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EDITION

PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

A TECHNICAL JOURNAL OF CRAFT, REPAIR & RESTORATION

10

ARCHIVE ISSUE NUMBER

INSIDE THE ARCHIVE

AN IMPERIAL SCOUT

HEAD HUNTERS NW • MINI MILL UPGRADES • MOSIN-NAGANT MODIFICATIONS • PROBLEMS SPRING OUT

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 238

DIGITAL ARCHIVE EDITION

Preserved for the bench.

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FROM THE ARCHIVE

Head Hunters NW

BY AMERICAN GUNSMITH EDITORS OCTOBER 2023

ORIGINAL PP. 2

Head Hunters NW has recruited talent for Fortune 500 corporations and family-owned businesses while uncovering talent for vital management positions, C-suite roles, and more.

In addition to supporting a variety of industries in a number of regions, Head Hunters NW has gladly served influential roles in the shooting industry, which they gladly and openly support on their website and in their media. “In 2004, I founded Head Hunters NW as my twenty-plus years as an executive recruiter greatly influence the duty I feel to specialize in the industries I’m most passionate about.

I quickly recognized the shooting, hunting, and outdoor industry was distinctive and appealing in its culture and legacy,” said Shaylene Keiner, HHNW President. “As the firearms marketplace continued evolving through ever-changing administrations and economic fluctuations, I predicted the need for companies to recruit high-quality talent.” HHNW starts with their Firearm Industry Employee Survey, which collects data to share with industry leaders, such as at the NSSF leadership summit.

The purpose of their survey is to learn what employees expect from current and future employers. As many companies struggle to understand what workplace incentives spark collaboration, motivation, and productivity in their ranks, this questionnaire provides useful information to human resource managers, team leaders, and corporate executives that are hiring and to the talent they are looking for.

They also maintain a private Linked In group called Firearm, Shooting & Outdoor Industry Job Seekers, the purpose of which is to provide resume feedback, interviewing help and prep, networking opportunities, and more for those seeking help getting hired within the Firearm, Shooting & Outdoor Industries. Members freely share leads as well as their personal experiences.

For services, HHNW offers On-Demand Recruiting to help human resource teams struggling with finding new people to have an on-demand recruiting service with dedicated recruiters finding qualified candidates. Their Executive Search locates the right leaders for a company that can drive the organization forward. Recruiters experienced in the shooting industry have the knowledge and expertise to identify the best candidates in a variety of positions and roles.

HHNW works closely with individuals and companies to recognize your company culture, values, and goals for the best fit. They deliver candidates with the right skills and experience into companies that need to hire them. Their services are flexible, allowing scaling up or down as recruiting needs change and supports filling a single position hire or a large-scale hiring project.

If you are an individual looking for a job in the shooting industry or area shop needing to hire new employees, visit HHNW online at HeadHuntersNW.com, Facebook.com/HeadHuntersNW, [Linked In. com/company/headhunters-nw](https://LinkedIn.com/company/headhunters-nw), or call John M. Buol Jr. AmericanGunsmith.info

FROM THE ARCHIVE

An Imperial Scout

Reviving a derelict Type 99 Arisaka and creating a Scout rifle.

BY KEVIN BAXTER OCTOBER 2023

ORIGINAL PP. 3-9



Above: The Type 99 Arisaka, pre-surgery.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



Right: The barrel showing light pitting and the anti-aircraft rear sight.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED

Oh, East is East, and West is West,
and never the twain shall meet, Till
Earth and Sky stand presently at
God's great Judgment Seat; But there is
neither East nor West, Border, nor Breed,
nor Birth, When two strong men stand face
to face, though they come from the ends of
the earth!

Rudyard Kipling had India and England in mind when he wrote "The Ballad of East and West" in 1889, but it works as preamble to my ongoing saga of amateur maintenance, repair, overhaul, and upgrade of unlikely firearms from the back of the closet. In this case, we have a Scout rifle, creation of the late Marine officer Lt. Col. Jeff Cooper, produced from a 7.7mmx58 Type 99 Arisaka which was formerly the personal property of the Emperor of Japan.

Like a good bit of the rest of the collection, I inherited this from my father, who picked it up at a gun show, probably with the notion of making a sporter out of it. The East Normally, I'm disinclined to do anything irreversible to a relic. See my article "1871 Vetterli Conversion" (July 2017) regarding the conversion of a Vetterli from rimfire to centerfire.

At first glance, this rifle looked like it might have some intrinsic and historic value, being an early product of the Nagoya factory (series 1) with a four-digit serial number and other markings indicating that it is of pre-war production, possibly in the first Type 99 production run, and with the chrysanthemum insignia fully intact. The furniture is in good shape apart from a bit broken off of the bayonet stud band; all of the hardware is present except for the dust cover for the receiver and the cleaning rod.

It doesn't appear to have ever been fitted with a bipod. However, somewhere in its history someone with a hacksaw and a vise took an inch or so off the front of the barrel, and the front sight went with it, along with any intrinsic value. On closer inspection, I came to strongly suspect that the stock—or at least, the upper handguard—is not original, and that the muzzle may have been damaged.

Upon taking the barrel and action out of the stock, I discovered a sizable dent in the barrel under the upper hand guard about 4" back from the muzzle—it carries through the barrel wall to create a bulge in the bore, something I understand to be generally

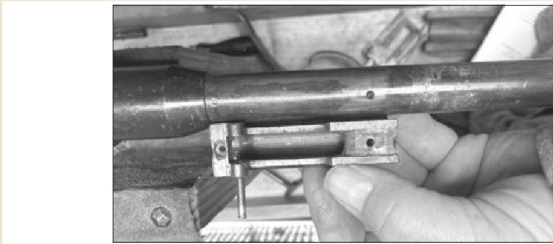
viewed with opprobrium in better gunsmithing circles. Even so, the barrel is plumb and the stock undamaged. It clearly took a brisk hit under the stock—possibly from a passing American bullet?—so the stock must surely be a replacement.

Nonetheless the barrel, aft of the dent, is in good shape apart from some light exterior pitting, the bore is clean albeit worn, the action is tight, and the bolt is in good shape, but of a different serial number than the receiver. Thus, since whatever collector value the rifle may have had was a distant memory, and the barrel needed to be either cut back or replaced to allow bullets out the business end unmolested, I began to consider my options.

My first thought was to re-barrel the action in something appropriate along the lines of Winchester's 350 Legend as the Arisaka Type 99 receiver is reputed to be among the strongest

AN IMPERIAL SCOUT CONTINUED

ORIGINAL PAGE 4



Above left: Not surrendered. The Chrysanthemum is fully intact, with the Nagoya marking behind..
Above right: The sight base when finally removed. The back screw took some persuasion with an 1/8" milling bit, but the threads remained intact.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED

The Chrysanthemum is fully intact, with the Nagoya marking behind.. The back screw took some persuasion with an 1/8" milling bit, but the threads remained intact. bolt actions ever made, very similar to the K98 Mauser. But considerations of domestic harmony dictated keeping the cost down, so I decided to see what I could do with the existing barrel. This is where the Scout rifle debuts. The West Col.

Cooper (intoned with proper reverence) developed the notion of the Scout rifle as a short, light, handy, versatile utility rifle. Typical specs called for a bolt-action, usually chambered in 308 Winchester, with a total length under one meter (about 39 inches), an 18" barrel (mixed metrics are original), lighter than three kilograms (a bit over six and a half pounds), with both iron sights and a forwardmounted optical sight, and fitted with a sling. There were variations.

A rifle with a detachable magazine could have a rear mounted scope; the forward mounted scope allows a magazine to be charged with a stripper clip. While 308 Winchester was his preferred round, anything common and easily procured in a .30-ish caliber is suitable. He also allowed for semi-auto rifles, although he was apparently less fond of them on the basis of complexity and concomitant potential mechanical failure. And he disapproved of a front mounted front sight that might catch on something.

