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PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

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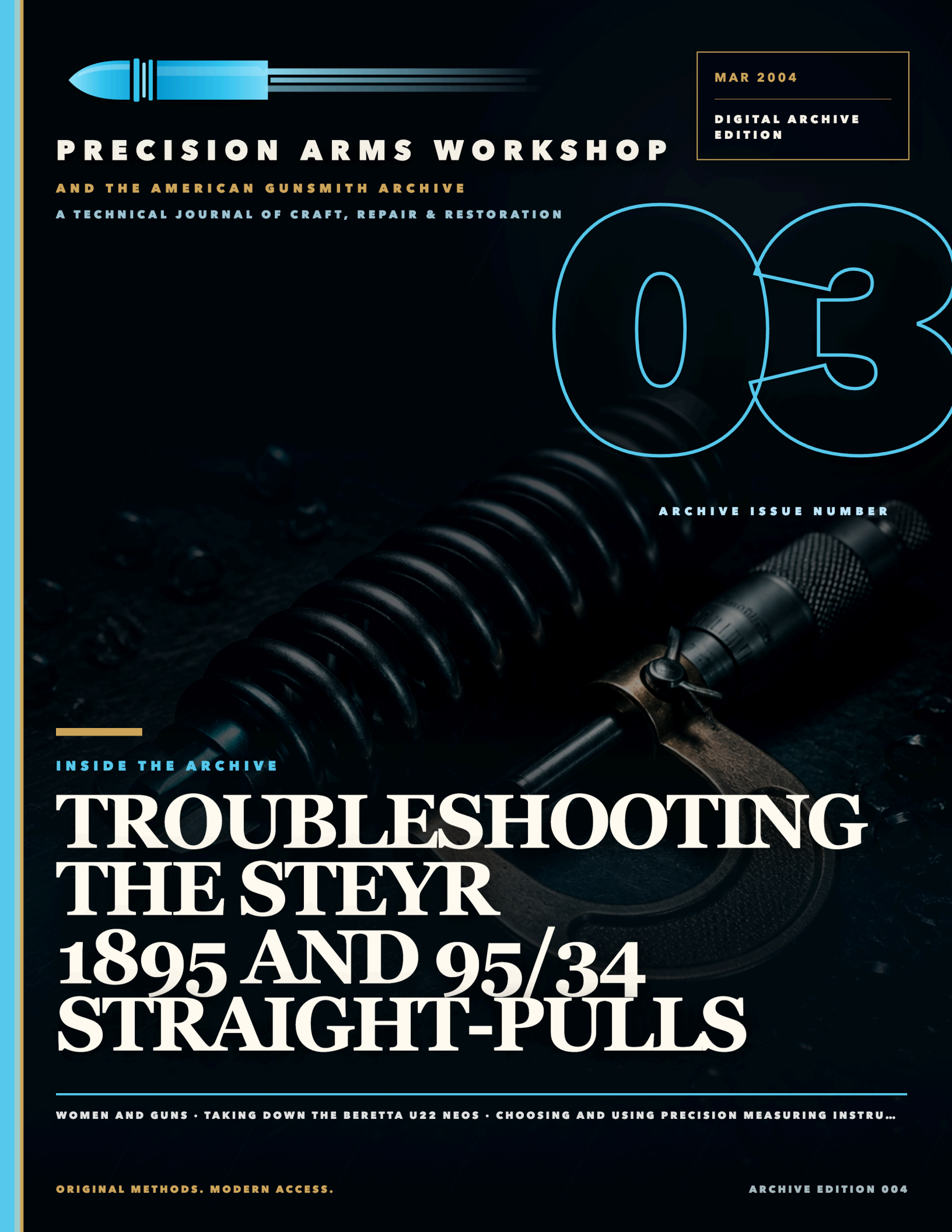

INSIDE THE ARCHIVE

TROUBLESHOOTING THE STEYR 1895 AND 95/34 STRAIGHT-PULLS

WOMEN AND GUNS · TAKING DOWN THE BERETTA U22 NEOS · CHOOSING AND USING PRECISION MEASURING INSTRU…

DIGITAL ARCHIVE EDITION

Preserved for the bench.

