

SICK POWER! PUT LS HEADS ON A SMALL-BLOCK

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SUPER CHEVY

THE #1 CHEVROLET ENTHUSIAST MAGAZINE

GMPP ZZ454 DYNO TEST
THE RESULTS WILL SHOCK YOU



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BACK TO THE STREET, PART 1

WE FOUND MORE THAN EXPECTED IN A GM PERFORMANCE PARTS ZZ454.

By Mike Ficacci

Photos by the author and Evan Smith

The price of clean Bow Ties has skyrocketed over the last decade, leaving many middle-class enthusiasts with nothing but pipe-dreams of owning a hot rod Chevrolet. Finding a first- or second-generation Camaro or Nova under \$15,000 will leave you with a rusted subframe and fenders a surfer could hang 10 on. Looking for a Corvette pre-1973? Better cash in your 401k. Oh wait...the stock market devoured that already.

Alas, there are other means of living the dream in a classic Chevy by using a little bit of creativity and imagination. First and foremost, if you happen to be smarter than the masses and hid your greenbacks under the mattress (as opposed to in the market), the price of vintage autos has dropped dramatically. At

the Super Chevy Show in Bristol, Tennessee, this past September, the Car Corral was crawling with over 60 hot rods begging for a new home. Sadly, this is a sign of the times, but it does breed opportunity for others.

Another route worth taking advantage of is the wide world of old drag cars. One common misconcep-

tion is that these quarter-mile rocket ships have been cut-up to the point of no return, and are simply meant to die. But that is not always the case. A simple scan through ebay.com or racingjunk.com and you will find a multitude of hot rods, both running and rolling, awaiting the chance at a new life. We perused racingjunk.com and within minutes had found four great starter cars for under \$10,000. Okay, they may need some work, but for a cheap starting point for a project, milking this cow is worth the time.


Back To The Street is exactly that. We are taking a 1971 Camaro bracket car off the drag strip and returning it to street duty while breathing new life into it. We have a slew of high-performance companies on board, including GM Performance Parts, Fat Man Fabrications, Level 10 Transmissions, and many more.

For motor-vation, we decided to do the simple thing and grab a big-block crate engine from GM

Performance Parts. Our mill is the ZZ454, one of the many crate motors available from GMPP. It features oval port aluminum cylinder heads, large 2.19-intake/1.88-exhaust valves, a forged rotating assembly, and a roller camshaft with .510/.540-inch lift. The aluminum cylinder heads drop close to 100 pounds off the nose, as compared to steel and utilizes small combustion chambers to add efficiency and 15 hp over the 454 H.O.

To complete your ZZ454, all you need to add is a carburetor, ignition system, and starter and you will be hearing that deep, throaty big-block

rumble in no time. The ZZ454 is rated at a robust 440 hp, but we wanted to see if any extra power could be found lurking under those shiny new valve covers. Was there ever! We tried a few different carburetor/header combinations after a long break-in period and could not have been more satisfied with the results.

Nothing sounds better than a large cubic-inch Bow Tie rumbling on the street and the pump-gas-friendly ZZ454 is going to offer us plenty of torque for the occasional trip to the drag strip, with equal street manners for daily driving. 



We went to B&B Performance Machine in Rahway, New Jersey, where Bob Oster already had the big-block sitting on the dyno. Bob brews up some of the fastest high-performance engines in the business. Our untouched ZZ454 was tested right out of the crate.



1 GM Performance Parts recommends 92-octane fuel and a Holley 770-cfm carburetor. We did one better and used 93-octane fuel, as that is the highest octane readily available at the pump in the Garden State. We filled the pan with 6 quarts of Royal Purple Break-In oil, and primed the motor to make sure oil had reached all corners and there were no blockages through the pushrods and into the stamped steel rockers. As he was priming, Bob turned the motor over a few time to ensure proper oiling.