Armed with the Colonel's specifications and a somewhat flexible mindset regarding strict adherence, I thought to perhaps create a Scout rifle from my bunged-up Type 99. It has a box magazine and provision for stripper clips, so a forward mounted long eye-relief scope is indicated, as is some method of mounting it. The 7.7mmx58 round performs within rounding error of the 308 Winchester, although it's nothing like as ubiquitous.

The length was solvable with a lathe and a cutoff tool, something that needed to be done anyway. Weight can be a challenge, but I'm a big guy—I was the one elected to lug the M60 around, so anything shy of that is a bonus. The sling is a matter of preference. So the decision was obvious. Disassembly The first order of business was to unship the barrel and action from the full length military stock.

This is accomplished in a straightforward manner by removing the screws holding the barrel bands in place, sliding the bands forward off the stock, and lifting off the upper handguard. The action is very similar to the K98 Mauser, with a couple of interesting wrinkles. Like the Mauser, there is a screw threaded into the base of the recoil lug forward of the magazine and another aft of the trigger guard that engages the back of the receiver.

In addition, there is a tang extension that dovetails under the back of the receiver and extends back about another three inches; the tang behind the trigger guard conforms



Above left: Not surrendered. The Chrysanthemum is fully intact, with the Nagoya marking behind..
Above right: The sight base when finally removed. The back screw took some persuasion with an 1/8" milling bit, but the threads remained intact.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED

to the small pistol grip in the stock, with a hole at the very end to accommodate another screw that engages the tang extension. All of the screws except the very aftmost—engaging the tang extension—backed out in a gentlemanly manner. That last one proved insuperable, however.

It resisted several days of soaking and gentle persuasion, so I ultimately wound up drilling the head off with a letter "O" drill. With the head disposed of and the lower reaches of the receiver pulled out, the tang extension came off and the barreled action was free. As it turns out, the recalcitrant screw was stuck in the rolled steel hole liner—it backed out of the tang extension hole with thumb and forefinger.

The magazine is pretty much a duplicate of the K98, although the spring-loaded floorplate release is different, riding in a slot at the forward end of the trigger guard and being held in place by a screw protected by the magazine wall, which in turn is held in place by its own springiness forward of the trigger guard, and detaches with a squeeze and a gentle pull upward. With the wall removed, the floorplate latch retaining screw can be backed out and the latch and spring removed.

The floorplate comes off the trigger guard by driving out the hinge pin with a 3/32" drift pin. As the rifle came apart, it was apparent that it hadn't been touched in along time. There was quite a bit of Cosmoline and varnish around the magazine well, the rear sight, trigger, and receiver.

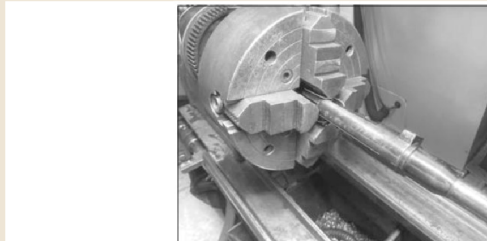
AN IMPERIAL SCOUT CONTINUED

ORIGINAL PAGE 5



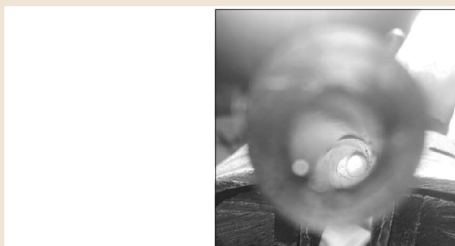
Far left: The Arisaka chucked up for circumcision. The shims protecting the receiver originally adorned Bailey as license plates on her collar. Left: With a center rest and live tailstock center and a cutoff tool aligned 18-1/2" from the front of the receiver, we're ready to proceed. The author was relieved to find that the barrel was straight by dial indicating it at 1" intervals down its length.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



Far left: The Arisaka chucked up for circumcision. The shims protecting the receiver originally adorned Bailey as license plates on her collar. Left: With a center rest and live tailstock center and a cutoff tool aligned 18-1/2" from the front of the receiver, we're ready to proceed. The author was relieved to find that the barrel was straight by dial indicating it at 1" intervals down its length.

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ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



Left: Post-surgery remains with about 6-1/2" off the end. The ding is evident. Below: The view down the cut off barrel end. You can see where the ding on the outside carries through to the bore at the top.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED

The rolled steel hole liners were all lightly rusted and had to be gently drifted out of the stock. The barrel had light pitting at about the middle all the way around, and at the very breech end. But overall, there was nothing particularly surprising or alarming, save the ding in the barrel. Stripping the rifle down to parade rest is essentially identical to the process for a K98 Mauser. The bolt is released by the ejector box on the back left side of the receiver.

This in turn is removed by backing out the hinge screw at the back, against a bit of pressure from the ejector box cover spring. It is then further disassembled by removing the ejector and spring, then sliding the ejector box cover spring out of the ejector box. All of the parts being well coated with Cosmoline, they all then went into a soup can full of solvent to soak for awhile. The last piece needing removal was the rear sight.

Like the K98, it mounts just forward of the receiver on the barrel, with an open battle sight at the base of the spring loaded ladder sight. Unique in my experience however, are two arms located on either side of the ladder sight. Spring loaded and hinged at the base of the main sight to swing down and out left and right, they have notches in the top and markings on back side to guide the intrepid — and highly optimistic—in- The ding is evident.

You can see where the ding on the outside carries through to the bore at the top. Far The shims protecting the receiver originally adorned Bailey as license plates on her collar. The author was relieved to find that the barrel was straight by dial indicating it at 1" intervals down its length. fantryman to a lead for engaging crossing aircraft.

When the shooter intended to be an anti-aircraft battery, he flipped the arms down and quickly estimating aircraft altitude, speed, aspect, and attitude, solved the fire control

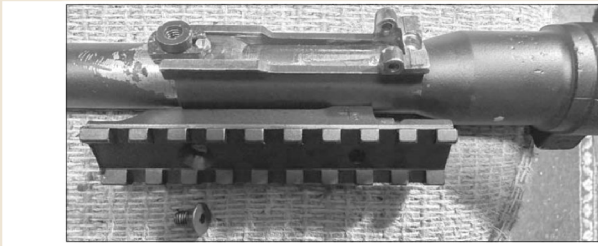
problem, aligned the proper notch on the target and pulled the trigger. This seems like a waste of ammunition based on the "big sky, little airplane" theory, but there it is. The base for the sight is essentially a tube sized to just fit over the barrel between where it starts to taper and the larger diameter base forward of the threads.

It has a machined top that includes a dovetail for the sight leaf spring and ears for the hinge pin at the back end and the rest for aligning the sight when laying flat at the front. It is kept in place with two screws—the forward one goes through the front of the leaf spring, threads into the base and inserts a short blind end of the screw into a hole in the barrel. The after screw threads through the back, again projecting the blind end of the screw into the corresponding hole in the top of the barrel.

This last proved to be a source of some frustration, as it refused to budge (the forward

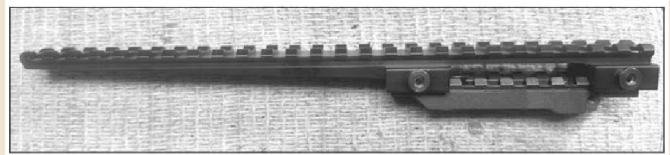
AN IMPERIAL SCOUT CONTINUED

ORIGINAL PAGE 6



Top: S&K Mounts' clever Picatinny rail for the rear sight base. You can see where the author had to relieve the dovetail nut to accommodate the slightly out of spec distance between the ears at the back of the base and the forward mounting screw. Above: The solution to the problem of simultaneously mounting a scope and iron sights was a cantilevered Picatinny rail extension, which raises the mount 1/2".

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



Top: S&K Mounts' clever Picatinny rail for the rear sight base. You can see where the author had to relieve the dovetail nut to accommodate the slightly out of spec distance between the ears at the back of the base and the forward mounting screw. Above: The solution to the problem of simultaneously mounting a scope and iron sights was a cantilevered Picatinny rail extension, which raises the mount 1/2".