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A complete guide to the searchable editorial work preserved from March 2004.

HISTORY

Women and Guns

BY AMERICAN GUNSMITH EDITORS MARCH 2004 ORIGINAL PP. 2

R. L. Wilson's Silk and Steel, a just-released and richly illustrated encyclopedic history of women interested in firearms, is receiving strongly positive reviews, according to the NSSF's Bullet Points newsletter, in part for revealing little-known facts about women's contributions to recreational shooting. Dame Juliana Berners, an English nun, for instance, wrote the first book on hunting in 1486. And, in 1851, women comprised half the working gunsmiths in London.

Women and Guns Another book, Blown Away: American Women and Guns, is in the final stages of production for release in April. It presents a much more contemporary examination of the sociological and political issues concerning women about guns. Journalist Caitlin Kelly, who attended one of NSSF's "Aiming for Accuracy" media seminars, pulls no punches in her investigative work.

It's an in-depth scrutiny of issues defining perceptions in popular culture about firearms and the reasons why American women want to own them. Invitation to New Women Hunters. The NRA's Women On Target ® program continues to increase sporting opportunities for the fastest-growing segment of the hunting community. The program had barely announced its ladies-only hunting schedule for 2004 and early 2005 before several of the events sold out. But there is still time to register for others.

Eleven hunts are offered in game-rich locations throughout the country, offering women of all experience levels the chance for success in the company of other women who love the outdoors. Giving women a good hunting experience and the chance to meet others of like mind are equal goals of the program. Registration forms and additional details about the 2004 and early 2005 hunts may be obtained by calling or by visiting More Diversity in the Shooting Sports. Kenneth V. F.

Blanchard, formerly in federal law enforcement and nowa pro-gun activist known on the internet as Blackmanwithagun.com, seeks to reach other African-American gun owners, hunters, military and law-enforcement personnel, trainers, and novices interested in the shooting sports. In the early 90s, Blanchard founded the Tenth Cavalry Gun Club, named for the famous "Buffalo Soldiers," with chapters in New York, New Jersey, Illinois, Maryland, and Washington, DC.

His web site has been around since 1997, and already has a fan base in six other countries outside the U. S. "Americans of color have been apart of the gun culture since the country was colonies..." says Blanchard. "We still are sometimes a segregated society where it comes to firearms.

I'm looking to change that so that we can profit from both the inclusion of what's going on and the power of being connected with others who like the same things." "If you have African-American friends who hunt, shoot, or participate in the shooting sports, please send them an invitation to contact me." Blanchard can be reached at or at Kenn@ Black manwithagun.com. Editor Keith Lawrence Technical

PEOPLE & COMPANIES

Taking Down the Beretta U22 NEOS

It appears to be patterned after a space hero's ray gun, but it shoots .22 Long Rifles rather than a death ray.

BY CHICK BLOOD MARCH 2004 ORIGINAL PP. 3-6

When I was a little fellow and radio ruled as in-home entertainment, I sent in a cereal boxtop plus some chump change for a replica of a Buck Rogers ray gun. Or was it a Flash Gordon? I forget, and which space pioneer it was doesn't really matter. The pistol I finally received (please allow 4 to 6 weeks for delivery) looked a lot like the Beretta U22 of today with its swept-back trigger guard and overall racy appearance. Of course, the ray gun merely spurted sparks when the trigger was pulled.

The NEOS spurts .22 Long Rifle. But after opening the box the first time, I couldn't help wondering if the Beretta USA Engineers and Giugiaro Auto Designers who collaborated on the gun hadn't gotten a peek at that ray gun from the past. The pistol's name, NEOS, is from the Greek for "new." It is being touted as a starting point for a complete line of Beretta handguns that would be ideal for entry-level shooters while being modular in concept to allow easy upgrading for more advanced shooting needs.

