

APPENDIX A

BRIGGS AND STRATTON INTEK NO. 1 EMISSION DATA SHEETS



Steady-State SORE Engine Test Information Engine: B+S #1 6.5HP

Date: 10/23/02

Test ID: B+S #1 BSLN5

Baseline emissions test with "lighter" governor spring and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3041	3061	3060	3063	3019	
Obs. Power	hp	4.24	3.27	2.17	1.08	0.42	
Obs. Torque	ft-lb	7.23	5.53	3.67	1.82	0.73	
Calc. Power (Obs. Torque*Speed)	hp	4.19	3.22	2.14	1.06	0.42	
Work (5 min Interval)	hp-hr	0.354	0.272	0.181	0.090	0.035	
Fuel Flow	lb/hr	2.846	2.428	1.925	1.333	1.080	
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	
Oil	deg F	254	268	244	210	190	
Exhaust Gas (muffler-in/manifold)	deg F	1259	1251	1252	1225	1216	
Exhaust Gas (muffler out)	deg F	766	663	546	406	336	
Catalyst/Muffler Surface	deg F	NA	NA	NA	NA	NA	
Intake Air (EPA)	deg F	79	79	78	77	76	
Intake Air DewPoint (EPA)	deg F	61	61	61	61	62	
Cyl Head (Spark Plug)	deg F	449	427	387	330	302	
PRESSURES							
Exhaust BP Before Cat	psig	0.77	0.56	0.35	0.15	0.08	
Barometer	"Hg	29.098	29.096	29.094	29.092	29.095	
F Factor	----	1.027	1.027	1.027	1.025	1.024	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	145.85	131.55	116.55	118.11	120.41	
Dilute CO conc (dry)	%	0.39	0.32	0.24	0.17	0.13	
Dilute CO ₂ conc (dry)	%	0.58	0.51	0.42	0.29	0.24	
Dilute NO _x conc (dry)	ppm	18.07	16.72	10.06	3.50	2.16	
Measured A/F	----	11.90	12.05	12.16	11.79	11.83	
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	
NO _x Humidity Correction	----	1.04	1.04	1.04	1.04	1.05	
Raw O ₂ conc (dry) _{measured}	%	-0.01	0.20	0.18	0.25	0.35	
HC Mass	g/hr	19.38	17.45	15.61	15.97	16.41	
NO _x Mass	g/hr	8.16	7.56	4.60	1.60	1.00	
CO Mass	g/hr	1022.0	843.7	631.7	454.9	363.7	
CO ₂ Mass	g/hr	2269	1978	1621	1079	871	
BSHC	g/hp-hr	4.48	5.33	7.19	14.79	37.99	
BSNO _x	g/hp-hr	1.89	2.31	2.12	1.48	2.31	
BSCO	g/hp-hr	236.22	257.72	290.95	421.17	842.23	
BSCO ₂	g/hp-hr	524.55	604.10	746.69	999.53	2017.47	
Emission Test Results							
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	7.88	2.06	9.94	303.5	729.4	0.890

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S #1 6.5HP

Date: 10/23/02

Test ID: B+S #1 BSLN6

Baseline emissions test with "lighter" governor spring and stock jetting (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	---						
Weight Factor	---	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	---	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3058	3064	3059	3080	3046	
Obs. Power	hp	4.32	3.25	2.16	1.12	0.42	
Obs. Torque	ft-lb	7.32	5.49	3.65	1.89	0.71	
Calc. Power (Obs. Torque*Speed)	hp	4.26	3.21	2.13	1.11	0.41	
Work (5 min Interval)	hp-hr	0.360	0.271	0.180	0.094	0.035	
Fuel Flow	lb/hr	2.875	2.467	1.856	1.389	1.097	
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	
Oil	deg F	239	259	234	203	192	
Exhaust Gas (muffler-in/manifold)	deg F	1264	1250	1258	1237	1223	
Exhaust Gas (muffler out)	deg F	767	651	537	412	337	
Catalyst/Muffler Surface	deg F	NA	NA	NA	NA	NA	
Intake Air (EPA)	deg F	76	77	76	75	75	
Intake Air DewPoint (EPA)	deg F	62	61	61	61	61	
Cyl Head (Spark Plug)	deg F	442	419	380	328	302	
PRESSURES							
Exhaust BP Before Cat	psig	0.74	0.53	0.31	0.14	0.06	
Barometer	"Hg	29.129	29.124	29.123	29.117	29.109	
F Factor	---	1.022	1.023	1.022	1.021	1.021	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	158.40	148.42	112.35	118.65	121.63	
Dilute CO conc (dry)	%	0.40	0.32	0.22	0.17	0.14	
Dilute CO ₂ conc (dry)	%	0.58	0.51	0.41	0.30	0.24	
Dilute NO _x conc (dry)	ppm	17.29	15.23	9.49	3.56	1.79	
Measured A/F	---	11.84	11.97	12.22	11.80	11.81	
Dry/Wet Correction	---	0.98	0.98	0.98	0.98	0.98	
NO _x Humidity Correction	---	1.05	1.04	1.04	1.04	1.03	
Raw O ₂ conc (dry) _{measured}	%	0.25	0.34	0.27	0.31	0.34	
HC Mass	g/hr	20.90	19.73	14.90	15.92	16.42	
NO _x Mass	g/hr	7.87	7.04	4.35	1.63	0.81	
CO Mass	g/hr	1043.7	862.1	594.9	472.5	376.8	
CO ₂ Mass	g/hr	2270	1996	1585	1128	874	
BSHC	g/hp-hr	4.77	6.07	6.94	14.27	39.11	
BSNO _x	g/hp-hr	1.80	2.17	2.02	1.46	1.92	
BSCO	g/hp-hr	238.42	265.20	276.87	423.51	897.49	
BSCO ₂	g/hp-hr	518.57	613.95	737.82	1011.51	2082.50	
Emission Test Results	---	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	8.04	1.96	10.00	303.4	732.1	0.892

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B&S#1 6.5hp

Date: 11/22/02

Test ID: B&S #1 BSLN-JET#2

Baseline Test with Fixed Jet #2 (.027 in) and STOCK muffler

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	120	120	120	120	120	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3050	3070	3069	3059	3047	
Obs. Power	hp	3.43	2.62	1.74	0.86	0.35	
Obs. Torque	ft-lb	5.83	4.41	2.93	1.46	0.59	
Calc. Power (Obs. Torque*Speed)	hp	3.39	2.58	1.71	0.85	0.34	
Work (5 min Interval)	hp-hr	0.114	0.087	0.058	0.029	0.012	
Fuel Flow	lb/hr	2.417	2.015	1.475	1.146	0.969	
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	
Oil	deg F	276	280	247	223	203	
Exhaust Gas (muffler-in/manifold)	deg F	1309	1264	1221	1181	1204	
Exhaust Gas (muffler out)	deg F	844	698	536	430	389	
Catalyst/Muffler Surface	deg F	NA	NA	NA	NA	NA	
Intake Air (EPA)	deg F	88	90	90	89	87	
Intake Air DewPoint (EPA)	deg F	36	36	35	35	35	
Cyl Head (Spark Plug)	deg F	475	435	383	339	319	
PRESSURES							
Exhaust BP Before Cat	psig	0.60	0.39	0.25	0.17	0.14	
Barometer	"Hg	29.370	29.375	29.377	29.377	29.375	
F Factor	----	1.018	1.021	1.020	1.018	1.016	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	138.45	155.84	133.87	107.99	96.10	
Dilute CO conc (dry)	%	0.22	0.18	0.13	0.11	0.09	
Dilute CO ₂ conc (dry)	%	0.61	0.51	0.38	0.29	0.25	
Dilute NO _x conc (dry)	ppm	53.83	39.11	17.96	4.81	2.29	
Measured A/F	----	13.08	13.11	13.00	12.71	12.77	
Dry/Wet Correction	----	0.99	0.99	0.99	0.99	0.99	
NO _x Humidity Correction	----	0.83	0.83	0.83	0.83	0.83	
Raw O ₂ conc (dry) _{measured}	%	NA	NA	NA	NA	NA	
HC Mass	g/hr	18.20	20.82	18.04	14.55	13.00	
NO _x Mass	g/hr	19.56	14.41	6.65	1.75	0.81	
CO Mass	g/hr	583.6	473.5	344.2	304.9	258.3	
CO ₂ Mass	g/hr	2412	2014	1469	1081	911	
BSHC	g/hp-hr	5.26	8.01	10.37	16.84	37.36	
BSNO _x	g/hp-hr	5.66	5.55	3.82	2.03	2.33	
BSCO	g/hp-hr	168.69	182.26	197.81	352.85	742.14	
BSCO ₂	g/hp-hr	697.30	775.23	844.34	1250.81	2618.58	
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	10.26	4.46	14.73	223.8	899.7	0.916

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B&S#1

Date: 11/27/02

Test ID: B+S #1 CAT-C-STCK-JET

Catalyst C integrated in stock muffler, 4-hole Venturi and Check Valve SAI, with STOCK Carburetor Jet

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3056	3066	3052	3057	3061	
Obs. Power	hp	3.48	2.65	1.76	0.88	0.36	
Obs. Torque	ft-lb	5.90	4.48	2.98	1.48	0.61	
Calc. Power (Obs. Torque*Speed)	hp	3.43	2.61	1.73	0.86	0.36	
Work (5 min Interval)	hp-hr	0.290	0.221	0.146	0.073	0.030	
Fuel Flow	lb/hr	0.000	0.000	0.000	0.000	0.000	
TEMPERATURES							
Catalyst Mid-bed	deg F	1267	1242	1215	1207	1229	
Oil	deg F	307	287	238	210	195	
Exhaust Gas (muffler-in/manifold)	deg F	972	897	797	748	758	
Exhaust Gas (muffler out)	deg F	831	729	615	545	511	
Catalyst/Muffler Surface	deg F	758	710	647	612	599	
Intake Air (EPA)	deg F	93	95	94	91	89	
Intake Air DewPoint (EPA)	deg F	24	25	24	25	25	
Cyl Head (Spark Plug)	deg F	473	435	373	325	309	
PRESSURES							
Exhaust BP Before Cat	psig	1.02	0.67	0.38	0.27	0.23	
Barometer	"Hg	29.445	29.439	29.423	29.436	29.435	
F Factor	----	1.019	1.022	1.020	1.016	1.014	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	126.59	107.84	80.20	74.42	57.11	
Dilute CO conc (dry)	%	0.25	0.19	0.12	0.11	0.07	
Dilute CO ₂ conc (dry)	%	0.64	0.52	0.40	0.32	0.29	
Dilute NO _x conc (dry)	ppm	3.24	1.79	0.62	0.17	0.15	
Measured A/F	----	12.57	12.62	12.56	11.88	12.27	
Dry/Wet Correction	----	0.99	0.99	0.99	0.99	0.99	
NO _x Humidity Correction	----	0.79	0.80	0.79	0.79	0.80	
Raw O ₂ conc (dry) _{measured}	%	0.94	1.10	1.38	1.70	1.90	
HC Mass	g/hr	16.75	14.33	10.69	9.99	7.58	
NO _x Mass	g/hr	1.10	0.61	0.20	0.04	0.03	
CO Mass	g/hr	672.1	504.7	341.9	318.2	215.8	
CO ₂ Mass	g/hr	2537	2052	1574	1206	1081	
BSHC	g/hp-hr	4.81	5.41	6.09	11.41	20.87	
BSNO _x	g/hp-hr	0.32	0.23	0.11	0.05	0.09	
BSCO	g/hp-hr	193.05	190.49	194.76	363.21	593.79	
BSCO ₂	g/hp-hr	728.63	774.61	896.61	1376.80	2973.92	
Emission Test Results							
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	6.80	0.18	6.98	229.1	946.4	0.948

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S #1

Date: 11/27/02

Test ID: B+S #1 CAT-C-BSLN3

Catalyst C integrated in muffler, Jet #2 (0.027 in.), 4-hole Venturi with Check Valve SAI

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3054	3065	3053	3057	3052	
Obs. Power	hp	3.59	2.74	1.82	0.90	0.37	
Obs. Torque	ft-lb	6.09	4.64	3.08	1.53	0.63	
Calc. Power (Obs. Torque*Speed)	hp	3.54	2.71	1.79	0.89	0.36	
Work (5 min Interval)	hp-hr	0.299	0.229	0.151	0.075	0.031	
Fuel Flow	lb/hr	2.388	1.934	1.499	1.179	0.893	
TEMPERATURES							
Catalyst Mid-bed	deg F	1308	1299	1300	1316	1314	
Oil	deg F	304	276	238	205	192	
Exhaust Gas (muffler-in/manifold)	deg F	1100	1037	967	888	896	
Exhaust Gas (muffler out)	deg F	857	756	668	597	510	
Catalyst/Muffler Surface	deg F	771	718	672	634	614	
Intake Air (EPA)	deg F	85	82	82	77	77	
Intake Air DewPoint (EPA)	deg F	23	24	23	23	24	
Cyl Head (Spark Plug)	deg F	483	435	379	330	311	
PRESSURES							
Exhaust BP Before Cat	psig	0.87	0.50	0.31	0.20	0.15	
Barometer	"Hg	29.523	29.550	29.548	29.555	29.555	
F Factor	----	1.006	1.000	1.001	0.993	0.994	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	75.08	59.52	42.95	41.93	12.81	
Dilute CO conc (dry)	%	0.11	0.08	0.05	0.04	0.00	
Dilute CO ₂ conc (dry)	%	0.71	0.59	0.47	0.37	0.32	
Dilute NO _x conc (dry)	ppm	6.54	3.86	1.42	0.56	1.08	
Measured A/F	----	13.63	13.72	13.59	13.31	14.26	
Dry/Wet Correction	----	0.99	0.99	0.99	0.99	0.99	
NO _x Humidity Correction	----	0.79	0.79	0.79	0.79	0.79	
Raw O ₂ conc (dry) _{measured}	%	0.98	1.26	1.59	2.20	2.65	
HC Mass	g/hr	9.78	7.77	5.56	5.49	1.42	
NO _x Mass	g/hr	2.24	1.33	0.47	0.16	0.35	
CO Mass	g/hr	303.5	206.0	137.4	115.9	5.4	
CO ₂ Mass	g/hr	2837	2361	1867	1453	1238	
BSHC	g/hp-hr	2.70	2.84	3.07	6.11	3.81	
BSNO _x	g/hp-hr	0.62	0.49	0.26	0.18	0.95	
BSCO	g/hp-hr	83.77	75.30	75.87	128.81	14.47	
BSCO ₂	g/hp-hr	783.10	862.77	1030.60	1614.86	3329.66	
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions³	g/hp-hr	3.48	0.40	3.88	86.1	1075.0	0.872

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B&S#1

Date: 11/27/02

Test ID: B+S #1 CAT-C-BSLN4

Catalyst C integrated in muffler, Jet #2 (0.027 in.), 4-hole Venturi with Check Valve SAI

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3050	3066	3054	3056	3061	
Obs. Power	hp	3.48	2.71	1.80	0.91	0.36	
Obs. Torque	ft-lb	5.91	4.57	3.05	1.54	0.62	
Calc. Power (Obs. Torque*Speed)	hp	3.43	2.67	1.77	0.90	0.36	
Work (5 min Interval)	hp-hr	0.290	0.226	0.150	0.076	0.030	
Fuel Flow	lb/hr	2.393	2.016	1.518	1.159	0.858	
TEMPERATURES							
Catalyst Mid-bed	deg F	1310	1305	1299	1289	1328	
Oil	deg F	307	288	243	204	194	
Exhaust Gas (muffler-in/manifold)	deg F	1099	1038	967	879	897	
Exhaust Gas (muffler out)	deg F	855	764	665	564	502	
Catalyst/Muffler Surface	deg F	770	724	671	624	614	
Intake Air (EPA)	deg F	83	84	80	83	82	
Intake Air DewPoint (EPA)	deg F	24	25	24	23	23	
Cyl Head (Spark Plug)	deg F	485	443	381	327	313	
PRESSURES							
Exhaust BP Before Cat	psig	0.87	0.53	0.31	0.19	0.15	
Barometer	"Hg	29.476	29.455	29.458	29.459	29.453	
F Factor	----	1.004	1.006	1.002	1.005	1.004	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	76.34	71.52	50.52	39.74	13.75	
Dilute CO conc (dry)	%	0.12	0.09	0.06	0.05	0.00	
Dilute CO ₂ conc (dry)	%	0.71	0.61	0.47	0.36	0.31	
Dilute NO _x conc (dry)	ppm	7.04	5.61	2.21	0.80	1.02	
Measured A/F	----	13.63	13.66	13.56	13.28	14.19	
Dry/Wet Correction	----	0.99	0.99	0.99	0.99	0.99	
NO _x Humidity Correction	----	0.79	0.79	0.79	0.79	0.79	
Raw O ₂ conc (dry) _{measured}	%	1.05	1.27	1.62	2.05	2.43	
HC Mass	g/hr	9.97	9.37	6.63	5.21	1.61	
NO _x Mass	g/hr	2.44	1.93	0.76	0.25	0.33	
CO Mass	g/hr	310.6	235.9	156.3	128.8	0.0	
CO ₂ Mass	g/hr	2833	2425	1861	1405	1197	
BSHC	g/hp-hr	2.79	3.46	3.68	5.71	4.48	
BSNO _x	g/hp-hr	0.68	0.71	0.42	0.28	0.93	
BSCO	g/hp-hr	86.87	86.99	86.81	141.26	0.00	
BSCO ₂	g/hp-hr	792.16	894.04	1033.72	1540.23	3322.61	
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	3.85	0.55	4.40	96.0	1076.4	0.885

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S#1 6.5 hp

Date: 2/6/03

Test ID: B+S#1-125-#1

125-hr. interval emissions testing with orig SAI check valve, fixed jet #2 (0.027in.), and catalyst C

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3055	3062	3062	3081	3061	
Obs. Power	hp	3.16	2.39	1.58	0.76	0.31	
Obs. Torque	ft-lb	5.36	4.05	2.66	1.28	0.53	
Calc. Power (Obs. Torque*Speed)	hp	3.12	2.36	1.55	0.75	0.31	
Work (5 min Interval)	hp-hr	0.263	0.200	0.131	0.064	0.026	
Fuel Flow	lb/hr	2.231	1.803	1.464	1.129	0.943	
TEMPERATURES							
Catalyst Mid-bed	deg F	1353	1355	1295	1273	1273	
Oil	deg F	253	228	208	185	177	
Exhaust Gas (muffler-in/manifold)	deg F	1042	998	928	883	867	
Exhaust Gas (muffler out)	deg F	835	788	694	615	578	
Catalyst/Muffler Surface	deg F	769	733	677	634	613	
Intake Air (EPA)	deg F	81	80	78	76	76	
Intake Air DewPoint (EPA)	deg F	48	47	45	44	44	
Cyl Head (Spark Plug)	deg F	450	406	358	321	305	
PRESSURES							
Exhaust BP Before Cat	psig	-----	-----	-----	-----	-----	
Barometer	"Hg	29.032	29.037	29.044	29.048	29.041	
F Factor	----	1.025	1.023	1.019	1.016	1.016	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	137.13	102.36	98.40	62.09	34.50	
Dilute CO conc (dry)	%	0.15	0.10	0.09	0.06	0.04	
Dilute CO ₂ conc (dry)	%	0.63	0.54	0.43	0.35	0.31	
Dilute NO _x conc (dry)	ppm	11.71	6.05	2.51	0.88	0.44	
Measured A/F	----	13.42	13.54	13.29	13.37	13.43	
Dry/Wet Correction	----	0.98	0.98	0.99	0.99	0.99	
NO _x Humidity Correction	----	0.90	0.89	0.88	0.87	0.87	
Raw O ₂ conc (dry) _{measured}	%	1.31	1.57	1.77	1.93	2.10	
HC Mass	g/hr	17.61	13.10	12.68	7.86	4.14	
NO _x Mass	g/hr	4.54	2.33	0.94	0.30	0.13	
CO Mass	g/hr	399.1	253.2	236.7	155.3	101.0	
CO ₂ Mass	g/hr	2444	2087	1639	1313	1150	
BSHC	g/hp-hr	5.56	5.49	8.01	10.24	13.29	
BSNO _x	g/hp-hr	1.43	0.98	0.59	0.39	0.41	
BSCO	g/hp-hr	126.03	106.04	149.49	202.26	323.94	
BSCO ₂	g/hp-hr	771.57	874.16	1035.14	1710.02	3685.58	
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	7.27	0.85	8.12	144.0	1094.5	0.959

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S#1 6.5 hp

Date: 2/6/03

Test ID: B+S #1-125-#2

125-hr. interval emissions testing with replacement SAI check valve, fixed jet #2 (0.027in.), and catalyst C

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	---						
Weight Factor	---	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	---	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3061	3060	3061	3077	3057	
Obs. Power	hp	3.26	2.43	1.62	0.84	0.32	
Obs. Torque	ft-lb	5.51	4.11	2.75	1.41	0.54	
Calc. Power (Obs. Torque*Speed)	hp	3.21	2.39	1.60	0.83	0.32	
Work (5 min Interval)	hp-hr	0.271	0.202	0.135	0.070	0.027	
Fuel Flow	lb/hr	2.291	1.876	1.461	1.185	0.958	
TEMPERATURES							
Catalyst Mid-bed	deg F	1325	1317	1272	1260	1251	
Oil	deg F	247	224	197	182	173	
Exhaust Gas (muffler-in/manifold)	deg F	1045	998	922	878	860	
Exhaust Gas (muffler out)	deg F	820	767	679	615	566	
Catalyst/Muffler Surface	deg F	763	726	666	634	608	
Intake Air (EPA)	deg F	78	76	75	74	73	
Intake Air DewPoint (EPA)	deg F	49	49	49	49	49	
Cyl Head (Spark Plug)	deg F	447	401	351	316	299	
PRESSURES							
Exhaust BP Before Cat	psig	-----	-----	-----	-----	-----	
Barometer	"Hg	29.042	29.051	29.065	29.068	29.068	
F Factor	---	1.021	1.018	1.016	1.014	1.013	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	143.71	107.49	96.18	68.20	40.75	
Dilute CO conc (dry)	%	0.16	0.10	0.09	0.06	0.04	
Dilute CO ₂ conc (dry)	%	0.64	0.54	0.43	0.37	0.32	
Dilute NO _x conc (dry)	ppm	13.23	6.80	2.61	0.92	0.61	
Measured A/F	---	13.42	13.51	13.32	13.33	13.48	
Dry/Wet Correction	---	0.98	0.98	0.98	0.98	0.98	
NO _x Humidity Correction	---	0.91	0.91	0.90	0.90	0.91	
Raw O ₂ conc (dry) _{measured}	%	1.19	1.42	1.61	1.85	1.96	
HC Mass	g/hr	18.94	14.51	12.58	8.86	5.17	
NO _x Mass	g/hr	5.24	2.75	1.00	0.32	0.20	
CO Mass	g/hr	412.6	277.7	244.7	163.4	99.8	
CO ₂ Mass	g/hr	2502	2147	1623	1376	1169	
BSHC	g/hp-hr	5.82	5.93	7.77	10.55	15.95	
BSNO _x	g/hp-hr	1.61	1.12	0.62	0.38	0.61	
BSCO	g/hp-hr	126.86	113.38	151.15	194.56	308.22	
BSCO ₂	g/hp-hr	769.26	876.68	1002.37	1638.98	3609.19	
Emission Test Results	---	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	7.51	0.94	8.45	146.2	1078.5	0.950

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S#1 6.5 hp

Date: 2/7/03

Test ID: B+S#1-125-BSLN

Fixed Jet #2 (0.027 in.) and stock muffler, tested after 125-hr. service accumulation

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3058	3061	3058	3062	3046	
Obs. Power	hp	3.18	2.41	1.59	0.79	0.31	
Obs. Torque	ft-lb	5.39	4.07	2.70	1.33	0.53	
Calc. Power (Obs. Torque*Speed)	hp	3.14	2.37	1.57	0.78	0.31	
Work (5 min Interval)	hp-hr	0.265	0.201	0.133	0.066	0.026	
Fuel Flow	lb/hr	2.309	1.886	1.509	1.125	1.057	
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	
Oil	deg F	244	229	201	179	173	
Exhaust Gas (muffler-in/manifold)	deg F	1287	1256	1221	1224	1234	
Exhaust Gas (muffler out)	deg F	777	683	563	467	420	
Catalyst/Muffler Surface	deg F	NA	NA	NA	NA	NA	
Intake Air (EPA)	deg F	77	81	77	71	77	
Intake Air DewPoint (EPA)	deg F	30	30	30	30	29	
Cyl Head (Spark Plug)	deg F	440	405	355	314	302	
PRESSURES							
Exhaust BP Before Cat	psig	-----	-----	-----	-----	-----	
Barometer	"Hg	29.461	29.453	29.444	29.451	29.449	
F Factor	----	0.998	1.004	0.999	0.991	0.999	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	244.53	228.89	198.03	126.25	104.38	
Dilute CO conc (dry)	%	0.20	0.16	0.13	0.10	0.10	
Dilute CO ₂ conc (dry)	%	0.58	0.48	0.38	0.29	0.27	
Dilute NO _x conc (dry)	ppm	57.68	37.84	16.57	4.94	2.91	
Measured A/F	----	13.20	13.17	13.00	12.92	12.82	
Dry/Wet Correction	----	0.99	0.99	0.99	0.99	0.99	
NO _x Humidity Correction	----	0.81	0.81	0.81	0.81	0.81	
Raw O ₂ conc (dry) _{measured}	%	0.57	0.63	0.66	0.55	0.55	
HC Mass	g/hr	32.59	30.53	26.66	17.04	14.02	
NO _x Mass	g/hr	20.86	13.75	6.04	1.76	1.01	
CO Mass	g/hr	532.3	427.7	364.0	284.6	284.6	
CO ₂ Mass	g/hr	2297	1875	1459	1076	990	
BSHC	g/hp-hr	10.25	12.72	16.70	21.52	43.29	
BSNO _x	g/hp-hr	6.56	5.73	3.78	2.23	3.12	
BSCO	g/hp-hr	167.32	178.19	228.02	359.36	878.58	
BSCO ₂	g/hp-hr	722.17	781.24	913.56	1358.23	3055.16	
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	15.63	4.73	20.35	235.0	952.9	0.978

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S#1 6.5 hp

Date: 2/7/03

Test ID: B+S#1-125-STK-BSLN

Stock fixed jet and muffler, tested after 125-hr. service accumulation

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3069	3053	3058	3058	3072	
Obs. Power	hp	3.25	2.47	1.64	0.83	0.33	
Obs. Torque	ft-lb	5.49	4.19	2.77	1.41	0.55	
Calc. Power (Obs. Torque*Speed)	hp	3.21	2.44	1.61	0.82	0.32	
Work (5 min Interval)	hp-hr	0.271	0.206	0.136	0.070	0.027	
Fuel Flow	lb/hr	2.506	2.066	1.631	1.339	1.176	
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	
Oil	deg F	224	208	184	169	163	
Exhaust Gas (muffler-in/manifold)	deg F	1242	1210	1176	1180	1198	
Exhaust Gas (muffler out)	deg F	755	658	539	456	408	
Catalyst/Muffler Surface	deg F	NA	NA	NA	NA	NA	
Intake Air (EPA)	deg F	71	69	67	68	70	
Intake Air DewPoint (EPA)	deg F	30	29	29	30	30	
Cyl Head (Spark Plug)	deg F	411	376	332	301	286	
PRESSURES							
Exhaust BP Before Cat	psig	-----	-----	-----	-----	-----	
Barometer	"Hg	29.445	29.426	29.424	29.425	29.431	
F Factor	----	0.991	0.989	0.986	0.988	0.990	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	282.83	258.24	215.57	166.37	142.72	
Dilute CO conc (dry)	%	0.30	0.25	0.20	0.16	0.15	
Dilute CO ₂ conc (dry)	%	0.53	0.44	0.35	0.29	0.25	
Dilute NO _x conc (dry)	ppm	24.49	16.91	8.30	3.43	2.12	
Measured A/F	----	12.32	12.30	12.16	11.94	11.75	
Dry/Wet Correction	----	0.99	0.99	0.99	0.99	0.99	
NO _x Humidity Correction	----	0.81	0.81	0.81	0.81	0.81	
Raw O ₂ conc (dry) _{measured}	%	0.56	0.60	0.58	0.55	0.54	
HC Mass	g/hr	37.32	34.27	28.70	22.08	18.82	
NO _x Mass	g/hr	8.91	6.19	3.07	1.28	0.79	
CO Mass	g/hr	827.3	679.6	544.1	459.4	429.9	
CO ₂ Mass	g/hr	2094	1720	1341	1085	914	
BSHC	g/hp-hr	11.31	13.94	17.37	26.29	58.09	
BSNO _x	g/hp-hr	2.70	2.52	1.86	1.53	2.45	
BSCO	g/hp-hr	250.77	276.33	329.24	547.04	1326.80	
BSCO ₂	g/hp-hr	634.81	699.56	811.26	1292.21	2819.68	
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	17.46	2.21	19.67	353.1	863.4	1.051

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle

APPENDIX B

BRIGGS AND STRATTON INTEK NO. 2 EMISSION DATA SHEETS



Steady-State SORE Engine Test Information Engine: B+S#2 6.5HP

Date: 10/21/02

Test ID: B+S #2 BSLN1

Baseline emissions test with "lighter" governor spring and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3050	3065	3058	3053	3079	
Obs. Power	hp	4.31	3.27	2.17	1.08	0.43	
Obs. Torque	ft-lb	7.32	5.52	3.68	1.84	0.73	
Calc. Power (Obs. Torque*Speed)	hp	4.25	3.22	2.14	1.07	0.43	
Work (5 min Interval)	hp-hr	0.359	0.272	0.181	0.090	0.036	
Fuel Flow	lb/hr	2.857	2.357	1.865	1.501	1.214	
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	
Oil	deg F	245	250	231	208	190	
Exhaust Gas (muffler-in/manifold)	deg F	1320	1312	1339	1326	1344	
Exhaust Gas (muffler out)	deg F	825	722	628	486	399	
Catalyst/Muffler Surface	deg F	NA	NA	NA	NA	NA	
Intake Air (EPA)	deg F	74	74	73	72	71	
Intake Air DewPoint (EPA)	deg F	60	60	60	60	60	
Cyl Head (Spark Plug)	deg F	431	411	372	329	303	
PRESSURES							
Exhaust BP Before Cat	psig	0.88	0.64	0.44	0.25	0.15	
Barometer	"Hg	29.048	29.036	29.038	29.040	29.035	
F Factor	----	1.021	1.022	1.020	1.019	1.018	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	110.67	113.92	94.84	109.35	119.43	
Dilute CO conc (dry)	%	0.41	0.32	0.24	0.21	0.16	
Dilute CO ₂ conc (dry)	%	0.57	0.49	0.40	0.31	0.26	
Dilute NO _x conc (dry)	ppm	13.99	12.05	6.87	3.15	1.88	
Measured A/F	----	12.50	12.55	12.61	12.44	12.54	
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	
NO _x Humidity Correction	----	1.02	1.02	1.02	1.02	1.02	
Raw O ₂ conc (dry) _{measured}	%	0.30	0.20	0.20	0.20	0.50	
HC Mass	g/hr	14.52	15.01	12.55	14.64	16.24	
NO _x Mass	g/hr	6.13	5.36	3.03	1.39	0.82	
CO Mass	g/hr	1075.6	844.2	646.2	559.7	434.4	
CO ₂ Mass	g/hr	2215	1886	1524	1150	947	
BSHC	g/hp-hr	3.35	4.58	5.74	13.56	37.58	
BSNO _x	g/hp-hr	1.42	1.64	1.39	1.29	1.89	
BSCO	g/hp-hr	248.45	257.79	295.77	518.23	1005.65	
BSCO ₂	g/hp-hr	511.75	575.96	697.66	1065.13	2191.40	
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	6.75	1.48	8.23	325.6	715.3	0.903

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S#2 6.5HP

Date: 10/22/02

Test ID: B+S #2 BSLN2

Baseline emissions testing with "lighter" governor spring and stock jetting

DESCRIPTION	UNIT		1	2	3	4	5	
Mode	----							
Weight Factor	----		0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----		300	300	300	300	300	
Speed Set	%Rated		85	85	85	85	85	
Load Set	%Rated		100	75	50	25	10	
ENGINE DATA								
Obs. Speed	rpm		3055	3050	3054	3064	3042	
Obs. Power	hp		4.29	3.24	2.15	1.08	0.43	
Obs. Torque	ft-lb		7.28	5.50	3.65	1.82	0.73	
Calc. Power (Obs. Torque*Speed)	hp		4.24	3.19	2.12	1.06	0.42	
Work (5 min Interval)	hp-hr		0.358	0.270	0.179	0.090	0.036	
Fuel Flow	lb/hr		2.819	2.396	1.929	1.485	1.110	
TEMPERATURES								
Catalyst Mid-bed	deg F		NA	NA	NA	NA	NA	
Oil	deg F		260	256	228	208	193	
Exhaust Gas (muffler-in/manifold)	deg F		1333	1316	1350	1332	1341	
Exhaust Gas (muffler out)	deg F		825	727	626	488	397	
Catalyst/Muffler Surface	deg F		NA	NA	NA	NA	NA	
Intake Air (EPA)	deg F		78	78	72	74	74	
Intake Air DewPoint (EPA)	deg F		61	64	61	62	60	
Cyl Head (Spark Plug)	deg F		441	418	373	331	306	
PRESSURES								
Exhaust BP Before Cat	psig		0.64	0.54	0.38	0.21	0.12	
Barometer	"Hg		29.125	29.116	29.112	29.105	29.096	
F Factor	----		1.025	1.028	1.018	1.020	1.021	
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED¹ (ETIS)								
Dilute HC conc (wet)	ppm		104.37	115.08	94.23	106.69	104.15	
Dilute CO conc (dry)	%		0.40	0.33	0.24	0.20	0.15	
Dilute CO ₂ conc (dry)	%		0.57	0.50	0.42	0.31	0.24	
Dilute NO _x conc (dry)	ppm		14.85	12.29	7.65	3.06	1.86	
Measured A/F	----		12.33	12.44	12.57	12.53	12.69	
Dry/Wet Correction	----		0.98	0.97	0.98	0.98	0.98	
NO _x Humidity Correction	----		1.04	1.08	1.04	1.05	1.03	
Raw O ₂ conc (dry) _{measured}	%		0.10	0.10	0.10	0.20	0.60	
HC Mass	g/hr		13.62	15.08	12.49	14.31	14.01	
NO _x Mass	g/hr		6.58	5.69	3.50	1.39	0.83	
CO Mass	g/hr		1042.2	853.7	638.8	537.0	396.8	
CO ₂ Mass	g/hr		2218	1925	1624	1165	868	
BSHC	g/hp-hr		3.16	4.67	5.79	13.17	32.43	
BSNO _x	g/hp-hr		1.53	1.76	1.62	1.28	1.91	
BSCO	g/hp-hr		241.99	264.56	295.92	494.22	918.40	
BSCO ₂	g/hp-hr		515.11	596.42	752.58	1072.06	2008.62	
Emission Test Results	----		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr		6.64	1.62	8.26	322.1	740.1	0.916

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S#2 6.5HP

Date: 10/22/02

Test ID: B+S #2 BSLN3

Baseline emissions test with "lighter" governor spring and stock jetting (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3064	3051	3054	3079	3070	
Obs. Power	hp	4.35	3.24	2.18	1.09	0.45	
Obs. Torque	ft-lb	7.36	5.51	3.70	1.84	0.77	
Calc. Power (Obs. Torque*Speed)	hp	4.29	3.20	2.15	1.08	0.45	
Work (5 min Interval)	hp-hr	0.363	0.270	0.182	0.091	0.038	
Fuel Flow	lb/hr	2.850	2.430	1.863	1.438	1.121	
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	
Oil	deg F	244	246	225	201	188	
Exhaust Gas (muffler-in/manifold)	deg F	1317	1297	1325	1305	1309	
Exhaust Gas (muffler out)	deg F	830	713	626	490	403	
Catalyst/Muffler Surface	deg F	NA	NA	NA	NA	NA	
Intake Air (EPA)	deg F	74	75	73	73	72	
Intake Air DewPoint (EPA)	deg F	62	62	62	62	62	
Cyl Head (Spark Plug)	deg F	436	413	375	331	306	
PRESSURES							
Exhaust BP Before Cat	psig	0.85	0.60	0.38	0.21	0.11	
Barometer	"Hg	29.097	29.129	29.125	29.121	29.120	
F Factor	----	1.022	1.021	1.019	1.019	1.018	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	103.80	104.67	84.30	97.20	105.28	
Dilute CO conc (dry)	%	0.39	0.32	0.23	0.19	0.15	
Dilute CO ₂ conc (dry)	%	0.58	0.51	0.41	0.30	0.24	
Dilute NO _x conc (dry)	ppm	14.95	13.28	7.33	3.13	1.78	
Measured A/F	----	12.38	12.29	12.49	12.57	12.69	
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	
NO _x Humidity Correction	----	1.05	1.06	1.05	1.05	1.05	
Raw O ₂ conc (dry) _{measured}	%	NA	NA	NA	NA	NA	
HC Mass	g/hr	13.70	13.88	11.17	13.08	14.24	
NO _x Mass	g/hr	6.88	6.23	3.40	1.45	0.81	
CO Mass	g/hr	1033.9	842.9	610.2	523.8	405.7	
CO ₂ Mass	g/hr	2274	1993	1582	1125	869	
BSHC	g/hp-hr	3.14	4.27	5.11	11.97	32.09	
BSNO _x	g/hp-hr	1.58	1.92	1.56	1.33	1.83	
BSCO	g/hp-hr	237.13	259.29	279.03	479.63	914.30	
BSCO ₂	g/hp-hr	521.55	612.92	723.40	1030.32	1957.83	
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb _f /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	6.08	1.67	7.75	311.6	729.8	0.896

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S #2

Date: 6/12/03

Test ID: B+S #2-BSLN-RPT#3

Repeat of October baseline tests with original carburetor, original jet, and stock muffler to establish new baseline at 0 hours

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3069	3065	3061	3057	3058	
Obs. Power	hp	4.23	3.20	2.13	1.06	0.41	
Obs. Torque	ft-lb	7.15	5.41	3.60	1.79	0.69	
Calc. Power (Obs. Torque*Speed)	hp	4.18	3.16	2.10	1.04	0.40	
Work (5 min Interval)	hp-hr	0.353	0.267	0.177	0.088	0.034	
Fuel Flow	lb/hr	2.917	2.397	1.847	1.437	1.143	
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	
Oil	deg F	248	234	214	191	180	
Exhaust Gas (muffler-in/manifold)	deg F	1311	1279	1283	1243	1216	
Exhaust Gas (muffler out)	deg F	812	699	593	460	390	
Catalyst/Muffler Surface	deg F	618	537	484	415	352	
Intake Air (EPA)	deg F	91	90	89	86	85	
Intake Air DewPoint (EPA)	deg F	65	64	64	63	63	
Cyl Head (Spark Plug)	deg F	506	472	432	381	352	
PRESSURES							
Exhaust BP Before Cat	psig	0.74	0.49	0.32	0.19	0.12	
Barometer	"Hg	28.858	28.848	28.846	28.842	28.839	
F Factor	----	1.055	1.053	1.052	1.047	1.046	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	152.13	133.12	109.22	123.12	154.77	
Dilute CO conc (dry)	%	0.41	0.32	0.23	0.19	0.16	
Dilute CO ₂ conc (dry)	%	0.60	0.51	0.41	0.31	0.24	
Dilute NO _x conc (dry)	ppm	16.53	14.12	8.02	3.12	1.69	
Measured A/F	----	11.86	12.02	12.17	11.82	11.64	
Dry/Wet Correction	----	0.97	0.97	0.97	0.98	0.98	
NO _x Humidity Correction	----	1.11	1.09	1.10	1.08	1.08	
Raw O ₂ conc (dry) _{measured}	%	0.13	0.15	0.15	0.27	0.48	
HC Mass	g/hr	19.58	17.18	14.11	16.16	20.48	
NO _x Mass	g/hr	7.76	6.63	3.81	1.46	0.79	
CO Mass	g/hr	1063.7	834.8	613.4	504.7	424.7	
CO ₂ Mass	g/hr	2301	1949	1547	1144	850	
BSHC	g/hp-hr	4.62	5.40	6.64	15.30	48.75	
BSNO _x	g/hp-hr	1.83	2.09	1.79	1.38	1.88	
BSCO	g/hp-hr	251.20	262.62	288.80	477.89	1010.90	
BSCO ₂	g/hp-hr	543.39	613.05	728.27	1083.57	2022.74	
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions³	g/hp-hr	7.99	1.86	9.85	319.0	744.0	0.918

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S #2

Date: 6/16/03

Test ID: B+S #2-BSLN-RPT#4

Repeat of October baseline tests with original carburetor, original jet, and stock muffler to establish new baseline at 0 hours

DESCRIPTION	UNIT		1	2	3	4	5	
Mode	----							
Weight Factor	----		0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----		300	300	300	300	300	
Speed Set	%Rated		85	85	85	85	85	
Load Set	%Rated		100	75	50	25	10	
ENGINE DATA								
Obs. Speed	rpm		3065	3059	3065	3071	3066	
Obs. Power	hp		4.43	3.32	2.21	1.10	0.44	
Obs. Torque	ft-lb		7.49	5.63	3.74	1.86	0.74	
Calc. Power (Obs. Torque*Speed)	hp		4.37	3.28	2.18	1.09	0.43	
Work (5 min Interval)	hp-hr		0.369	0.277	0.184	0.092	0.037	
Fuel Flow	lb/hr		2.829	2.344	1.855	1.408	1.067	
TEMPERATURES								
Catalyst Mid-bed	deg F		NA	NA	NA	NA	NA	
Oil	deg F		241	223	202	182	170	
Exhaust Gas (muffler-in/manifold)	deg F		1310	1278	1284	1239	1217	
Exhaust Gas (muffler out)	deg F		817	704	591	464	379	
Catalyst/Muffler Surface	deg F		NA	NA	NA	NA	NA	
Intake Air (EPA)	deg F		86	85	82	80	78	
Intake Air DewPoint (EPA)	deg F		58	58	56	56	55	
Cyl Head (Spark Plug)	deg F		504	467	424	373	343	
PRESSURES								
Exhaust BP Before Cat	psig		0.75	0.50	0.33	0.21	0.13	
Barometer	"Hg		29.097	29.103	29.098	29.096	29.099	
F Factor	----		1.034	1.032	1.028	1.025	1.022	
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED¹ (ETIS)								
Dilute HC conc (wet)	ppm		131.19	120.83	100.69	124.09	133.94	
Dilute CO conc (dry)	%		0.38	0.30	0.22	0.18	0.14	
Dilute CO ₂ conc (dry)	%		0.59	0.50	0.42	0.30	0.23	
Dilute NO _x conc (dry)	ppm		17.91	14.97	9.05	3.04	1.59	
Measured A/F	----		11.99	12.11	12.35	11.78	11.82	
Dry/Wet Correction	----		0.98	0.98	0.98	0.98	0.98	
NO _x Humidity Correction	----		1.00	0.99	0.98	0.97	0.96	
Raw O ₂ conc (dry) _{measured}	%		0.13	0.15	0.16	0.33	0.56	
HC Mass	g/hr		17.11	15.89	13.31	16.67	18.15	
NO _x Mass	g/hr		7.75	6.52	3.90	1.30	0.66	
CO Mass	g/hr		1006.3	807.2	585.1	504.9	391.0	
CO ₂ Mass	g/hr		2277	1924	1604	1103	805	
BSHC	g/hp-hr		3.86	4.78	6.00	15.11	40.89	
BSNO _x	g/hp-hr		1.75	1.96	1.76	1.17	1.49	
BSCO	g/hp-hr		227.25	242.84	263.55	457.66	880.90	
BSCO ₂	g/hp-hr		514.30	578.82	722.70	999.53	1813.99	
Emission Test Results								
Emission Test Results	----		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr		7.30	1.75	9.05	294.9	709.0	0.864

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S #2

Date: 5/27/03

Test ID: B+S #2-L-BSLN#1

Development testing with catalyst L integrated inside of Briggs muffler and stock jetting.

