Building the REMINGTON VARMINT RIFLE

Text & Photos by Steve Sieberts

Cleaned, Reassembled, and Crazy Accurate – and We're Not Done Yet

Last month, we were able to remove the barreled action from the stock and thoroughly inspect our spot bedding job. Finding no voids, gaps, air pockets or pinholes, the work seems solid.

Now we'll clean up the whole works, then install the Match grade trigger, and mount the new scope. Then it's off to the range to see how much the rifle's accuracy has improved over its out-of-the-box baseline.

The author dry firing the project rifle and getting ready to sight in. It takes a little practice to get used to the high quality of the Jewell trigger, which has a clean one-pound pull weight.

▲ When I initially bedded the rifle I placed some bedding material on the front and rear guard screw areas of the stock, so the fit of the floorplate was snug, as it should be. Here, I'm reinstalling the floorplate and checking for fit.

THE DIRTY WORK

It's true, nobody likes to clean up, but we have to before moving on to the more interesting areas of the project.

The first task is to remove the modeling clay we used to keep the epoxy from flowing into the gas port, trigger slot, and other places we didn't want it getting into. Then, remove all of the bedding tape.

Make sure that the barrel is free floating by scraping out the epoxy that flowed in front of the recoil lug and remove the tape from the bottom of the recoil lug.

After taking off the tape and the modeling clay, use a good solvent and an air hose to clean any remaining traces of release agent residue from all the metal parts, including the floorplate.

▲ Installing the Jewell Match trigger, along with bedding the rifle, will go a long way toward getting the rifle to shoot one-hole groups. The trigger is fully adjustable for sear engagement, weight of pull and overtravel without removing the barreled action from the stock, making adjustments fast and easy.

Now that the metal is pretty much cleaned up, we can shift our efforts to the stock by stripping off the masking tape as we move on.

Before we begin our next chore, be acutely aware that there must be no stock-to-metal contact anywhere on the front and rear guard screws; wood touching the bolt handle is forbidden as well.

With those key points in mind, let's get out the carbide bits and grind away any overflowed epoxy so it's even with the wood. Don't worry about accidently grinding into the wood; we'll go back later and seal the wood.

Next, drill out the guard screw holes using the drill press and a 17/64-inch drill bit, if available. As long as the bit that you're using is slightly larger than 1/4-inch, things should be fine. We are not drilling to a specific dimension, we just need a clearance hole.

So far, we've cleansed the metal components, tidied up the stock and drilled out the stock screw holes. The fun steps are next, so let's start reassembling the rifle.

STOCKLESS TRIGGER INSTALL & FUNCTIONALITY

In the July issue, I mentioned replacing the factory trigger with the outstanding Jewell trigger. One of the Jewell trigger's practical features is that it's a captive trigger. This means that the sear is contained within the trigger housing, creating an easy to install unit, rather than a bunch of individual pieces to assemble.

Don't get me wrong; the factory trigger isn't difficult to reinstall, it's just that you have to use a little more care so the sear doesn't flop open and dump the sear spring onto the shop floor.

▲ This area where the bolt release lever on the trigger pushes up on the bolt release is a good spot to use a little bit of dry graphite lubricant.

If this happens — and it will if you mess with factory triggers long enough — you'll be doing the "gunsmith's crawl" on your hands and knees looking for small springs, pins and whatnot that fall out of the gun and onto the floor. The spring or part always flies into an obscure corner, making your time looking for it exponentially longer.

The Jewell trigger that I ordered from Brownell's has the standard safety located at the top right, and the bottom bolt release is in the original Remington factory location. Depending on the type of gun you've decided to work on, you can choose from several safety and bolt release options.

In addition, our Jewell trigger can be adjusted for sear engagement, weight of pull and overtravel without the need to remove the rifle

▲ Here I'm using the wood scrapers to get out the epoxy in front of the recoil lug.

from the stock, which is really convenient.

To install the Jewell trigger, insert the front trigger retaining pin first to hold the trigger on the receiver. At this point, I use a "helper" punch to line up the bolt release and bolt release spring while I drive in the rear trigger retaining pin.