Interchangeable barrels and grip frames are expected to be among the possible upgrades. The gun field strips without special tools, but with a couple of important caveats. Basic Disassembly The magazine is out, the chamber is empty, the safety is engaged and you are wearing eye protection. Pull the slide to the rear. Lock it open with the slide stop (#51). Press in on the barrel-lock screw (#60). This frees the barrel nut (#52) to be turned clockwise and release the barrel from the receiver (#56).

Pull the slide rearward, press down on the slide stop if it hasn't dropped down on its own, and control the slide as it moves forward and off the receiver. Why the control? The slide is under pressure from the recoil spring. Releasing the stop without holding on to the slide can fling the slide off the frame with two possible consequences: (a) the slide can get damaged or (b) the flying slide could hurt someone or something—maybe your other hand.

Just in case you forgot to engage the safety, do it now or keep your finger off the trigger. Otherwise, you could easily"touch off" the firing pin and the pin is under strong spring tension. This takes care of field stripping. As you go through additional disassembly, take careful note of how all springs are positioned in relation to the parts they affect. Detailed Disassembly It seemed to me that the firing-pin guide (#22) was the key element in the U22 NEOS.

BESIDES HOUSING THE FIRING-PIN ASSEMBLY, IT WEARS A BOTTOM

lug that fits into the receiver as well as an upper lug serving to limit rearward travel of the slide by fitting into the barrel extension (#15) identified in the parts list as the "strap." About that lower lug: In earlier model pistols, its muzzle end was fully radiused. Now it is partially radiused and has a corner on the right-hand side.

If you ever have to replace the firing-pin guide from an early-model pistol with a newly configured guide, you will have to use a scraper on the guide-receiver recess to accept the corner just mentioned. What you don't do is attempt to transform the newer guide into an older design. These comments about firing-pin guide replacement are for your information only; you'll probably never have to put the information to use.

Like many other components of the NEOS, the guide isn't for sale by Beretta and I doubt scouring the aftermarket would turn up any either. Things could change about parts availability, however. They have before. Removing the guide calls for disengaging the safety, compressing the end of the firing pin slightly on a protected bench surface, pulling the trigger, and easing the pin and its spring out of their housing. (See the red dot on the end of the pin?

It's the "locked and loaded" indicator.) Below left and The guide body is attached to the safety insert (#43) by the guide screw (#21). The safety insert fits into the polymer receiver (#56) and the ejector block (#59) is retained in the receiver by the grip screw (#42). A 5mm hex wrench is used to remove the screw, and the block can be drifted upwards from the receiver after its retaining roll pin (#55) is pushed out. A brass or nylon rod is recommended for drifting the ejector block.

Note that the guide screw is installed with red Lok Tite, should be periodically checked for tightness and reinstalled using red Lok Tite. "Hold on there," you say. "Red Lok Tite requires 450 degrees of heat in order to defeat it, right?" Yes, you'd need the heat if the bond were metal-to-metal, but the safety insert here is polymer.

What you do need to remove the screw is a slim-diameter, perfectly fitting screwdriver blade. (Slim diameter because the opening in the guide body won't accept anything else, and perfectly fitting because the screw head slot is quite shallow.) One of Brownells Mag Na Tip bits can be ground to meet both requirements, but I found that the #26 bit from the Chapman Gun Screwdriver Kit suited extremely well without modification. There's another thing about the guide screw.

When the guide is B Aremoved from the safety insert, the sear assembly (#24, 25, and 26) will usually pop out. Notice how #25 seats in #26 and how both fit into #24. During reassembly, you can preassemble these parts by holding them together with a dab of white Lithium grease or Vaseline. The key fact here is that sear-assembly part #26 is the safety plunger. Leave the sear itself (#23) alone. It's held in by a press-fit, knurled pin (#27).