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED

Some careful drilling into the sides of the slot with a #70 drill and subsequent attempts to use a couple of dental picks to apply upward pressure while turning failed utterly. I wound up machining it down with a 1/8" milling bit. Through what I will claim was outstanding machining enabled by a steady hand and keen eye but what was really at least an equal part dumb luck, I succeeded in freeing the broken screw while leaving the threads intact.

The blind end of the screw stayed in the hole and came out when I tipped the barrel upside down. This accomplished, it took just a little gentle persuasion with a brass drift pin to start the sight base forward—once about half of it had cleared the back of the barrel and was over the taper, it slid off with a gentle pull by hand. This revealed that the barrel had been blued after the sight base was attached; it was clean and bright as the day it was assembled.

With the barrel and action now stripped down, I was ready for surgery. Barrel Cleanup and Trimming The first step was to chuck up the action in my ancient lathe's 4 jaw with a center rest downstream. Using past years' aluminum dog license plates (please don't mention to my wife that I

saved them) as shims to protect the action, I got the barreled action in place and centered quickly with the center rest.

I was concerned that whatever force put that ding in the barrel might have imparted a curve in the barrel, so I dial indicated the barrel at 1" increments from the action to the muzzle finding no discernible variation. The Colonel's spec for barrel length is 18". Not wanting to incur the wrath of the ATE, I checked the regs for measuring barrel length, learning that it is measured from the bolt face.

Exercising the better part of valor, I chose to measure from the face of the action, giving me about an inch of buffer as well as a simpler measurement. To this I added another half inch just for safety and then applied a cutoff tool at the appropriate spot. The remaining 6-1/2" of barrel dropped into the bin under the bed, and a short session with a bit of my brother John's design (also a contributor to these pages) imparted an acceptable crown.

The remainder of the machining comprised addressing the barrel with increasingly fine emery cloth, then crocus cloth with plenty of oil to clean up the surface and mitigate some of the pitting. This completed, I took

the circumcised barreled action off the lathe and set it aside in consideration of the next step.

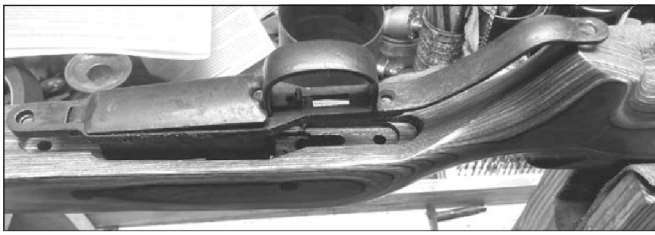
Given the uncertain provenance of this rifle and its undoubted hard usage, I figured it would be a good idea at this point to take a casting of the chamber and the bore to confirm that they still showed some relation to the original spec before going further. I read somewhere that the Type 99 bore is not unlike its cousin the Ross in .303 caliber and exhibiting a wide variation to the norm across samples under the best of circumstances.

A couple of hours with my brick of Cerrosafe confirmed that, remarkably enough, the chamber was still exactly to spec as listed on the Ammo Guide site (AmmoGuide.com), and that the bore measured .312 despite the wear. I also rented a set of go/no-go gauges from 4D Reamer Rentals (4Drentals.com) which, when tried, showed that the head spacing, despite the mismatched bolt serial numbers, was fine.

Stock and Sights I gave some considerable thought to the stock, considering everything from a bespoke stock from a nice piece of walnut to a plastic stock

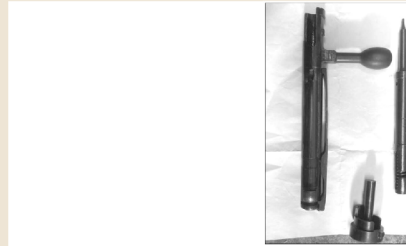
AN IMPERIAL SCOUT CONTINUED

ORIGINAL PAGE 7



Left: The bolt, disassembled. It's a model of simplicity and robust design. Above: The extended trigger guard. Far too much to try to extend the inletting in the composite stock, and not worth the effort.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



Left: The bolt, disassembled. It's a model of simplicity and robust design. Above: The extended trigger guard. Far too much to try to extend the inletting in the composite stock, and not worth the effort.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



Far left: The solution was a carbide cutoff tool followed by a deft touch with the belt sander. Left: The truncated trigger guard, fitted to the existing inletting. The inletting required a little relieving for everything to line up, including the space for the magazine wall. The cut off remains are on the pistol grip for reference.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



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ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED

It's a model of simplicity and robust design. Far too much to try to extend the inletting in the composite stock, and not worth the effort. modified discretely with a Dremel tool and patience. Providentially, it turned out that Optics Planet (OpticsPlanet.com, carries a composite stock specifically for the Type 99 Arisaka, produced by Boyd's Hardwood Gunstocks. They also had a sale in progress at the time of my need.

The stars thus aligning in my favor, I ordered the stock and started thinking about the sighting arrangements for my nascent Scout rifle. A combination of a forward mounted scope and preferably coincidental iron sights is the ideal, but one that's hard to realize with an 18" barrel and a standard stock.

Fortunately, mounting along eye relief scope turned out to be the easiest part of the project with the discovery of a bespoke Weaver rail for the Type 99 from S&K

Mounts (ScopeMounts.com, S&K makes a variety of scope mounts for military rifles designed to replace the typical military ladder sight using the existing sight mount on the rifle and requiring no modification to the rifle. Installation involves removing the original sight, leaving the base in place.

A nut with a dovetailed head fits into the dovetail where the leaf spring resided, resting over top of the forward screw holding the base in place, into which one screws a short flathead screw through the rail, securing the front end. The back end is secured with a pair of hex screws installed into holes that match up to the ears at the back of the base, with a vertical set screw to put the whole under tension.

Now in my case, it turned out that the distance from the forward screw hole (securing the base to the barrel through the leaf spring) of the sight base to the ears must be

about 1/8" shorter than standard, as I couldn't place the dovetailed nut centered over that screw (necessary to thread the screw) without the back of the rail being too far aft to attach to the ears.

I solved this by trimming the head of the screw a bit on top, then milling a notch in the wedge nut so it could slide over the screw head to the appropriate distance from the ears. This doesn't affect its function as it just takes up against the dovetail when the Allen screw is tightened through the rail. Being as this is something of an experiment, I went with an inexpensive long eye relief scope to test the rig before investing in a really good piece of glass.

Far The inletting required a little relieving for everything to line up, including the space for the magazine wall. The cut off remains are on the pistol grip for reference.

AN IMPERIAL SCOUT CONTINUED

ORIGINAL PAGE 8



Above: The Imperial Scout, dressed in its long eye-relief scope and offset iron sights on a cantilevered Picatinny rail extension.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



Below: The rifle from the back. This shows the orientation of the offset iron sights and the height of the scope, which turned out to be okay for cheek weld. Below right: The rifle from the front. The cantilever and offset iron sights are a bit jarring to the traditional mind, but they work.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



Below: The rifle from the back. This shows the orientation of the offset iron sights and the height of the scope, which turned out to be okay for cheek weld. Below right: The rifle from the front. The cantilever and offset iron sights are a bit jarring to the traditional mind, but they work.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED

Having solved the scope mount part of the problem, the question of iron sights moved to the front of the queue. I think my ideal solution would be an Aimpoint-like zero magnification sight with some manner of flip-up magnification like that popular on black guns. But I couldn't convince myself that any could accommodate the 10" or so of eye relief demanded by a forward mounted rail. I'd be delighted to be corrected. In any case, my solution is a bit of a kluge, but in practice actually not bad.

I found a cantilevered Weaver rail extension that sits a half inch above the base rail, with 25 slots along its 9". This shows the orientation of the offset iron sights and the height of the scope, which turned out to be okay for cheek weld. The cantilever and offset iron sights area bit jarring to the traditional mind, but they work. length. This allows mounting the scope on low mounts, leaving a couple of slots at the back.

To this I added a set of 45° offset flip up sights, offset to the right, with the rear sight in the rearmost slot and the front sight as far forward as I could go to allow some semblance of a meaningful sight radius. To one brought up with classically outfitted rifles,

it's a bit jarring but if one looks for the beauty in the function (as defined) rather than the form, it's still ugly but it makes sense. More to the point, it works.