The pins have a flat end and a tapered end, and it really doesn't matter which way they go in, because we aren't doing a full bedding job on the rifle. It will matter later, however.

Once the rear retaining pin is in place, it's time to do a function check. Even though we can make adjustments to the trigger with the receiver installed into the stock, it's still easier with it out of the stock.

So, cock the rifle and place it on Safe, pull and release the trigger, and move the safety from Safe to Fire. The gun should NOT fire.

Open the bolt and retract it as if ejecting a spent shell, then slam the bolt home and drop the bolt handle one time. The rifle should stay cocked; if it fires, you need more sear engagement.

Use your trigger pull gauge to set the weight of pull exactly where you want, or leave it at the Jewell factory setting. The Jewell trigger is set from Jewell at 1 pound and I'll leave it there.

I could adjust it higher, but why would I do that? This is a varmint rifle and lighter is better. If this trigger was going on a tactical rifle, and we installed a bunch of them when I was building rifles for the Government, we always set the triggers for about 2.5 pounds. Law enforcement triggers should be set to 3 pounds for liability reasons.

During the function checks, there was a bit too much trigger overtravel for my tastes. For a varmint rifle, I can set it very close without worry.

A tactical rifle trigger would be set differently, as we will discuss in upcoming articles. When I start building the tactical version of our base rifle, you will see how much tactical rifles and varmint rifles have in common, as well as the differences between them.

STOCKING THE ACTION

Now that the trigger is in, the next steps include reinstalling the magazine box and patiently working the spot-bedded stock onto the receiver assembly. This should be a very tight fit, so you'll have to wiggle the stock a little to get it up into the receiver.

The stock-to-receiver dimensional tolerances are much closer than on a factory-fresh firearm, which greatly improves the accuracy potential of our rifle. And improving the accuracy is why we are going through the trouble of bedding the rifle.

With the stock in place, turn the rifle upside down and insert the guard screws in the stock. The screws should easily drop into the holes you drilled earlier.

If you have to push the guard screws into place, the holes are too small. No problem, just stop what you're doing, take off the stock and drill the holes again with a larger drill bit.

> **"Our Jewell trigger can be adjusted for sear engagement, weight of pull and overtravel without removing the rifle from the stock...**

After the guard screws have dropped easily into their holes, snug them up with an Allen wrench, then use a torque wrench to tighten the screws to about 50 inch-pounds.

I've installed the front trigger retaining pin, and now I'm using a "helper" punch to hold the trigger parts in place so I can drive in the rear retaining pin. As I drive in the retaining pin, I'll pull out the helper punch.

The Nightforce NXS 8x32x56 is an outstanding and very versatile scope for either varmint or tactical use. There are many reticle options to suit any need.

Sixty-five inch-pounds is a good setting for a pillar bedded rifle, but this is just spot bedding, so we don't want to compress the stock too much with over-tightened fasteners. Fifty inch-pounds is usually perfect, but all rifles are different and experimenting with guard screw torque values could help you get the very last bit of accuracy from your gun.

PROBLEMS FOUND

The rifle is reassembled, meaning we need another round of function checks to make sure things still work as they should.

Cock the rifle and test the safety, then manipulate the bolt release to verify proper function.

Check to make sure the floorplate locks and unlocks with both an empty magazine box, and a full one. You do not want the floorplate to pop open, dumping out your ammunition at the most inopportune time.

The routine function tests revealed that this rifle was interesting, and could require extra attention. The bolt release was binding on the trigger guard slot, so I filed off material to open up space for the bolt release to work properly, resolving the problem. After the bolt release was fixed, another issue reared its ugly head.

When function testing the assembled rifle, I found that if the bolt was cocked with the safety in the Safe position, moving the safety lever from Safe to Fire caused the rifle to fire – without touching the trigger.

This is one of the most dangerous real-world scenarios, and good troubleshooting techniques can make a bad situation go away.

DIAGNOSIS AND TREATMENT

First, I wanted to find out if the Safe to Fire malfunction occurred only after we reassembled the action and stock. I performed a function check without the stock, and since it was not working properly, my guess was the trigger was binding on the stock.