The grip frame is separated from the receiver by pressing down and forward on the frame's upper lug, visible through the cutout in the receiver in front of the barrel lock nut. The result of the separation will more than likely allow the slide stop (#51) and its spring (#52) to drop from the receiver. The Colt Woodsman behaves in a similar manner, and who knows how many of those tiny slide-release springs have wandered away when the right-hand grip was taken off a Hi-Standard Victor.

By now, the trigger bar (#30) will have popped up above the receiver rails. Rotate the bar fully forward, remove the trigger pin (#50), lift out the bar, its spring, and the trigger, and move to the rear of the receiver. Look closely at the right-hand safety lever (#33). In its midsection is what appears to be a pin. Actually, it's the safety-lever retainer (#44). Under it is the retainer spring (#43).

On the other end of that spring is the safety-wing retainer spring (#45), safety body (#46), safety detent/ lock-plunger spring (#47), and detent G

1 Barrel 2 Strap Screw* 3 Strap Dowel* 4 Barrel Rib* 5 Front Sight Cross Pin 6 Front Sight 7 Front & Rear Barrel Rib Screw* 8 Rear Sight Elevation Screw 9 Rear Sight Blade 10 Rear Sight Windage Screw 11 Rear Sight Windage Spring 12 Rear Sight Body 13 Rear Sight Elevation Spring 14 Cross Pin Assembly* 15 Strap* 16 Extractor 17 Extractor Plunger 18 Extractor Spring 19 Slide 20 Slide Spring 21 Firing Pin Guide Screw* 22 Firing Pin Guide* 23 Sear* 24 Sear Plunger* 25 Sear Spring* 26 Safety Plunger* 27 Sear Pivot Pin, Knurled* 28 Firing Pin Spring Beretta U22 NEOS Semi-Auto Pistol 36 Magazine Button 37 Magazine Body Assembly 38 Magazine Spring 39 Magazine Bottom Retainer 40 Magazine Bottom 41 Grip 42 Grip Screw 43 Safety Insert* 44 Safety Wing Retainer 45 Safety Wing Retainer Spring 46 Safety Body* 47 Safety Detent/ Lock Plunger Spring* 48 Safety Detent* 49 Trigger** 50 Trigger Pivot Pin** 51 Slide Stop 52 Barrel Nut 53 Slide Stop Spring 54 Barrel Nut Lock 55 Ejector Retaining Pin** 56 Receiver* 57 Magazine Catch Pivot Pin** 58 Barrel Nut Locking Spring 59 Ejector** 60 Barrel Nut Lock Screw 61 Barrel Stud* 29 Firing Pin 30 Trigger Bar Assembly* 31 Trigger & Trigger Bar Spring** 32 Magazine Catch** 33 Safety Wing 34 Magazine Catch Spring** 35 Magazine Follower *not for sale **must be installed by a qualified gunsmith

The firing pin is locked back but the safety is in the "fire" position. If the trigger is pulled, the firing pin will become a pointed missile in search of someone or something to harm. (#48). Depress #44. Push the righthand safety lever forward and cover the hole where #44 lives. Insert a proper diameter drift punch in the hole, position a thumb forward of part #46, and push out the safety assembly. Why the thumb? When the stem of #46 clears the receiver, #47 and #48 will fly out if you don't.

The safety insert can now be drifted upward from the receiver with a brass or nylon drift. The magazine catch is mounted to the receiver on the right hand side about 1/2-inch back from where the trigger attaches to the trigger bar. The catch-retaining roll pin (#57) can be drifted out up or down, but remember to control the catch spring (#34) and note how it's positioned.

If the barrel nut (#52) hasn't fallen out by now, back off the lock screw (#60), remove the nut lock (#54), the nutlock spring (#58), and the nut. You can now remove the barrel assembly. As already mentioned, slide travel is limited by the lug on the firing-pin guide when it engages the barrel extension (strap). The strap is secured to the barrel by a press-fit steel dowel (#3) and a screw (#2).

