

Team Results for Clean Snowmobile Challenge 2012

2012 Clean Snowmobile Competition - Lab Emission Event Emission Data Sheet

Test Date : 2012/03/08 12:41:19
 Team Name : Idaho
 Team Number : 3
 Model : Skidoo
 Engine : MXZ
 Displacement[cc] : 797cc
 100% Speed : 6636
 100% Torque : 124.6
 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	:	75.6	37.1	21.7	10.8	0.0
HC_m g/hr	:	5578.63	1014.76	514.29	242.60	101.74
CO_m g/hr	:	24078.07	8025.26	4206.05	171.84	41.05
NOx_m g/hr	:	243.98	218.21	72.82	2.79	1.08
Soot_m mg/hr	:	50.26	6.36	3.62	0.19	0.10
N2O_m mg/hr	:	0.00	0.01	0.01	0.00	0.00
CO2_m g/hr	:	51403.08	24665.88	15986.15	10534.69	1113.22
CH4_m g/hr	:	325.26	92.73	58.89	3.34	0.63
W_HC g/hr	:	669.44	273.98	128.57	75.21	5.09
W_CO g/hr	:	2889.37	2166.82	1051.51	53.27	2.05
W_NOx g/hr	:	29.28	58.92	18.21	0.87	0.05
W_HCNOx g/hr	:	698.71	332.90	146.78	76.07	5.14
W_Soot mg/hr	:	6.03	1.72	0.91	0.06	0.01
W_N2O g/hr	:	0.00	0.00	0.00	0.00	0.00
W_CO2 g/hr	:	6168.37	6659.79	3996.54	3265.75	55.66
W_CH4 g/hr	:	39.03	25.04	14.72	1.04	0.03

Total Weighted Power [kW] 27.871

Weighted Emissions

	HC	CO	NOx	HC+NOx
Total Mass [g/hr]	1152.28	6163.03	107.32	1259.60
Specific Mass [g/kW-hr]	41.34	221.12	3.85	45.19
BSFC [g/kW-hr]	344.5			

Total Soot [mg/hr] 8.72 Specific Soot [mg/kW-hr] 0.31

Not Used for Competition

Total N2O [mg/hr]	0.00	Specific N2O [mg/kW-hr]	0.00
Total CO2 [g/hr]	20146.11	Specific CO2 [g/kW-hr]	722.83
Total CH4 [g/hr]	79.86	Specific CH4 [g/kW-hr]	2.87

EMISSION TESTS:

	Value	Limit	Result
Power	86.55	<96.94 kW	PASS
Soot	0.31	<100 mg/kW-hr	PASS
CO	221.12	<275 g/kW-hr	PASS
HC + NOX	45.19	<90 g/kW-hr	PASS
E-Score	124.59	>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	310	1162	1140	1090	1154
PtsInMode	points	630	2388	1787	2171	1794
Speed	rpm	6600.33	5648.69	5021.08	4321.10	1206.68
Torque	Nm	109.34	62.77	41.36	23.82	0.00
Power	kW	75.58	37.13	21.75	10.78	0.00
BSFC	g/kw-hr	452.52	349.35	356.90	344.06	**
Fuel	g/hr	34199.78	12970.40	7761.31	3708.08	479.48
T_int	degC	10.01	8.53	9.07	7.27	7.46
RelHumid	%	36.51	37.70	34.56	36.29	37.20
Baro	in Hg	28.84	28.83	28.83	28.83	28.83
Baro	mmHg	732.43	732.34	732.35	732.39	732.39
Pvap_kPa	kPa	0.41	0.39	0.37	0.35	0.36
Pvap_inHg	inHg	0.12	0.11	0.11	0.10	0.11
AbsHumidity	grains/lb	18.41	17.41	16.48	15.54	16.10
SatPres	kPa	97.24	97.25	97.27	97.30	97.28
Hum Factor		1.00	1.00	1.00	1.00	1.00
F_fac		0.98	0.98	0.98	0.98	0.98
K_fac		1.01	1.00	1.00	1.00	1.00
Humidity	g/kg	2.63	2.49	2.35	2.22	2.30
H2		2.09	1.68	1.37	0.08	0.05
WetDry Factor		0.87	0.89	0.90	0.88	0.96

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Modal Emissions Concentrations

ModeNum		1	2	3	4	5
THC	ppmC1	19836.00	9408.52	7692.41	6646.71	7389.53
CO	%	4.31	3.75	3.17	0.24	0.15
N2O	ppm	0.02	0.17	0.41	0.19	0.39
CH4	ppm	1020.33	758.51	777.06	80.71	40.61
CO2	%	5.86	7.34	7.67	9.26	2.59
O2	%	5.38	5.00	5.15	5.36	16.04
CNOx	ppm	266.18	620.77	334.21	23.49	24.06
AHC	ppm	732.65	332.18	279.22	290.82	329.71
C2H2	ppm	248.85	339.28	401.64	37.68	21.47
C2H4	ppm	1264.30	425.51	228.41	118.06	83.02
C3H6	ppm	464.57	165.51	69.39	42.20	28.71
C4H6	ppm	27.95	10.23	4.02	3.77	3.99
ETOH	ppm	1162.31	429.64	356.87	631.48	747.48
H2O	%	12.66	10.66	10.01	11.52	4.07
HCHO	ppm	1191.50	515.24	278.35	152.49	116.73
HCN	ppm	16.50	19.68	15.13	0.94	0.25
HNCO	ppm	98.57	56.26	26.57	10.90	0.59
MECHO	ppm	760.03	256.51	152.01	128.45	102.20
NC5	ppm	361.99	259.71	305.07	415.91	566.73
NH3	ppm	0.06	1.47	2.19	1.13	0.21
NO	ppm	201.30	567.57	298.15	16.55	14.22
NO2	ppm	64.88	53.20	36.06	6.95	9.84
Soot	mg/m3	0.12	0.04	0.03	0.00	0.00
AFR	:1	8.90	11.31	12.12	14.06	34.07

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Measurement Accuracy (SAE paper 961804)

H2_XLS %	ModalHC_Dry %	ModalFTIR_H2O %	N2 %	Ar %	AFR :1	Tr_Eff -
2.396	2.271	12.658	80.678	0.933	14.307	0.726
1.886	1.053	10.663	79.118	0.915	15.672	0.747
1.523	0.855	10.015	78.247	0.904	16.399	0.740
0.095	0.751	11.525	83.411	0.964	18.911	0.731
0.057	0.770	4.073	80.127	0.926	56.450	0.223

ModalWHC %	ModalC1 %	ModalC8 %	ModalSUM_HC %	ModalT_Emiss %	ModalError %
5578.632	-1.546	-0.193	-1.740	100.112	0.112
1014.755	-2.354	-0.294	-2.648	97.340	2.660
514.285	-2.502	-0.313	-2.815	95.666	4.334
242.600	-2.336	-0.292	-2.628	98.637	1.363
101.741	-2.052	-0.256	-2.308	98.384	1.616

Power Run

TeamNumber	3
TeamName	Idaho
Model	Skidoo
Engine	MXZ

Displacement cc	797cc
RatedSpeed	6636
RatedTorque	124.6

