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PRECISION ARMS WORKSHOP

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INSIDE THE ARCHIVE

RAT RIFLE

HOME AGAIN • AN IN-LINE MUZZLE LOADING PISTOL • HOW TO MAKE A MAUSER BOLT TURNING FIXTURE • GUNSMITHI...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 141

DIGITAL ARCHIVE EDITION

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FROM THE ARCHIVE

Home Again

BY AMERICAN GUNSMITH EDITORS SEPTEMBER 2015

ORIGINAL PP. 2

Michael Kenneth Smith presents a compelling tale of historical Civil War (or is that War of Northern Aggression?) fiction in *Home Again*, lived through the experiences of two young men on each side. Luke is a Confederate, volunteering for service as a medic assisting field surgeons who proves his bravery to his fellow soldiers on the battlefield. Zach is a Union soldier earning notoriety for his skill with a custom-built rifle made by his gunsmithing father.

Both men end up serving as sharpshooters, the nineteenth century predecessors of today's sniper with equipment and skill capable of accurate shots out to 1,000 yards. With the character interest in riflery, Smith spends plenty of time discussing the design and construction of long range rifles of this era, with plenty of passages on their character's use and skill with them. *Home Again* does not take sides as both Luke and Zach are from Tennessee.

In this book, little is discussed on the reasons or justifications for the war. Instead, the story fixes on the tales of two boys quickly turned to men during war, told from each character's perspective in alternating chapters, and concentrates on their experiences and adventures in the harsh realities of battle. While this is fiction, Smith weaves in plenty of historical events, notably Gettysburg and Shiloh.

Key leaders from the battles are also presented in the tales, as well as historical biographies at the end. An interesting sidebar on the shooting portions would be looking at actual marksmanship standards of sharp-

shooters back then. Hiram Berdan, a noted competition marksman of the day, famously formed Berdan's Sharpshooters during this era. As was common then, there was no formal training program for potential recruits as men were selected based on already developed skill.

After Fort Sumter was fired upon, Berdan began forming regiments of sharpshooters which was approved by the War Department in 1861, appointing Berdan as Colonel of the 1st Regiment United States Sharpshooters.

Recruit testing stated, "No man would be enlisted who could not put ten bullets in succession within five inches from the center at a distance of six hundred feet from a rest or three hundred feet off hand." A potential recruit was required to fire his own open-sight rifle, fire ten consecutive rounds, reloading as fast as possible, at two targets. The first target was 200 yards away and fired at using a rest. The second target was paced at 100 yards and fired at offhand.

A contestant missing the targets or averaging more than five inches (known as the string of 50) from the center was disqualified. The original recruits were told to bring their own rifles if they wished. A number of noted historians and authors have praised *Home Again* for its story and accuracy in the historical backdrop, including Dr. Michael Bernath, a History Professor at the University of Miami, and award-winning author Rafael Lima. A thorough read will reveal why.

HISTORY

Rat Rifle

Rat Rifle Mounting a scope on a Stevens Model 15-A.

BY WENDELL DEANER SEPTEMBER 2015

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I wonder how many youth rifles are sitting in a corner behind someone's bedroom door or gathering dust in a closet. These are usually chambered for one of the .22 rimfires but can be in archaic rounds as .25 Stevens rimfire, Remington .267 Rimfire, or .32-20 Winchester and such. Millions of them were sold during the end of the nineteenth century up until the early 1960s.

True, many manufacturers are offering so-called kid's rifles today, such as the Cricket, Savage Rascal, Ruger American Compact, and other shortstocked rimfires and centerfires to cater to this segment of the market. That's good and as it should be, but when you see one of these old singleshoot rifles and pick it up you'll understand the difference. It's a piece of long-gone history. These types of guns were actually used to teach safe gun handling and also put meat on the table.

Remember the old story about giving the kid This one was rusted into its seat and had to be helped with an impact driver. Below center: The stock screw goes into the stock's escutcheon deeply before contacting the barrel stud. This is why removal tech-

niques like penetrating oil are useless. three cartridges and expecting him to come back with three squirrels or rabbits? I'd be hard pressed to do that myself.

Even so, this kind of training does favor the "sit still and let the game come close before taking a shot" mentality, something I believe that the so-called long range "hunters" of today should be schooled in. Many of these guns required loading the chamber and then pulling back a cocking knob before a shot could be fired. The more modern Cricket shares this feature. This is for safety and is very effective. Kids of those days weren't interested in killing zombies or spraying and praying shots into the woods.

They were very concerned with safety. God forbid that you let an errant shot loose or exhibit poor gun handling. Your peers would never let you forget it. No kid wanted to be labeled as unsafe; it just wasn't done. We still need that type of training now as ever before. Sadly, some kids can find a gun and pick it up without even a modicum of safety training. We all know what can happen in that instance.

I've been having a little trouble with pests around the homestead and decided to get one of these rifles to alleviate the problem. Of course, I have plenty of .22s, some of them expensive with excellent sights, that would do the job just as easily if not better, but I wanted one of these rifles. That's enough reason for me. I recently picked up a Stevens Model 15-A for a reasonable price and was well pleased with its condition and accuracy with open sights.

However, I wanted a scope mounted to help my aging eyes and also to gather some extra light during dawn and dusk when these critters are most active. The rifle weighs five pounds two ounces with the scope I mounted, has a 24-inch barrel, and a straight shotgun-style butt stock without a plastic or rubber butt pad. Length of pull is a child-like 13 inches. The chamber doesn't have a feed ramp and cartridges must be inserted directly instead of just thrown in front of the bolt. Sights are rudimentary but not bad.

At the rear is a square-notched blade adjustable for elevation via a sliding, notched piece recognizable to anyone who

RAT RIFLE CONTINUED

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Notice the rust. Above center: The barrel stud showing rust in need of removal before putting the gun back together. has ever sighted in a '94 Winchester. In front, the dove-tailed, undercut, black bead can be tapped for windage. For inexpensive sights they offer a pretty good sight picture, at least for short range. This is suitable for the critters that concern me but I opted to add an optic. I had a couple of 4X Simmons scopes built for .22s.