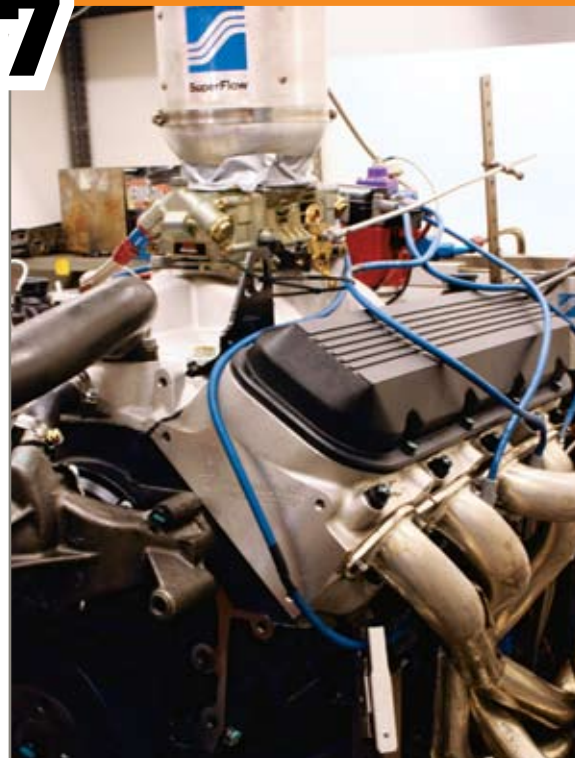
2 Here, SUPER CHEVY Senior Editor Evan Smith is hot-wiring the electric choke blade open. On the dyno, in a controlled environment, the electric choke was unnecessary and could have potentially impeded our testing.

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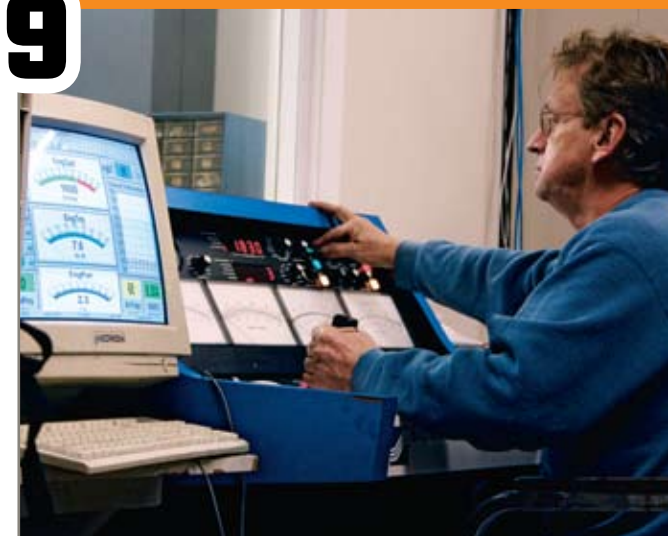
We slapped on a set of 2-inch Hooker headers with collectors. We tried a few different sets of header sizes, ranging from 1 7/8-inches to 2 1/8, but found that the 2-inch set with the merge collectors on the end made the best power throughout the entire range.

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Time for the first dyno pull. All of our pulls were made from 4,100 rpm up through 5,900 rpm. With 6 quarts of break-in oil, and timing set at 24-degrees, we made 405 hp and 460 lb-ft of torque. A little on the low side, but as we started tuning and adding timing, we suspected we would see some more power. After two more pulls and virtually no improvement, we figured something was wrong.

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We made one pull and as the motor was rising through the rpm range, we all looked at each other and knew we made some power. The engine sounded much more clean and crisp, equating to some serious horsepower numbers. We saw 491 hp and 517 lb-ft of torque— a whopping 86 hp and 58 lbs of torque over our initial tests.

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For the warm-up period and initial testing, we set the total timing to 24-degrees as per the recommendation of GM Performance Parts.

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We started fiddling with the 770 Holley we originally slapped on the motor. We emptied the fuel, cleaned it out, opened and closed the secondaries, and bolted it on for another try. It turns out that the secondaries were caught-up on a linkage and once we got the problem fixed, the motor ran through the rpm like a dream. How does 491 hp and 521 lb-ft of torque sound? A lot better than the 440 GMPP rates it!

