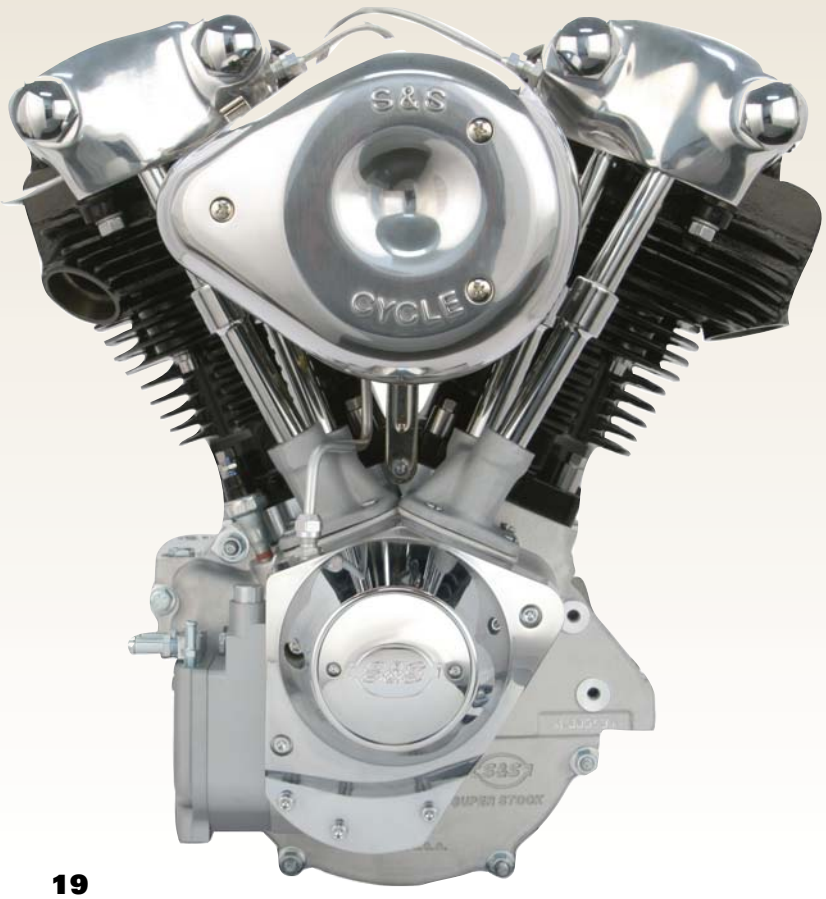
S&S KN-Kone Engine:

In June, S&S Cycles sent out a press release about its upcoming KN-Kone motor, a knucklehead top end on a cone lower. The engine was supposed to debut in August as we waited with bated breath. By the end of September we had to ask, "What's up?" and gave S&S a call. Bruce Tessmer, S&S Cycles' marketing manager, put us in touch with Flathead Power Product Line Manager Eric Wangen for vintage engines projects who filled us in on the details and latest goings-on in Viola.

VTN: Lets start with an overview. Describe the new KN-Kone Engine.

Eric Wangen: *The Kone is virtually the same as our KN-93. In fact, the lower end and from the case deck on up, everything is the same as our Alt/Gen KN-93. What is new is that this KNK-93 engine has a cone crankcase, or as we call it, a Kone crankcase. This allows fitment in chassis from 1948 to 1999. To clarify, you have to run a primary that fits 1970 -'99, or some primary configuration that uses the longer sprocket shaft. Our overall goal for the KNK-93 is to provide a modern fitment engine with a very clean transition to a vintage top end. That also means that this engine can be used with all sorts of modern clutches and transmissions. If you want to use a 6-speed, you can do it easily.*



Vintage With A Twist

VTN: How does this fit in with the rest of S&S's engine lineup? What niche were you trying to fill?

Eric Wangen: *If you look at our P-Series and SH-Series engine line, we offer three configurations there as well. We have the Gen/Gen version, which is a bolt-in for chassis of those years and accepts inner primaries from 1955-'64. There is the Alt/Gen version for the custom application market with a generator right side and an alternator left side accepting primaries from 1970-'99. Then there is the alternator case version that give the modern look, has less mechanical,s and would be much easier to build exhaust systems for when you drop this engine in a late model chassis. We actually had several customer requests for an alternator style case that would accept the KN top end, so we looked into it and decided it was something we could offer.*

VTN: What were some of the engineering issues that had to be overcome to get it ready for market?

