

Simulation

Environment			
Temperature:	60.0 deg F	Humidity:	50.0 %
		Altitude:	387.00 ft
X	Calculated Value	Manual Entry	0.98486

Short Block

Short Block:	3.8L		
No. Cylinders:	6	Bore:	3.820 in
		Rod Length:	6.380 in
Total Volume:	233.8 ci	Stroke:	3.400 in
		Rod Ratio:	1.876
		Pin Offset:	0.000 in

Cylinder Heads

Type:	Custom Airflow		
Valve Specifications:			
Intake Valves/Port:	1	Exhaust Valves/Port:	1
Intake Valve Dia:	1.710 in	Exhaust Valve Dia:	1.490 in

Combustion

Compression Ratio:	11.10		
Combustion Space:	63.22 cc	Cylinder Volume:	638.55 cc
Fuel Type:	Ethanol	Nitrous Augmentation:	0.0 HP
Air Fuel Ratio:	7.70	Equivalence Ratio:	1.17
Combustion Chamber Design:	Wedge, Closed		
Chamber Timing Requirements:	28.0 Deg		
Ignition Timing (Spark Timing)			
X	Estimate Ignition Timing (For Best Torque @ Each RPM Point)		
	Basic Ignition Timing @ Crank:	*** Deg	BTDC
	Timing Advance (Mechanical): 0.0 Deg Per 1000 RPM		
	Until: 3000 rpm		

Induction

Manifold Type: Tuned Runner, Short Max-Flow, Large Plenum					
Total Induction Airflow:					
Flow Rate: 440.8 cfm @ 1.50 inHg					
Forced Induction Specifications:					
Blower Type:	Roots- EATON M90	Surge	Choke	Overspeed	
Turbine Size:	*** in	Turbine A/R:	***		
Internal Ratio:	1.00	Belt Ratio:	2.20	Number Turbos:	1
Boost Limit:	15.0 psi	Intercooler Eff:	None	IC Press. Drop:	None

Exhaust

Exhaust Model:	Small-Tube Headers, Mufflers W/Cat
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Camshaft

Cam Type: Ecotec cam						
Cam Specification	Intake	Exhaust	V-V-T Enable			
Gross Lobe Lift:	0.293 in	0.293 in	X	Display Low-Speed Lobe		
Rocker Ratio:	1.60	1.60	—	Display High-Speed Lobe		
Valve Lash:	0.000 in	0.000 in	Cam Specification			
Lift At Valve:	0.469 in	0.469 in	Lobe Centerline:	103.0		
Duration:	255.0	249.0	Valve Overlap:	46.0		
Centerline Angle:	106.5	99.5	Lifter Accel Rate:	2.84		
True Centerline Ang:	106.5	99.5	Timing Based On:	Seat-To-Seat		
Cam Adv(+)/Ret(-):	0.0	0.0	HS Lobe Activation:	5000 rpm		
Valve Events			IVO	IVC	EVO	EVC
Simulation Timing (Seat-to-Seat):			21.0	54.0	44.0	25.0
Additional Timing (0.050-inch):			-1.0	35.0	35.5	-0.5
Simulation Timing (720-Based):			339.0	594.0	136.0	385.0
True Timing (Corrected For Cam Adv/Ret):			21.0	54.0	44.0	25.0

