written by greg acosta > photos by the author and mark rapp

THE BOSS HOG

boss' bits

>> WE SORT OUT THE ACCESSORIES ON BOSS HOG

Over the past few months we've brought you the power-making components used in our big-bore 347-cube small-block build. Now, it's time for us to take a look at some of the supporting hardware that we'll be running on the engine. While the engine block, rotating assembly, top end and valvetrain parts are some of the most key components in an engine build, they are noting without the support of good accessory equipment, such as the carburetor, ignition, water pump, and oiling system. Really, these components may not get the glamour or the spotlight, but the exceptional quality and craftsmanship of the items we've selected for our build are second-to-none.

With a desire to learn and diversify the tech in the book, we decided to use a carburetor on the build.

FUELING THE FIRE

When it came time to choose and induction system for this engine way back in the planning stage, we all agreed that we didn't have near-enough carburetor tech in the magazine. In addition to that, the author grew up with a keyboard in his hand, and has only owned EFI vehicles. So with a desire to learn and diversify the tech in the book, we decided to use a carburetor on the build. At this year's MPMC conference, we had a meeting with Holley in which we talked about their new line of Ultra HP carbs. Once the project was rolling along, we started talking about carb specs, and Mark suggested something in the 950-plus cfm range, since the engine will be singing its song in the higher RPM ranges. So we ran the engine's specs through Holley's online carb selector and sure enough, their Ultra HP 950cfm carb popped up. We contacted

>>The internal baffling on the Moroso oil consists of these four "trap doors" along with another pair of baffles to keep the oil at the pickup even under hard acceleration and deceleration.

>> Here, Mark took the reins to check to make sure that there was enough clearance between the pickup and the pan. There was plenty, according to the modeling clay we used to check.

>> While we opted for one of MSD's Ready-to-Run distributors, we made sure to lock out both the mechanical and vacuum advance systems, as well as installing the bronze gear that MSD provided.

THE BOSS HOG

Holley for final verification on the model with our specs and they concurred. Designed for race applications, the Ultra HP 950 (P/N: 0-80676) carb is packed with features like a billet aluminum base plate and metering blocks, with changeable emulsion bleeds and idle-feed restrictors. It also comes with a notched float and jet extensions, progressive secondaries, and dual 30cc accelerator pumps. Stainless steel throttle plates occupy the 1.750-inch throttle bores, and fuel is fed through 1.376-inch venturi. The 950 Ultra HP will be able to handle our N/A power goals with ease; and it'll also work well with our plate kit.

CLEARING YOUR PLATE

Since this engine will end up providing power in an open-comp-style class, our power adder of choice was nitrous oxide. After seeing FSC's big-block Ford project engine make a metric crap-ton of power using Nitrous Oxide Systems' Crosshair plate kit, we were sold on the design and wanted to use it in this build—albeit in the 4150 pattern, instead of the Dominator-pattern FSC's Brutus used. Mechanically, the Crosshair plate (P/N: 12566NOS) is designed for a large shot of nitrous, with the advertised ability to spray more than an additional 350 horsepower into and engine. We know that to be true, as on FSC's big-block, they were able to pick up 500 horsepower on the dyno. While we aren't going to be THAT greedy on the dyno, it's nice to know that we have the option. With the dual "double-down" spray bar design which is based off of the venerable Double Cross plate design, and two nitrous and fuel inlets, the plate can be plumbed with a quartet of solenoids for a two-stage kit. With the author's affinity for gadgetry, the nitrous can even be brought on in three stages. While a progressive such as the NOS Launcher would be the ideal way to bring on two big stages of nitrous, depending on the ruleset you compete under, creative wiring could make for a legal way to bring in a big hit of nitrous without the use of a progressive. The improved distribution of the fuel and nitrous over the previous design is critical with today's intake manifolds, and will be well received by our Edelbrock Victor Jr. intake manifold.

