

# the screaming eagle, part 1

WE FOLLOW ALONG AS COAST HIGH PERFORMANCE ASSEMBLES ONE OF THEIR PRO-STREET SHORTBLOCKS FOR WARHORSE



In the world of small-block Fords, there are a multitude of engine displacements available in everything from component kit form to ready to go crate motors. For our goals, we decided that a new shortblock would be the way to go, so that we could use the top end of our choice. While there are some common combinations in the arena of small-block Ford motors (306, 331, 347, etc), we wanted to be a little bit unique with the bullet for Project Warhorse. As we were perusing Coast High Performance's shortblock catalog, we came across a unique combination that piqued our interest – their 363-inch Pro-Street shortblock. By utilizing a 4.125-inch bore size with a 3.4-inch stroke in an 8.2-inch deck block, the design is essentially a big-bore version of the tried and true 347 stroker. With a solid design and more cubes, the 363 seemed like a no-brainer.

Coast High Performance has over 20 years in the high-performance marketplace; constantly researching and

developing new engine combos for both street and race applications. They offer everything from engine kits consisting of matched components, to fully assembled, turn-key crate motors, and everything in between. With an in-house machine shop, they control every aspect of a motor's build from the initial machining of the bare block to their master builders doing a final torque check on an assembled motor. The Coast High Performance team was on board with our ideas and together we set out to build what will be the heart of Project Warhorse – The Screaming Eagle.

#### THE BLOCK

At the center of this build is the Dart Iron Eagle Sportsman block. We went with the 4.125-inch bore version so that, even with the big bore called for in the design specs, there's plenty of meat left in the block. The 4.125-inch bore version of the block has the ability to still be punched out another 50-thou-

sandths of an inch, for a monster 4.185-inch bore, should we ever need to bore the block down the road. For now, the 4.125 bore was plenty for us. Designed to work with stock components, the Iron Eagle Sportsman block is cast from high strength iron and has extra thick cylinder walls and decks. Four-bolt steel main caps adorn the center three mains, and two-bolt caps reside on the front and rear mains, clearing factory and factory-style oil pans. The Iron Eagle Sportsman block also offers a vastly improved priority-main oiling system, making sure that there are no oiling issues at high RPM.

#### THE ROTATING ASSEMBLY

The rotating assembly consists entirely of forged goodness from Probe Industries. Designed for "serious street applications and racing use," the crankshaft is made from forged 4340 steel and is heat treated for maximum strength. It has a 3.400-inch throw – which gives us 363 cubic-inches