Notes

CYLINDER HEAD AIRFLOW DATA

Description: 2-Valve, Wedge, Low Perf/Pocket Porting

Intake Valve

Test Diameter: 1.710 in
Pressure Drop: 28.0 inH2O
Valves Per Port: 1

Lift: inFlow: cfm

0.200

114.3

0.300

155.7

0.400

177.5

0.500

184.0

0.600

184.0

Exhaust Valve

Test Diameter: 1.490 in
Pressure Drop: 28.0 inH2O
Valves Per Port: 1

Lift: inFlow: cfm

0.200

98.2

0.300

132.1

0.400

145.5

0.500

148.1

0.600

152.6

CALCULATED POWER AND ENGINE PRESSURES

Engine RPM	Power (Fly) (HP)	Torque (Fly) (FT LB)	Power (Wheel) (HP)	Torque (Wheel) (FT LB)	Int Man Pressure (PSI)	Vol Eff %	BMEP Pressure (PSI)
1000	64	336	54	286	21.95	83.9	220.2
1500	123	431	105	366	24.78	98.4	282.1
2000	182	479	155	407	26.61	109.4	313.8
2500	226	476	192	404	27.38	112.8	311.5
3000	278	487	236	414	27.88	118.9	318.9
3500	321	482	273	410	28.07	122.1	315.9
4000	357	469	303	398	28.21	122.7	306.9
4500	390	455	332	387	28.36	122.9	298.1
5000	415	436	353	371	28.85	121.7	285.5
5500	420	401	357	341	28.90	116.7	262.7
6000	396	346	336	294	28.83	109.6	226.7
6500	343	277	291	235	28.79	100.8	181.4
7000	293	220	249	187	28.81	92.3	143.9
7500	228	160	194	136	28.84	82.3	104.5
8000	171	112	145	95	28.93	74.7	73.5
8500	105	65	90	55	28.98	66.6	42.7
9000	40	24	34	20	29.06	59.4	15.4
9500	0	0	0	0	29.13	52.1	0.0
10000	0	0	0	0	29.22	45.3	0.0
10500	0	0	0	0	29.30	38.7	0.0
11000	0	0	0	0	29.38	32.3	0.0
11500	0	0	0	0	29.45	29.2	0.0
12000	0	0	0	0	29.48	26.3	0.0
12500	0	0	0	0	29.51	23.8	0.0
13000	0	0	0	0	29.53	21.4	0.0
13500	0	0	0	0	29.55	19.1	0.0
14000	0	0	0	0	29.57	17.1	0.0
14500	0	0	0	0	29.59	15.6	0.0
Average Values (Set Range In Simulation Category):							
	351	361	299	307	28.63	110.1	236.2

PROTOOLS CALCULATED POWER AND ENGINE PRESSURES

Engine RPM	Power (Fly) (HP)	Indicated Power (HP)	Frictional Power (HP)	Pumping Power (HP)	Mech. Eff %	Induction Airflow (CFM)	Piston Force (LBS)	Piston Speed (FT/MIN)	IMEP Pressure (PSI)	FMEP Pressure (PSI)	PMEP Pressure (PSI)	Ignition Timing (deg)
1000	64	69	4	0	93.5	56.7	2698	567	235.4	14.2	0.9	19.0
1500	123	133	8	1	93.7	99.9	3449	850	300.9	17.0	1.8	20.6
2000	182	198	12	2	93.4	148.0	3851	1133	336.0	19.5	2.7	22.2
2500	226	248	16	2	92.6	190.8	3856	1417	336.4	21.6	3.4	23.8
3000	278	307	21	4	91.9	241.3	3976	1700	346.9	23.9	4.2	26.1
3500	321	358	27	5	91.1	289.2	3974	1983	346.8	26.1	4.9	27.6
4000	357	402	33	6	90.1	332.0	3903	2267	340.6	28.2	5.4	28.6
4500	390	445	41	8	89.1	374.1	3836	2550	334.7	30.6	6.0	29.0
5000	415	480	49	10	87.8	411.6	3726	2833	325.1	33.1	6.5	29.9
5500	420	495	58	11	86.1	434.1	3495	3117	305.0	35.6	6.7	30.5
6000	396	482	68	12	83.4	444.8	3116	3400	271.9	38.6	6.5	30.9
6500	343	440	81	11	79.0	443.2	2630	3683	229.5	42.1	6.0	31.0
7000	293	403	95	11	73.7	437.2	2238	3967	195.2	45.9	5.5	31.2
7500	228	353	111	11	65.6	417.8	1825	4250	159.3	50.0	4.8	31.3
8000	171	312	128	10	55.7	404.1	1514	4533	132.1	54.3	4.2	31.8
8500	105	264	148	9	40.6	383.2	1206	4817	105.2	59.0	3.6	32.0
9000	40	219	170	8	18.8	361.6	943	5100	82.3	63.9	3.0	32.3
9500	0	165	194	6	0.0	334.9	675	5383	58.9	69.1	2.2	32.3
10000	0	108	220	4	0.0	306.6	417	5667	36.4	74.7	1.5	32.4
10500	0	46	250	2	0.0	274.7	172	5950	15.0	80.6	0.6	32.4
11000	0	0	281	0	0.0	240.3	0	6233	0.0	86.6	0.0	32.5
11500	0	0	314	0	0.0	227.2	0	6517	0.0	92.6	0.0	32.5
12000	0	0	349	0	0.0	213.7	0	6800	0.0	98.6	0.0	32.6
12500	0	0	387	0	0.0	201.0	0	7083	0.0	104.9	0.0	32.6
13000	0	0	427	0	0.0	188.6	0	7367	0.0	111.4	0.0	32.7
13500	0	0	471	0	0.0	174.3	0	7650	0.0	118.1	0.0	32.7
14000	0	0	516	0	0.0	161.7	0	7933	0.0	125.0	0.0	32.8
14500	0	0	565	0	0.0	153.0	0	8217	0.0	132.1	0.0	32.8
Average Values (Set Range In Simulation Category):												
	351	429	62	9	82.9	398.2	3194	3117	278.7	36.7	5.8	30.0