The nitrous plate is available separately or as part of a kit. We opted Included in the kit is a "Cheater" fuel solenoid and a "Pro-Race" Nitrous solenoid. Both of the solenoids feature a stainless steel base and a new, proprietary plunger material which resists swelling, but still seals as well as Viton. In addition, the kit comes with Jetting, plumbing and hardware to connect the solenoids to the plate. In addition to the plate

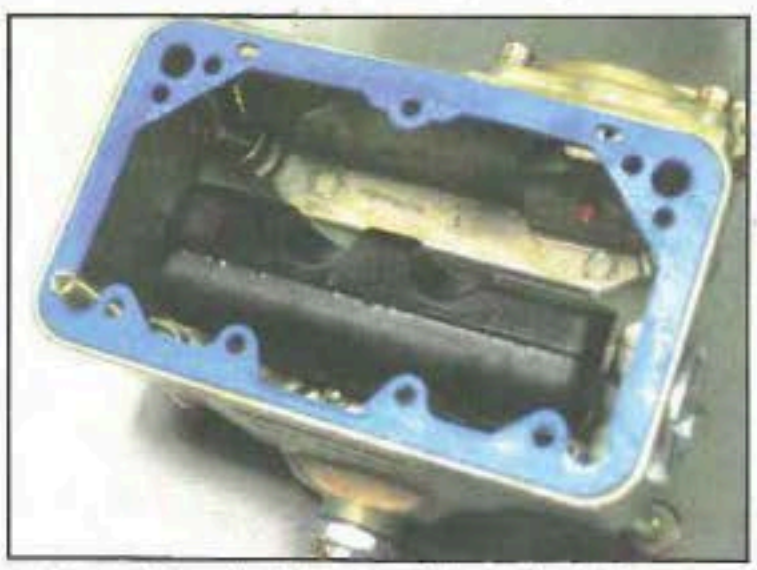
>> The "Crosshair Professional Kit" comes with a "Cheater" fuel solenoid and a "Pro-Race" nitrous solenoid, along with the associated fittings and hardware.

Precision Oil Pumps

Much like how there are carb shops that modify another manufacturer's carburetor, Precision Oil Pumps does the same thing, but with oil pumps. What they do is take the venerable Melling M-68 and disassemble it, remove all the casting flash from the internal passages and then radius and polish the corners to improve flow. Then, The housings and gears are deburred via a vibratory polisher, and the gears get a Tech-Line moly-coating to reduce internal friction. Then, upon reassembly, several critical clearances—gear-to-housing, gear backlash, and gear-to-cover plate—are checked and adjusted for the correct clearances. The internal relief valve is removed and deburred with emory cloth prior to being reinstalled with new hardware. Then the coverplate is vibratory polished, cleaned and safety-wired with aircraft bolts. The whole assembly is then bench tested prior to being shipped, ensuring you receive a killer oil pump for your project.

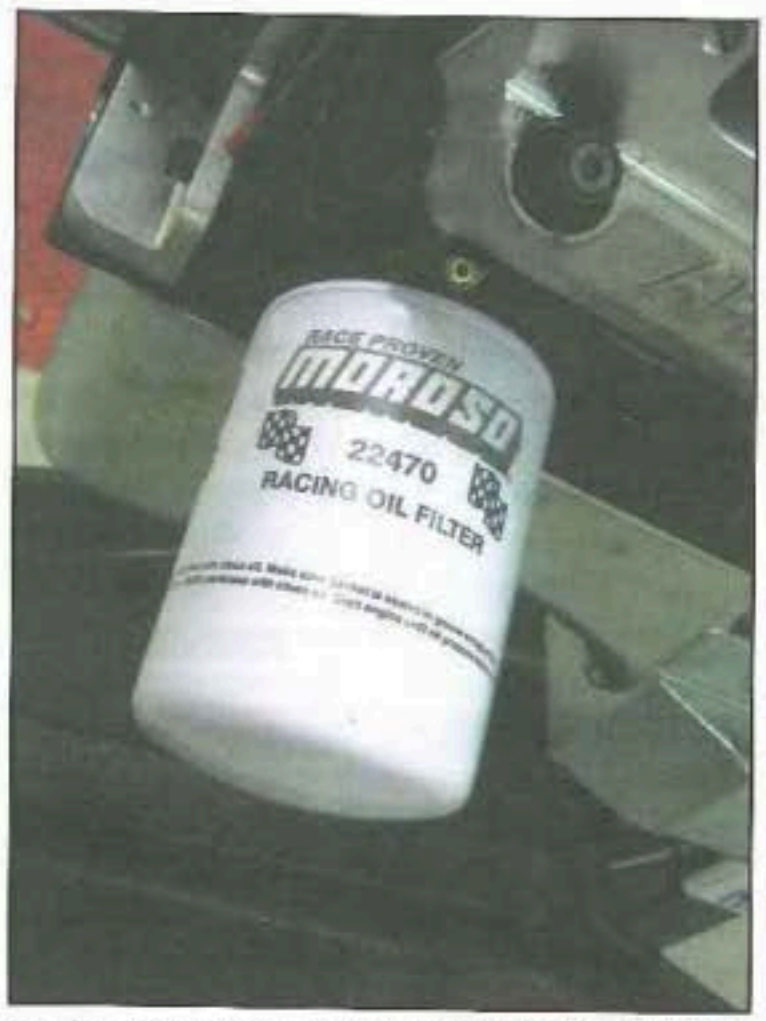
The improved distribution of the fuel and nitrous over the previous design is critical with today's intake manifolds.