DESCRIPTION	UNIT		1	2	3	4	5	
Mode	----							
Weight Factor	----		0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----		300	300	300	300	300	
Speed Set	%Rated		85	85	85	85	85	
Load Set	%Rated		100	75	50	25	10	
ENGINE DATA								
Obs. Speed	rpm		3054	3062	3059	3062	3064	
Obs. Power	hp		4.24	3.18	2.17	1.05	0.42	
Obs. Torque	ft-lb		7.19	5.38	3.67	1.77	0.71	
Calc. Power (Obs. Torque*Speed)	hp		4.18	3.14	2.14	1.03	0.41	
Work (5 min Interval)	hp-hr		0.353	0.265	0.181	0.087	0.035	
Fuel Flow	lb/hr		2.904	2.375	1.942	1.555	1.262	
TEMPERATURES								
Catalyst Mid-bed	deg F		1159	1067	1043	1021	1035	
Oil	deg F		241	230	211	194	175	
Exhaust Gas (muffler-in/manifold)	deg F		1318	1263	1252	1207	1181	
Exhaust Gas (muffler out)	deg F		799	697	645	586	548	
Catalyst/Muffler Surface	deg F		580	528	501	466	441	
Intake Air (EPA)	deg F		87	87	86	85	83	
Intake Air DewPoint (EPA)	deg F		61	62	62	61	61	
Cyl Head (Spark Plug)	deg F		491	452	412	366	332	
PRESSURES								
Exhaust BP Before Cat	psig		0.69	0.49	0.35	0.24	0.18	
Barometer	"Hg		29.228	29.239	29.239	29.239	29.240	
F Factor	----		1.033	1.033	1.031	1.031	1.027	
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED¹ (ETIS)								
Dilute HC conc (wet)	ppm		98.86	93.25	82.69	104.37	115.69	
Dilute CO conc (dry)	%		0.31	0.26	0.20	0.16	0.13	
Dilute CO ₂ conc (dry)	%		0.68	0.55	0.47	0.37	0.31	
Dilute NO _x conc (dry)	ppm		7.91	4.56	2.23	0.80	0.39	
Measured A/F	----		12.36	12.10	12.00	11.39	11.12	
Dry/Wet Correction	----		0.97	0.98	0.98	0.98	0.98	
NO _x Humidity Correction	----		1.04	1.05	1.04	1.04	1.04	
Raw O ₂ conc (dry) _{measured}	%		0.10	0.10	0.10	0.15	0.22	
HC Mass	g/hr		12.79	12.16	10.78	13.84	15.47	
NO _x Mass	g/hr		3.53	2.06	0.98	0.32	0.13	
CO Mass	g/hr		830.7	697.7	527.7	445.6	345.3	
CO ₂ Mass	g/hr		2670	2150	1823	1407	1155	
BSHC	g/hp-hr		3.01	3.82	5.07	13.10	36.85	
BSNO _x	g/hp-hr		0.83	0.65	0.46	0.31	0.31	
BSCO	g/hp-hr		195.61	219.01	248.37	421.83	822.42	
BSCO ₂	g/hp-hr		628.75	674.70	857.78	1331.90	2750.10	
Emission Test Results	----		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions³	g/hp-hr		6.13	0.57	6.70	269.4	873.0	0.951

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S #2

Date: 6/16/03

Test ID: B+S #2-L-#3

Final development testing with catalyst L integrated in a modified muffler, original stock carburetion, and a passive SAI system

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3069	3060	3061	3060	3075	
Obs. Power	hp	4.37	3.30	2.19	1.09	0.44	
Obs. Torque	ft-lb	7.37	5.59	3.71	1.84	0.75	
Calc. Power (Obs. Torque*Speed)	hp	4.31	3.26	2.16	1.07	0.44	
Work (5 min Interval)	hp-hr	0.364	0.275	0.183	0.091	0.037	
Fuel Flow	lb/hr	2.970	2.302	1.789	1.370	1.053	
TEMPERATURES							
Catalyst Mid-bed	deg F	1252	1193	1163	1150	1174	
Oil	deg F	256	232	210	188	176	
Exhaust Gas (muffler-in/manifold)	deg F	1283	1222	1166	1077	987	
Exhaust Gas (muffler out)	deg F	848	758	687	642	597	
Catalyst/Muffler Surface	deg F	567	515	467	426	406	
Intake Air (EPA)	deg F	93	90	87	85	83	
Intake Air DewPoint (EPA)	deg F	55	56	56	56	56	
Cyl Head (Spark Plug)	deg F	529	483	436	385	355	
PRESSURES							
Exhaust BP Before Cat	psig	0.46	0.30	0.21	0.15	0.10	
Barometer	"Hg	29.081	29.071	29.069	29.066	29.062	
F Factor	----	1.042	1.039	1.036	1.033	1.031	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	84.57	69.59	56.87	57.33	50.98	
Dilute CO conc (dry)	%	0.34	0.24	0.16	0.12	0.08	
Dilute CO ₂ conc (dry)	%	0.68	0.55	0.46	0.36	0.30	
Dilute NO _x conc (dry)	ppm	5.91	3.39	1.50	0.57	0.32	
Measured A/F	----	12.44	12.51	12.63	12.36	12.44	
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	
NO _x Humidity Correction	----	0.96	0.97	0.97	0.97	0.97	
Raw O ₂ conc (dry) _{measured}	%	0.54	0.66	0.84	1.18	1.57	
HC Mass	g/hr	10.77	8.89	7.21	7.34	6.49	
NO _x Mass	g/hr	2.43	1.41	0.62	0.22	0.11	
CO Mass	g/hr	899.2	642.0	429.2	321.6	205.3	
CO ₂ Mass	g/hr	2660	2146	1776	1367	1113	
BSHC	g/hp-hr	2.44	2.69	3.26	6.73	14.62	
BSNO _x	g/hp-hr	0.55	0.43	0.28	0.20	0.25	
BSCO	g/hp-hr	204.19	194.54	194.37	294.60	462.30	
BSCO ₂	g/hp-hr	603.97	650.37	804.44	1252.05	2507.66	
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	3.71	0.37	4.08	219.5	827.1	0.856

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S #2

Date: 6/16/03

Test ID: B+S #2-L-#4

Final development testing with catalyst L integrated in a modified muffler, original stock carburetion, and a passive SAI system

DESCRIPTION	UNIT		1	2	3	4	5	
Mode	----							
Weight Factor	----		0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----		300	300	300	300	300	
Speed Set	%Rated		85	85	85	85	85	
Load Set	%Rated		100	75	50	25	10	
ENGINE DATA								
Obs. Speed	rpm		3058	3062	3064	3058	3066	
Obs. Power	hp		4.45	3.37	2.25	1.12	0.45	
Obs. Torque	ft-lb		7.53	5.70	3.81	1.89	0.76	
Calc. Power (Obs. Torque*Speed)	hp		4.38	3.32	2.22	1.10	0.44	
Work (5 min Interval)	hp-hr		0.370	0.281	0.188	0.093	0.038	
Fuel Flow	lb/hr		2.933	2.337	1.814	1.363	1.084	
TEMPERATURES								
Catalyst Mid-bed	deg F		1252	1197	1169	1148	1168	
Oil	deg F		250	238	217	194	178	
Exhaust Gas (muffler-in/manifold)	deg F		1283	1226	1176	1075	985	
Exhaust Gas (muffler out)	deg F		844	761	693	640	595	
Catalyst/Muffler Surface	deg F		568	520	472	428	407	
Intake Air (EPA)	deg F		95	92	89	87	85	
Intake Air DewPoint (EPA)	deg F		56	56	56	56	56	
Cyl Head (Spark Plug)	deg F		530	491	444	389	357	
PRESSURES								
Exhaust BP Before Cat	psig		0.45	0.30	0.21	0.15	0.11	
Barometer	"Hg		29.057	29.050	29.049	29.048	29.046	
F Factor	----		1.046	1.043	1.039	1.036	1.034	
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)								
Dilute HC conc (wet)	ppm		86.08	73.43	53.65	58.55	63.02	
Dilute CO conc (dry)	%		0.33	0.25	0.16	0.12	0.09	
Dilute CO ₂ conc (dry)	%		0.68	0.56	0.47	0.36	0.30	
Dilute NO _x conc (dry)	ppm		6.12	3.97	1.74	0.58	0.33	
Measured A/F	----		12.47	12.53	12.68	12.33	12.38	
Dry/Wet Correction	----		0.98	0.98	0.98	0.98	0.98	
NO _x Humidity Correction	----		0.97	0.97	0.97	0.97	0.97	
Raw O ₂ conc (dry) _{measured}	%		0.55	0.64	0.79	1.21	1.55	
HC Mass	g/hr		10.92	9.29	6.73	7.44	8.10	
NO _x Mass	g/hr		2.53	1.65	0.72	0.22	0.11	
CO Mass	g/hr		873.0	660.3	431.4	321.7	232.5	
CO ₂ Mass	g/hr		2649	2164	1809	1355	1108	
BSHC	g/hp-hr		2.45	2.77	3.00	6.66	18.24	
BSNO _x	g/hp-hr		0.57	0.49	0.32	0.20	0.26	
BSCO	g/hp-hr		195.57	196.51	192.29	288.16	523.49	
BSCO ₂	g/hp-hr		593.43	644.11	806.54	1214.17	2495.37	
Emission Test Results								
Emission Test Results	----		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr		3.69	0.41	4.09	217.7	817.2	0.847

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S #2

Date: 7/25/03

Test ID: B+S #2-125-L-#1

125-hour interval emission test "as-received" from durability with catalyst L, passive SAI system, and stock jetting. (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3055	3061	3065	3067	3051	
Obs. Power	hp	3.73	2.80	1.86	0.93	0.37	
Obs. Torque	ft-lb	6.33	4.74	3.15	1.58	0.63	
Calc. Power (Obs. Torque*Speed)	hp	3.68	2.76	1.84	0.92	0.36	
Work (5 min Interval)	hp-hr	0.311	0.233	0.155	0.078	0.031	
Fuel Flow	lb/hr	2.739	2.274	1.820	1.281	1.077	
TEMPERATURES							
Catalyst Mid-bed	deg F	1248	1209	1172	1153	1173	
Oil	deg F	226	216	198	178	166	
Exhaust Gas (muffler-in/manifold)	deg F	1237	1190	1120	1021	986	
Exhaust Gas (muffler out)	deg F	702	577	581	583	568	
Catalyst/Muffler Surface	deg F	590	557	508	455	439	
Intake Air (EPA)	deg F	100	99	97	94	93	
Intake Air DewPoint (EPA)	deg F	61	61	60	60	59	
Cyl Head (Spark Plug)	deg F	519	484	434	382	362	
PRESSURES							
Exhaust BP Before Cat	psig	0.46	0.34	0.24	0.16	0.12	
Barometer	"Hg	29.195	29.182	29.179	29.174	29.173	
F Factor	----	1.052	1.050	1.047	1.044	1.041	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	172.63	137.09	108.64	69.86	54.28	
Dilute CO conc (dry)	%	0.33	0.27	0.20	0.11	0.08	
Dilute CO ₂ conc (dry)	%	0.59	0.50	0.42	0.33	0.29	
Dilute NO _x conc (dry)	ppm	6.33	3.64	2.19	0.64	0.37	
Measured A/F	----	12.24	12.21	12.18	12.35	12.41	
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	
NO _x Humidity Correction	----	1.04	1.03	1.02	1.02	1.01	
Raw O ₂ conc (dry) _{measured}	%	0.65	0.69	0.84	1.21	1.38	
HC Mass	g/hr	23.25	18.42	14.67	9.40	7.27	
NO _x Mass	g/hr	2.81	1.63	0.96	0.26	0.14	
CO Mass	g/hr	884.7	721.1	531.4	303.9	233.2	
CO ₂ Mass	g/hr	2326	1955	1637	1265	1100	
BSHC	g/hp-hr	6.23	6.59	7.88	10.04	19.53	
BSNO _x	g/hp-hr	0.75	0.58	0.52	0.28	0.37	
BSCO	g/hp-hr	237.06	257.89	285.62	324.67	626.95	
BSCO ₂	g/hp-hr	623.15	699.10	879.72	1351.64	2956.83	
Emission Test Results							
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	7.79	0.55	8.34	283.1	894.2	0.986

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S #2

Date: 7/25/03

Test ID: B+S #2-125-L-#2

125-hour interval emission test "as-received" from durability with catalyst L, passive SAI system, and stock jetting.

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3058	3075	3057	3065	3058	
Obs. Power	hp	3.80	2.86	1.90	0.95	0.38	
Obs. Torque	ft-lb	6.44	4.81	3.21	1.61	0.65	
Calc. Power (Obs. Torque*Speed)	hp	3.75	2.82	1.87	0.94	0.38	
Work (5 min Interval)	hp-hr	0.317	0.238	0.158	0.080	0.032	
Fuel Flow	lb/hr	2.700	2.256	1.790	1.307	1.169	
TEMPERATURES							
Catalyst Mid-bed	deg F	1238	1203	1154	1117	1116	
Oil	deg F	234	224	205	183	169	
Exhaust Gas (muffler-in/manifold)	deg F	1247	1200	1122	1019	982	
Exhaust Gas (muffler out)	deg F	NA	NA	NA	NA	NA	
Catalyst/Muffler Surface	deg F	593	559	506	453	436	
Intake Air (EPA)	deg F	118	115	108	101	98	
Intake Air DewPoint (EPA)	deg F	60	59	59	59	59	
Cyl Head (Spark Plug)	deg F	527	494	442	386	360	
PRESSURES							
Exhaust BP Before Cat	psig	0.45	0.34	0.24	0.16	0.13	
Barometer	"Hg	29.162	29.146	29.145	29.139	29.137	
F Factor	----	1.075	1.071	1.063	1.054	1.050	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	148.79	121.70	101.73	81.91	91.98	
Dilute CO conc (dry)	%	0.32	0.26	0.20	0.14	0.13	
Dilute CO ₂ conc (dry)	%	0.60	0.51	0.41	0.31	0.27	
Dilute NO _x conc (dry)	ppm	7.87	4.54	2.31	0.78	0.56	
Measured A/F	----	12.38	12.36	12.17	11.91	11.66	
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	
NO _x Humidity Correction	----	1.02	1.01	1.01	1.01	1.01	
Raw O ₂ conc (dry) _{measured}	%	0.59	0.64	0.79	1.06	1.33	
HC Mass	g/hr	19.46	15.90	13.34	10.77	12.21	
NO _x Mass	g/hr	3.48	1.98	1.00	0.32	0.22	
CO Mass	g/hr	838.4	686.7	539.5	380.7	362.5	
CO ₂ Mass	g/hr	2356	1991	1586	1175	1010	
BSHC	g/hp-hr	5.12	5.57	6.99	11.36	32.84	
BSNO _x	g/hp-hr	0.92	0.69	0.53	0.34	0.60	
BSCO	g/hp-hr	220.40	240.51	282.66	401.71	974.77	
BSCO ₂	g/hp-hr	619.39	697.46	831.10	1240.27	2714.69	
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	7.36	0.63	7.99	290.8	854.0	0.965

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S #2

Date: 7/29/03

Test ID: B+S #2-125-STK-#1

125-hour interval emission test of the stock engine (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3052	3062	3055	3074	3065	
Obs. Power	hp	3.96	2.95	1.97	0.98	0.39	
Obs. Torque	ft-lb	6.72	5.00	3.34	1.66	0.66	
Calc. Power (Obs. Torque*Speed)	hp	3.90	2.91	1.95	0.97	0.39	
Work (5 min Interval)	hp-hr	0.330	0.246	0.164	0.082	0.033	
Fuel Flow	lb/hr	2.812	2.340	1.894	1.365	1.105	
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	
Oil	deg F	211	197	181	166	155	
Exhaust Gas (muffler-in/manifold)	deg F	1328	1321	1284	1230	1225	
Exhaust Gas (muffler out)	deg F	773	689	578	441	384	
Catalyst/Muffler Surface	deg F	661	609	542	444	399	
Intake Air (EPA)	deg F	86	87	86	84	82	
Intake Air DewPoint (EPA)	deg F	59	60	59	59	59	
Cyl Head (Spark Plug)	deg F	483	452	407	359	339	
PRESSURES							
Exhaust BP Before Cat	psig	0.70	0.50	0.34	0.21	0.16	
Barometer	"Hg	29.132	29.119	29.117	29.111	29.108	
F Factor	----	1.035	1.036	1.034	1.032	1.029	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	243.90	204.09	179.85	156.09	121.16	
Dilute CO conc (dry)	%	0.35	0.28	0.24	0.18	0.15	
Dilute CO ₂ conc (dry)	%	0.59	0.50	0.39	0.28	0.23	
Dilute NO _x conc (dry)	ppm	20.79	13.71	7.61	3.15	1.73	
Measured A/F	----	12.17	12.23	11.97	11.69	11.76	
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	
NO _x Humidity Correction	----	1.01	1.02	1.01	1.02	1.01	
Raw O ₂ conc (dry) _{measured}	%	0.28	0.27	0.32	0.38	0.70	
HC Mass	g/hr	32.67	27.46	24.35	21.36	16.57	
NO _x Mass	g/hr	9.16	6.05	3.36	1.36	0.71	
CO Mass	g/hr	928.2	752.7	652.5	486.7	401.7	
CO ₂ Mass	g/hr	2329	1969	1518	1058	846	
BSHC	g/hp-hr	8.27	9.28	12.30	21.73	41.83	
BSNO _x	g/hp-hr	2.32	2.05	1.70	1.38	1.80	
BSCO	g/hp-hr	235.04	254.53	329.58	495.34	1014.28	
BSCO ₂	g/hp-hr	589.70	665.86	766.95	1076.46	2137.57	
Emission Test Results							
Weighted Specific Emissions ³	g/hp-hr	12.73	1.90	14.63	329.6	783.1	BSFC (^{lb} /hp-hr) 0.969

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S #2

Date: 7/29/03

Test ID: B+S #2-125-STK-#2

125-hour interval emission test of the stock engine

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3062	3063	3058	3056	3067	
Obs. Power	hp	4.03	3.03	2.00	0.99	0.39	
Obs. Torque	ft-lb	6.82	5.12	3.39	1.69	0.66	
Calc. Power (Obs. Torque*Speed)	hp	3.97	2.99	1.97	0.98	0.38	
Work (5 min Interval)	hp-hr	0.336	0.252	0.167	0.083	0.032	
Fuel Flow	lb/hr	2.793	2.337	1.852	1.484	1.184	
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	
Oil	deg F	212	201	184	171	158	
Exhaust Gas (muffler-in/manifold)	deg F	1331	1321	1282	1241	1219	
Exhaust Gas (muffler out)	deg F	772	683	568	460	388	
Catalyst/Muffler Surface	deg F	647	592	522	457	403	
Intake Air (EPA)	deg F	90	90	88	86	84	
Intake Air DewPoint (EPA)	deg F	59	59	60	59	59	
Cyl Head (Spark Plug)	deg F	490	460	414	367	337	
PRESSURES							
Exhaust BP Before Cat	psig	0.70	0.50	0.34	0.22	0.16	
Barometer	"Hg	29.100	29.091	29.091	29.087	29.085	
F Factor	----	1.041	1.040	1.039	1.036	1.033	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	244.02	209.33	175.99	173.96	147.95	
Dilute CO conc (dry)	%	0.34	0.28	0.23	0.21	0.16	
Dilute CO ₂ conc (dry)	%	0.60	0.51	0.39	0.29	0.24	
Dilute NO _x conc (dry)	ppm	22.30	15.41	7.56	3.20	1.88	
Measured A/F	----	12.26	12.31	12.03	11.44	11.53	
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	
NO _x Humidity Correction	----	1.01	1.01	1.02	1.01	1.01	
Raw O ₂ conc (dry) _{measured}	%	0.27	0.26	0.29	0.37	0.64	
HC Mass	g/hr	32.22	27.78	23.55	23.46	20.04	
NO _x Mass	g/hr	9.69	6.72	3.27	1.29	0.70	
CO Mass	g/hr	899.1	734.7	627.1	568.0	443.2	
CO ₂ Mass	g/hr	2349	1992	1503	1088	879	
BSHC	g/hp-hr	8.02	9.19	11.68	23.28	50.51	
BSNO _x	g/hp-hr	2.41	2.22	1.62	1.28	1.77	
BSCO	g/hp-hr	223.81	243.02	311.16	563.53	1117.11	
BSCO ₂	g/hp-hr	584.82	658.87	745.83	1079.34	2215.26	
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	12.83	1.93	14.77	330.5	774.5	0.964

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S #2

Date: 9/18/03

Test ID: B+S #2-250-L-#1

250-hour interval emission test "as-received" from durability with catalyst L, passive SAI system, and stock jetting. (methane test)

DESCRIPTION	UNIT		1	2	3	4	5	
Mode	----							
Weight Factor	----		0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----		300	300	300	300	300	
Speed Set	%Rated		85	85	85	85	85	
Load Set	%Rated		100	75	50	25	10	
ENGINE DATA								
Obs. Speed	rpm		3080	3064	3063	3069	3072	
Obs. Power	hp		3.86	2.88	1.91	0.97	0.38	
Obs. Torque	ft-lb		6.49	4.88	3.23	1.64	0.63	
Calc. Power (Obs. Torque*Speed)	hp		3.80	2.85	1.89	0.96	0.37	
Work (5 min Interval)	hp-hr		0.321	0.240	0.159	0.081	0.031	
Fuel Flow	lb/hr		2.786	2.184	1.735	1.368	1.051	
TEMPERATURES								
Catalyst Mid-bed	deg F		1215	1177	1165	1158	1171	
Oil	deg F		244	228	207	192	179	
Exhaust Gas (muffler-in/manifold)	deg F		1211	1144	1077	1023	927	
Exhaust Gas (muffler out)	deg F		832	759	704	645	568	
Catalyst/Muffler Surface	deg F		538	537	494	456	397	
Intake Air (EPA)	deg F		96	93	91	90	88	
Intake Air DewPoint (EPA)	deg F		61	61	61	62	62	
Cyl Head (Spark Plug)	deg F		481	445	402	363	330	
PRESSURES								
Exhaust BP Before Cat	psig		0.51	0.36	0.25	0.17	0.12	
Barometer	"Hg		29.069	29.079	29.076	29.073	29.066	
F Factor	----		1.051	1.047	1.044	1.042	1.041	
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED¹ (ETIS)								
Dilute HC conc (wet)	ppm		208.52	157.69	122.38	95.68	69.41	
Dilute CO conc (dry)	%		0.33	0.24	0.17	0.13	0.09	
Dilute CO ₂ conc (dry)	%		0.61	0.50	0.42	0.34	0.28	
Dilute NO _x conc (dry)	ppm		9.69	5.67	2.85	1.25	0.67	
Measured A/F	----		12.36	12.44	12.52	12.29	12.29	
Dry/Wet Correction	----		0.98	0.98	0.98	0.98	0.98	
NO _x Humidity Correction	----		1.04	1.04	1.04	1.05	1.05	
Raw O ₂ conc (dry) _{measured}	%		0.75	0.84	1.00	1.26	1.64	
HC Mass	g/hr		27.90	21.14	16.43	12.89	9.31	
NO _x Mass	g/hr		4.34	2.56	1.29	0.55	0.28	
CO Mass	g/hr		877.8	640.6	459.9	354.0	238.7	
CO ₂ Mass	g/hr		2387	1948	1626	1295	1049	
BSHC	g/hp-hr		7.29	7.34	8.63	13.26	24.95	
BSNO _x	g/hp-hr		1.13	0.89	0.68	0.57	0.76	
BSCO	g/hp-hr		229.30	222.52	241.47	364.18	639.55	
BSCO ₂	g/hp-hr		623.47	676.54	853.89	1332.44	2810.46	
Emission Test Results								
Weighted Specific Emissions ³	g/hp-hr		9.09	0.82	9.91	262.7	873.2	0.950
			HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S #2

Date: 9/18/03

Test ID: B+S #2-250-L-#2

250-hour interval emission test "as-received" from durability with catalyst L, passive SAI system, and stock jetting.

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3068	3059	3065	3063	3065	
Obs. Power	hp	3.96	2.98	1.99	0.99	0.39	
Obs. Torque	ft-lb	6.68	5.04	3.36	1.68	0.65	
Calc. Power (Obs. Torque*Speed)	hp	3.90	2.94	1.96	0.98	0.38	
Work (5 min Interval)	hp-hr	0.330	0.248	0.166	0.083	0.032	
Fuel Flow	lb/hr	2.734	2.220	1.754	1.363	1.045	
TEMPERATURES							
Catalyst Mid-bed	deg F	1219	1179	1159	1163	1185	
Oil	deg F	246	231	211	191	179	
Exhaust Gas (muffler-in/manifold)	deg F	1216	1147	1079	1018	931	
Exhaust Gas (muffler out)	deg F	834	760	697	635	564	
Catalyst/Muffler Surface	deg F	589	540	474	453	410	
Intake Air (EPA)	deg F	100	96	94	92	90	
Intake Air DewPoint (EPA)	deg F	64	64	65	62	62	
Cyl Head (Spark Plug)	deg F	485	449	403	361	332	
PRESSURES							
Exhaust BP Before Cat	psig	0.48	0.34	0.24	0.16	0.12	
Barometer	"Hg	29.061	29.056	29.059	29.059	29.053	
F Factor	----	1.058	1.053	1.050	1.046	1.044	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	200.71	167.02	128.82	95.81	71.61	
Dilute CO conc (dry)	%	0.32	0.25	0.18	0.13	0.09	
Dilute CO ₂ conc (dry)	%	0.61	0.51	0.42	0.34	0.28	
Dilute NO _x conc (dry)	ppm	9.79	5.79	2.85	1.18	0.49	
Measured A/F	----	12.40	12.42	12.44	12.28	12.31	
Dry/Wet Correction	----	0.97	0.97	0.97	0.98	0.98	
NO _x Humidity Correction	----	1.09	1.09	1.10	1.05	1.05	
Raw O ₂ conc (dry) _{measured}	%	0.74	0.83	0.99	1.13	1.63	
HC Mass	g/hr	26.27	21.97	17.01	12.61	9.35	
NO _x Mass	g/hr	4.56	2.72	1.35	0.52	0.20	
CO Mass	g/hr	845.9	653.1	480.8	350.8	236.7	
CO ₂ Mass	g/hr	2370	1975	1617	1294	1045	
BSHC	g/hp-hr	6.63	7.43	8.59	12.66	23.32	
BSNO _x	g/hp-hr	1.15	0.92	0.68	0.52	0.49	
BSCO	g/hp-hr	213.55	220.88	242.80	352.25	590.10	
BSCO ₂	g/hp-hr	598.40	668.15	816.86	1299.05	2604.56	
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	8.87	0.83	9.70	257.2	846.5	0.924

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S #2

Date: 9/19/03

Test ID: B+S #2-250-STK-#1

250-hour interval emission test of the stock engine (methane test)

DESCRIPTION	UNIT		1	2	3	4	5	
Mode	----							
Weight Factor	----		0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----		300	300	300	300	300	
Speed Set	%Rated		85	85	85	85	85	
Load Set	%Rated		100	75	50	25	10	
ENGINE DATA								
Obs. Speed	rpm		3063	3059	3060	3072	3068	
Obs. Power	hp		4.08	3.06	2.04	1.02	0.40	
Obs. Torque	ft-lb		6.89	5.18	3.46	1.72	0.68	
Calc. Power (Obs. Torque*Speed)	hp		4.02	3.02	2.01	1.01	0.40	
Work (5 min Interval)	hp-hr		0.340	0.255	0.170	0.085	0.034	
Fuel Flow	lb/hr		2.823	2.247	1.731	1.380	1.124	
TEMPERATURES								
Catalyst Mid-bed	deg F		NA	NA	NA	NA	NA	
Oil	deg F		238	223	203	186	174	
Exhaust Gas (muffler-in/manifold)	deg F		1339	1307	1291	1279	1239	
Exhaust Gas (muffler out)	deg F		762	647	537	445	365	
Catalyst/Muffler Surface	deg F		608	534	470	413	348	
Intake Air (EPA)	deg F		88	87	86	85	84	
Intake Air DewPoint (EPA)	deg F		58	58	58	59	59	
Cyl Head (Spark Plug)	deg F		475	438	395	353	322	
PRESSURES								
Exhaust BP Before Cat	psig		0.72	0.49	0.33	0.23	0.15	
Barometer	"Hg		29.217	29.202	29.198	29.200	29.188	
F Factor	----		1.033	1.032	1.030	1.030	1.029	
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED¹ (ETIS)								
Dilute HC conc (wet)	ppm		275.33	238.90	194.95	164.44	193.23	
Dilute CO conc (dry)	%		0.34	0.27	0.20	0.17	0.14	
Dilute CO ₂ conc (dry)	%		0.60	0.48	0.38	0.29	0.23	
Dilute NO _x conc (dry)	ppm		24.10	16.43	9.48	3.60	1.82	
Measured A/F	----		12.27	12.27	12.31	11.83	11.76	
Dry/Wet Correction	----		0.98	0.98	0.98	0.98	0.98	
NO _x Humidity Correction	----		1.00	0.99	1.00	1.00	1.01	
Raw O ₂ conc (dry) _{measured}	%		0.36	0.39	0.43	0.56	0.96	
HC Mass	g/hr		37.06	32.37	26.59	22.62	26.89	
NO _x Mass	g/hr		10.46	7.24	4.22	1.60	0.81	
CO Mass	g/hr		905.4	715.7	532.7	473.2	400.1	
CO ₂ Mass	g/hr		2367	1883	1474	1095	843	
BSHC	g/hp-hr		9.08	10.58	13.04	21.92	65.72	
BSNO _x	g/hp-hr		2.56	2.37	2.07	1.55	1.99	
BSCO	g/hp-hr		221.92	233.98	261.22	458.50	977.77	
BSCO ₂	g/hp-hr		580.09	615.53	722.88	1060.66	2060.99	
Emission Test Results	---		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr		13.94	2.20	16.14	292.3	747.8	0.904

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle



Steady-State SORE Engine Test Information Engine: B+S #2

Date: 9/19/03

Test ID: B+S #2-250-STK-#2

250-hour interval emission test of the stock engine

DESCRIPTION	UNIT	1	2	3	4	5	
Mode	----						
Weight Factor	----	0.09	0.21	0.31	0.32	0.07	
DF Mode Interval (sec)	----	300	300	300	300	300	
Speed Set	%Rated	85	85	85	85	85	
Load Set	%Rated	100	75	50	25	10	
ENGINE DATA							
Obs. Speed	rpm	3060	3056	3055	3068	3053	
Obs. Power	hp	4.11	3.09	2.05	1.04	0.41	
Obs. Torque	ft-lb	6.96	5.24	3.48	1.76	0.70	
Calc. Power (Obs. Torque*Speed)	hp	4.06	3.05	2.02	1.03	0.41	
Work (5 min Interval)	hp-hr	0.343	0.257	0.171	0.087	0.034	
Fuel Flow	lb/hr	2.852	2.276	1.780	1.418	1.139	
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	
Oil	deg F	238	225	203	187	176	
Exhaust Gas (muffler-in/manifold)	deg F	1332	1308	1290	1279	1236	
Exhaust Gas (muffler out)	deg F	760	652	543	451	368	
Catalyst/Muffler Surface	deg F	609	542	477	420	353	
Intake Air (EPA)	deg F	90	89	87	86	85	
Intake Air DewPoint (EPA)	deg F	58	58	58	58	59	
Cyl Head (Spark Plug)	deg F	474	440	396	356	324	
PRESSURES							
Exhaust BP Before Cat	psig	0.72	0.48	0.31	0.22	0.14	
Barometer	"Hg	29.180	29.173	29.170	29.166	29.162	
F Factor	----	1.037	1.035	1.033	1.032	1.031	
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	281.09	240.16	193.85	166.71	201.63	
Dilute CO conc (dry)	%	0.34	0.26	0.20	0.17	0.15	
Dilute CO ₂ conc (dry)	%	0.60	0.49	0.39	0.30	0.23	
Dilute NO _x conc (dry)	ppm	23.21	17.98	9.83	3.73	1.87	
Measured A/F	----	12.25	12.37	12.32	11.90	11.68	
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	
NO _x Humidity Correction	----	1.00	0.99	1.00	1.00	1.00	
Raw O ₂ conc (dry) _{measured}	%	0.36	0.38	0.41	0.55	0.92	
HC Mass	g/hr	37.32	32.17	26.12	22.62	27.57	
NO _x Mass	g/hr	10.20	7.86	4.38	1.67	0.83	
CO Mass	g/hr	907.3	696.2	537.3	467.5	407.0	
CO ₂ Mass	g/hr	2403	1954	1537	1156	851	
BSHC	g/hp-hr	9.04	10.39	12.74	21.93	67.60	
BSNO _x	g/hp-hr	2.47	2.54	2.13	1.62	2.04	
BSCO	g/hp-hr	219.78	224.88	261.91	453.20	997.89	
BSCO ₂	g/hp-hr	582.04	631.21	749.41	1120.93	2087.18	
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb _f /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	13.78	2.27	16.05	288.0	771.1	0.916

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 5-mode CARB Generator Test Cycle

APPENDIX C

TECUMSEH OVRM120 EMISSION DATA SHEETS



Steady-State SORE Engine Test Information Engine: Tecumseh OVRM120 #2

Date: 12/26/02

Test ID: TEC2 BSLN #1

Baseline testing of Tecumseh engine #2 with Carb. sent on engine from Tecumseh (w/methane analysis)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3037	3055	3066	3054	3041	2499
Obs. Power	hp	3.31	2.53	1.69	0.83	0.33	0.06
Obs. Torque	ft-lb	5.64	4.29	2.85	1.41	0.57	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.26	2.50	1.66	0.82	0.33	0.06
Work (5 min Interval)	hp-hr	0.275	0.211	0.140	0.069	0.028	0.005
Fuel Flow	lb/hr	2.539	2.174	1.658	1.292	1.070	0.801
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	317	288	262	242	238	216
Exhaust Gas (muffler-in/manifold)	deg F	1251	1123	1060	1036	1054	786
Exhaust Gas (muffler out)	deg F	NA	NA	NA	NA	NA	NA
Catalyst/Muffler Surface	deg F	NA	NA	NA	NA	NA	NA
Intake Air (EPA)	deg F	72	71	70	70	70	69
Intake Air DewPoint (EPA)	deg F	36	36	37	37	38	38
Cyl Head (Spark Plug)	deg F	522	459	417	388	385	340
PRESSURES							
Exhaust BP Before Cat	psig	1.73	1.24	0.89	0.65	0.55	0.26
Barometer	"Hg	29.425	29.417	29.418	29.414	29.406	29.398
F Factor	----	0.995	0.994	0.993	0.994	0.994	0.993
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	80.59	83.28	68.91	54.97	35.03	52.54
Dilute CO conc (dry)	%	0.28	0.30	0.21	0.14	0.07	0.10
Dilute CO ₂ conc (dry)	%	0.61	0.46	0.37	0.32	0.32	0.20
Dilute NO _x conc (dry)	ppm	26.67	8.76	5.11	3.22	2.72	1.18
Measured A/F	----	12.71	11.86	12.10	12.58	13.52	12.10
Dry/Wet Correction	----	0.99	0.99	0.99	0.99	0.99	0.99
NO _x Humidity Correction	----	0.83	0.83	0.83	0.84	0.84	0.84
Raw O ₂ conc (dry) _{measured}	%	0.12	0.13	0.13	0.12	0.12	0.44
HC Mass	g/hr	10.42	10.90	9.05	7.18	4.48	6.96
NO _x Mass	g/hr	9.51	3.17	1.87	1.18	1.00	0.42
CO Mass	g/hr	733.7	792.0	568.7	379.5	182.8	274.1
CO ₂ Mass	g/hr	2372	1767	1400	1192	1197	670
BSHC	g/hp-hr	3.11	4.31	5.39	8.55	13.32	-----
BSNO _x	g/hp-hr	2.83	1.25	1.11	1.40	2.97	-----
BSCO	g/hp-hr	218.58	312.92	338.49	451.60	543.99	-----
BSCO ₂	g/hp-hr	706.61	698.11	833.46	1418.23	3562.51	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	5.45	1.58	7.02	337.1	921.5	1.048

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Tecumseh OVRM120 #2

Date: 12/27/02

Test ID: TEC2 BSLN #2

Baseline testing of Tecumseh engine #2 with Carb. sent on engine from Tecumseh

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3069	3071	3064	3051	3054	2409
Obs. Power	hp	3.38	2.55	1.70	0.83	0.33	0.07
Obs. Torque	ft-lb	5.70	4.31	2.87	1.41	0.56	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.33	2.52	1.68	0.82	0.33	0.07
Work (5 min Interval)	hp-hr	0.281	0.213	0.142	0.069	0.028	0.006
Fuel Flow	lb/hr	2.585	2.179	1.748	1.268	1.096	0.772
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	310	291	264	244	238	205
Exhaust Gas (muffler-in/manifold)	deg F	1257	1128	1079	1038	1064	755
Exhaust Gas (muffler out)	deg F	NA	NA	NA	NA	NA	NA
Catalyst/Muffler Surface	deg F	NA	NA	NA	NA	NA	NA
Intake Air (EPA)	deg F	73	70	68	70	70	68
Intake Air DewPoint (EPA)	deg F	45	45	45	44	44	43
Cyl Head (Spark Plug)	deg F	512	460	414	382	381	335
PRESSURES							
Exhaust BP Before Cat	psig	1.75	1.27	0.94	0.66	0.58	0.29
Barometer	"Hg	29.511	29.509	29.508	29.505	29.502	29.497
F Factor	----	0.996	0.993	0.990	0.993	0.993	0.989
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	89.70	84.42	87.18	57.17	35.31	64.57
Dilute CO conc (dry)	%	0.27	0.30	0.23	0.14	0.06	0.11
Dilute CO ₂ conc (dry)	%	0.64	0.46	0.38	0.31	0.33	0.17
Dilute NO _x conc (dry)	ppm	28.90	8.31	4.97	2.97	2.72	0.94
Measured A/F	----	12.78	11.83	12.00	12.55	13.59	11.25
Dry/Wet Correction	----	0.98	0.99	0.99	0.99	0.99	0.99
NO _x Humidity Correction	----	0.88	0.88	0.88	0.87	0.87	0.86
Raw O ₂ conc (dry) _{measured}	%	0.13	0.13	0.13	0.14	0.14	0.42
HC Mass	g/hr	11.54	11.01	11.49	7.46	4.45	8.61
NO _x Mass	g/hr	10.93	3.16	1.91	1.14	1.05	0.34
CO Mass	g/hr	698.6	793.4	613.6	376.8	174.7	312.4
CO ₂ Mass	g/hr	2487	1772	1448	1161	1248	565
BSHC	g/hp-hr	3.41	4.33	6.79	8.89	13.26	-----
BSNO _x	g/hp-hr	3.23	1.24	1.13	1.36	3.13	-----
BSCO	g/hp-hr	206.45	312.06	362.64	448.69	519.86	-----
BSCO ₂	g/hp-hr	734.86	696.91	855.84	1382.11	3712.90	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	6.05	1.65	7.70	342.2	925.7	1.058

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Tecumseh OVRM120 #2

Date: 12/30/02

Test ID: TEC2 BSLN #3

Baseline testing of Tecumseh engine #2 with Carb. sent on engine from Tecumseh

DESCRIPTION	UNIT		1	2	3	4	5	6
Mode	----							
Weight Factor	----		0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----		300	300	300	300	300	300
Speed Set	%Rated		85	85	85	85	85	Idle
Load Set	%Rated		100	75	50	25	10	0
ENGINE DATA								
Obs. Speed	rpm		3054	3071	3057	3064	3059	2416
Obs. Power	hp		3.04	2.29	1.52	0.76	0.30	0.01
Obs. Torque	ft-lb		5.15	3.87	2.58	1.29	0.50	0.00
Calc. Power (Obs. Torque*Speed)	hp		3.00	2.26	1.50	0.75	0.29	0.01
Work (5 min Interval)	hp-hr		0.253	0.191	0.127	0.063	0.025	0.001
Fuel Flow	lb/hr		2.527	2.186	1.616	1.301	1.059	0.772
TEMPERATURES								
Catalyst Mid-bed	deg F		NA	NA	NA	NA	NA	NA
Oil	deg F		314	285	270	253	245	214
Exhaust Gas (muffler-in/manifold)	deg F		1230	1114	1060	1037	1036	780
Exhaust Gas (muffler out)	deg F		NA	NA	NA	NA	NA	NA
Catalyst/Muffler Surface	deg F		NA	NA	NA	NA	NA	NA
Intake Air (EPA)	deg F		80	80	81	80	79	77
Intake Air DewPoint (EPA)	deg F		63	63	64	63	63	62
Cyl Head (Spark Plug)	deg F		505	450	418	392	383	345
PRESSURES								
Exhaust BP Before Cat	psig		1.73	1.28	0.95	0.73	0.64	0.37
Barometer	"Hg		28.801	28.759	28.745	28.740	28.744	28.743
F Factor	----		1.040	1.043	1.044	1.042	1.041	1.039
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED¹ (ETIS)								
Dilute HC conc (wet)	ppm		93.31	94.06	72.44	60.62	43.87	65.80
Dilute CO conc (dry)	%		0.32	0.34	0.23	0.16	0.09	0.11
Dilute CO ₂ conc (dry)	%		0.60	0.45	0.36	0.32	0.31	0.18
Dilute NO _x conc (dry)	ppm		16.01	6.05	3.97	2.82	2.24	0.94
Measured A/F	----		12.31	11.42	11.77	12.39	13.26	11.45
Dry/Wet Correction	----		0.97	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----		1.08	1.08	1.09	1.07	1.07	1.07
Raw O ₂ conc (dry) _{measured}	%		0.12	0.13	0.13	0.13	0.13	0.33
HC Mass	g/hr		11.65	11.91	9.15	7.65	5.42	8.44
NO _x Mass	g/hr		7.14	2.75	1.81	1.27	1.01	0.41
CO Mass	g/hr		810.7	870.4	593.4	413.0	228.2	302.7
CO ₂ Mass	g/hr		2229	1657	1303	1149	1108	579
BSHC	g/hp-hr		3.84	5.24	6.00	10.12	18.09	-----
BSNO _x	g/hp-hr		2.35	1.21	1.19	1.68	3.37	-----
BSCO	g/hp-hr		267.42	382.91	389.48	546.52	760.88	-----
BSCO ₂	g/hp-hr		735.42	729.05	855.00	1520.36	3693.65	-----
Emission Test Results	----		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr		6.48	1.54	8.02	405.2	960.5	1.155

