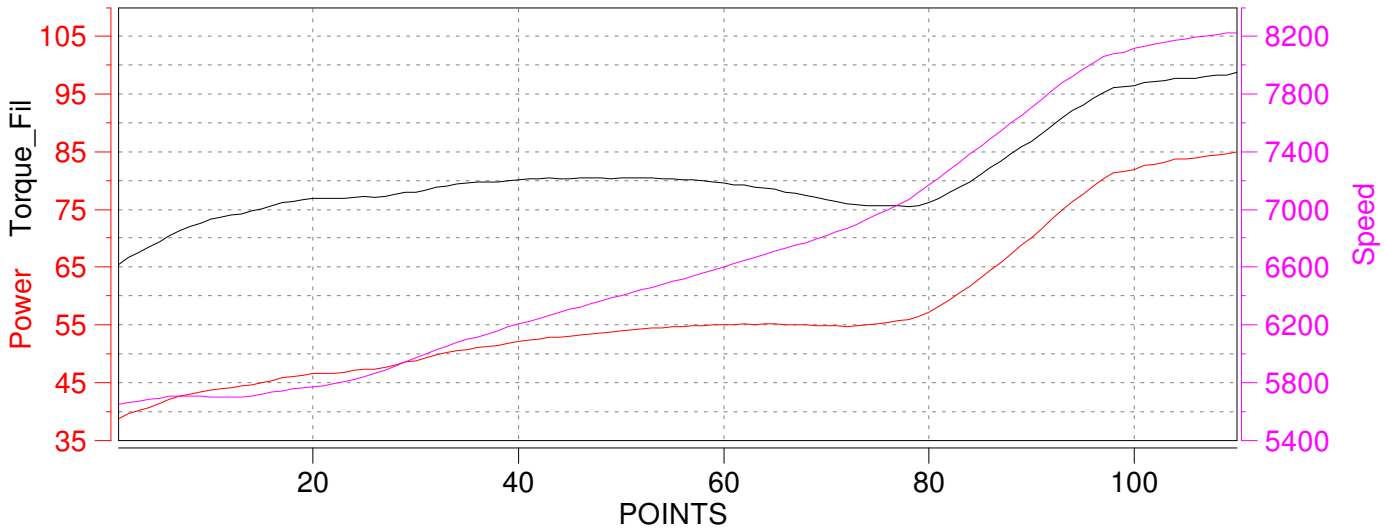
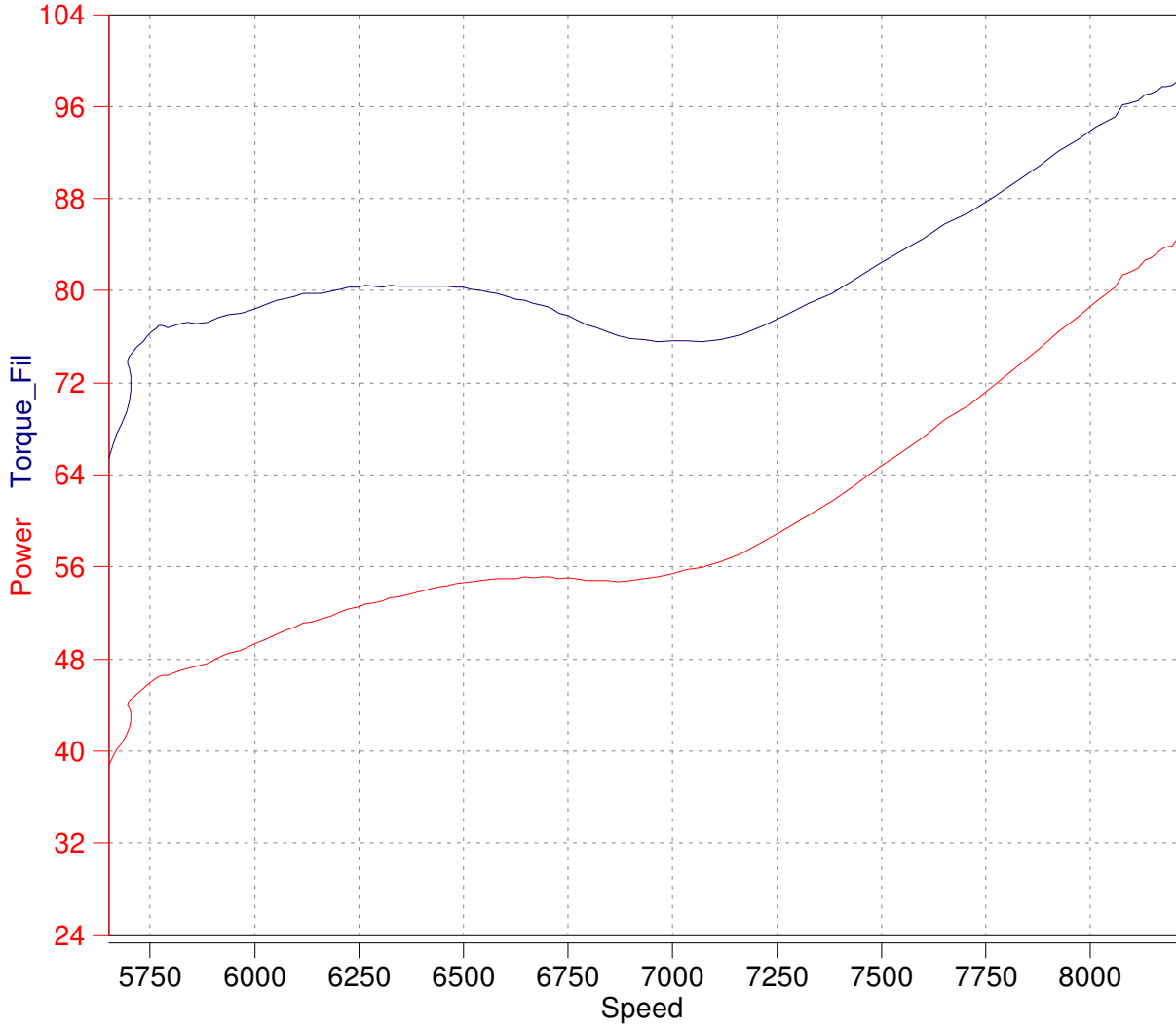
### Modal Emissions Concentrations