The place I bought them was practically giving them away and I already had this idea in the back of my mind for a rat rifle. These scopes probably should be given away but they would fit my purposes exactly. Also, these scopes weigh scant ounces, getting a diminutive rifle to just over five pounds and I didn't want to defeat my purpose by mounting a heavy optic on my little rat rifle.

Besides, I am only planning on shooting inside 25 yards and I've had a similar optic mounted on a .22 Magnum that kept zero for almost 40 years. I began the project by taking the rifle completely apart due to some areas

that had rust. I cleaned thoroughly and checked for broken or Below center: Bolt in closed position. Notice that the bolt is curved. malfunctioning parts. Long-neglected rifles likely need some care and a little lube and Loctite can make a positive contribution.

Test firing proved that a little TLC was all it needed. Someone had already refinished the stock so I left that alone. In case somebody is howling about destroying the collector value, there is no collector interest here. Disassembly Make sure the gun is unloaded and remove the bolt, which comes out easily by holding the trigger and pulling back on it. Clamp down the rifle and turn the large screw on the bottom of the stock counter clockwise to remove it. Easy, right? Well, not in this case.

I didn't have a wideenough screwdriver bit to match the screw and it was extremely tight in its seat. I thought about using some penetrating oil and applying heat to break it loose but neither one of those techniques would have worked and potentially could have

caused damage because the screw threads through a stock escutcheon attached to the barrel far away from the reach of oil or heat. It might be possible to heat the barrel enough to warm the seat, but I wouldn't advise it. Heat and oil are an anathema to wood.

All this would have done it mess up the stock. Instead, I did what any red-blooded American gunsmith would have done: I picked up my four-pound dead blow hammer and an impact wrench. Years ago I purchased an impact driver from Brownells (631-290-000AK) and an adapter (080-430-025AK) allowing the use of screwdriver bits. This impact driver is somewhat smaller than the ones for automotive use and perfect for the gunsmith. A couple of whacks with this baby and my impossible screw came loose.

After I got the action removed from the stock I found rust was the source of the problem and set it aside for clean up.

RAT RIFLE CONTINUED

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Original caption: Bottom: Trigger, sear, and stud.

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22 rimfire. Above center: The cartridge must be inserted into the chamber. Just tossing it in and closing the bolt doesn't work. Another safety feature for youngsters. Bolt Disassembly/Reassembly The round cocking knob and mainspring retaining bolt will screw off by turning counterclockwise, easily done with a good pair of pliers padded with scrap inner tube. There is very small purchase on the back of this little bolt. Be very careful not to misplace the mainspring retain-

You can't get simpler than this. Gunsmiths beware. ing washer and the rebound collar as this leaves you with the bolt body which houses the ejector and firing pin. The ejector goes through the hole in the body and can be drifted out rather easily. It holds the firing

pin which can then be removed without difficulty. The Steven's rifle had come apart rather easily so I checked it more closely.

Sure enough, the retaining pin had broken off right at the base of the seat where the broken piece couldn't be grasped by any kind of tool I had. I thought I'd get smart and pulled out the smallest Easy Out extractor in my kit. I drilled and fiddled, heated and sprayed penetrating oil, and froze the bolt, but I ended up with was a ruined bolt body and a bill from Numrich that makes this rifle almost worth more than I paid for it. But, I decided, I would persevere.

This piece was rusted in and stuck like an Alabama tick. Did I break it when I removed the pin or was it just a problem that had already happened waiting there for me to find

it? Who knows. There is no way to determine if something like this is going to happen since this part can't really be inspected until it is taken apart, so gunsmiths must beware before they set a bill for services. These rifles are inexpensive (cheap) to begin with.

If you try to work one and end up buying parts that add almost the original cost of the rifle, is it worth it? Depends. I know I will never acquire one of these again unless I can get the price down further. That being said, I still like them and know I'm going to get more. Perhaps I just like the punishment. Scope Mounting While waiting for my new parts, I started the process of mounting a scope and decided to mount on the barrel instead of the receiver even though this mount could be used on the receiver. I went

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I used a level to keep it straight. Note the TIN-coated drill. I left the date stamp intact. Brownells supplied the drill and bottom tap, ahead of the chamber and set my mill to drill 0.015" deep, checked with a dial indicator on a magnetic base so I was sure of its specs and had plenty of clearance to not drill through the barrel. An 8x40 #28 Ti N coated drill bit from Brownells (361-651-028) made quick work of drilling the holes for the mount screws, followed up with an 8-40 bottom tap (748-002-840).

A TDC (Top Dead Center) tool (871-100-000) kept the mount holes straight and in line with the bore and a dovetail scope base (080-029-844) ideal for non-grooved .22 re-

ceivers completed the mount. The bottom tap is necessary to bring the threads all the way not the same used when drilling the actual hole. Blow the hole clean with compressed air and make sure to not break this little tap off. Keep backing it out every turn or so to clean out the chips.

If you have to apply very much force to get it to turn, you're finished. I decided to only drill two holes for my mount (the mount has three) as there is hardly any recoil from .22 Short and the weight of the scope isn't a factor. If you have taken the bolt apart without missteps, put the little mainspring retaining washer back on the end of the mainspring retaining bolt.

The rebound collar goes back into the striker and the mainspring goes back over the retaining bolt from the threaded end, put through the hole in the striker. Start the bolt into the seat in the bolt body until it holds the spring in place, then hold the end of Top I am not recommending this scope but it has worked OK so far. Bottom) into the blind holes on the barrel. Since the holes were only 0.015" deep, the tap didn't have to cut far.

It was generously lubricated with WD-40, which I have found works as well as anything else for jobs like this. For tapping, use a thin oil,

RAT RIFLE CONTINUED

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He was working with anew Cricket .22. His headgear isn't mandatory but I know it helped on this cold, windy day. the retaining bolt with a pair of padded pliers and screw it tight, turning the bolt instead of the retaining bolt. Be careful when putting the striker into the bolt body because there is a small indent that matches a seat in the striker so the striker is held from turning. 22 Short hollow points. The rest I used was wobbly and I know the rifle can do better.

