

## Blueprinting Basics:

# Oil System Upgrades

**Nitemare Performance shows how to keep your high-performance Pontiac's engine spinning smoothly with some key upgrades to its lubrication system.**



Is your Pontiac's oil system capable of coping with all the extra power you've built into your engine ... or all the abuse that you give it? With these upgrades and tips, you'll feel far more confident that it can.

## Story and Photos by Jason Scott

**W**hen Pontiac engineers designed the original Strato Streak overhead valve V8 back in the early 1950s, they based its oiling system on the best-known systems that they were aware of: the designs used on the then-recently introduced Oldsmobile Rocket 303 and Cadillac's similar 331 V-8.

But that original 287-cubic-inch Strato Streak only produced 180 horsepower – less than half of what a Ram Air III made, and only a third or so of a typical 500-horsepower build, today. And while that original oiling system design may have been entirely satisfactory for the underpowered 287, and could be reasonably

capable of protecting a stock rebuild of a musclecar-era Pontiac's engine, it's likely woefully inadequate for a high performance rebuild.

Darrin Magro, founder of Nitemare Performance, identified the weaknesses of the stock Pontiac oiling system long ago and many of the company's earliest product offerings

focused on addressing those shortcomings to ensure the reliability of Nitemare-built engines and minimize the chances of them suffering oiling-related failures.

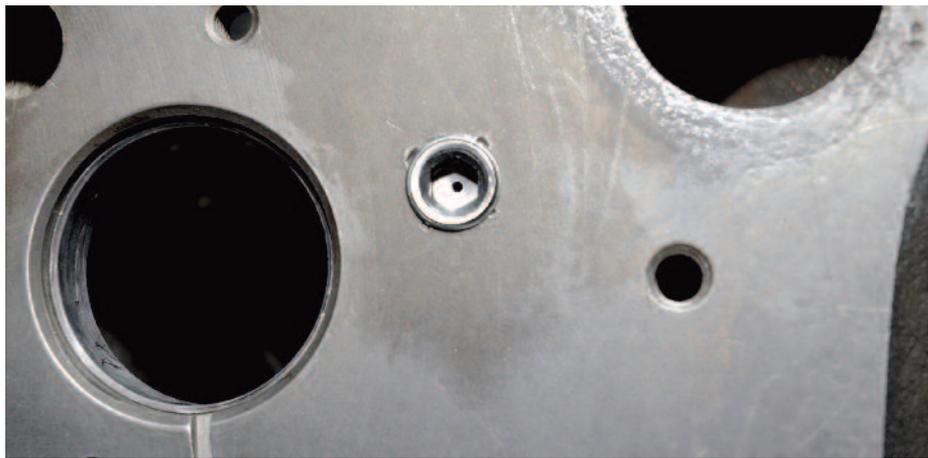
Magro recently walked us through some of Nitemare Performance's patented and custom-designed oiling system components and their benefits during the build-up of a 462-inch stroker motor that will be raffled off this summer for charity (see sidebar for info on how you can enter to win it).

Whether your next Pontiac V-8 build-up is a restoration-quality rebuild or an all-out race motor, Nitemare Performance's oiling system upgrades can help make your engine run better and last longer, for not much more money than it takes to just run factory-style parts.

## Oil

You wouldn't have much of an oiling system without oil. And, of course, the oil you run in your Pontiac's engine most definitely impacts its reliability and performance. But it's important to understand that oil has changed a lot, even in just the last 10-20 years. You need to consider the type of oil you run – synthetic or conventional petroleum-based; its viscosity; and especially how much zinc it contains.

For breaking-in a freshly-rebuilt engine, Magro uses a quality oil that's specifically formulated for break-ins, like Joe Gibbs Racing's Driven Break-In Oil. It's a conventional (non-synthetic) motor oil with a 15W50 viscosity and an extra helping of friction-reducing zinc mixed in to protect the camshaft and other metal-on-



**One of the first oiling system mods that Nitemare Performance makes is to drill a 0.050-inch hole in the front galley plugs (which Nitemare also replaces with threaded-in pipe plugs, to ensure they don't pop out under pressure). The holes allow oil to stream out under pressure to ensure sufficient oil flow to lube the timing chain.**

metal wear surfaces during the critical first start-up.

Beyond the break-in period, Magro likes Joe Gibbs Racing's Driven Hot Rod Motor Oil, which also features extra zinc to protect the cam and other wear-prone bits in the engine. Because the oil contains extra zinc, there's no real need to run a zinc additive, though doing so for extra insurance shouldn't cause any problems, either, apart from the extra cost

of a bottle of zinc additive, like ZDDP. And don't overlook the importance of quality assembly lube when rebuilding a Pontiac V-8 (or any engine). It's vitally important during those first few minutes of operation, to protect the camshaft lobes, bearings, and other components from immediate and potentially catastrophic wear.

