

Report Comment: Cobra289 Engine

Engine Comments:
 New Cobra289 350 Small Block Chev
 AFR Heads 2.02 Intakes 1.60 Exhaust 58 cc combustion chamber
 HSR Injection 24# injectors

Projected Performance

| Engine RPM | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 | 5500 | 6000 | 6500 |
|--------------------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| Brk Tq, ft lb | 383 | 399 | 424 | 471 | 496 | 487 | 440 | 385 | 326 | 268 |
| Brake HP | 146 | 190 | 242 | 314 | 378 | 417 | 419 | 403 | 373 | 332 |
| Exh Pres, PSI | 0.2 | 0.3 | 0.5 | 0.9 | 1.3 | 1.7 | 1.8 | 1.8 | 1.7 | 1.6 |
| Int Vac, "Hg | 0.0 | 0.1 | 0.1 | 0.2 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| Vol Eff, % | 78.3 | 82.0 | 87.7 | 98.3 | 104.9 | 104.9 | 97.8 | 89.0 | 79.8 | 72.4 |
| Actual CFM | 159 | 208 | 266 | 348 | 425 | 478 | 495 | 496 | 485 | 477 |
| Fuel Flow, lb/hr | 58.0 | 76.0 | 97.5 | 127 | 156 | 175 | 181 | 181 | 178 | 175 |
| Nitrous, lb/hr | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Ntrs Fuel, lb/hr | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| BMEP, PSI | 165 | 172 | 183 | 203 | 214 | 210 | 190 | 166 | 141 | 116 |
| A/F Mxtr Qlty, % | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| BSFC, lb/HP-hr | 0.398 | 0.400 | 0.403 | 0.406 | 0.411 | 0.419 | 0.433 | 0.450 | 0.476 | 0.525 |
| Thermal Eff, % | 36.90 | 36.93 | 36.80 | 36.52 | 36.16 | 35.89 | 35.50 | 35.16 | 34.60 | 33.14 |
| IMEP, PSI | 181 | 189 | 202 | 224 | 237 | 235 | 217 | 196 | 173 | 150 |
| Frctn Tq, ft-lbs | 35.84 | 40.25 | 44.77 | 49.41 | 54.2 | 59.1 | 64.1 | 69.3 | 74.6 | 80.0 |
| Frctn HP | 13.65 | 19.16 | 25.57 | 32.93 | 41.27 | 50.6 | 61.0 | 72.5 | 85.2 | 99.0 |
| FMEP, PSI | 15.45 | 17.35 | 19.30 | 21.30 | 23.36 | 25.47 | 27.63 | 29.86 | 32.14 | 34.48 |
| Mech Eff, % | 91.4 | 90.8 | 90.4 | 90.5 | 90.2 | 89.2 | 87.3 | 84.7 | 81.4 | 77.0 |
| Motoring HP | 14.61 | 20.97 | 29.15 | 40.02 | 53.0 | 67.1 | 83.1 | 98.0 | 117 | 134 |
| Pumpng Work, HP | -0.96 | -1.82 | -3.57 | -7.09 | -11.71 | -16.48 | -22.11 | -25.51 | -31.76 | -35.47 |
| Residual Exh, % | 5.4 | 4.8 | 4.6 | 3.7 | 3.0 | 3.3 | 3.7 | 4.2 | 4.3 | 4.5 |
| Shrt Circuit, % | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Exh Temp, deg F | 1445 | 1470 | 1494 | 1526 | 1547 | 1554 | 1552 | 1541 | 1531 | 1484 |
| Mx Cyl Pres, PSI | 936 | 972 | 1039 | 1165 | 1243 | 1241 | 1155 | 1043 | 930 | 821 |
| Mx Cyl Tmp, deg F | 4721 | 4714 | 4708 | 4753 | 4779 | 4752 | 4735 | 4671 | 4648 | 4495 |
| In Port Tmp, deg F | 117 | 111 | 104 | 97 | 92 | 91 | 86 | 86 | 81 | 80 |
| Piston Spd, ft/min | 1160 | 1450 | 1740 | 2030 | 2320 | 2610 | 2900 | 3190 | 3480 | 3770 |
| Piston Gs @ TDC | 260 | 400 | 580 | 790 | 1030 | 1310 | 1610 | 1950 | 2320 | 2720 |
| Coolant HP | 45.80 | 54.7 | 64.6 | 75.4 | 86.3 | 97.2 | 109 | 119 | 130 | 136 |
| Blow By, CFM | 4.5 | 4.7 | 5.0 | 5.6 | 6.0 | 6.0 | 5.6 | 5.1 | 4.6 | 4.1 |
| In Tun Pres, PSI | 0.0 | 0.1 | 0.6 | 2.3 | 4.2 | 5.6 | 6.2 | 5.9 | 5.4 | 4.6 |
| Avg In Vel, ft/sec | 137 | 172 | 206 | 241 | 275 | 309 | 344 | 378 | 412 | 447 |
| Avg Ex Vel, ft/sec | 144 | 180 | 216 | 252 | 288 | 324 | 360 | 396 | 432 | 468 |
| Mach # | 0.164 | 0.205 | 0.246 | 0.287 | 0.328 | 0.369 | 0.410 | 0.451 | 0.492 | 0.533 |
| Act In FlowArea,% | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Act Ex FlowArea,% | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Valve Toss | | | | | | | | | | PmpUp |
| Knock Index | 1.9 | 1.9 | 1.9 | 2.2 | 2.3 | 2.2 | 1.7 | 1.3 | 0.9 | 0.6 |
| Spark Advnc, deg | 27.5 | 28.9 | 30.0 | 30.2 | 30.6 | 31.7 | 33.2 | 35.0 | 36.7 | 38.2 |
| Injctr Dty Cyc, % | 28.2 | 36.9 | 47.3 | 61.9 | 75.5 | 84.8 | 87.9 | 88.0 | 86.1 | 84.6 |
| Inj Plse Wdth, ms | 16.9 | 17.7 | 18.9 | 21.2 | 22.6 | 22.6 | 21.1 | 19.2 | 17.2 | 15.6 |
| Calc Error | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