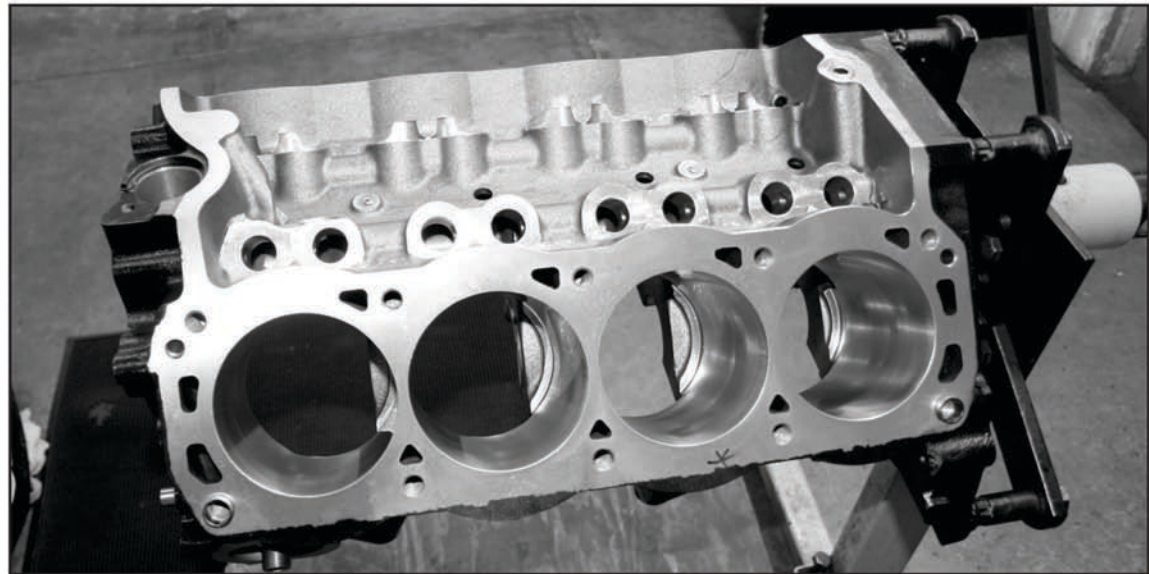
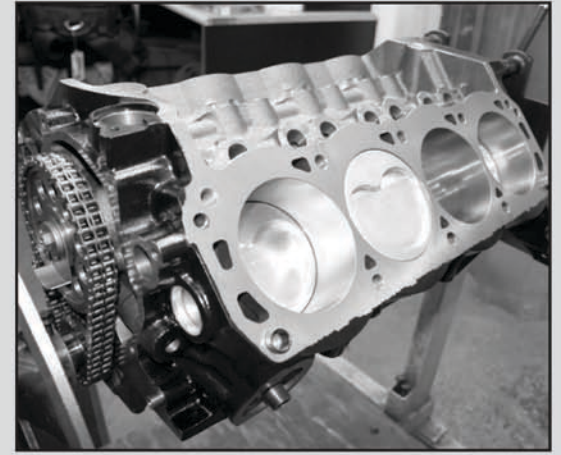
^ To balance our combination, we went with an SFI 18.1-certified ATI Super Damper. Available in 28 oz., 50 oz., and neutral balances, with either a steel or aluminum shell, and in street and race versions. There are quite a few options available when choosing your balancer. We went with a 28 oz. imbalance and a steel shell, which should meet our needs perfectly.

of displacement with the 4.125-inch bore – and a “standard 302” 2.248-inch main diameter. The connecting rods are an H-beam design and are also made from forged 4340 steel. They are vacuum degassed during manufacturing to remove impurities and forged in two pieces to insure proper grain flow before they are CNC-machined and shot-peened to relieve stress. Silicon bronze bushings are used on the small end, while precision ground alignment sleeves are added to the rod cap to prevent cap walk. The pistons are from the Probe Sportsman Race Series (SRS) lineup. They are made from forged 2618-t61 aluminum and feature a 20.6cc dish. We opted for the dished piston because we will be going with forced induction down the road, and with the heads we have on the shelf, will yield something in the neighborhood of 9.15:1 compression ratio. Discussing it with the builders at Coast, they assured us that while not optimal, the motor will still run fine sans power adder for a few months. The rings used were Clevite Perfect Circle steel rings. The Perfect Circle steel rings offer better strength and longer ring life, while also having less mass than a ductile iron ring. For the bearings in the motor, we also turned to Clevite. The rod and main bearings used were the Clevite H-Series bearings, which were developed primarily for competition engines that operate in the mid-to-high rev range. They feature enlarged chamfers at the sides for greater crank-fillet clearance and come with both 180- and 360-degree oil grooves. Coast High Performance elected to use a .001-inch thinner main bearing in our motor for additional clearance.

Coast prefers to use a 28 oz. imbalance in the rotating assembly, as opposed to the stock 50 oz. So for our balancer we went to one of the most proven companies in the market – ATI. They offer a range of dampers for everything from near-stock street applications to all out race pieces. We went with their Super Damper in a 28 oz. imbalance. Designed exclusively for high performance engines, the Super Damper exceeds SFI 18.1 specs, has laser-engraved 306-degree timing marks, and features a black zinc chromate finish. They are also available with both steel and aluminum outer shells.