Back to oil ... when considering which viscosity to run, you should



**Another early oil system mod is installing BOP Engineering's one-piece rear main seal. Its singular seam can be located at the top of the bearing to minimize the chance of leakage. In addition, the seal has a dual lip design that seals better.**



At the front of the engine, a fresh crankshaft seal should be fitted to the timing cover and lubricated with assembly lube to prevent damaging it during the critical first fire-up and break-in.



In a future installment, we'll look at how Nitemare Performance prepares and installs the timing cover and water pump assembly. For now, though, it's a prerequisite for installing the oil pan, so on it goes.

think about your bearing clearances; the presence or absence of any friction-reducing coatings on your engine's components; and the air temperatures in which you'll be operating the vehicle, among other factors. Pontiac typically recommended 5W30 for colder climates/seasons (-20°F to 30°F), 10W30 for 0°F to 60°F, and 10W40 for 20°F to 100°F. But if your Pontiac's clearances are on the looser side of the spec and you ex-

pect to run your engine harder—and you won't be operating it in cold weather—then you might want to consider 15W50, which is a favorite of Magro's for performance engines driven in fair weather.

Finally, today's oil is better than the oil that originally filled your Pontiac's oil pan when it first left the factory. The formulas and additive packages – not to mention the development of vastly superior synthetic oils – are

better for your Pontiac's engine. But that doesn't necessarily mean that you don't have to change your oil just as frequently. For more on that, see the sidebar Gimme Five.

### Oil Pan

Your Pontiac's oil pan (which is sometimes referred to as a "sump") has two basic functions: to store oil until it's drawn into and pumped through the engine (and then returns to the pan);



Nitemare Performance's Pro Series Oil Pump Drive-shaft is made from heat-treated, hardened steel and features a custom-honed steel sleeve that is pressed and pinned onto the pump end of the shaft to ensure that the shaft doesn't disconnect from the pump's input shaft during operation. The Pro shaft is then gun-drilled to reduce weight, which helps reduce strain on the bottom of the distributor and smoothes oil pump operation.



Here, you can see the sleeve, which captures the pump's input shaft, making it almost impossible for the drive shaft to twist off the pump shaft. It also ensures proper alignment of the two shafts for smoother operation and prevents the drive shaft from wobbling and potentially contacting the crank counterweight.

and to help cool the oil while it's in the pan. While there's nothing inherently wrong with factory oil pans, they can be improved upon.

Nitemare Performance developed its own custom-engineered oil pans for Pontiac V8s to address a few specific shortcomings of factory pans. Two versions of Nitemare's pans are available: the first design fits '64-'72 A-bodies and '67-'69 F-bodies; and the second fits '70-'81 F-bodies. Aside from differences to accommodate the different chassis, the pans are similar.

The first issue that Nitemare addressed is oil pan capacity. Stock pans hold about 4.5 quarts, but at high rpm a high-volume oil pump can literally suck all the oil out of the pan before enough oil drains back to prevent the pump from sucking air, which results in a sudden loss of oil pressure that causes oil flow to stop. Nitemare's pans feature an oversized sump area that increases oil capacity to 6 quarts, reducing the chance of cavitation.

Despite the oversized sump, Magro designed Nitemare's pans to ensure ample clearance to the ground, the chassis, the starter, and your exhaust.

The extra capacity and ample clearance both contribute to the improved cooling capabilities of Nitemare's pans, compared to stock. As hot oil returns to the pan from the engine, the pan's material absorbs some of the oil's heat, then air rushing around the pan absorbs some of that heat and carries it away. With more surface area compared to a stock pan, there's both more pan material to absorb heat, and more area

for air to contact to withdraw it. The increased capacity helps with oil temps, too, since more oil tends to stay in the sump longer during normal driving, giving it more time for air to absorb more of the heat.

Factory oil pans use only a simple baffle that's minimally effective at keeping oil in the sump to keep the pickup submerged during different driving maneuvers. In fact, under heavy acceleration, there's almost nothing to prevent oil from sloshing up the back of the pan, potentially uncovering the pickup. Nitemare's pans feature trap door-style baffles that surround the pickup, ensuring that a healthy supply of oil will be present even during extreme acceleration or cornering.

Pontiac was one of the few manufacturers that attempted to minimize oil sloshing onto the crankshaft during operation – a condition known as “windage” – because it slows the crank's rotation in the same way that it's more difficult to when waist-deep in water. Pontiac's solution was to install a windage tray. Unfortunately, factory windage trays (which were available in two different lengths through the years) lacked good drain-back provisions, so oil could actually pool up in the tray, trapping it closer to the crank than if there were no tray. Nitemare improved on the factory solution by equipping its oil pans with a heavy-duty wire screen-style windage tray that's attached directly to the pan. Wire screen windage trays greatly improve oil drain back but still prevent large volumes of oil from sloshing up through the tray and onto the crank. In addition, rather than being a separate

component, Nitemare's tray is part of its pan, which not only reduces costs and simplifies engine assembly, but keeps the oil trapped down lower, farther from the spinning crankshaft.

Another nice touch is that Nitemare's oil pans feature an O-ring-sealed drain plug, to minimize the chance of a leak.