These two elements make any shock load from recoil go from steel to steel, rather than polymer to steel or polymer to polymer. The rib (#4) can be removed by drifting out its three pins (#14) and undoing its front and rear screws (#7). These screws should receive the blue Lok Tite treatment when reinstalled. The front sight (#6) can be replaced by drifting out pin #5.

The rear sight blade (#9) is replaced by pushing it to the far left, turning the windage screw (#10) clockwise to its maximum, and lifting up the righthand edge of the blade. There's nothing left to take apart, and there are many parts in this gun on the "not for sale" list. That's just another way of saying: "Restricted; factory installation only." Reassembly Tips Putting the NEOS back together is relatively straightforward and is performed in reverse order.

However, if the safety insert has been removed, make sure the sear-assembly hole in the firing-pin guide and the related safety insert holes are aligned by using a slave pin. Also make certain the trigger bar moves freely after the trigger is reinstalled. When remounting the barrel assembly, the strap must be positioned over the upper lug on the firing-pin guide. If this is overlooked, there will be a gap between the slide and rib when the barrel nut is tightened, which will result in major feeding malfunctions.

This can be avoided by starting the barrel nut onto its stud two or three turns, camming the sight rib down into the proper position, and then tightening the barrel nut. Examine the slide-stop closely. Above its lower tab that fits into the receiver is a very small notch. The bent leg of the slide-stop spring that powers the stop downward fits in that notch. What's the best way to reinstall these elements without going nuts? Place the spring on its stop stud and keep it there with a dab of grease.

Place the stop against the receiver to trap the spring on the stud. Slide the stop toward its receiver cutout, seat it, and hold it in place until you secure it in place with the grip frame. Finally, check it for free movement. Getting the firing-pin/spring assembly back into the guide is another potential source of a migraine. The safety must be off. Hold the receiver in the web of one hand. There's a .006-inch-deep recess in the forward end of the guide tunnel.

Assemble the firing pin to the spring, and place the rear coil of the spring in the recess. Use your free thumb and forefinger to keep the spring straight as you feed the firing pin into the guide tunnel. As long as the safety remains off, the firing pin will depress the sear as you push the pin fully to the rear. Slip on the recoil spring, then the rear of the slide. Pull the slide back and lock it there with the slide stop. And then proceed with reinstalling the barrel as described above. ■

MEASUREMENT & INSPECTION

Choosing and Using Precision Measuring Instruments

The precise fitting of gun parts is an impossible task without accurate measuring instruments. Here's a guide to the types available, their uses, and what you should expect to pay for quality tools.

BY DENNIS A. WOOD MARCH 2004 ORIGINAL PP. 7-9

During my early training as a toolmaker, I quickly learned the value of having accurate measuring tools. Getting the hang of how to use these instruments afforded me a means to measure my progress when fitting the various parts during the fitting and assembly of functional gauges and holding fixtures. As I moved on into gunsmithing, I found these same tools also became invaluable in the fitting of many firearm parts.

Micrometers If there's one measuring instrument anyone working on firearms should have near their bench, it's a micrometer. A 0-to-1-inch micrometer will fit most of the gunsmith's needs quite handily. A 1-to-2-inch micrometer gets occasional use, but is not needed as frequently as the 1-inch. The micrometer has two anvils. The front anvil is stationary while the rear anvil moves when the increment barrel is turned along the lead screw. Micrometers have a 40-thread-perinch lead screw.

Thus, with a full rotation of the barrel, the movable anvil is advanced .025 inch. Along the barrel are corresponding dash marks that are calibrated in perpendicular spaces equal to one-thousandth of an inch. With some micrometers, the barrel that houses the advance spindle has an even finer measurement bar. This breaks your measurements down into ten-thousandths (.0001) of an inch.