This is easily "minute of rat." After tightening the bolt, replace the cocking piece and insert the bolt into the receiver. Check to make sure the striker can move and is held by the sear when cocked. It is a rather crude system but very solid. It would have been that easier if Numrich had sent a bolt that actually fit my receiver. I don't think that's too probable, since there was, in all fairness, many variations of this rifle. I got a straight bolt handle while the original was bent.

It didn't make any difference as far as mounting the scope goes, but the position of the bolt handle would not allow me to fully close it. Out came the old needle files. The bolt handle locks the bolt as there are no lugs. Go extremely slow with the filing. A couple of strokes between checks is best as it's much easier to take it off than to put the metal back on. The bolt should fit very snugly. It wasn't really much of a chore, but just one more problem I experienced with this gun.

One good thing is that most parts for this rifle are available. I used Numrich as a source but there are others. For a customer's rifle, I would have to think long and hard about what kind of trouble I could get into when starting work on it. An inexpensive rifle is not worth putting very much money into unless the customer doesn't care, such as with a family heirloom. Usually you can tell what is wrong if the gun doesn't operate properly as there aren't too many parts.

A broken ejector or a blunt firing pin could be a culprit but if the retaining bolt breaks in half just hope there is enough left to twist it out. If I ever have to take a bolt apart again I will start with a caveat about the charge. And, if I ever take one apart again I will be dousing it with penetrating oil, heating it, etc. I'm going to be safe rather than sorry. This little rifle will account for many vermin. It doesn't need a scope to fulfill the function it was intended for but I am pleased with the results.

I like fooling with .22 rifles although they can be a pain. It's sad that many of these little rifles rest behind kitchen doors or buried in the closet and never used. Find them, clean them up, and make sure they function properly and safely, then sell them to the parent of a young boy or girl. Give the kids three .22 cartridges and tell them to bring home the game! AG

PISTOLS

An In-Line Muzzle Loading Pistol

The designer of the first in-line muzzle loading rifle discusses ideas for in-line pistols.

BY IRVEN F SEPTEMBER 2015

ORIGINAL PP. 8-9

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. Palmer, Jr. Most Americans are quick to embrace technological change or advances and we buy the new iPads, smart phones, flat screen TVs and hybrid-electric cars in great numbers. However, there are a few of us who want to retain the simplicity of having a firearm that does not require any pre-loaded, manufactured cartridges. All you need are the basics: Black powder, lead round balls or slugs, and a percussion cap.

The muzzle loading shooting community is a growing segment 45 caliber muzzle loading pistol in its display case. Included in the case is the ramrod and a complete set of disassembly tools. The glass vials hold 30 grains of FFFg black powder. Much greater powder charges can be used if desired. The round tin containers hold the lead round balls and Number 11 percussion caps. of shooting sports as witnessed by the rack of new muzzle loading firearms in any gun store.

As most readers know, most of the cap and ball rifles made today are often inline models. The term refers to the elimination of an external hammer in a muzzle loading firearm with an in-line bolt that moves straight

forward to contact the percussion cap. I designed the first modern inline muzzle loading rifle back in 1963, as reported in Alaska Sportsman Magazine and the October 2013 issue of American Gunsmith. Today, there are a dozen different types on the market.

While many black powder shooters have switched over to the in-line type of ignition for their rifles, no such action has taken place for muzzle loading pistols. Samuel Colt created the first revolver in 1836 which relied on loose powder loaded into the cylinders with wads and lead balls pushed down on top and fired by percussion caps on the cylinders. The Colt company went on to refine the cap and ball revolver and produced several different models in later years.

The most famous was the 1860 model supplied to Union Army troops during the Civil War. The 1858 Remington was another percussion revolver in .36 and .44 caliber that also relied on the same approach to loading. The Remington was used by both sides during the Civil War and was stronger than the

AN IN-LINE MUZZLE LOADING PISTOL CONTINUED

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The bolt (hammer), spring, bolt rod and threaded bushing all can be easily removed for cleaning. Also shown is the rotating thumb safety and the two cap screws that fasten the frame to the receiver. Colt owing to a frame strap across the top of the cylinder. Replicas of these and other cap and ball revolvers are still being made today, however, few if any are using in-line muzzle loading pistols, an odd situation as in-line ignition has proven reliable and popular in rifles.

General Specifications One piece barrel/receiver 12" Diameter barrel 7/8" Barrel length 7-1/2" Diameter receiver 1-1/8" Frame of flat steel plate (front to back) 4-1/2" Frame depth (top to bottom) 4-1/2" Trigger opening height 1" width 1-3/8" Bolt (hammer) diameter 9/16" length 3/4" Bolt (cocking rod & spring retainer) 3-1/2" Bolt rod diameter 1/4" Bolt face drilled and recessed to fit over the percussion cap.

Bolt (threaded spring retainer bushing) threads 3/4" length 7/8" Top capping hole length 1" width with oval ends 1/2" Breech plug and nipple to fit No. 11 caps length 1-1/2" Threaded 9/16" x 1" In fact, as far as I know, no manufacturers are producing in-line muzzle

loading pistols. My photos here illustrate an inline muzzle loading pistol I designed back in 1965. It is a single shot .45 caliber model with an adjustable rear sight, adjustable trigger pull and a rotating thumb safety.

In some of the photos I have taken the picture with the pistol over laying a one inch grid to provide the reader with a perspective of actual size. Readers with proper machine tools could easily make one of their own. I have included the basic specifications to get you started. The caliber is .45. The one piece barrel/receiver is made from rifled blank barrel stock. The breech plug end cut on end to fit No. 11 caps with flat sides forward of nipple for removal. The frame to barrel is attached by cap screws.

The piece has Walnut grips, the front sight is a simple ramp and the rear sight is adjustable. It is my hope that some firearms manufacturer or individual gunsmiths will read this article and decide that there just might be a market out there for an in-line muzzle loading pistols in our shooting and hunting community. AG

TOOLS & FIXTURES

How To Make A Mauser Bolt Turning Fixture

Specialty tools are useful but can be expensive, especially if used infrequently. Here's how to save money by building your own.

BY RYAN HOOVER SEPTEMBER 2015

ORIGINAL PP. 10-11

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In most gunsmithing shops, thrift is key. We all know our tools (at least the good ones) are expensive and our profession doesn't always provide the means to purchase the myriad specialty tools we need.