ModeNum		1	2	3	4	5
THC	ppmC1	21444.16	16001.13	15328.92	15728.44	35286.17
CO	%	5.20	5.77	5.70	3.76	0.46
N2O	ppm	0.00	0.76	0.40	0.40	0.78
CH4	ppm	1404.22	1149.05	941.07	400.17	95.84
CO2	%	7.49	6.90	6.83	8.03	4.53
O2	%	2.85	3.12	3.60	3.75	12.81
CNOx	ppm	216.56	76.46	39.71	40.16	318.85
AHC	ppm	774.74	617.69	579.91	651.73	1478.38
C2H2	ppm	177.43	274.74	349.03	237.77	42.27
C2H4	ppm	1756.26	964.60	632.02	233.23	60.16
C3H6	ppm	570.93	357.81	263.27	81.00	15.86
C4H6	ppm	38.99	24.15	18.20	6.46	1.43
ETOH	ppm	973.82	760.33	890.87	1415.66	3848.69
H2O	%	11.81	11.45	11.11	11.19	5.33
HCHO	ppm	1298.56	856.34	629.97	179.13	151.02
HCN	ppm	14.15	9.51	7.82	5.29	3.25
HNCO	ppm	93.27	71.04	51.95	4.81	0.00
MECHO	ppm	826.73	593.00	505.05	255.71	338.06
NC5	ppm	197.14	265.96	388.10	947.93	840.95
NH3	ppm	7.22	10.33	11.72	6.28	2.08
NO	ppm	183.02	52.88	22.05	28.94	245.21
NO2	ppm	33.53	23.57	17.60	11.43	73.57
Soot	mg/m3	6.16	5.17	1.67	0.86	18.07
AFR	:1	7.72	8.40	8.74	9.35	10.47

# Power Run

TeamNumber	7
TeamName	ETS
Model	BRP
Engine	MXZ TNT 600 E-Tec

Displacement cc	600cc
RatedSpeed	8222
RatedTorque	98.8



Measurement Accuracy (SAE paper 961804)

H2_XLS %	ModalHC_Dry %	ModalFTIR_H2O %	N2 %	Ar %	AFR :1	Tr_Eff -
2.821	2.432	11.815	76.569	0.885	12.171	0.853
3.256	1.807	11.452	75.495	0.873	12.492	0.840
3.201	1.724	11.111	76.242	0.881	12.902	0.815
1.868	1.771	11.187	78.035	0.902	13.964	0.809
0.181	3.727	5.332	79.024	0.913	23.077	0.363

ModalWHC %	ModalC1 %	ModalC8 %	ModalSUM_HC %	ModalT_Emiss %	ModalError %
5076.018	-0.035	-0.004	-0.039	97.870	2.130
2015.012	-0.775	-0.097	-0.871	96.582	3.418
1260.627	-1.199	-0.150	-1.348	97.122	2.878
626.639	-1.109	-0.139	-1.248	97.058	2.942
393.714	-2.000	-0.250	-2.250	96.706	3.294