## SHORTBLOCK SPEC SHEET

**Engine Block:** Dart Iron Eagle Sportsman, 4.125-inch bore (P/N: 31354275)  
**Crank:** Probe Industries Forged 4340 Steel, 3.400-inch stroke (P/N 10052)  
**Rods:** Probe Industries Forged 4340 Steel H-beam (P/N: 10075)  
**Pistons:** Probe Industries SRS, Forged 2618-t61 aluminum, -20.6cc Reverse Dome (P/N: 14712-STD)  
**Piston Rings:** Clevite Perfect Circle pre-fit (P/N: 315-0032-030)  
**Camshaft:** Comp Cams XFI hydraulic roller cam; .579/.579, 236/248 @ .050, 114 LSA (P/N: 35-775-8)  
**Balancer:** ATI Super Damper 28 oz. (P/N: 918911)  
**Timing Set:** Comp Cams keyway adjustable billet timing set (P/N: 7138)



^ One of the major benefits of going with the Dart Iron Eagle Sportsman block is that it is designed with a 4.125 bore, which is the key feature of the 363 motor. Probe also offers the build with a 4.155 bore, which increases the displacement to 369 cubes while still retaining enough meat to go even bigger. With Dart's listed maximum bore size of 4.185-inches, you can get a whopping 374 cubic-inches out of an 8.2-deck motor with a 3.400-inch stroke. All while looking like a little 302 from the outside.



^ One of the main benefits of having our engine built by Coast High Performance was the thorough blue-printing everything received. Here, Jun is checking the side clearance of the connecting rods.



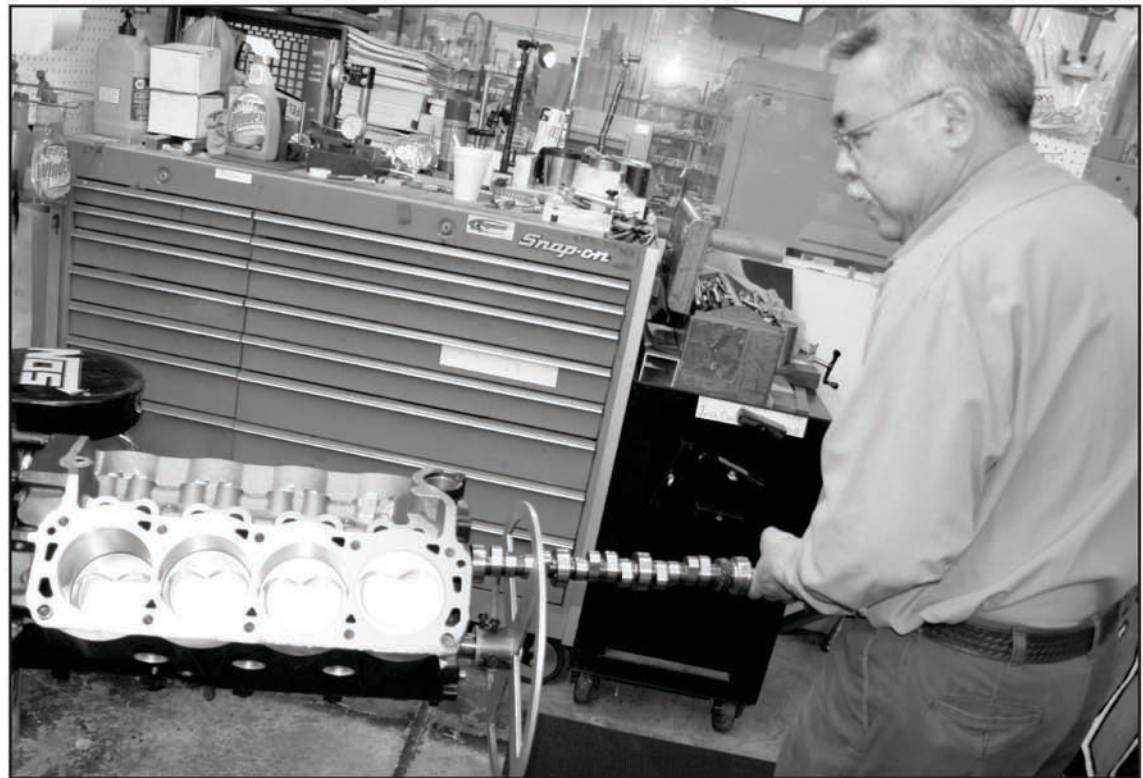
^ The Probe SRS pistons we went with are forged from 2618-t61 aluminum and feature a 20.6cc reverse dome in order to accommodate the boost we're planning on throwing at it. With the heads we've selected, we should have a static compression ratio of 9.15:1.