Even though I'm the owner/operator of a gunsmithing shop (HCP Gunsmithing, hcp-gunsmithing.com) and sometimes feel the need to purchase a specialty tool for almost every model of gun that comes through the shop, there is a constant balancing act between new tools needed and whether or not they will pay for themselves. With that attitude in mind, I approached a specific need in my shop for a certain fixture. I have a Mauser 98 action in my shop that I am building a hunting rifle from.

Military Mausers are classic rifles but they almost always need a little TLC before they are ready to build from. One of the operations most needed are truing the locking lugs and cleaning up the bolt face. Volumes have been written on converting Mauser actions by masters far more skilled than I so I won't go into the details of the particular work except to say it involves turning the

bolt on the lathe. But how to turn it? There is a female thread on the back that the bolt shroud screws into.

The 0.528"-13, 60 degree buttress thread is a weird, angled thread that is difficult to turn; it is at least more difficult than is necessary when other options are available. There used to be a false center tool available that is basically a shaft that fits in the chuck of a lathe and has the male bolt shroud threads on the other end. I couldn't find it on my last search but I found another solution.

While scratching my head trying to figure out how to turn those darn threads it occurred to me that the hole in the bolt shroud that the firing pin goes through has flats on two sides. Why not use those flats to turn the bolt in combination with the steady rest? I found a piece of scrap 1-inch round steel a little over 3 inches long in the shop and set to work.

I measured the internal diameter of the bolt shroud where the cocking piece is inserted and then took an outside diameter mea-

surement of the firing pin where it goes through the bolt shroud. They measured 0.560" and 0.330" respectively. The side-to-side flats of the firing pin measured just about 0.250" but the inside of the shroud was 0.290" so there was some wiggle room there. Putting the round stock in my lathe, I turned a shoulder on the back so it would butt up against the chuck.

Then I flipped the piece around, faced it off and turned about 1.635" of it to a little under 0.560" diameter. The length was an arbitrary number and it just ended up that way. I found that the bolt shroud would not fit over it but I figured I could tweak it later if needed. I then turned about 0.950" of the end down to 0.325" diameter. I drilled and tapped a hole for a 10-32 machine screw in the end. This is what will hold the bolt shroud tight up against the fixture. Now for the real work.

Remember those special tools I was talking about not being able to afford? Well, in my shop, a mill is one of them. If I had a mill, creating the flats

HOW TO MAKE A MAUSER BOLT TURNING FIXTURE CONTINUED

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on the sides of the piece would be a snap. Unfortunately, I don't. One of the positive side affects of not having a mill is that I have gotten pretty good at hand filing. I even do dovetails by hand! I'm sure the ghosts of 19th century craftsmen are smiling at me while I sweat away at the vise, but I digress. I kept the piece in the lathe and put a cloth down over the ways to catch the filings. Filings will always find away to get into and ruin the most expensive part of your lathe!

I The rollers on the rest ride on the extractor collar of the bolt. filed down each end until the flats measured 0.265" and they fit neatly in the shroud. This part is easy to mess up so I went slow and checked my work often. The

distance from the rear of the bolt shroud to the end of the firing pin hole in the shroud was about 0.665" long. I wanted to make the shaft a little longer so I could use it on different bolt shrouds of different dimensions.

The length ended up being 0.685" and I turned the diameter to 0.552" so it slips into the shroud. Now I had my fixture and it works great. I put the bolt shroud over the end and installed the machine screw with some washers to hold it tight. Then I screwed the bolt on to the shroud and installed the steady rest in the lathe so it would support the bolt at the extractor collar. Using the rollers on the steady rest I was able to indicate the bolt body until it was running true.

Using a tool I ground in the shop, I was able to clean up the bolt face and remove any old pits and dings. Fortunately, the bolt face looked pretty good so I didn't have to go too deep. I imagine if the damage was too deep this fixture would be helpful when installing a firing pin bushing as well. I also trued up the lugs on the back. Whenever I get to do a project like this I feel like I've put knowledge and experience I've gained over the years to use and have a great deal of pride and a sense of accomplishment.

**WHEN IT WORKS AS WELL AS THIS
FIXTURE DOES, IT'S EVEN BETTER. AG**

RIFLES

Gunsmithing AR-7 Rifles

Originally intended as a backup for downed Air Force pilots, Henry Repeating Arms now produces the AR-7 as their U. S. Survival Rifle. A Trinidad State-trained gunsmith demonstrates the particulars.

BY GARY YEE SEPTEMBER 2015

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Originally designed by Armalite's Eugene Stoner, the AR-7 rifle was intended for but never adopted by the United States Air Force as a survival rifle. It is a compact, semi-automatic blowback-operated .22 LR. It is unique among take-down .22s in that both the action and barrel may be stowed inside the stock. Furthermore, it is impervious to weather and will float once stowed in the stock.

Another highly desirable trait of the AR is the major components like the trigger/sear, hammer, magazine release, firing pin, extractor, and ejector can be fabricated from flat stock with simple hand tools. Use the original as a pattern, such as photocopying the part and gluing it onto the flat stock. Sawing, filing, and time is all that is needed. This is ideal in a situation where parts can't be mail ordered. S. Survival AR-7 Rifle.

AR-7s have been produced by Armalite, Charter Arms, Survival Arms, and Henry Repeating Arms, its most recent incarnation. They come equipped with an extra

eight round magazine that may be stowed in the stock. In the past, longer 10, 15, 25, and 50 round magazines have been offered by various makers. One thing Henry Repeating Arms did to lighten the AR-7 further was to replace the steel lined aluminum barrel with steel-lined carbon fiber barrel.

Another improvement was replacing the plastic stock with a more durable ABS type material. To disassemble it, first remove the magazine and check the action to insure that it is not loaded. Unscrew the barrel nut and pull the barrel straight out. The receiver may be removed by unscrewing the nut found in the grip cap and then pulling the receiver straight out. By pulling off the butt cap, stowage compartments may be found for the barrel and its nut, receiver with magazine stacked, and the spare magazine.