During use, the part to be measured rests against the stationary anvil, and the micrometer thimble The vernier-type requires aligning witness marks to read measurement. is then turned toward the part until contact is made. When measuring round parts, to get an accurate measurement it's best to rotate the movable rear anvil of the micrometer slightly to find the high point opposite the stationary anvil. Most micrometers are equipped with either a slip thimble or ratcheting device at the rear of the thimble.

When the thimble begins to slip or the ratchet clicks, you've reached the point of reading your measurement. This helps prevent any over-tightening of the measurement thimble that could record a false reading. There are three styles of micrometers available: the vernier style, where you need to align witness marks on

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Original caption: Below top: The vernier-style caliper requires the alignment of lines to achieve a precise measurement. Below bottom: The dial caliper shows its measurements on an easy-to-read dial.

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the barrel to the recording thimble; the analog type that has actual numbers that click into place as you turn the thimble; and the digital style that is the easiest to read, but also the most costly. A 0-to1- inch micrometer will cost anywhere from about $20 to nearly $150, depending on the style and brand you prefer. A depth micrometer has interchangeable stems in 1-inch-long increments, with most sets measuring 1 to 6 inches.

This style of micrometer has a flat base that rests against a shoulder and records the distance from that shoulder to a targeted face or shoulder. A couple of examples would be the distance from the front face of a receiver on a bolt-action rifle (with the barrel removed) to the front face of the bolt. This measurement is needed to establish the barrel-shank length. Another example would be the measurement from the front face of a revolver frame to the cylinder face to establish barrel-to-cylinder gap.

During a rebarreling and threading job, the depth micrometer will also help to get the correct length of the barrel shank by measuring from the rear barrel face to the barrel shoulder. When installing front sights, the depth mike is used to help get the sight centered in the sight base. By measuring each side of the sight to the ramp, you'll know exactly how far the bead insert will need to be moved to become centered in the ramp dovetail.

One type of micrometer that gets limited use, but is nonetheless useful, is the internal-groove-type micrometer. The one I have is made by Starrett, and comes into play most often on semi-auto pistol slides to measure the right-to-left distance of grooves when fitting slides to frame rails. This type of micrometer will reach down into areas that are difficult to get at with other measuring tools. Calipers Another measurement tool that's useful to have around is the caliper.

A vernier-type caliper is something like a slide-rule, if you remember how those operate. These are low-cost measuring instruments, and require the reading of witness lines that align when the caliper jaws are drawn together over the part being measured. While not as accurate as a micrometer, a caliper will do for 90 percent of the measuring done in gunsmithing. The next level up would be the dial caliper. This style has a geared dial that rides along a tooth rack in the caliper.

A dial with a recording needle lets you know which increment between the witness marks along the caliper you've reached for measurement. The calipers that are easiest to use and read are those with a digital readout. These calipers have a built-in scale reader that displays your measurements on an LCD screen incorpo

rated into the movable rear jaw of the caliper. If you're ready to spring for the cost of a caliper, this would be the type to go with. The cost of this type of caliper will depend on whether you choose an established name brand or one of the many imports that are coming into the country. A Starrett, Mitutoyo, or Brown & Sharpe digital caliper will run close to $150, while an import will typically cost from $30 to $90.

These calipers are usually available in 4-, 6-, and 8-inch lengths, with the 6-inch being the most popular for our type of work. The caliper will not only measure outside diameters or distances, but also has blades that will record inside diameters and distances. A depth-recording stem is also provided that moves out the rear of the caliper as the movable jaw is retracted.

If you happen to be a reloader of metallic ammunition, the caliper will also find use on your reloading bench to measure the trim length on cartridge cases after residing and turning. Indicators If you've ever operated a metal lathe or milling machine, you know the value of a dial indicator. Dial indicators come in quite a variety of styles, and are available in both the dial and electronic (digital) variety. These instruments will record in .0001, .0005, and .001-inch increments, depending on your accuracy needs.

