**Haverkamp 6mm Dasher Project Rifle**

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Awhile back I was contacted by a guy named Tom Haverkamp, who had watched the precision chambering video I filmed with Grizzly Industrial. He said he also had read a number of the technical articles I had written for Varmint Hunter magazine. He talked with me about my chambering methods and lathe setup awhile. Then he asked me if I would be willing to look at and critique a prototype custom action he was in the process of starting to produce. I told him I would be glad to help him out, so he sent one to me.

I was very impressed with Haverkamp’s action when I finally had some time to check it over good. Everything was extremely well machined, straight and true. The bolt was well fitted to the action raceway with a minimum of clearance, with the bolt play in this action measuring just over .001”. But even with tolerances this close the bolt operated very smooth and easy – something that doesn’t always happen with close tolerance custom actions.

I told Tom I felt it would be beneficial to reduce the firing pin tip diameter to minimize primer cratering and blanking. This is especially prevalent when fireforming high-pressure wildcats that require you to blow the shoulder forward, like the 6mmDasher for example. So Tom modified the bolt and reduced the firing pin tip size to .062” for me.

I also suggested he change the angle of the cocking ramp slightly to make the bolt open even easier than it already did, which he did. This easy opening is especially nice when trying to operate a rifle quickly like we so often do in 600 and 1000 yard benchrest competition, where we are trying to get our shots off as quickly and accurately as we can before the wind changes very much. The easier the gun cocks, the less the gun’s tracking is disturbed in the bags, which really helps to get the next shot off quicker and more accurately. This “run and gun” method is extremely effective in long range shooting and a crucial part of that is having an action that cocks and opens as easily and smoothly as this one does now. I’ll talk more about this later.

Then I asked Tom if he would consider doing a dual-port action, since this is a configuration that is extremely popular with 600 and 1000 yard match shooters, again to speed things up a little. So we discussed port size and location and he made a prototype dual-port action and sent it to me.

I thought it came out extremely well so I asked Tom if it was OK with him if I built a project 1000 yard benchrest rifle using this action and other parts and processes I’ll mention later. I told Tom I thought it would be beneficial to other shooters if I wrote a Varmint Hunter article about this project. He was fine with that, so that’s what I’m doing!

I plan to do some testing with this rifle with Krieger standard vs. gain-twist barrels, and am going to use a radical Sharpshooter Supply benchrest stock with an off-set forend.

But first let me tell you a little about Tom’s operation and background. Then I will talk about the action and the other parts I am using on this rifle project.

Some of you may have met Tom and his wife at the 2010 VHA Jamboree, where they had a booth set up all week at the range showing their actions and products.

Tom said he has been involved with high-accuracy machining most of his life. He previously was an instructor at Indiana State University, School of Technology, and then went into the machine shop business for himself. He has been operating his own machine shop business, Production Machining Company, for over 42 years now. His action company, Haverkamp Precision, is a division of that.

Tom says Production Machining Company specializes in manufacturing high volume precision parts for medical, hydraulic valve, diesel engine, and compact disc manufacturing. They have a total of 14 CNC machines including some high-tech 6-axis turning equipment.

Tom says he started building rifle actions in 2002. But these were prototypes to experiment with, not actions for sale. He designated these prototype actions as Haverkamp Model HV50, which were large 1.500” diameter actions designed for the benchrest Heavy Varmint Class (13 ½#). These early prototypes had various mistakes and Tom was not satisfied with the design at first. Tom said these were a learning experience, and the mistakes he made working with these prototypes helped him design an action which overcame all the early problems.

One of the main problems he found with manufacturing actions was heat-treat distortion (warpage). He found he had the best success when all openings in an action were made after heat-treating (in hardened steel) in order for the receiver to remain straight. This is difficult since the receiver is hardened to Rockwell C42. Through experimentation on his prototypes, Tom found he could do this properly by using premium grade carbide tools and/or EDM machining. Tom says that factory actions are usually manufactured the “easy way” by machining first and heat-treating last.