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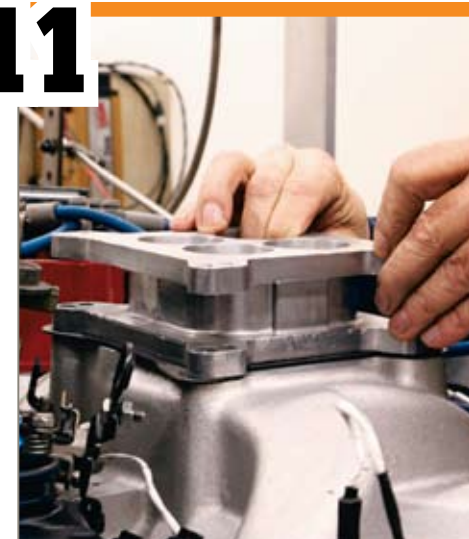
Finally...the moment of truth. There are few experiences more nerve-racking than starting a motor for the first time, but we knew we would have no problems with the GM Performance Parts ZZ454/440. Bob turned on the ignition and the fuel pumps, and the big-block immediately came to life. Oil pressure was steady at 75 psi, water temperature was steadily rising, and she idled nicely at around 1,600 rpm, as we made sure to break the 454 in properly.

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Dave Jack, of Dave Jack Cylinder Heads, handed us a 950-cfm carburetor that he had heavily modified, and uses often when customers are having issues on the dyno. What could it make, 15 hp more?

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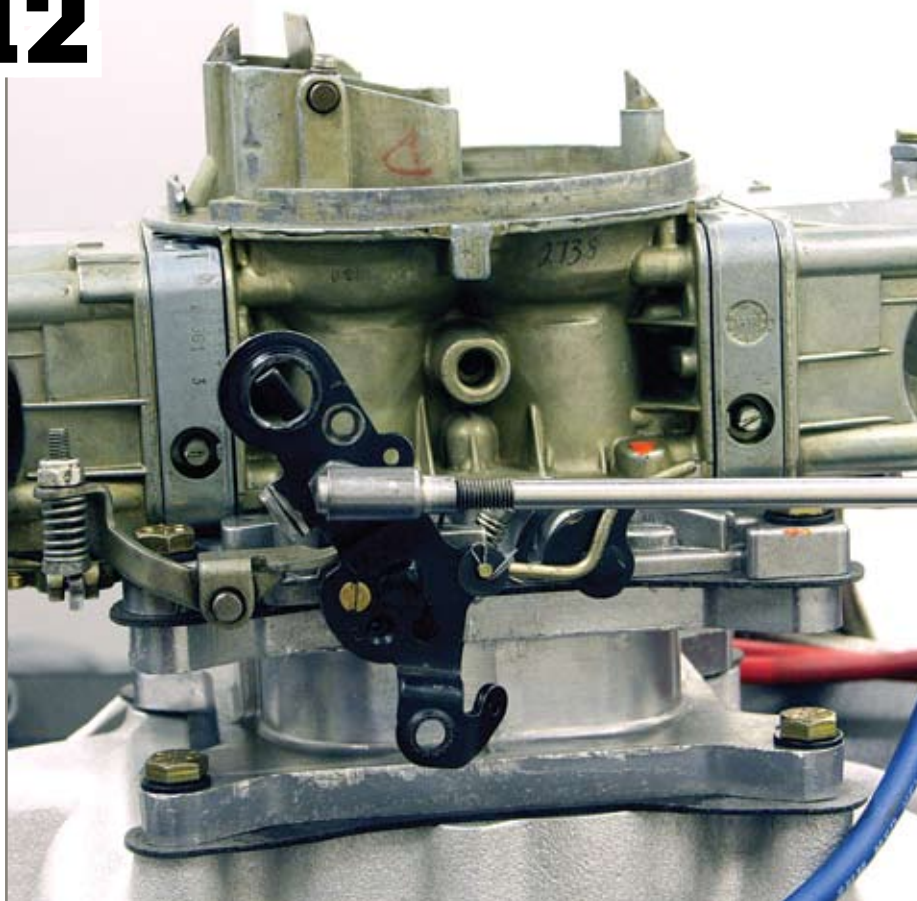
Allowing for better airflow and increased volume, a carb spacer is almost guaranteed to make a few horsepower ... if you can fit it under the hood. We stole this 1 1/2-inch spacer from Dave. It should clear under our Camaro's L88-style hood, no sweat.