EARLIER AR-7S HAD ALUMINUM RECEIVERS AND THE CURRENT HENRY RE-

GUNSMITHING AR-7 RIFLES CONTINUED

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peating Arms model uses zinc. To disassemble the receiver, first push back the bolt slightly. Pull the bolt knob out of the bolt and allow the bolt to slide forward and out of the receiver. The two recoil springs may or may not come out with the bolt. You can reach in with pliers to pull them and the recoil spring

guide out. To disassemble the bolt, punch out the firing pin retaining pin. The firing pin may then be lifted out.

A roll pin punch is used to knock the extractor out and the extractor and extractor spring may now be lifted out of the bolt carrier. Next, remove the screw holding receiver

plate. Lift it up carefully as you don't need anything to go orbital. Note, sometimes the hammer and trigger may be displaced by the merely removing the plate. The magazine catch is removed next followed by the magazine catch pivot pin. The ejector may be pulled down and out of the receiver. De-

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tension both legs of the hammer, allowing the hammer assembly to be lifted out. The hammer pivot pin can be lifted off and the hammer spring slid off the hammer. Next, lift out the trigger pivot pin. The hammer/trigger

spring support pin should fall right out when the trigger is lifted. The safety snap ring may be removed to allow the safety to pushed out. This completes the disassembly. It is not recommended to disassemble the magazine.

The tab on the bottom must be straightened out and repetition of straightening and bending can work harden it until it breaks off.

GUNSMITHING AR-7 RIFLES CONTINUED

ORIGINAL PAGE 15

To reassemble the rifle, first insert the action spring guide with springs. Then drop in the bolt and secure them with the bolt handle. Place in the ejector, then the magazine catch and its pivot pin. Secure them in place with the magazine catch spring. Reassemble the hammer assembly. The long end of the hammer pivot pin goes down. Hook the rear leg of the hammer pin onto the receiver shelf. Now put in the trigger pivot pin and the trigger.

With a dental pick, lift up the rear hammer spring arm and insert the hammer/trigger spring support pin. Now lift the remaining hammer spring arm over the hammer/trigger spring support pin. Replace the receiver cover. Before the screw may be tightened, the cover must be aligned with the hammer pivot pin the trigger pivot pin. The most common complaint on these guns is failure to feed (jamming.) Check if the barrel nut is tight. A loose barrel nut affects both accuracy and reliability.

Second, rule out the ammunition by trying different brands or bullet types. Some .22s work better in some guns than others. Because the AR-7 is blowback operated, it should be used with high velocity .22 LR cartridges. The third thing is to clean the action thoroughly as the majority of all firearms malfunctions may be traced to dirty guns. While it is disassembled, check for burrs or anything that may impede the function of the bolt.

Some folks suggest chamfering the chamber but I don't since doing so will eliminate any case support and make the gun more susceptible to case failure with the case blowing out into the action. The malfunction I have experienced most often with these guns were usually a three point jam. The top of the lead round nose would jam itself against the top of the chamber. The bottom of the lead round nose bullet would be jammed into the bottom of the chamber where a feed ramp would be in many other guns.

The bolt would press against the side of the case, and this will usually dent it. It was determined that the magazine's bullet guide spring was not keeping the bullet nose low enough when the bolt was pushing the bullet forward. The bullet would porpoise up and then slam forward, jamming into the chamber. I have found an ideal cure for this is a 0.040" wire spring cut about three inches long and looped over on itself. Place the looped wire into a vise and bend it down with an eight-ounce hammer.

This is strictly a trial and error thing so don't get frustrated if the first one doesn't work. The bottom of the spring must then be bent 90 degrees to fit into the retaining hole. I placed the spring upside down in the vise with only the tip to be bent exposed. This was then hammered over. The end may flare out a bit, making it too big to fit into its hole in the magazine body, however, this is easily remedied by filing it round. When assembled, the spring must sit flush with the magazine.

If it doesn't, it will rub against the magazine well and be difficult to insert or remove. The loop itself cannot be too long either or it will cause bolt drag. When assembled on the magazine, it should also be nestled behind the little feed lip of the magazine body. I had to bend mine slightly in to keep it from slipping past that finger. If it does that it won't guide the bullet as well as it should.

The other problem was when the bolt recoiled, the magazine catch would bounce and release the magazine enough such that it would barely strip out a fresh bullet when the bolt went forward. Being far too low, it would jam again. If that didn't happen the magazine would fall too low to feed. This was remedied by installing a slightly longer (and stiffer) spring of the same diameter. It is better to get too long of a piece and progressively shorten it than get a short spring that won't work.

TURNING

Making Contender Barrels The Easy Way

Open or expand the Contender market for your gunshop.

BY LOWELL KENNEY SEPTEMBER 2015

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Gunsmiths and serious shooters now have away to make excellent barrels for the Thompson/Center Contender frame quickly and accurately. There is a strong market for custom Contender and Encore barrels. Stubbing is a good way of turning those takeoff barrels stacked in the back corner into sellable items. Barrels with the throats shot out can often be repurposed. This is a .357 Magnum with a 1:12 twist that I shoot 200 and 225 grain rifle bullets with.

The barrel was one of two that we made from a single 28" Mc-Gowen Precision barrel blank. One barrel paid for the barrel and both stub kits. This one was a bonus. posed into very nice long range Contender pistol-length barrels. I recently took a brand new .17 Remington barrel of a CZ 527 to make a .243 wildcat with the action.

The chances of a customer with a CZ 527 wanting to rebarrel to a .17 Remington was about nil so I took that barrel, cut off most

of the chamber converted it into a .17 Hornady Hornet Contender barrel that would smoke out of here if I wasn't fascinated with that new cartridge too. If you can thread and chamber a bolt action barrel, you can tap into this lucrative single shot barrel market to build or expand your gun shops business line. The EVA Stub system makes it very easy.

You will produce a superior product from what else is on the market as well. Borrowing the idea of cutting off old Contender barrels to make new ones, Eagle View Arms developed custom machined stubs supplied to our customers on barrels and to other gunsmiths as parts. As the demand grew the stubs have become our major product and will be expanded to the Encore barrels this summer.

The EVA Model C-Tb Stub Kit features a monolithic 4140 CNC machined Stub, a simple turn thread and mount with no welds Contender barrel, EVA Forever Tight

locking bolts, EVA Constant Pressure two piece extractor with constant spring action, and a photo-intensive manual on a mini-CD or downloadable from the web site. We now machine the stubs from monolithic blocks of 4140 prehardened steel using 4-Axis CNC milling machines.