One could quibble that the cantilever creates as much a catching hazard as a proper front sight, but it's set well back from the muzzle, ending a bit aft of the front end of the forearm, so there's some mitigation there. Refinishing and Assembly The next consideration was the metal finish. I decided on Lauer's Duracoat (DuracoatFirearmFinishes.com, 800)830-6677) in matte black using their clever aerosol can.

I've used Duracoat before and found it to be every bit as durable as advertised and, if one follows the directions, easy to apply successfully even when mixing it for an air sprayer. The aerosol can is easier yet: shake it for the prescribed time, attach the red button to the bottom and give it a push, then shake the can again and you're ready to go. Plus you get a couple of weeks of working time.

I have a small paint booth that was designed for working on HO scale model railroad models, so it's perfect for everything except the barreled action. The good news is that

Duracoat is very forgiving. I coated the receiver and a bit of the barrel first, then when that was set after six coats, I was able to maneuver the remainder of the 18" barrel such that I could spray into the booth and still have the fumes exhausted.

Before assembling the rifle, I tore the bolt down to parade rest, figuring (correctly, as it turns out) that it needed to be cleaned, inspected, and lubricated. It comes apart very similarly to a K98 bolt, although the safety is different. In this, it's even easier. Grab the bolt with your weak hand and shove inward on the safety knob with the other one and turn the knob clockwise, facing forward. Gently ease off the pressure and the safety will come out under spring pressure.

Remove the striker and the spring, and it's done. Reassembly is simply the reverse, making sure to align the sear projection on the striker in the aft-most notch in the bolt body, and the alignment detent on the shaft of the safety with the corresponding notch in the striker. Very simple and elegant. Now it was time to fit the barreled action to the stock. As it turned out, the stock was not designed to ac-

AN IMPERIAL SCOUT CONTINUED

ORIGINAL PAGE 9



Left: Baxter shooting his Imperial Scout. First round out the barrel in an unknown but likely large number of years. It's a sweet shooter.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED

First round out the barrel in an unknown but likely large number of years. It's a sweet shooter. commodate the tang extension or the corresponding long tail on the trigger guard. This necessitated a quick session with a cutoff tool to cut the trigger guard back to just aft of the middle (now aft) screw hole. I cut it a bit long to give myself room to fit the inletting on the stock, then started free-handing the radius on the back of the trigger guard with a Rockwell vertical belt sander.

When I got the radius right and was able to test the fit, I discovered that the inletting and the pre-drilled screw holes were slightly misaligned longitudinally both for the trigger guard and the barreled action. The space for the magazine well also needed relieved. Fortunately, the errors were all in the same direction and by the same amount. Remarkably, the holes were right, just the inletting was off.

The stock was not drilled to accommodate the rolled steel hole liners, nor was it set up for across bolt for the recoil lug. The hole liners were easily accommodated with a letter "O" drill for the forward recoil lug hole and a 5/16" drill for the receiver tang screw. After some consideration, I opted to forego the cross bolt as I expect that the composite stock is particularly strong in compression. Given the amount of shooting the rifle is apt to experience it probably isn't worth the extra fiddling.

With these matters handled, it remained to relieve the magazine well space, the back of the inletting for the receiver and the trigger guard, and the face that mates to the recoil

lug on the receiver. This was accomplished with a vast amount of patience with some good sharp chisels, and a bit of judicious application of the Dremel tool. After considerable minute cutting, cleaning, testing and repeating, I got it right and everything fell into place, all without damage to either the metal or wood finish.

Assembly of the barreled action to the new stock was straightforward. The only tricky part is inserting the spring loaded floorplate latch into its recess ahead of the trigger guard loop and holding it in place while inserting and tightening the keeper screw. This is easily accomplished with a large thumb as the spring is not particularly robust. I sprung the magazine well back onto the trigger guard, then attached the floorplate with the spring and follower with its pin.

The barrel is floated for the time being and the action is pillar bedded. After bore sighting the scope and iron sights there only remained the test firing of my new scout. Taking a box of Norma 174 grain soft point rounds to my favorite 100-yard range at the Fairfax Rod and Gun Club, I engaged in an internal debate about how to send the first round from this rifle in God-only-knows how many years downrange.

I considered strapping it to my rest and deploying a length of string to a discrete distance, but I ultimately decided to just shoot it. As you can no doubt tell, all turned out fine—even my target was unmolested. But some careful spotting and adjustments got me on the paper inside of ten rounds. I decided I like the load as the recoil was unex-

pectedly light and there was almost no rise with just a push back, making it pretty easy to keep an eye on the target.

I'll work up some loads when my brass, dies, and bullets get here, but I think it's safe to say I'll stick with the longer, heavier bullet which that short barrel seems to like. I think I've been reasonably true to Col Cooper's vision. The rifle's overall length is 38", it's .30ish caliber (7.7mmx58—basically a .303), the scope and iron sights are as required, and it weighs in at about 7 pounds fully loaded.

It's quite handy, the sight picture for both the scope and the iron sights is excellent, it points quickly, is easy to control, and somewhat to my surprise, the cheek weld with a pretty high mounted sight is natural. Even canting the rifle left to bring the right-offset iron sights into play is intuitive and not uncomfortable. I do need to find a sling. And I may think about a plastic stock in the future to get the weight down.

I'm looking forward to finding the loads it likes and getting some more use out of the newly resuscitated and re-purposed Arisaka. Like Kipling's Colonel's son and Kamal, old foes are now friends, and a rifle taken from the service of the Japanese Emperor is now in the service of a recovering US Naval officer.

And another relic from the back of the closet has foundanew life. '...The Colonel's son a pistol drew, and held it muzzle-end, "Ye have taken the one from a foe," said he. "Will ye take the mate from a friend?"...' AG

MACHINING

Mini Mill Upgrades

Here's how I improved my Harbor Freight mini mill.

BY GLEN CALVERT OCTOBER 2023

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After using my Central Machinery 44991 mill on a few projects, I decided to upgrade it with a belt drive system and air spring from Little Machine Shop (LittleMachineShop.com, along with digital readout (DRO) displays and a tachometer from Amazon. Since I was installing the belt drive and air spring at the same time, I reinstalled the motor on the headstock after I had drilled and tapped the holes for the air spring installation. Having the motor out of the way made it much easier.

Belt Drive Installation This mini mill uses a two speed gearbox to get the appropriate torque and speed from the PWM (Pulse Width Modulation) motor. I described the differences in the various models of mini mills in my previous article, "Mini Mill Overview" (August 2023). The gearbox uses plastic gears which are very noisy (I wear hearing protection when using the mill as is) and area known weak spot. The

belt drive system uses stepped pulleys to get the Lo/Hi speed ranges and bypasses the internal gears.

The smaller pulley is installed on the motor and the larger one is installed on the spindle. The motor mount has an upper and lower plate; the upper plate, which the motor bolts to, pivots on the lower plate and has a locking bolt to adjust belt tension. The parts are well made and the installation instructions are easy to follow. There are videos available as well. I'll cover the basics in this article.

The installation starts with unplugging the mill and inserting the spindle lock pin into the spindle so it doesn't rotate. The set screw in the spindle nut is removed and the nut is turned clockwise to loosen; it's a left hand thread. The set screw damages the spindle threads making it a little difficult to rotate the nut initially, so I cleaned up the threads with a file before reinstalling the nut.

The four socket head bolts that hold the motor mount to the headstock are removed and the motor and mount are removed from the headstock. I set the motor on top of the headstock and secured it with a bungee cord. Note the orientation of the motor on the mount relative to the power cable. The motor will need to be installed in the same orientation on the new plate. Remove the four screws that hold the motor on the mount. The retaining ring and small gear are removed from the motor shaft.