### **Oil Pan Gasket**

The factory used a four-piece gasket set to seal the oil pan to the engine assembly: cork strips along the block's pan rails, plus rubber strips at the timing cover and rear main cap, and dabs of sealant where each of the pieces meet another. The cork would easily deform if the pan bolts were over-tightened, plus it could become brittle as it aged, while the rubber strips dry out and crack over time, none of which were conducive to preventing leaks.

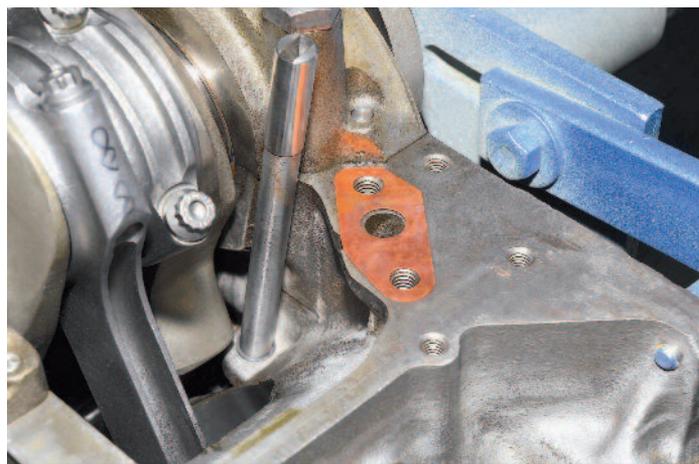
Unless he's doing a restoration-quality rebuild, Magro prefers to install a BOP Engineering one-piece, silicone oil pan gasket. Equipped with anti-crush sleeves at all the bolt holes, the BOP one-piece gasket doesn't get pinched or squished out from between the pan and engine, greatly improving its sealing characteristics. In addition, the silicone material doesn't become brittle or crack, so it retains its thick, supple shape to fill the gaps between the pan and engine.

### **Rear Main Seal**

Rear main seals have improved drastically since the days of our original, asbestos-based, two-piece, “rope”-style seals and the rubber seals that eventually replaced them, and which



Installation of the oil pump driveshaft is a simple "drop-in" affair. The C-clip toward the top end prevents it from passing through the block, even without the distributor in place.



Nitemare Performance replaces flimsy paper-based oil pump base gaskets with its own gasket made from annealed copper, which is malleable enough to crush and conform to the surfaces of the pump body and block, yet vastly more capable of containing oil pressures even at high rpm without risk of a blowout.



Nitemare Performance's Pro-Series Oil Pump Plate is twice as thick as a stock pump plate, at 1/4-inch, which better resists warpage of the pump.



The pump side of Nitemare's Pro pump plate is machined to be perfectly flat for optimal sealing to the pump body, then two circular grooves are cut into it to serve as oil reservoirs to maintain sufficient oil between the gears and the plate to reduce friction, heat, and metal-to-metal wear.



Nitemare's Select Series oil pump is based on a Melling CNC-machined pump that's upgraded with Nitemare's own Pro Series Oil Pump Plate and, in this case, fitted with Nitemare's bracketed oil pickup tube and screen assembly that bolts to the pump body in two places to ensure it doesn't vibrate loose from the pump.



Here, you can see the precision cut of Nitemare's oil pump base gasket that perfectly matches the contour of the pump.

are still common today.

While Magro has some tricks that he's learned through the years to make those old-style seals work and remain mostly leak free, whenever possible, he opts to use a state-of-the-art, Viton one-piece rear main seal from BOP Engineering that eliminates the typical, leak-prone seams in favor of a single seam that can be oriented at the top of the rear main, where there's little chance of oil leaking from it. And the Viton synthetic rubber fluoroelastomer from which it's made resists drying out, so it doesn't shrink, which would open up gaps between it and the crankshaft that could allow oil through. The material is also durable and resists wear from the spinning crank, and uses a special double-lip design to further help retain oil.

### **Oil Pump and Pickup Assembly**

A key element of the original Pontiac V-8's design was its oil pump, which was based on the proven Olds/Cadillac V8 pump designs. The fact that the design still works so well nearly 70 years later is all the proof one should need. But, again, there's room for improvement to ensure ample supply of oil in a high-performance engine.

Nitemare Performance starts with a CNC-machined Melling pump body that's fitted with billet gears that are CNC-milled to provide tighter tolerances than standard pumps for improved pump efficiency. Nitemare then replaces the pump plate with its proprietary, laser-cut Pro-line pump plate that's twice the thickness of a factory plate to resist pump body warpage during use and precision-

machined to be perfectly flat for an optimal seal against the pump body, to again improve pump efficiency. On the gear side of the pump plate, directly beneath the pump gears, Nitemare machines two circular oil retention channels that ensure the gears always have a cushion of oil to glide upon, instead of contacting the pump plate. For most applications, Magro uses a high-volume, standard-pressure pump, though a high-volume, high-pressure pump is available for circumstances for which it's best suited.