So I decided to do another function check, and the safety was only malfunctioning with the stock on the rifle, which indicated to me that the trigger must be binding on the stock.

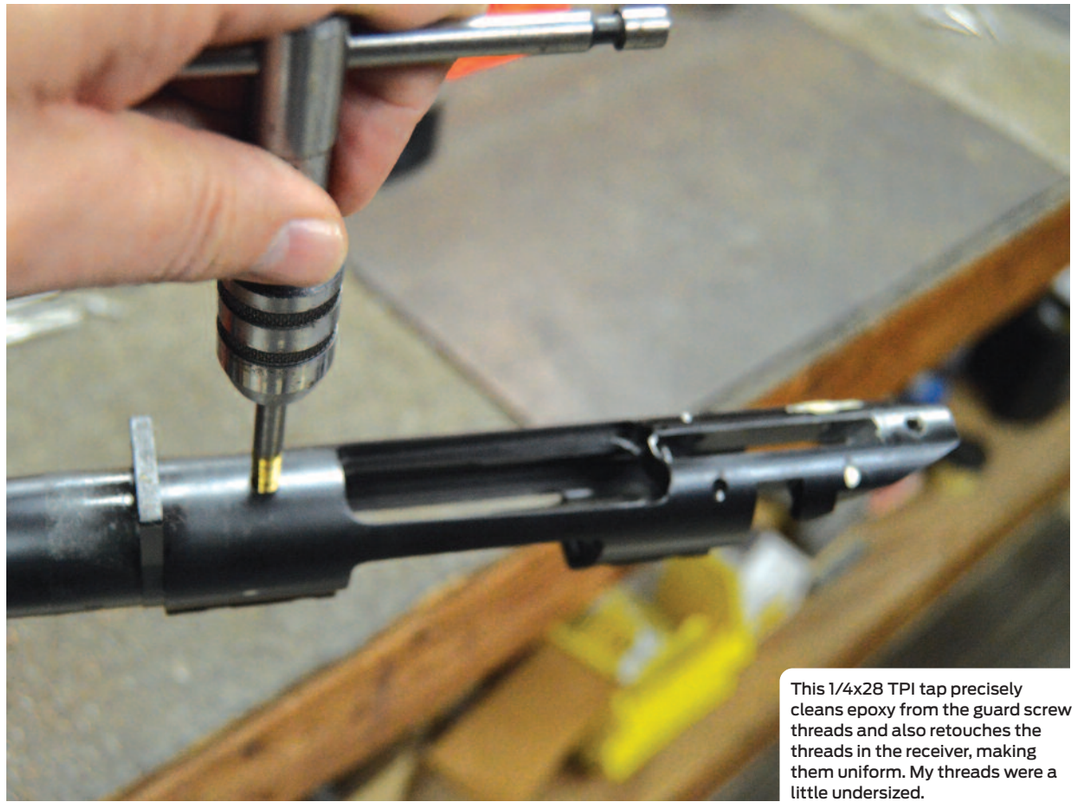
The next step is to look for areas on the stock and the trigger where it might be binding. Shiny spots on the wood or the trigger can reveal sources of contact.

It took me a while to locate exactly where the stock and trigger were rubbing together, but the Kutzall bit quickly relieved the area and all was good.

Once I removed the area on the stock that was causing the trigger safety to bind up, I sealed the wood with a good polyurethane sealer to keep moisture out of the wood. If moisture enters the wood through an unsealed spot, the stock will warp and swell, undoing the close fit we achieved by bedding the rifle.

Finally, once the rifle was back together, the barrel got a good scrubbing and patching out with Shooter's Choice bore solvent. I always clean the rifle barrel first before installing the scope to avoid damaging the optical coatings with stray solvent.

The scope is the Nightforce NXS 8x32x56. It's a bit large for a walking rifle, but an excellent



This 1/4x28 TPI tap precisely cleans epoxy from the guard screw threads and also retouches the threads in the receiver, making them uniform. My threads were a little undersized.

▲ The Clymer finish reamer and the Go headspace gauge in SAAMI-spec 22-250 are precision ground tools that will be used to set the final chamber dimension and headspace when we rebarrel the rifle with the short-chambered Shilen Match barrel.

choice for long-range varmint and predator hunting.