>> The NOS Crosshair plate is a modernization of the company's "Double Cross" design. Rated to flow 350-plus horsepower-worth of nitrous and fuel, we probably won't be THAT greedy on the dyno.



>> Once of the nice features of the Holley Ultra HP 950 is the notched floats and jet extensions. A lot of formerly "trick" pieces in carbs, now come from the factory.

>> The 950 cfm rating is thanks in part to the 1-3/4-inch throttle blades. You can also see the billet aluminum base plate as well as the billet metering blocks peeking through.



>> Along with all the other goodies, Moroso included their racing oil filter. It only makes sense that one of the biggest names in oiling systems knows a thing or two about good filter design.

>> One of the final touches we needed to put on the engine was to clearance the Ford Racing BOSS valve covers for our Crower shaft rockers. You'll notice, it really only needed minor work, which surprised us.

We were going to have to go with something a little special when it came to the water pump.

kit, we ordered the electrical wiring kit and the bottle kit. The single-stage electric wiring kit (P/N: 15634NOS) contains everything needed to wire up the nitrous kit: Micro-switch and bracket, relay and harness, and the necessary wires and connectors. The 10-pound bottle Kit (P/N: 14762NOS) come complete with the 10-pound nitrous bottle with the super Hi-Flow valve, nitrous pressure gauge, bottle nut with Teflon washer, brackets and 16 feet of -6 A/N braided line.