To his super pump, Magro attaches a Nitemare pickup that is specifically designed to work with the oversized sump of the Nitemare oil pan, plus features a sturdy, steel bracket that bolts to the pump housing in two locations to eliminate the chance of the pickup tube ever working itself free from the pump body, and to improve durability of the pickup assembly.

Finally, an item that's often overlooked by rebuilders who are less familiar with Pontiac V-8s is the pump-to-block mating surface. The factory used a typical paper-based gasket to account for minor imperfections. Many rebuilders either forget or choose to eliminate the gasket, which can result in a loss of oil pressure and volume if the mating surfaces of both the pump and block aren't perfectly flat. Or, if they use a factory-style paper gasket, it eventually degrades and can even blow-out over time, due to the pressures generated by the pump. Magro, instead, designed a Pro-grade gasket that's cut from annealed copper, which provides superior crush between the two mating surfaces for an optimal seal,

but is also durable enough to withstand even the highest oil pressures.

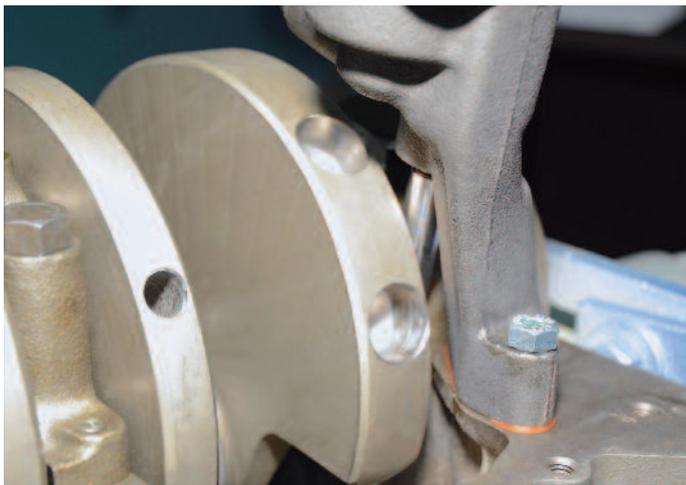
### **Oil Pump Driveshaft**

Yet another area that's overlooked by many engine builders is the simple, steel oil pump driveshaft. The factory shaft is nothing special: steel bar stock machined on one end to fit into the distributor shaft and on the other end to engage with the oil pump's drive gear shaft.

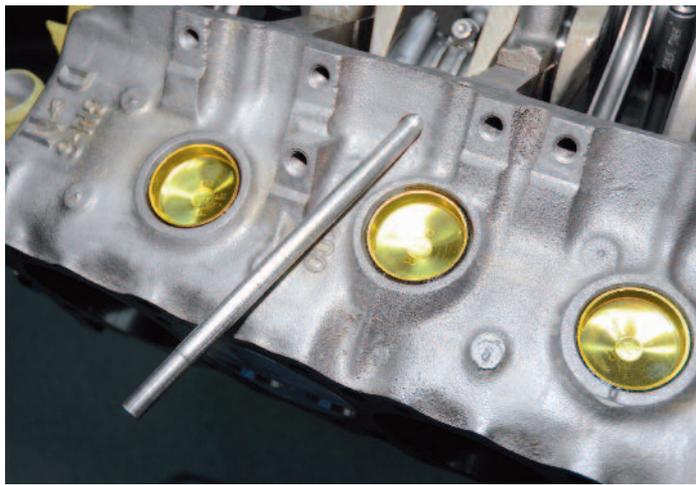
But Magro has seen and experienced the weaknesses of the stock shaft system, so he designed not one but two possible replacements! Nitemare's HP-series oil pump driveshaft is machined from heat-treated, high-carbon steel and features a precision-honed steel sleeve that's pressed and pinned onto the shaft, to ensure that the driveshaft can't become detached from the shaft. The opposite end of the shaft features a C-clip in a precisely-machined groove, to prevent the shaft from dropping out of the block, if the block is inverted with the driveshaft removed (as can easily occur on an engine stand). Such a situation would normally require removal of the pan, and pump assembly to correct, but Nitemare's shafts eliminate that hassle. The two Nitemare designs differ in weight: whereas the HP-series shaft is solid hardened steel, the Pro-series shaft is gun-drilled its entire length to reduce rotating mass to reduce strain on the distributor and reduce the power needed to drive the pump.

### **Oil Galley Restrictors**

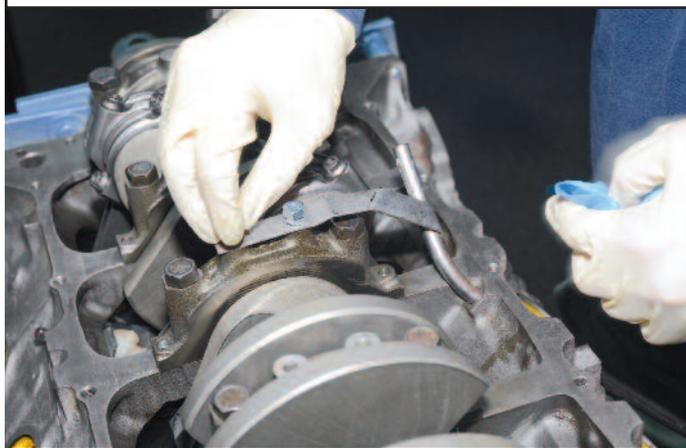
Another subtle oiling system upgrade that Magro makes to all Nitemare



You need to verify the clearance between the oil pump driveshaft and the crankshaft counterweight with a feeler gauge. Ideally, you want around 0.040-inch to allow for a slight amount of movement during operation.