Once we mount the block the stubs are never removed from the jig until all the machining is done. This assures that every hole and slot stays in alignment and true to each other. Since there is no welding done on the EVA stubs there is no heat distortion. Later this year we will also offer the stubs in stainless steel. The EVA Evertight locking bolts will fit T/C and other barrel maker's hinge bar but the EVA Constant Pressure extractor works only with the EVA Barrel Stub.

We will occasionally make runs of T/C-style extractors to supply gunsmiths with these

MAKING CONTENDER BARRELS THE EASY WAY CONTINUED

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Here the kit sits in front of a 12" .357 Magnum barrel Contender and a .223 Wylde 22" barrel on a G2 frame. hard-to-find parts. The Stub is in the white with all holes drilled, tapped, and reamed to proper size. The sight mounting holes are drilled and tapped to a 6×48 thread. The Constant Pressure extractor is unique to EVA's Stub. This is the part that finally allowed us to actually machine a monolithic stub.

It has been carefully engineered to provide a strong extraction force as well as being its own spring to catch the rim or groove on rimless cartridges. With the two locking bolts and locking Above is a whole Stub. Turn down the last 0.300" of the barrel to 0.6406".

I leave this a bolt spring, two 0.938 roll pins retain the locking bolts and extractor. These are much easier to install and remove than the 1/6" roll pin that T/Cuses.

Two dovetail barrel threading lugs screw the forend to the barrel with a 10×32 thread. To start making anew T/C barrel, review the instructions. Most people print it out for reference. Cut the barrel blank to rough length and face both ends. Using a 4-jaw chuck and centering the barrel, lathe small 60 degree bevels at the edge of the bore for the lathe centers or use a bore center reamer as available from Pacific Tool and Gauge to provide a suitable fit for the lathe centers.

Make sure that these bevels are smaller than the diameter of your chamber. Set the barrel up between centers with the faceplate and lathe dog and turn the barrel down to largest diameter plus 0.020". Measure 2.3" from the breech end of the barrel. I usually set the barrel in a steady rest, keeping the bore centered. Turn this 2.3" section down to 0.6875" diameter, making a threaded tenon, then thread the whole tenon for 24 threads per inch.

Make sure the barrel shoulder is square and sharp and that there is no radius where the threaded tenon meets the full barrel.

MAKING CONTENDER BARRELS THE EASY WAY CONTINUED

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223 Wylde chambered Contender barrel built with an EVA Barrel Stub out for its first firing. The constant pressure extractor works well with the rimless case. 224 Green Mountain barrel in an EVA C-Tb Stub shot this one hundred yard five round group with 55 grain V-Max bullets at about 3000 feet per second, shot off of sandbags on the hood of my car. little proud and the fit it tightly in the smooth breech end of the stub because it makes for a better looking barrel.

Screw on the Stub, fitting the smooth breech section to it. Measure the distance from the muzzle side of the 3/8" pivot pin to the face of the Contender action. Place the pin in the barreled stub and measure from the pin to the breech face of the barrel. Trim the barrel and stub length to length. This fits the stubbed barrel to the action. Chamber the barrel using what ever method you usually use.

Fit the extractor, which can be done on a milling machine, using an EVA Barrel Lathe Vise, or with hand tools if you Minimum Tooling Needed: (custom tools from

EagleViewArms.com, • • • • • Thread cutting metal lathe with an adjustable and true tailstock. 4 jaw lathe chuck, three jaw chuck, steady rest, quick change tool post. Inside and outside digital or dial calipers, test indicators (2) and magnetic toolbases with adjustable stands. 0-1" micrometer.

Either a rotating head knee milling machine or the EVA quick change extractor cutting vise. Thread and turning lathe tooling and a 3/16", 1/4", and 3/8" 60 degree dovetail end mill or a 60 degree 1/4" triangle file and some careful measuring and filling. Standard Chamber reaming tooling. • are very careful. Dovetail the barrel for the 10-32 barrel bolts according the pattern for your forend. Threaded stubs have many advantages.

They are quick to do, have a barrel-to-receiver face that stiffens the chamber and tunes the barrel very much like a bolt action rifle. We started developing these stubs for our 5MM RRM/Craig barrels but they work well for all cartridges that Thompson/Center recommends. Minimum Tools Needed The minimum tools needed

for this project start with a thread cutting metal lathe with an adjustable and true tailstock, a 4-jaw lathe chuck, three jaw chuck, steady rest and quick change tool post.

Also, an inside and outside digital or dial calipers, two test indicators and magnetic toolbases with adjustable stands, 0-1" micrometer, either a rotating head knee milling machine or the EVA quick change extractor cutting vise. Finally, you'll need thread and turning lathe tooling and a 3/16", 1/4", and 3/8" 60 degree dovetail end mill or a 60 degree 1/4" triangle file and some careful measuring and filling along with your standard chamber reaming tooling. Other gunsmiths asked for these stubs and I saw the need.

When S&W bought T/C and the small parts became hard to obtain, I expanded our manufacturing capabilities to become anew source for Contender parts. I also wanted to open the custom Contender barrel market to more gunsmiths. We will have Encore Stub Kits available as soon as we can and will bring them out in stainless steel as well. AG

MACHINING

AMT Automag III

Fitting magazines for this out of production handgun.

BY DAVE STROM SEPTEMBER 2015

ORIGINAL PP. 19

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AG-3168150D0B-A1913-P19-F02

The AMT Automag III is a semiautomatic pistol designed by Harry Sanford, creator of the first Automag. The pistol was originally manufactured by Arcadia Machine & Tool and later Irwindale Arms, Incorporated. Unlike Sanford's first design chambered in .44 Automag with ballistics similar to the .44 Remington Magnum, the Automag III is chambered in .30 Carbine (the same cartridge developed for the WWII-era M1 Carbine) instead of a magnum cartridge.