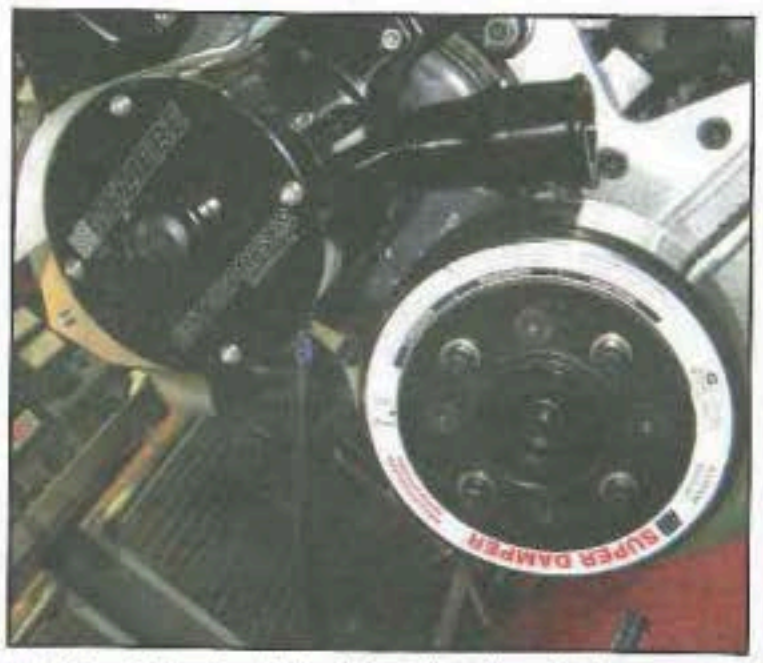
A WELL-OILED MACHINE

One of the most critical systems of a high-performance engine is its oiling system. For those duties, we went to Moroso with our project and they responded with the parts which would work for our application. They started us off with their seven-quart, 7.5-inch deep rear-sump pan (P/N: 20527) which is made from zinc-coated steel and features killer baffling with four trap doors and two baffles to keep the oil where it's needed the most—at the pickup. Is it also designed to clear our four-bolt main caps on number 2, 3, and 4 mains. The pan come's pre-drilled-and-tapped with a half-inch NPT oil temperature bung, and a dipstick bung (with a universal dipstick kit). Along with the oil pan, Moroso included their well-designed oil pickup tube (P/N: 24527), a main-stud kit (P/N: 38191) and their louvered windage tray (P/N: 22930) to further control the oil at high-rpm.

When it came to the oil pump, we have to give a tip of the hat to FSC Publisher Aaron Hahn for turning us on to a company by the name of Precision Oil Pumps. We utilized one of their precision Melling M-68HV pumps (see sidebar for full details on what they do) to act as the heart in our engine-oil circulatory system. We also sourced once of their billet drive kits along with an ARP 12-point bolt kit, making our oiling system as bulletproof as possible.

KEEPING YOUR COOL

When it came time to look at the cooling system, we fell back to one of the best names in the business—Meziere. With the Jesel belt-drive setup on the engine, we knew we were going to have to go with something a little special when it came to the water pump. We called up Meziere and told them what we were doing, and asked which of their pumps—and which spacers—we needed for our application. Don chuckled and mentioned that he had a part number that was not only designed to fit in the SN-95's engine bay, but one that was designed specifically for a belt-drive application. The WP-173HD pump was designed to be a heavy-duty, high performance pump, right here in the USA. With a 42 gpm free-flow rating, the Meziere pump is crafted with a large-diameter stainless steel main-shaft, a high-performance ceramic seal, and all stainless hardware throughout. In addition to freeing up horsepower by eliminating an engine-driven water pump, the whole assembly only tips the scale at 5.7 pounds. Meziere has also designed the pump with a 3000-plus hour life expectancy, meaning there is a good



>> One of the nice bits of functionality of the Meziere pump, is the dual inlet locations. With three timing tab locations on Fords, having the dual inlet locations accommodates them all.

>> Not only does the 42 gph Meziere have a stout spec and capability sheet, but the parts really add to the aesthetics of the engine. Their pumps and water necks are available in a number of anodized colors.

chance it will outlast the engine [even if we baby the engine]. In the water pump unit, the housing features provisions for either a right- or left-side radiator inlet, so it will work no matter which timing tab location you are using.

In addition to the pump, Meziere included one of their beautifully-crafted billet water necks. Made from billet aluminum, the Meziere design uses an integral O-ring, eliminating the need for a gasket, and comes with a bypass fitting and block-off plug, to suit each user's specific application.

3...2...1... WE WAVE IGNITON

Without a way to ignite the fuel-air mixture, the engine just a really pretty manual air pump. Thankfully, the folks over at MSD have the whole ignition thing down pat. For our application, all of our required parts were off-the-shelf propositions for MSD, making our life quite a bit simpler. Don't misinterpret an off-the-shelf part as not being every bit as good as a custom piece, because MSD's years of knowledge and innovation go into every part in their catalog. For the distributor, we went with one of their Ready-To-Run 302 distributors [P/N: 8352]. It features a simple, three-wire connection and has a built-in module that provides a 7.5-amp spark throughout the RPM range. It features a CNC-machined billet aluminum housing and base, and is 5/8-inch smaller in diameter than the stock distributor. The polished steel shaft is OPO-coated and guided by a sealed ball-bearing pack for reliable, smooth high-RPM operation. The distributor features a host of vacuum and mechanical advance features, but for our application, we locked it all out in favor of fixed total timing. Topping the assembly off is a bolt-down cap and MSD's race rotor, and a nice feature for us Californians—a CARB E.O. number.