**THE CAMSHAFT**

With the plans to go forced induction dancing in the back of our head, we contacted Comp Cams for a camshaft. After discussing it with both Comp and Coast, we decided to go with a profile that will run decently on motor alone, but would really wake up with copious amounts of compressed intake charge thrown at it. What we ended up with was Comp's 35-775-8 hydraulic roller camshaft. From the XFI family of camshafts, the cam was designed specifically for a stroked motor. Comp Cams did more than just take an existing grind for the 5.0L and add duration, instead doing some serious R&D and maximizing the profile to the increased displacement and altered event profile encountered in a stroker motor. For the timing set, we went with the Comp Cams keyway adjustable timing set. We chose it not only for its robust, billet construction, but also because it offers finer adjustments than the traditional three-way timing set, with the nine-way crank sprocket offering two-degree adjustments at the crank (which translates to one degree at the cam) and a total adjustment range of eight degrees at the crank and four at the cam.

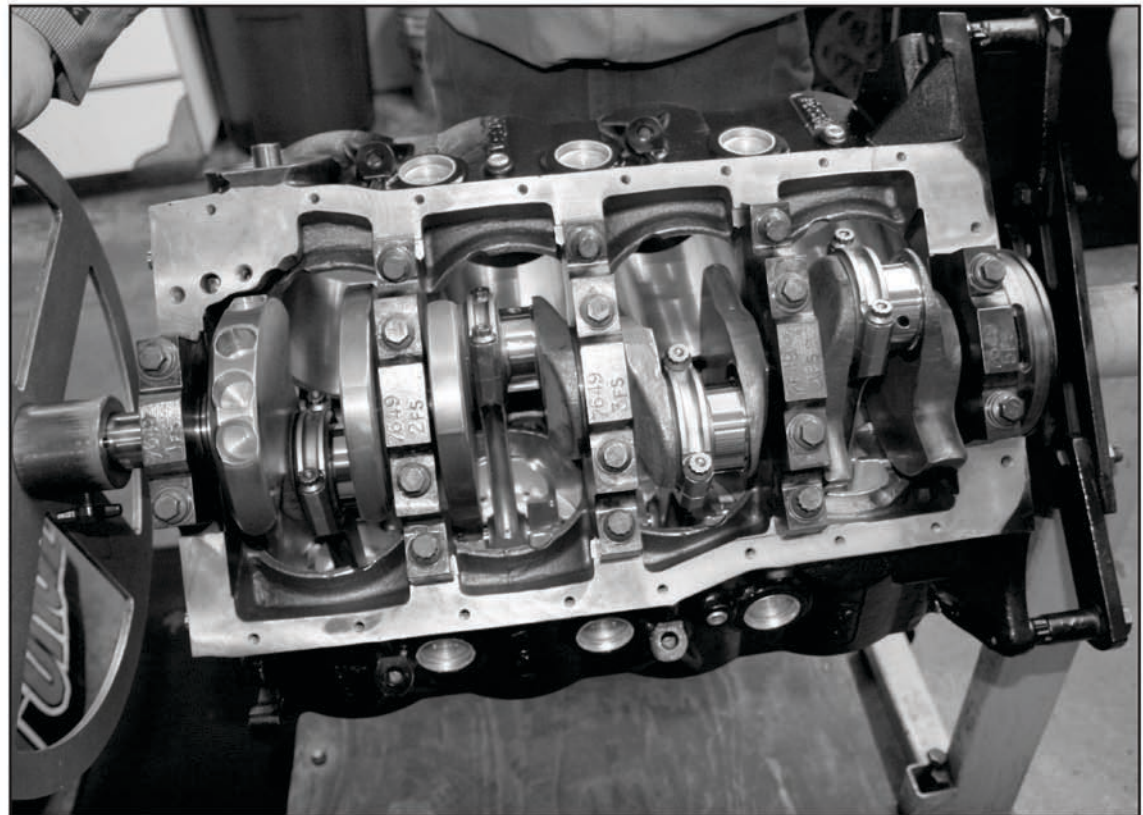
Coast High Performance's engine builder, Jun, assembled the shortblock with a level of competence that you'd be hard pressed to find elsewhere and, as expected, the assembly went off without a hitch. We consulted with those in the know and are very confident that this shortblock has all the right parts to carry us to our goal of 600 horsepower and beyond. Stay tuned as next month, as Probe assembles the top end of the Screaming Eagle and we get one step closer to giving Warhorse a new heart. ■