Factory dipstick tubes are often damaged or broken off, and NOS ones are impossible to locate, so Nitemare produces its own tube made from high-quality stainless steel that will better resist rust for years.



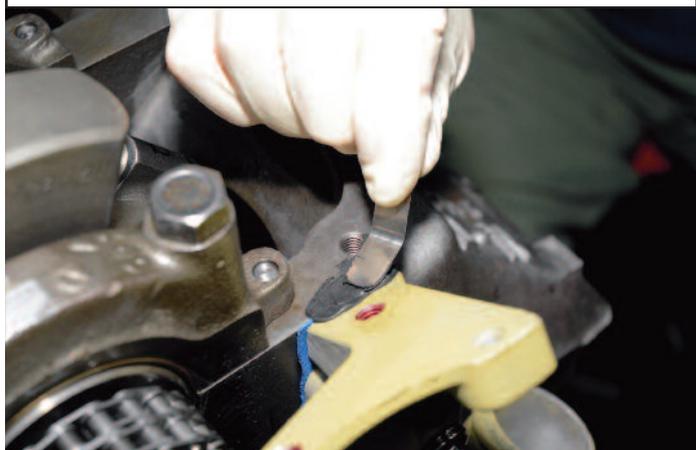
The lower dipstick tube is an important factory piece that positions the end of the dipstick safely away from the crankshaft counterweights, into the sump. It bolts to the main cap.



Nitemare Performance sells its pans and oil pumps with pickup as a matched package, and as part of that, Nitemare preadjusts the pickup height for you, since the pickup height is not adjustable once the pickup is installed. But you still should verify proper clearance, starting with measuring the depth of the sump.



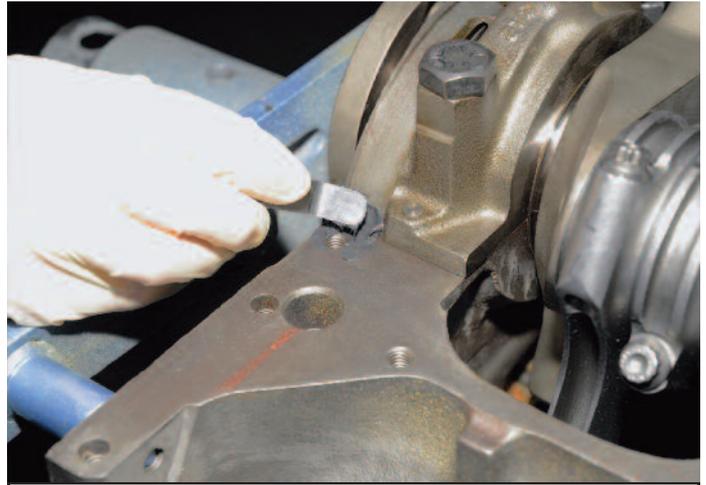
Then verify the depth of the pickup screen, as shown. The difference between the pan depth minus the screen depth is your clearance. It's also good to verify that the pickup assembly had sufficient clearance from the rotating assembly.



Darrin Magro – Nitemare Performance's founder – shared one of his assembly tips for a leak-free pan: apply a dab of black RTV to strategic spots, like the corner between the block and the timing cover.



Each oil pan bolt hole in the timing cover also receives a dab of black RTV to prevent oil from wicking through the threads.



Another dab of black RTV is applied to the corners of the rear main cap at the block.



Nitemare Performance's custom oil pans feature a number of upgrades over a stock, Pontiac pan, not the least of which is a full-length, screen-style windage tray that traps oil away from the crankshaft to minimize any drag that might slow the crank's rotation.



Nitemare's pans also feature custom trap door-style baffling all around the pickup screen area, to ensure the pickup is always submerged in oil, even during aggressive acceleration, deceleration, or cornering.



Before setting the gasket on the pan, Magro applies a bit more RTV to strategic spots, to both keep the gasket in place and prevent leaks. Here, he's putting a small amount on each of the locating notches at the rear of the pan.



And a bit more RTV goes at the "corners" toward the front of the pan. Experience has shown Magro that these are some of the more leak-prone spots on Pontiac oil pans, and a little RTV can prevent a big leak.



As for the gasket itself, unless it's a full restoration, Magro recommends using BOP Engineering's one-piece, silicone-based rubber gasket with anti-crush collars at each of the bolt holes and a metal inner frame. It's simply light-years ahead of the old, four-piece cork and rubber gasket set.