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle

SwRI Proj: 08-05734



Steady-State SORE Engine Test Information Engine: Tecumseh OVRM120 #2

Date: 1/7/03

Test ID: TEC2-C-DEV1

Testing of Tecumseh engine #2 with Carb. sent on engine from Tecumseh w/Catalyst C

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3066	3057	3070	3064	3078	2403
Obs. Power	hp	3.75	2.82	1.88	0.93	0.38	0.07
Obs. Torque	ft-lb	6.33	4.77	3.17	1.57	0.63	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.69	2.78	1.85	0.92	0.37	0.07
Work (5 min Interval)	hp-hr	0.312	0.235	0.157	0.078	0.031	0.006
Fuel Flow	lb/hr	2.554	2.165	1.758	1.331	1.056	0.799
TEMPERATURES							
Catalyst Mid-bed	deg F	1289	1119	1050	1009	1012	807
Oil	deg F	304	273	257	241	231	215
Exhaust Gas (muffler-in/manifold)	deg F	1315	1195	1193	1217	1273	1003
Exhaust Gas (muffler out)	deg F	842	686	596	515	450	410
Catalyst/Muffler Surface	deg F	765	675	647	625	591	605
Intake Air (EPA)	deg F	71	71	71	71	70	75
Intake Air DewPoint (EPA)	deg F	38	39	39	39	38	38
Cyl Head (Spark Plug)	deg F	504	445	405	375	366	328
PRESSURES							
Exhaust BP Before Cat	psig	0.84	0.59	0.45	0.35	0.31	0.22
Barometer	"Hg	29.528	29.518	29.517	29.516	29.517	29.511
F Factor	----	0.991	0.991	0.991	0.991	0.990	0.997
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	60.62	66.61	50.09	35.10	20.07	46.36
Dilute CO conc (dry)	%	0.16	0.20	0.15	0.08	0.03	0.08
Dilute CO ₂ conc (dry)	%	0.72	0.54	0.46	0.39	0.35	0.21
Dilute NO _x conc (dry)	ppm	9.73	2.68	1.75	1.12	0.86	0.68
Measured A/F	----	13.34	12.44	12.51	12.91	13.62	11.03
Dry/Wet Correction	----	0.99	0.99	0.99	0.99	0.99	0.99
NO _x Humidity Correction	----	0.84	0.84	0.84	0.84	0.84	0.84
Raw O ₂ conc (dry) _{measured}	%	0.16	0.14	0.12	0.12	0.12	0.24
HC Mass	g/hr	7.79	8.72	6.52	4.47	2.39	6.10
NO _x Mass	g/hr	3.47	0.87	0.53	0.29	0.19	0.12
CO Mass	g/hr	426.5	549.5	401.4	214.3	81.2	226.7
CO ₂ Mass	g/hr	2883	2142	1812	1514	1344	744
BSHC	g/hp-hr	2.08	3.09	3.46	4.78	6.43	-----
BSNO _x	g/hp-hr	0.93	0.31	0.28	0.31	0.52	-----
BSCO	g/hp-hr	113.90	194.85	213.04	228.99	218.19	-----
BSCO ₂	g/hp-hr	769.96	759.63	961.83	1617.36	3612.07	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	3.51	0.43	3.93	197.2	1025.4	0.961

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Tecumseh OVRM120 #2

Date: 1/14/03

Test ID: TEC2-C-BSLN1m

LE Developed Baseline Test #1 (Stock Jetting, Catalyst C, and Modified 4-hole Venturi SAI) with methane analysis

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3065	3066	3057	3068	3066	2471
Obs. Power	hp	3.58	2.73	1.79	0.90	0.36	-0.02
Obs. Torque	ft-lb	6.06	4.62	3.04	1.52	0.62	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.53	2.70	1.77	0.89	0.36	-0.02
Work (5 min Interval)	hp-hr	0.299	0.228	0.150	0.075	0.030	-0.002
Fuel Flow	lb/hr	2.512	2.077	1.656	1.262	1.081	0.782
TEMPERATURES							
Catalyst Mid-bed	deg F	1366	1280	1242	1236	1237	1128
Oil	deg F	298	277	253	237	231	194
Exhaust Gas (muffler-in/manifold)	deg F	1215	1118	1068	1042	1048	812
Exhaust Gas (muffler out)	deg F	964	831	740	664	601	482
Catalyst/Muffler Surface	deg F	789	758	734	712	694	603
Intake Air (EPA)	deg F	65	65	65	65	65	65
Intake Air DewPoint (EPA)	deg F	42	42	42	42	42	42
Cyl Head (Spark Plug)	deg F	506	451	405	376	370	317
PRESSURES							
Exhaust BP Before Cat	psig	1.68	1.45	1.31	1.22	1.18	1.10
Barometer	"Hg	29.493	29.484	29.485	29.478	29.485	29.476
F Factor	----	0.986	0.985	0.986	0.986	0.986	0.986
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	54.83	48.80	39.44	24.67	15.24	33.44
Dilute CO conc (dry)	%	0.21	0.18	0.13	0.06	0.02	0.05
Dilute CO ₂ conc (dry)	%	0.65	0.53	0.44	0.38	0.36	0.23
Dilute NO _x conc (dry)	ppm	4.30	1.50	0.63	0.33	0.37	0.20
Measured A/F	----	13.02	12.82	12.80	13.33	13.94	12.56
Dry/Wet Correction	----	0.98	0.99	0.99	0.99	0.99	0.99
NO _x Humidity Correction	----	0.86	0.86	0.86	0.86	0.86	0.86
Raw O ₂ conc (dry) _{measured}	%	0.52	0.67	0.81	0.94	1.00	1.70
HC Mass	g/hr	7.11	6.35	5.10	3.06	1.73	4.35
NO _x Mass	g/hr	1.62	0.55	0.22	0.10	0.12	0.05
CO Mass	g/hr	561.2	486.1	350.4	162.1	56.0	155.2
CO ₂ Mass	g/hr	2615	2125	1753	1504	1421	838
BSHC	g/hp-hr	1.97	2.35	2.83	3.43	4.80	-----
BSNO _x	g/hp-hr	0.45	0.20	0.12	0.11	0.32	-----
BSCO	g/hp-hr	155.88	179.97	194.69	181.73	155.60	-----
BSCO ₂	g/hp-hr	726.40	786.81	974.14	1686.45	3947.18	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	2.77	0.21	2.98	184.4	1049.2	0.962

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Tecumseh OVRM120 #2

Date: 1/14/03

Test ID: TEC2-C-BSLN2m

LE Developed Baseline Test #2 (Stock Jetting, Catalyst C, and Modified 4-hole Venturi SAI)

DESCRIPTION	UNIT		1	2	3	4	5	6
Mode	----							
Weight Factor	----		0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----		300	300	300	300	300	300
Speed Set	%Rated		85	85	85	85	85	Idle
Load Set	%Rated		100	75	50	25	10	0
ENGINE DATA								
Obs. Speed	rpm		3093	3061	3053	3051	3041	2509
Obs. Power	hp		3.59	2.68	1.77	0.89	0.36	-0.03
Obs. Torque	ft-lb		6.00	4.53	3.00	1.51	0.61	0.00
Calc. Power (Obs. Torque*Speed)	hp		3.54	2.64	1.75	0.88	0.35	-0.03
Work (5 min Interval)	hp-hr		0.299	0.223	0.148	0.074	0.030	-0.003
Fuel Flow	lb/hr		2.627	2.047	1.623	1.241	1.094	0.752
TEMPERATURES								
Catalyst Mid-bed	deg F		1368	1286	1253	1252	1222	1168
Oil	deg F		302	281	261	244	239	213
Exhaust Gas (muffler-in/manifold)	deg F		1223	1128	1084	1068	1095	851
Exhaust Gas (muffler out)	deg F		963	829	737	656	550	492
Catalyst/Muffler Surface	deg F		810	769	742	719	668	624
Intake Air (EPA)	deg F		71	71	72	71	72	71
Intake Air DewPoint (EPA)	deg F		42	42	41	42	41	42
Cyl Head (Spark Plug)	deg F		509	451	414	386	383	334
PRESSURES								
Exhaust BP Before Cat	psig		1.71	1.47	1.34	1.25	1.21	1.13
Barometer	"Hg		29.398	29.393	29.391	29.390	29.395	29.391
F Factor	----		0.996	0.996	0.998	0.996	0.998	0.996
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)								
Dilute HC conc (wet)	ppm		54.65	46.08	32.64	19.39	10.15	23.60
Dilute CO conc (dry)	%		0.22	0.17	0.10	0.03	0.01	0.03
Dilute CO ₂ conc (dry)	%		0.69	0.54	0.47	0.41	0.39	0.25
Dilute NO _x conc (dry)	ppm		4.90	1.61	0.85	0.57	2.11	0.26
Measured A/F	----		13.02	12.88	13.22	13.86	14.57	13.14
Dry/Wet Correction	----		0.98	0.99	0.99	0.99	0.99	0.99
NO _x Humidity Correction	----		0.86	0.86	0.86	0.86	0.86	0.86
Raw O ₂ conc (dry) _{measured}	%		0.50	0.71	0.83	0.97	0.95	1.76
HC Mass	g/hr		6.93	5.83	4.03	2.22	0.94	2.82
NO _x Mass	g/hr		1.82	0.59	0.31	0.20	0.80	0.08
CO Mass	g/hr		588.3	460.0	267.2	88.3	13.7	96.1
CO ₂ Mass	g/hr		2734	2126	1841	1593	1508	893
BSHC	g/hp-hr		1.95	2.18	2.27	2.50	2.61	-----
BSNO _x	g/hp-hr		0.51	0.22	0.17	0.23	2.22	-----
BSCO	g/hp-hr		165.63	171.85	150.48	99.42	38.06	-----
BSCO ₂	g/hp-hr		769.71	794.06	1036.84	1793.58	4187.76	-----
Emission Test Results	----		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr		2.31	0.30	2.60	153.3	1103.2	0.965

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Tecumseh OVRM120 #2

Date: 3/18/03

Test ID: TEC2-125-#1

125-hour interval emission test "as-received" from durability with catalyst C, and passive SAI system. Test run prior to scheduled maintenance.

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3042	3061	3055	3055	3062	2530
Obs. Power	hp	3.36	2.52	1.69	0.85	0.32	0.00
Obs. Torque	ft-lb	5.73	4.27	2.87	1.44	0.55	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.32	2.49	1.67	0.84	0.32	0.00
Work (5 min Interval)	hp-hr	0.280	0.210	0.141	0.071	0.027	0.000
Fuel Flow	lb/hr	2.489	2.134	1.742	1.377	1.222	0.833
TEMPERATURES							
Catalyst Mid-bed	deg F	1380	1314	1286	1274	1248	1174
Oil	deg F	333	303	280	260	251	220
Exhaust Gas (muffler-in/manifold)	deg F	1183	1092	1047	1021	997	845
Exhaust Gas (muffler out)	deg F	969	839	744	648	561	468
Catalyst/Muffler Surface	deg F	812	667	635	601	570	499
Intake Air (EPA)	deg F	76	71	70	69	69	68
Intake Air DewPoint (EPA)	deg F	52	51	49	49	50	51
Cyl Head (Spark Plug)	deg F	521	470	433	404	385	355
PRESSURES							
Exhaust BP Before Cat	psig	0.13	0.12	0.07	0.03	0.01	-0.02
Barometer	"Hg	28.675	28.662	28.663	28.659	28.655	28.678
F Factor	----	1.032	1.027	1.024	1.023	1.023	1.022
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	94.71	79.86	57.72	40.65	30.44	31.31
Dilute CO conc (dry)	%	0.22	0.23	0.17	0.10	0.06	0.05
Dilute CO ₂ conc (dry)	%	0.66	0.51	0.44	0.39	0.38	0.25
Dilute NO _x conc (dry)	ppm	5.84	1.24	0.65	0.38	0.49	0.20
Measured A/F	----	13.10	12.48	12.67	13.10	13.64	13.03
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	0.94	0.93	0.91	0.91	0.92	0.92
Raw O ₂ conc (dry) _{measured}	%	0.61	0.72	0.90	1.04	1.20	1.80
HC Mass	g/hr	11.92	10.08	7.18	4.90	3.53	3.69
NO _x Mass	g/hr	2.33	0.48	0.24	0.13	0.17	0.05
CO Mass	g/hr	565.9	623.8	454.7	266.1	151.8	144.0
CO ₂ Mass	g/hr	2560	1978	1703	1496	1463	929
BSHC	g/hp-hr	3.51	3.98	4.24	5.71	10.91	-----
BSNO _x	g/hp-hr	0.69	0.19	0.14	0.15	0.54	-----
BSCO	g/hp-hr	166.70	246.55	268.75	310.22	468.50	-----
BSCO ₂	g/hp-hr	754.17	781.54	1006.65	1744.00	4514.68	-----
Emission Test Results							
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	4.47	0.27	4.74	256.1	1085.4	1.072

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Tecumseh OVRM120 #2

Date: 3/19/03

Test ID: TEC2-125-#2

125-hour interval emission test with catalyst C, and passive SAI system. Test run after scheduled maintenance.

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3067	3056	3063	3065	3047	2478
Obs. Power	hp	3.21	2.41	1.62	0.80	0.33	0.00
Obs. Torque	ft-lb	5.43	4.08	2.73	1.36	0.56	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.17	2.37	1.59	0.79	0.33	0.00
Work (5 min Interval)	hp-hr	0.268	0.200	0.135	0.067	0.027	0.000
Fuel Flow	lb/hr	2.467	2.114	1.656	1.278	1.106	0.763
TEMPERATURES							
Catalyst Mid-bed	deg F	1410	1352	1327	1273	1273	1237
Oil	deg F	337	329	315	292	273	250
Exhaust Gas (muffler-in/manifold)	deg F	1195	1116	1084	1005	999	868
Exhaust Gas (muffler out)	deg F	980	884	790	690	628	536
Catalyst/Muffler Surface	deg F	840	790	765	727	708	666
Intake Air (EPA)	deg F	88	89	88	84	83	81
Intake Air DewPoint (EPA)	deg F	36	34	35	33	33	33
Cyl Head (Spark Plug)	deg F	548	508	477	427	407	371
PRESSURES							
Exhaust BP Before Cat	psig	0.15	0.10	0.06	0.03	0.02	-0.01
Barometer	"Hg	28.679	28.673	28.677	28.678	28.678	28.678
F Factor	----	1.042	1.044	1.042	1.036	1.034	1.033
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	101.76	95.44	52.60	38.05	25.06	23.36
Dilute CO conc (dry)	%	0.22	0.23	0.13	0.10	0.05	0.05
Dilute CO ₂ conc (dry)	%	0.65	0.51	0.45	0.35	0.34	0.23
Dilute NO _x conc (dry)	ppm	10.53	2.65	1.17	0.41	0.50	0.18
Measured A/F	----	13.24	12.72	13.25	12.95	13.52	12.92
Dry/Wet Correction	----	0.99	0.99	0.99	0.99	0.99	0.99
NO _x Humidity Correction	----	0.83	0.83	0.83	0.82	0.82	0.82
Raw O ₂ conc (dry) _{measured}	%	0.63	0.83	0.90	1.16	1.27	1.83
HC Mass	g/hr	12.77	12.10	6.55	4.68	2.96	2.77
NO _x Mass	g/hr	3.78	0.95	0.42	0.14	0.17	0.06
CO Mass	g/hr	559.5	596.1	349.4	277.2	148.3	137.8
CO ₂ Mass	g/hr	2537	1987	1750	1340	1307	844
BSHC	g/hp-hr	3.98	5.02	4.04	5.82	9.15	-----
BSNO _x	g/hp-hr	1.18	0.39	0.26	0.17	0.54	-----
BSCO	g/hp-hr	174.54	247.13	215.52	344.92	457.94	-----
BSCO ₂	g/hp-hr	791.40	823.75	1079.31	1667.13	4036.05	-----
Emission Test Results							
Weighted Specific Emissions ³	g/hp-hr	4.80	0.47	5.27	246.8	1108.9	1.079
		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Tecumseh OVRM120 #2

Date: 3/20/03

Test ID: TEC2-125-#3

125-hour interval emission test with catalyst C, and passive SAI system. Test run after scheduled maintenance.

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3059	3058	3073	3081	3050	2486
Obs. Power	hp	3.18	2.40	1.61	0.80	0.33	0.00
Obs. Torque	ft-lb	5.39	4.06	2.71	1.35	0.56	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.14	2.37	1.58	0.79	0.32	0.00
Work (5 min Interval)	hp-hr	0.265	0.200	0.134	0.067	0.027	0.000
Fuel Flow	lb/hr	2.412	2.136	1.719	1.248	1.040	0.788
TEMPERATURES							
Catalyst Mid-bed	deg F	1421	1337	1314	1270	1277	1242
Oil	deg F	326	331	312	287	270	251
Exhaust Gas (muffler-in/manifold)	deg F	1202	1101	1065	1003	1010	869
Exhaust Gas (muffler out)	deg F	985	868	779	687	622	529
Catalyst/Muffler Surface	deg F	844	776	754	721	705	675
Intake Air (EPA)	deg F	87	95	92	87	81	77
Intake Air DewPoint (EPA)	deg F	43	43	44	44	45	43
Cyl Head (Spark Plug)	deg F	543	501	469	426	410	376
PRESSURES							
Exhaust BP Before Cat	psig	0.10	0.04	0.01	-0.02	-0.03	-0.06
Barometer	"Hg	28.977	28.987	28.990	28.993	28.993	28.996
F Factor	----	1.033	1.043	1.039	1.032	1.025	1.019
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	83.49	90.71	61.63	35.78	18.34	25.85
Dilute CO conc (dry)	%	0.19	0.24	0.15	0.09	0.04	0.06
Dilute CO ₂ conc (dry)	%	0.66	0.50	0.45	0.35	0.34	0.24
Dilute NO _x conc (dry)	ppm	9.38	1.82	1.02	0.33	0.32	0.24
Measured A/F	----	13.36	12.49	13.02	12.97	13.77	12.78
Dry/Wet Correction	----	0.98	0.99	0.99	0.99	0.99	0.99
NO _x Humidity Correction	----	0.87	0.87	0.87	0.87	0.88	0.87
Raw O ₂ conc (dry) _{measured}	%	0.65	0.83	0.95	1.13	1.26	1.85
HC Mass	g/hr	10.52	11.71	7.92	4.49	2.12	3.18
NO _x Mass	g/hr	3.51	0.69	0.39	0.12	0.12	0.09
CO Mass	g/hr	492.2	647.3	406.1	256.0	100.9	153.4
CO ₂ Mass	g/hr	2572	1939	1745	1332	1292	853
BSHC	g/hp-hr	3.28	4.88	4.93	5.59	6.80	-----
BSNO _x	g/hp-hr	1.10	0.29	0.24	0.15	0.38	-----
BSCO	g/hp-hr	153.68	269.73	252.58	318.35	323.35	-----
BSCO ₂	g/hp-hr	802.96	807.76	1084.94	1657.21	4142.14	-----
Emission Test Results							
Weighted Specific Emissions ³	g/hp-hr	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
		4.84	0.41	5.25	255.8	1107.0	1.088

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Tecumseh OVRM120 #2

Date: 3/19/03

Test ID: TEC2-125-STK-#1

125-hour interval emission test "as-received" from durability with stock muffler. Test run prior to scheduled maintenance.

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3051	3064	3057	3066	3062	2468
Obs. Power	hp	3.15	2.41	1.57	0.80	0.32	0.00
Obs. Torque	ft-lb	5.35	4.07	2.67	1.35	0.54	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.11	2.38	1.55	0.79	0.32	0.00
Work (5 min Interval)	hp-hr	0.263	0.201	0.131	0.067	0.027	0.000
Fuel Flow	lb/hr	2.515	2.166	1.697	1.205	1.010	0.757
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	347	342	327	311	299	277
Exhaust Gas (muffler-in/manifold)	deg F	1207	1138	1090	1048	1044	829
Exhaust Gas (muffler out)	deg F	NA	NA	NA	NA	NA	NA
Catalyst/Muffler Surface	deg F	NA	NA	NA	NA	NA	NA
Intake Air (EPA)	deg F	83	83	84	83	84	83
Intake Air DewPoint (EPA)	deg F	38	37	39	38	38	37
Cyl Head (Spark Plug)	deg F	523	487	455	429	416	373
PRESSURES							
Exhaust BP Before Cat	psig	0.49	0.33	0.22	0.13	0.10	0.02
Barometer	"Hg	28.761	28.762	28.761	28.765	28.762	28.763
F Factor	----	1.033	1.033	1.035	1.033	1.035	1.033
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	129.31	125.15	105.05	63.54	53.77	68.28
Dilute CO conc (dry)	%	0.31	0.33	0.23	0.13	0.07	0.11
Dilute CO ₂ conc (dry)	%	0.57	0.43	0.36	0.30	0.29	0.17
Dilute NO _x conc (dry)	ppm	19.55	7.18	4.90	3.23	2.55	1.04
Measured A/F	----	12.79	11.60	11.92	12.72	13.46	11.89
Dry/Wet Correction	----	0.99	0.99	0.99	0.99	0.99	0.99
NO _x Humidity Correction	----	0.84	0.84	0.85	0.84	0.84	0.84
Raw O ₂ conc (dry) _{measured}	%	0.24	0.30	0.30	0.30	0.43	0.79
HC Mass	g/hr	16.52	16.07	13.58	8.15	6.88	8.95
NO _x Mass	g/hr	6.99	2.44	1.66	1.04	0.80	0.22
CO Mass	g/hr	804.0	859.9	620.5	349.6	199.6	292.4
CO ₂ Mass	g/hr	2208	1633	1360	1113	1080	573
BSHC	g/hp-hr	5.16	6.73	8.57	10.14	21.24	-----
BSNO _x	g/hp-hr	2.18	1.02	1.05	1.29	2.47	-----
BSCO	g/hp-hr	250.97	360.23	391.74	435.03	616.16	-----
BSCO ₂	g/hp-hr	689.11	683.97	858.54	1384.28	3334.21	-----
Emission Test Results							
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	8.07	1.33	9.40	374.6	911.9	1.089

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Tecumseh OVRM120 #2

Date: 3/19/03

Test ID: TEC2-125-STK-#2

125-hour interval emission test with stock muffler. Test run after scheduled maintenance.

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3059	3042	3066	3076	3060	2542
Obs. Power	hp	2.96	2.22	1.48	0.75	0.29	0.00
Obs. Torque	ft-lb	5.01	3.78	2.50	1.27	0.49	0.00
Calc. Power (Obs. Torque*Speed)	hp	2.92	2.19	1.46	0.74	0.28	0.00
Work (5 min Interval)	hp-hr	0.247	0.185	0.123	0.063	0.024	0.000
Fuel Flow	lb/hr	2.366	2.060	1.656	1.280	1.052	0.796
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	347	333	310	294	269	248
Exhaust Gas (muffler-in/manifold)	deg F	1209	1111	1062	1035	978	845
Exhaust Gas (muffler out)	deg F	NA	NA	NA	NA	NA	NA
Catalyst/Muffler Surface	deg F	NA	NA	NA	NA	NA	NA
Intake Air (EPA)	deg F	88	84	81	81	80	80
Intake Air DewPoint (EPA)	deg F	33	33	34	33	32	33
Cyl Head (Spark Plug)	deg F	535	486	454	426	396	375
PRESSURES							
Exhaust BP Before Cat	psig	0.48	0.31	0.23	0.16	0.10	0.03
Barometer	"Hg	28.734	28.729	28.732	28.719	28.713	28.712
F Factor	----	1.040	1.034	1.031	1.030	1.029	1.029
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	142.87	139.09	99.34	77.41	60.87	57.83
Dilute CO conc (dry)	%	0.30	0.32	0.22	0.15	0.11	0.11
Dilute CO ₂ conc (dry)	%	0.53	0.39	0.35	0.30	0.26	0.18
Dilute NO _x conc (dry)	ppm	20.26	6.62	5.00	3.15	2.10	1.14
Measured A/F	----	12.39	11.50	11.97	12.46	12.68	11.92
Dry/Wet Correction	----	0.99	0.99	0.99	0.99	0.99	0.99
NO _x Humidity Correction	----	0.82	0.82	0.82	0.82	0.82	0.82
Raw O ₂ conc (dry) _{measured}	%	0.33	0.43	0.23	0.22	0.24	0.45
HC Mass	g/hr	18.17	18.01	12.85	10.00	7.87	7.52
NO _x Mass	g/hr	7.18	2.38	1.83	1.16	0.78	0.42
CO Mass	g/hr	771.0	850.8	602.6	403.7	307.2	296.6
CO ₂ Mass	g/hr	2046	1493	1333	1128	967	626
BSHC	g/hp-hr	6.06	8.07	8.63	13.45	27.31	-----
BSNO _x	g/hp-hr	2.39	1.07	1.23	1.55	2.69	-----
BSCO	g/hp-hr	256.99	381.17	404.99	542.76	1066.59	-----
BSCO ₂	g/hp-hr	682.08	668.77	895.76	1516.53	3355.97	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	9.27	1.49	10.76	411.0	939.2	1.152

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Tecumseh OVRM120 #2

Date: 4/21/03

Test ID: TEC2-250-#1

250-hour interval emission test with catalyst C, and passive SAI system. Test run before scheduled maintenance.

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3085	3062	3058	3053	3073	2558
Obs. Power	hp	3.32	2.46	1.66	0.81	0.32	0.00
Obs. Torque	ft-lb	5.57	4.17	2.81	1.37	0.54	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.27	2.43	1.64	0.80	0.32	0.00
Work (5 min Interval)	hp-hr	0.276	0.205	0.138	0.067	0.027	0.000
Fuel Flow	lb/hr	2.368	2.030	1.676	1.331	1.075	0.778
TEMPERATURES							
Catalyst Mid-bed	deg F	1423	1335	1317	1303	1293	1211
Oil	deg F	303	272	252	239	230	214
Exhaust Gas (muffler-in/manifold)	deg F	1208	1111	1074	1048	1041	903
Exhaust Gas (muffler out)	deg F	954	827	748	694	627	520
Catalyst/Muffler Surface	deg F	882	812	787	776	752	685
Intake Air (EPA)	deg F	79	79	79	79	78	77
Intake Air DewPoint (EPA)	deg F	50	50	50	50	50	50
Cyl Head (Spark Plug)	deg F	539	476	442	415	398	364
PRESSURES							
Exhaust BP Before Cat	psig	0.48	0.33	0.23	0.16	0.12	0.05
Barometer	"Hg	29.230	29.197	29.181	29.169	29.165	29.168
F Factor	----	1.016	1.017	1.018	1.018	1.017	1.016
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	65.47	61.58	42.03	28.69	16.85	19.02
Dilute CO conc (dry)	%	0.16	0.21	0.15	0.09	0.04	0.04
Dilute CO ₂ conc (dry)	%	0.65	0.49	0.43	0.37	0.34	0.25
Dilute NO _x conc (dry)	ppm	8.10	1.16	0.69	0.40	0.30	0.24
Measured A/F	----	13.50	12.68	12.88	13.04	13.61	13.27
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.99
NO _x Humidity Correction	----	0.91	0.91	0.92	0.92	0.91	0.92
Raw O ₂ conc (dry) _{measured}	%	0.67	0.81	0.92	1.00	1.07	1.51
HC Mass	g/hr	8.35	7.89	5.27	3.44	1.81	2.12
NO _x Mass	g/hr	3.26	0.45	0.26	0.14	0.10	0.07
CO Mass	g/hr	435.2	556.1	399.3	255.6	110.4	96.0
CO ₂ Mass	g/hr	2607	1946	1703	1451	1327	932
BSHC	g/hp-hr	2.52	3.19	3.18	4.16	5.58	-----
BSNO _x	g/hp-hr	0.98	0.18	0.16	0.17	0.30	-----
BSCO	g/hp-hr	131.45	224.87	241.30	308.74	340.96	-----
BSCO ₂	g/hp-hr	787.36	786.86	1029.27	1753.50	4096.04	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} / _{hp-hr})
Weighted Specific Emissions ³	g/hp-hr	3.32	0.33	3.65	230.3	1096.7	1.049

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Tecumseh OVRM120 #2

Date: 4/21/03

Test ID: TEC2-250-#2

250-hour interval emission test with catalyst C, and passive SAI system. Test run before scheduled maintenance.

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3070	3067	3065	3054	3046	2535
Obs. Power	hp	3.30	2.46	1.62	0.81	0.30	0.00
Obs. Torque	ft-lb	5.57	4.15	2.74	1.37	0.51	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.26	2.42	1.60	0.80	0.30	0.00
Work (5 min Interval)	hp-hr	0.275	0.205	0.135	0.067	0.025	0.000
Fuel Flow	lb/hr	2.327	2.092	1.721	1.378	1.018	0.774
TEMPERATURES							
Catalyst Mid-bed	deg F	1426	1338	1318	1300	1287	1212
Oil	deg F	307	279	255	239	231	215
Exhaust Gas (muffler-in/manifold)	deg F	1208	1111	1073	1041	1030	897
Exhaust Gas (muffler out)	deg F	957	833	753	701	623	520
Catalyst/Muffler Surface	deg F	885	812	785	776	748	681
Intake Air (EPA)	deg F	82	82	81	80	80	80
Intake Air DewPoint (EPA)	deg F	52	52	52	52	52	52
Cyl Head (Spark Plug)	deg F	543	482	444	414	398	364
PRESSURES							
Exhaust BP Before Cat	psig	0.47	0.32	0.23	0.16	0.11	0.04
Barometer	"Hg	29.161	29.161	29.145	29.139	29.133	29.100
F Factor	----	1.024	1.023	1.023	1.022	1.022	1.023
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	59.48	64.77	45.29	33.96	16.11	18.44
Dilute CO conc (dry)	%	0.16	0.21	0.16	0.11	0.04	0.04
Dilute CO ₂ conc (dry)	%	0.65	0.51	0.44	0.37	0.33	0.25
Dilute NO _x conc (dry)	ppm	7.36	1.42	0.71	0.41	0.29	0.21
Measured A/F	----	13.50	12.69	12.78	12.76	13.60	13.20
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	0.93	0.93	0.93	0.93	0.93	0.94
Raw O ₂ conc (dry) _{measured}	%	0.68	0.80	0.90	0.98	1.05	1.51
HC Mass	g/hr	7.45	8.27	5.66	4.13	1.67	2.01
NO _x Mass	g/hr	2.97	0.53	0.23	0.11	0.06	0.02
CO Mass	g/hr	425.2	570.6	426.4	311.3	101.8	99.5
CO ₂ Mass	g/hr	2568	2007	1724	1428	1261	921
BSHC	g/hp-hr	2.28	3.38	3.45	5.06	5.56	-----
BSNO _x	g/hp-hr	0.91	0.21	0.14	0.13	0.19	-----
BSCO	g/hp-hr	129.80	233.09	259.45	381.63	339.28	-----
BSCO ₂	g/hp-hr	783.84	819.99	1048.78	1750.62	4201.72	-----
Emission Test Results							
Weighted Specific Emissions ³	g/hp-hr	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
		3.55	0.31	3.86	249.9	1110.3	1.081

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Tecumseh OVRM120 #2

Date: 4/22/03

Test ID: TEC2-250-STK-#1

250-hour interval emission test with stock muffler and stock jetting. Test run before scheduled maintenance.

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3063	3059	3061	3055	3058	2517
Obs. Power	hp	3.01	2.23	1.50	0.75	0.32	0.00
Obs. Torque	ft-lb	5.10	3.78	2.54	1.27	0.55	0.00
Calc. Power (Obs. Torque*Speed)	hp	2.97	2.20	1.48	0.74	0.32	0.00
Work (5 min Interval)	hp-hr	0.251	0.186	0.125	0.063	0.027	0.000
Fuel Flow	lb/hr	2.448	2.196	1.722	1.496	1.201	0.779
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	300	275	257	242	231	216
Exhaust Gas (muffler-in/manifold)	deg F	1246	1166	1144	1090	1063	895
Exhaust Gas (muffler out)	deg F	916	759	655	556	490	351
Catalyst/Muffler Surface	deg F	871	793	738	657	607	478
Intake Air (EPA)	deg F	79	79	78	76	76	75
Intake Air DewPoint (EPA)	deg F	62	62	63	62	62	61
Cyl Head (Spark Plug)	deg F	518	472	446	411	393	361
PRESSURES							
Exhaust BP Before Cat	psig	1.40	1.06	0.82	0.63	0.49	0.24
Barometer	"Hg	29.072	29.070	29.074	29.074	29.079	29.080
F Factor	----	1.029	1.029	1.027	1.026	1.024	1.022
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	126.57	120.97	85.87	81.28	58.51	45.29
Dilute CO conc (dry)	%	0.27	0.30	0.19	0.20	0.13	0.08
Dilute CO ₂ conc (dry)	%	0.59	0.47	0.42	0.33	0.30	0.21
Dilute NO _x conc (dry)	ppm	16.39	6.25	4.88	2.74	1.92	1.07
Measured A/F	----	12.58	11.89	12.58	11.96	12.56	12.59
Dry/Wet Correction	----	0.97	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.06	1.06	1.06	1.06	1.06	1.04
Raw O ₂ conc (dry) _{measured}	%	0.26	0.21	0.19	0.17	0.16	0.38
HC Mass	g/hr	16.38	15.79	11.18	10.64	7.57	5.80
NO _x Mass	g/hr	7.21	2.60	1.99	1.00	0.62	0.21
CO Mass	g/hr	705.0	785.3	495.3	529.7	350.2	226.7
CO ₂ Mass	g/hr	2271	1794	1599	1230	1109	716
BSHC	g/hp-hr	5.44	7.00	7.39	14.07	24.27	-----
BSNO _x	g/hp-hr	2.40	1.15	1.32	1.33	1.98	-----
BSCO	g/hp-hr	234.16	348.19	327.56	700.61	1122.93	-----
BSCO ₂	g/hp-hr	754.19	795.34	1057.59	1626.81	3555.65	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	8.43	1.49	9.93	396.6	1071.0	1.228

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Tecumseh OVRM120 #2

Date: 4/22/03

Test ID: TEC2-250-STK-#2

250-hour interval emission test with stock muffler and stock jetting. Test run after scheduled maintenance.

DESCRIPTION	UNIT		1	2	3	4	5	6
Mode	----							
Weight Factor	----		0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----		300	300	300	300	300	300
Speed Set	%Rated		85	85	85	85	85	Idle
Load Set	%Rated		100	75	50	25	10	0
ENGINE DATA								
Obs. Speed	rpm		3072	3071	3061	3067	3050	2526
Obs. Power	hp		2.89	2.20	1.44	0.72	0.30	0.00
Obs. Torque	ft-lb		4.88	3.71	2.44	1.21	0.51	0.00
Calc. Power (Obs. Torque*Speed)	hp		2.85	2.17	1.42	0.71	0.30	0.00
Work (5 min Interval)	hp-hr		0.241	0.183	0.120	0.060	0.025	0.000
Fuel Flow	lb/hr		2.447	2.195	1.846	1.487	1.265	0.830
TEMPERATURES								
Catalyst Mid-bed	deg F		NA	NA	NA	NA	NA	NA
Oil	deg F		305	280	257	243	235	217
Exhaust Gas (muffler-in/manifold)	deg F		1254	1167	1123	1083	1058	936
Exhaust Gas (muffler out)	deg F		923	774	658	556	498	374
Catalyst/Muffler Surface	deg F		879	799	733	654	615	504
Intake Air (EPA)	deg F		80	79	79	78	77	76
Intake Air DewPoint (EPA)	deg F		63	63	62	62	61	61
Cyl Head (Spark Plug)	deg F		528	479	445	416	399	377
PRESSURES								
Exhaust BP Before Cat	psig		1.34	1.05	0.81	0.63	0.49	0.26
Barometer	"Hg		29.057	29.043	29.041	29.034	29.027	29.017
F Factor	----		1.032	1.031	1.030	1.028	1.027	1.026
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)								
Dilute HC conc (wet)	ppm		130.40	126.03	101.58	89.34	64.22	40.44
Dilute CO conc (dry)	%		0.26	0.32	0.25	0.19	0.16	0.08
Dilute CO ₂ conc (dry)	%		0.60	0.45	0.39	0.33	0.29	0.22
Dilute NO _x conc (dry)	ppm		18.39	5.96	4.09	2.67	2.01	1.12
Measured A/F	----		12.70	11.70	11.80	12.00	12.08	12.82
Dry/Wet Correction	----		0.97	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----		1.07	1.06	1.06	1.05	1.04	1.04
Raw O ₂ conc (dry) _{measured}	%		0.24	0.21	0.19	0.14	0.10	0.30
HC Mass	g/hr		16.81	16.42	13.27	11.67	8.28	5.07
NO _x Mass	g/hr		8.42	2.74	1.89	1.22	0.92	0.50
CO Mass	g/hr		678.7	830.8	676.1	516.4	429.6	222.6
CO ₂ Mass	g/hr		2310	1718	1482	1236	1072	797
BSHC	g/hp-hr		5.79	7.48	9.21	16.21	27.37	-----
BSNO _x	g/hp-hr		2.90	1.25	1.32	1.69	3.03	-----
BSCO	g/hp-hr		234.03	378.33	469.52	717.49	1420.21	-----
BSCO ₂	g/hp-hr		796.38	782.14	1029.02	1717.01	3542.04	-----
Emission Test Results								
Weighted Specific Emissions ³	g/hp-hr		9.58	1.70	11.28	457.2	1082.5	1.307
			HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Tecumseh OVRM120 #2

Date: 4/23/03

Test ID: TEC2-250-#3

250-hour interval emission test with catalyst C, and passive SAI system. Test run after scheduled maintenance.

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3070	3055	3054	3047	3077	2604
Obs. Power	hp	3.19	2.38	1.58	0.80	0.32	0.00
Obs. Torque	ft-lb	5.38	4.04	2.67	1.36	0.53	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.14	2.35	1.56	0.79	0.31	0.00
Work (5 min Interval)	hp-hr	0.266	0.199	0.131	0.067	0.026	0.000
Fuel Flow	lb/hr	2.335	2.091	1.692	1.401	1.172	0.789
TEMPERATURES							
Catalyst Mid-bed	deg F	1440	1368	1349	1339	1333	1298
Oil	deg F	303	276	257	242	231	215
Exhaust Gas (muffler-in/manifold)	deg F	1196	1108	1071	1040	1019	930
Exhaust Gas (muffler out)	deg F	953	850	774	712	651	545
Catalyst/Muffler Surface	deg F	827	795	791	782	770	708
Intake Air (EPA)	deg F	82	81	80	80	79	78
Intake Air DewPoint (EPA)	deg F	63	62	62	62	61	61
Cyl Head (Spark Plug)	deg F	544	486	450	419	395	372
PRESSURES							
Exhaust BP Before Cat	psig	0.45	0.31	0.22	0.15	0.11	0.04
Barometer	"Hg	28.932	28.929	28.928	28.925	28.924	28.918
F Factor	----	1.038	1.037	1.036	1.035	1.034	1.033
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	64.04	63.88	44.32	33.64	27.70	18.29
Dilute CO conc (dry)	%	0.18	0.24	0.17	0.13	0.10	0.03
Dilute CO ₂ conc (dry)	%	0.65	0.50	0.43	0.37	0.33	0.27
Dilute NO _x conc (dry)	ppm	7.39	1.21	0.61	0.31	0.26	0.21
Measured A/F	----	13.46	12.57	12.68	12.61	12.75	13.46
Dry/Wet Correction	----	0.97	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.07	1.06	1.06	1.05	1.05	1.04
Raw O ₂ conc (dry) _{measured}	%	0.85	0.99	1.11	1.27	1.40	1.89
HC Mass	g/hr	8.14	8.21	5.61	4.21	3.41	2.14
NO _x Mass	g/hr	3.39	0.54	0.26	0.12	0.09	0.07
CO Mass	g/hr	460.6	624.2	453.0	349.9	251.9	74.4
CO ₂ Mass	g/hr	2522	1923	1640	1400	1235	982
BSHC	g/hp-hr	2.55	3.46	3.54	5.31	10.98	-----
BSNO _x	g/hp-hr	1.06	0.23	0.16	0.15	0.30	-----
BSCO	g/hp-hr	144.34	262.80	285.98	441.83	810.49	-----
BSCO ₂	g/hp-hr	790.21	809.41	1035.55	1767.32	3974.60	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	3.79	0.36	4.15	286.3	1109.2	1.121

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Tecumseh OVRM120 #2

Date: 4/23/03

Test ID: TEC2-250-#4

250-hour interval emission test with catalyst C, and passive SAI system. Test run after scheduled maintenance.