^ Originally, we were going to install a cam with an optimized N/A profile, and then swap out the cam when we put the blower on the car. But since we had the motor out and don't plan on it running naturally aspirated for too long, both Coast High Performance and Comp suggested we go with a profile that would suit our end goal. With the specs we chose, the car should still run well naturally aspirated, and scream under boost.



^ The Dart block also features a priority main oiling system, making sure that the oil goes where it's needed most, first. It's a very nice feature to have in any motor that's going to see the type of use we plan for it.



^ The Dart Iron Eagle Sportsman block features steel splayed four-bolt main caps on the number two, three, and four mains. The two end main caps – number one and five – are two bolt caps. It's a combination of power-holding ability and convenience and standard oil pans will clear this design.





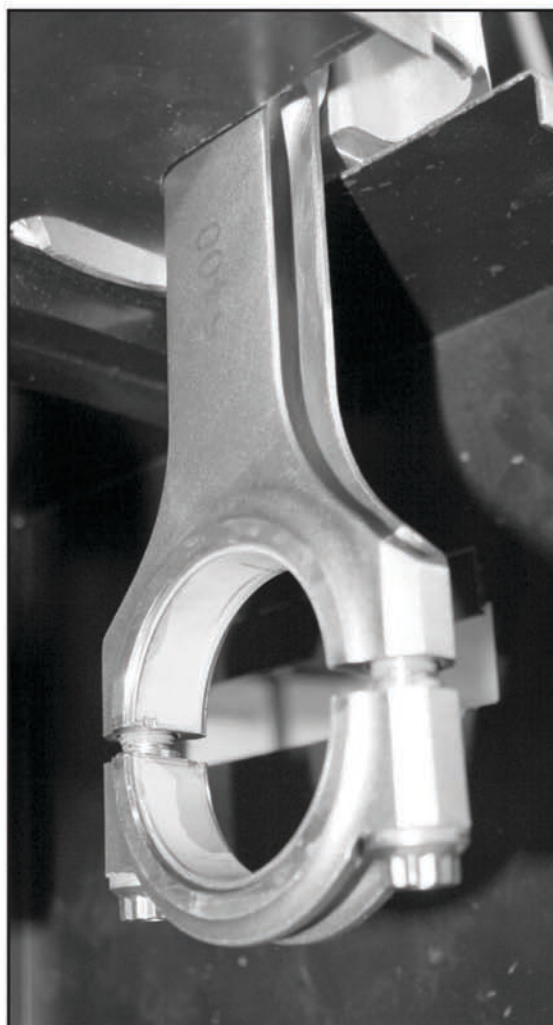
^ The foundation of any good rotating assembly is a good crank. Coast High Performance's 363 rotating assembly calls for a 3.400-inch stroke Probe crank. Forged out of 4340 steel, it features standard 2.248-inch main journals and 2.123-inch rod journals and should support our power goals, and then some.



