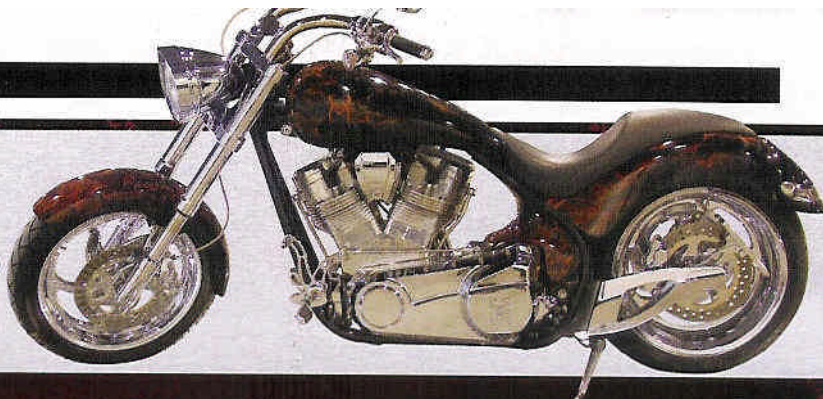


**John Wyckoff**

# The "Holy Grail"



Last year I wrote an article for the trade press about the Viper motorcycle. That new V-Twin manufacturer is about to ship their first 100 bikes to dealers later this year. Viper has an ad that reads: "No Kit, No S\*it." What they are referring to is a vast majority of the other American big V-Twin makers use an S&S motor or some other readily available engine. Viper's engine is huge, of their own design, and made from billet aluminum.

My reference to the "Holy Grail" related to the conventional wisdom that billet engines run hotter, not cooler than conventionally manufactured power plants.

I flew up to Minnesota, rented a car, and drove to the very small town of Big Lake, the home of Viper. It's located about an hour's drive from the Minneapolis airport. Viper had just moved into their new facility and was having an open house to get some feedback from dealers, riders and industry people.

The first person I collared was the company's managing director, John Silseth. I found that John is a very competent engineering type with a real passion for what he's doing. I had an opportunity to sit down and talk with him about this new engine and

their claim of running 30% cooler. After all, I have my reputation as a skeptic to protect.

OK, so he's an engineer and I'm not. What that means is it was very easy for him to talk over my head despite that I've been in this business for well over 40 years. I asked him to boil it down and email me a layman's version of their concept. Here's what I received:

## "Air-cooled Engines running cooler"

*Al Melling of Rochdale, UK, is listed in the who's who of Formula 1 website (<http://www.mcz.com/f1/f1who.htm>) utilized Formula 1 technology in the design of our engine.*

*It has been recognized from the 1990's in Formula 1 engine technology that if the piston acceleration is matched accurately to the speed of the [fuel burn] then not only is the expansion of the gases used more efficiently to produce power but also there is less heat taken into the engine components, such as the cylinder head and the piston/cylinder.*

*The Viper engine produces power equal to, and in some cases more, power than its competitors due to its detail design but more importantly the engine has far more durability than its competitors.*

*The detail of the cylinder head which is designed as a heat sink rather than as an air-cooled cylinder head depending on the fins for cooling, also the cylinder head exhaust porting is specially design to eliminate lamina flow [whatever that is] in the areas of high temperature, regarding the combustion chamber, this is developed to provide a flame speed equal to the distance required at the maximum torque speed along with a crank stroke/connecting rod length to suit, therefore the burn is expanding at a velocity ratio with the acceleration of the piston from TDC. [I got most of that.]*

*As can be seen, the engine runs at a considered low compression ratio, [7.9-1 on the standard engine and 9-1 on the high performance version] this is possible also due to the burn/piston acceleration allowing a more controlled expansion of the gases and better control of the cooling of the engine.*

I added the [ ] brackets. What's in them are my words/thoughts, not John's. I'm still not sure

of what it all means but I did notice the pistons had very short skirts and there were two spark plugs per cylinder. "Both of these conditions also lend themselves to a cooler running engine," John assured me.

The proof was there. They had a test bike with a series of LCD readouts attached to the top of the gas tank. They monitored temperatures while the bike was being ridden. I got to see what the temperatures were and can tell you they appeared considerably lower than I had anticipated.

Viper's iterations have been many. This has not been an overnight project. They have intentionally delayed production until they were confident that they were able to offer both high performance and exceptional reliability. After all, the bigger version is a whopping 152" engine. They also have a 115" version.

John told me that at first they attempted to use a conventional gearbox. But soon found that their engine had too much torque and just snapped the shafts and gears. They had to find a new source that could make the box strong enough to handle all that power.

While Harley-Davidson and many others are switching to fuel injection, Viper has opted to stick with carburetion. When I told John that I live at an altitude of 5,000 feet and often rode at altitudes about 10,000 feet, I was suggesting that I thought fuel injection would be preferable. His response? "We have so much horsepower and torque that those elevations won't be a problem."

There are problems when working with a very large and very powerful engine. The engineers were, apparently, aware of that and created a very strong and stable billet swingarm. Oh, by the way, to keep the temperatures down, Viper's oil tank is incorporated into the frame. John told me that doing so requires several extra steps in making the frame, but I won't go into that. It's safe to say, however, that they know what the steps are and why they are needed to assure a good flow of clean oil.

By the time you read this Viper stock will be on the NASDAQ and they will have completed their second round of financing.

It's my hope that this new company gets enough traction to flourish in the high end of the V-Twin market with a high performance, smooth riding, and very sexy bike.

- John Wyckoff