Even with the anti-crush collars in the BOP Engineering one-piece gasket, Magro insists on installing torque spreaders at each oil pan bolt hole to minimize distortion and ensure the clamping force is spread along as much of the pan rail surface as possible. The bolts are from ARP.



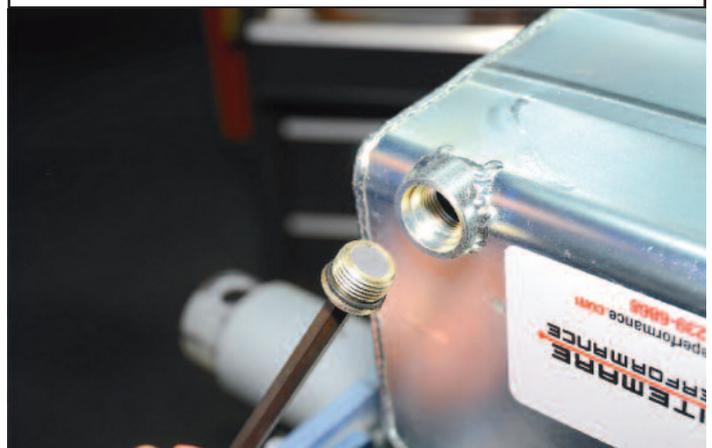
Magro attributes this tip to Nunzi, from whom he learned a good deal about building performance Pontiacs: a little RTV strategically applied to the rear pan gasket can prevent annoying seepage at this trouble-prone spot. He's applying it with an old feeler gauge.



With the gasket in place on the pan, Magro carefully sets the Nitemare Performance oil pan onto the block. Note the Nitemare pan's modified sump that provides additional oil capacity, cooling, and baffling to ensure a sufficient supply of oil around the pickup.



When the block was being prepped, Magro ran a cleaning tap through each bolt hole, ensuring that bolts go in easily at this stage. Specs call for 12 ft/lbs per bolt in a typical "inner to outer" circular pattern, but Magro has found that can be too much force and instead snugs them, being careful not to cause distortion or crush the gasket.



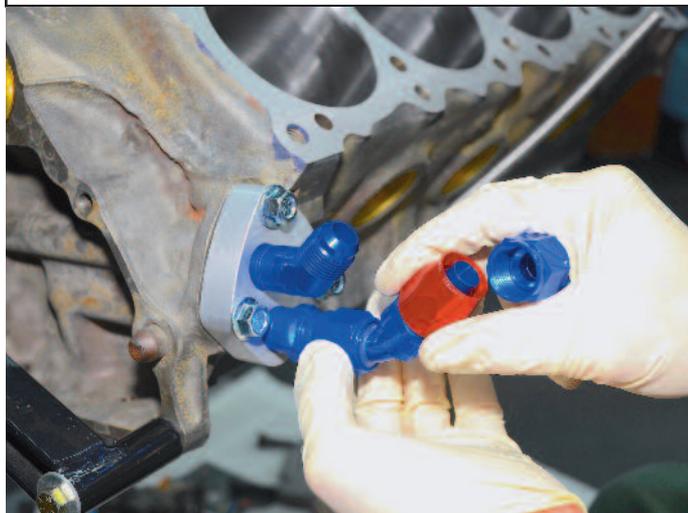
When designing the Nitemare Performance oil pans, Magro insisted on an o-ringed drain plug to ensure a leak-free seal. He really hates messes of any kind, especially oil leaks.



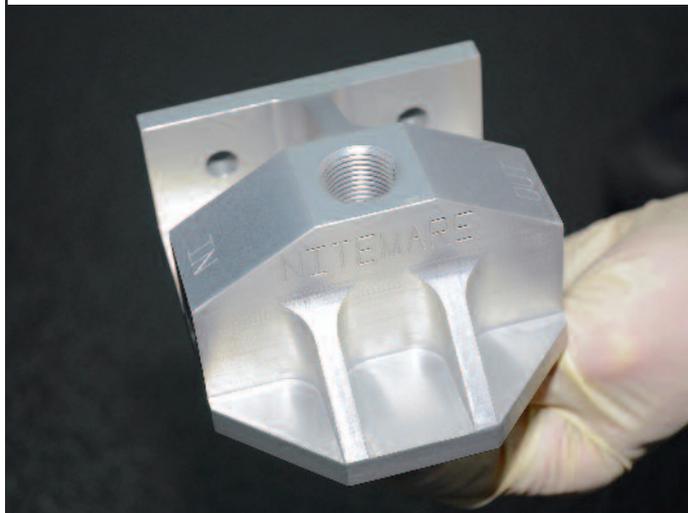
You should test insertion of a dipstick, to ensure it doesn't hit anything on its way in. Better to find out now, when you can easily fix it, than later, when the engine is in the vehicle and fixes are much more difficult.



