THE EVERYMAN ENGINE

Building a Chevy 383 stroker with all off-the-shelf parts

TEXT & PHOTOS: **Jeff Huneycutt**

These days it certainly seems like LS engines are the most popular option when it comes to engine swaps. And there's no doubt the LS has its advantages. But sometimes a particular car just requires something a little more old school.

That's certainly the case with Dana Hoodenpyle's 1968 Camaro. Hoodenpyle says he purchased this bright-orange convertible sight unseen, and has never regretted it. It's a numbers-matching car, so while he would like more horsepower to help get the adrenaline flowing when he's behind the wheel, he also wants to keep the original look and feel to the car. And he definitely doesn't want to go cutting up the car such that it can't be returned to its all-original form later on.

So the obvious solution was to pull the original engine and set it aside, then build a new, more powerful small-block that can drop right in its place. What's cool about the Chevy small-block is it has been so well supported by the aftermarket industry that you can build an all-new small-block completely out of a catalog and make great power on a real-world budget. Even though GM hasn't installed a first-gen small-block Chevrolet engine in any vehicle in years, every single part is still available from one aftermarket manufacturer or another. The SBC is still very much alive and well.

GET THE HOOKUP

Air Flow Research
661.257.8124
airflowresearch.com

ARP
800.826.3045
arp-bolts.com

Comp Cams
800.999.0853
compcams.com

CP-Carrillo
949.567.9000
cp-carrillo.com

Edelbrock
310.781.2222
edelbrock.com

Fel-Pro
800.325.8886
felpro-only.com

KT Engine Development
704.784.2610

Melling
517.787.8172
melling.com

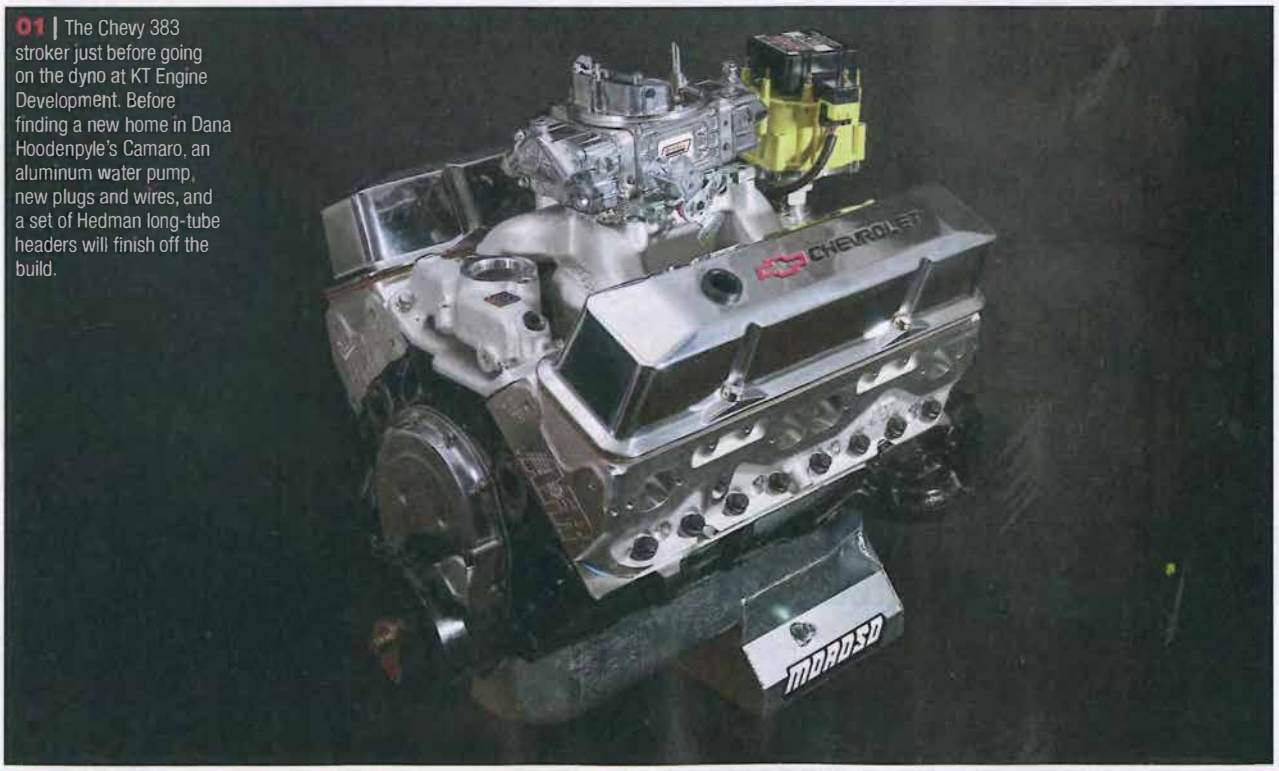
Moroso Performance Products
203.453.6571
moroso.com