6



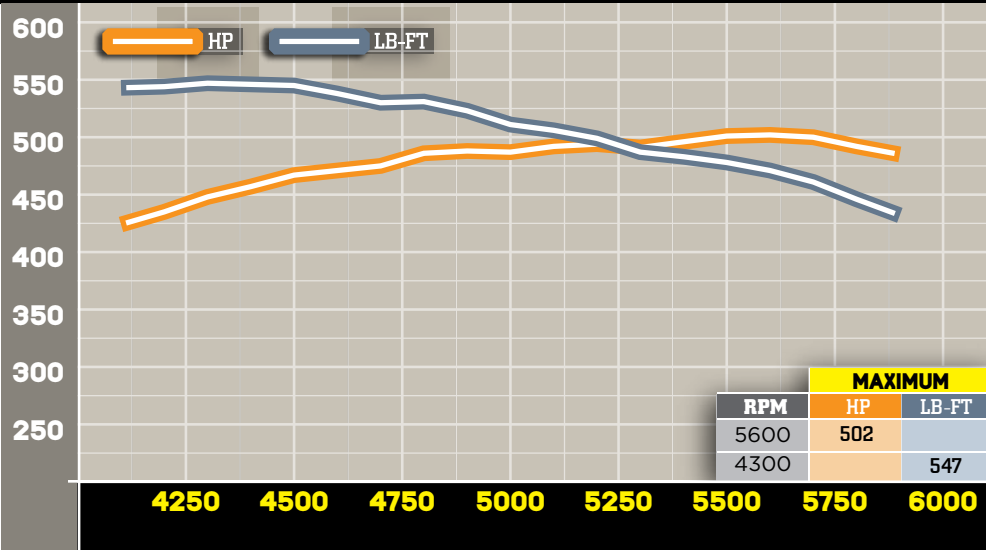
Static fuel pressure was at 7 psi and that is exactly where we wanted it to be. Setting fuel pressure any higher is unnecessary, as the Holley carburetor was running like a champ and the air/fuel ratio was right at 13:1 through the rpm range. We put the SuperFlow hat to intake to measure exactly that.

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Last but not least, we let the motor sit for about 20 minutes, slapped on a 1 1/2-inch carb spacer, and pushed the wand to WOT. What a great way to end the day. With the 770-cfm Holley right out of the box, 93-octane fuel, 34 degrees of timing, and the air/fuel ratio averaging 12.8, we could not have been happier with the result: 502 hp, 547 tq.

DYNO GRAPH ZZ454-440 – HOLLEY 770/93 OCTANE



GM PERFORMANCE PARTS ZZ454/440

Part Number:	12498777
Engine Type:	Chevy big-block V-8
Displacement (cu in):	454
Bore x Stroke (in):	4.25 x 4.00
Block (P/N 12561353):	Cast iron with 4-bolt main caps
Crankshaft (P/N 14096983):	Forged steel
Con. Rods (P/N 19170198):	Forged steel
Pistons (P/N 10215228):	Forged aluminum
Camshaft (P/N 24502611):	Hydraulic roller
Camshaft Lift (in):	.510 intake / .540 exhaust
Cam. Duration (@.050 in):	211° intake / 230° exhaust
Heads (P/N 12363392):	Aluminum oval port; 110cc chambers
Valve Size (in):	2.19 intake / 1.88 exhaust
Compression Ratio:	9.6:1
Rockers (P/N 12368082):	Stamped steel
Rocker Arm Ratio:	1.7:1
Water Pump (19168606):	Cast iron, long-style
Flexplate (10185034):	14-in.
Recommended Fuel:	92 octane
Ignition Timing:	Base 4° BTDC, 26° Total
Max. Recommended rpm:	5500
Balanced:	External

SOURCES

B&B PERFORMANCE MACHINE
732/388-1089

GM PERFORMANCE PARTS
gmperformanceparts.com