The gear may need a little persuasion to slide off. Keep track of the key in the shaft as it will be reused. Remove the screw from the plastic gear on the headstock and gently pry the gear off the shaft. Remove the key and install the plastic sleeve that comes with the kit on the shaft. The sleeve is a very tight fit and



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Plastic sleeve installed on small shaft. Above center: New components installed. Motor has not been installed to provide clearance for drilling and tapping the holes. The motor is secured with a bungee cord. The instructions say to soften it in warm—not hot—water. I waved a heat gun (low setting) at the sleeve until it was pliable, and it slid on without much effort. The sleeve is intended to prevent the shaft from dropping into the headstock.

The shaft is retained by the press fit in the bearings and I doubt it will fall out, but you never know. Remove the metal sleeve from the spindle, keeping the key in place. Install the new lower plate on the headstock with the supplied bolts and install the pulley on the spindle with the smaller diameter groove on top. Align the slot in the pulley with the key in the spindle. Push the pulley down as far as it will go. Install the spindle nut, tighten it counterclockwise and install, then tighten the set screw.

The gearbox needs to be in the neutral position after the belt drive is installed. The instructions state that lever should be pushed against the plate to be in neutral. I found the neutral position by turning the spindle and watching the shaft with the plastic sleeve to see if it turned. Moving the lever until the shaft did not turn indicated the neutral position; the lever was about 0.3" from the plate on my mill.

When the motor pulley is installed, align the slot with the shaft key, which is the smaller diameter groove facing away from the motor. The key on the motor shaft was a little too tall and I had to file it down so that the pulley would slide onto the shaft. Install and tighten the set screw. Bolt the upper plate onto the motor making sure the power cable orientation is correct. I had to enlarge one of the holes with a 17/64" drill because the bolt was binding against the side of the hole.

Install the belt on the pulleys before setting the upper plate on the lower plate. Install the pivot bolt and tensioning bolt and set the belt tension. The hole for the spindle lock pin on the new plate is smaller than the original and the original pin will not fit. Instead, I am using the largest Allen key that fits through the hole. The plastic spindle cover is flimsy and had to be spaced out from the headstock to prevent the belt from rubbing on it. I will fabricate a better one in aluminum.

Air Spring Installation Most mini mills use a torsion spring to offset the weight of the headstock when raising and lowering it. The issues with the torsion spring are that it doesn't do a great job in holding the headstock in position and it limits how close the spindle can get to the table. It also has a retaining collar on the right side of the mill column that prevents the installation of a DRO for the Z-axis. The



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Above center: Belt drive assembly completed. The hole for the spindle lock pin in the lower plate is smaller than the original, requiring a new pin. An air spring deletes the entire torsion spring assembly. The installation instructions are pretty good and there is a video linked to the Little Machine Shop website. I located and marked the hole positions on the top of the headstock, then drilled and tapped them. The bolts only have 0.25" thread engagement so I drilled the holes 0.75" deep and tapped them 0.5".

The diagram in the instructions is a little misleading as it shows the mounting holes centered on the slot in the headstock. The 60 mm dimension centerline should be located from the outside edges of the headstock, not the slot for the rack. The motor is normally in the way when doing this, so I did this task before I reinstalled the motor when doing the belt drive conversion. I marked the location for the hole in the rear of the column and drilled it. A new rack for the Zaxis is included and replaces the original.

The new rack and relocated upper bump stock increases the maximum spindle height by about 0.6" and the air spring allows the spindle to get 1.5" closer to the table. Overall spindle travel increased from 7.4" to 9.5". A T30 Torx bit is required to remove and install the rack

screws. Relocating the upper bump stop required drilling and tapping another hole on the front of the column. The upper bump stock was shortened to clear the air spring bracket on the top of the headstock.

Again, having the motor removed from Below center: The torsion spring collar is removed from the right side of the column and the spring assembly is removed from the left side. The headstock makes this much easier. The air spring is dropped down through the column and the nut is installed on the lower bolt, but not tightened. The air spring is installed on the headstock with the rod and brackets. When all the parts are in place, the bolts and nuts are tightened.

The torsion spring and mounting hardware are then removed. The collar on the right side of the column is removed first. The bolt assembly that rides in the slot on the left side is loosened and the spring assembly is pulled from the column. The cup that contained the spring is removed from the column. Note, the cross bar for the torsion spring interferes with the air spring rod and the nut on the back of the column cannot be fully tightened until the crossbar is removed.

The air spring does a much better job in holding the headstock in place. When you move the headstock, it stays in the new location.

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DRO Installation I decided to install digital readouts on the three axis to make machining parts easier and more precise. There are several videos on You- Tube, and I picked up a few ideas on how to do it. I found some inexpensive magnetic-type DROs on Amazon that had the needed travel length. The brand I used is Shahe and they are available in 6, 8, and 12-inch lengths. I used the 12 inch for the X and Z-axis and the 6 inch for the Y-axis.

The overall length of the DRO is about five inches longer than the effective measurement length, including the mounting brackets on the ends. The slider is 3.1" long and has tapped holes on the back to attach mounting hardware. Each DRO has a readout screen with on/off, inch or millimeter selection, and zeroing buttons. These are basic readouts and they don't have the offset and other functions found on more expensive models.

These DRO units use two CR2032 batteries (supplied) and have magnets on the The slider shown in the middle of the bar is attached to the base with an aluminum bracket. back. I stacked the three readouts on a thin piece of steel attached to the wall behind the mill. I installed the X and Y-axis DROs before writing this article so I can only show them as completed. The main task

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when installing the DRO is to ensure the magnetic bar is parallel to the axis travel so the slider does not bind on the bar.

The mounting brackets are slotted to help do this. On the X-axis, I installed a piece of one-inch aluminum angle to the rear of the table using existing tapped holes and attached the bar to the aluminum angle. The slider was attached to the mill base with a bracket made from thin aluminum sheet, again using existing tapped holes. The existing holes made this part of the installation much easier than having to remove the table to drill and tap them.

The aluminum angle covers the magnetic bar and slider which helps keep the chips off them. The hardest part was getting the accordion baffle reinstalled. The Y-axis DRO installation required drilling and tapping holes on the left end of the mill, in the base for the bar, and in the table for the slider bracket. The left side is readily accessible so this wasn't too difficult. The bolt at the left rear corner of the base had to be permanently removed to make room for the bar.

Removing the torsion spring collar opened the right side of the column for the Z-axis DRO. After marking the new upper and lower

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Far I placed them on a thin steel sheet in a readily visible location. travel limits on the column, the mounting hole locations for the bar and the required shape of the slider bracket were established. I used a gib adjustment screw and nut to secure the slider bracket to the headstock. With the slider bracket in place and the screws holding the bar to the column loosely installed, the headstock was moved through its full travel to align the bar with the travel and the screws tightened.

The tapped holes on the back of the slider are through holes and depending on the thickness of the bracket, the screws can bottom out on the magnetic bar, locking the slider. This type of DRO required spacers behind the bar mounting brackets to provide clearance for the slider mounting bracket and screw heads. Each installation is different, so some fitting is required.

I'm happy with these DRO units as they've proven to be accurate and they make life easier when moving the table and spindle to the desired position. The 12" DROs cost

\$40 each and the 6" one was \$20. The sensor and magnet are on the bottom. Below center: The sensor, shown on the right at the spindle, is mounted on a bracket that is bolted to the headstock with the threaded bar from the torsion spring assembly. Twelve volt power supply plugs into the back.

Tach Installation The belt drive reportedly increases the max speed in the Lo range from 1,200 rpm to 1,700 rpm and from 2,500 to 4,300 in Hi range. I typically use the Lo range when milling. I decided to try a cheap digital tach from Amazon to measure the spindle speed. The tach uses a Hall effect sensor and a small magnet that attaches to the spindle. I made a bracket to hold the sensor at the spindle and bolted the other end to the headstock using the large, tapped hole and threaded bar from the torsion spring.

The magnet pole orientation is critical so I checked it for function before gluing it to the spindle. I mounted the readout in a small plastic electrical box and mounted it

to the headstock using the screw and nut that held the pointer for the Z-axis scale. The tach requires 8 to 18v so I used a small 12v power supply that plugs into the rear of the box. The tach worked fine, the max speed in Lo range measured 1,865 rpm.