Nickels Performance
800.251.0331
nickelsperformance.com

Performance Distributors
901.396.5782
performancedistributors.com

Quick Fuel
866.464.6553
holley.com/brands/quick_fuel/

Scat Crankshafts
310.370.5501
scatcrankshafts.com



01 | The Chevy 383 stroker just before going on the dyno at KT Engine Development. Before finding a new home in Dana Hoodenpyle's Camaro, an aluminum water pump, new plugs and wires, and a set of Hedman long-tube headers will finish off the build.

02 | Hoodenpyle's purpose for this engine is his 1968 Camaro, which he says is still a numbers-matching example from the era. Still, more horsepower always equals more fun. The modern, carbureted small-block will drop right in place with minimal changes to the car.

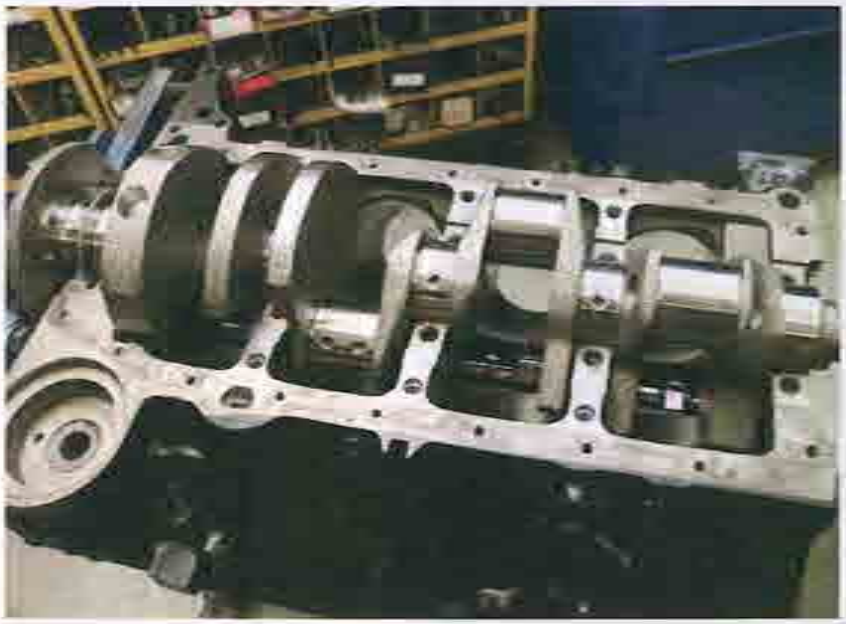
03 | While every other component used for this build is new, Hoodenpyle wanted to use a stock block from his Camaro's era to keep the numbers-matching "feel." It's a standard Chevrolet two-piece rear main seal block that's been machined and bored 0.030-over to make a final bore size of 4.030 inches.