DESCRIPTION	UNIT		1	2	3	4	5	6
Mode	----							
Weight Factor	----		0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----		300	300	300	300	300	300
Speed Set	%Rated		85	85	85	85	85	Idle
Load Set	%Rated		100	75	50	25	10	0
ENGINE DATA								
Obs. Speed	rpm		3056	3051	3065	3053	3038	2521
Obs. Power	hp		3.15	2.36	1.59	0.79	0.29	0.00
Obs. Torque	ft-lb		5.34	4.00	2.69	1.33	0.50	0.00
Calc. Power (Obs. Torque*Speed)	hp		3.11	2.33	1.57	0.77	0.29	0.00
Work (5 min Interval)	hp-hr		0.262	0.197	0.133	0.065	0.024	0.000
Fuel Flow	lb/hr		2.216	2.033	1.720	1.300	1.087	0.770
TEMPERATURES								
Catalyst Mid-bed	deg F		1432	1370	1351	1331	1343	1326
Oil	deg F		301	281	261	240	231	214
Exhaust Gas (muffler-in/manifold)	deg F		1194	1121	1084	1032	1042	916
Exhaust Gas (muffler out)	deg F		941	852	782	679	630	539
Catalyst/Muffler Surface	deg F		822	801	796	773	764	710
Intake Air (EPA)	deg F		84	83	82	81	80	79
Intake Air DewPoint (EPA)	deg F		63	63	63	62	62	61
Cyl Head (Spark Plug)	deg F		539	491	456	413	401	365
PRESSURES								
Exhaust BP Before Cat	psig		0.43	0.31	0.22	0.13	0.10	0.03
Barometer	"Hg		28.895	28.893	28.887	28.886	28.879	28.874
F Factor	----		1.042	1.041	1.040	1.039	1.037	1.036
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)								
Dilute HC conc (wet)	ppm		53.96	55.28	43.81	26.04	18.12	22.87
Dilute CO conc (dry)	%		0.17	0.22	0.16	0.10	0.05	0.03
Dilute CO ₂ conc (dry)	%		0.62	0.50	0.45	0.37	0.35	0.26
Dilute NO _x conc (dry)	ppm		6.32	1.40	0.65	0.64	0.51	0.34
Measured A/F	----		13.44	12.68	12.83	13.00	13.58	13.44
Dry/Wet Correction	----		0.97	0.97	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----		1.08	1.08	1.07	1.06	1.05	1.05
Raw O ₂ conc (dry) _{measured}	%		0.82	0.99	1.12	1.28	1.33	1.95
HC Mass	g/hr		6.68	6.92	5.45	3.08	2.01	2.67
NO _x Mass	g/hr		2.94	0.64	0.29	0.29	0.22	0.15
CO Mass	g/hr		444.3	581.7	425.0	260.7	123.9	74.9
CO ₂ Mass	g/hr		2384	1912	1724	1402	1322	952
BSHC	g/hp-hr		2.12	2.93	3.44	3.95	6.69	-----
BSNO _x	g/hp-hr		0.93	0.27	0.18	0.37	0.75	-----
BSCO	g/hp-hr		140.74	245.99	268.29	334.32	412.86	-----
BSCO ₂	g/hp-hr		755.27	808.73	1088.43	1797.76	4407.43	-----
Emission Test Results	----		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr		3.24	0.40	3.64	251.6	1126.7	1.094

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle

APPENDIX D
HONDA GCV160 EMISSION DATA SHEETS



Steady-State SORE Engine Test Information Engine: Honda GCV160

Date: 3/25/03

Test ID: HON-160-BSLN#1

Baseline test with stock jetting and stock muffler after 1 hour break-in (methane test)

DESCRIPTION	UNIT		1	2	3	4	5	6
Mode	----							
Weight Factor	----		0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----		300	300	300	300	300	300
Speed Set	%Rated		85	85	85	85	85	Idle
Load Set	%Rated		100	75	50	25	10	0
ENGINE DATA								
Obs. Speed	rpm		3045	3062	3063	3070	3060	1852
Obs. Power	hp		3.41	2.56	1.73	0.86	0.34	0.00
Obs. Torque	ft-lb		5.80	4.34	2.93	1.45	0.57	0.00
Calc. Power (Obs. Torque*Speed)	hp		3.37	2.53	1.71	0.85	0.33	0.00
Work (5 min Interval)	hp-hr		0.284	0.214	0.144	0.072	0.028	0.000
Fuel Flow	lb/hr		2.352	1.809	1.509	1.084	0.910	0.438
TEMPERATURES								
Catalyst Mid-bed	deg F		NA	NA	NA	NA	NA	NA
Oil	deg F		236	214	194	179	164	136
Exhaust Gas (muffler-in/manifold)	deg F		1260	1195	1108	1079	1043	816
Exhaust Gas (muffler out)	deg F		845	700	590	494	418	261
Catalyst/Muffler Surface	deg F		571	508	441	393	350	245
Intake Air (EPA)	deg F		95	92	88	86	84	79
Intake Air DewPoint (EPA)	deg F		64	63	63	64	63	63
Cyl Head (Spark Plug)	deg F		440	402	356	322	295	246
PRESSURES								
Exhaust BP Before Cat	psig		0.29	0.20	0.14	0.10	0.08	0.04
Barometer	"Hg		29.000	29.000	29.003	28.997	28.997	28.998
F Factor	----		1.054	1.049	1.044	1.041	1.039	1.033
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)								
Dilute HC conc (wet)	ppm		113.03	80.67	82.30	70.85	75.18	66.72
Dilute CO conc (dry)	%		0.29	0.21	0.21	0.13	0.12	0.06
Dilute CO ₂ conc (dry)	%		0.55	0.44	0.33	0.26	0.21	0.12
Dilute NO _x conc (dry)	ppm		30.08	19.28	5.26	2.37	1.55	0.47
Measured A/F	----		12.22	12.52	11.83	12.24	11.84	11.94
Dry/Wet Correction	----		0.97	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----		1.08	1.07	1.07	1.08	1.08	1.08
Raw O ₂ conc (dry) _{measured}	%		0.16	0.19	0.27	0.41	0.73	2.47
HC Mass	g/hr		14.41	10.32	10.69	9.23	9.89	8.82
NO _x Mass	g/hr		13.26	8.38	1.96	0.60	0.21	0.00
CO Mass	g/hr		750.0	542.5	552.9	358.7	334.8	156.8
CO ₂ Mass	g/hr		2071	1650	1212	926	718	340
BSHC	g/hp-hr		4.17	4.00	6.23	10.68	29.50	-----
BSNO _x	g/hp-hr		3.84	3.25	1.14	0.70	0.63	-----
BSCO	g/hp-hr		217.15	210.29	322.18	415.06	998.67	-----
BSCO ₂	g/hp-hr		599.79	639.43	706.32	1071.27	2142.61	-----
Emission Test Results	----		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr		6.45	2.26	8.71	295.7	754.7	0.885

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GCV160

Date: 3/25/03

Test ID: HON-160-BSLN#2

Baseline test with stock jetting and stock muffler after 1 hour break-in

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3065	3064	3060	3053	3048	1807
Obs. Power	hp	3.37	2.54	1.67	0.83	0.33	0.00
Obs. Torque	ft-lb	5.69	4.30	2.83	1.41	0.55	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.32	2.51	1.65	0.82	0.32	0.00
Work (5 min Interval)	hp-hr	0.281	0.212	0.140	0.069	0.027	0.000
Fuel Flow	lb/hr	2.292	1.848	1.502	1.124	0.923	0.432
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	231	211	191	176	166	138
Exhaust Gas (muffler-in/manifold)	deg F	1258	1192	1106	1072	1057	792
Exhaust Gas (muffler out)	deg F	840	696	576	484	434	250
Catalyst/Muffler Surface	deg F	570	508	440	391	361	237
Intake Air (EPA)	deg F	97	93	90	87	85	80
Intake Air DewPoint (EPA)	deg F	63	63	62	63	63	62
Cyl Head (Spark Plug)	deg F	440	403	356	321	301	244
PRESSURES							
Exhaust BP Before Cat	psig	0.31	0.22	0.15	0.12	0.10	0.06
Barometer	"Hg	28.984	28.967	28.965	28.964	28.959	28.960
F Factor	----	1.057	1.053	1.048	1.045	1.042	1.034
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	101.49	85.02	88.86	74.32	73.38	65.81
Dilute CO conc (dry)	%	0.29	0.21	0.21	0.14	0.12	0.05
Dilute CO ₂ conc (dry)	%	0.53	0.45	0.33	0.27	0.22	0.12
Dilute NO _x conc (dry)	ppm	26.12	16.38	5.28	2.57	1.62	0.61
Measured A/F	----	12.14	12.51	11.93	12.18	12.02	12.12
Dry/Wet Correction	----	0.97	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.08	1.08	1.06	1.07	1.07	1.05
Raw O ₂ conc (dry) _{measured}	%	0.18	0.19	0.25	0.43	0.65	2.95
HC Mass	g/hr	12.86	10.86	11.54	9.68	9.61	8.70
NO _x Mass	g/hr	11.41	7.98	1.94	0.68	0.24	0.00
CO Mass	g/hr	754.5	553.1	546.6	367.1	320.0	145.7
CO ₂ Mass	g/hr	1985	1686	1209	968	760	350
BSHC	g/hp-hr	3.83	4.29	6.87	11.53	27.62	-----
BSNO _x	g/hp-hr	3.40	3.15	1.15	0.81	0.69	-----
BSCO	g/hp-hr	224.63	218.45	325.23	437.12	919.63	-----
BSCO ₂	g/hp-hr	591.09	665.99	719.56	1152.87	2183.34	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions³	g/hp-hr	6.80	2.17	8.97	303.3	780.8	0.913

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GCV160

Date: 3/26/03

Test ID: HON-160-BSLN#3

Baseline test with stock jetting and stock muffler after 1 hour break-in

DESCRIPTION	UNIT		1	2	3	4	5	6
Mode	----							
Weight Factor	----		0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----		300	300	300	300	300	300
Speed Set	%Rated		85	85	85	85	85	Idle
Load Set	%Rated		100	75	50	25	10	0
ENGINE DATA								
Obs. Speed	rpm		3084	3064	3060	3077	3064	1828
Obs. Power	hp		3.54	2.65	1.74	0.90	0.34	0.00
Obs. Torque	ft-lb		5.95	4.48	2.95	1.51	0.58	0.00
Calc. Power (Obs. Torque*Speed)	hp		3.50	2.61	1.72	0.89	0.34	0.00
Work (5 min Interval)	hp-hr		0.295	0.221	0.145	0.075	0.029	0.000
Fuel Flow	lb/hr		2.445	1.883	1.528	1.129	0.876	0.434
TEMPERATURES								
Catalyst Mid-bed	deg F		NA	NA	NA	NA	NA	NA
Oil	deg F		235	216	196	179	167	147
Exhaust Gas (muffler-in/manifold)	deg F		1264	1200	1112	1079	1027	794
Exhaust Gas (muffler out)	deg F		863	722	595	501	420	251
Catalyst/Muffler Surface	deg F		569	507	438	390	339	234
Intake Air (EPA)	deg F		87	86	83	79	81	78
Intake Air DewPoint (EPA)	deg F		44	43	42	43	39	39
Cyl Head (Spark Plug)	deg F		444	406	358	322	292	243
PRESSURES								
Exhaust BP Before Cat	psig		0.23	0.15	0.09	0.06	0.02	-0.02
Barometer	"Hg		29.182	29.182	29.178	29.175	29.171	29.171
F Factor	----		1.025	1.024	1.020	1.015	1.016	1.012
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)								
Dilute HC conc (wet)	ppm		98.52	80.52	82.06	71.37	65.00	58.68
Dilute CO conc (dry)	%		0.29	0.20	0.19	0.13	0.12	0.05
Dilute CO ₂ conc (dry)	%		0.56	0.45	0.34	0.27	0.20	0.13
Dilute NO _x conc (dry)	ppm		35.41	23.61	6.85	3.02	1.49	0.72
Measured A/F	----		12.35	12.64	12.17	12.41	11.83	12.59
Dry/Wet Correction	----		0.98	0.99	0.99	0.99	0.99	0.99
NO _x Humidity Correction	----		0.87	0.87	0.86	0.86	0.85	0.84
Raw O ₂ conc (dry) _{measured}	%		0.15	0.18	0.23	0.31	0.50	1.70
HC Mass	g/hr		12.74	10.48	10.85	9.49	8.60	7.87
NO _x Mass	g/hr		13.39	8.96	2.55	1.06	0.45	0.15
CO Mass	g/hr		764.3	548.8	516.1	350.0	320.2	127.9
CO ₂ Mass	g/hr		2184	1743	1296	1002	698	383
BSHC	g/hp-hr		3.62	3.95	6.15	10.69	23.90	-----
BSNO _x	g/hp-hr		3.81	3.38	1.45	1.19	1.25	-----
BSCO	g/hp-hr		217.31	207.17	292.66	394.59	889.86	-----
BSCO ₂	g/hp-hr		620.83	657.93	734.89	1129.54	1938.85	-----
Emission Test Results								
Emission Test Results	----		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr		6.20	2.48	8.69	280.2	782.0	0.886

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GCV160

Date: 3/27/03

Test ID: HON-160-J-#1

Development using catalyst J in place of stock muffler

DESCRIPTION	UNIT		1	2	3	4	5	6
Mode	----							
Weight Factor	----		0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----		300	300	300	300	300	300
Speed Set	%Rated		85	85	85	85	85	Idle
Load Set	%Rated		100	75	50	25	10	0
ENGINE DATA								
Obs. Speed	rpm		3075	3058	3062	3058	3057	1869
Obs. Power	hp		3.62	2.69	1.80	0.90	0.37	0.00
Obs. Torque	ft-lb		6.09	4.56	3.04	1.53	0.62	0.00
Calc. Power (Obs. Torque*Speed)	hp		3.57	2.66	1.78	0.89	0.36	0.00
Work (5 min Interval)	hp-hr		0.301	0.225	0.150	0.075	0.031	0.000
Fuel Flow	lb/hr		2.419	1.835	1.537	1.129	0.927	0.501
TEMPERATURES								
Catalyst Mid-bed	deg F		1211	1110	969	869	808	619
Oil	deg F		230	210	188	170	162	144
Exhaust Gas (muffler-in/manifold)	deg F		1192	1148	1088	1104	1096	897
Exhaust Gas (muffler out)	deg F		NA	NA	NA	NA	NA	NA
Catalyst/Muffler Surface	deg F		504	453	391	335	304	246
Intake Air (EPA)	deg F		94	92	90	86	83	79
Intake Air DewPoint (EPA)	deg F		54	52	53	54	54	54
Cyl Head (Spark Plug)	deg F		440	404	357	319	296	252
PRESSURES								
Exhaust BP Before Cat	psig		0.25	0.23	0.22	0.21	0.20	0.19
Barometer	"Hg		28.838	28.812	28.807	28.799	28.792	28.784
F Factor	----		1.052	1.050	1.047	1.043	1.039	1.035
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)								
Dilute HC conc (wet)	ppm		86.10	67.47	78.61	65.07	61.92	54.19
Dilute CO conc (dry)	%		0.21	0.14	0.16	0.11	0.10	0.04
Dilute CO ₂ conc (dry)	%		0.63	0.50	0.37	0.29	0.23	0.15
Dilute NO _x conc (dry)	ppm		6.72	3.95	1.17	0.42	0.15	0.11
Measured A/F	----		12.54	12.84	12.10	12.35	11.86	12.27
Dry/Wet Correction	----		0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----		0.95	0.94	0.94	0.95	0.95	0.95
Raw O ₂ conc (dry) _{measured}	%		0.13	0.14	0.14	0.14	0.16	0.33
HC Mass	g/hr		11.07	8.73	10.31	8.57	8.17	7.19
NO _x Mass	g/hr		2.74	1.59	0.45	0.15	0.03	0.01
CO Mass	g/hr		554.4	365.0	437.8	289.3	273.0	101.9
CO ₂ Mass	g/hr		2483	1970	1432	1100	844	519
BSHC	g/hp-hr		3.06	3.24	5.69	9.52	21.97	-----
BSNO _x	g/hp-hr		0.76	0.59	0.25	0.16	0.08	-----
BSCO	g/hp-hr		153.43	135.26	241.67	321.48	733.88	-----
BSCO ₂	g/hp-hr		687.26	730.17	790.80	1222.77	2268.96	-----
Emission Test Results	----		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr		5.48	0.44	5.92	214.0	858.8	0.865

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GCV160

Date: 4/8/03

Test ID: HON-160-J-BSLN#1

Final 0-hr development tests with catalyst J, stock jetting, and passive SAI system (methane analysis)

DESCRIPTION	UNIT		1	2	3	4	5	6
Mode	----							
Weight Factor	----		0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----		300	300	300	300	300	300
Speed Set	%Rated		85	85	85	85	85	Idle
Load Set	%Rated		100	75	50	25	10	0
ENGINE DATA								
Obs. Speed	rpm		3071	3062	3069	3070	3058	1847
Obs. Power	hp		3.73	2.69	1.78	0.89	0.34	0.00
Obs. Torque	ft-lb		6.30	4.55	3.01	1.51	0.58	0.00
Calc. Power (Obs. Torque*Speed)	hp		3.68	2.65	1.76	0.88	0.34	0.00
Work (5 min Interval)	hp-hr		0.311	0.224	0.149	0.074	0.028	0.000
Fuel Flow	lb/hr		2.347	1.762	1.416	1.042	0.877	0.403
TEMPERATURES								
Catalyst Mid-bed	deg F		1441	1361	1251	1200	1134	762
Oil	deg F		240	216	200	181	167	161
Exhaust Gas (muffler-in/manifold)	deg F		1277	1196	1121	1089	991	815
Exhaust Gas (muffler out)	deg F		766	655	552	479	413	242
Catalyst/Muffler Surface	deg F		698	631	556	505	449	314
Intake Air (EPA)	deg F		90	86	84	81	78	76
Intake Air DewPoint (EPA)	deg F		34	36	35	37	36	34
Cyl Head (Spark Plug)	deg F		428	382	342	308	275	250
PRESSURES								
Exhaust BP Before Cat	psig		0.17	0.12	0.07	0.04	0.02	-0.02
Barometer	"Hg		29.416	29.415	29.414	29.410	29.406	29.400
F Factor	----		1.018	1.013	1.010	1.007	1.003	1.001
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)								
Dilute HC conc (wet)	ppm		38.97	33.52	29.74	24.62	36.19	16.93
Dilute CO conc (dry)	%		0.14	0.07	0.08	0.04	0.06	0.00
Dilute CO ₂ conc (dry)	%		0.68	0.54	0.42	0.33	0.26	0.17
Dilute NO _x conc (dry)	ppm		4.27	2.28	0.74	0.23	0.11	0.83
Measured A/F	----		13.10	13.46	13.17	13.40	12.76	16.37
Dry/Wet Correction	----		0.99	0.99	0.99	0.99	0.99	0.99
NO _x Humidity Correction	----		0.82	0.83	0.83	0.84	0.83	0.82
Raw O ₂ conc (dry) _{measured}	%		0.85	1.06	1.20	1.40	1.63	5.00
HC Mass	g/hr		4.87	4.23	3.76	3.10	4.74	2.06
NO _x Mass	g/hr		1.54	0.85	0.27	0.08	0.03	0.31
CO Mass	g/hr		367.4	197.6	204.0	112.3	154.1	0.0
CO ₂ Mass	g/hr		2696	2145	1651	1274	971	559
BSHC	g/hp-hr		1.32	1.58	2.10	3.51	13.17	-----
BSNO _x	g/hp-hr		0.42	0.32	0.15	0.09	0.09	-----
BSCO	g/hp-hr		99.72	73.88	114.11	127.16	428.23	-----
BSCO ₂	g/hp-hr		731.68	801.77	923.56	1442.73	2698.57	-----
Emission Test Results	----		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} / _{hp-hr})
Weighted Specific Emissions ³	g/hp-hr		2.23	0.25	2.49	105.2	972.1	0.817

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GCV160

Date: 4/8/03

Test ID: HON-160-J-BSLN#2

Final 0-hr development tests with catalyst J, stock jetting, and passive SAI system (methane analysis)

DESCRIPTION	UNIT		1	2	3	4	5	6
Mode	----							
Weight Factor	----		0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----		300	300	300	300	300	300
Speed Set	%Rated		85	85	85	85	85	Idle
Load Set	%Rated		100	75	50	25	10	0
ENGINE DATA								
Obs. Speed	rpm		3061	3056	3049	3056	3056	1834
Obs. Power	hp		3.58	2.68	1.78	0.89	0.35	0.00
Obs. Torque	ft-lb		6.05	4.54	3.02	1.51	0.60	0.00
Calc. Power (Obs. Torque*Speed)	hp		3.53	2.64	1.75	0.88	0.35	0.00
Work (5 min Interval)	hp-hr		0.298	0.223	0.148	0.074	0.029	0.000
Fuel Flow	lb/hr		2.375	1.770	1.446	1.047	0.870	0.352
TEMPERATURES								
Catalyst Mid-bed	deg F		1432	1356	1248	1205	1159	773
Oil	deg F		247	218	195	180	168	149
Exhaust Gas (muffler-in/manifold)	deg F		1271	1192	1113	1085	1015	814
Exhaust Gas (muffler out)	deg F		760	650	555	484	422	238
Catalyst/Muffler Surface	deg F		672	623	563	528	480	363
Intake Air (EPA)	deg F		89	86	83	81	79	74
Intake Air DewPoint (EPA)	deg F		36	35	37	34	37	37
Cyl Head (Spark Plug)	deg F		431	387	342	309	281	248
PRESSURES								
Exhaust BP Before Cat	psig		0.16	0.11	0.07	0.04	0.02	-0.02
Barometer	"Hg		29.388	29.382	29.385	29.390	29.385	29.383
F Factor	----		1.018	1.014	1.011	1.007	1.005	0.999
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)								
Dilute HC conc (wet)	ppm		41.13	29.58	34.22	25.83	26.62	9.87
Dilute CO conc (dry)	%		0.15	0.08	0.08	0.05	0.04	0.00
Dilute CO ₂ conc (dry)	%		0.68	0.54	0.42	0.34	0.28	0.15
Dilute NO _x conc (dry)	ppm		5.92	2.93	0.88	0.39	0.21	0.72
Measured A/F	----		13.13	13.48	13.07	13.39	13.24	16.34
Dry/Wet Correction	----		0.99	0.99	0.99	0.99	0.99	0.99
NO _x Humidity Correction	----		0.83	0.83	0.83	0.82	0.84	0.84
Raw O ₂ conc (dry) _{measured}	%		0.80	1.00	1.13	1.31	1.52	5.00
HC Mass	g/hr		5.12	3.63	4.32	3.08	3.33	0.98
NO _x Mass	g/hr		2.16	1.08	0.32	0.13	0.06	0.27
CO Mass	g/hr		383.6	203.8	227.4	118.3	93.7	0.0
CO ₂ Mass	g/hr		2708	2148	1654	1271	1061	491
BSHC	g/hp-hr		1.43	1.36	2.43	3.46	9.25	-----
BSNO _x	g/hp-hr		0.60	0.40	0.18	0.14	0.18	-----
BSCO	g/hp-hr		107.34	76.50	128.00	133.27	260.21	-----
BSCO ₂	g/hp-hr		757.68	806.42	931.11	1430.77	2947.06	-----
Emission Test Results	----		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr		2.19	0.34	2.53	110.3	983.0	0.830

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GCV160

Date: 4/25/03

Test ID: HON-160-J-125-#1

125-hour interval testing with catalyst J, stock jetting, and passive SAI system (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3074	3058	3074	3041	3073	1828
Obs. Power	hp	3.40	2.55	1.72	0.83	0.35	0.00
Obs. Torque	ft-lb	5.73	4.33	2.90	1.42	0.59	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.35	2.52	1.70	0.82	0.34	0.00
Work (5 min Interval)	hp-hr	0.283	0.213	0.143	0.070	0.029	0.000
Fuel Flow	lb/hr	2.081	1.661	1.373	1.036	0.834	0.424
TEMPERATURES							
Catalyst Mid-bed	deg F	1427	1359	1261	1217	1145	831
Oil	deg F	234	208	188	178	167	144
Exhaust Gas (muffler-in/manifold)	deg F	1268	1196	1152	1127	1054	861
Exhaust Gas (muffler out)	deg F	694	589	491	430	378	243
Catalyst/Muffler Surface	deg F	610	556	497	465	423	320
Intake Air (EPA)	deg F	90	89	84	83	83	77
Intake Air DewPoint (EPA)	deg F	45	46	46	45	46	46
Cyl Head (Spark Plug)	deg F	430	385	343	318	292	250
PRESSURES							
Exhaust BP Before Cat	psig	0.17	0.11	0.07	0.04	0.02	-0.01
Barometer	"Hg	28.880	28.893	28.896	28.898	28.904	28.899
F Factor	----	1.041	1.039	1.033	1.031	1.030	1.023
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	28.81	23.77	22.32	13.19	13.90	25.09
Dilute CO conc (dry)	%	0.07	0.05	0.05	0.01	0.02	0.00
Dilute CO ₂ conc (dry)	%	0.66	0.53	0.43	0.36	0.29	0.17
Dilute NO _x conc (dry)	ppm	7.40	3.01	1.57	0.68	0.30	0.73
Measured A/F	----	13.86	13.81	13.71	14.02	13.77	16.89
Dry/Wet Correction	----	0.98	0.98	0.99	0.99	0.99	0.99
NO _x Humidity Correction	----	0.88	0.89	0.88	0.88	0.89	0.89
Raw O ₂ conc (dry) _{measured}	%	0.82	0.96	1.15	1.24	1.38	5.50
HC Mass	g/hr	3.56	2.90	2.74	1.49	1.59	3.19
NO _x Mass	g/hr	2.86	1.15	0.58	0.23	0.07	0.25
CO Mass	g/hr	175.5	147.9	149.1	39.8	51.7	6.6
CO ₂ Mass	g/hr	2628	2085	1680	1384	1082	573
BSHC	g/hp-hr	1.05	1.14	1.60	1.77	4.66	-----
BSNO _x	g/hp-hr	0.84	0.45	0.34	0.27	0.22	-----
BSCO	g/hp-hr	51.49	58.11	86.90	47.33	151.38	-----
BSCO ₂	g/hp-hr	771.26	819.44	979.29	1648.16	3165.85	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	1.52	0.47	1.99	65.8	1044.9	0.823

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GCV160

Date: 4/25/03

Test ID: HON-160-J-125-#2

125-hour interval testing with catalyst J, stock jetting, and passive SAI system (methane test)

DESCRIPTION	UNIT		1	2	3	4	5	6
Mode	----							
Weight Factor	----		0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----		300	300	300	300	300	300
Speed Set	%Rated		85	85	85	85	85	Idle
Load Set	%Rated		100	75	50	25	10	0
ENGINE DATA								
Obs. Speed	rpm		3071	3056	3060	3044	3064	1850
Obs. Power	hp		3.35	2.53	1.68	0.84	0.33	0.00
Obs. Torque	ft-lb		5.66	4.29	2.85	1.44	0.57	0.00
Calc. Power (Obs. Torque*Speed)	hp		3.31	2.50	1.66	0.83	0.33	0.00
Work (5 min Interval)	hp-hr		0.279	0.211	0.140	0.070	0.028	0.000
Fuel Flow	lb/hr		1.943	1.691	1.319	1.052	0.867	0.423
TEMPERATURES								
Catalyst Mid-bed	deg F		1427	1353	1259	1218	1135	835
Oil	deg F		230	209	191	177	167	147
Exhaust Gas (muffler-in/manifold)	deg F		1268	1192	1149	1127	1036	875
Exhaust Gas (muffler out)	deg F		686	585	490	432	378	243
Catalyst/Muffler Surface	deg F		609	557	496	465	421	321
Intake Air (EPA)	deg F		91	88	86	83	82	79
Intake Air DewPoint (EPA)	deg F		46	46	45	45	45	45
Cyl Head (Spark Plug)	deg F		432	384	346	320	290	254
PRESSURES								
Exhaust BP Before Cat	psig		0.17	0.11	0.07	0.04	0.02	-0.01
Barometer	"Hg		28.904	28.904	28.903	28.901	28.894	28.887
F Factor	----		1.041	1.038	1.034	1.031	1.030	1.026
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED¹ (ETIS)								
Dilute HC conc (wet)	ppm		19.12	24.23	24.36	17.95	19.78	18.56
Dilute CO conc (dry)	%		0.04	0.06	0.05	0.02	0.03	0.00
Dilute CO ₂ conc (dry)	%		0.65	0.54	0.42	0.36	0.29	0.18
Dilute NO _x conc (dry)	ppm		9.80	4.63	1.40	0.53	0.32	0.77
Measured A/F	----		14.06	13.78	13.69	13.96	13.55	16.80
Dry/Wet Correction	----		0.98	0.98	0.99	0.99	0.99	0.99
NO _x Humidity Correction	----		0.89	0.89	0.88	0.88	0.88	0.88
Raw O ₂ conc (dry) _{measured}	%		0.87	1.10	1.13	1.23	1.45	5.50
HC Mass	g/hr		2.05	2.76	2.81	1.95	2.21	2.06
NO _x Mass	g/hr		3.77	1.79	0.51	0.17	0.08	0.27
CO Mass	g/hr		100.1	149.3	132.4	50.4	77.6	0.8
CO ₂ Mass	g/hr		2558	2126	1631	1388	1085	585
BSHC	g/hp-hr		0.61	1.09	1.67	2.32	6.57	-----
BSNO _x	g/hp-hr		1.12	0.70	0.30	0.20	0.24	-----
BSCO	g/hp-hr		29.69	58.71	78.79	59.99	230.96	-----
BSCO ₂	g/hp-hr		758.75	835.92	971.04	1652.29	3228.41	-----
Emission Test Results	----		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions³	g/hp-hr		1.52	0.58	2.10	62.1	1047.8	0.821

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GCV160

Date: 4/28/03

Test ID: HON-160-STK-125-#1

125-hour interval testing with stock jetting and stock muffler (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3077	3061	3050	3057	3069	1904
Obs. Power	hp	3.18	2.38	1.57	0.79	0.32	0.00
Obs. Torque	ft-lb	5.35	4.03	2.66	1.34	0.55	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.14	2.35	1.55	0.78	0.32	0.00
Work (5 min Interval)	hp-hr	0.265	0.198	0.131	0.066	0.027	0.000
Fuel Flow	lb/hr	2.004	1.697	1.280	1.041	0.846	0.444
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	225	207	191	181	169	148
Exhaust Gas (muffler-in/manifold)	deg F	1281	1212	1170	1170	1127	971
Exhaust Gas (muffler out)	deg F	833	713	611	547	466	355
Catalyst/Muffler Surface	deg F	560	504	464	439	387	319
Intake Air (EPA)	deg F	90	88	86	84	83	79
Intake Air DewPoint (EPA)	deg F	60	60	60	59	59	58
Cyl Head (Spark Plug)	deg F	426	387	350	327	301	262
PRESSURES							
Exhaust BP Before Cat	psig	0.60	0.43	0.30	0.22	0.16	0.05
Barometer	"Hg	29.063	29.061	29.056	29.058	29.056	29.056
F Factor	----	1.043	1.040	1.038	1.035	1.033	1.027
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	82.44	72.62	59.71	45.71	37.84	70.98
Dilute CO conc (dry)	%	0.13	0.13	0.10	0.06	0.05	0.00
Dilute CO ₂ conc (dry)	%	0.58	0.47	0.36	0.32	0.26	0.17
Dilute NO _x conc (dry)	ppm	67.32	34.16	11.87	4.91	2.35	1.10
Measured A/F	----	13.57	13.33	13.27	13.67	13.57	15.91
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.02	1.02	1.02	1.02	1.01	1.00
Raw O ₂ conc (dry) _{measured}	%	0.20	0.33	0.24	0.30	0.43	5.00
HC Mass	g/hr	10.57	9.39	7.69	5.81	4.77	9.46
NO _x Mass	g/hr	29.74	15.35	5.37	2.20	1.04	0.46
CO Mass	g/hr	338.2	340.4	263.0	156.4	143.0	9.9
CO ₂ Mass	g/hr	2243	1812	1356	1195	945	577
BSHC	g/hp-hr	3.35	3.95	4.89	7.33	15.29	-----
BSNO _x	g/hp-hr	9.43	6.46	3.41	2.78	3.34	-----
BSCO	g/hp-hr	107.18	143.27	167.22	197.00	458.40	-----
BSCO ₂	g/hp-hr	711.07	762.78	862.26	1505.63	3028.44	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	5.16	5.46	10.62	157.4	956.6	0.871

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GCV160

Date: 4/29/03

Test ID: HON-160-STK-125-#2

125-hour interval testing with stock jetting and stock muffler (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3072	3060	3068	3058	3080	1818
Obs. Power	hp	3.13	2.34	1.57	0.79	0.32	0.00
Obs. Torque	ft-lb	5.28	3.97	2.66	1.33	0.53	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.09	2.31	1.55	0.77	0.31	0.00
Work (5 min Interval)	hp-hr	0.261	0.195	0.131	0.065	0.026	0.000
Fuel Flow	lb/hr	2.014	1.654	1.359	1.044	0.865	0.442
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	228	209	192	180	171	150
Exhaust Gas (muffler-in/manifold)	deg F	1277	1216	1171	1168	1139	937
Exhaust Gas (muffler out)	deg F	828	707	608	540	468	335
Catalyst/Muffler Surface	deg F	554	501	460	435	389	307
Intake Air (EPA)	deg F	92	91	88	86	85	80
Intake Air DewPoint (EPA)	deg F	64	64	64	64	64	64
Cyl Head (Spark Plug)	deg F	430	389	351	328	305	260
PRESSURES							
Exhaust BP Before Cat	psig	0.59	0.41	0.32	0.23	0.16	0.04
Barometer	"Hg	29.027	29.024	29.026	29.027	29.031	29.029
F Factor	----	1.050	1.047	1.043	1.041	1.039	1.033
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	81.22	71.77	63.85	47.48	39.43	86.29
Dilute CO conc (dry)	%	0.14	0.12	0.11	0.06	0.05	0.01
Dilute CO ₂ conc (dry)	%	0.58	0.47	0.38	0.32	0.27	0.17
Dilute NO _x conc (dry)	ppm	61.33	33.76	11.36	4.75	2.61	0.98
Measured A/F	----	13.51	13.42	13.22	13.64	13.61	16.11
Dry/Wet Correction	----	0.97	0.97	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.09	1.08	1.08	1.09	1.09	1.08
Raw O ₂ conc (dry) _{measured}	%	0.22	0.32	0.25	0.30	0.41	4.50
HC Mass	g/hr	10.42	9.26	8.27	6.08	5.01	11.62
NO _x Mass	g/hr	28.58	15.72	5.18	2.04	1.01	0.21
CO Mass	g/hr	355.9	313.6	282.9	163.2	138.5	15.0
CO ₂ Mass	g/hr	2229	1796	1433	1187	979	559
BSHC	g/hp-hr	3.32	3.94	5.26	7.80	16.05	-----
BSNO _x	g/hp-hr	9.09	6.69	3.30	2.61	3.23	-----
BSCO	g/hp-hr	113.24	133.44	179.93	209.23	444.08	-----
BSCO ₂	g/hp-hr	709.24	764.09	911.62	1521.99	3139.42	-----
Emission Test Results							
	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	5.43	5.40	10.83	161.3	975.0	0.889

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GCV160

Date: 5/16/03

Test ID: HON-160-J-250-#1

250-hour interval testing with catalyst J, stock jetting, and passive SAI system (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	---						
Weight Factor	---	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	---	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3054	3062	3069	3053	3076	1775
Obs. Power	hp	3.55	2.69	1.79	0.90	0.35	0.00
Obs. Torque	ft-lb	6.02	4.55	3.02	1.52	0.59	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.50	2.65	1.76	0.88	0.35	0.00
Work (5 min Interval)	hp-hr	0.296	0.224	0.149	0.075	0.029	0.000
Fuel Flow	lb/hr	2.141	1.693	1.331	1.052	0.783	0.398
TEMPERATURES							
Catalyst Mid-bed	deg F	1440	1408	1303	1266	1183	821
Oil	deg F	235	216	199	187	174	155
Exhaust Gas (muffler-in/manifold)	deg F	1249	1207	1148	1125	1016	850
Exhaust Gas (muffler out)	deg F	693	603	503	438	377	241
Catalyst/Muffler Surface	deg F	661	624	553	519	466	299
Intake Air (EPA)	deg F	97	96	94	92	90	86
Intake Air DewPoint (EPA)	deg F	64	64	63	63	62	62
Cyl Head (Spark Plug)	deg F	441	400	357	329	294	265
PRESSURES							
Exhaust BP Before Cat	psig	0.16	0.11	0.07	0.04	0.02	-0.02
Barometer	"Hg	28.847	28.843	28.844	28.842	28.843	28.838
F Factor	---	1.063	1.061	1.058	1.056	1.052	1.047
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	56.54	36.34	28.09	34.45	30.37	17.21
Dilute CO conc (dry)	%	0.10	0.05	0.06	0.02	0.03	0.00
Dilute CO ₂ conc (dry)	%	0.67	0.56	0.42	0.36	0.26	0.16
Dilute NO _x conc (dry)	ppm	6.23	2.84	0.48	0.25	0.05	0.56
Measured A/F	---	13.58	13.80	13.46	13.82	13.33	16.84
Dry/Wet Correction	---	0.97	0.97	0.98	0.98	0.98	0.98
NO _x Humidity Correction	---	1.09	1.09	1.08	1.08	1.06	1.06
Raw O ₂ conc (dry) _{measured}	%	0.87	1.15	1.24	1.31	1.51	5.50
HC Mass	g/hr	7.15	4.52	3.47	4.36	3.84	2.06
NO _x Mass	g/hr	2.85	1.27	0.18	0.08	0.00	0.22
CO Mass	g/hr	247.3	127.8	161.8	63.2	89.0	11.3
CO ₂ Mass	g/hr	2589	2156	1599	1361	945	534
BSHC	g/hp-hr	2.00	1.69	1.94	4.91	11.03	-----
BSNO _x	g/hp-hr	0.80	0.48	0.10	0.09	0.00	-----
BSCO	g/hp-hr	69.15	47.78	90.50	71.20	255.84	-----
BSCO ₂	g/hp-hr	723.92	806.08	894.45	1531.64	2716.27	-----
Emission Test Results							
Emission Test Results	---	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} / _{hp-hr})
Weighted Specific Emissions ³	g/hp-hr	2.54	0.36	2.90	72.3	977.7	0.785

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GCV160

Date: 5/16/03

Test ID: HON-160-J-250-#2

250-hour interval testing with catalyst J, stock jetting, and passive SAI system

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3047	3049	3063	3063	3072	1797
Obs. Power	hp	3.47	2.62	1.74	0.87	0.35	0.00
Obs. Torque	ft-lb	5.90	4.44	2.95	1.48	0.59	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.42	2.58	1.72	0.86	0.34	0.00
Work (5 min Interval)	hp-hr	0.289	0.218	0.145	0.073	0.029	0.000
Fuel Flow	lb/hr	2.115	1.705	1.359	1.034	0.829	0.414
TEMPERATURES							
Catalyst Mid-bed	deg F	1434	1398	1302	1259	1189	821
Oil	deg F	241	221	202	187	175	158
Exhaust Gas (muffler-in/manifold)	deg F	1244	1201	1147	1124	1021	861
Exhaust Gas (muffler out)	deg F	690	594	501	436	378	246
Catalyst/Muffler Surface	deg F	660	620	554	514	469	312
Intake Air (EPA)	deg F	100	98	95	94	92	88
Intake Air DewPoint (EPA)	deg F	63	62	62	62	61	61
Cyl Head (Spark Plug)	deg F	444	400	358	329	296	269
PRESSURES							
Exhaust BP Before Cat	psig	0.15	0.11	0.07	0.04	0.02	-0.02
Barometer	"Hg	28.827	28.824	28.821	28.818	28.816	28.809
F Factor	----	1.066	1.063	1.060	1.058	1.054	1.050
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	37.13	29.61	29.91	20.33	21.43	21.79
Dilute CO conc (dry)	%	0.10	0.06	0.06	0.02	0.03	0.00
Dilute CO ₂ conc (dry)	%	0.66	0.56	0.43	0.36	0.28	0.17
Dilute NO _x conc (dry)	ppm	6.63	3.94	1.03	0.30	0.16	0.64
Measured A/F	----	13.56	13.73	13.46	13.80	13.38	16.78
Dry/Wet Correction	----	0.97	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.07	1.06	1.05	1.05	1.04	1.04
Raw O ₂ conc (dry) _{measured}	%	0.88	1.15	1.24	1.37	1.56	5.50
HC Mass	g/hr	4.52	3.57	3.64	2.39	2.55	2.63
NO _x Mass	g/hr	2.92	1.67	0.37	0.04	0.00	0.19
CO Mass	g/hr	266.2	149.1	169.5	58.5	85.2	9.5
CO ₂ Mass	g/hr	2530	2144	1625	1349	1019	557
BSHC	g/hp-hr	1.30	1.37	2.09	2.72	7.33	-----
BSNO _x	g/hp-hr	0.84	0.64	0.21	0.04	0.00	-----
BSCO	g/hp-hr	76.48	57.27	97.41	66.62	244.72	-----
BSCO ₂	g/hp-hr	727.01	823.43	934.11	1535.95	2927.67	-----
Emission Test Results							
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} / _{hp-hr})
Weighted Specific Emissions ³	g/hp-hr	1.97	0.44	2.41	78.0	1003.3	0.808

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GCV160

Date: 5/14/03

Test ID: HON-160-STK-250-#1

250-hour interval testing with stock muffler and stock jetting (methane test)

DESCRIPTION	UNIT		1	2	3	4	5	6
Mode	----							
Weight Factor	----		0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----		300	300	300	300	300	300
Speed Set	%Rated		85	85	85	85	85	Idle
Load Set	%Rated		100	75	50	25	10	0
ENGINE DATA								
Obs. Speed	rpm		3049	3062	3053	3062	3065	1856
Obs. Power	hp		3.28	2.47	1.65	0.82	0.33	0.00
Obs. Torque	ft-lb		5.57	4.18	2.81	1.39	0.55	0.00
Calc. Power (Obs. Torque*Speed)	hp		3.24	2.44	1.63	0.81	0.32	0.00
Work (5 min Interval)	hp-hr		0.273	0.206	0.138	0.069	0.027	0.000
Fuel Flow	lb/hr		2.083	1.695	1.325	1.008	0.845	0.416
TEMPERATURES								
Catalyst Mid-bed	deg F		NA	NA	NA	NA	NA	NA
Oil	deg F		228	213	190	177	168	145
Exhaust Gas (muffler-in/manifold)	deg F		1289	1281	1144	1116	1081	922
Exhaust Gas (muffler out)	deg F		914	827	619	526	451	364
Catalyst/Muffler Surface	deg F		489	464	383	369	356	292
Intake Air (EPA)	deg F		91	89	86	84	83	79
Intake Air DewPoint (EPA)	deg F		62	62	62	62	62	61
Cyl Head (Spark Plug)	deg F		434	408	353	322	297	262
PRESSURES								
Exhaust BP Before Cat	psig		0.70	0.54	0.29	0.20	0.15	0.04
Barometer	"Hg		28.976	28.966	28.969	28.964	28.959	28.962
F Factor	----		1.048	1.046	1.042	1.040	1.038	1.032
GASEOUS EMISSIONS								
			EMISSIONS ARE UNWEIGHTED ¹ (ETIS)					
Dilute HC conc (wet)	ppm		90.89	68.24	68.42	56.99	50.38	76.18
Dilute CO conc (dry)	%		0.14	0.07	0.11	0.07	0.07	0.00
Dilute CO ₂ conc (dry)	%		0.60	0.53	0.36	0.29	0.24	0.16
Dilute NO _x conc (dry)	ppm		68.27	51.65	11.04	3.61	1.96	0.90
Measured A/F	----		13.57	14.12	13.11	13.32	13.17	15.99
Dry/Wet Correction	----		0.97	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----		1.06	1.06	1.05	1.05	1.05	1.04
Raw O ₂ conc (dry) _{measured}	%		0.30	0.30	0.26	0.30	0.48	3.80
HC Mass	g/hr		11.64	8.73	8.89	7.41	6.54	10.19
NO _x Mass	g/hr		30.86	23.43	5.00	1.54	0.77	0.27
CO Mass	g/hr		361.9	191.8	297.4	199.7	188.6	8.9
CO ₂ Mass	g/hr		2312	2045	1361	1075	867	538
BSHC	g/hp-hr		3.51	3.53	5.41	9.08	20.20	-----
BSNO _x	g/hp-hr		9.31	9.48	3.04	1.89	2.38	-----
BSCO	g/hp-hr		109.22	77.57	180.89	244.80	582.44	-----
BSCO ₂	g/hp-hr		697.96	827.45	828.05	1317.38	2675.39	-----
Emission Test Results	----		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr		5.57	6.14	11.72	150.1	925.3	0.841