PkTq=496@4000 Avg=408
 PkHP=419@5000 Avg=321

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Special Calculations

| ----- Valve Flow & Cam Calculations ----- | | ----- | --Int-- | --Exh-- |
|---|--------|-----------------------|---------|---------|
| Overlap Area, deg*sq-in | 2.1 | Vlv Area, deg*sq-in | 263.8 | 205.1 |
| Total Exh/Int % | 77.8 | Total Avg Flow Coef | 0.319 | 0.384 |
| Lobe Separation, deg | 112.0 | Lobe Area, inch*deg | 22.53 | 24.29 |
| Overlap, deg | 38 | Duration @ .003, deg | 258 | 266 |
| Overlap @ .050, deg | -11 | Opening Events, deg | 17 | 65 |
| | | Closing Events, deg | 61 | 21 |
| | | Duration @.050, deg | 209 | 217 |
| | | Opn Evnts @.050, deg | -8 | 41 |
| | | Cls Evnts @.050, deg | 37 | -4 |
| | | Lobe Centerlns, deg | 112.0 | 112.0 |
| | | Grss Tappet Lft, in | 0.310 | 0.323 |
| ----- General Engine Calculations ----- | | ----- | | ----- |
| Displacement, ccs | 5734.0 | Displacement, cu in | 349.85 | |
| Dynamic Comp. Ratio | 8.21 | Compression Ratio | 10.02 | |
| Theo. Crank Comprsn, PSI | 212 | Clearance Volume, ccs | 79.5 | |
| Pk Secondary Tuning RPM | na | Idle Vacuum, 'Hg | 19.5 | |

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Engine Input Specs

Short Block, File: 12556121-GM Performance Parts 350 Partial Engine

12556121-GM Performance Parts 350 Partial Engine

| | | |
|--------------------------------------|------|-------------------------------|
| Block/Pistons/Rods | | Accessories |
| Bore, in | 4 | Fan Type: Electric |
| Stroke, in | 3.48 | Wtr Pump: Lower Pulley Ratio |
| # of Cylinders | 8 | Engine Inertia/Crank Design |
| Rings: 3 Standard Tension | | Inertia: Eng Only, Std Flywhl |
| Rod Length, in | 5.7 | Crank Design: Typical Windage |
| Pstn Skrt: Typical Skirt | | |
| Bearing Size | .65 | |
| Pstn Top: Typical Insulating Coating | | |
| Cyl Lckg: Typical Leakage | | |