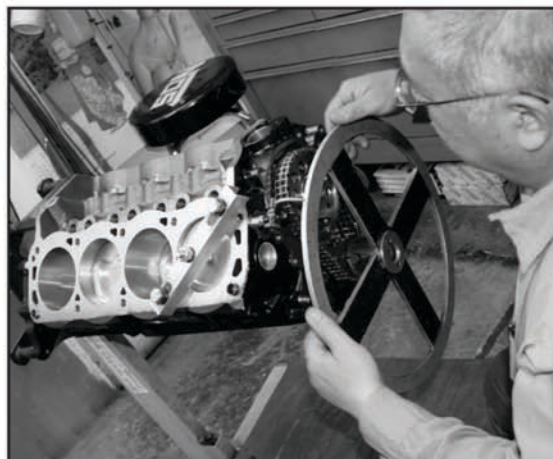
^ For piston rings, Coast used Clevite Perfect Circle pre-fit steel rings in the standard 1/16-inch top, 1/16-inch second and 3/16-inch oil ring sizes. The top ring is gap is .021-inches and the second ring gap is .024-inches.



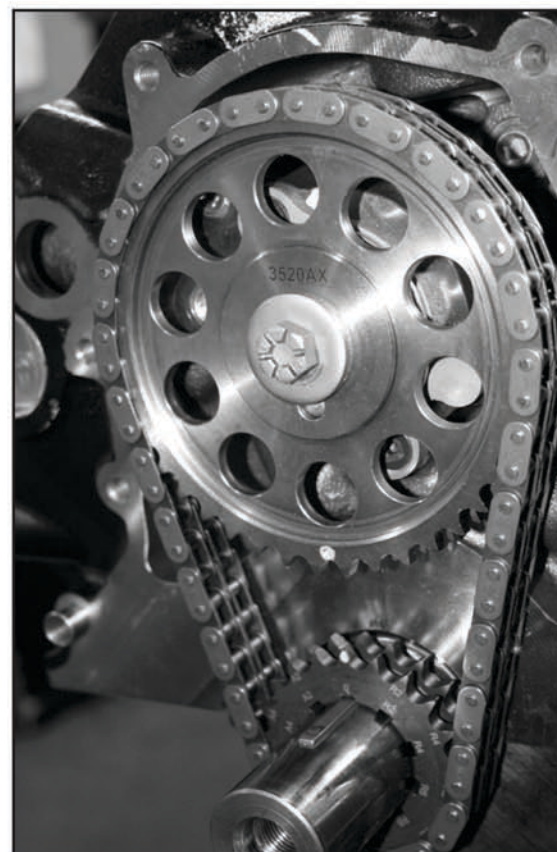
^ Attaching the rod cap to the connecting rod itself are ARP 7/16-inch 12-point rod bolts. There's no point in using quality parts if you aren't going to use quality fasteners to button everything up. Thankfully, ARP makes some killer fasteners to help everything stay together under serious loads.



^ For connecting rods, Coast uses forged Probe H-Beams in the kit. Made from forged 4340 steel, the rods are vacuum degassed, CNC-machined, and then shot-peened to relieve stress. They feature a floating, bronze-bushed wristpin and use precision-ground alignment sleeves in the rod caps to prevent cap walk at full song.



^ After everything was tightened down, we degreed the cam. Everything spec'd out perfectly. Now our Coast High Performance 363 Pro Street shortblock is ready for the heads and valvetrain, which you'll see next month!



^ For the timing set, we went with a Comp keyway adjustable double roller set. Made of billet steel, it offers twice the adjustment range as a standard three-way adjustable set (eight degrees of total adjustment at that crank, and four at the cam), with adjustments that are more precise, allowing for one-degree adjustments at the cam.

**source**

**ATI Performance Products**

877-298-5039  
www.atiracing.com

**Mahle-Clevite**

www.mahleclevite.com

**Coast High Performance**

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