Tom said he recently started to make smaller Model LV40 actions for Light Varmint Class (10 ½#) guns, which has an OD of 1.400”. The Haverkamp actions are made from aircraft-quality 4140 chrome-moly steel and incorporate an additional heat-treating process. This additional heat-treating is used to normalize (stress relieve) the steel after gun drilling the hole through the receiver. Tom said they make all the parts for the action in-house except the springs and the extractor. This includes the firing pin assembly, trigger hanger, scope bases, and optional recoil lug.

The LV40 resembles a Remington 700 with several improvements - “a Remington on steroids” as one of Tom’s friends puts it! These improvements include having the receiver bore honed and air-gauged for a precise bolt-to-receiver fit, the bolt lugs are precision ground prior to lapping, a Sako-style extractor, a beefier rear tang area for added stiffness, the receiver is machined straight and true after heat-treating, and deep machined helical fluting of the bolt.

The LV40 does not use a recoil lug between the action and barrel, but instead has a machined-in integral lug surface for small cartridges like BR and PPC. Haverkamp now offers an optional recoil lug that can be fitted to the bottom of the action when using larger cartridges. You have your choice of coned or Remington-style square bolt nose, your choice of .062” or .074” firing pin tip, and three bolt face options depending on what cartridge you’re planning to use. You also have your choice of right or left port, or you can make it a dual-port like mine.

The LV40 action OD measures 1.400” which is about .060” or so larger diameter than a Remington 700 action. This adds considerably to the rigidity of the action, which helps accuracy. The front of the action is about .200” longer than a Remington, which gives a longer, stiffer bedding surface, and allows for a longer threaded shank on the barrel. The LV40 is a solid-bottom single-shot action with a milled-in flat portion which will help control torquing in the stock if bedded properly. The bolt handle is longer for smooth easy cocking, and the trigger is mounted in a trigger hanger for easy trigger removal if using a glue-in stock. The LV40 action will fit most Remington 700/40X short-action stocks with a little modification, which mostly entails enlarging the action area for the slightly larger diameter.

The stock I am using for this project comes from Fred and Lisa Moreo of Sharpshooter Supply Co. Many of you know Fred and Lisa as the well-known Savage specialists who have attended many VHA Jamborees. I decided to use one of their Dog Tracker style laminated wood stocks for this project rifle. The Dog Tracker has been designed for long range benchrest and F-Class shooting with fast twist barrels. The Sharpshooter website describes this as a low profile stock which incorporates an off-set forearm to counteract the torque from fast twist barrels. The bottom of the forearm is 3 inches wide with a channel milled down the center of the stock leaving two tracking rails to guide it on the bags. This is a very nice feature which Fred calls a “railroaded forearm”.

I think another big advantage to offsetting the forearm on a rifle is this helps the shooter cock and cycle the action between shots faster without disturbing the stock tracking and sight picture on the bags so much. This helps with the “run and gun” method of shooting I mentioned earlier. I know from my own experience that I prefer the advantages of using offset forearms or offset tracking plates on my own 1000 yard rifles and on a number of my customer’s rifles for just this reason.

If I remember right, the first stock with an offset forearm I ever used was a Dave Tooley stock that I used when building one of Lee Fischer’s record-setting 1000 yard rifles. Tooley is a well-known innovative gunsmith who I believe was probably one of the first gunsmiths to market this offset forearm idea.

I soon started adding offset tracking plates to get the same effect on my own and my customer’s rifles. I found that my ability to cycle the action between shots easier and faster with less tracking disturbance on the bags translated into being able to get my next shot off just a little quicker. This translates into being able to get your string of shots to complete your group off a few seconds faster. Since you cannot see your shots on paper at 1000 yards (and rarely at 600), this “run and gun” method of shooting often is the best way to the winner’s circle since you are trying to get your shots off before the wind has changed much. This will very often make the difference between winning and losing. I have experienced this and seen it happen more times than I can say in the years I have been competing in 1000 yard benchrest!