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GCV160

Date: 5/14/03

Test ID: HON-160-STK-250-#2

250-hour interval testing with stock muffler and stock jetting (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	---	1	2	3	4	5	6
Weight Factor	---	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	---	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3049	3052	3053	3049	3069	1874
Obs. Power	hp	3.40	2.55	1.70	0.86	0.35	0.00
Obs. Torque	ft-lb	5.78	4.33	2.89	1.45	0.58	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.36	2.52	1.68	0.84	0.34	0.00
Work (5 min Interval)	hp-hr	0.284	0.213	0.142	0.071	0.029	0.000
Fuel Flow	lb/hr	2.146	1.669	1.327	0.989	0.760	0.419
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	235	220	194	182	173	149
Exhaust Gas (muffler-in/manifold)	deg F	1245	1284	1151	1120	1089	921
Exhaust Gas (muffler out)	deg F	877	833	626	532	456	365
Catalyst/Muffler Surface	deg F	489	474	404	421	381	310
Intake Air (EPA)	deg F	94	93	90	89	88	83
Intake Air DewPoint (EPA)	deg F	61	61	61	62	62	61
Cyl Head (Spark Plug)	deg F	446	414	359	329	303	265
PRESSURES							
Exhaust BP Before Cat	psig	0.64	0.52	0.29	0.20	0.15	0.04
Barometer	"Hg	28.933	28.914	28.907	28.901	28.897	28.890
F Factor	---	1.053	1.052	1.049	1.049	1.047	1.041
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	97.54	60.79	66.58	50.81	40.28	73.10
Dilute CO conc (dry)	%	0.19	0.06	0.11	0.07	0.05	0.00
Dilute CO ₂ conc (dry)	%	0.57	0.54	0.36	0.29	0.23	0.16
Dilute NO _x conc (dry)	ppm	55.65	59.42	11.70	3.91	1.77	0.89
Measured A/F	---	13.14	14.37	13.14	13.44	13.34	16.04
Dry/Wet Correction	---	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	---	1.04	1.04	1.04	1.06	1.06	1.05
Raw O ₂ conc (dry) _{measured}	%	0.19	0.30	0.22	0.32	0.50	4.00
HC Mass	g/hr	12.47	7.60	8.53	6.45	5.04	9.61
NO _x Mass	g/hr	24.67	26.38	5.19	1.70	0.70	0.28
CO Mass	g/hr	488.1	149.2	296.3	182.7	140.4	10.2
CO ₂ Mass	g/hr	2200	2080	1367	1079	828	541
BSHC	g/hp-hr	3.66	2.97	5.01	7.57	14.99	-----
BSNO _x	g/hp-hr	7.24	10.30	3.04	2.00	2.07	-----
BSCO	g/hp-hr	143.18	58.25	173.84	214.46	417.92	-----
BSCO ₂	g/hp-hr	645.36	812.19	802.04	1266.42	2464.10	-----
Emission Test Results							
Emission Test Results	---	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	4.95	6.01	10.96	141.2	891.2	0.806

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GCV160

Date: 5/20/03

Test ID: HON-160-J-250-#3

250-hour interval testing with catalyst J, stock jetting, and passive SAI system after carburetor maintenance

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	---						
Weight Factor	---	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	---	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3062	3062	3052	3066	3065	1835
Obs. Power	hp	3.67	2.76	1.83	0.91	0.37	0.01
Obs. Torque	ft-lb	6.21	4.67	3.11	1.55	0.63	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.62	2.72	1.81	0.90	0.37	0.01
Work (5 min Interval)	hp-hr	0.306	0.230	0.153	0.076	0.031	0.001
Fuel Flow	lb/hr	2.079	1.771	1.491	1.105	0.941	0.498
TEMPERATURES							
Catalyst Mid-bed	deg F	1450	1412	1278	1203	1136	1069
Oil	deg F	228	213	193	178	165	146
Exhaust Gas (muffler-in/manifold)	deg F	1276	1241	1146	1091	988	723
Exhaust Gas (muffler out)	deg F	712	622	512	439	381	255
Catalyst/Muffler Surface	deg F	656	614	530	477	430	352
Intake Air (EPA)	deg F	92	90	88	87	86	82
Intake Air DewPoint (EPA)	deg F	58	58	58	58	58	58
Cyl Head (Spark Plug)	deg F	440	404	359	322	287	253
PRESSURES							
Exhaust BP Before Cat	psig	0.18	0.13	0.09	0.05	0.03	-0.01
Barometer	"Hg	29.246	29.243	29.239	29.236	29.232	29.231
F Factor	---	1.037	1.035	1.032	1.031	1.029	1.025
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	35.31	32.54	37.53	31.83	41.31	22.70
Dilute CO conc (dry)	%	0.09	0.05	0.10	0.07	0.08	0.01
Dilute CO ₂ conc (dry)	%	0.65	0.58	0.43	0.33	0.26	0.19
Dilute NO _x conc (dry)	ppm	5.45	6.06	1.36	0.66	0.61	0.59
Measured A/F	---	13.69	13.88	13.16	13.21	12.58	14.13
Dry/Wet Correction	---	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	---	1.00	0.99	0.99	0.99	1.00	0.99
Raw O ₂ conc (dry) _{measured}	%	0.84	0.92	1.05	1.18	1.42	3.05
HC Mass	g/hr	4.27	3.94	4.68	3.94	5.27	2.71
NO _x Mass	g/hr	2.36	2.65	0.60	0.29	0.27	0.26
CO Mass	g/hr	229.3	125.3	260.1	181.2	221.6	31.0
CO ₂ Mass	g/hr	2538	2272	1666	1252	953	641
BSHC	g/hp-hr	1.16	1.43	2.56	4.26	14.18	-----
BSNO _x	g/hp-hr	0.64	0.96	0.33	0.32	0.73	-----
BSCO	g/hp-hr	62.46	45.41	142.59	196.12	595.77	-----
BSCO ₂	g/hp-hr	691.41	823.83	913.11	1354.93	2562.49	-----
Emission Test Results	---	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	2.46	0.60	3.06	112.3	956.8	0.815

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GCV160

Date: 5/20/03

Test ID: HON-160-STK-250-#3

250-hour interval testing with stock muffler and stock jetting after carburetor maintenance

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	---						
Weight Factor	---	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	---	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3046	3064	3064	3059	3070	1847
Obs. Power	hp	3.39	2.58	1.72	0.87	0.35	0.01
Obs. Torque	ft-lb	5.77	4.36	2.91	1.47	0.59	0.00
Calc. Power (Obs. Torque*Speed)	hp	3.35	2.54	1.70	0.85	0.34	0.01
Work (5 min Interval)	hp-hr	0.283	0.215	0.143	0.072	0.029	0.000
Fuel Flow	lb/hr	2.126	1.789	1.546	1.100	1.020	0.484
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	235	215	198	176	166	144
Exhaust Gas (muffler-in/manifold)	deg F	1301	1283	1198	1100	1087	823
Exhaust Gas (muffler out)	deg F	874	776	636	489	440	275
Catalyst/Muffler Surface	deg F	573	538	479	400	371	214
Intake Air (EPA)	deg F	93	91	89	86	85	81
Intake Air DewPoint (EPA)	deg F	61	61	60	59	59	58
Cyl Head (Spark Plug)	deg F	447	413	369	318	298	252
PRESSURES							
Exhaust BP Before Cat	psig	0.67	0.51	0.34	0.20	0.16	0.03
Barometer	"Hg	29.197	29.220	29.223	29.231	29.236	29.241
F Factor	---	1.042	1.038	1.035	1.031	1.028	1.023
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	96.56	81.63	83.48	72.79	78.35	61.87
Dilute CO conc (dry)	%	0.16	0.11	0.14	0.11	0.11	0.04
Dilute CO ₂ conc (dry)	%	0.59	0.52	0.40	0.28	0.25	0.15
Dilute NO _x conc (dry)	ppm	59.69	43.63	11.05	3.39	2.08	0.88
Measured A/F	---	13.36	13.58	12.90	12.67	12.44	13.25
Dry/Wet Correction	---	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	---	1.03	1.03	1.02	1.01	1.01	1.00
Raw O ₂ conc (dry) _{measured}	%	0.14	0.16	0.17	0.26	0.35	1.22
HC Mass	g/hr	12.38	10.50	10.86	9.54	10.39	8.17
NO _x Mass	g/hr	26.54	19.63	4.83	1.39	0.81	0.26
CO Mass	g/hr	425.2	295.9	386.8	307.6	312.0	102.8
CO ₂ Mass	g/hr	2272	2009	1524	1029	906	491
BSHC	g/hp-hr	3.61	4.07	6.33	11.06	29.88	----
BSNO _x	g/hp-hr	7.74	7.61	2.82	1.61	2.33	----
BSCO	g/hp-hr	123.95	114.75	225.33	356.35	897.02	----
BSCO ₂	g/hp-hr	662.24	779.16	887.70	1191.73	2605.00	----
Emission Test Results							
Weighted Specific Emissions ³	g/hp-hr	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
		6.46	5.11	11.57	204.8	899.9	0.886

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle

APPENDIX E

KAWASAKI FH601V EMISSION DATA SHEETS



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 2/14/03

Test ID: KAW2-BSLN#1

Baseline Test #1 of replacement Kawasaki engine after break-in (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3056	3057	3045	3089	3045	1556
Obs. Power	hp	15.38	11.56	7.68	3.86	1.51	0.00
Obs. Torque	ft-lb	26.08	19.59	13.06	6.46	2.56	0.00
Calc. Power (Obs. Torque*Speed)	hp	15.17	11.40	7.57	3.80	1.48	0.00
Work (5 min Interval)	hp-hr	1.282	0.964	0.640	0.321	0.125	0.000
Fuel Flow	lb/hr	9.660	8.101	6.849	5.943	3.992	1.613
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	259	251	232	215	206	185
Exhaust Gas (muffler-in/manifold)	deg F	1275	1258	1222	1194	1154	775
Exhaust Gas (muffler out)	deg F	828	737	641	534	423	180
Catalyst/Muffler Surface	deg F	NA	NA	NA	NA	NA	NA
Intake Air (EPA)	deg F	95	88	85	84	83	84
Intake Air DewPoint (EPA)	deg F	65	65	66	65	65	64
Cyl Head (Spark Plug)	deg F	421	384	338	309	297	243
PRESSURES							
Exhaust BP Before Cat	psig	0.25	0.16	0.10	0.05	0.02	0.00
Barometer	"Hg	28.907	28.893	28.881	28.880	28.868	28.865
F Factor	----	1.059	1.050	1.047	1.045	1.044	1.044
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	97.64	88.79	104.77	161.32	83.37	82.08
Dilute CO conc (dry)	%	0.48	0.39	0.38	0.38	0.21	0.08
Dilute CO ₂ conc (dry)	%	0.64	0.53	0.39	0.28	0.24	0.12
Dilute NO _x conc (dry)	ppm	20.45	12.40	4.73	1.38	1.41	0.23
Measured A/F	----	11.26	11.16	10.57	9.91	10.64	10.85
Dry/Wet Correction	----	0.97	0.97	0.97	0.98	0.98	0.98
NO _x Humidity Correction	----	1.12	1.11	1.12	1.11	1.11	1.08
Raw O ₂ conc (dry) _{measured}	%	0.07	0.09	0.11	0.19	0.22	0.93
HC Mass	g/hr	38.47	35.61	42.88	67.69	34.97	35.12
NO _x Mass	g/hr	29.66	18.17	7.07	2.00	2.08	0.23
CO Mass	g/hr	3771.2	3180.7	3142.7	3162.4	1804.5	664.3
CO ₂ Mass	g/hr	7485	6239	4522	3146	2647	1107
BSHC	g/hp-hr	2.52	3.08	5.59	17.63	23.12	-----
BSNO _x	g/hp-hr	1.94	1.57	0.92	0.52	1.38	-----
BSCO	g/hp-hr	246.68	274.85	409.85	823.53	1193.05	-----
BSCO ₂	g/hp-hr	489.63	539.15	589.69	819.38	1750.32	-----
Emission Test Results							
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	6.63	1.27	7.90	417.6	615.9	0.923

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V

Date: 2/14/03

Test ID: KAW2-BSLN#2

Baseline Test #2 of replacement Kawasaki engine after break-in (TEST VOID-Idle emissions invalid)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3061	3064	3070	3085	3032	1682
Obs. Power	hp	15.44	11.58	7.67	3.85	1.49	0.00
Obs. Torque	ft-lb	26.14	19.58	12.95	6.47	2.54	0.00
Calc. Power (Obs. Torque*Speed)	hp	15.23	11.42	7.57	3.80	1.47	0.00
Work (5 min Interval)	hp-hr	1.287	0.965	0.639	0.321	0.124	0.000
Fuel Flow	lb/hr	9.638	8.245	6.856	5.965	3.891	2.668
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	270	256	236	217	207	194
Exhaust Gas (muffler-in/manifold)	deg F	1294	1248	1225	1191	1147	798
Exhaust Gas (muffler out)	deg F	848	736	642	531	420	190
Catalyst/Muffler Surface	deg F	NA	NA	NA	NA	NA	NA
Intake Air (EPA)	deg F	93	89	87	85	84	84
Intake Air DewPoint (EPA)	deg F	64	64	64	63	63	62
Cyl Head (Spark Plug)	deg F	430	383	341	309	296	248
PRESSURES							
Exhaust BP Before Cat	psig	0.23	0.14	0.08	0.03	0.00	0.00
Barometer	"Hg	28.948	28.937	28.939	28.929	28.928	28.919
F Factor	----	1.053	1.048	1.045	1.043	1.042	1.042
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	88.59	86.71	95.29	155.01	77.47	128.92
Dilute CO conc (dry)	%	0.44	0.43	0.38	0.38	0.21	0.13
Dilute CO ₂ conc (dry)	%	0.67	0.51	0.39	0.28	0.23	0.17
Dilute NO _x conc (dry)	ppm	27.32	10.88	4.92	1.47	1.34	0.40
Measured A/F	----	11.43	11.02	10.60	9.94	10.61	10.78
Dry/Wet Correction	----	0.97	0.97	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.09	1.09	1.08	1.08	1.08	1.06
Raw O ₂ conc (dry) _{measured}	%	0.08	0.09	0.11	0.19	0.26	0.86
HC Mass	g/hr	34.91	34.85	39.18	65.25	32.61	56.09
NO _x Mass	g/hr	38.88	15.66	7.18	2.10	1.94	0.51
CO Mass	g/hr	3503.8	3460.4	3133.5	3174.9	1795.8	1110.9
CO ₂ Mass	g/hr	7886	6003	4558	3165	2528	1804
BSHC	g/hp-hr	2.26	3.01	5.08	16.99	21.57	----
BSNO _x	g/hp-hr	2.52	1.35	0.93	0.55	1.28	----
BSCO	g/hp-hr	227.12	299.07	405.97	826.80	1187.73	----
BSCO ₂	g/hp-hr	511.16	518.82	590.50	824.23	1671.91	----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	6.41	1.32	7.73	423.7	618.0	0.931

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V

Date: 2/17/03

Test ID: KAW2-BSLN #3

Baseline Test #3 of replacement Kawasaki engine after break-in

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3068	3086	3055	3053	3078	1544
Obs. Power	hp	16.12	12.13	8.05	4.02	1.61	0.00
Obs. Torque	ft-lb	27.22	20.36	13.65	6.82	2.72	0.00
Calc. Power (Obs. Torque*Speed)	hp	15.90	11.96	7.94	3.96	1.59	0.04
Work (5 min Interval)	hp-hr	1.344	1.011	0.671	0.335	0.135	0.000
Fuel Flow	lb/hr	8.747	8.624	7.232	5.831	4.172	1.666
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	276	242	224	206	197	180
Exhaust Gas (muffler-in/manifold)	deg F	1381	1246	1225	1173	1143	758
Exhaust Gas (muffler out)	deg F	872	720	614	484	402	159
Catalyst/Muffler Surface	deg F	NA	NA	NA	NA	NA	NA
Intake Air (EPA)	deg F	103	106	94	90	88	83
Intake Air DewPoint (EPA)	deg F	36	38	37	37	38	39
Cyl Head (Spark Plug)	deg F	452	380	331	297	288	238
PRESSURES							
Exhaust BP Before Cat	psig	0.18	0.09	0.03	0.00	0.00	0.00
Barometer	"Hg	29.328	29.319	29.318	29.319	29.310	29.305
F Factor	----	1.039	1.043	1.028	1.022	1.021	1.014
GASEOUS EMISSIONS		EMISSIONS ARE UNWEIGHTED¹ (ETIS)					
Dilute HC conc (wet)	ppm	68.42	89.06	90.00	107.83	81.55	85.60
Dilute CO conc (dry)	%	0.20	0.44	0.37	0.33	0.22	0.08
Dilute CO ₂ conc (dry)	%	0.77	0.49	0.40	0.28	0.23	0.12
Dilute NO _x conc (dry)	ppm	96.81	11.47	6.24	2.05	1.36	0.20
Measured A/F	----	12.68	10.88	10.64	10.15	10.45	10.74
Dry/Wet Correction	----	0.99	0.99	0.99	0.99	0.99	0.99
NO _x Humidity Correction	----	0.83	0.84	0.84	0.83	0.84	0.84
Raw O ₂ conc (dry) _{measured}	%	0.07	0.08	0.10	0.18	0.19	0.94
HC Mass	g/hr	27.35	37.05	38.07	46.70	35.43	37.85
NO _x Mass	g/hr	110.37	13.51	7.51	2.49	1.67	0.23
CO Mass	g/hr	1661.6	3760.7	3243.6	2988.6	1966.2	705.7
CO ₂ Mass	g/hr	9556	6056	4916	3327	2645	1108
BSHC	g/hp-hr	1.69	3.05	4.72	11.59	22.03	-----
BSNO _x	g/hp-hr	6.84	1.11	0.93	0.62	1.04	-----
BSCO	g/hp-hr	102.91	309.88	402.23	741.47	1222.76	-----
BSCO ₂	g/hp-hr	591.82	498.99	609.57	825.51	1644.80	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions³	g/hp-hr	5.21	2.08	7.29	386.1	628.0	0.893

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: FH601V 19 Hp

Date: 2/17/03

Test ID: KAW2-BSLN#4

Baseline Test #4 of replacement Kawasaki engine after break-in (methane analysis)

DESCRIPTION	UNIT		1	2	3	4	5	6
Mode	---							
Weight Factor	---		0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	---		300	300	300	300	300	300
Speed Set	%Rated		85	85	85	85	85	Idle
Load Set	%Rated		100	75	50	25	10	0
ENGINE DATA								
Obs. Speed	rpm		3035	3084	3067	3063	3042	1533
Obs. Power	hp		15.60	11.95	7.93	3.97	1.57	0.00
Obs. Torque	ft-lb		26.63	20.07	13.39	6.71	2.68	0.00
Calc. Power (Obs. Torque*Speed)	hp		15.39	11.78	7.82	3.91	1.55	0.04
Work (5 min Interval)	hp-hr		1.300	0.996	0.660	0.331	0.131	0.000
Fuel Flow	lb/hr		8.405	7.836	6.624	5.506	3.920	1.620
TEMPERATURES								
Catalyst Mid-bed	deg F		NA	NA	NA	NA	NA	NA
Oil	deg F		286	251	226	208	201	182
Exhaust Gas (muffler-in/manifold)	deg F		1378	1288	1236	1174	1142	770
Exhaust Gas (muffler out)	deg F		846	731	621	491	400	171
Catalyst/Muffler Surface	deg F		NA	NA	NA	NA	NA	NA
Intake Air (EPA)	deg F		112	88	85	82	81	88
Intake Air DewPoint (EPA)	deg F		40	38	39	38	40	38
Cyl Head (Spark Plug)	deg F		462	390	337	302	291	236
PRESSURES								
Exhaust BP Before Cat	psig		0.27	0.14	0.08	0.04	0.01	0.00
Barometer	"Hg		29.182	29.229	29.222	29.210	29.200	29.197
F Factor	---		1.056	1.024	1.020	1.015	1.015	1.024
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)								
Dilute HC conc (wet)	ppm		61.36	71.13	79.30	104.97	70.21	79.35
Dilute CO conc (dry)	%		0.20	0.32	0.32	0.32	0.20	0.08
Dilute CO ₂ conc (dry)	%		0.75	0.54	0.39	0.27	0.23	0.12
Dilute NO _x conc (dry)	ppm		96.82	20.88	6.92	1.87	1.61	0.16
Measured A/F	---		12.60	11.40	10.95	10.10	10.74	10.73
Dry/Wet Correction	---		0.98	0.99	0.99	0.99	0.99	0.99
NO _x Humidity Correction	---		0.85	0.84	0.84	0.84	0.85	0.84
Raw O ₂ conc (dry) _{measured}	%		0.08	0.09	0.10	0.16	0.19	0.94
HC Mass	g/hr		23.89	28.78	32.88	44.75	29.80	34.48
NO _x Mass	g/hr		111.41	24.52	8.29	2.25	1.94	0.15
CO Mass	g/hr		1607.1	2684.7	2812.0	2801.4	1759.3	705.7
CO ₂ Mass	g/hr		9173	6668	4758	3172	2634	1054
BSHC	g/hp-hr		1.52	2.41	4.15	11.29	18.81	-----
BSNO _x	g/hp-hr		7.11	2.06	1.05	0.57	1.23	-----
BSCO	g/hp-hr		102.55	225.15	355.05	706.97	1110.31	-----
BSCO ₂	g/hp-hr		585.30	559.22	600.75	800.54	1662.62	-----
Emission Test Results								
Emission Test Results	---		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr		4.69	2.46	7.15	337.7	639.6	0.846

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Test ID: KAW2-E-BSLN#1

Development testing with catalyst E, stock carburetion, and no SAI

DESCRIPTION	UNIT		1	2	3	4	5	6
Mode	---							
Weight Factor	---		0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	---		300	300	300	300	300	300
Speed Set	%Rated		85	85	85	85	85	Idle
Load Set	%Rated		100	75	50	25	10	0
ENGINE DATA								
Obs. Speed	rpm		3071	3073	3041	3098	3047	1541
Obs. Power	hp		15.90	11.92	7.89	3.98	1.56	0.00
Obs. Torque	ft-lb		26.82	20.09	13.44	6.66	2.65	0.00
Calc. Power (Obs. Torque*Speed)	hp		15.68	11.76	7.78	3.93	1.54	0.00
Work (5 min Interval)	hp-hr		1.325	0.993	0.657	0.332	0.130	0.000
Fuel Flow	lb/hr		9.735	8.554	7.279	6.163	3.940	1.713
TEMPERATURES								
Catalyst Mid-bed	deg F		1329	1247	1169	1107	1009	633
Oil	deg F		277	264	244	224	215	192
Exhaust Gas (muffler-in/manifold)	deg F		1281	1230	1200	1184	1145	747
Exhaust Gas (muffler out)	deg F		1040	940	838	737	560	297
Catalyst/Muffler Surface	deg F		649	598	550	512	427	267
Intake Air (EPA)	deg F		93	91	89	87	85	75
Intake Air DewPoint (EPA)	deg F		60	60	60	61	60	60
Cyl Head (Spark Plug)	deg F		424	385	335	305	292	238
PRESSURES								
Exhaust BP Before Cat	psig		0.26	0.19	0.14	0.10	0.07	0.02
Barometer	"Hg		29.182	29.184	29.188	29.195	29.193	29.183
F Factor	---		1.042	1.039	1.036	1.033	1.031	1.018
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED¹ (ETIS)								
Dilute HC conc (wet)	ppm		52.17	81.83	79.52	105.04	64.65	85.81
Dilute CO conc (dry)	%		0.28	0.27	0.26	0.24	0.11	0.06
Dilute CO ₂ conc (dry)	%		0.85	0.70	0.56	0.44	0.34	0.15
Dilute NO _x conc (dry)	ppm		1.08	0.55	0.34	0.19	0.25	0.22
Measured A/F	---		11.81	10.83	10.17	9.15	11.00	10.71
Dry/Wet Correction	---		0.97	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	---		1.02	1.02	1.02	1.03	1.02	1.02
Raw O ₂ conc (dry) _{measured}	%		0.08	0.09	0.10	0.13	0.12	0.31
HC Mass	g/hr		20.82	33.41	33.13	44.67	27.84	37.91
NO _x Mass	g/hr		1.26	0.56	0.28	0.07	0.15	0.11
CO Mass	g/hr		2185.3	2204.3	2123.9	2051.6	914.1	498.3
CO ₂ Mass	g/hr		10138	8414	6756	5270	3996	1499
BSHC	g/hp-hr		1.31	2.81	4.18	11.19	17.58	-----
BSNO _x	g/hp-hr		0.08	0.05	0.03	0.02	0.10	-----
BSCO	g/hp-hr		137.48	185.17	267.86	513.94	577.29	-----
BSCO ₂	g/hp-hr		637.80	706.81	852.02	1320.08	2523.39	-----
Emission Test Results								
Emission Test Results	---		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr		4.77	0.05	4.82	263.9	874.7	0.931

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 3/14/03

Test ID: KAW2-EO3-#1

Development "engine-out" testing with stock muffler, SAI venturi pipe, and Tier 3 jetting (116/120)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	---	1	2	3	4	5	6
Weight Factor	---	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	---	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3041	3059	3050	3053	3050	1527
Obs. Power	hp	15.23	11.50	7.64	3.80	1.52	0.00
Obs. Torque	ft-lb	25.95	19.47	12.98	6.45	2.57	0.00
Calc. Power (Obs. Torque*Speed)	hp	15.03	11.34	7.54	3.75	1.50	0.00
Work (5 min Interval)	hp-hr	1.269	0.958	0.637	0.317	0.126	0.000
Fuel Flow	lb/hr	8.898	6.732	5.906	4.535	3.616	1.192
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	289	281	261	239	222	199
Exhaust Gas (muffler-in/manifold)	deg F	1288	1317	1217	1145	1091	769
Exhaust Gas (muffler out)	deg F	NA	NA	NA	NA	NA	NA
Catalyst/Muffler Surface	deg F	524	507	435	364	330	195
Intake Air (EPA)	deg F	101	101	99	97	95	83
Intake Air DewPoint (EPA)	deg F	53	53	52	52	52	52
Cyl Head (Spark Plug)	deg F	459	428	368	329	307	249
PRESSURES							
Exhaust BP Before Cat	psig	0.71	0.58	0.47	0.36	0.07	0.00
Barometer	"Hg	29.030	29.023	29.018	29.016	29.013	29.010
F Factor	---	1.054	1.053	1.052	1.048	1.046	1.030
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	81.27	58.83	63.03	60.22	53.18	71.90
Dilute CO conc (dry)	%	0.34	0.15	0.22	0.19	0.14	0.02
Dilute CO ₂ conc (dry)	%	0.67	0.61	0.43	0.31	0.26	0.13
Dilute NO _x conc (dry)	ppm	44.79	63.69	12.68	3.63	2.19	0.40
Measured A/F	---	12.09	13.68	12.64	12.33	12.59	15.03
Dry/Wet Correction	---	0.98	0.98	0.98	0.98	0.98	0.99
NO _x Humidity Correction	---	0.95	0.94	0.94	0.93	0.94	0.93
Raw O ₂ conc (dry) _{measured}	%	0.30	0.35	0.52	0.82	1.27	5.00
HC Mass	g/hr	31.82	23.16	25.44	24.72	21.93	30.51
NO _x Mass	g/hr	56.64	81.16	16.47	4.79	2.93	0.54
CO Mass	g/hr	2722.2	1215.7	1881.2	1605.0	1231.3	212.1
CO ₂ Mass	g/hr	8087	7448	5237	3753	3062	1243
BSHC	g/hp-hr	2.08	2.01	3.32	6.48	14.28	-----
BSNO _x	g/hp-hr	3.71	7.06	2.15	1.25	1.91	-----
BSCO	g/hp-hr	178.26	105.75	245.72	420.61	801.86	-----
BSCO ₂	g/hp-hr	529.55	647.86	684.06	983.58	1994.34	-----
Emission Test Results	---	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	3.55	3.89	7.43	225.6	719.1	0.774

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 3/14/03

Test ID: KAW2-E-DEV-FNL#1

Final development testing with catalyst E muffler, SAI venturi pipe, and Tier 3 jetting (116/120) w/methane

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3064	3059	3061	3078	3070	1532
Obs. Power	hp	15.56	11.60	7.78	3.89	1.53	0.00
Obs. Torque	ft-lb	26.31	19.65	13.16	6.55	2.57	0.00
Calc. Power (Obs. Torque*Speed)	hp	15.35	11.44	7.67	3.84	1.50	0.00
Work (5 min Interval)	hp-hr	1.297	0.967	0.648	0.324	0.127	0.000
Fuel Flow	lb/hr	8.953	6.567	5.689	4.664	3.430	1.407
TEMPERATURES							
Catalyst Mid-bed	deg F	1359	1390	1247	1175	1136	1067
Oil	deg F	283	269	251	227	214	190
Exhaust Gas (muffler-in/manifold)	deg F	1300	1344	1236	1154	1105	805
Exhaust Gas (muffler out)	deg F	1101	1016	884	743	627	398
Catalyst/Muffler Surface	deg F	474	460	440	403	395	311
Intake Air (EPA)	deg F	90	90	89	88	86	77
Intake Air DewPoint (EPA)	deg F	57	57	56	56	55	55
Cyl Head (Spark Plug)	deg F	453	419	359	317	298	247
PRESSURES							
Exhaust BP Before Cat	psig	0.66	0.54	0.43	0.11	0.07	0.02
Barometer	"Hg	29.179	29.180	29.177	29.172	29.171	29.166
F Factor	----	1.037	1.037	1.035	1.033	1.030	1.018
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	46.68	16.15	26.97	33.62	25.85	16.22
Dilute CO conc (dry)	%	0.19	0.04	0.11	0.11	0.07	0.00
Dilute CO ₂ conc (dry)	%	0.84	0.71	0.53	0.41	0.32	0.18
Dilute NO _x conc (dry)	ppm	0.71	1.17	0.06	0.15	0.00	0.38
Measured A/F	----	12.88	13.95	12.67	12.07	12.24	14.61
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	0.98	0.98	0.98	0.97	0.96	0.96
Raw O ₂ conc (dry) _{measured}	%	0.46	0.54	0.57	0.82	1.05	3.00
HC Mass	g/hr	17.66	5.44	10.10	13.14	9.91	5.83
NO _x Mass	g/hr	0.92	1.54	0.08	0.20	0.00	0.53
CO Mass	g/hr	1519.7	350.8	921.6	950.1	599.9	27.3
CO ₂ Mass	g/hr	10098	8631	6489	4999	3832	1909
BSHC	g/hp-hr	1.13	0.47	1.30	3.38	6.45	-----
BSNO _x	g/hp-hr	0.06	0.13	0.01	0.05	0.00	-----
BSCO	g/hp-hr	97.68	30.20	118.89	244.44	390.68	-----
BSCO ₂	g/hp-hr	649.01	742.86	837.06	1286.28	2495.45	-----
Emission Test Results							
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	1.45	0.07	1.52	110.8	880.6	0.756

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 3/14/03

Test ID: KAW2-E-DEV-FNL#2

Final development testing with catalyst E muffler, SAI venturi pipe, and Tier 3 jetting (116/120) w/methane

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3059	3073	3065	3063	3053	1537
Obs. Power	hp	15.35	11.59	7.72	3.85	1.53	0.00
Obs. Torque	ft-lb	26.00	19.54	13.05	6.51	2.59	0.00
Calc. Power (Obs. Torque*Speed)	hp	15.14	11.43	7.62	3.80	1.51	0.00
Work (5 min Interval)	hp-hr	1.279	0.966	0.644	0.321	0.127	0.000
Fuel Flow	lb/hr	8.807	6.338	5.704	4.299	3.434	1.296
TEMPERATURES							
Catalyst Mid-bed	deg F	1368	1411	1237	1161	1121	1079
Oil	deg F	287	279	257	238	222	202
Exhaust Gas (muffler-in/manifold)	deg F	1301	1348	1226	1146	1096	795
Exhaust Gas (muffler out)	deg F	1118	1037	882	736	619	417
Catalyst/Muffler Surface	deg F	462	485	456	423	399	351
Intake Air (EPA)	deg F	96	96	95	94	92	83
Intake Air DewPoint (EPA)	deg F	53	54	54	53	53	53
Cyl Head (Spark Plug)	deg F	462	429	366	328	306	256
PRESSURES							
Exhaust BP Before Cat	psig	0.68	0.58	0.44	0.14	0.07	0.02
Barometer	"Hg	29.103	29.091	29.083	29.078	29.071	29.066
F Factor	----	1.045	1.046	1.044	1.042	1.041	1.029
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	33.78	10.65	29.11	28.71	30.24	16.57
Dilute CO conc (dry)	%	0.19	0.03	0.11	0.09	0.07	0.00
Dilute CO ₂ conc (dry)	%	0.83	0.70	0.53	0.39	0.32	0.17
Dilute NO _x conc (dry)	ppm	1.11	0.14	0.33	0.15	0.07	0.30
Measured A/F	----	12.93	14.12	12.69	12.23	12.42	14.51
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	0.95	0.95	0.95	0.94	0.94	0.95
Raw O ₂ conc (dry) _{measured}	%	0.44	0.59	0.60	0.75	1.01	3.00
HC Mass	g/hr	12.53	3.35	11.12	11.14	11.92	6.15
NO _x Mass	g/hr	1.38	0.18	0.43	0.20	0.09	0.41
CO Mass	g/hr	1469.4	224.8	925.6	790.3	587.3	14.5
CO ₂ Mass	g/hr	9988	8514	6500	4745	3850	1773
BSHC	g/hp-hr	0.81	0.29	1.44	2.90	7.71	-----
BSNO _x	g/hp-hr	0.09	0.02	0.06	0.05	0.06	-----
BSCO	g/hp-hr	95.52	19.45	119.85	205.74	379.51	-----
BSCO ₂	g/hp-hr	649.27	736.79	841.69	1235.33	2488.07	-----
Emission Test Results							
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	1.32	0.05	1.37	100.7	871.1	0.738

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 4/14/03

Test ID: KAW2-125-E-#1

125-hour interval emission test "as-received" from durability with catalyst E, Tier 3 jetting (116/120), and passive SAI system. (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3057	3052	3069	3068	3046	1533
Obs. Power	hp	15.39	11.50	7.69	3.86	1.53	0.00
Obs. Torque	ft-lb	26.07	19.52	12.98	6.51	2.61	0.00
Calc. Power (Obs. Torque*Speed)	hp	15.18	11.34	7.59	3.80	1.51	0.00
Work (5 min Interval)	hp-hr	1.282	0.959	0.641	0.321	0.128	0.000
Fuel Flow	lb/hr	8.877	6.653	5.801	4.477	3.459	1.263
TEMPERATURES							
Catalyst Mid-bed	deg F	1207	1187	1076	978	929	661
Oil	deg F	274	266	243	224	214	187
Exhaust Gas (muffler-in/manifold)	deg F	1317	1359	1259	1182	1137	796
Exhaust Gas (muffler out)	deg F	1075	993	841	694	600	337
Catalyst/Muffler Surface	deg F	707	694	614	545	510	347
Intake Air (EPA)	deg F	87	88	88	86	85	75
Intake Air DewPoint (EPA)	deg F	58	58	58	58	57	57
Cyl Head (Spark Plug)	deg F	432	407	350	312	296	248
PRESSURES							
Exhaust BP Before Cat	psig	1.17	0.72	0.43	0.20	0.11	-0.09
Barometer	"Hg	29.264	29.270	29.273	29.278	29.277	29.276
F Factor	----	1.030	1.031	1.030	1.027	1.026	1.013
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	38.56	24.27	33.97	37.84	30.16	12.17
Dilute CO conc (dry)	%	0.23	0.07	0.13	0.12	0.08	0.00
Dilute CO ₂ conc (dry)	%	0.81	0.70	0.53	0.39	0.32	0.17
Dilute NO _x conc (dry)	ppm	0.30	1.49	0.44	0.29	0.22	0.45
Measured A/F	----	12.69	13.75	12.69	12.27	12.58	15.01
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.00	0.99	0.99	0.99	0.98	0.98
Raw O ₂ conc (dry) _{measured}	%	0.35	0.47	0.55	0.71	0.88	2.70
HC Mass	g/hr	14.02	8.45	12.71	14.57	11.42	3.74
NO _x Mass	g/hr	0.34	1.93	0.56	0.36	0.26	0.59
CO Mass	g/hr	1763.8	547.1	1057.0	984.5	650.5	3.1
CO ₂ Mass	g/hr	9618	8433	6425	4678	3788	1753
BSHC	g/hp-hr	0.91	0.73	1.65	3.78	7.38	-----
BSNO _x	g/hp-hr	0.02	0.17	0.07	0.09	0.17	-----
BSCO	g/hp-hr	114.96	47.49	137.36	255.67	420.34	-----
BSCO ₂	g/hp-hr	626.90	732.01	834.93	1214.90	2447.63	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	1.67	0.10	1.77	127.5	859.6	0.760

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 4/14/03

Test ID: KAW2-125-E-#2

125-hour interval emission test "as-received" from durability with catalyst E, Tier 3 jetting (116/120), and passive SAI system. (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3057	3055	3049	3049	3074	1529
Obs. Power	hp	15.34	11.52	7.65	3.82	1.52	0.00
Obs. Torque	ft-lb	25.99	19.53	12.99	6.49	2.57	0.00
Calc. Power (Obs. Torque*Speed)	hp	15.13	11.36	7.54	3.77	1.50	0.00
Work (5 min Interval)	hp-hr	1.278	0.960	0.637	0.319	0.127	0.000
Fuel Flow	lb/hr	9.074	6.797	5.656	4.366	3.490	1.221
TEMPERATURES							
Catalyst Mid-bed	deg F	1369	1385	1283	1229	1217	803
Oil	deg F	280	269	244	229	218	193
Exhaust Gas (muffler-in/manifold)	deg F	1315	1342	1252	1179	1143	808
Exhaust Gas (muffler out)	deg F	1085	1064	958	852	765	370
Catalyst/Muffler Surface	deg F	725	705	628	565	538	345
Intake Air (EPA)	deg F	91	92	91	90	89	80
Intake Air DewPoint (EPA)	deg F	57	57	57	57	56	55
Cyl Head (Spark Plug)	deg F	438	410	353	316	301	253
PRESSURES							
Exhaust BP Before Cat	psig	1.10	0.65	0.33	0.12	0.04	-0.17
Barometer	"Hg	29.269	29.233	29.223	29.214	29.215	29.212
F Factor	----	1.034	1.037	1.036	1.035	1.033	1.021
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	43.77	30.74	30.02	29.59	23.85	14.89
Dilute CO conc (dry)	%	0.23	0.08	0.12	0.10	0.06	0.00
Dilute CO ₂ conc (dry)	%	0.83	0.71	0.53	0.40	0.34	0.16
Dilute NO _x conc (dry)	ppm	1.12	1.04	0.27	0.24	0.26	0.56
Measured A/F	----	12.74	13.65	12.82	12.46	12.80	15.96
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	0.98	0.98	0.98	0.98	0.97	0.97
Raw O ₂ conc (dry) _{measured}	%	0.55	0.66	0.80	1.04	1.25	4.43
HC Mass	g/hr	16.02	10.98	10.91	10.92	8.59	4.88
NO _x Mass	g/hr	1.27	1.18	0.19	0.15	0.18	0.60
CO Mass	g/hr	1779.1	629.4	961.5	828.3	531.1	9.1
CO ₂ Mass	g/hr	9865	8498	6377	4780	4028	1681
BSHC	g/hp-hr	1.04	0.95	1.43	2.85	5.59	-----
BSNO _x	g/hp-hr	0.08	0.10	0.03	0.04	0.12	-----
BSCO	g/hp-hr	115.74	54.48	125.78	216.31	345.99	-----
BSCO ₂	g/hp-hr	641.74	735.64	834.26	1248.17	2623.82	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	1.52	0.07	1.59	118.7	870.2	0.758

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 4/15/03

Test ID: KAW2-125-STK-#1

125-hr. testing of Kawasaki with stock muffler, no SAI system, and stock jetting (136/140)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3068	3063	3074	3052	3056	1533
Obs. Power	hp	15.22	11.39	7.64	3.76	1.51	0.00
Obs. Torque	ft-lb	25.70	19.26	12.88	6.39	2.56	0.00
Calc. Power (Obs. Torque*Speed)	hp	15.02	11.23	7.54	3.71	1.49	0.00
Work (5 min Interval)	hp-hr	1.269	0.949	0.637	0.314	0.126	0.000
Fuel Flow	lb/hr	10.742	8.044	6.686	5.039	3.478	1.141
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	260	249	237	222	215	187
Exhaust Gas (muffler-in/manifold)	deg F	1211	1228	1203	1165	1167	787
Exhaust Gas (muffler out)	deg F	182	657	570	461	380	157
Catalyst/Muffler Surface	deg F	478	437	397	339	305	166
Intake Air (EPA)	deg F	90	89	89	88	87	78
Intake Air DewPoint (EPA)	deg F	59	59	59	58	58	58
Cyl Head (Spark Plug)	deg F	404	378	336	305	298	238
PRESSURES							
Exhaust BP Before Cat	psig	0.54	0.30	0.16	0.04	-0.03	-0.13
Barometer	"Hg	29.130	29.126	29.123	29.110	29.107	29.099
F Factor	----	1.039	1.039	1.038	1.036	1.035	1.024
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	144.34	105.78	103.37	95.40	50.16	94.62
Dilute CO conc (dry)	%	0.68	0.43	0.37	0.29	0.14	0.01
Dilute CO ₂ conc (dry)	%	0.54	0.47	0.37	0.27	0.26	0.13
Dilute NO _x conc (dry)	ppm	8.02	8.51	4.87	2.47	2.31	0.76
Measured A/F	----	10.15	11.13	10.72	10.41	12.28	14.70
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.00	1.01	1.00	1.00	0.99	1.00
Raw O ₂ conc (dry) _{measured}	%	0.12	0.13	0.12	0.16	0.17	3.00
HC Mass	g/hr	56.47	41.80	41.45	38.65	19.60	39.58
NO _x Mass	g/hr	10.21	11.10	6.27	3.00	2.76	0.61
CO Mass	g/hr	5413.3	3525.7	3094.8	2441.3	1151.9	107.7
CO ₂ Mass	g/hr	6365	5597	4373	3103	3000	1306
BSHC	g/hp-hr	3.71	3.68	5.44	10.23	12.96	-----
BSNO _x	g/hp-hr	0.67	0.98	0.82	0.79	1.83	-----
BSCO	g/hp-hr	355.77	310.15	406.15	645.84	761.81	-----
BSCO ₂	g/hp-hr	418.31	492.37	573.91	820.81	1984.35	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	5.70	0.86	6.55	410.0	587.5	0.892