For most gun work, indicators recording in .001inch will do just fine. (You'll find that indicators reading in the .0001-inch range usually have limited travel, so the recording range will not be as great as the .001-inch style.) Dial indicators are invaluable for finding out how much run-out you have in apart, and where the high points of that run-out are. A couple of examples would be a bent ejector rod on a revolver cylinder or a bent firing pin.

Place the indicator tip over top dead center of the firing pin while it rests in a V-block, and rotate the bent part one full revolution to see the amount of bend this part has. An indicator mounted on a surface-gauge base will tell you how flat apart is. An example of this use would be on the flat bottom of a rifle action to determine if the action was twisted during barrel removal. I have a dial indicator that will record 2 full inches of travel in .001inch increments.

This indicator has saved my bacon many times when drilling blind holes to a specific depth in thin-walled material. Every time I need to drill ramp-mounting holes on the muzzle end of a thin barrel, I use an indicator to record the depth the drill is cutting. The indicator is set against a collar mounted on the drill's quill, and as the quill is fed down against the indicator tip, the recording needle shows exactly how deep the drill is cutting.

Conclusions There are many imported measuring tools on the market, some of which are worth the money and some best avoided. Going with the brands that have been around quite awhile— Starrett, Mitutoyo, Brown & Sharpe, or Fowler—you'll never go wrong. I know that some of the imported gauges sell for less than the cost of a box of .30-06 ammo, and I've looked some of these instruments over carefully.

My choice has been to go with a well-known American company that will be around should something go wrong with the gauge and I need to return it for repair. ■

PISTOLS

Build an 'Orthopedic' Handgun

Few projects are more satisfying or rewarding than modifying a handgun for use by a physi cally challenged shooter.

BY ROBERT K. CAMPBELL MARCH 2004 ORIGINAL PP. 10-11

There are those of us who are physically challenged and cannot use their handgun of choice. Some of these folks manage by simply going to a lighter caliber, while others must consider a different type of gun altogether. Instruction and care in manipulation helps, but some guns are simply too difficult for those of limited ability to use well. I myself have been through several injuries during along and active police career. On one occasion, my left arm was injured and in a sling for some time.

During that time, I had to put away my .45 auto, and carried a .38 revolver instead. One of my last injuries was long-lasting, however, and it gave me a chance to take a hard look at handgun modifications for physically challenged shooters. For many shooters who are approaching my age, the sights of the handgun appear fuzzier than they once did. Since the metal has not crumbled, it's a safe bet that my eyes are somewhat less keen than they once were.

Thus, it seems that tired and aging muscles and eyes are another consideration in addition to physical injuries. In fact, I've found that many perfectly healthy, strong individuals can appreciate these modifications. As one shooter told me, a physical problem or two should not prevent anyone from enjoying the shooting sports or defending his person and property. Among my favorite handguns is the Ruger .22/45 pistol.

This is a fine practice pistol, and one chosen by many shooters who cannot tolerate the recoil of a larger-caliber handgun. I've also seen many of these pistols in competition. The most common problems I've noted with the gun are difficulty in cocking the bolt, and in seeing the gun's black sights. Among the few malfunctions I've seen are failures to extractor fire. While certainly not a design flaw, the pistol can be modified to practically eliminate these problems.

Among the better options for improving the Ruger is a titanium firing pin from Power Custom (29379 Highway J, Gravois Mills, MO 65037). Installation of the firing pin is a little tricky, but not tedious. Start by loop ing a string around the mainspring latch and raising the latch. The latch is raised up out of the frame like opening a folding pocketknife. Be certain the trigger and hammer are at rest, in the uncocked position.

Pull the mainspring housing down until the mainspring housing pin is clear of the receiver. The housing can now be removed. Simply pulling the bolt handles and bringing the bolt to the rear can remove the bolt, but often the hammer has moved to the cocked position and will not allow the bolt to come out. Point the barrel toward the ceiling to reposition the hammer strut. The upper receiver can be brought away by pressing the bolt-stop thumbpiece upwards, and holding it in position.