Sharpshooter’s stocks come in laminated wood in a variety of colors. I have to say that the stocks I’ve used from Sharpshooter Supply have been pre-inletted and outside shaped/prepped as good as any laminated stocks I’ve ever received from any other stockmaker - and way better than most! This may not mean much to a lot of do-it-yourselfers, but to me it really helps me keep my labor cost down for my customers. My labor costs aren’t cheap, so if I can buy a stock from a stockmaker that I don’t have to do so much work on, this just saves my customers some money which I like.

The total cost of a project using a laminated wood stock generally costs a fair amount more than using a synthetic stock due to all the extra labor involved in fitting and finishing the stock. But the laminates do seem to control barrel harmonics and vibrations a little better so many people think the extra cost is worth it. If you have the ability to do your own stock work, the initial cost of a laminated stock blank is very reasonable, so it will be a less expensive way for you to go since you won’t have to pay someone like me to do all the stock work.

Another advantage I like with laminated wood is the ability to mill the side and bottom tracking surfaces of the stock perfectly in line with the barreled action. This helps it to track better, which I believe translates into better accuracy and gives you a speed advantage when trying to “run and gun” quickly during tricky conditions. You can’t do much milling and straightening on synthetic stocks, so I often add a tracking plate to synthetic stocks that I can align true to the barreled action for better tracking.

One modification I plan to do to this stock soon is mill the bottom of the stock so it is on the nearly the same plane as the barrel. This is legal to do in 600 and 1000 yard benchrest, but may not be legal for other disciplines. This modification is one I have been experimenting with on stocks, especially when the bottom of the forearm is angled considerably different than the barrel. Stocks that have the bottom of the forearm angled up usually work OK with smaller cartridges, but on bigger, heavier kicking cartridges it seems like it sometimes causes vertical dispersion in the groups. I believe on stocks like this the forearm has a tendency to jump off the bag more during recoil, which can hurt accuracy for some shooters. Some guys get along great with it while others have had problems, so the individual shooter’s bench technique plays a part in this also.

Now let me tell you how I get these benchrest stocks tracking even better than they do already. After I have the barreled action pillar-bedded into the stock, I set it upside down in the mill with the barreled action dialed-in straight and true. Then I mill the stock where it rides the bags (the sides and bottom of the stock, front and rear) true to the barreled action. I do this all in one setup to make sure it is milled absolutely straight and true, front and rear, just like I want it. Now it will track perfectly straight and true which I feel is advantageous for accuracy and faster shooting!

I use Krieger barrels about 90% of the time for customer’s rifles I build in my shop, so it was only natural that I use Krieger barrels for this project rifle. I really like cut-rifled barrels, which is what Krieger manufactures. Since I started to “slug” and evaluate rifle barrels from quite a few of the custom barrel makers a number of years ago, I consistently found the Krieger barrels to have about the highest “acceptance rate” of any barrel-maker, so I use them the most.

I decided to fit two stainless steel barrels to this project rifle. One is a standard 1-8” twist and the other is a gain twist barrel. The gain twist starts at 1-8.75” twist rate at the chamber and speeds up to a 1-8.3” twist at the muzzle. I am chambering both these barrels identically in 6mm Dasher with a .270” neck, 30” long, and am crowning the muzzles with good-looking, extremely true eleven degree crowns. If a bore is dialed-in straight and true when crowning the barrel, I don’t believe the shape or degree of the crown makes any accuracy difference. But this is the crown look/shape that so many shooters prefer, so it’s one I do more often than any other on target barrels.