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 4/15/03

Test ID: KAW2-125-STK-#2

125-hr. testing of Kawasaki with stock muffler, no SAI system, and stock jetting (136/140)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3055	3066	3071	3062	3062	1545
Obs. Power	hp	15.16	11.40	7.61	3.79	1.51	0.00
Obs. Torque	ft-lb	25.70	19.26	12.84	6.40	2.56	0.00
Calc. Power (Obs. Torque*Speed)	hp	14.95	11.24	7.51	3.73	1.49	0.00
Work (5 min Interval)	hp-hr	1.263	0.950	0.634	0.315	0.126	0.000
Fuel Flow	lb/hr	10.817	8.683	6.626	5.074	3.440	1.253
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	268	257	241	226	218	193
Exhaust Gas (muffler-in/manifold)	deg F	1203	1211	1200	1166	1167	826
Exhaust Gas (muffler out)	deg F	749	661	569	462	381	164
Catalyst/Muffler Surface	deg F	481	449	398	343	309	174
Intake Air (EPA)	deg F	93	92	91	89	89	80
Intake Air DewPoint (EPA)	deg F	58	58	58	57	58	57
Cyl Head (Spark Plug)	deg F	407	382	338	307	300	249
PRESSURES							
Exhaust BP Before Cat	psig	0.59	0.36	0.18	0.05	-0.02	-0.13
Barometer	"Hg	29.084	29.073	29.070	29.061	29.062	29.050
F Factor	----	1.045	1.043	1.042	1.039	1.039	1.027
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	151.56	131.35	103.33	98.03	50.47	83.94
Dilute CO conc (dry)	%	0.70	0.52	0.38	0.29	0.13	0.01
Dilute CO ₂ conc (dry)	%	0.53	0.45	0.36	0.27	0.26	0.15
Dilute NO _x conc (dry)	ppm	7.59	6.55	4.71	2.49	2.49	0.86
Measured A/F	----	9.99	9.80	10.77	10.45	12.26	14.16
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.00	1.00	1.00	0.99	0.99	0.99
Raw O ₂ conc (dry) _{measured}	%	0.10	0.12	0.12	0.16	0.17	2.80
HC Mass	g/hr	59.55	52.29	41.63	40.11	20.07	35.15
NO _x Mass	g/hr	9.59	8.35	5.99	2.97	3.02	0.76
CO Mass	g/hr	5565.3	4254.0	3127.1	2464.3	1118.8	106.8
CO ₂ Mass	g/hr	6222	5316	4238	3111	2998	1479
BSHC	g/hp-hr	3.92	4.60	5.47	10.58	13.17	-----
BSNO _x	g/hp-hr	0.63	0.73	0.79	0.78	1.98	-----
BSCO	g/hp-hr	366.79	374.01	410.89	650.09	734.13	-----
BSCO ₂	g/hp-hr	410.04	467.41	556.84	820.69	1967.29	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} / _{hp-hr})
Weighted Specific Emissions ³	g/hp-hr	6.08	0.76	6.84	434.5	573.8	0.911

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 4/16/03

Test ID: KAW2-125-EO3-#3

125-hr. testing with stock muffler, passive SAI, and Tier 3 jetting (116/120)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3060	3058	3074	3069	3049	1516
Obs. Power	hp	15.16	11.37	7.64	3.79	1.51	0.00
Obs. Torque	ft-lb	25.66	19.26	12.88	6.40	2.57	0.00
Calc. Power (Obs. Torque*Speed)	hp	14.95	11.21	7.54	3.74	1.49	0.00
Work (5 min Interval)	hp-hr	1.263	0.948	0.637	0.316	0.126	0.000
Fuel Flow	lb/hr	8.747	6.504	5.542	4.324	3.259	1.167
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	279	272	253	235	221	194
Exhaust Gas (muffler-in/manifold)	deg F	1312	1347	1250	1178	1136	742
Exhaust Gas (muffler out)	deg F	808	719	582	444	364	171
Catalyst/Muffler Surface	deg F	553	532	463	390	362	195
Intake Air (EPA)	deg F	98	99	97	94	93	82
Intake Air DewPoint (EPA)	deg F	57	57	56	55	56	56
Cyl Head (Spark Plug)	deg F	444	417	360	321	304	236
PRESSURES							
Exhaust BP Before Cat	psig	1.23	0.77	0.43	0.19	0.09	-0.11
Barometer	"Hg	28.989	28.984	28.980	28.977	28.973	28.964
F Factor	----	1.054	1.055	1.052	1.048	1.047	1.032
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	87.04	62.66	65.00	56.91	46.86	136.01
Dilute CO conc (dry)	%	0.32	0.13	0.20	0.17	0.12	0.01
Dilute CO ₂ conc (dry)	%	0.69	0.62	0.43	0.32	0.26	0.14
Dilute NO _x conc (dry)	ppm	46.31	63.66	13.48	4.30	2.65	0.99
Measured A/F	----	12.88	13.84	12.83	12.56	12.96	17.09
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	0.99	0.99	0.98	0.97	0.98	0.97
Raw O ₂ conc (dry) _{measured}	%	0.29	0.41	0.53	0.80	1.11	5.80
HC Mass	g/hr	33.99	24.61	26.06	23.12	19.04	58.21
NO _x Mass	g/hr	60.06	83.63	18.04	5.77	3.63	1.39
CO Mass	g/hr	2519.6	1027.0	1643.1	1433.4	987.4	33.3
CO ₂ Mass	g/hr	8187	7420	5100	3733	2955	1402
BSHC	g/hp-hr	2.24	2.17	3.43	6.10	12.49	-----
BSNO _x	g/hp-hr	3.96	7.37	2.38	1.52	2.38	-----
BSCO	g/hp-hr	166.11	90.57	216.38	378.00	647.90	-----
BSCO ₂	g/hp-hr	539.74	654.28	671.66	984.44	1938.91	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} / _{hp-hr})
Weighted Specific Emissions ³	g/hp-hr	3.77	4.16	7.93	199.1	719.9	0.746

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 5/6/03

Test ID: KAW2-250-E-#1

250-hour interval emission test "as-received" from durability with catalyst E, Tier 3 jetting (116/120), and passive SAI system. (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3054	3048	3073	3063	3079	1556
Obs. Power	hp	14.97	11.23	7.52	3.77	1.52	0.00
Obs. Torque	ft-lb	25.39	19.08	12.67	6.38	2.56	0.00
Calc. Power (Obs. Torque*Speed)	hp	14.76	11.08	7.41	3.72	1.50	0.00
Work (5 min Interval)	hp-hr	1.247	0.936	0.626	0.314	0.127	0.000
Fuel Flow	lb/hr	8.593	6.794	6.000	4.511	3.687	1.590
TEMPERATURES							
Catalyst Mid-bed	deg F	1381	1378	1249	1169	1150	904
Oil	deg F	283	274	249	229	221	196
Exhaust Gas (muffler-in/manifold)	deg F	1357	1372	1263	1190	1165	783
Exhaust Gas (muffler out)	deg F	1103	1020	852	701	616	342
Catalyst/Muffler Surface	deg F	717	730	664	598	570	410
Intake Air (EPA)	deg F	101	100	96	94	93	87
Intake Air DewPoint (EPA)	deg F	62	62	63	65	67	66
Cyl Head (Spark Plug)	deg F	443	415	358	321	308	244
PRESSURES							
Exhaust BP Before Cat	psig	1.20	0.78	0.45	0.23	0.13	-0.07
Barometer	"Hg	28.816	28.831	28.838	28.846	28.860	28.854
F Factor	----	1.068	1.066	1.062	1.060	1.059	1.050
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	41.80	27.70	38.60	33.00	30.00	17.40
Dilute CO conc (dry)	%	0.17	0.06	0.14	0.12	0.08	0.00
Dilute CO ₂ conc (dry)	%	0.81	0.70	0.52	0.37	0.32	0.17
Dilute NO _x conc (dry)	ppm	1.10	1.20	0.39	0.24	0.34	0.69
Measured A/F	----	13.17	13.84	12.67	12.32	12.73	15.96
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.06	1.06	1.08	1.11	1.15	1.13
Raw O ₂ conc (dry) _{measured}	%	0.45	0.55	0.60	0.76	0.88	4.50
HC Mass	g/hr	15.67	10.27	15.00	12.95	11.77	6.58
NO _x Mass	g/hr	1.48	1.62	0.53	0.33	0.50	1.07
CO Mass	g/hr	1330.5	507.0	1122.0	963.2	634.2	25.7
CO ₂ Mass	g/hr	9897	8688	6595	4765	4131	2166
BSHC	g/hp-hr	1.04	0.91	2.01	3.45	7.72	-----
BSNO _x	g/hp-hr	0.10	0.14	0.07	0.09	0.33	-----
BSCO	g/hp-hr	88.63	44.96	150.27	256.52	416.01	-----
BSCO ₂	g/hp-hr	659.24	770.48	883.22	1269.07	2709.64	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	1.83	0.11	1.95	125.8	909.1	0.794

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 5/6/03

Test ID: KAW2-250-E-#2

250-hour interval emission test "as-received" from durability with catalyst E, Tier 3 jetting (116/120), and passive SAI system. (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3060	3073	3054	3054	3079	1577
Obs. Power	hp	14.79	11.16	7.35	3.66	1.48	0.00
Obs. Torque	ft-lb	25.03	18.82	12.47	6.20	2.48	0.00
Calc. Power (Obs. Torque*Speed)	hp	14.59	11.01	7.25	3.61	1.46	0.00
Work (5 min Interval)	hp-hr	1.232	0.930	0.613	0.305	0.123	0.000
Fuel Flow	lb/hr	8.402	6.829	5.818	4.531	3.712	1.522
TEMPERATURES							
Catalyst Mid-bed	deg F	1394	1367	1246	1170	1154	862
Oil	deg F	287	275	252	232	224	198
Exhaust Gas (muffler-in/manifold)	deg F	1372	1368	1261	1193	1173	807
Exhaust Gas (muffler out)	deg F	1105	1006	845	700	620	332
Catalyst/Muffler Surface	deg F	723	721	658	597	567	378
Intake Air (EPA)	deg F	102	101	98	96	96	90
Intake Air DewPoint (EPA)	deg F	67	66	66	66	65	64
Cyl Head (Spark Plug)	deg F	447	416	359	324	313	250
PRESSURES							
Exhaust BP Before Cat	psig	1.19	0.79	0.42	0.20	0.13	-0.07
Barometer	"Hg	28.834	28.809	28.798	28.795	28.791	28.784
F Factor	----	1.073	1.071	1.067	1.065	1.064	1.055
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	37.40	25.50	37.10	34.60	26.50	13.30
Dilute CO conc (dry)	%	0.15	0.08	0.14	0.12	0.07	0.00
Dilute CO ₂ conc (dry)	%	0.83	0.70	0.51	0.38	0.33	0.16
Dilute NO _x conc (dry)	ppm	1.13	0.99	0.28	0.14	0.37	0.59
Measured A/F	----	13.35	13.70	12.66	12.39	12.81	15.94
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.16	1.13	1.13	1.13	1.12	1.10
Raw O ₂ conc (dry) _{measured}	%	0.44	0.50	0.60	0.73	0.87	4.50
HC Mass	g/hr	13.75	9.27	14.23	13.45	10.18	4.73
NO _x Mass	g/hr	1.62	1.41	0.39	0.18	0.53	0.87
CO Mass	g/hr	1133.8	619.4	1096.6	945.3	606.4	17.1
CO ₂ Mass	g/hr	9945	8564	6382	4819	4215	2091
BSHC	g/hp-hr	0.93	0.84	1.94	3.65	6.84	----
BSNO _x	g/hp-hr	0.11	0.13	0.05	0.05	0.36	----
BSCO	g/hp-hr	76.69	55.78	149.32	256.61	407.41	----
BSCO ₂	g/hp-hr	672.65	771.20	869.05	1308.12	2831.90	----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	1.77	0.10	1.87	126.4	914.9	0.799

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 5/7/03

Test ID: KAW2-250-E-#3

250-hour interval emission test "as-received" from durability with catalyst E, Tier 3 jetting (116/120), and passive SAI system. (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3054	3040	3068	3053	3062	1546
Obs. Power	hp	14.94	11.15	7.51	3.73	1.49	0.00
Obs. Torque	ft-lb	25.35	19.01	12.67	6.33	2.53	0.00
Calc. Power (Obs. Torque*Speed)	hp	14.74	11.00	7.40	3.68	1.47	0.00
Work (5 min Interval)	hp-hr	1.245	0.929	0.625	0.311	0.125	0.000
Fuel Flow	lb/hr	8.531	6.612	5.862	4.649	3.898	1.633
TEMPERATURES							
Catalyst Mid-bed	deg F	1383	1379	1254	1169	1153	1053
Oil	deg F	285	270	252	232	221	196
Exhaust Gas (muffler-in/manifold)	deg F	1361	1377	1270	1195	1176	717
Exhaust Gas (muffler out)	deg F	1101	1010	855	700	618	377
Catalyst/Muffler Surface	deg F	721	723	652	582	556	460
Intake Air (EPA)	deg F	99	97	96	94	93	86
Intake Air DewPoint (EPA)	deg F	68	68	67	67	67	66
Cyl Head (Spark Plug)	deg F	441	413	360	323	311	228
PRESSURES							
Exhaust BP Before Cat	psig	1.18	0.74	0.43	0.20	0.12	-0.07
Barometer	"Hg	28.925	28.933	28.932	28.929	28.929	28.929
F Factor	----	1.067	1.063	1.060	1.058	1.056	1.047
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	40.20	23.50	35.70	35.30	27.20	24.10
Dilute CO conc (dry)	%	0.17	0.05	0.13	0.12	0.08	0.00
Dilute CO ₂ conc (dry)	%	0.82	0.70	0.52	0.39	0.34	0.17
Dilute NO _x conc (dry)	ppm	0.98	1.39	0.28	0.14	0.16	0.72
Measured A/F	----	13.20	13.96	12.76	12.41	12.84	16.28
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.18	1.18	1.15	1.15	1.15	1.14
Raw O ₂ conc (dry) _{measured}	%	0.44	0.55	0.61	0.74	0.93	5.00
HC Mass	g/hr	15.00	8.61	13.80	13.91	10.63	9.51
NO _x Mass	g/hr	1.40	2.07	0.37	0.16	0.19	1.08
CO Mass	g/hr	1293.9	410.0	1051.4	958.6	677.3	34.2
CO ₂ Mass	g/hr	9869	8591	6516	4962	4362	2204
BSHC	g/hp-hr	1.00	0.77	1.84	3.72	7.22	-----
BSNO _x	g/hp-hr	0.09	0.18	0.05	0.04	0.13	-----
BSCO	g/hp-hr	86.43	36.61	140.41	256.11	460.19	-----
BSCO ₂	g/hp-hr	659.23	767.02	870.21	1325.81	2963.68	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	1.78	0.11	1.89	120.3	916.3	0.793

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 5/7/03

Test ID: KAW2-250-EO3-#1

250-hour interval engine-out emission test with stock muffler, Tier 3 jetting (116/120), and passive SAI system.
(methane test)

DESCRIPTION	UNIT		1	2	3	4	5	6
Mode	----							
Weight Factor	----		0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----		300	300	300	300	300	300
Speed Set	%Rated		85	85	85	85	85	Idle
Load Set	%Rated		100	75	50	25	10	0
ENGINE DATA								
Obs. Speed	rpm		3062	3063	3070	3069	3057	1580
Obs. Power	hp		14.93	11.20	7.49	3.73	1.48	0.00
Obs. Torque	ft-lb		25.26	18.93	12.64	6.29	2.51	0.00
Calc. Power (Obs. Torque*Speed)	hp		14.73	11.04	7.39	3.68	1.46	0.00
Work (5 min Interval)	hp-hr		1.244	0.933	0.624	0.311	0.123	0.000
Fuel Flow	lb/hr		8.837	6.573	5.744	4.560	3.699	1.530
TEMPERATURES								
Catalyst Mid-bed	deg F		NA	NA	NA	NA	NA	NA
Oil	deg F		284	271	256	237	226	194
Exhaust Gas (muffler-in/manifold)	deg F		1349	1383	1274	1200	1192	635
Exhaust Gas (muffler out)	deg F		814	715	576	440	375	158
Catalyst/Muffler Surface	deg F		820	772	643	528	495	229
Intake Air (EPA)	deg F		102	100	99	97	96	89
Intake Air DewPoint (EPA)	deg F		65	64	64	64	64	63
Cyl Head (Spark Plug)	deg F		440	415	363	327	317	209
PRESSURES								
Exhaust BP Before Cat	psig		1.28	0.80	0.45	0.20	0.12	-0.08
Barometer	"Hg		28.905	28.899	28.882	28.876	28.868	28.857
F Factor	----		1.068	1.065	1.065	1.062	1.061	1.051
GASEOUS EMISSIONS								
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)								
Dilute HC conc (wet)	ppm		90.50	55.90	65.60	57.20	43.60	248.00
Dilute CO conc (dry)	%		0.30	0.10	0.19	0.17	0.11	0.01
Dilute CO ₂ conc (dry)	%		0.70	0.63	0.43	0.32	0.28	0.12
Dilute NO _x conc (dry)	ppm		45.30	65.40	12.20	3.90	2.40	1.00
Measured A/F	----		12.96	14.03	12.82	12.59	13.10	17.38
Dry/Wet Correction	----		0.97	0.97	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----		1.11	1.09	1.10	1.10	1.09	1.08
Raw O ₂ conc (dry) _{measured}	%		0.30	0.46	0.51	0.76	1.03	8.00
HC Mass	g/hr		35.20	21.82	26.21	23.15	17.59	105.90
NO _x Mass	g/hr		64.06	94.14	17.65	5.83	3.62	1.52
CO Mass	g/hr		2320.3	783.1	1574.8	1373.2	931.3	111.4
CO ₂ Mass	g/hr		8623	7908	5491	4158	3663	1641
BSHC	g/hp-hr		2.36	1.95	3.49	6.18	11.83	-----
BSNO _x	g/hp-hr		4.30	8.43	2.35	1.56	2.43	-----
BSCO	g/hp-hr		155.61	70.12	209.56	366.78	626.06	-----
BSCO ₂	g/hp-hr		578.32	708.12	730.67	1110.45	2462.65	-----
Emission Test Results	----		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb _m /hp-hr)
Weighted Specific Emissions ³	g/hp-hr		4.10	4.55	8.65	186.9	792.8	0.785

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 5/8/03

Test ID: KAW2-250-EO3-#2

250-hour interval engine-out emission test with stock muffler, Tier 3 jetting (116/120), and passive SAI system.
(methane test)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3058	3080	3073	3056	3090	1530
Obs. Power	hp	14.91	11.27	7.52	3.72	1.49	0.00
Obs. Torque	ft-lb	25.27	18.95	12.67	6.31	2.50	0.00
Calc. Power (Obs. Torque*Speed)	hp	14.71	11.11	7.42	3.67	1.47	0.00
Work (5 min Interval)	hp-hr	1.243	0.939	0.627	0.310	0.124	0.000
Fuel Flow	lb/hr	8.586	6.287	5.504	4.231	3.380	1.218
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	283	271	250	230	221	188
Exhaust Gas (muffler-in/manifold)	deg F	1344	1385	1279	1204	1195	632
Exhaust Gas (muffler out)	deg F	819	725	577	442	377	153
Catalyst/Muffler Surface	deg F	816	772	644	526	494	225
Intake Air (EPA)	deg F	99	98	95	94	93	85
Intake Air DewPoint (EPA)	deg F	67	67	67	67	67	66
Cyl Head (Spark Plug)	deg F	437	414	359	323	313	203
PRESSURES							
Exhaust BP Before Cat	psig	1.26	0.79	0.45	0.20	0.11	-0.11
Barometer	"Hg	28.880	28.894	28.888	28.891	28.889	28.884
F Factor	----	1.067	1.064	1.061	1.059	1.058	1.047
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	96.75	59.47	70.07	60.45	47.06	264.32
Dilute CO conc (dry)	%	0.31	0.10	0.19	0.17	0.12	0.01
Dilute CO ₂ conc (dry)	%	0.70	0.64	0.44	0.32	0.28	0.13
Dilute NO _x conc (dry)	ppm	42.81	64.64	12.12	3.88	2.48	1.12
Measured A/F	----	12.92	14.06	12.88	12.58	13.08	17.65
Dry/Wet Correction	----	0.97	0.97	0.97	0.97	0.97	0.98
NO _x Humidity Correction	----	1.14	1.15	1.15	1.16	1.16	1.13
Raw O ₂ conc (dry) _{measured}	%	0.32	0.50	0.56	0.86	1.13	8.00
HC Mass	g/hr	37.03	22.62	27.48	23.93	18.42	112.85
NO _x Mass	g/hr	61.80	96.51	17.84	5.40	3.24	1.04
CO Mass	g/hr	2404.6	770.8	1590.0	1403.5	974.4	88.5
CO ₂ Mass	g/hr	8133	7525	5126	3647	3147	1218
BSHC	g/hp-hr	2.48	2.01	3.66	6.41	12.38	-----
BSNO _x	g/hp-hr	4.14	8.59	2.38	1.45	2.18	-----
BSCO	g/hp-hr	161.03	68.59	211.80	376.18	654.81	-----
BSCO ₂	g/hp-hr	544.66	669.66	682.87	977.58	2114.75	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	4.28	4.57	8.85	189.6	729.3	0.743

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 5/8/03

Test ID: KAW2-250-STK-#1

250-hour interval stock engine-out emission test with stock muffler, and stock jetting (136/140).

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	---						
Weight Factor	---	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	---	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3088	3048	3052	3053	3083	1534
Obs. Power	hp	15.00	11.10	7.41	3.71	1.48	0.00
Obs. Torque	ft-lb	25.16	18.86	12.58	6.30	2.48	0.00
Calc. Power (Obs. Torque*Speed)	hp	14.80	10.94	7.31	3.66	1.46	0.00
Work (5 min Interval)	hp-hr	1.250	0.925	0.617	0.309	0.123	0.000
Fuel Flow	lb/hr	10.378	7.987	6.724	5.270	3.357	1.201
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	268	260	245	229	224	197
Exhaust Gas (muffler-in/manifold)	deg F	1238	1244	1212	1188	1224	653
Exhaust Gas (muffler out)	deg F	789	693	592	490	389	165
Catalyst/Muffler Surface	deg F	656	593	526	450	406	207
Intake Air (EPA)	deg F	95	96	95	94	93	85
Intake Air DewPoint (EPA)	deg F	66	65	65	65	65	65
Cyl Head (Spark Plug)	deg F	407	385	342	314	314	215
PRESSURES							
Exhaust BP Before Cat	psig	0.48	0.27	0.14	0.02	-0.04	-0.17
Barometer	"Hg	28.865	28.859	28.854	28.852	28.848	28.839
F Factor	---	1.061	1.062	1.061	1.059	1.059	1.048
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	160.98	124.36	121.67	132.04	49.19	264.78
Dilute CO conc (dry)	%	0.66	0.45	0.41	0.33	0.11	0.01
Dilute CO ₂ conc (dry)	%	0.55	0.47	0.36	0.27	0.28	0.13
Dilute NO _x conc (dry)	ppm	8.29	7.58	3.99	2.08	2.66	1.16
Measured A/F	---	10.34	11.01	10.32	9.97	12.72	16.62
Dry/Wet Correction	---	0.97	0.97	0.97	0.98	0.98	0.98
NO _x Humidity Correction	---	1.12	1.12	1.12	1.11	1.11	1.12
Raw O ₂ conc (dry) _{measured}	%	0.13	0.13	0.14	0.19	0.19	6.00
HC Mass	g/hr	61.94	48.52	48.19	53.24	19.05	111.68
NO _x Mass	g/hr	11.51	10.65	5.47	2.68	3.58	1.33
CO Mass	g/hr	5131.1	3581.8	3292.6	2686.5	952.3	65.7
CO ₂ Mass	g/hr	6282	5409	4095	2996	3146	1235
BSHC	g/hp-hr	4.17	4.37	6.51	14.36	13.02	-----
BSNO _x	g/hp-hr	0.77	0.96	0.74	0.72	2.44	-----
BSCO	g/hp-hr	345.22	322.33	445.00	724.76	650.89	-----
BSCO ₂	g/hp-hr	422.65	486.81	553.48	808.26	2150.49	-----
Emission Test Results							
Emission Test Results	---	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	7.54	0.85	8.38	434.8	580.3	0.919

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 5/8/03

Test ID: KAW2-250-STK-#2

250-hour interval stock engine-out emission test with stock muffler, and stock jetting (136/140). (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3069	3054	3058	3065	3058	1542
Obs. Power	hp	14.96	11.17	7.42	3.71	1.45	0.00
Obs. Torque	ft-lb	25.25	18.94	12.57	6.27	2.45	0.00
Calc. Power (Obs. Torque*Speed)	hp	14.76	11.02	7.32	3.66	1.43	0.00
Work (5 min Interval)	hp-hr	1.247	0.931	0.618	0.309	0.121	0.000
Fuel Flow	lb/hr	10.395	8.124	6.697	5.212	3.235	1.229
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	268	261	247	232	226	194
Exhaust Gas (muffler-in/manifold)	deg F	1235	1244	1215	1191	1231	527
Exhaust Gas (muffler out)	deg F	792	690	594	491	414	150
Catalyst/Muffler Surface	deg F	656	593	529	452	406	187
Intake Air (EPA)	deg F	98	98	97	96	95	87
Intake Air DewPoint (EPA)	deg F	65	65	65	64	64	65
Cyl Head (Spark Plug)	deg F	407	386	344	316	316	184
PRESSURES							
Exhaust BP Before Cat	psig	0.47	0.26	0.14	0.02	-0.05	-0.17
Barometer	"Hg	28.835	28.828	28.821	28.816	28.811	28.806
F Factor	----	1.065	1.066	1.064	1.063	1.062	1.052
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	163.46	127.01	121.21	128.57	47.31	379.68
Dilute CO conc (dry)	%	0.66	0.46	0.41	0.32	0.10	0.01
Dilute CO ₂ conc (dry)	%	0.55	0.48	0.36	0.27	0.28	0.12
Dilute NO _x conc (dry)	ppm	8.28	7.61	4.04	2.08	2.61	1.25
Measured A/F	----	10.29	10.97	10.35	10.02	12.89	17.60
Dry/Wet Correction	----	0.97	0.97	0.97	0.98	0.98	0.98
NO _x Humidity Correction	----	1.11	1.12	1.11	1.10	1.10	1.11
Raw O ₂ conc (dry) _{measured}	%	0.13	0.12	0.14	0.19	0.19	8.00
HC Mass	g/hr	62.25	48.80	47.28	51.02	17.68	159.78
NO _x Mass	g/hr	11.33	10.54	5.48	2.61	3.41	1.43
CO Mass	g/hr	5160.7	3643.3	3280.5	2647.2	854.8	99.5
CO ₂ Mass	g/hr	6258	5503	4079	2983	3133	1072
BSHC	g/hp-hr	4.17	4.36	6.35	13.68	12.09	-----
BSNO _x	g/hp-hr	0.76	0.94	0.74	0.70	2.33	-----
BSCO	g/hp-hr	345.87	325.52	440.36	709.56	584.27	-----
BSCO ₂	g/hp-hr	419.44	491.66	547.61	799.58	2141.64	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	7.70	0.83	8.53	431.3	576.5	0.912

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 6/20/03

Test ID: KAW2-500-E-#1

500-hour interval emission test "as-received" from durability with catalyst E, Tier 3 jetting (116/120), and passive SAI system. (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3054	3058	3061	3060	3068	1548
Obs. Power	hp	15.23	11.44	7.61	3.81	1.51	0.00
Obs. Torque	ft-lb	25.84	19.38	12.88	6.44	2.55	0.00
Calc. Power (Obs. Torque*Speed)	hp	15.02	11.28	7.51	3.75	1.49	0.00
Work (5 min Interval)	hp-hr	1.269	0.953	0.634	0.317	0.126	0.000
Fuel Flow	lb/hr	8.335	6.655	5.724	4.517	3.351	1.294
TEMPERATURES							
Catalyst Mid-bed	deg F	1330	1311	1194	1114	1101	1001
Oil	deg F	268	266	245	228	220	191
Exhaust Gas (muffler-in/manifold)	deg F	1359	1354	1252	1183	1162	758
Exhaust Gas (muffler out)	deg F	1007	929	802	680	613	400
Catalyst/Muffler Surface	deg F	702	697	619	556	529	409
Intake Air (EPA)	deg F	92	95	94	92	91	85
Intake Air DewPoint (EPA)	deg F	64	65	65	65	64	64
Cyl Head (Spark Plug)	deg F	428	399	343	311	299	235
PRESSURES							
Exhaust BP Before Cat	psig	1.20	0.76	0.43	0.21	0.12	-0.08
Barometer	"Hg	29.024	29.025	29.028	29.028	29.030	29.029
F Factor	---	1.050	1.055	1.052	1.050	1.048	1.039
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	46.51	35.77	49.49	48.01	35.40	18.83
Dilute CO conc (dry)	%	0.16	0.09	0.15	0.13	0.08	0.00
Dilute CO ₂ conc (dry)	%	0.82	0.69	0.50	0.38	0.31	0.17
Dilute NO _x conc (dry)	ppm	1.80	1.74	0.41	0.18	0.11	0.58
Measured A/F	----	13.33	13.67	12.49	12.28	12.64	15.55
Dry/Wet Correction	----	0.97	0.97	0.97	0.98	0.98	0.98
NO _x Humidity Correction	----	1.08	1.12	1.11	1.10	1.09	1.09
Raw O ₂ conc (dry) _{measured}	%	0.35	0.41	0.47	0.61	0.81	3.10
HC Mass	g/hr	17.12	13.04	19.05	19.12	13.54	6.59
NO _x Mass	g/hr	2.09	2.07	0.50	0.23	0.14	0.76
CO Mass	g/hr	1243.3	685.3	1270.7	1075.5	665.1	34.7
CO ₂ Mass	g/hr	9667	8205	5962	4578	3607	1737
BSHC	g/hp-hr	1.12	1.14	2.50	5.01	8.84	-----
BSNO _x	g/hp-hr	0.14	0.18	0.07	0.06	0.09	
BSCO	g/hp-hr	81.54	59.97	166.75	281.83	434.16	-----
BSCO ₂	g/hp-hr	634.06	717.97	782.45	1199.78	2354.34	-----
Emission Test Results	---	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	2.34	0.12	2.47	138.8	836.1	0.758

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 6/20/03

Test ID: KAW2-500-E-#2

500-hour interval emission test "as-received" from durability with catalyst E, Tier 3 jetting (116/120), and passive SAI system.

DESCRIPTION	UNIT		1	2	3	4	5	6
Mode	----							
Weight Factor	----		0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----		300	300	300	300	300	300
Speed Set	%Rated		85	85	85	85	85	Idle
Load Set	%Rated		100	75	50	25	10	0
ENGINE DATA								
Obs. Speed	rpm		3061	3057	3062	3069	3063	1562
Obs. Power	hp		15.42	11.54	7.69	3.86	1.53	0.00
Obs. Torque	ft-lb		26.09	19.55	13.01	6.51	2.59	0.00
Calc. Power (Obs. Torque*Speed)	hp		15.21	11.38	7.59	3.81	1.51	0.00
Work (5 min Interval)	hp-hr		1.285	0.961	0.641	0.322	0.127	0.000
Fuel Flow	lb/hr		8.425	6.577	5.712	4.389	3.424	1.365
TEMPERATURES								
Catalyst Mid-bed	deg F		1332	1323	1194	1119	1105	1045
Oil	deg F		284	268	247	231	222	190
Exhaust Gas (muffler-in/manifold)	deg F		1349	1363	1251	1189	1163	730
Exhaust Gas (muffler out)	deg F		997	930	807	691	621	408
Catalyst/Muffler Surface	deg F		730	718	632	569	544	439
Intake Air (EPA)	deg F		96	95	94	93	92	85
Intake Air DewPoint (EPA)	deg F		60	58	59	58	58	58
Cyl Head (Spark Plug)	deg F		434	402	345	314	301	222
PRESSURES								
Exhaust BP Before Cat	psig		1.21	0.77	0.43	0.21	0.12	-0.08
Barometer	"Hg		29.015	29.002	29.001	28.995	28.990	28.987
F Factor	----		1.052	1.050	1.049	1.047	1.046	1.037
GASEOUS EMISSIONS								
			EMISSIONS ARE UNWEIGHTED¹ (ETIS)					
Dilute HC conc (wet)	ppm		49.92	31.07	46.86	43.61	32.64	27.80
Dilute CO conc (dry)	%		0.18	0.07	0.15	0.12	0.08	0.00
Dilute CO ₂ conc (dry)	%		0.81	0.69	0.50	0.38	0.32	0.17
Dilute NO _x conc (dry)	ppm		1.12	1.62	0.42	0.27	0.20	0.78
Measured A/F	----		13.18	13.77	12.56	12.40	12.78	15.89
Dry/Wet Correction	----		0.97	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----		1.02	1.00	1.00	1.00	1.00	0.99
Raw O ₂ conc (dry) _{measured}	%		0.33	0.39	0.46	0.60	0.80	>5.00
HC Mass	g/hr		18.41	11.20	17.95	16.91	12.40	10.58
NO _x Mass	g/hr		1.20	1.86	0.28	0.08	0.00	0.80
CO Mass	g/hr		1413.4	595.4	1257.7	1014.0	644.2	34.8
CO ₂ Mass	g/hr		9523	8241	5970	4502	3746	1825
BSHC	g/hp-hr		1.19	0.97	2.33	4.39	8.10	-----
BSNO _x	g/hp-hr		0.08	0.16	0.04	0.02	0.00	
BSCO	g/hp-hr		91.73	51.69	163.25	263.23	421.09	-----
BSCO ₂	g/hp-hr		618.03	715.40	774.86	1168.63	2448.42	-----
Emission Test Results	----		HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr		2.17	0.09	2.25	133.8	826.5	0.745

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 6/24/03

Test ID: KAW2-500-STK-#1

500-hour interval stock engine-out emission test with stock muffler, and stock jetting (136/140). (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3064	3059	3054	3065	3069	1551
Obs. Power	hp	15.52	11.59	7.71	3.86	1.53	0.00
Obs. Torque	ft-lb	26.23	19.63	13.08	6.52	2.58	0.00
Calc. Power (Obs. Torque*Speed)	hp	15.30	11.44	7.60	3.81	1.50	0.00
Work (5 min Interval)	hp-hr	1.293	0.966	0.643	0.322	0.127	0.000
Fuel Flow	lb/hr	9.345	7.432	6.044	4.572	3.431	1.242
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	281	265	245	230	223	194
Exhaust Gas (muffler-in/manifold)	deg F	1310	1289	1262	1210	1224	627
Exhaust Gas (muffler out)	deg F	791	687	567	448	384	150
Catalyst/Muffler Surface	deg F	672	620	549	458	417	192
Intake Air (EPA)	deg F	94	93	92	91	91	87
Intake Air DewPoint (EPA)	deg F	64	64	64	63	63	62
Cyl Head (Spark Plug)	deg F	423	386	343	313	309	203
PRESSURES							
Exhaust BP Before Cat	psig	0.51	0.30	0.15	0.03	-0.02	-0.14
Barometer	"Hg	29.015	29.012	29.009	29.003	29.002	28.995
F Factor	----	1.052	1.052	1.050	1.049	1.048	1.043
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	133.17	116.49	96.71	77.87	53.79	294.88
Dilute CO conc (dry)	%	0.41	0.33	0.26	0.21	0.12	0.01
Dilute CO ₂ conc (dry)	%	0.67	0.52	0.43	0.31	0.28	0.13
Dilute NO _x conc (dry)	ppm	28.87	14.71	8.56	3.27	2.49	1.08
Measured A/F	----	12.13	12.04	12.02	11.65	12.61	16.49
Dry/Wet Correction	----	0.97	0.97	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.09	1.09	1.08	1.08	1.08	1.06
Raw O ₂ conc (dry) _{measured}	%	0.10	0.10	0.12	0.14	0.14	>5.00
HC Mass	g/hr	51.36	45.69	38.42	31.16	21.18	125.59
NO _x Mass	g/hr	40.50	20.94	12.29	4.59	3.43	1.34
CO Mass	g/hr	3244.6	2664.7	2100.5	1749.2	989.8	89.5
CO ₂ Mass	g/hr	7832	6081	5046	3559	3185	1211
BSHC	g/hp-hr	3.28	3.94	4.98	8.06	13.79	-----
BSNO _x	g/hp-hr	2.59	1.81	1.59	1.19	2.23	-----
BSCO	g/hp-hr	207.51	229.87	272.32	452.54	644.42	-----
BSCO ₂	g/hp-hr	500.88	524.63	654.13	920.78	2073.51	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	5.81	1.81	7.62	281.1	655.0	0.796

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 6/24/03

Test ID: KAW2-500-STK-#2

500-hour interval stock engine-out emission test with stock muffler, and stock jetting (136/140).

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	---						
Weight Factor	---	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	---	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3049	3066	3064	3069	3044	1550
Obs. Power	hp	15.49	11.63	7.76	3.88	1.52	0.00
Obs. Torque	ft-lb	26.32	19.65	13.12	6.54	2.58	0.00
Calc. Power (Obs. Torque*Speed)	hp	15.28	11.47	7.66	3.82	1.50	0.00
Work (5 min Interval)	hp-hr	1.291	0.969	0.647	0.323	0.126	0.000
Fuel Flow	lb/hr	9.375	7.413	5.838	4.264	3.263	1.230
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	281	269	249	233	225	196
Exhaust Gas (muffler-in/manifold)	deg F	1284	1296	1275	1216	1232	634
Exhaust Gas (muffler out)	deg F	780	686	569	449	383	150
Catalyst/Muffler Surface	deg F	682	625	557	463	420	192
Intake Air (EPA)	deg F	97	96	94	94	93	89
Intake Air DewPoint (EPA)	deg F	64	63	63	63	63	62
Cyl Head (Spark Plug)	deg F	417	391	348	317	312	204
PRESSURES							
Exhaust BP Before Cat	psig	0.50	0.30	0.14	0.03	-0.02	-0.14
Barometer	"Hg	28.990	28.975	28.970	28.971	28.972	28.970
F Factor	---	1.057	1.056	1.054	1.053	1.052	1.046
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	140.28	116.94	86.80	70.16	47.12	284.39
Dilute CO conc (dry)	%	0.48	0.33	0.24	0.19	0.10	0.01
Dilute CO ₂ conc (dry)	%	0.61	0.53	0.43	0.30	0.28	0.13
Dilute NO _x conc (dry)	ppm	18.73	16.73	9.00	3.13	2.39	0.93
Measured A/F	---	11.57	12.16	12.20	11.80	12.84	16.42
Dry/Wet Correction	---	0.97	0.97	0.98	0.98	0.98	0.98
NO _x Humidity Correction	---	1.09	1.08	1.08	1.08	1.08	1.06
Raw O ₂ conc (dry) _{measured}	%	0.10	0.11	0.12	0.13	0.15	>5.00
HC Mass	g/hr	54.00	45.54	34.15	27.77	18.27	120.47
NO _x Mass	g/hr	25.68	23.45	12.57	4.31	3.26	1.11
CO Mass	g/hr	3762.4	2590.6	1940.4	1574.2	854.6	83.2
CO ₂ Mass	g/hr	7052	6171	5023	3412	3172	1220
BSHC	g/hp-hr	3.48	3.92	4.41	7.18	11.90	-----
BSNO _x	g/hp-hr	1.66	2.02	1.62	1.11	2.12	-----
BSCO	g/hp-hr	242.67	223.25	250.61	406.88	556.77	-----
BSCO ₂	g/hp-hr	454.87	531.82	648.71	882.05	2066.19	-----
Emission Test Results	---	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	5.46	1.69	7.15	270.5	640.7	0.773

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 6/25/03

Test ID: KAW2-500-STK-#3

500-hour interval stock engine-out emission test with stock muffler, and stock jetting (136/140).

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	---	1	2	3	4	5	6
Weight Factor	---	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	---	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3069	3070	3065	3056	3056	1552
Obs. Power	hp	15.25	11.44	7.60	3.79	1.51	0.00
Obs. Torque	ft-lb	25.74	19.30	12.84	6.42	2.56	0.00
Calc. Power (Obs. Torque*Speed)	hp	15.04	11.28	7.49	3.73	1.49	0.00
Work (5 min Interval)	hp-hr	1.271	0.953	0.633	0.315	0.126	0.000
Fuel Flow	lb/hr	10.632	8.257	6.506	4.655	3.354	1.214
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	280	265	247	231	224	198
Exhaust Gas (muffler-in/manifold)	deg F	1225	1244	1218	1198	1241	592
Exhaust Gas (muffler out)	deg F	NA	NA	NA	NA	NA	NA
Catalyst/Muffler Surface	deg F	653	591	520	438	407	192
Intake Air (EPA)	deg F	97	95	93	92	92	84
Intake Air DewPoint (EPA)	deg F	61	60	59	58	59	59
Cyl Head (Spark Plug)	deg F	403	379	336	313	312	198
PRESSURES							
Exhaust BP Before Cat	psig	0.56	0.33	0.17	0.04	0.00	-0.13
Barometer	"Hg	29.065	29.059	29.056	29.056	29.052	29.049
F Factor	---	1.052	1.050	1.047	1.044	1.045	1.035
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	183.36	142.31	114.45	80.30	45.23	310.74
Dilute CO conc (dry)	%	0.68	0.47	0.36	0.23	0.11	0.01
Dilute CO ₂ conc (dry)	%	0.53	0.46	0.37	0.29	0.28	0.12
Dilute NO _x conc (dry)	ppm	9.26	7.68	4.49	2.73	2.42	0.93
Measured A/F	---	10.00	10.82	10.80	11.29	12.83	16.92
Dry/Wet Correction	---	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	---	1.04	1.03	1.02	1.00	1.01	1.01
Raw O ₂ conc (dry) _{measured}	%	0.10	0.12	0.12	0.14	0.18	>5.0
HC Mass	g/hr	71.71	56.47	46.11	32.46	17.74	133.48
NO _x Mass	g/hr	12.31	10.24	6.01	3.58	3.17	1.10
CO Mass	g/hr	5410.5	3815.3	2947.8	1953.9	900.8	76.0
CO ₂ Mass	g/hr	6169	5396	4339	3349	3227	1169
BSHC	g/hp-hr	4.72	4.93	6.07	8.56	11.66	-----
BSNO _x	g/hp-hr	0.81	0.89	0.79	0.94	2.08	-----
BSCO	g/hp-hr	355.98	333.27	387.86	515.43	592.10	-----
BSCO ₂	g/hp-hr	405.86	471.34	570.85	883.46	2121.18	-----
Emission Test Results	---	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	6.86	0.88	7.74	388.1	588.5	0.871

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 6/25/03

Test ID: KAW2-500-STK-#4

500-hour interval stock engine-out emission test with stock muffler, and stock jetting (136/140).