04 | One big change is KT Engine Development machined the block with splayed bolt holes to accept four-bolt main caps, which should help this block handle the extra power. Honestly, the expense of this process (it's pretty labor intensive) makes an aftermarket four-bolt main block a bit of a bargain in comparison. But if you prefer to keep an OEM block, converting to four-bolt main caps can really help add needed strength.

05 | The camshaft is a hydraulic roller from Comp Cams that has been ground with 224/230-degrees duration at 0.050-inch lift on a 106-degree LSA. KT Engine's owner Ken Troutman also had the cam ground with a reduced base circle to help provide just a bit more clearance for the stroker crankshaft.

For this particular build, Hoodenpyle had an OEM iron block from the same era as the Camaro so he chose to use that so that it would be "numbers-correct," if not numbers-matching. To help hold the extra power he hoped to make, engine builder KT Engine Development in Concord, North Carolina, machined the block to accept four-bolt main caps. Hoodenpyle also chose most of the components used in the build, although KT Engine did help with spec'ing out the camshaft and valvetrain, the intake manifold, and the cylinder heads.

What's cool about this build is that it makes good power and great torque with tried-and-true components. A 3.75-inch stroker crank bumps the displacement up to 383 cubic inches to help move more air and fuel into the combustion chambers. Hoodenpyle could have made a bigger peak power number by using a single-plane intake, but that's



06 | The crankshaft is a forged steel unit from Scat. It pushes the stroke from the stock 3.500 inches to 3.750. It's basically the same dimensions as a Chevrolet 400 crank, just of a lot higher quality. That extra stroke, along with the 0.030-inch overbore will bump the total displacement up to 383 cubic inches.

07 When cutting a stock block to accept four-bolt main caps, remember that the new bolt holes will extend into the water jackets. So to keep coolant from wicking down the bolt's threads and into the oil in the pan, you must use thread sealer on the outer cap bolts.

08 Ken Troutman checks to make sure he has at least 0.005-inch of crankshaft endplay. This is an important check for any engine build, but when you've changed out the original main caps for new ones like we have here, checking crankshaft endplay is critical. If you have too little, you can lightly sand the thrust surfaces of the thrust bearing with a piece of super-fine-grit sandpaper laying on a perfectly flat surface to create a little extra clearance.

09 The forged connecting rods are also from Scat. They are a stock 5.700-inch length. The pistons are CP-Carrillo Bullet pieces. This lightweight forging has a 1.425-inch compression height, which moves the wristpin closer to the top of the piston so that you can use a stock-length connecting rod and still keep the pistons from sticking out of the deck of the block at TDC.

mostly only good on the racetrack. Instead, this build uses an Edelbrock RPM Air-Gap dual-plane intake, which significantly improves the low-end torque. For a street machine, an engine that makes lots of horsepower but only at a high rpm level is really only good for bragging rights. But an engine that makes lots of torque down low can make any car a fun machine. After all, who doesn't want to have tire-squawling grunt at the first touch of the go pedal?

On the dyno, we saw 488.9 peak horsepower at 5,800 rpm and 499.7 lb-ft of torque at 4,600. Best of all,

10 | Between the first and second day of assembly, builder Ken Troutman fell ill so other members of the shop took over. Here, Kevin Troutman finishes the short-block; torqueing the rod bolts to 65 ft-lb to achieve the proper bolt stretch.

12 | The Bullet pistons sit just a few thousandths of an inch below the deck of the block at TDC to help maximize squish in the combustion chambers.

this naturally aspirated small-block doesn't dip below 475 lb-ft of torque from the start of the pull at 4,200 rpm all the way to 5,400. And by going with an HEI distributor, Hoodenpyle didn't have to spend a fortune and can take his new engine straight from the dyno and drop it into his Camaro.