Head(s), File: AFR Heads 2.02 Intakes 1.60 Exhaust

AFR Heads 2.02 Intakes 1.60 Exhaust
 58 cc combustion chamber

| | | | | | | | |
|-------------------------------|------|-------|------|-------------------------------|------|------|------|
| Intake Port Specs | | | | Exhaust Port Specs | | | |
| Port Layout: 1 valve & 1 port | | | | Port Layout: 1 valve & 1 port | | | |
| Valve Diameter, in | | 2.02 | | Valve Diameter, in | | 1.6 | |
| Avg Port Diameter, in | | 1.5 | | Avg Port Diameter, in | | 1.32 | |
| Port Length, in | | 6 | | Port Length, in | | 3 | |
| Single Flow Coef | | na | | Single Flow Coef | | na | |
| Anti-Reversion, % | | 0 | | Anti-Reversion, % | | 0 | |
| Combustion Chamber | | | | Miscellaneous | | | |
| Compression Ratio | | 10.02 | | Mtrl/Coating: Aluminum | | | |
| Chamber Design: Compact Wedge | | | | Burn Rating: Typical | | | |
| Int Valve Primary Angle | | | | Exh Valve Primary Angle | | | |
| 0 | | | | 0 | | | |
| Int Valve Canted Angle | | | | Exh Valve Canted Angle | | | |
| 0 | | | | 0 | | | |
| Int Valve-Deck Distance | | | | Exh Valve-Deck Distance | | | |
| 0 | | | | 0 | | | |
| Deck Ht Clearance | | | | Head Gasket Thickness | | | |
| 0 | | | | 0 | | | |
| ---- Int Head Flow @ 28" ---- | | | | ---- Exh Head Flow @ 28" ---- | | | |
| Lift | L/D | CFM | FlCf | Lift | L/D | CFM | FlCf |
| .200 | .099 | 129 | .664 | .200 | .125 | 106 | .689 |
| .300 | .149 | 195 | .670 | .300 | .188 | 156 | .676 |
| .400 | .198 | 240 | .618 | .400 | .250 | 178 | .579 |
| .500 | .248 | 255 | .525 | .500 | .313 | 190 | .618 |
| .550 | .272 | 258 | .526 | .550 | .344 | 192 | .624 |
| .600 | .297 | 260 | .530 | .600 | .375 | 194 | .631 |
| .000 | | | | .000 | | | |
| .000 | | | | .000 | | | |
| .000 | | | | .000 | | | |
| .000 | | | | .000 | | | |
| .000 | | | | .000 | | | |
| .000 | | | | .000 | | | |

Intake System, File: Holley Stealth Ram

Holley Stealth Ram EFI intake with 1000 CFM throttle body

| | | | |
|-------------------------------------|------|------------------------|------|
| Manifold Specs (1 runner /cyl) | | Throttle Body(s) | |
| Runner Dia @ Head, in | 1.5 | Total CFM Rating | 1000 |
| Runner Design: Straight Runners, No | | Secondary Throttles | na |
| Runner Length, in | 6.26 | Air Cleaner CFM Rating | na |
| Runner Flow Coef | 2.3 | Air Meter CFM Rating | na |
| Runner Taper, deg | na | Restrictor CFM Rating | na |
| Type: Single Plenum-EFI | | Plenum | |
| Int Heat: Reduced Heat | | Plenum Volume, cu in | est |

Report Comment: Cobra289 Engine

Engine Input Specs

Fuel Delivery, File: Holley Stealth Ram

| | | | |
|-------------------------------|------|------------------------------|----|
| Fuel Injection | | Carburetor | |
| Injector Rating, lb/hr | 24 | # Primary Venturies | na |
| Injector Rated Pres, PSI | 43.5 | # Secondary Venturies | na |
| Operating Fuel Pres, PSI | 50 | Primary Venturi Diameter, in | na |
| Pres Contrl: Hold Const. Pres | | Secondary Venture Dia, in | na |
| Total # Injectors on Engine | 8 | Power Valve | na |
| Firing: Once/Cycle (2 revs) | | Venturi Discharge Coef | na |
| | | Air Bleed | na |