We also opted for a blaster HVC coil and a Digital-6-Plus ignition box [details of which you'll see in an upcoming installment of Project Nutjob], along with MSD's direct-fit 8.5mm Super Conductor spark plug wires. MSD also sent us a bronze distributor gear, since we are running a billet-core camshaft in this engine. Their one-stop shop had everything we needed to make sure that we get the most precise and complete combustion possible.

Now, with the engine complete, it's time to add in the fluids and break the engine in on Rapp Racing's run stand, before we head over to Westech and see what this bad boy is really capable of! ■

[source]

ATI
877-298-5039
atiracing.com

Ford Racing
800-FORD-788
Fordracingparts.com

Holley
270-782-2900
Holley.com

Meziere
800-208-1755
Meziere.com

Morosa
203-453-6571
Morosa.com

MSD
888-673-7859
Msdignition.com

NOS
270-782-2900
Nosnitrous.com

Precision Oil Pumps
559-325-3553
Precisionoilpumps.com

Rapp Racing
714-842-7300
Rappracing.com

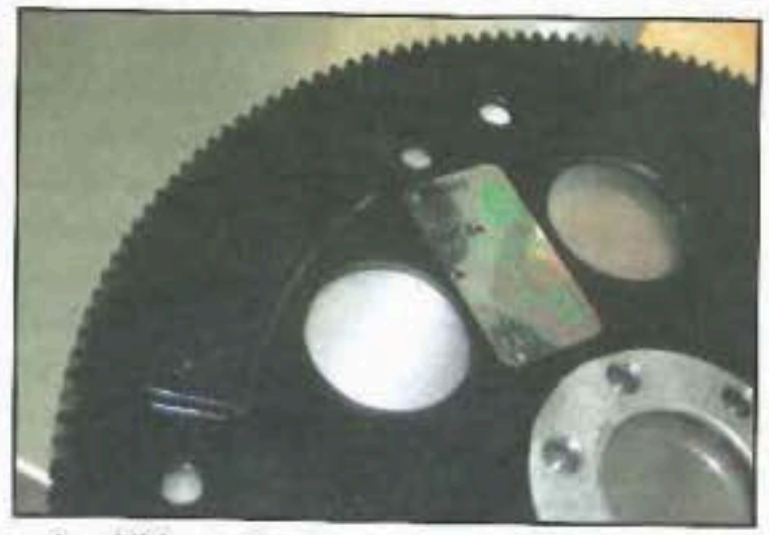
Maintaining Balance

While mechanically, the balancer is an integral part of the rotating assembly, it was one of the last parts installed on the engine as a whole. For the Boss Hog project, we went to ATI for one of their renowned Super Dampers. With a large variety of available options and configurations, we were able to get a configuration that fit our project perfectly. We decided on P/N: 918900, which has the standard diameter [6.325-inches] 4-bolt steel outer shell [which features eight computer-machined groves to retain the proper, dyno-tested durometer O-rings], in 28.2-ounce imbalance and [thanks to FSC's Jake the Snake for the heads up on this one] the shorter 3.35-inch snout—which is an aesthetic move with the belt drive. As with all of ATI's Super Dampers, Ours exceeds SFI 18.1 specifications, has an attractive, durable black zinc-chromate finish, and has laser-engraved 360-degree timing marks.

It's time to add in the fluids and break the engine in on Rapp Racing's run stand

>> You'll be seeing the Digital-6 Plus ignition box and Blaster HVC coil being installed on the author's SN-95 in an upcoming issue. One of the benefits is that the box will work on the stock engine as well as with Boss Hog.

>> To get the spark from the distributor to the plugs, we went with MSD's 8.5mm Super Conductor wires. MSD offers them in pre-fit sets, meaning no building plug wires.



>> In addition to the Super Damper, ATI provided us with an SFI-certified 28-ounce flexplate. The 164-tooth design will allow us some versatility in our transmission choice, while its robust construction will handle anything we throw at it.