The readout doesn't drop to zero immediately after stopping the spindle; it takes several seconds to zero. Starting the spindle again displays the correct rpm. The tach only cost \$19 so I really can't complain. The mill is considerably quieter with the belt drive (I don't have to wear hearing protection when using this mill anymore) and it should be more durable. The extended Z-axis travel is very useful and makes setups easier. The DROs are well worth the time and cost to install them.

These upgrades were relatively easy, not overly expensive, and made a marked improvement in this mini mill. These upgrades will fit many brands of mini mill of this size. The LittleMachineShop.com website has compatibility lists for the belt drive and air spring. AG

RIFLES

Mosin-Nagant Modifications

The story of a very un Mosin-Nagant with notes on the current state of sporterizing classic military rifles.

BY PAUL MAZAN OCTOBER 2023

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An untold number of gunsmiths of my generation learned their trade sporterizing and customizing surplus Mauser rifles. Back then, they were cheap and plentiful and we could all afford to learn by doing. Today, Mausers are no longer cheap and this generation has looked to surplus rifles of the Cold War period to find guns to learn and practice their skills on.

Before my son passed away from complications of Covid, he was trying to convince me that the Russian M1891 Mosin-Nagant rifle, invented in 1891, was his generation's equivalent of the Mausers we learned gunsmithing skills on. I acknowledged that the Mosin filled the niche of an inexpensive and plentiful surplus rifle but questioned the wisdom of doing all that work to just end up with a customized Mosin.

The Mauser was and is a great design that lends itself to refining while the Mosin was designed to be abused by peasants and still function. Both rifles are tough, reliable, and will continue to operate in extreme conditions with little maintenance. The difference is that the Mauser accomplishes this with the elegant engineering of a German luxury car while the Mosin is engineered to have all the toughness and aesthetic appeal of a farm tractor.

I was recently at a local auction when the perfect example of what my son was trying to tell me came up on the block. Here was a Mosin-Nagant originally made by New England Westinghouse under contract to Russia. When the Bolshevik revolution took place in 1917 all the orders were canceled and the American manufacturer was left holding the bag for the units they had produced. These have since become very collectible and therefore rather expensive as Mosin-Nagants go.

Unfortunately, having been altered, this one is no longer in that category. However, it is still a very well made rifle with a pristine bore that serves as an example of what can be done after turning a run-of-the-mill military surplus rifle into a project for the beginning gunsmith. Let's take a look at what was done, why it was done, and what we can learn from it. We'll start with the walnut stock. The forend was shortened in the manner normal to sporterized military rifles.

However, whoever did this one took the pains to taper the forend. The addition of spacers, a pistol grip, grip cap, and checkering make this Mosin-Nagant a unique and personal firearm.

MOSIN-NAGANT MODIFICATIONS CONTINUED

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and leave it with a very pleasant and finished look. The most impressive work was done in the wrist area. The standard military stock is a straight grip and there is not enough depth to change it into a pistol grip with a grip cap as was done here. In this case it appears the bottom of the wrist area was flattened and another piece of walnut was added to the bottom to allow a pistol grip—complete with grip cap—to be formed. The line where the two pieces of wood meet was hidden by checkering the area.

Despite the grip cap being too prominent for my taste, the work was excellently done. In fact, it was done so well it had me thinking it was an after-market Removal of the large military sight and installing a more conventional sporter sight streamlines the outline of this utilitarian Mosin-Nagant. The removal of the military rear sight required a much lower front sight blade. The previous owner made an interesting choice on a replacement blade. stock for awhile.

When I couldn't find an aftermarket stock that had the sling attachment and the finger grooves, I took a closer look and found where the wood had been added. The checkering is coarse and the diamonds not brought to a point. This type of checkering is reminiscent of some European and English guns I have seen and goes along well with the overall design of the gun. Two black plastic spacers at the butt end appear to have been added to extend the length of pull as they do nothing to moderate recoil.

All in all, the craftsman that did the stock is a fine woodworker. Moving on to the metal-work I very much appreciate the modification. A sniper bolt with a longer handle sculpted to a more useful position as well as adding leverage to ease opening and closing the bolt. A bolt handle. The sweep and curve bring the elongated handle to the right position for fast and sure operation. The length of the handle provides great leverage, making bolt operation much easier than with the stubby handle of the standard rifle.

I believe this was the bolt from a sniper rifle and the handle was heated and altered. The numbers on the barrel, bolt, and trigger guard are all different indicating that items were added and are not original to the gun. Unfortunately, the polishing done to the barrel and action before rebluing was both not enough and too much. It was not enough in that it did not remove all the pitting on the receiver and the gun was reblued over the pits. On the other hand, the barrel was buffed to death.

So much metal was removed from the barrel that the lettering is all but erased. It is not that the finish is bad, it looks pretty good but erasing the lettering reduces the value of the rifle considerably. The military rear sight was removed and the shortening of the barrel also removed the military front sight. A dovetail was cut for the rear sight and a sight marked "Savage Arms Company" was in-

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stalled. I assume this was simply a rear sight the owner had available. The front sight base is soldered in place and fitted with a curious sight blade that almost looks like a dulled down checkering cutter. With all the work that was done on the wood and metal I can only guess that the owner had enough and decided that the buttplate didn't need the polishing and bluing that the rest of the gun received. We are left with an interesting but strangely incomplete project.

Much as I would like to return this gun to its military configuration, the shortening of the barrel and destruction of the markings insure that it will never have the collector value it might have if left unaltered. Being me, I just couldn't leave well enough alone so I polished and blued the buttplate, modified the grip cap, replaced the front sight blade, and polished the bolt. It is sort of making a silk purse from a sow's ear but I simply couldn't resist finishing the project.

A trip to the range involved getting the gun on target with the new front sight blade and proved that although lacking the elegance of the Mauser, the Nagant is more than accurate enough for hunting and casual range work. All in all an interesting and very fun project

for the beginning gunsmith. Sporterizing was a great way to learn gunsmithing because surplus rifles were readily available and cheap.

As time marches on, what used to be cheap surplus are becoming historical pieces garnering increasing interest as collectibles. Even the Mosin-Nagant has seen increased popularity by collectors. As reported in these pages ("Rock Island Auction Company", March 2023) audits of firearms auctions in the past decade has revealed the average Mosin-Nagant price has tripled.

In 2015, a Mosin-Nagant averaged \$211.83 in price, inching up another \$32.33 in 2016 before rocketing up more than \$200 in 2017 and holding that average for the next three years before continuing up to \$692.69. Of course, top pricing assumes a specimen in top condition, with original serial numbers, all as-issued accessories, etc.

Lesser quality pieces, particularly one with significant wear or having already seen modification (particularly if the sporterizing attempt was less than stellar), can be had for much less. An unwanted old rifle lacking good qualities won't appeal to collectors but might still be an ideal vehicle to learn and use your gunsmithing skills.

AG

MAINTENANCE & REPAIR

Problems Spring Out

Sometimes luck is better than being good. Previously missed by two gunsmiths, here's how I stumbled unto a fix for a customer.

BY KENNETH FINLEY OCTOBER 2023

ORIGINAL PP. 18-19

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A customer brought in a problem that except for a bit of luck was almost a stumper. He had a Ruger P85 that would not break down for cleaning. I wasn't too alarmed at first. I like and own several Ruger firearms and have found some of them have rather strange conventions regarding taking them down for cleaning—Ruger Standard and Mark II- III being good examples. The P85 is a full-sized, all metal 9mm semi-auto that is hammer fired.

As with any semi-auto pistol, the first steps were to make sure the magazine was out, the chamber empty, and the safety set to On with the white dot showing. I downloaded the owner's manual and looked for instructions. They were unusual—with the slide locked back, you have to reach down through the ejection port with your finger and push the ejector down into the magazine well. At first, I could not help wondering if this wasn't anew approach to acquire an "M1 thumb".