Exhaust System, File: Block Hugger SS 1-5-8 inch 2.5 inch

Block Hugger Stainless Steel 1-5/8" 2.5"

| | | | |
|---------------------------------------|-----|----------------------|-----|
| Header Primary (1 runner /cyl) | | Full Exhaust System | |
| Straight Primary (no diameter change) | | CFM Rating | 640 |
| Section 1, Inside Dia, in | 1.5 | Collector (not used) | |
| Section 1, Length, in | 12 | Collector Length, in | na |
| Section 2, Inside Dia, in | na | Collector Dia, in | na |
| Section 2, Length, in | na | Collector Taper, deg | na |
| Section 3, Inside Dia, in | na | | |
| Section 3, Length, in | na | | |
| Runner Flow Coef | 1.5 | | |

Cam/Valve Train, File: ISKY 257-265

ISKY 257-265

| | | | |
|------------------------------------|------|------------------------------------|-------|
| Intake Cam Profile | | Exhaust Cam Profile | |
| Centerline, deg ATDC | 112 | Centerline, deg BTDC | 112 |
| Duration @ .050" | 209 | Duration @ .050" | 217 |
| Opening @ .050" | -7.5 | Opening @ .050" | 40.5 |
| Closing @ .050" | 36.5 | Closing @ .050" | -3.5 |
| Max Lobe Lift, in | .31 | Max Lobe Lift, in | .3231 |
| Actual Valve Lash, in | hyd | Actual Valve Lash, in | hyd |
| Designed Valve Lash, in | hyd | Designed Valve Lash, in | hyd |
| Rocker Arm Ratio | 1.6 | Rocker Arm Ratio | 1.6 |
| Profile Type: Spec Hyd Roller | | Profile Type: Spec Hyd Roller | |
| Ramp Rating, % | 40.9 | Ramp Rating, % | 41.7 |
| Gross Valve Lift, in | .496 | Gross Valve Lift, in | .517 |
| Dwell over Nose: 0 Deg-Std Profile | | Dwell over Nose: 0 Deg-Std Profile | |
| Use a Cam File | No | Use a Cam File | No |
| | | Total Cam Adv: | |
| | | Lobe Separation, cam deg | 112.0 |
| | | Lift for Rating: .050 inches | |

Valve Train Dynamics, File: ISKY 257-265

| | | | |
|---------------------------------|--|--|--|
| Intake Valve Train | | Exhaust Valve Train | |
| Gen Type: Pushrod & Rocker Arm | | Gen Type: Gen Type: Pushrod & Rocker Arm | |
| Eff Valve Mass, gms | | Eff Valve Mass, gms | |
| Eff Rckr Arm Stffnss, lb/in | | Eff Rckr Arm Stffnss, lb/in | |
| Eff Lifter Mass, gms | | Eff Lifter Mass, gms | |
| Eff Lifter Stiffness, lb/in est | | Eff Lifter Stiffness, lb/in est | |
| Spring Rate, lb/in | | Spring Rate, lb/in | |
| Seated Spring Force, lbs | | Seated Spring Force, lbs | |

Engine Analyzer Pro v3.5
Eng: Cobra289 AFR & HS
Engine Input Specs

Performance Trends (C) 2007
Cobra289
Chevy 350 AFR&HSR injection

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Engine Input Specs

Calculation Conditions, File: Cobra289 AFR & HSR Injection

Test Conditions

CorFctr: Std Dyno (60 deg, 29.92")
Barometric Pressure, "Hg na
Intake Air Temp, deg F na
Dew Point, deg F na
Elevation, feet na
Cooling Sys: Liquid Cooled
Coolant Temp, deg F 170
Accel Rate: 0 Steady State

Fuel Specs

Fuel Type: Gasoline
Fuel Octane (R+M)/2 93
Use Nitrous Oxide No
Program Sets Spark for Best Power

RPM to Run

Starting RPM 2000
Number of RPM Steps 10
RPM Step Size 500

Tq, HP, Air and Fuel Flow