The Automag III is large, constructed of stainless steel, and well made. Sadly the company's been out of business for some time. I had one come in my shop recently. Understandably, the owner wanted a couple of spare magazines. To say they are quite scarce is an understatement. I found a few for \$50.00 each and they can go for up to \$100.00 each! The supplier was not sure if these were factory or aftermarket mags. Once ordered, the magazines arrived quickly and I tried them as is.

They fit rather tightly in the magazine well but locked in place solidly. There was some failure of the mags to feed well. Thankfully I had one factory magazine which worked flawlessly to compare the others with. First I addressed the mag well fit. The high spots were evident by the scratches left on the sides of the magazine body. These were dressed down lightly with a diamond file and re-trial fitting. Each mag was then further fitted by laying the mag on a fine diamond stone with light oil.

Once they fit well the mag body's were polished lightly inside and out with Flitz metal polish. In comparing the factory followers to the aftermarket versions I found them to be very close to the originals. One notable difference was the top corners of the factory 30 Carbine. follower were beveled at the top corners. The replacements were not and would hang up in feeding. The followers area sort of vinyl-type material. Cutting

these bevels revealed them to be a bit "mushy" underneath the file when reshaping them.

They also leave a burr in just a couple strokes of the file. I found it best to make two or three strokes with the file and then scrape off the burr with a razor knife before continuing. As these are rare and difficult to obtain, I took my time reshaping them. The front corner's beveled areas measure about 3/8" and the rear is about 1/8" as shown in the accompanying pictures. After reshaping, the bevels were made smooth with a bit of 600 grit wet/dry sandpaper and WD-40.

Finally, the springs were checked for kinks, nicks, and bends in the spring wire. None were found but if there were any I'd have removed them and polished them smooth. The replacement mags have been tested extensively since the repairs and both have been flawless. Now my client has spare mags he can depend on. AG

MAINTENANCE & REPAIR

Kahr Arms CW45 Repair

This compact polymer .45 is a popular concealed carry option. Here's how I repaired one a customer brought into my shop.

BY WILLIAM O. MILNE SEPTEMBER 2015

ORIGINAL PP. 20-21

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A customer showed up at my shop with a Kahr CW45 all locked up, slide stop pin in hand, with a spent cartridge in the chamber. After tapping on it with a wooden mallet while working the slide I managed to get the pin back in and eject the cartridge. During take down the problem was shown to me by the customer. The slide stop spring screw was loose. He had tightened it several times when the pin was working out.

On further examination I found the plastic hole that the #2-56 machine thread screw was supposed to be in. After a glue-in method failed and realizing the expense of a full replacement, this was the best alternative. The hole was stripped out. A call to Kahr's service department revealed that their five year warranty covers the original customer only. A determination as to whether the damage was a factory defect could not be made over the phone and had to be examined by a factory representative.

The usual fix was a frame replacement at a cost of \$250.00 plus \$65.00 for one hour of labor. I decided to pursue an alternative fix for my customer. Reinforced Fastener Normal engineering practice would be to reinforce an area where a fastener is to be placed under stress during use. In this case, that would be when a .45 ACP cartridge goes "bang" and drives the barrel and slide back against a pin held in plastic. The shock is transmitted to the screw via the pin to the spring and washer.

The spring is wound counter clockwise around the screw so a hit by the pin on the spring and the movement of the tail upwards at the last shot tends to loosen the screw. A quick Google search produced a number of people looking for a solution to the same problem. I first tried a Super Glue method one person had success with, but to no avail. The screw would not tighten enough and it striped out again. The only

option left was to reinforce the hole. Stem Nut Fix The first step was to make a barrel or stem nut.

There is not much room beside the pin hole so I settled on a diameter of 0.100 inch for the stem. The through hole is drilled at 0.067" (#51) for a #2-56 thread. A small tapered flange will retain the stem nut in the frame. The overall length was decided at 0.190", a short step down in diameter to 0.096" for the first 0.050" in length of the stem nut which allows easy insertion in the frame after the old screw hole is carefully opened up to 0.096" (#41).

I used my Foreman rotary tool with a small round burr to reach in and chamfer the hole inside at the lug area just enough to seat the head of the stem nut flush and out of the way of the barrel lug. Start the stem on the inside with a set of needle nose pliers and finish with a pair of regular pliers opened up to pinch the nut and frame until seated flush.

KAHR ARMS CW45 REPAIR CONTINUED

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No-Lathe Option For gunsmiths in need of performing this repair that don't possess a lathe, I can supply the stem nut for \$20.00 plus shipping from William Oliver G A little dab of Loctite Blue 242 on the screw will keep it from working loose. The counter sink in the washer goes up. Tighten the screw

carefully just right—not too tight—to where the spring makes a good snap in the spring does two jobs.

It holds the slide stop in its place and holds the stop down until the empty mag overcomes it, locking the slide open. slide pin

when it is seated. Insert the pin slowly and carefully to prevent bending the spring tail. The end of the spring must ride above the notch shelf on the pin. It is very easy to damage the spring. Properly installed the

PEOPLE & COMPANIES

Reader Forum

BY AMERICAN GUNSMITH EDITORS SEPTEMBER 2015

ORIGINAL PP. 22-24

Winchester Model 97 I need to change out a worn barrel extension in a Winchester Model 97. How tight should the barrel-to-extension fit be? How is the fit deemed correct? I was told by a gunsmith that works on Model 12s that this is accomplished by torque, with the final barrel-to-ring torque set at 65 ft-lbs, ignoring the original sight bead position, drilling for anew bead, then adjusting headspace if needed.

Another person told me it was accomplished by indexing the front site to a certain position by adding threads to the barrel or facing off a small amount of shoulder after the last thread with a lathe, then tightening the barrel the last few degrees (10,12,15 degrees) until the sight bead clocks to vertical. A third person told me you can get shims to do the same thing. This part of the "fit up" process always seems to be missing from anything I have read or discovered to date about Model 97 or 12 work.

Any guidance regarding reference material, tooling, or details about this procedure will be truly appreciated. Paul Becher Slick Guns Ironworks The closest to being right is the first gunsmith but something hit us right between the eyes about your barrel to bring us to a screeching halt. You mention the extension being worn out. We know of no means to correct that particular problem beyond anew barrel.