Moving on to the oil filter system, Magro says installation of the Nitemare Performance Remote Oil Filter System is the single-best oiling system upgrade that you can apply to your Pontiac. And it's one of the easiest: start by replacing the stock oil filter adapter with this o-ringed, billet aluminum adapter plate.



The Nitemare Remote Oil Filter System uses anodized AN fittings for the hoses. Relocating the filter away from exhaust heat greatly reduces oil temps, which helps the oil and your engine last longer.



The custom CNC-machined, billet aluminum oil filter housing is a rugged piece. It features not only the clearly-marked 1/2-inch "In" and "Out" ports, but a convenient third 1/2-inch port in which you can install an auxiliary oil temp sensor.



The underside of the Nitemare Performance billet aluminum oil filter housing shows the flat, smooth surface for the filter gasket to seal against, as well as the machined groove that helps maximize flow to and through the filter.



Magro recommends use of a two-quart ACDelco filter, to maximize filter surface area, increase oil capacity, and to further help aid cooling of the oil.

## Viscosity Explained

Terms like “5W30” or “10W40” or “15W50” describe an oil’s viscosity – how easily it flows when poured or pumped. An oil with a viscosity rating of “5W30” is considered a multi-grade oil. The first number denotes the oil’s flow rating at zero degrees Fahrenheit; the lower the number, the less viscous the oil will be and the more easily it will flow at that temperature ... and that’s important, because you want your oil to flow quickly to the parts that it needs to protect. The “W” stands for “Winter,” which indicates that the oil met certain cold weather-related testing criteria, as defined by the Society of Automotive Engineers (SAE). The number after the “W” refers to the oil’s flow rating at 212 degrees Fahrenheit, and, again, a lower number indicates the oil will be thinner or less viscous; however, since oil naturally becomes thinner (less viscous) at higher temperatures, you want your oil to remain somewhat viscous to ensure it provides a protective cushion between parts.

## Gimme Five!

Few folks realize it, but your engine’s oil has five critical functions that it must perform during each and every single revolution of the crankshaft – and some that it performs even when the engine isn’t running. In addition to lubricating parts, it cools, cleans, protects, and seals your engine and its components.

### Lubricant

This is the obvious function that everyone “gets” about oil: it keeps two parts from coming in direct contact with each other, to prevent wear and minimize friction. And all you need is an amazingly thin film of oil to prevent catastrophic failure from occurring. For example, consider a typical main bearing clearance of, say, 0.002”. That means that there’s actually only 0.001” of room for oil, all the way around the crank journal. That’s insanely thin. For comparison, a typical sheet of paper is four times thicker, at 0.004”. That measly 0.001” of oil is all that’s needed to keep your crankshaft from grinding against the bearing and destroying itself.

Finally, there’s oil. For break-ins, Magro runs Driven Break-In Motor Oil from Joe Gibbs Racing, which features extra zinc to minimize wear during the critical break-in period. After break-in, the crankcase is drained and Magro refills it with Driven’s 15W50 Hot Rod Motor Oil, which is specially formulated (again, with lots of zinc to minimize wear) for vintage V-8s.



### Coolant

Most enthusiasts don’t tend to think of oil as a form of coolant, but your engine has tons of parts that never get close to water jackets or coolant. But oil is pumped pretty much everywhere inside your engine, and everywhere it goes – the underside and skirt of each piston, the connecting rods, the cylinder walls, the camshaft, the valves, the timing chain and gears – it absorbs heat, then carries it away as it returns to the oil pan, where air rushing around the pan’s sump whisks away some of the heat before the oil goes for another circuit through the engine.

### Cleanser

This is another one that’s logical when you think about it, because you know your oil gets dirty over time. That’s one of the reasons that you change it. Again, while the engine is flowing and oozing its way around inside your engine, it encounters all kinds of contaminants – carbon deposits, rust, dirt, moisture, fuel, and even just oxygen – and the oil collects it and sweeps it back to the pan, and even-

Performance-built engines is the installation of drilled oil galley plugs at the front of the engine, behind the timing chain. In place of factory-style, galley plugs that are merely swaged to keep them in place, Magro taps the galley plug holes and fits threaded plugs that have been drilled through with a 0.050-inch bleed hole that ensures ample oil to the timing chain (and fuel pump eccentric, if running one) during operation.

### Remote Oil Filter System

According to Magro, "the single best upgrade you can make, is to install our Pro Series Remote Oil Filter Sys-

tem." The system Magro referenced relocates your Pontiac's oil filter away from exhaust heat, to help reduce operating oil temperatures. In addition, the two-quart-capacity ACDelco oil filter supplied by Nitemare more than doubles both the filter surface area for better filtration and the oil capacity, which helps further reduce oil temps.