Eric Wangen: *There were three major obstacles we had to overcome to make this engine a reality, technically known as the "fun stuff" here at S&S:*

1. *Putting an old machining in a modern crankcase.*
2. *Getting oil to the top end without the engine looking like a science experiment.*

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3. Creating a cam with a KN grind and a late model snout (alternator-style outer bearing surface).

Using 2D and 3D CAD, we could layout the crankcase and eliminate machining we didn't need and replace it with info from the generator case to accept our high-evacuation breather gear, provide the proper oil and vacuum passages, and KN tappet block bolt pattern that we needed to marry the old with the new.

We looked at running oil to the top end by using one of the pressure-fed passages in the crankcase and feeding it through a braided line into a junction box and then splitting it to each side, but that just sounded too much like a cobble job. We finally decided that part of the character of the KN was the visible hard Y-line from the gear cover to the top end, so the decision was made to create a version of our billet gear cover with the proper oil passages going to a fitting that is in the exact same place as it is on our 8-rib cover and keep it clean.

Next was the hybrid cam, which, in the past, could have proven to be a more difficult part to get made, but since we added the capability to create our own cams in house in late 2006, it was pretty painless to add the late model snout to our KN 420 cam grind.

VTN: Okay, fill me in on the details and specifications that will be of interest to our readers.

Eric Wangen: *To do the KN-Kone justice let's cover the basic improvements of the KN components we released in late 2008. First the material, the original FHP used ductile iron to cast the heads and cylinders for added strength.*

In fact, they used to show off the strength by whacking the heads with a hammer. The problem, or, I should say, the main problem with ductile, or "nodular" iron as it is sometimes called, is that it has very poor heat dissipation qualities, and on an iron motor that is the last thing you want.

The second problem with ductile is directly tied to the poor cooling. When you have cool open road air hitting the front of the cylinder and warmer air on the sides, and then hot air between the cylinders, the growth of the cylinder is even more uneven in ductile iron and can cause piston seize. This isn't just theory, we proved this catastrophically during our testing and development of the KN product line. So while ductile is strong, we cast all of the KN cast-iron components in the same 30,000-pound gray iron we've been using on our SH-Series cylinders for years. This material is proven and has the additional advantage of reduced sound conductivity, so our gray iron cylinders are plenty strong, cool bette,r and actually make the engine quieter. Today's standards for cast iron are much better than they were back in 1936 and even into the 70s. Besides, when was the last time any of us let someone take a hammer to our ride?

Other improvements include oil scavenging and oil control to the top end. We developed new high-evacuation breather gear that doubles the vacuum to the top end. We use a special oil pump on all the KN-Series engines that has a lower pop-off pressure. That reduces the likelihood of flooding the tins with oil. Scavenging oil from the top end has always been a challenge in knuckle engines, so in the KN-Series, we tried to avoid the problem by

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reducing the oil pressure a little. That and oil control through machining tolerances on our rocker arms and shafts, rather than using the band-aid reducers and restrictors. This makes KN-Series parts a step above the rest. Even better, all of the components in our KN heads can also bolt directly to stock heads.

We need to keep in mind this is still a vintage engine with all the quirks of the original. We've taken steps to improve what we can, but you can only go so far before you start taking away from the authentic appearance. It's a fine line, but I think we've done well to preserve the vintage look and feel of the engine.

Speaking of feel, the KNK-93 should deliver the same horsepower and torque numbers as our KN-93. There is a slight possibility of some gain by reducing the number of moving parts in the cam chest, but I doubt it would prove to be significant. If you look at the dyno chart, you'll see the KN-93 makes 57 SAE rear wheel horse power and 77 foot-pounds of torque. That torque curve is right in the fun spot of riding from 2,000 to about ,3300 rpm that gives you that strong pull and makes this motor a thrill to ride.

VTN: When will the KN-Kone be ready for release?

Eric Wangen: *Well we got a little egg on our face on this one. We originally said we'd release it in August, but several new projects kind of converged at once as well as our new manufacturing services business picked up gobbling considerable resources. This vintage product line requires specialized people to develop and machine these parts, and sometimes we have to share those people with other areas of the company so things get to be a juggling act. So where do we stand now? We just released our vintage 1940 -'50 kicker cover; we are in the process of releasing a stock replacement KN-74 and side valve UL cylinders in December, so we are looking at a mid to late January release for a debut at the 2011 V-Twin Expo. We've received a lot of calls regarding this motor so we'll try to get it out sooner if possible, but you can see we have quite a few things in the works here.*