Except for the machine work, this is a build that most experienced hot rodders can perform right in their own garage. And with all that torque on tap—while burning pump gas—this is a combo that will transform practically any classic street machine. **CHP**

11 | Any time you add stroke to an engine package, you must be careful that the crankshaft's extra throw doesn't bash the big end of the connecting rods into either the bottom of the cylinder bore or the camshaft lobes. One reason the 383 stroker combo is so popular with small-block builds is because a 3.750 stroke crankshaft normally will fit without having to clearance the block. But there's no guarantee; We had one connecting rod bolt that barely contacted the block. Kevin solved that issue by marking the bolt, pulling it from the rod, and filing down the edge just a bit with a hand file. Here, you can see the results with the bolt torqued back in place.

13 | Oiling duties will be handled by a standard Melling oil pump. With a new build, it's always a good idea to pull the pump apart and add a little assembly lube between all the lobes on the pump's gears. The lubricant not only helps protect the steel gears on initial start-up, but it also helps create a seal between the lobes so that the pump will prime faster and start moving oil throughout the engine quicker.

14 | The crown jewels for this build definitely are the pair of AFR Eliminator Race Ready cylinder heads. These aluminum castings are fully CNC ported. The 220cc intake runners flow a healthy 292 cfm at 0.500-inch lift and 311 at 0.650. The combustion chambers are sized at 75 cc's (you can also order the smaller 65cc version) and are equipped with larger-than-stock 2.10/1.60 intake/exhaust valves.

15 | Here's a look at the beautiful, CNC-cut intake ports. When building a naturally aspirated engine, airflow equals power, and AFR's heads have proven to move tons of air and fuel without breaking the bank.

16 | KT Engines kept AFR's valves, retainers, and locks, but they felt the aggressive camshaft required different valvesprings. They used a set of Comp Cams springs that spec'd out at 150 pounds on the seat and 360 at this cam's 0.580-inch maximum lift.

17 | KT Engine's Mike Blackwell gently sets the AFR heads into place with a set of Fel-Pro composite gaskets in place to provide the seal between the combustion chambers and the cylinder bores.

18 | One potential issue with small-block cylinder heads using performance valvesprings is the larger diameter can squeeze the center head-bolt hole located at the top of the head. That's the case with AFR's Eliminator heads where the spring seats are cut for larger diameter valvesprings, as you can see here. The head bolt will still fit, but you will need to file the opposite sides of the washer to get it to drop into place between the springs.

19 | Blackwell preps the ARP head bolts with ARP lube underneath the head of the bolts and on the washers, then he applies sealer on the threads before torqueing them down to 70 ft-lb.

20 | A Moroso eight-quart oil pan increases oil capacity and reduces windage to help both power and longevity.

21 | The 1.5:1 ratio steel roller rocker arms are Nickels Performance's Engine Works brand. They are activated by 5/16-inch diameter hardened pushrods that are 7.350-inches long.

22 | Blackwell drops the Edelbrock RPM Air-Gap intake in place. The Air-Gap is an excellent intake because it makes great torque down low, but the raised runner design also doesn't run out of air in the upper rpm range like many dual-plane intakes. Just make sure you have enough room under the hood for the taller Air-Gap intake.

23 | Back in the day, all Chevrolet engines came equipped with an HEI ignition. This build stays true to that heritage with a D.U.I. HEI from Performance Distributors. Performance Distributors' HEI design is a significant upgrade over the stock unit. It not only provides a much stronger spark that stays hot as the rpm climbs above 5,000 rpm, it also allows you to open up the plug gaps to help improve initial combustion.

24 | One of Quick Fuel's 680-cfm HR-series carbs has been chosen to provide the air/fuel mixing duties because it is packed with street-friendly components like an adjustable electric choke and vacuum secondary while also including features normally only found in race carbs, such as dual metering blocks, four-corner idle control, screw-in air bleeds, and sight-glass windows on the fuel bowls.

25 | On the dyno, this 383 cranked easily, even when hot, it idled smoothly and produced mountains of torque. We were near 500 lb-ft of torque when Ken Troutman started the pull at 4,200 rpm and didn't drop below 475 until 5,400. That's a recipe for a fun ride in practically any car you put this small-block into!