The 6mm Dasher cartridge is based on a 6mmBR case with the shoulder blown forward .100” and the shoulder angle changed to 40 degrees. The 6mm Dasher is an extremely popular and effective 600 and 1000 yard benchrest cartridge that has won many matches and set many records. It is most popular when shooting the heavy high-BC long range match bullets like the 95-115 grain match bullets. I so far have had my best luck in the 1-8” barrel with the 105 Berger and 105 Hornady A-Max bullets. I’ll be real interested to find out what the gain-twist barrel prefers when I start load development with that.

The gain-twist rifling process has been around for many years. Now that the machining technology has improved to the level it is today, a lot of experimentation is again being done to try to determine if there is an advantage to this process. One advantage some engineers think gain twist barrels may have is the ever changing twist rate may help dampen barrel harmonics more than a conventional constant-twist barrel. Generally anything that can be done to dampen barrel harmonics is beneficial to accuracy. Another theorized advantage is the ever-changing twist rate keeps the bullet tight against the driving edge of the lands – maybe so, maybe not, but that’s one of the theories.

One advantage that does seem to happen is the ability to attain slightly faster velocities without excessive pressure when you start the bullet at a slower twist rate. This advantage is nice to have when trying to attain maximum velocities for minimizing wind drift in variable wind conditions at long range. Even a little less wind drift can often be the winning difference at a match on a windy day.

Haverkamp actions are not stainless steel like some other custom actions and come either nicely blued or in-the-white. They can easily be refinished with a variety of aftermarket finishes depending on how you want your action to look. I always like to have my guns look a little different than everyone else’s, so I decided to have this project action and related parts (rings, bases, trigger guard) finished with Cerakote in Tungsten Gray color.

Cerakote is an extremely durable, good looking, professionally applied finish that comes in a variety of colors, so that is what I chose for this project. I have had Eddie Fosnaugh with Fosnaugh Customs do my Cerakote work for several years now. Eddie is very meticulous and does an extremely good job, so I keep sending projects his way when I need things Cerakoted.

Eddie is very good at protecting the bore and other critical areas from overspray when he applies the Cerakote finish. I have had guns come into my shop on more than one occasion with accuracy problems caused by someone getting finish in the bore at the muzzle. Some people assume this will shoot out, but with Cerakote this may not happen. I have a customer’s gun in the shop right now where someone had installed a custom barrel and applied an unknown finish that may or may not be Cerakote. But there is overspray in the last ½” of bore by the crown that did not shoot out and has caused accuracy problems for the customer. I could see it in my borescope and feel it when I slugged the bore. The accuracy improved after I lapped the bore to get this overspray out.

Let me finish by telling you a little about how this project rifle has performed for me so far. I decided I wanted to compete in the 2010 IBS 1000 Yard Nationals with this project rifle. The Sharpshooter stock was not here yet, so I quickly fit a spare McMillan Edge benchrest stock to this rifle and chambered/installed the 1-8” Krieger barrel so I could shoot the Nationals with it. The Edge is an extremely lightweight short range benchrest stock with a much shorter forearm than I prefer with a 30” 1000 yard barrel. It is very light in the butt and not balanced well at all with the long heavy 30” barrel on the rifle. I did tape some lead weight to the butt which helped the balance a little. Finally I installed a Jewell 2 oz. trigger to complete the package.

I only had a few days to get ready before the Nationals so I quickly fireformed some brass and did some preliminary load development with the 1-8” barrel. It shot quite well despite the front-heavy balance. The first group out of it while breaking the barrel in was .242” @ 100 yards, and then I shot some groups in the .2’s and .3’s when I did some testing at 200 yards.

So it was off to the 1000 Yard Nationals up in Harris, Minnesota. The wind conditions at the Nationals were extremely tough to say the least, but I did win one relay with it and ended up placing quite high in several categories. The Haverkamp fed and functioned flawlessly the entire time and I was very pleased with how the gun performed.

I am very interested in seeing how it performs now with the Sharpshooter stock and the gain-twist Krieger barrel on it. I plan to do some serious testing to see how it performs at the range and in competition with both barrels!

References:

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