However, with the appropriate caution my finger remained uncrunched. With the slide locked back and the ejector pushed down to clear the slide, I continued. Here was the basic problem: What you are supposed to be able to do next is release the slide and

The lanyard loop at the base of the grip shows its heritage of being entered in the US Army's 1984 competition to replace the venerable 45 ACP M1911A1. let it move forward to the point where you can push out the slide stop.

Ruger came up with away to capture the slide stop, eliminating the need to completely remove it. The slide stop retaining spring is set into the side of the frame. Trust me, you do not want to remove it. At this point the slide is supposed to simply slide straight forward off the rails, retaining the barrel, guide rod, and recoil spring as a complete sub-assembly. That was the customer's problem: the slide would move to its usual position and lock up.

Reversing the process resulted in a pistol that would fire reliably. Thinking it possible that some debris was jamming the action, the owner had tried using an ultrasonic cleaner to clean the pistol. After it dried, it functioned reliably but would still not break down. That is when I received the pistol. Following the above procedure, it did the same thing for me. I could not remove the slide from the frame using the recommended procedure. This project had three aspects.

First, I had to successfully disassemble the pistol. Second, once disassembled diagnose the cause of the problem. Third, return the pistol to a functional condition with all features intact. I restored the pistol to firing condition and walked through the procedure with no success. Observing the relationship of the barrel and slide during the attempts, it was clear that the barrel was locking up firmly between frame and slide even with the slide stop pulled all the way out to its stop.

Removing the stocks from the frame provided no additional clue. I locked the frame in a vise and attempted to tap the slide off with a brass hammer. Whatever was holding the pistol together was buried deep inside the frame where I could not see it. I attempted to insert a thin flexible spring steel probe from the front with no success. I tried inserting the probe up through the magazine well and into the space between slide and frame. Whether that worked or I got lucky, I do not know.

However, my next attempt To disassemble the P85 for cleaning, first lock the slide back and press the ejector down to clear the slide.

PROBLEMS SPRING OUT CONTINUED

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to walk through the procedure saw the slide move forward an additional 1/8" before sticking. I tapped the rear of the slide sharply with the heel of my hand and the slide assembly reluctantly began to slide off the frame. A couple more taps resulted in my holding the problematic slide in my hand. I examined the slide and found the recoil spring's open end was riding up over the rim of the spring guide rod. The tolerances within the pistol are so tight that this caused a problem.

The recoil spring is coiled spring steel that is closed on one end, very slightly flared and open on the other. Examining the recoil spring and guide rod more closely revealed the flare at the lower right end of the spring is barely noticeable. The upper left end fits very securely on the guide rod. The flared end is supposed to fit into the front of the slide when reassembling the pistol after cleaning. Ruger did a very nice thing here.

With the expanded end fitting snug into the end of the slide, and the closed end secure on the guide rod, parts are much less likely to go flying when the pistol is torn down for cleaning. If, however, the unsuspecting user reverses the spring because it goes together more easily, problems might well occur. The pistol certainly goes together easily with the spring in the wrong position, and if nothing causes it to The spring is slightly flared on one end.

The closed end fits tightly over the guide rod and fits into the groove at the base of the rod. Far With the slide stop pulled out to the take down position, the slide would not leave the frame. ride up over the rim of

the guide rod, it will break down exactly as designed. On to correct assembly. The correct orientation of the recoil spring when inserted on the guide rod is crucial. The closed end drops slightly into the groove of the guide rod helping to keep the spring in place during assembly and disassembly.

The flared end requires some pressure to fit into the end of the pistol slide and requires some pull to get it to disengage. To an individual inexperienced with the pistol, this could lead them to assume the spring installs reversed. I have to admit this fix was "Gunsmithing Lite". On the other hand, this issue initially stumped two other gunsmiths. Even if the cause and solution gives you a laugh, it's something to consider. Parts, springs or otherwise, might not be reversible even if they appear to be.

Mel Brooks in History of the World: Part I repeated the phrase "It's good to be the king." I would say "It's good to be lucky." I freely admit that luck may have played a significant role in getting the spring to slip off the rim and let the slide off the frame. When I tried to tap it off with the brass hammer, I was very concerned about damaging something internally. Continually cycling the slide and then attempting to break it down may have caused the spring to slip off the guide rod rim.

It is also possible the flexible bit of metal slid up through the grip may have pushed it off. Either way, the pistol is restored to function and returned to the happy customer. AG

PISTOLS

Legal Compliance

Like it or not, legislation may mandate modifications to firearms and/or magazines. Here's how to get guns into compliance.

BY ROBERT K. CAMPBELL OCTOBER 2023

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At American Gunsmith, we deal with the nuts and bolt of technical details. Just the same, it is foolish not to keep abreast of the law. A simple mistake can be ruinous. For one recent example, the ATF issued a bulletin on wrist braces and stocks for AR-type pistols that arbitrarily made previously legally-purchased items illegal. This forced some folks to scramble and bring their firearms into compliance or to file paperwork to remain in compliance or potentially face legal consequences.

I am not an expert on this one; like many, I don't study things that don't concern me but no man is an island. It is a terrible thing for a government to rule something legal then change their mind a few years later, potentially turning law-abiding citizens purchasing items in good faith into criminals by mere possession of said items. This is the type of environment that makes it difficult for business people to invest and plan ahead. Certain politicians view business people and gun owners as adversaries.

It doesn't matter where you live—a free state or a people's republic as we often say with a grain of truth. As a young man in a wonderfully free southern state, I've watched the people suffer through disastrous changes overnight. A Democrat governor and former segregationist—they never change, he simply realized he needed a political future—managed to push a law through that mandated one handgun a month purchases.

He was one of Carter's men and was later rewarded with an ambassadorship to Saudi Arabia where we did his best to rehabilitate their reputation. Below center: Ruger's five-round 10/22 magazine is readily available. As recent events show he simply taught them to cover up their atrocities. At the time few states had shall issue concealed carry. One of my friends is a retired New York Cop still living there and has noted those who needed permits could not get them.

In New York City and especially New Jersey, only celebrities or the Mafia had carry permits. In the south the well heeled and politically connected could obtain

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Far a permit. While supposedly out of the Jim Crow era some kept the trappings with gun control laws and limited gun permits. Be vigilant! Many young people do not realize how difficult the era was as far as gun rights. Human rights and civil rights gradually improved. We have shall issue laws but this bit of history is a warning of things that may happen again if certain folks get their way. Addressing Issues Recently a correspondent contacted American Gunsmith with concerns about impending laws in his home state.

He articulated his concerns that adjustable stocks are being targeted and wanted to know the best approach to changing a Colt AR-15 adjustable stock to something like the original solid M16type stock. He asked if this just a screw off/screw on change. Also, he asked about best practices for converting box magazines to a capacity of less than ten rounds due to a bill proposed in his state that would ban anything holding ten or more rounds.

He owns AR-15, Mini-14, M14/M1A, M1 Carbine, Glock, and standard Ruger 10/22 rotary magazines, all of which could be impacted. With concerns voiced I took a hard look at solutions. While some of these concerns are theoretical, some are real. As one example, the original 1994 Assault Weapons Bill ("It's a Crime, Bill") of the Clinton era banned production of new magazines with a capacity over ten rounds but did not outlaw possession of older firearms.

Before sunsetting in 2004, some firearms owners are surprised to learn this ban existed! While there are other details, we are primarily concerned with magazine issues. With the M1 Carbine I hit a block. A proposed ban one correspondent mentioned limits capacity to 9 rounds, not 10, as the previous bill had, although most firearm prohibition bills normally limit capacity to ten rounds. There are any number of pistol magazines available for the Glock and other handguns with a ten round capacity.

You will have to spend money and either destroy, turn in, or ship such magazines to another state if older magazines are not grandfathered in. The same may be said for AR magazines. Let's consider some options. Before I go further, it is critical to check your local laws and any proposed legislation likely to pass. Under some legislation, it may be legal to convert existing magazines, while it is not in others. I suspect the modification must be permanent, but it might not be.