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3068	3072	3051	3065	3045	1528
Obs. Power	hp	15.22	11.42	7.59	3.78	1.49	0.00
Obs. Torque	ft-lb	25.69	19.26	12.89	6.39	2.54	0.00
Calc. Power (Obs. Torque*Speed)	hp	15.01	11.27	7.49	3.73	1.47	0.00
Work (5 min Interval)	hp-hr	1.268	0.952	0.633	0.315	0.124	0.000
Fuel Flow	lb/hr	10.525	8.321	6.551	4.640	3.449	1.244
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	280	264	246	230	224	200
Exhaust Gas (muffler-in/manifold)	deg F	1251	1251	1213	1203	1237	591
Exhaust Gas (muffler out)	deg F	NA	NA	NA	NA	NA	NA
Catalyst/Muffler Surface	deg F	664	594	518	439	402	194
Intake Air (EPA)	deg F	95	95	93	91	91	84
Intake Air DewPoint (EPA)	deg F	58	59	58	57	57	57
Cyl Head (Spark Plug)	deg F	410	381	335	313	311	199
PRESSURES							
Exhaust BP Before Cat	psig	0.55	0.33	0.17	0.04	-0.01	-0.13
Barometer	"Hg	29.030	29.021	29.020	29.021	29.016	29.010
F Factor	----	1.049	1.050	1.047	1.044	1.044	1.035
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	182.99	147.97	122.21	85.78	49.93	310.56
Dilute CO conc (dry)	%	0.63	0.47	0.37	0.23	0.10	0.01
Dilute CO ₂ conc (dry)	%	0.57	0.47	0.36	0.29	0.29	0.13
Dilute NO _x conc (dry)	ppm	13.08	8.72	4.66	3.29	2.90	1.32
Measured A/F	----	10.51	10.93	10.63	11.34	12.88	17.09
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.00	1.01	1.00	0.99	0.99	0.99
Raw O ₂ conc (dry) _{measured}	%	0.15	0.12	0.14	0.16	0.16	>5.00
HC Mass	g/hr	71.40	58.65	49.13	34.67	19.75	132.99
NO _x Mass	g/hr	16.42	11.06	5.72	3.88	3.35	1.20
CO Mass	g/hr	4989.0	3767.7	3049.3	1919.7	870.7	52.9
CO ₂ Mass	g/hr	6682	5553	4232	3376	3402	1248
BSHC	g/hp-hr	4.71	5.14	6.50	9.12	13.06	-----
BSNO _x	g/hp-hr	1.08	0.97	0.76	1.02	2.21	-----
BSCO	g/hp-hr	328.92	330.39	403.48	505.17	575.88	-----
BSCO ₂	g/hp-hr	440.55	486.90	560.03	888.42	2249.84	-----
Emission Test Results							
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	7.18	0.96	8.14	384.9	600.4	0.876

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 6/23/03

Test ID: KAW2-500-EO3-#1

500-hour interval engine-out emission test with stock muffler, Tier 3 jetting (116/120), and passive SAI system. (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	---						
Weight Factor	---	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	---	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3062	3065	3071	3067	3067	1592
Obs. Power	hp	15.07	11.31	7.56	3.76	1.52	0.00
Obs. Torque	ft-lb	25.50	19.11	12.75	6.36	2.57	0.00
Calc. Power (Obs. Torque*Speed)	hp	14.87	11.15	7.46	3.71	1.50	0.00
Work (5 min Interval)	hp-hr	1.256	0.942	0.630	0.314	0.127	0.000
Fuel Flow	lb/hr	8.565	6.424	5.458	4.254	3.464	1.263
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	285	274	252	231	223	195
Exhaust Gas (muffler-in/manifold)	deg F	1341	1385	1266	1200	1176	719
Exhaust Gas (muffler out)	deg F	801	716	564	433	364	160
Catalyst/Muffler Surface	deg F	803	772	628	524	483	232
Intake Air (EPA)	deg F	94	95	93	92	91	85
Intake Air DewPoint (EPA)	deg F	67	63	62	61	60	58
Cyl Head (Spark Plug)	deg F	431	408	351	318	306	226
PRESSURES							
Exhaust BP Before Cat	psig	1.25	0.83	0.45	0.21	0.12	-0.09
Barometer	"Hg	28.978	28.977	28.971	28.971	28.968	28.967
F Factor	---	1.056	1.054	1.051	1.048	1.046	1.038
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	108.49	66.76	75.58	64.48	50.55	165.78
Dilute CO conc (dry)	%	0.27	0.09	0.19	0.16	0.11	0.01
Dilute CO ₂ conc (dry)	%	0.72	0.65	0.43	0.32	0.28	0.14
Dilute NO _x conc (dry)	ppm	53.52	70.27	11.78	3.77	2.53	0.85
Measured A/F	---	13.14	14.14	12.87	12.67	13.05	16.65
Dry/Wet Correction	---	0.97	0.97	0.98	0.98	0.98	0.98
NO _x Humidity Correction	---	1.15	1.07	1.05	1.04	1.02	1.00
Raw O ₂ conc (dry) _{measured}	%	0.28	0.37	0.41	0.75	0.98	>5.00
HC Mass	g/hr	41.70	25.48	29.77	25.55	19.78	70.49
NO _x Mass	g/hr	81.34	100.30	16.91	5.36	3.56	1.14
CO Mass	g/hr	2146.8	713.4	1537.5	1347.7	976.4	84.1
CO ₂ Mass	g/hr	8495	7798	5137	3762	3256	1419
BSHC	g/hp-hr	2.78	2.26	3.95	6.76	13.09	-----
BSNO _x	g/hp-hr	5.42	8.88	2.24	1.42	2.36	-----
BSCO	g/hp-hr	142.96	63.16	203.73	356.64	646.21	-----
BSCO ₂	g/hp-hr	565.69	690.34	680.65	995.51	2154.98	-----
Emission Test Results	---	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	4.27	4.86	9.13	178.8	744.6	0.742

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Kawasaki FH601V #2

Date: 6/23/03

Test ID: KAW2-500-EO3-#2

500-hour interval engine-out emission test with stock muffler, Tier 3 jetting (116/120), and passive SAI system.

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	---						
Weight Factor	---	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	---	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3051	3057	3075	3066	3057	1541
Obs. Power	hp	15.31	11.50	7.71	3.84	1.52	0.00
Obs. Torque	ft-lb	26.00	19.48	12.99	6.48	2.57	0.00
Calc. Power (Obs. Torque*Speed)	hp	15.10	11.34	7.61	3.79	1.50	0.00
Work (5 min Interval)	hp-hr	1.276	0.958	0.643	0.320	0.127	0.000
Fuel Flow	lb/hr	8.395	6.775	5.611	4.232	3.383	1.261
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	285	277	253	234	224	195
Exhaust Gas (muffler-in/manifold)	deg F	1338	1377	1275	1202	1175	701
Exhaust Gas (muffler out)	deg F	802	713	571	434	362	162
Catalyst/Muffler Surface	deg F	806	768	638	527	486	234
Intake Air (EPA)	deg F	96	96	95	95	93	88
Intake Air DewPoint (EPA)	deg F	60	60	61	61	60	61
Cyl Head (Spark Plug)	deg F	433	410	355	321	307	223
PRESSURES							
Exhaust BP Before Cat	psig	1.23	0.81	0.46	0.21	0.11	-0.09
Barometer	"Hg	28.939	28.928	28.922	28.916	28.914	28.911
F Factor	---	1.055	1.056	1.055	1.055	1.052	1.046
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	105.48	69.27	76.77	65.76	48.51	208.35
Dilute CO conc (dry)	%	0.28	0.10	0.19	0.16	0.11	0.01
Dilute CO ₂ conc (dry)	%	0.69	0.64	0.45	0.32	0.28	0.14
Dilute NO _x conc (dry)	ppm	51.68	68.08	13.18	4.08	2.50	0.90
Measured A/F	---	13.06	14.01	12.96	12.67	13.11	16.87
Dry/Wet Correction	---	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	---	1.02	1.03	1.04	1.04	1.02	1.04
Raw O ₂ conc (dry) _{measured}	%	0.26	0.37	0.47	0.73	1.01	>5.00
HC Mass	g/hr	40.31	26.29	30.00	25.88	18.79	87.98
NO _x Mass	g/hr	68.23	92.62	18.44	5.74	3.47	1.23
CO Mass	g/hr	2219.3	837.4	1532.4	1346.0	919.4	69.5
CO ₂ Mass	g/hr	8147	8092	5359	3732	3235	1386
BSHC	g/hp-hr	2.63	2.28	3.90	6.76	12.24	-----
BSNO _x	g/hp-hr	4.45	8.04	2.39	1.50	2.26	-----
BSCO	g/hp-hr	144.65	72.69	199.04	351.62	598.79	-----
BSCO ₂	g/hp-hr	530.99	702.41	696.06	975.02	2106.91	-----
Emission Test Results	---	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions³	g/hp-hr	4.33	4.47	8.80	178.9	741.8	0.740

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle

APPENDIX F
HONDA GX340 EMISSION DATA SHEETS



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 7/22/03

Test ID: HON-340-BSLN#3r

Baseline testing over 6-mode cycle @ 3600 RPM with stock muffler and stock jetting (methane test)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3589	3609	3601	3600	3618	1567
Obs. Power	hp	9.69	7.29	4.85	2.42	0.98	0.00
Obs. Torque	ft-lb	13.98	10.46	6.97	3.49	1.40	0.00
Calc. Power (Obs. Torque*Speed)	hp	9.56	7.19	4.78	2.39	0.96	0.00
Work (5 min Interval)	hp-hr	0.807	0.607	0.404	0.202	0.081	0.000
Fuel Flow	lb/hr	5.631	4.927	3.852	2.787	2.241	0.672
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	237	230	218	201	186	162
Exhaust Gas (muffler-in/manifold)	deg F	1348	1283	1244	1188	1102	605
Exhaust Gas (muffler out)	deg F	1055	961	816	660	547	235
Catalyst/Muffler Surface-Top	deg F	1011	963	844	746	662	310
Muffler Heat Shield Surface-Top	deg F	411	387	305	254	221	119
Intake Air (EPA)	deg F	85	86	85	85	84	81
Intake Air DewPoint (EPA)	deg F	61	61	61	60	61	60
Cyl Head (Spark Plug)	deg F	446	414	376	339	312	255
PRESSURES							
Exhaust BP Before Cat	psig	0.72	0.52	0.28	0.11	0.03	-0.11
Barometer	"Hg	29.125	29.088	29.087	29.082	29.078	29.076
F Factor	----	1.035	1.038	1.036	1.035	1.034	1.031
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	95.00	90.28	81.68	69.08	64.00	40.66
Dilute CO conc (dry)	%	0.30	0.29	0.24	0.15	0.13	0.04
Dilute CO ₂ conc (dry)	%	0.81	0.68	0.51	0.39	0.31	0.12
Dilute NO _x conc (dry)	ppm	54.02	27.58	11.93	5.80	2.65	0.42
Measured A/F	----	13.01	12.78	12.58	12.72	12.55	12.66
Dry/Wet Correction	----	0.97	0.97	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.03	1.04	1.03	1.03	1.03	1.02
Raw O ₂ conc (dry) _{measured}	%	0.15	0.17	0.18	0.26	0.23	1.46
HC Mass	g/hr	21.18	20.32	18.62	15.89	14.82	9.47
NO _x Mass	g/hr	40.65	21.09	9.12	4.43	1.97	0.20
CO Mass	g/hr	1358.2	1303.8	1108.5	724.2	616.6	184.5
CO ₂ Mass	g/hr	5511	4635	3475	2630	2054	601
BSHC	g/hp-hr	2.18	2.79	3.84	6.52	15.26	----
BSNO _x	g/hp-hr	4.19	2.89	1.88	1.82	2.02	----
BSCO	g/hp-hr	140.08	179.00	228.57	297.29	634.55	----
BSCO ₂	g/hp-hr	568.34	636.31	716.56	1079.57	2113.80	----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions³	g/hp-hr	3.89	2.65	6.54	214.8	748.3	0.802

¹ Emissions results are based on bag sample emissions through ETIS

² Raw emissions are calculated using the dilution factor and dilute concentrations

³ Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 7/23/03

Test ID: HON-340-BSLN#4r

Baseline testing over 6-mode cycle @ 3600 RPM with stock muffler and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----	1	2	3	4	5	6
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3601	3589	3620	3612	3604	1543
Obs. Power	hp	9.49	7.07	4.76	2.38	0.93	0.00
Obs. Torque	ft-lb	13.66	10.21	6.82	3.42	1.34	0.00
Calc. Power (Obs. Torque*Speed)	hp	9.36	6.98	4.70	2.35	0.92	0.00
Work (5 min Interval)	hp-hr	0.791	0.589	0.397	0.199	0.077	0.000
Fuel Flow	lb/hr	5.710	4.913	3.966	2.819	2.227	0.802
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	238	229	216	201	182	160
Exhaust Gas (muffler-in/manifold)	deg F	1326	1274	1210	1184	1113	607
Exhaust Gas (muffler out)	deg F	1027	954	795	640	540	199
Catalyst/Muffler Surface-Top	deg F	1031	963	858	755	677	311
Muffler Heat Shield Surface-Top	deg F	606	556	471	378	292	122
Intake Air (EPA)	deg F	85	85	84	84	82	80
Intake Air DewPoint (EPA)	deg F	65	65	65	64	64	63
Cyl Head (Spark Plug)	deg F	446	411	374	337	311	253
PRESSURES							
Exhaust BP Before Cat	psig	0.71	0.51	0.30	0.12	0.06	-0.07
Barometer	"Hg	29.128	29.142	29.145	29.143	29.143	29.148
F Factor	----	1.037	1.036	1.036	1.034	1.032	1.028
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	94.40	91.37	84.87	69.29	62.64	45.23
Dilute CO conc (dry)	%	0.30	0.29	0.25	0.15	0.13	0.04
Dilute CO ₂ conc (dry)	%	0.84	0.68	0.53	0.40	0.31	0.13
Dilute NO _x conc (dry)	ppm	52.88	24.29	11.21	5.58	2.76	0.65
Measured A/F	----	13.06	12.72	12.55	12.75	12.56	12.68
Dry/Wet Correction	----	0.97	0.97	0.97	0.98	0.98	0.98
NO _x Humidity Correction	----	1.10	1.10	1.10	1.09	1.09	1.07
Raw O ₂ conc (dry) _{measured}	%	0.10	0.10	0.09	0.14	0.14	1.29
HC Mass	g/hr	20.74	20.31	19.16	15.76	14.32	10.47
NO _x Mass	g/hr	40.37	18.77	8.71	4.21	1.95	0.23
CO Mass	g/hr	1335.8	1321.6	1137.5	718.4	617.4	215.7
CO ₂ Mass	g/hr	5656	4588	3584	2683	2036	728
BSHC	g/hp-hr	2.19	2.86	4.04	6.64	15.31	----
BSNO _x	g/hp-hr	4.27	2.64	1.84	1.77	2.08	----
BSCO	g/hp-hr	141.13	186.01	240.07	302.37	659.81	----
BSCO ₂	g/hp-hr	597.54	645.76	756.39	1129.39	2176.04	----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	4.01	2.56	6.57	222.3	779.6	0.833

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 7/18/03

Test ID: HON-340-I2-BSLN#2

Baseline testing @ 3600 RPM with catalyst I2 integrated in a modified muffler with stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3604	3598	3606	3617	3610	1549
Obs. Power	hp	9.37	6.99	4.66	2.32	0.94	0.00
Obs. Torque	ft-lb	13.47	10.06	6.70	3.32	1.35	0.00
Calc. Power (Obs. Torque*Speed)	hp	9.24	6.89	4.60	2.29	0.93	0.00
Work (5 min Interval)	hp-hr	0.781	0.582	0.389	0.193	0.078	0.000
Fuel Flow	lb/hr	5.220	4.539	3.752	2.772	2.250	0.742
TEMPERATURES							
Catalyst Mid-bed	deg F	1612	1526	1445	1385	1329	925
Oil	deg F	236	225	215	203	190	166
Exhaust Gas (muffler-in/manifold)	deg F	1395	1350	1293	1242	1173	753
Exhaust Gas (muffler out)	deg F	1243	1208	832	695	629	386
Catalyst/Muffler Surface-Top	deg F	1072	1022	843	738	671	529
Muffler Heat Shield Surface-Top	deg F	564	528	362	281	240	212
Intake Air (EPA)	deg F	85	85	85	84	83	82
Intake Air DewPoint (EPA)	deg F	65	66	65	65	64	63
Cyl Head (Spark Plug)	deg F	434	404	372	336	311	257
PRESSURES							
Exhaust BP Before Cat	psig	0.63	0.48	0.30	0.18	0.13	-0.02
Barometer	"Hg	29.275	29.276	29.270	29.266	29.262	29.260
F Factor	----	1.032	1.033	1.031	1.031	1.029	1.026
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	20.17	17.77	38.61	31.44	30.36	30.17
Dilute CO conc (dry)	%	0.15	0.14	0.14	0.08	0.07	0.02
Dilute CO ₂ conc (dry)	%	0.90	0.77	0.59	0.46	0.37	0.15
Dilute NO _x conc (dry)	ppm	5.22	3.27	0.46	0.37	0.19	0.18
Measured A/F	----	13.07	12.71	12.76	12.90	12.61	12.69
Dry/Wet Correction	----	0.97	0.97	0.97	0.97	0.98	0.98
NO _x Humidity Correction	----	1.11	1.13	1.10	1.11	1.09	1.07
Raw O ₂ conc (dry) _{measured}	%	0.39	0.44	0.45	0.53	0.55	0.77
HC Mass	g/hr	4.00	3.49	8.50	6.92	6.72	6.82
NO _x Mass	g/hr	4.07	2.58	0.36	0.29	0.14	0.13
CO Mass	g/hr	657.7	615.7	671.6	393.4	352.1	93.3
CO ₂ Mass	g/hr	6101	5236	4056	3155	2507	849
BSHC	g/hp-hr	0.43	0.50	1.83	2.96	7.19	----
BSNO _x	g/hp-hr	0.44	0.37	0.08	0.12	0.15	----
BSCO	g/hp-hr	70.54	87.88	144.29	168.39	376.31	----
BSCO ₂	g/hp-hr	654.30	747.40	871.46	1350.73	2679.23	----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions³	g/hp-hr	1.47	0.25	1.72	120.4	903.8	0.802

¹ Emissions results are based on bag sample emissions through ETIS

² Raw emissions are calculated using the dilution factor and dilute concentrations

³ Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 7/18/03

Test ID: HON-340-I2-BSLN#3

Baseline testing @ 3600 RPM with catalyst I2 integrated in a modified muffler with stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3599	3604	3585	3605	3604	1553
Obs. Power	hp	9.74	7.33	4.88	2.41	0.96	0.00
Obs. Torque	ft-lb	14.02	10.54	7.05	3.46	1.38	0.00
Calc. Power (Obs. Torque*Speed)	hp	9.60	7.23	4.81	2.38	0.94	0.00
Work (5 min Interval)	hp-hr	0.812	0.611	0.406	0.201	0.080	0.000
Fuel Flow	lb/hr	5.509	4.673	3.772	2.750	2.220	0.704
TEMPERATURES							
Catalyst Mid-bed	deg F	1610	1523	1434	1392	1335	915
Oil	deg F	235	223	214	201	188	166
Exhaust Gas (muffler-in/manifold)	deg F	1389	1347	1284	1247	1182	757
Exhaust Gas (muffler out)	deg F	1239	1172	830	703	631	392
Catalyst/Muffler Surface-Top	deg F	1083	1009	841	751	677	534
Muffler Heat Shield Surface-Top	deg F	597	517	371	300	252	285
Intake Air (EPA)	deg F	86	85	85	84	84	82
Intake Air DewPoint (EPA)	deg F	61	60	62	61	61	60
Cyl Head (Spark Plug)	deg F	444	406	373	337	312	251
PRESSURES							
Exhaust BP Before Cat	psig	0.66	0.47	0.30	0.18	0.12	-0.02
Barometer	"Hg	29.249	29.235	29.227	29.224	29.219	29.217
F Factor	----	1.031	1.030	1.031	1.030	1.029	1.026
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	23.95	27.62	43.18	32.79	31.42	24.11
Dilute CO conc (dry)	%	0.17	0.15	0.15	0.08	0.07	0.02
Dilute CO ₂ conc (dry)	%	0.93	0.77	0.58	0.45	0.36	0.14
Dilute NO _x conc (dry)	ppm	5.88	3.46	0.42	0.25	0.16	0.10
Measured A/F	----	13.04	12.80	12.77	12.94	12.76	12.72
Dry/Wet Correction	----	0.97	0.97	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.04	1.02	1.04	1.03	1.03	1.02
Raw O ₂ conc (dry) _{measured}	%	0.38	0.42	0.48	0.56	0.59	0.77
HC Mass	g/hr	5.07	6.01	9.85	7.46	7.21	5.44
NO _x Mass	g/hr	4.42	2.62	0.32	0.18	0.11	0.07
CO Mass	g/hr	751.0	677.6	694.8	395.5	349.9	78.5
CO ₂ Mass	g/hr	6347	5315	4042	3122	2468	824
BSHC	g/hp-hr	0.52	0.82	2.02	3.09	7.51	----
BSNO _x	g/hp-hr	0.45	0.36	0.06	0.08	0.12	----
BSCO	g/hp-hr	77.19	92.54	142.25	163.91	364.43	----
BSCO ₂	g/hp-hr	652.43	725.83	827.65	1293.73	2571.31	----
Emission Test Results							
Weighted Specific Emissions ³	g/hp-hr	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
		1.66	0.24	1.89	121.3	870.1	0.778

¹ Emissions results are based on bag sample emissions through ETIS

² Raw emissions are calculated using the dilution factor and dilute concentrations

³ Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 8/18/03

Test ID: HON-340-I2-125-#1

125-hour Emissions Testing @ 3600 RPM with catalyst I2 and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3573	3609	3602	3615	3590	1509
Obs. Power	hp	9.59	7.30	4.88	2.41	0.96	0.00
Obs. Torque	ft-lb	13.90	10.47	7.01	3.45	1.39	0.00
Calc. Power (Obs. Torque*Speed)	hp	9.46	7.20	4.81	2.38	0.95	0.00
Work (5 min Interval)	hp-hr	0.799	0.608	0.406	0.201	0.080	0.000
Fuel Flow	lb/hr	5.724	5.027	3.936	2.802	2.278	0.719
TEMPERATURES							
Catalyst Mid-bed	deg F	1556	1489	1438	1391	1314	904
Oil	deg F	232	223	210	196	184	162
Exhaust Gas (muffler-in/manifold)	deg F	1301	1256	1217	1165	1104	676
Exhaust Gas (muffler out)	deg F	1002	880	747	626	542	295
Catalyst/Muffler Surface-Top	deg F	1066	983	905	829	755	516
Muffler Heat Shield Surface-Top	deg F	603	517	454	391	327	212
Intake Air (EPA)	deg F	116	106	99	94	91	88
Intake Air DewPoint (EPA)	deg F	63	64	62	62	63	61
Cyl Head (Spark Plug)	deg F	422	384	358	325	301	251
PRESSURES							
Exhaust BP Before Cat	psig	0.71	0.53	0.35	0.22	0.16	0.00
Barometer	"Hg	29.126	29.124	29.119	29.115	29.113	29.109
F Factor	----	1.077	1.064	1.054	1.047	1.044	1.039
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	55.29	60.87	50.92	34.58	34.85	26.37
Dilute CO conc (dry)	%	0.32	0.32	0.22	0.12	0.11	0.02
Dilute CO ₂ conc (dry)	%	0.80	0.65	0.54	0.42	0.33	0.14
Dilute NO _x conc (dry)	ppm	1.90	0.76	0.56	0.36	0.30	0.19
Measured A/F	----	12.61	12.14	12.42	12.69	12.31	12.29
Dry/Wet Correction	----	0.97	0.97	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.08	1.08	1.06	1.06	1.07	1.04
Raw O ₂ conc (dry) _{measured}	%	0.18	0.18	0.19	0.24	0.25	0.53
HC Mass	g/hr	12.43	13.93	11.64	7.80	7.97	5.88
NO _x Mass	g/hr	1.45	0.56	0.40	0.25	0.20	0.11
CO Mass	g/hr	1449.6	1489.1	1019.8	585.1	548.4	117.4
CO ₂ Mass	g/hr	5521	4500	3751	2893	2234	782
BSHC	g/hp-hr	1.29	1.90	2.40	3.23	8.30	----
BSNO _x	g/hp-hr	0.15	0.08	0.08	0.10	0.21	----
BSCO	g/hp-hr	149.93	203.50	210.02	242.58	571.06	----
BSCO ₂	g/hp-hr	571.03	614.94	772.42	1199.29	2325.90	----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb ₁ /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	2.31	0.10	2.41	208.2	782.7	0.816

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 8/18/03

Test ID: HON-340-I2-125-#2

125-hour Emissions Testing @ 3600 RPM with catalyst I2 and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3600	3611	3612	3591	3612	1529
Obs. Power	hp	9.97	7.52	5.00	2.49	0.98	0.00
Obs. Torque	ft-lb	14.34	10.78	7.18	3.59	1.41	0.00
Calc. Power (Obs. Torque*Speed)	hp	9.83	7.41	4.94	2.45	0.97	0.00
Work (5 min Interval)	hp-hr	0.831	0.626	0.417	0.207	0.082	0.000
Fuel Flow	lb/hr	5.781	5.072	3.951	2.776	2.209	0.707
TEMPERATURES							
Catalyst Mid-bed	deg F	1562	1499	1437	1396	1319	929
Oil	deg F	238	231	216	201	189	167
Exhaust Gas (muffler-in/manifold)	deg F	1305	1262	1216	1166	1107	687
Exhaust Gas (muffler out)	deg F	1005	892	752	628	544	310
Catalyst/Muffler Surface-Top	deg F	1073	997	908	832	756	553
Muffler Heat Shield Surface-Top	deg F	616	534	456	388	321	231
Intake Air (EPA)	deg F	117	109	101	94	92	90
Intake Air DewPoint (EPA)	deg F	63	62	61	61	61	61
Cyl Head (Spark Plug)	deg F	428	393	363	331	304	255
PRESSURES							
Exhaust BP Before Cat	psig	0.70	0.53	0.37	0.23	0.16	0.00
Barometer	"Hg	29.105	29.098	29.093	29.093	29.091	29.087
F Factor	----	1.079	1.068	1.057	1.048	1.045	1.042
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	58.22	60.15	50.61	31.80	31.98	27.40
Dilute CO conc (dry)	%	0.32	0.32	0.23	0.12	0.11	0.03
Dilute CO ₂ conc (dry)	%	0.83	0.68	0.54	0.43	0.33	0.14
Dilute NO _x conc (dry)	ppm	2.92	0.90	0.36	0.36	0.28	0.14
Measured A/F	----	12.69	12.26	12.31	12.77	12.41	12.26
Dry/Wet Correction	----	0.97	0.97	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.07	1.06	1.04	1.04	1.04	1.03
Raw O ₂ conc (dry) _{measured}	%	0.19	0.20	0.20	0.23	0.25	0.52
HC Mass	g/hr	12.46	13.06	10.99	6.65	6.76	5.75
NO _x Mass	g/hr	2.20	0.65	0.22	0.23	0.16	0.05
CO Mass	g/hr	1423.6	1451.4	1086.8	561.3	530.0	124.0
CO ₂ Mass	g/hr	5640	4624	3668	2899	2171	755
BSHC	g/hp-hr	1.25	1.75	2.20	2.66	6.87	----
BSNO _x	g/hp-hr	0.22	0.09	0.04	0.09	0.17	----
BSCO	g/hp-hr	142.76	194.14	217.79	224.90	538.78	----
BSCO ₂	g/hp-hr	565.60	618.46	735.00	1161.35	2206.94	----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	2.08	0.10	2.18	203.0	763.4	0.795

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 8/19/03

Test ID: HON-340-I2-125-#3

125-hour Emissions Testing @ 3060 RPM with catalyst I2 and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3073	3066	3066	3062	3053	1532
Obs. Power	hp	9.20	6.88	4.60	2.28	0.91	0.00
Obs. Torque	ft-lb	15.50	11.62	7.77	3.86	1.54	0.00
Calc. Power (Obs. Torque*Speed)	hp	9.07	6.78	4.54	2.25	0.89	0.00
Work (5 min Interval)	hp-hr	0.766	0.573	0.383	0.190	0.076	0.000
Fuel Flow	lb/hr	5.159	4.486	3.339	2.282	1.763	0.698
TEMPERATURES							
Catalyst Mid-bed	deg F	1517	1444	1379	1289	1226	914
Oil	deg F	225	220	207	190	177	162
Exhaust Gas (muffler-in/manifold)	deg F	1259	1208	1158	1078	1019	695
Exhaust Gas (muffler out)	deg F	1052	938	789	644	559	347
Catalyst/Muffler Surface-Top	deg F	1057	980	899	800	732	584
Muffler Heat Shield Surface-Top	deg F	681	626	552	442	379	294
Intake Air (EPA)	deg F	109	100	91	88	87	86
Intake Air DewPoint (EPA)	deg F	61	61	60	61	61	60
Cyl Head (Spark Plug)	deg F	419	382	354	313	287	241
PRESSURES							
Exhaust BP Before Cat	psig	0.56	0.41	0.27	0.16	0.11	0.00
Barometer	"Hg	29.169	29.153	29.151	29.150	29.145	29.143
F Factor	----	1.065	1.053	1.041	1.037	1.035	1.034
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	59.08	61.46	47.04	32.91	29.52	25.25
Dilute CO conc (dry)	%	0.28	0.29	0.17	0.09	0.07	0.02
Dilute CO ₂ conc (dry)	%	0.73	0.58	0.48	0.36	0.28	0.14
Dilute NO _x conc (dry)	ppm	1.89	0.70	0.61	0.33	0.15	0.12
Measured A/F	----	12.68	12.13	12.63	12.88	12.69	12.29
Dry/Wet Correction	----	0.97	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.04	1.03	1.03	1.03	1.04	1.02
Raw O ₂ conc (dry) _{measured}	%	0.25	0.24	0.25	0.27	0.30	0.50
HC Mass	g/hr	13.34	14.10	10.76	7.45	6.70	5.69
NO _x Mass	g/hr	1.43	0.52	0.45	0.23	0.09	0.07
CO Mass	g/hr	1293.2	1351.7	791.5	419.9	343.6	109.8
CO ₂ Mass	g/hr	4991	3975	3295	2441	1853	766
BSHC	g/hp-hr	1.46	2.05	2.35	3.25	7.35	-----
BSNO _x	g/hp-hr	0.16	0.08	0.10	0.10	0.10	-----
BSCO	g/hp-hr	141.24	196.92	172.67	183.54	376.73	-----
BSCO ₂	g/hp-hr	545.09	579.05	718.81	1067.09	2031.73	-----
Emission Test Results							
Weighted Specific Emissions ³	g/hp-hr	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
		2.37	0.10	2.47	180.5	724.9	0.742

¹ Emissions results are based on bag sample emissions through ETIS

² Raw emissions are calculated using the dilution factor and dilute concentrations

³ Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 8/19/03

Test ID: HON-340-I2-125-#4

125-hour Emissions Testing @ 3060 RPM with catalyst I2 and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3049	3069	3055	3057	3049	1544
Obs. Power	hp	9.09	6.87	4.53	2.26	0.89	0.00
Obs. Torque	ft-lb	15.44	11.59	7.68	3.84	1.51	0.00
Calc. Power (Obs. Torque*Speed)	hp	8.96	6.78	4.47	2.23	0.88	0.00
Work (5 min Interval)	hp-hr	0.757	0.572	0.377	0.189	0.074	0.000
Fuel Flow	lb/hr	5.123	4.496	3.253	2.261	1.776	0.666
TEMPERATURES							
Catalyst Mid-bed	deg F	1512	1451	1376	1296	1217	914
Oil	deg F	231	226	213	196	182	168
Exhaust Gas (muffler-in/manifold)	deg F	1255	1216	1156	1083	1013	704
Exhaust Gas (muffler out)	deg F	1048	944	785	648	557	354
Catalyst/Muffler Surface-Top	deg F	1055	989	902	811	733	594
Muffler Heat Shield Surface-Top	deg F	679	640	556	454	379	307
Intake Air (EPA)	deg F	111	103	94	91	89	90
Intake Air DewPoint (EPA)	deg F	61	61	61	61	61	61
Cyl Head (Spark Plug)	deg F	422	388	358	318	289	249
PRESSURES							
Exhaust BP Before Cat	psig	0.52	0.39	0.25	0.16	0.11	0.02
Barometer	"Hg	29.136	29.132	29.127	29.124	29.120	29.120
F Factor	----	1.068	1.058	1.047	1.042	1.040	1.040
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	56.71	60.51	47.23	32.79	32.91	23.86
Dilute CO conc (dry)	%	0.29	0.29	0.17	0.09	0.08	0.02
Dilute CO ₂ conc (dry)	%	0.73	0.60	0.47	0.36	0.28	0.13
Dilute NO _x conc (dry)	ppm	2.00	1.17	0.65	0.38	0.24	0.11
Measured A/F	----	12.67	12.28	12.61	12.90	12.58	12.30
Dry/Wet Correction	----	0.97	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.04	1.04	1.04	1.04	1.04	1.04
Raw O ₂ conc (dry) _{measured}	%	0.23	0.23	0.24	0.27	0.30	0.48
HC Mass	g/hr	12.37	13.37	10.47	7.13	7.24	5.09
NO _x Mass	g/hr	1.46	0.84	0.44	0.23	0.12	0.02
CO Mass	g/hr	1292.0	1309.7	791.9	429.9	377.0	116.0
CO ₂ Mass	g/hr	4947	4057	3177	2398	1817	714
BSHC	g/hp-hr	1.36	1.95	2.30	3.12	8.02	----
BSNO _x	g/hp-hr	0.16	0.12	0.10	0.10	0.14	----
BSCO	g/hp-hr	142.19	191.47	174.11	188.20	417.87	----
BSCO ₂	g/hp-hr	544.44	593.17	698.61	1049.90	2013.95	----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	2.29	0.12	2.41	180.8	719.6	0.738

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 8/20/03

Test ID: HON-340-STK-125-#1

125-hour Emissions Testing @ 3600 RPM in stock configuration with stock muffler and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3590	3601	3600	3619	3598	1511
Obs. Power	hp	9.54	7.19	4.82	2.41	0.94	0.00
Obs. Torque	ft-lb	13.77	10.34	6.94	3.45	1.35	0.00
Calc. Power (Obs. Torque*Speed)	hp	9.41	7.09	4.76	2.37	0.92	0.00
Work (5 min Interval)	hp-hr	0.795	0.599	0.402	0.201	0.078	0.000
Fuel Flow	lb/hr	5.761	5.112	4.059	2.775	2.212	0.689
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	232	223	211	196	183	159
Exhaust Gas (muffler-in/manifold)	deg F	1189	1127	1063	1005	927	469
Exhaust Gas (muffler out)	deg F	954	861	739	597	499	206
Catalyst/Muffler Surface-Top	deg F	1002	928	851	753	664	277
Muffler Heat Shield Surface-Top	deg F	652	573	436	331	263	117
Intake Air (EPA)	deg F	132	110	101	94	92	86
Intake Air DewPoint (EPA)	deg F	64	62	63	62	61	60
Cyl Head (Spark Plug)	deg F	423	392	365	330	304	247
PRESSURES							
Exhaust BP Before Cat	psig	0.67	0.49	0.31	0.16	0.08	-0.09
Barometer	"Hg	29.140	29.137	29.130	29.127	29.123	29.120
F Factor	----	1.097	1.068	1.056	1.047	1.043	1.035
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	112.60	111.36	88.30	59.99	52.77	45.39
Dilute CO conc (dry)	%	0.32	0.34	0.26	0.13	0.11	0.04
Dilute CO ₂ conc (dry)	%	0.84	0.66	0.53	0.41	0.32	0.11
Dilute NO _x conc (dry)	ppm	54.70	21.99	11.29	6.44	2.99	0.39
Measured A/F	----	12.98	12.42	12.46	13.04	12.86	12.51
Dry/Wet Correction	----	0.97	0.97	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.08	1.06	1.07	1.05	1.04	1.03
Raw O ₂ conc (dry) _{measured}	%	0.11	0.11	0.11	0.20	0.16	1.50
HC Mass	g/hr	25.22	25.39	20.35	13.92	12.34	10.76
NO _x Mass	g/hr	41.44	16.95	8.86	5.11	2.36	0.30
CO Mass	g/hr	1392.1	1556.2	1204.3	619.2	540.8	208.6
CO ₂ Mass	g/hr	5624	4476	3604	2785	2142	583
BSHC	g/hp-hr	2.63	3.53	4.24	5.80	12.85	-----
BSNO _x	g/hp-hr	4.32	2.35	1.85	2.13	2.46	-----
BSCO	g/hp-hr	145.19	216.13	250.94	258.00	563.54	-----
BSCO ₂	g/hp-hr	586.57	621.69	750.93	1160.35	2231.76	-----
Emission Test Results							
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	4.20	2.54	6.75	227.5	772.2	0.834

¹ Emissions results are based on bag sample emissions through ETIS

² Raw emissions are calculated using the dilution factor and dilute concentrations

³ Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 8/20/03

Test ID: HON-340-STK-125-#2

125-hour Emissions Testing @ 3600 RPM in stock configuration with stock muffler and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3573	3599	3614	3600	3596	1573
Obs. Power	hp	9.12	6.89	4.62	2.28	0.91	0.00
Obs. Torque	ft-lb	13.22	9.92	6.62	3.27	1.31	0.00
Calc. Power (Obs. Torque*Speed)	hp	8.99	6.80	4.55	2.24	0.90	0.00
Work (5 min Interval)	hp-hr	0.760	0.574	0.385	0.190	0.076	0.000
Fuel Flow	lb/hr	5.804	5.153	4.121	2.859	2.325	0.669
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	236	230	216	200	190	163
Exhaust Gas (muffler-in/manifold)	deg F	1167	1117	1049	1004	933	481
Exhaust Gas (muffler out)	deg F	962	872	753	618	520	214
Catalyst/Muffler Surface-Top	deg F	991	931	852	764	679	285
Muffler Heat Shield Surface-Top	deg F	630	582	467	356	283	120
Intake Air (EPA)	deg F	125	114	104	96	93	87
Intake Air DewPoint (EPA)	deg F	62	61	61	62	60	60
Cyl Head (Spark Plug)	deg F	431	396	367	336	310	250
PRESSURES							
Exhaust BP Before Cat	psig	0.72	0.54	0.34	0.17	0.09	-0.08
Barometer	"Hg	29.112	29.109	29.106	29.102	29.097	29.093
F Factor	----	1.088	1.073	1.060	1.050	1.045	1.037
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	117.72	111.74	94.83	65.74	57.77	44.31
Dilute CO conc (dry)	%	0.35	0.36	0.29	0.14	0.13	0.04
Dilute CO ₂ conc (dry)	%	0.81	0.66	0.52	0.42	0.33	0.11
Dilute NO _x conc (dry)	ppm	47.23	21.82	10.36	6.92	3.27	0.63
Measured A/F	----	12.80	12.33	12.24	12.93	12.70	12.47
Dry/Wet Correction	----	0.97	0.97	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.05	1.04	1.04	1.05	1.03	1.02
Raw O ₂ conc (dry) _{measured}	%	0.11	0.11	0.11	0.19	0.13	1.50
HC Mass	g/hr	25.61	24.48	20.95	14.44	12.69	9.77
NO _x Mass	g/hr	35.38	16.25	7.76	5.18	2.30	0.20
CO Mass	g/hr	1547.1	1626.8	1334.0	676.8	621.3	207.9
CO ₂ Mass	g/hr	5438	4425	3482	2807	2168	560
BSHC	g/hp-hr	2.78	3.55	4.56	6.33	13.91	----
BSNO _x	g/hp-hr	3.85	2.35	1.69	2.27	2.52	----
BSCO	g/hp-hr	168.20	235.76	290.16	296.84	680.99	----
BSCO ₂	g/hp-hr	591.20	641.24	757.46	1231.15	2376.51	----
Emission Test Results							
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	4.43	2.43	6.85	258.4	794.2	0.886

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 8/28/03

Test ID: HON-340-STK-125-#3

125-hour Emissions Testing @ 3060 RPM in stock configuration with stock muffler and stock jetting (Test Void-error @ idle)

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3045	3064	3057	3070	3057	1521
Obs. Power	hp	8.72	6.60	4.39	2.21	0.87	0.00
Obs. Torque	ft-lb	14.84	11.15	7.43	3.73	1.47	0.00
Calc. Power (Obs. Torque*Speed)	hp	8.60	6.50	4.33	2.18	0.86	0.00
Work (5 min Interval)	hp-hr	0.727	0.550	0.366	0.184	0.073	0.000
Fuel Flow	lb/hr	5.358	4.678	3.478	2.375	1.884	0.288
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	227	220	205	188	176	157
Exhaust Gas (muffler-in/manifold)	deg F	1109	1059	979	874	816	484
Exhaust Gas (muffler out)	deg F	865	770	635	474	400	195
Catalyst/Muffler Surface-Top	deg F	925	868	781	638	567	280
Muffler Heat Shield Surface-Top	deg F	585	541	386	260	217	114
Intake Air (EPA)	deg F	106	100	95	91	90	84
Intake Air DewPoint (EPA)	deg F	63	63	62	62	61	60
Cyl Head (Spark Plug)	deg F	426	391	360	315	287	241
PRESSURES							
Exhaust BP Before Cat	psig	0.61	0.44	0.26	0.13	0.07	-0.05
Barometer	"Hg	29.098	29.084	29.077	29.073	29.075	29.068
F Factor	----	1.064	1.057	1.050	1.045	1.042	1.035
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	121.72	114.33	89.24	70.58	71.17	25.44
Dilute CO conc (dry)	%	0.36	0.35	0.23	0.15	0.13	0.02
Dilute CO ₂ conc (dry)	%	0.69	0.56	0.44	0.31	0.24	0.06
Dilute NO _x conc (dry)	ppm	29.73	15.41	10.70	4.07	1.83	0.34
Measured A/F	----	12.41	11.98	12.27	12.28	12.02	12.44
Dry/Wet Correction	----	0.97	0.97	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.07	1.06	1.05	1.05	1.04	1.03
Raw O ₂ conc (dry) _{measured}	%	0.00	0.00	0.00	0.00	0.00	0.00
HC Mass	g/hr	27.28	25.92	20.38	16.24	16.57	5.27
NO _x Mass	g/hr	22.83	11.83	8.30	3.09	1.28	0.07
CO Mass	g/hr	1642.4	1608.1	1088.8	723.8	624.3	107.0
CO ₂ Mass	g/hr	4673	3799	2989	2065	1549	211
BSHC	g/hp-hr	3.11	3.92	4.65	7.40	18.92	----
BSNO _x	g/hp-hr	2.60	1.79	1.90	1.41	1.46	----
BSCO	g/hp-hr	187.13	243.50	248.51	329.62	712.69	----
BSCO ₂	g/hp-hr	532.44	575.20	682.20	940.17	1767.99	----
Emission Test Results							
Weighted Specific Emissions ³	g/hp-hr	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
		4.84	1.91	6.75	256.3	679.1	0.801

¹ Emissions results are based on bag sample emissions through ETIS

² Raw emissions are calculated using the dilution factor and dilute concentrations

³ Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 8/28/03

Test ID: HON-340-STK-125-#4

125-hour Emissions Testing @ 3060 RPM in stock configuration with stock muffler and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3063	3065	3058	3066	3059	1531
Obs. Power	hp	8.65	6.53	4.37	2.17	0.86	0.00
Obs. Torque	ft-lb	14.63	11.04	7.40	3.66	1.46	0.00
Calc. Power (Obs. Torque*Speed)	hp	8.53	6.44	4.31	2.14	0.85	0.00
Work (5 min Interval)	hp-hr	0.721	0.544	0.364	0.181	0.072	0.000
Fuel Flow	lb/hr	5.374	4.791	3.470	2.416	1.963	0.779
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	231	225	213	195	180	164
Exhaust Gas (muffler-in/manifold)	deg F	1112	1055	974	891	815	490
Exhaust Gas (muffler out)	deg F	870	771	639	495	406	204
Catalyst/Muffler Surface-Top	deg F	929	864	777	653	569	296
Muffler Heat Shield Surface-Top	deg F	591	538	389	275	227	125
Intake Air (EPA)	deg F	109	104	99	95	93	88
Intake Air DewPoint (EPA)	deg F	63	62	62	62	62	61
Cyl Head (Spark Plug)	deg F	429	395	365	322	291	249
PRESSURES							
Exhaust BP Before Cat	psig	0.57	0.41	0.23	0.10	0.04	-0.05
Barometer	"Hg	29.057	29.045	29.042	29.036	29.030	29.027
F Factor	----	1.070	1.062	1.057	1.051	1.048	1.042
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	120.23	114.51	91.25	73.27	75.27	53.43
Dilute CO conc (dry)	%	0.36	0.36	0.24	0.16	0.14	0.05
Dilute CO ₂ conc (dry)	%	0.70	0.58	0.44	0.32	0.25	0.12
Dilute NO _x conc (dry)	ppm	30.86	16.95	10.82	4.22	1.84	0.51
Measured A/F	----	12.45	12.01	12.24	12.30	11.90	12.39
Dry/Wet Correction	----	0.97	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.06	1.05	1.05	1.05	1.05	1.04
Raw O ₂ conc (dry) _{measured}	%	0.00	0.00	0.00	0.00	0.00	0.00
HC Mass	g/hr	26.65	25.65	20.59	16.68	17.31	12.27
NO _x Mass	g/hr	23.52	12.91	8.29	3.16	1.26	0.19
CO Mass	g/hr	1638.9	1641.2	1115.1	740.9	669.2	246.8
CO ₂ Mass	g/hr	4701	3902	2936	2094	1584	641
BSHC	g/hp-hr	3.07	3.93	4.73	7.65	20.03	-----
BSNO _x	g/hp-hr	2.71	1.98	1.90	1.45	1.46	-----
BSCO	g/hp-hr	188.71	251.41	255.99	339.85	774.50	-----
BSCO ₂	g/hp-hr	541.30	597.80	674.11	960.40	1833.50	-----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	5.00	2.00	7.01	265.8	695.3	0.824

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 8/29/03

Test ID: HON-340-STK-125-#5

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3045	3067	3066	3072	3069	1560
Obs. Power	hp	8.83	6.68	4.45	2.22	0.88	0.04
Obs. Torque	ft-lb	15.02	11.28	7.52	3.75	1.49	0.00
Calc. Power (Obs. Torque*Speed)	hp	8.70	6.59	4.39	2.19	0.87	0.04
Work (5 min Interval)	hp-hr	0.735	0.556	0.371	0.185	0.073	0.003
Fuel Flow	lb/hr	5.365	4.686	3.340	2.221	1.770	0.708
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	225	218	204	186	173	159
Exhaust Gas (muffler-in/manifold)	deg F	1111	1057	978	894	831	501
Exhaust Gas (muffler out)	deg F	863	764	624	470	390	204
Catalyst/Muffler Surface-Top	deg F	924	864	774	642	560	287
Muffler Heat Shield Surface-Top	deg F	599	552	418	280	221	115
Intake Air (EPA)	deg F	107	101	93	87	85	81
Intake Air DewPoint (EPA)	deg F	65	65	65	64	63	63
Cyl Head (Spark Plug)	deg F	418	384	353	310	283	245
PRESSURES							
Exhaust BP Before Cat	psig	0.53	0.38	0.21	0.07	0.02	-0.06
Barometer	"Hg	29.094	29.097	29.099	29.099	29.096	29.094
F Factor	----	1.067	1.059	1.048	1.040	1.037	1.032
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	120.21	110.66	83.72	60.68	54.51	43.36
Dilute CO conc (dry)	%	0.35	0.33	0.21	0.11	0.09	0.04
Dilute CO ₂ conc (dry)	%	0.72	0.58	0.45	0.33	0.26	0.12
Dilute NO _x conc (dry)	ppm	33.84	17.44	12.03	4.88	2.14	0.56
Measured A/F	----	12.57	12.17	12.55	12.95	12.83	12.45
Dry/Wet Correction	----	0.97	0.97	0.97	0.98	0.98	0.98
NO _x Humidity Correction	----	1.11	1.10	1.10	1.09	1.08	1.06
Raw O ₂ conc (dry) _{measured}	%	0.21	0.21	0.20	0.24	0.35	1.25
HC Mass	g/hr	26.84	25.26	18.94	13.72	12.38	9.74
NO _x Mass	g/hr	26.28	13.69	9.42	3.77	1.55	0.25
CO Mass	g/hr	1550.3	1523.8	950.9	514.4	444.5	210.2
CO ₂ Mass	g/hr	4828	3945	3021	2191	1688	610
BSHC	g/hp-hr	3.04	3.79	4.29	6.18	14.13	----
BSNO _x	g/hp-hr	2.97	2.05	2.13	1.70	1.76	----
BSCO	g/hp-hr	175.29	228.39	215.33	231.78	507.42	----
BSCO ₂	g/hp-hr	545.91	591.23	684.17	987.36	1926.87	----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	4.45	2.20	6.65	221.4	702.2	0.777

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 9/8/03

Test ID: HON-340-I2-250-#1

250-hour Emissions Testing @ 3600 RPM with catalyst I2 and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3595	3602	3607	3588	3612	1563
Obs. Power	hp	9.97	7.51	5.01	2.50	1.00	0.00
Obs. Torque	ft-lb	14.37	10.80	7.19	3.61	1.44	0.00
Calc. Power (Obs. Torque*Speed)	hp	9.84	7.41	4.94	2.46	0.99	0.00
Work (5 min Interval)	hp-hr	0.831	0.626	0.417	0.208	0.084	0.000
Fuel Flow	lb/hr	5.526	5.090	3.839	2.768	2.140	0.656
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	233	227	216	199	186	161
Exhaust Gas (muffler-in/manifold)	deg F	1344	1286	1292	1188	1159	683
Exhaust Gas (muffler out)	deg F	1077	954	863	684	603	338
Catalyst/Muffler Surface-Top	deg F	1126	1032	1003	864	797	518
Muffler Heat Shield Surface-Top	deg F	606	507	490	392	344	237
Intake Air (EPA)	deg F	102	109	108	88	87	84
Intake Air DewPoint (EPA)	deg F	62	62	62	61	60	59
Cyl Head (Spark Plug)	deg F	445	406	386	342	318	247
PRESSURES							
Exhaust BP Before Cat	psig	0.71	0.53	0.37	0.21	0.15	-0.01
Barometer	"Hg	29.086	29.069	29.063	29.060	29.052	29.051
F Factor	----	NaN	1.068	1.067	1.041	1.038	1.035
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	47.41	55.53	30.81	24.10	18.52	18.80
Dilute CO conc (dry)	%	0.20	0.28	0.12	0.09	0.06	0.02
Dilute CO ₂ conc (dry)	%	0.90	0.72	0.63	0.45	0.36	0.13
Dilute NO _x conc (dry)	ppm	5.71	1.83	1.10	0.42	0.15	0.51
Measured A/F	----	13.45	12.71	13.44	13.24	13.31	12.39
Dry/Wet Correction	----	0.97	0.97	0.97	0.98	0.98	0.98
NO _x Humidity Correction	----	1.05	1.05	1.05	1.04	1.03	1.01
Raw O ₂ conc (dry) _{measured}	%	0.28	0.28	0.29	0.33	0.33	0.53
HC Mass	g/hr	10.42	12.53	6.72	5.22	3.88	4.00
NO _x Mass	g/hr	4.33	1.40	0.86	0.33	0.11	0.41
CO Mass	g/hr	891.7	1260.7	566.1	433.8	301.6	103.2
CO ₂ Mass	g/hr	6133	4950	4347	3092	2445	724
BSHC	g/hp-hr	1.04	1.67	1.34	2.08	3.81	-----
BSNO _x	g/hp-hr	0.43	0.19	0.17	0.13	0.11	-----
BSCO	g/hp-hr	89.13	168.09	113.16	172.99	295.66	-----
BSCO ₂	g/hp-hr	612.98	660.02	868.91	1232.90	2396.97	-----
Emission Test Results							
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	1.59	0.22	1.81	139.7	842.3	0.779

¹ Emissions results are based on bag sample emissions through ETIS

² Raw emissions are calculated using the dilution factor and dilute concentrations

³ Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 9/8/03

Test ID: HON-340-I2-250-#2

250-hour Emissions Testing @ 3600 RPM with catalyst I2 and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3616	3592	3602	3587	3595	1571
Obs. Power	hp	9.83	7.37	4.88	2.46	0.99	0.00
Obs. Torque	ft-lb	14.08	10.63	7.02	3.55	1.42	0.00
Calc. Power (Obs. Torque*Speed)	hp	9.69	7.27	4.81	2.42	0.97	0.00
Work (5 min Interval)	hp-hr	0.819	0.614	0.407	0.205	0.082	0.000
Fuel Flow	lb/hr	5.520	4.972	3.829	2.737	2.086	0.704
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	237	232	220	203	191	166
Exhaust Gas (muffler-in/manifold)	deg F	1346	1280	1289	1188	1150	696
Exhaust Gas (muffler out)	deg F	1078	945	859	684	601	349
Catalyst/Muffler Surface-Top	deg F	1127	1023	999	865	792	529
Muffler Heat Shield Surface-Top	deg F	607	501	493	395	345	245
Intake Air (EPA)	deg F	103	105	109	91	90	87
Intake Air DewPoint (EPA)	deg F	62	61	61	61	60	59
Cyl Head (Spark Plug)	deg F	449	408	388	346	320	250
PRESSURES							
Exhaust BP Before Cat	psig	0.67	0.51	0.36	0.20	0.14	-0.02
Barometer	"Hg	29.041	29.032	29.026	29.023	29.019	29.016
F Factor	----	1.062	1.064	1.070	1.046	1.044	1.040
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	47.42	56.93	33.34	25.34	19.23	26.97
Dilute CO conc (dry)	%	0.20	0.28	0.12	0.09	0.07	0.03
Dilute CO ₂ conc (dry)	%	0.91	0.70	0.63	0.45	0.35	0.14
Dilute NO _x conc (dry)	ppm	6.50	1.70	1.34	0.48	0.21	0.21
Measured A/F	----	13.48	12.66	13.44	13.27	13.27	12.40
Dry/Wet Correction	----	0.97	0.97	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.06	1.05	1.05	1.03	1.03	1.01
Raw O ₂ conc (dry) _{measured}	%	0.28	0.29	0.30	0.33	0.32	0.61
HC Mass	g/hr	10.16	12.52	7.16	5.38	3.96	5.97
NO _x Mass	g/hr	4.76	1.10	0.83	0.16	0.00	0.00
CO Mass	g/hr	872.6	1269.7	570.0	425.6	316.9	127.8
CO ₂ Mass	g/hr	6156	4774	4325	3062	2346	745
BSHC	g/hp-hr	1.03	1.70	1.47	2.19	3.98	----
BSNO _x	g/hp-hr	0.48	0.15	0.17	0.06	0.00	----
BSCO	g/hp-hr	88.65	172.83	116.65	173.17	318.08	----
BSCO ₂	g/hp-hr	625.43	649.78	885.12	1245.92	2354.92	----
Emission Test Results	----	HC	NO_x	HC+NO_x	CO	CO₂	BSFC (lb/hp-hr)
Weighted Specific Emissions³	g/hp-hr	1.68	0.20	1.88	142.8	848.0	0.787

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 9/9/03

Test ID: Hon-340-I2-250-#3

250-hour Emissions Testing @ 3060 RPM with catalyst I2 and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3048	3053	3071	3056	3066	1541
Obs. Power	hp	9.10	6.81	4.60	2.27	0.91	0.00
Obs. Torque	ft-lb	15.46	11.56	7.75	3.85	1.54	0.00
Calc. Power (Obs. Torque*Speed)	hp	8.97	6.72	4.53	2.24	0.90	0.00
Work (5 min Interval)	hp-hr	0.758	0.568	0.383	0.189	0.076	0.000
Fuel Flow	lb/hr	4.879	4.369	3.190	2.168	1.796	0.724
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	229	220	207	188	175	155
Exhaust Gas (muffler-in/manifold)	deg F	1270	1208	1208	1092	1057	676
Exhaust Gas (muffler out)	deg F	1095	973	894	704	625	368
Catalyst/Muffler Surface-Top	deg F	1064	971	949	813	755	528
Muffler Heat Shield Surface-Top	deg F	563	487	473	360	317	210
Intake Air (EPA)	deg F	97	94	91	86	85	81
Intake Air DewPoint (EPA)	deg F	64	65	65	65	65	65
Cyl Head (Spark Plug)	deg F	445	404	382	334	307	250
PRESSURES							
Exhaust BP Before Cat	psig	0.58	0.42	0.29	0.16	0.10	0.01
Barometer	"Hg	29.087	29.093	29.095	29.097	29.102	29.104
F Factor	----	1.054	1.050	1.046	1.039	1.037	1.032
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	54.86	59.75	28.97	20.26	21.29	29.10
Dilute CO conc (dry)	%	0.20	0.24	0.10	0.06	0.05	0.03
Dilute CO ₂ conc (dry)	%	0.76	0.61	0.53	0.37	0.31	0.14
Dilute NO _x conc (dry)	ppm	4.76	1.74	0.69	0.16	0.22	0.16
Measured A/F	----	13.23	12.60	13.39	13.20	13.16	12.20
Dry/Wet Correction	----	0.97	0.97	0.97	0.98	0.98	0.98
NO _x Humidity Correction	----	1.10	1.10	1.10	1.10	1.11	1.10
Raw O ₂ conc (dry) _{measured}	%	0.28	0.27	0.30	0.33	0.35	0.58
HC Mass	g/hr	12.32	13.71	6.37	4.33	4.62	6.65
NO _x Mass	g/hr	3.60	1.21	0.37	0.00	0.00	0.00
CO Mass	g/hr	931.2	1127.6	465.7	311.1	263.3	143.1
CO ₂ Mass	g/hr	5179	4168	3616	2466	2031	746
BSHC	g/hp-hr	1.35	2.01	1.39	1.91	5.06	----
BSNO _x	g/hp-hr	0.39	0.18	0.08	0.00	0.00	----
BSCO	g/hp-hr	102.07	165.43	101.74	137.17	288.75	----
BSCO ₂	g/hp-hr	567.69	611.56	789.98	1087.27	2226.80	----
Emission Test Results							
Weighted Specific Emissions ³	g/hp-hr	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
		1.80	0.16	1.96	132.4	767.8	0.717

¹ Emissions results are based on bag sample emissions through ETIS

² Raw emissions are calculated using the dilution factor and dilute concentrations

³ Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 9/9/03

Test ID: HON-340-I2-250-#4

250-hour Emissions Testing @ 3060 RPM with catalyst I2 and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3050	3068	3059	3075	3072	1538
Obs. Power	hp	8.89	6.70	4.46	2.26	0.89	0.00
Obs. Torque	ft-lb	15.10	11.31	7.56	3.80	1.51	0.00
Calc. Power (Obs. Torque*Speed)	hp	8.77	6.61	4.40	2.23	0.88	0.00
Work (5 min Interval)	hp-hr	0.741	0.558	0.372	0.188	0.074	0.000
Fuel Flow	lb/hr	5.011	4.394	3.192	2.264	1.863	0.713
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	234	225	213	185	177	160
Exhaust Gas (muffler-in/manifold)	deg F	1274	1219	1216	1078	1017	688
Exhaust Gas (muffler out)	deg F	1093	982	906	694	610	373
Catalyst/Muffler Surface-Top	deg F	1065	980	969	801	734	539
Muffler Heat Shield Surface-Top	deg F	573	504	502	347	310	221
Intake Air (EPA)	deg F	101	98	95	89	87	84
Intake Air DewPoint (EPA)	deg F	67	67	66	66	65	64
Cyl Head (Spark Plug)	deg F	450	409	386	330	301	255
PRESSURES							
Exhaust BP Before Cat	psig	0.55	0.41	0.30	0.15	0.10	0.02
Barometer	"Hg	29.104	29.107	29.101	29.101	29.096	29.093
F Factor	----	1.061	1.057	1.052	1.044	1.041	1.036
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	54.56	60.38	24.37	36.05	33.23	23.98
Dilute CO conc (dry)	%	0.20	0.24	0.07	0.08	0.08	0.03
Dilute CO ₂ conc (dry)	%	0.79	0.62	0.56	0.37	0.29	0.14
Dilute NO _x conc (dry)	ppm	5.83	1.57	1.08	0.38	0.23	0.13
Measured A/F	----	13.29	12.68	13.64	13.03	12.47	12.29
Dry/Wet Correction	----	0.97	0.97	0.97	0.97	0.98	0.98
NO _x Humidity Correction	----	1.16	1.14	1.12	1.12	1.11	1.09
Raw O ₂ conc (dry) _{measured}	%	0.29	0.27	0.34	0.33	0.33	0.48
HC Mass	g/hr	12.25	13.82	4.16	8.21	7.56	5.40
NO _x Mass	g/hr	4.51	1.07	0.66	0.09	0.00	0.00
CO Mass	g/hr	922.1	1115.1	343.5	379.9	409.5	139.1
CO ₂ Mass	g/hr	5375	4222	3817	2478	1884	742
BSHC	g/hp-hr	1.37	2.06	0.93	3.64	8.51	----
BSNO _x	g/hp-hr	0.51	0.16	0.15	0.04	0.00	----
BSCO	g/hp-hr	103.29	166.53	77.17	168.47	461.17	----
BSCO ₂	g/hp-hr	602.06	630.54	857.45	1098.61	2121.44	----
Emission Test Results							
Weighted Specific Emissions ³	g/hp-hr	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
		2.00	0.20	2.20	133.1	802.3	0.743

¹ Emissions results are based on bag sample emissions through ETIS

² Raw emissions are calculated using the dilution factor and dilute concentrations

³ Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 9/10/03

Test ID: HON-340-STK-250-#1

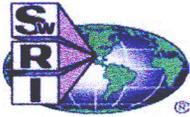
250-hour Emissions Testing @ 3600 RPM with stock muffler and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3611	3610	3629	3592	3618	1536
Obs. Power	hp	9.46	7.09	4.78	2.35	0.95	0.00
Obs. Torque	ft-lb	13.57	10.17	6.83	3.40	1.36	0.00
Calc. Power (Obs. Torque*Speed)	hp	9.33	6.99	4.72	2.32	0.93	0.00
Work (5 min Interval)	hp-hr	0.788	0.591	0.399	0.196	0.079	0.000
Fuel Flow	lb/hr	5.941	5.124	4.079	2.862	2.334	0.691
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	226	220	209	195	184	159
Exhaust Gas (muffler-in/manifold)	deg F	1148	1093	1050	1002	929	470
Exhaust Gas (muffler out)	deg F	830	731	639	521	434	174
Catalyst/Muffler Surface-Top	deg F	958	890	829	743	657	271
Muffler Heat Shield Surface-Top	deg F	405	349	302	249	209	108
Intake Air (EPA)	deg F	101	97	95	92	90	84
Intake Air DewPoint (EPA)	deg F	68	67	67	66	66	65
Cyl Head (Spark Plug)	deg F	430	395	369	339	312	248
PRESSURES							
Exhaust BP Before Cat	psig	0.74	0.53	0.35	0.17	0.10	-0.07
Barometer	"Hg	29.088	29.087	29.086	29.086	29.083	29.084
F Factor	----	1.062	1.057	1.053	1.048	1.047	1.038
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	149.92	142.61	118.80	81.96	73.78	54.97
Dilute CO conc (dry)	%	0.38	0.36	0.28	0.15	0.14	0.04
Dilute CO ₂ conc (dry)	%	0.79	0.64	0.52	0.41	0.32	0.11
Dilute NO _x conc (dry)	ppm	38.68	18.99	9.76	5.96	2.71	0.54
Measured A/F	----	12.56	12.21	12.32	12.85	12.54	12.38
Dry/Wet Correction	----	0.97	0.97	0.97	0.97	0.97	0.98
NO _x Humidity Correction	----	1.16	1.16	1.15	1.12	1.12	1.11
Raw O ₂ conc (dry) _{measured}	%	0.13	0.12	0.12	0.16	0.14	1.50
HC Mass	g/hr	33.73	32.50	27.18	18.82	17.10	12.79
NO _x Mass	g/hr	30.57	15.11	7.73	4.68	2.03	0.23
CO Mass	g/hr	1718.0	1642.7	1268.0	700.4	650.0	209.1
CO ₂ Mass	g/hr	5333	4335	3510	2761	2122	579
BSHC	g/hp-hr	3.57	4.59	5.72	7.96	18.04	-----
BSNO _x	g/hp-hr	3.23	2.13	1.63	1.98	2.14	-----
BSCO	g/hp-hr	181.62	232.10	266.75	296.27	685.70	-----
BSCO ₂	g/hp-hr	563.79	612.52	738.33	1167.85	2238.52	-----
Emission Test Results							
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
Weighted Specific Emissions ³	g/hp-hr	5.63	2.16	7.80	252.7	762.4	0.859

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 9/10/03

Test ID: HON-340-STK-250-#2

250-hour Emissions Testing @ 3600 RPM with stock muffler and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3598	3604	3604	3594	3597	1545
Obs. Power	hp	9.37	7.04	4.68	2.33	0.94	0.00
Obs. Torque	ft-lb	13.49	10.12	6.73	3.35	1.35	0.00
Calc. Power (Obs. Torque*Speed)	hp	9.24	6.95	4.62	2.30	0.93	0.00
Work (5 min Interval)	hp-hr	0.781	0.587	0.390	0.194	0.078	0.000
Fuel Flow	lb/hr	5.909	5.164	4.119	2.847	2.325	0.763
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	230	227	214	201	189	171
Exhaust Gas (muffler-in/manifold)	deg F	1165	1110	1053	986	905	506
Exhaust Gas (muffler out)	deg F	847	753	647	514	424	191
Catalyst/Muffler Surface-Top	deg F	981	910	837	731	638	287
Muffler Heat Shield Surface-Top	deg F	452	379	321	247	205	109
Intake Air (EPA)	deg F	114	107	100	95	94	88
Intake Air DewPoint (EPA)	deg F	65	64	64	63	64	63
Cyl Head (Spark Plug)	deg F	433	403	375	340	312	256
PRESSURES							
Exhaust BP Before Cat	psig	0.72	0.53	0.34	0.16	0.09	-0.08
Barometer	"Hg	29.046	29.037	29.032	29.028	29.025	29.021
F Factor	----	1.079	1.069	1.059	1.053	1.052	1.043
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	133.72	129.84	109.39	78.75	74.64	51.55
Dilute CO conc (dry)	%	0.37	0.37	0.27	0.16	0.15	0.05
Dilute CO ₂ conc (dry)	%	0.82	0.65	0.53	0.40	0.31	0.12
Dilute NO _x conc (dry)	ppm	45.63	20.42	10.73	5.68	2.64	0.54
Measured A/F	----	12.70	12.25	12.36	12.71	12.35	12.39
Dry/Wet Correction	----	0.97	0.97	0.97	0.98	0.98	0.98
NO _x Humidity Correction	----	1.12	1.09	1.08	1.08	1.09	1.07
Raw O ₂ conc (dry) _{measured}	%	0.12	0.12	0.12	0.14	0.15	1.10
HC Mass	g/hr	29.62	29.19	24.76	17.90	17.13	11.88
NO _x Mass	g/hr	34.76	15.61	8.26	4.32	1.92	0.20
CO Mass	g/hr	1618.1	1656.6	1261.3	738.0	691.9	229.2
CO ₂ Mass	g/hr	5458	4379	3583	2684	2044	648
BSHC	g/hp-hr	3.16	4.16	5.28	7.65	18.29	----
BSNO _x	g/hp-hr	3.71	2.22	1.76	1.85	2.05	----
BSCO	g/hp-hr	172.71	235.98	268.82	315.48	739.01	----
BSCO ₂	g/hp-hr	582.57	623.85	763.68	1147.27	2183.22	----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	5.22	2.31	7.53	256.9	774.1	0.872

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 9/11/03

Test ID: HON-340-STK-250-#3

250-hour Emissions Testing @ 3060 RPM with stock muffler and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3069	3071	3053	3064	3066	1538
Obs. Power	hp	8.72	6.56	4.33	2.17	0.88	0.00
Obs. Torque	ft-lb	14.72	11.06	7.35	3.68	1.48	0.00
Calc. Power (Obs. Torque*Speed)	hp	8.61	6.47	4.27	2.14	0.86	0.00
Work (5 min Interval)	hp-hr	0.727	0.547	0.361	0.181	0.073	0.000
Fuel Flow	lb/hr	5.354	4.585	3.439	2.397	1.929	0.704
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	230	215	204	183	172	153
Exhaust Gas (muffler-in/manifold)	deg F	1106	1045	979	896	821	472
Exhaust Gas (muffler out)	deg F	841	730	602	457	372	182
Catalyst/Muffler Surface-Top	deg F	848	755	658	538	469	781
Muffler Heat Shield Surface-Top	deg F	360	302	254	200	169	106
Intake Air (EPA)	deg F	98	94	91	88	87	82
Intake Air DewPoint (EPA)	deg F	68	68	67	67	67	66
Cyl Head (Spark Plug)	deg F	436	397	367	324	295	248
PRESSURES							
Exhaust BP Before Cat	psig	0.66	0.47	0.27	0.14	0.07	-0.08
Barometer	"Hg	29.059	29.068	29.066	29.069	29.069	29.066
F Factor	----	1.060	1.054	1.049	1.045	1.043	1.036
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	134.19	120.87	95.21	75.41	67.58	47.75
Dilute CO conc (dry)	%	0.35	0.33	0.21	0.14	0.12	0.04
Dilute CO ₂ conc (dry)	%	0.69	0.54	0.44	0.32	0.25	0.11
Dilute NO _x conc (dry)	ppm	30.89	14.95	9.94	3.87	1.87	0.58
Measured A/F	----	12.49	11.99	12.41	12.45	12.18	12.41
Dry/Wet Correction	----	0.97	0.97	0.97	0.97	0.97	0.98
NO _x Humidity Correction	----	1.18	1.18	1.16	1.15	1.14	1.12
Raw O ₂ conc (dry) _{measured}	%	0.22	0.19	0.18	0.20	0.27	1.42
HC Mass	g/hr	30.89	28.31	22.52	17.99	16.18	11.34
NO _x Mass	g/hr	25.33	12.35	8.16	3.10	1.38	0.26
CO Mass	g/hr	1593.4	1569.6	1016.6	672.4	602.0	211.6
CO ₂ Mass	g/hr	4732	3725	3042	2170	1647	598
BSHC	g/hp-hr	3.54	4.31	5.19	8.24	18.51	----
BSNO _x	g/hp-hr	2.90	1.88	1.88	1.42	1.58	----
BSCO	g/hp-hr	182.40	239.12	234.34	307.98	688.92	----
BSCO ₂	g/hp-hr	541.72	567.53	701.28	994.00	1884.53	----
Emission Test Results							
Weighted Specific Emissions ³	g/hp-hr	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
		5.42	2.00	7.42	247.1	699.5	0.807

¹ Emissions results are based on bag sample emissions through ETIS

² Raw emissions are calculated using the dilution factor and dilute concentrations

³ Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 9/11/03

Test ID: HON-340-STK-250-#4

250-hour Emissions Testing @ 3060 RPM with stock muffler and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3046	3069	3071	3058	3068	1565
Obs. Power	hp	8.62	6.55	4.36	2.17	0.88	0.00
Obs. Torque	ft-lb	14.67	11.05	7.35	3.68	1.48	0.00
Calc. Power (Obs. Torque*Speed)	hp	8.50	6.46	4.30	2.14	0.86	0.00
Work (5 min Interval)	hp-hr	0.719	0.546	0.363	0.181	0.073	0.000
Fuel Flow	lb/hr	5.377	4.651	3.436	2.354	1.947	0.713
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	230	224	210	184	177	160
Exhaust Gas (muffler-in/manifold)	deg F	1110	1053	986	896	815	492
Exhaust Gas (muffler out)	deg F	841	736	606	456	372	193
Catalyst/Muffler Surface-Top	deg F	884	786	685	546	472	713
Muffler Heat Shield Surface-Top	deg F	374	320	265	202	171	113
Intake Air (EPA)	deg F	101	98	94	90	90	86
Intake Air DewPoint (EPA)	deg F	67	67	67	67	67	66
Cyl Head (Spark Plug)	deg F	438	401	371	326	297	252
PRESSURES							
Exhaust BP Before Cat	psig	0.58	0.43	0.25	0.10	0.05	-0.08
Barometer	"Hg	29.047	29.028	29.019	29.013	28.998	28.989
F Factor	----	1.063	1.059	1.055	1.050	1.049	1.044
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	136.67	124.59	97.05	75.10	73.89	49.51
Dilute CO conc (dry)	%	0.35	0.34	0.22	0.13	0.13	0.04
Dilute CO ₂ conc (dry)	%	0.69	0.55	0.44	0.32	0.25	0.11
Dilute NO _x conc (dry)	ppm	30.08	15.65	10.58	3.89	2.10	0.53
Measured A/F	----	12.48	11.99	12.43	12.55	12.11	12.36
Dry/Wet Correction	----	0.97	0.97	0.97	0.97	0.97	0.98
NO _x Humidity Correction	----	1.16	1.15	1.14	1.15	1.14	1.13
Raw O ₂ conc (dry) _{measured}	%	0.15	0.13	0.12	0.18	0.23	1.20
HC Mass	g/hr	31.29	28.77	22.60	17.64	17.44	11.63
NO _x Mass	g/hr	24.45	12.75	8.65	3.07	1.56	0.21
CO Mass	g/hr	1603.2	1591.8	1029.9	646.2	623.6	221.7
CO ₂ Mass	g/hr	4748	3779	3018	2154	1633	593
BSHC	g/hp-hr	3.61	4.41	5.20	8.12	19.91	-----
BSNO _x	g/hp-hr	2.82	1.96	1.99	1.41	1.78	-----
BSCO	g/hp-hr	184.79	244.21	237.08	297.62	712.16	-----
BSCO ₂	g/hp-hr	547.22	579.79	694.72	992.25	1865.02	-----
Emission Test Results							
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	5.48	2.05	7.52	248.9	702.2	0.811

¹ Emissions results are based on bag sample emissions through ETIS

² Raw emissions are calculated using the dilution factor and dilute concentrations

³ Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 10/17/03

Test ID: HON-340-STK-500-#1

500-hour Emissions Testing @ 3600 RPM with stock muffler and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3611	3612	3585	3603	3615	1539
Obs. Power	hp	9.26	6.92	4.60	2.30	0.90	0.00
Obs. Torque	ft-lb	13.29	9.92	6.65	3.30	1.29	0.00
Calc. Power (Obs. Torque*Speed)	hp	9.14	6.82	4.54	2.27	0.89	0.00
Work (5 min Interval)	hp-hr	0.772	0.577	0.384	0.192	0.075	0.000
Fuel Flow	lb/hr	5.878	5.108	3.713	2.662	2.216	0.649
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	225	218	203	187	177	158
Exhaust Gas (muffler-in/manifold)	deg F	1249	1187	1129	1046	984	553
Exhaust Gas (muffler out)	deg F	905	798	674	535	454	188
Catalyst/Muffler Surface-Top	deg F	881	817	742	643	589	266
Muffler Heat Shield Surface-Top	deg F	534	446	349	250	209	114
Intake Air (EPA)	deg F	106	97	90	86	85	82
Intake Air DewPoint (EPA)	deg F	59	60	60	59	60	59
Cyl Head (Spark Plug)	deg F	427	391	363	325	300	250
PRESSURES							
Exhaust BP Before Cat	psig	0.79	0.56	0.35	0.18	0.11	-0.05
Barometer	"Hg	29.251	29.237	29.235	29.226	29.226	29.224
F Factor	----	1.056	1.045	1.036	1.030	1.029	1.026
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	150.56	145.75	111.97	77.89	68.73	37.86
Dilute CO conc (dry)	%	0.36	0.36	0.22	0.13	0.13	0.03
Dilute CO ₂ conc (dry)	%	0.79	0.63	0.50	0.38	0.30	0.12
Dilute NO _x conc (dry)	ppm	38.77	19.38	12.86	5.71	2.79	0.64
Measured A/F	----	12.59	12.13	12.58	12.76	12.38	13.29
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.01	1.01	1.03	1.01	1.01	1.01
Raw O ₂ conc (dry) _{measured}	%	0.15	0.14	0.15	0.17	0.18	1.70
HC Mass	g/hr	34.67	34.08	26.40	18.53	16.47	8.95
NO _x Mass	g/hr	28.86	14.57	9.79	4.23	1.95	0.22
CO Mass	g/hr	1625.4	1638.7	1007.7	640.6	629.1	131.6
CO ₂ Mass	g/hr	5389	4316	3421	2581	1996	655
BSHC	g/hp-hr	3.76	4.93	5.71	8.04	18.30	----
BSNO _x	g/hp-hr	3.13	2.11	2.12	1.84	2.16	----
BSCO	g/hp-hr	176.37	237.08	218.04	277.96	698.98	----
BSCO ₂	g/hp-hr	584.73	624.35	740.22	1120.05	2217.55	----
Emission Test Results							
Weighted Specific Emissions ³	g/hp-hr	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
		5.75	2.27	8.02	234.3	763.3	0.839

¹ Emissions results are based on bag sample emissions through ETIS

² Raw emissions are calculated using the dilution factor and dilute concentrations

³ Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 10/17/03

Test ID: HON-340-STK-500-#2

500-hour Emissions Testing @ 3600 RPM with stock muffler and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3596	3609	3619	3600	3602	1557
Obs. Power	hp	9.21	6.92	4.64	2.31	0.91	0.00
Obs. Torque	ft-lb	13.27	9.93	6.64	3.32	1.31	0.00
Calc. Power (Obs. Torque*Speed)	hp	9.08	6.83	4.58	2.28	0.90	0.00
Work (5 min Interval)	hp-hr	0.767	0.577	0.387	0.192	0.076	0.000
Fuel Flow	lb/hr	5.801	5.041	3.718	2.602	2.185	0.678
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	230	218	203	189	181	162
Exhaust Gas (muffler-in/manifold)	deg F	1247	1182	1124	1039	982	549
Exhaust Gas (muffler out)	deg F	906	800	677	535	454	191
Catalyst/Muffler Surface-Top	deg F	877	814	743	644	590	271
Muffler Heat Shield Surface-Top	deg F	540	458	347	248	209	118
Intake Air (EPA)	deg F	107	99	94	89	88	85
Intake Air DewPoint (EPA)	deg F	59	59	59	59	59	59
Cyl Head (Spark Plug)	deg F	430	393	364	326	303	250
PRESSURES							
Exhaust BP Before Cat	psig	0.75	0.55	0.33	0.17	0.11	-0.05
Barometer	"Hg	29.222	29.213	29.213	29.209	29.210	29.212
F Factor	----	1.058	1.048	1.042	1.035	1.033	1.030
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	153.37	146.33	108.72	81.05	69.90	43.52
Dilute CO conc (dry)	%	0.36	0.36	0.22	0.13	0.13	0.04
Dilute CO ₂ conc (dry)	%	0.78	0.62	0.50	0.37	0.30	0.12
Dilute NO _x conc (dry)	ppm	37.72	18.07	12.73	5.85	2.83	0.63
Measured A/F	----	12.57	12.03	12.55	12.71	12.41	12.60
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.98
NO _x Humidity Correction	----	1.01	1.01	1.01	1.00	1.01	1.00
Raw O ₂ conc (dry) _{measured}	%	0.15	0.14	0.15	0.17	0.18	1.53
HC Mass	g/hr	34.59	33.49	25.16	18.91	16.34	10.19
NO _x Mass	g/hr	27.85	13.47	9.58	4.31	1.96	0.21
CO Mass	g/hr	1622.2	1642.1	1019.0	641.5	608.2	181.2
CO ₂ Mass	g/hr	5289	4220	3413	2497	1986	612
BSHC	g/hp-hr	3.75	4.85	5.45	8.23	17.69	----
BSNO _x	g/hp-hr	3.02	1.95	2.07	1.88	2.12	----
BSCO	g/hp-hr	176.02	237.99	220.56	279.09	658.21	----
BSCO ₂	g/hp-hr	573.85	611.65	738.81	1086.42	2149.31	----
Emission Test Results							
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	5.68	2.19	7.87	235.6	750.3	0.831

¹ Emissions results are based on bag sample emissions through ETIS

² Raw emissions are calculated using the dilution factor and dilute concentrations

³ Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 10/20/03

Test ID: HON-340-STK-500-#3

500-hour Emissions Testing @ 3060 RPM with stock muffler and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3080	3067	3071	3062	3062	1540
Obs. Power	hp	8.83	6.59	4.42	2.18	0.87	0.00
Obs. Torque	ft-lb	14.85	11.13	7.46	3.69	1.47	0.00
Calc. Power (Obs. Torque*Speed)	hp	8.71	6.50	4.36	2.15	0.86	0.00
Work (5 min Interval)	hp-hr	0.736	0.549	0.369	0.182	0.073	0.000
Fuel Flow	lb/hr	5.323	4.493	3.377	2.168	1.827	0.689
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	218	209	195	179	168	153
Exhaust Gas (muffler-in/manifold)	deg F	1184	1111	1051	931	865	535
Exhaust Gas (muffler out)	deg F	829	713	589	434	364	181
Catalyst/Muffler Surface-Top	deg F	809	740	669	555	497	260
Muffler Heat Shield Surface-Top	deg F	468	380	277	195	167	110
Intake Air (EPA)	deg F	96	90	85	83	81	79
Intake Air DewPoint (EPA)	deg F	50	50	50	50	50	50
Cyl Head (Spark Plug)	deg F	428	388	359	313	286	244
PRESSURES							
Exhaust BP Before Cat	psig	0.59	0.41	0.23	0.09	0.04	-0.05
Barometer	"Hg	29.284	29.265	29.259	29.253	29.253	29.247
F Factor	----	1.037	1.029	1.023	1.020	1.018	1.016
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED ¹ (ETIS)							
Dilute HC conc (wet)	ppm	147.07	133.88	106.87	74.35	77.34	42.57
Dilute CO conc (dry)	%	0.34	0.33	0.19	0.12	0.12	0.03
Dilute CO ₂ conc (dry)	%	0.68	0.52	0.45	0.30	0.23	0.12
Dilute NO _x conc (dry)	ppm	33.93	15.98	15.59	4.67	2.06	0.63
Measured A/F	----	12.47	11.83	12.61	12.57	11.93	12.75
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.99	0.99
NO _x Humidity Correction	----	0.92	0.91	0.91	0.92	0.91	0.92
Raw O ₂ conc (dry) _{measured}	%	0.21	0.18	0.18	0.19	0.29	1.60
HC Mass	g/hr	34.27	31.61	25.36	17.70	18.69	10.05
NO _x Mass	g/hr	24.50	11.58	11.44	3.32	1.33	0.22
CO Mass	g/hr	1561.1	1558.9	902.9	565.6	601.4	175.6
CO ₂ Mass	g/hr	4731	3606	3128	2026	1500	637
BSHC	g/hp-hr	3.90	4.81	5.76	8.06	21.05	----
BSNO _x	g/hp-hr	2.79	1.76	2.60	1.51	1.50	----
BSCO	g/hp-hr	177.72	237.06	205.02	257.57	677.53	----
BSCO ₂	g/hp-hr	538.54	548.43	710.24	922.69	1690.11	----
Emission Test Results	----	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (^{lb} /hp-hr)
Weighted Specific Emissions ³	g/hp-hr	5.82	2.18	8.00	227.8	682.0	0.772

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle



Steady-State SORE Engine Test Information Engine: Honda GX340

Date: 10/20/03

Test ID: HON-340-STK-500-#4

500-hour Emissions Testing @ 3060 RPM with stock muffler and stock jetting

DESCRIPTION	UNIT	1	2	3	4	5	6
Mode	----						
Weight Factor	----	0.09	0.20	0.29	0.30	0.07	0.05
DF Mode Interval (sec)	----	300	300	300	300	300	300
Speed Set	%Rated	85	85	85	85	85	Idle
Load Set	%Rated	100	75	50	25	10	0
ENGINE DATA							
Obs. Speed	rpm	3037	3068	3058	3066	3059	1544
Obs. Power	hp	8.74	6.60	4.41	2.19	0.86	0.00
Obs. Torque	ft-lb	14.91	11.15	7.47	3.71	1.46	0.00
Calc. Power (Obs. Torque*Speed)	hp	8.62	6.51	4.35	2.16	0.85	0.00
Work (5 min Interval)	hp-hr	0.728	0.550	0.368	0.183	0.072	0.000
Fuel Flow	lb/hr	5.241	4.471	3.283	2.293	1.841	0.722
TEMPERATURES							
Catalyst Mid-bed	deg F	NA	NA	NA	NA	NA	NA
Oil	deg F	224	214	199	182	173	157
Exhaust Gas (muffler-in/manifold)	deg F	1176	1114	1051	940	872	552
Exhaust Gas (muffler out)	deg F	825	718	592	442	369	188
Catalyst/Muffler Surface-Top	deg F	803	743	670	562	503	269
Muffler Heat Shield Surface-Top	deg F	463	392	285	201	172	114
Intake Air (EPA)	deg F	100	92	88	85	84	82
Intake Air DewPoint (EPA)	deg F	50	50	50	50	51	51
Cyl Head (Spark Plug)	deg F	432	393	362	318	290	247
PRESSURES							
Exhaust BP Before Cat	psig	0.55	0.39	0.22	0.09	0.04	-0.05
Barometer	"Hg	29.242	29.236	29.237	29.236	29.234	29.235
F Factor	----	1.043	1.033	1.028	1.024	1.022	1.020
GASEOUS EMISSIONS							
EMISSIONS ARE UNWEIGHTED¹ (ETIS)							
Dilute HC conc (wet)	ppm	150.14	140.94	105.68	76.73	73.34	45.30
Dilute CO conc (dry)	%	0.34	0.33	0.19	0.12	0.12	0.04
Dilute CO ₂ conc (dry)	%	0.67	0.52	0.44	0.32	0.24	0.12
Dilute NO _x conc (dry)	ppm	32.93	17.15	15.25	5.02	2.03	0.66
Measured A/F	----	12.43	11.88	12.60	12.64	12.10	12.75
Dry/Wet Correction	----	0.98	0.98	0.98	0.98	0.98	0.99
NO _x Humidity Correction	----	0.92	0.91	0.91	0.92	0.92	0.92
Raw O ₂ conc (dry) _{measured}	%	0.19	0.17	0.17	0.18	0.27	1.30
HC Mass	g/hr	34.39	32.57	24.65	18.01	17.30	10.57
NO _x Mass	g/hr	23.66	12.35	11.16	3.57	1.30	0.25
CO Mass	g/hr	1552.3	1555.6	881.2	581.0	572.4	190.1
CO ₂ Mass	g/hr	4632	3578	3036	2172	1569	658
BSHC	g/hp-hr	3.91	4.94	5.60	8.20	19.76	----
BSNO _x	g/hp-hr	2.69	1.87	2.53	1.63	1.49	----
BSCO	g/hp-hr	176.48	236.13	200.10	264.47	653.64	----
BSCO ₂	g/hp-hr	526.60	543.09	689.39	988.70	1791.62	----
Emission Test Results							
Weighted Specific Emissions ³	g/hp-hr	HC	NO _x	HC+NO _x	CO	CO ₂	BSFC (lb/hp-hr)
		5.82	2.19	8.01	226.5	683.6	0.772

1 Emissions results are based on bag sample emissions through ETIS

2 Raw emissions are calculated using the dilution factor and dilute concentrations

3 Based on the 6-mode CARB-SORE Test Cycle