The system can be easily retrofitted to any traditional Pontiac V-8, thanks to the CNC-machined, billet aluminum block adapter that seals to the block with high-quality O-rings. Aluminum AN fittings and braided, stainless steel lines carry oil to and

from the filter base. A steel mounting plate is included, and is specifically designed to fit over and clear typical aftermarket multi-spark ignition boxes, like those from MSD, to make the most of precious firewall real estate. Or, for a more stealthy configuration, the system can be paired with an oil cooler and mounted in a concealed location, such as behind your Pontiac's grille or to the core support, inside a fender cavity. Painting the filter and base semi-gloss black and using Russel's black, Pro Classic II braided hose and black-anodized AN fittings would further conceal your ultimate oil filtration setup. **PP**

**tually to the oil filter, where most contaminants get trapped, leaving the oil reasonably clean so that it can absorb more undesirable particles when it gets recirculated through the engine.**

### Protectant

**Oil protects the inside of your engine by preventing the formation of rust or corrosion. How? A film of oil prevents air and moisture from coming in contact with internal components, which greatly minimizes the chance that rust or corrosion will occur. This, by the way, is the reason that WD-40 (Water Displacement, formula 40) was invented: to prevent rust and corrosion on aerospace equipment.**

### Sealant

**Oil actually helps seal your engine in two ways:**

**First, it seals outside contaminants – dirt, moisture, etc. – from getting inside your engine by helping to keep typical paper, cork, or rubber gaskets moist, which prevents them from shrinking, thereby enabling them to better seal the gaps between components like the oil pan and the block, or the rear main seal and the crankshaft, or the rocker covers and the head, and various other components. Of course, improving those sealing surfaces also helps them prevent anything inside your engine – like crankcase gases or oil – from getting out of your engine.**

**Second, oil helps seal the cylinders by filling minor gaps between the cylinder walls and the piston rings. This helps maximize cylinder-filling during the intake stroke, minimizes the loss of cylinder pressure during the compression stroke as well as blow-by during the power stroke, and maximizes cylinder evacuation during the exhaust stroke.**

### Change It Regularly

**With so many critical functions, it's vital that your oil be clean and "healthy," in order to perform its various jobs well. Failure to change your oil will allow fuel to thin it, moisture and oxygen to cause foaming that minimizes protection, dirt particles that can damage bearings and journals, valve guides, cylinder walls and rings, and just about anything else in the engine, and the older and more contaminated and more oxidized the oil becomes, the more easily it begins to break down when exposed to heat, forming a layer of sticky, sludgy, hard-to-remove deposits throughout the engine. Don't risk your expensive engine. Spend the few dollars to change your oil at least every year or every few thousand miles. Your Pontiac will thank you by rewarding you with many more miles and a whole bunch more smiles every time you sink your foot into it.**

### Sources

**Nitemare Performance**

[www.nitemareperformance.com](http://www.nitemareperformance.com)

Oil pump, pump plate, pump pickup, pump driveshaft, oil pan, remote oil filtration system, engine assembly

**BOP Engineering**

[www.bopengineering.com](http://www.bopengineering.com)

One-piece, Viton rear main seal; one-piece, silicone oil pan gasket

**Driven Racing Oil**

[www.drivenracingoil.com](http://www.drivenracingoil.com)

Racing oil with ZDDP additive



### About Nitemare Performance

Nitemare Performance, located in North Haven, Connecticut, specializes in the restoration and race-preparation of vintage Pontiacs. In addition, Nitemare manufactures a full line of precision-engineered performance parts for Pontiac engines.

### Win This Engine!

One hundred tickets are being sold at \$100 each, with all proceeds from the raffle going to The Tomorrow Fund and Alex's Lemonade Stand Foundation charities to benefit children afflicted with cancer. Each \$100 ticket gets you a 1-in-100 chance of winning this very engine. The engine build-up will be covered here in the pages of *Poncho Perfection*, and the drawing for the raffle will take place on September 23 at the Pontiac Registry's "Pontiacs With A Purpose" event in Warwick, Rhode Island.

To purchase a ticket, make out a check or money order to Pontiac Registry Fund and send it along with a self-addressed, stamped envelope to:

**Nitemare Performance**  
**11 Belmont Rd**  
**North Haven, CT 06473**

Don't forget to include your full name, daytime phone number, and email address for notification purposes.

For more info about the raffle, visit [nitemareperformance.com](http://nitemareperformance.com); event info: [pontiacregistry.com](http://pontiacregistry.com).

**CELEBRATING PONTIAC'S RICH HISTORY**

**2018**

**PONTIACS with a Purpose**

**A PONTIAC CELEBRATION**

**EASTERN REGIONAL MEET**

Warwick, Rhode Island • September 21-23, 2018

**ALL PROFITS GO TO FIGHT CHILDHOOD CANCER**

- Friday Night Parking Lot Party and "Teddy Bear Cruise" at Host Hotel- all cars welcome!
- Informative Technical Seminars
- Saturday Afternoon ALL Pontiac Show
- Saturday Night Family BBQ Party
- Sunday Farewell Breakfast
- Swap Meet & Arts and Crafts -

FOR INFORMATION: E-Mail: [info@pontiacregistry.com](mailto:info@pontiacregistry.com)  
or [frdigi@cox.net](mailto:frdigi@cox.net) / call 941-792-6279 or local (RI) 401-934-0663