We've heard of extensions in the condition we suspect yours to be in separating from the barrel and/or creating havoc within the receiver. We wouldn't depend on Winchester, presently Browning-Winchester, to be the replacement barrel provider. Not for a Model 97. The aftermarket, including present importers or manufacturers of Model 97 clones, should

prove to be productive. Remington SP-10 Can you direct me to information (manuals, schematics, etc.) about Remington's now-obsolete SP-10 10gauge?

I can't find anything in any of J. B. Wood's Gun Digest manuals, nor in the various NRA Guide to Firearms Assembly books. This model apparently differed sufficiently enough from its predecessor (the Ithaca Mag-10) to warrant separate take-down instructions, paraphrasing J. B. Wood in his book, but none seem available. From the blogs I've read, I gather that the disassembly, particularly regarding the piston assembly, can be very tricky. John R.

Cooney, MD In the February 2002 issue we published an article on the SP-10 Magnum that should serve to answer your needs. Unfortunately, reprints are no longer available. We will publish your letter trusting that one of your fellow members has an intact copy of that issue and will contact you via email to arrange forwarding of the article there-in to you. AR-15 Barrel Removal I have recently built several AR-15 rifles and have been reading the American Gunsmith articles by Joe Carlos on the subject.

In his articles Carlos mentions using Loctite Green 620 on barrel extensions that produced increased accuracy. I tried this procedure and found a noticeable increase in accuracy, but don't know the method for removing the barrel once green Loctite is utilized. The specifications state it takes an application of 250 degrees of heat to remove. Is it safe to apply that much heat to the receiver area to remove a barrel that has been installed this way? My receiver is 7075-T6 aluminum forging.

Author Joe Carlos responds. To remove a barrel whose extension had been Loctited in place with Green 620, heat the receiver

threads with a blow torch, hold the barrel near its midpoint and tap the receiver with a wooden or plastic mallet, section of regular 2x4, or something similarly soft to drive it off. The whole process only takes about five minutes and the heat applied doesn't seem to harm the receiver at all. I have done hundreds of them this way.

Some of the Loctite will need to be cleaned out of the receiver before installing anew barrel. I use an old hunting knife but steel wool or fine emery cloth also helps. That will take another five to ten minutes. I'm glad to hear that the Loctite improved your accuracy! Perazzi Model 500 Shotgun Any information on the Perazzi Model 500 Shotgun would be appreciated. Verlin L. Weaver Jr. Mountain Man Gun Works Sorry this took so long but it usually does with offshore-produced items.

Their manufacturers frequently insist the only way queries such as yours can be answered is via an on-site visit by one of us to their factory for personal instruction. Though there are those among us who'd welcome a junket to Italy, United Kingdom, Spain, Turkey, or Serbia... well, unlike Congress, we have no taxpayers to soak for the trips. We didn't want to drop that bit of news in your lap and leave you with no hope.

A few years back, we saw a video on Perazzi and the 500 was included in the content but we've had no luck finding a source for that production so far. To be absolutely sure you find what you're looking for and not what we think you're looking for, please contact the Rutgers Book Center in Highland Park, NJ (Phone: Shawn Shupp Fax: Note, the book center is not connected with the university. Baikal 81M I have been told that any of the collapsible and folding stocks that fit a

READER FORUM CONTINUED

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Mossberg 500 will also fit the Baikal 81M with a some small modifications. Do you have a feel for what these “small modifications” might actually entail? We would hesitate to hand out the specifics without first contacting European American Armory, which is exactly what you should do Just tell them you need some shotgun stock information. Of course, also knowing the dimensions of the Mossberg stock is equally important.

Hopkins & Allen I have a Hopkins & Allen Arms Company single barrel 12 gauge shotgun without exposed hammers in my shop from a customer that apparently has a broken trigger mechanism. Is there a reference or schematic that I can research? The parts are held in by pins but I’m not sure whether they can come out to either side or just one way. Naturally there is some rust and accumulation of extra residue in the receiver.

Jimmy Thompson Hopkins & Allen went bankrupt in 1916 and the shotgun was probably made prior to that. We have never done an article on these shotguns though the company did produce many singles and doubles for private branding. They were then considered to be good quality. John Street No schematic can be found that we’re aware of. If you measure both ends of the mentioned pins, one end will be smaller than its opposite if they are tapered and can be drifted out from the smaller end.

If even on both ends, following the norm of “lefty loosey, righty tighty” should serve. Once you have the pins out you can go after the internal rust and residue in the receiver with good quality solvent and a bronze wire brush. We’d be very hesitant to fire modern high brass (hunting) loads in the gun. Mild target loads would be a safer starting point. Metal fatigue can happen with guns approaching 100 years old and the result of this can range from dangerous to death.

Bullet Tumble I have a Colt Coltsman rifle chambered in .243 and it won’t hit a twofoot target at 50 yards. At 25 yards holes on the target print sideways, indicating tumbling. I have cleaned the bore with four different cleaners and made sure the bore is completely unfouled but it did not help. What do you think the problem is? What can I do to correct it? Tom Masters The Coltsman went out of production in 1966.

If the one you’re dealing with has had considerable use in its roughly five decade lifetime or if it has not been properly cared for, the barrel may be shot out. Push a soft lead slug through from breech to muzzle. Make a magnified examination of it for signs of lands and grooves. Measure the outside diameter of the exited slug against the intended bore diameter of a .243 rifle, as referenced by SAAMI specifications. Do the same with the recommended bullet diameter of an unfired .243 cartridge.

We’re betting neither measurement will match the specified requirement. We’ll further make another bet that there is also muzzle damage. Any combination of the above can be corrected by rebarreling the rifle, which may well be the only way to get the rifle back on target. We’re assuming you’re shooting with iron sights but if not, are the scope base and rings firmly attached? Color Case Work Do you know where I can get quality color case work done? I have a custom Rolling Block that needs the same.

Dominick Pisano If your objective is to ship out the job and get it back perfect, try Doug Turnbull Restorations in Bloomfield New York Doug is a member of the American Custom Gunmakers Guild and the American Pistolsmiths Guild. If want to pick a brain, hit the books. We have never heard of or met a craftsperson in case coloring or case hardening worthy of a rave referral whose lips were sealed regarding their proprietary secrets. AG

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