I understand the mechanics but the law may be more complicated. While I hold a degree in Criminal Justice, it's along way from pre-law study. Magazine manufacturers such as Magpul offer magazine capacity blockers (Product code: MCL_Pmag10_30). Magpul's magazine blockers are available for \$4.95 each or in packages of three for \$10.54. The blocker may work with other

LEGAL COMPLIANCE CONTINUED

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similar magazines as well. These devices are simple enough. To use the ten round blocker the magazine is disassembled by removing the floor plate of a PMag magazine by depressing the plunger on the base pad and slide the base pad away. The floor plate and magazine spring are removed and the blocker is inserted into the magazine. It is possible to epoxy the base into a permanent fix, however, Mag Pul issues a warning: "This will NOT make a banned magazine legal!"

This product is intended for TEMPORARY capacity reduction of PMAG AR/M4 GEN M3 magazines. This product does not constitute a permanent capacity reduction. The user is responsible for knowing applicable laws in any jurisdiction that restricts magazines based on capacity or regulates magazine capacity for hunting. Please check all state and local laws and regulations to determine the legality of your host ammunition magazines." So, perhaps the blocker modified magazine may only be legal for hunting?

Many states had capacity restrictions in place in the hunting field long before we began hunting with the AR-15. I am stating the resource and its availability but the legal quandary is a serious one. If magazines are limited to nine rounds I bet Magpul will make one. When it comes to the Ruger 10/22 the solution is much easier as Ruger already offers a five round magazine, SKU: 90041. When it comes to other magazines, take time and study the problem as well as the legislation concerning them.

I would not yet stock up on magazine limiters but the problem is worth a look and may be a suitable fix. If not, a certain moral ground exists. Sending the magazines to a free state is one answer. Selling them at what will likely be an elevated price is another. Permanent modification is another. With metal body magazines

there are viable modifications. It is simple enough to modify an existing magazine with a punch and creating a divot in the magazine body.

This divot is punched into place below the carrier at the spot the carrier supports the desired number of cartridges. Load five to nine cartridges (or whatever the arbitrary limit is) and mark the space on the magazine needed to be modified. Take a punch, being careful not to actually punch through the magazine, and drive it into the magazine body creating a divot preventing the magazine from accepting a full load of cartridges.

I would like to have a letter from the attorney general before I did this work as it may be a waste of time otherwise. According to many sources telescoping and other adjustable position stocks are on some attempt to ban lists. This can be addressed by changing out the standard AR-15 butt stock, which is simple enough. A quick check at Brownells and other outlets located no less than sixteen types of fixed stock options for the AR-15, ranging from around sixty dollars to several hundred dollars in price.

Some are inexpensive and others are highly elevated target-grade stocks. Some notes on a stock swap. First, before attempting any type of modification, be certain the rifle is unloaded. To change the stock remove the upper receiver from the lower receiver. The buffer and buffer spring are easily removed from the rifle. Remove the flat head screw at the rear of the AR-15 buttstock. Screw the buffer tube out and away from the lower receiver. Don't lose the buffer retainer spring!

The buttstock itself usually slides from the tube by releasing a small tab or button. Simple as that! Let's hope that we do not have a business with modifying firearms to lower capacity as an important part of the day. Just the same, be prepared for the possibility. AG Far

READER FORUM

Reader Forum

BY AMERICAN GUNSMITH EDITORS OCTOBER 2023

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Gunsmith Poll We conducted a poll of gunsmiths on our Facebook group (FB.com/ groups/american-gunsmith). Of the 205 responses, the results were 41% are current gunsmith (either full or part-time), 32% work on their own or friends' guns in a non-professional capacity, 19% consider themselves general gun enthusiasts, and 8% are either serious gunsmith hobbyists or former gunsmith/retired from the trade. Thanks to everyone that responded! Free Gunsmith Video Series We have a free gunsmithing video series online.

The topic emphasis is building match-grade AR-15 competition rifles. See the series at AmericanGunsmith.info/free-gunsmithing-videos. KBC Time Savers Are you happy with the state of your toolroom or toolbox or does it look like a 15 year old's bedroom just before mom does the laundry? Even if you keep a decent toolroom and work area, would you and your shop benefit from going through some sort of reorganization effort?

Studies show that many have made the leap to a better organized floor using an inventory management system. Vending machines are a natural representation of the best possible inventory management system by having and displaying what you want when you need it. Before implementing a vending system, you need to determine feasibility. How large is your facility? How many employees do you have on the floor? How many work stations are you currently stocking? How far does one have to walk to re-tool on consumables?

Do you have a core group of tools or consumables that represent 50% or more of your budget? Is your spend over \$75,000 a year? If you don't have a minimum spend and a highly concentrated usage of specific items,

your buying power as a vending customer is just not there. For a vending machine to be viable there is a cost associated with the machine and usually an agreement to purchase a certain dollar amount within a specified time frame with the budget growing yearly.

Most companies offer a slightly different version of the same program. What if instead you could get the simplicity and efficiency of ordering products as needed without all of the commitment and size constraints associated with vending machines? Plus get the labeling and support to further organize your facility with a place for everything, and everything in its place? Due to client demand to help improve the speed and ease of purchasing and reordering KBC Tools & Machinery recently added their KBC Tools App.

Available in the United States and Canada in the Apple and Android app stores, this app puts all of KBC's 100,000+ sku's in the machine operator's hand on site, in the cafeteria, or in the toolroom. Unlike some existing programs that first appear to reduce manufacturers' overall spend but end up locking them into long term vending programs with huge margins on incidental spend and annual contracts requiring a minimum spend to keep the vending machines on site, KBC's App approach doesn't require this lock in.

Customers can buy where they want without contractual obligations. It helps standardize product purchases by allowing customers to create templates of commonly bought products for quick ordering, with common pre-made templates available. A reorder can be made from previous purchases with just a click. Your mobile device can scan barcodes to look up exact items and no data entry

READER FORUM CONTINUED

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means no mistakes and no paperwork. KBC can create Barcode Labels for your toolroom for ease of identification, specified storage locations, and quick replenishment of critical MRO supplies. The app helps determine optimal min/max levels for each SKU based on usage and inventory requirements for LEAN, Just in Time, or Just in Case ordering. This works for a busy one person manual machine shop or a 500-person CNC manufacturing facility.

For time savings in your machine work, KBC offers their Octane Chip Guard T-slot covers for T-slot tables to save shops money and machinists and tool and die makers clean up and set up time. Those ever-common T-slot grooves quickly fill up with metal chips and need cleaning on a regular basis and before the next tooling set up. Chip Guards eliminates the hassle, the mess, and the potential eye injuries from operators blowing those chips out of the T-slots.

Derek Pulsifer, President of Octane Workholding LLC, offers the following break down. "A conservative estimate based on a small shop with one machine and a \$90/ hour shop rate based on 250 working days a year running a single shift, a shop is spending \$1.50 per minute. The Octane Chip Guard easily saves 15 minutes per day and often much more than that. That equates to \$22.50 saved per day, and \$5,625.00 per year on a single machine.

Automatic washdown is possible when the swarf can easily be evacuated, making cleanup a thing of the past for many shops. We have customers with hundreds of machines, some with bed lengths longer than train cars and their return on investment can be staggering." Octane Chip Guards are made from a high temperature silicone and come in 10 foot lengths in a bright and attractive blue and in the most popular T-slot sizes, (9/16"/14mm, 5/8"/16mm, 11/16"/18mm, 7/8"/22").

The flexible silicone Chip Guards are durable and washable and reusable should you need a different setup. Installation is easy with no special tools required: Measure the length you need and trim with a utility knife. You can measure the full length of your table or around workholding setup, whichever you prefer. Apply a rust preventative to the T-slot and along the cover, this protects your bare metal surfaces and aids in installation. LPS3 or similar is recommended.

Pinch the flexible legs and press straight down into the T-slot. If the Chip Guard is difficult to install, place one end in the T-slot. Next, pull the opposite end with your free hand and begin pressing the Chip Guard along the groove from the starting side. Stretching the Chip Guard in this way reduces its width for the perfect fit. Press the Chip Guard until it is flush with the T-slots chamfer. The compressed silicone will retain itself for a very secure hold. AG

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Precision Arms Workshop

The American Gunsmith Archive

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