Our scope has the NP-2DD reticle, which is just a simple fine dot with three tapered lines converging almost onto the dot. It makes for an uncluttered sight picture. The field of view was bright, and adjustments were crisp and precise.

SHOOTING & MEASURING

Shooting the rifle at the range was a blast. Conditions were excellent, with temperatures in the 70s and a light swirling breeze. The rifle is a lot of fun to shoot, and since the 22-250 generates such little recoil, firing 30 to 40 rounds in 90 minutes is easy and enjoyable. Acquiring and holding the aiming point was easy using the Nightforce 8x32 scope.

Each of the range tests consisted of firing a five-shot group into a target located 100 yards away, then precisely measuring the bullet holes in the paper target to quantify accuracy.

The first groups I fired were to get the rifle on paper and see if there were any issues. The Federal American Eagle had 1.5-inch groups for five shots, which was about what I expected.

The next group was the factory Hornady ammunition, which performed well with the box-stock rifle. This time, groups had shrunk to less than 1 inch, with the 50-grain V-Max coming in at 0.979 inches.

This was followed by the Federal loaded with the 60-grain Nosler Partition, which didn't shoot as well as I thought it would, grouping five rounds at 1.587 inches. I think the bullet is a bit too heavy for the 1:14 twist of the factory barrel. I'll be interested to see what this load can do once I install the 1:7 Shilen barrel.

My 52-grain Berger flat base Match varmint handloads went downrange next, giving up a sizzling 0.380-inch five-shot group. This would turn out to be the best group of the day.

The last groups were also my handloads, using the Hornady 50-grain Z-Max zombie bullet. I shot two groups with that load and both were under an inch, coming in at 0.627 inches and 0.923 inches.

To put these numbers in perspective, before I started to work on this rifle, the groups averaged around 1.25 inches. After this trip to the range, four of the eight groups were under an inch, much better than what the rifle could do before the spot bedding job and new trigger. The accuracy is improving.

Remember, I haven't even started working on load development. Experimenting with powders, primers, and seating depths, and working with the Redding neck-sizing die could make this rifle really sing, even before we install the match grade barrel.

However, load development is an ammunition-refining topic, and we're mainly concerned with the rifle, so we'll keep working on the gun. By adding the new barrel, along with a few other tricks, this rifle will be even more of a tack driver than it already is.

One thing I noticed when dry firing prior to shooting was the jump of the rifle when the firing pin slammed home. I could really see the reticle jump when the firing pin fell. I'll address this issue later on in the build.

I'm pretty happy with the project so far. It has proven that a little bit of bedding work, a decent trigger, good ammunition and high-quality optics go a long way toward making a precision rifle.

I hope I've also shown that Remington rifles respond well to a small amount of very basic bench work, making Remingtons popular platforms for custom rifle builders. **GW**

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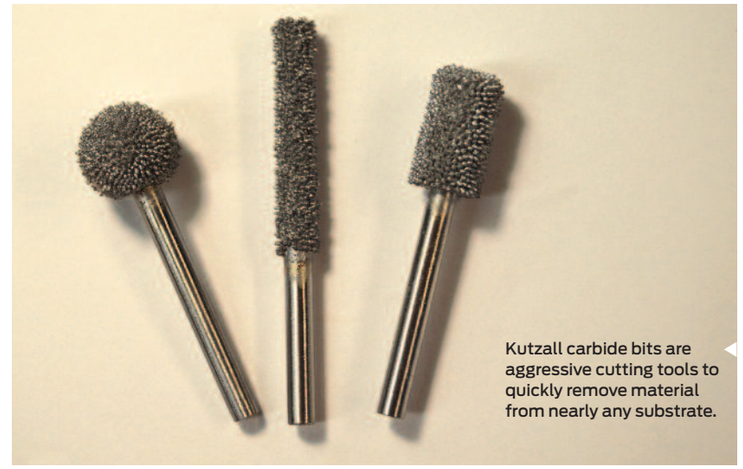

Kutzall carbide bits are aggressive cutting tools to quickly remove material from nearly any substrate.