I tap the rear of the receiver with—of all things—a Quinetics bullet puller, which works for me. When the pistol is disassembled, you will note that the only thing holding the firing pin is the firing-pin stop pin. Before you take the firing pin away from the bolt, carefully study or diagram its position so you will be able to properly install the 22/45, and does not create a problem in firing the gun.

22. Normally, the finish is not marred at attachment points. Power Custom unit. The firing-pin stop is easily removed with a small punch. I used the punch contained in my CED 1911 Toolkit. The firing-pin rebound support will come out at this point, and care must be taken not to lose this part. The Power Custom firing pin is of titanium stock, but is dimensionally identical to the old pin. It is much sharper, however, and deals a quicker blow.

Place the Power Custom unit in the bolt slop properly, and then drift the firing pin stop back in place slowly and carefully. Before replacing the bolt, test the firing pin to be certain it can travel in the bolt slot without restriction. I've never experienced any binding, but Power Custom includes this step in their instruction sheet and it could avoid trouble. When the bolt is reassembled, the rebound spring will be putting pressure against the lower hook on the firing pin, pressing the firing pin to the rear.

The rebound-spring support is in a small recess, in case you forget. That's all that's required to install the firing pin. This firing pin is added to ensure reliability in a gun that may be used for self-defense. To allow the slide to be racked quickly and with a minimum of effort, I suggest you add the Power Custom slide racker to the pistol. This device aids in manipulation and getting the handgun ready for service. The Ruger does have a stout spring for a rimfire handgun.

The bolt racker resembles a hook and is easily set over the cocking ears of the pistol. It can be turned for leftor right-hand operation. I've never experienced any problems in installing these items, but Power Custom tells me that some early-model Rugers may require fitting. The racker fits over the cocking ears, and set screws are tightened to hold it in place. I have aggressively racked and slammed the bolt of this pistol a hundred times or more, with no problems in slippage.

While not well suited to concealed carry, with the right holster it is not impossible to carry this modified handgun. Finally, I addressed the sights of the pistol. The Ruger's sights, especially the adjustable models, are sharp and clear to most eyes, but not to everyone. I have one eye that is not as strong as the other, and for me the front sight was indeed fuzzy. I installed a special rear aperture from One Ragged Hole Tallahassee, FL 32317).

This sight is of the type normally fitted to rifles, but works well in handguns. Indeed, one of the top tactical experts in the country, Denny Hansen, has used aperture sights extensively on his Glock handguns—a powerful endorsement. The eye is drawn to the circle of this sight, and the ring (often called a "ghost ring") seems to vanish when the front sight is well centered. Fitting this sight is simple but requires care. The windage-adjustment screw of the Ruger is screwed almost all of the way out. The leaf will then be loose in the sight channel. There is a small notch in the Ruger sight, and a corresponding tab in the sight leaf. The tab is lined up with the notch taken out, being careful not to lose the tension spring contained in the sight. A small pin or paper clip can be used to depress the spring as the Smoking Hole sight leaf is placed in the sight channel. Then, the windage screw is replaced and tightened.

The pistol then requires some sighting in, of course, which can usually be accomplished in less than 20 rounds. From the benchrest, I was able to secure several 1.5-inch groups at 25 yards with this sight and Winchester Wildcat ammunition. The sight is quick to acquire at moderate ranges on man-size targets, and I am able to see the front clearly with this intense focus. I have fired several hundred rounds in the Ruger with good results.

I feel these modifications are among the most sensible and the most helpful I have performed—even for a shooter with no handicaps. A quick look at Brownells catalog shows many more options, of course, for many more handguns. There are a number of slide rackers offered for 1911 pistols, and various front sights with combinations of fiber optics that allow far better sight acquisition. The sky is the limit, and when you are helping someone who may not be able to handle a standard handgun, the rewards are many. ■

FROM THE ARCHIVE

Tech Topics

In this feature, we examine new tools and tooling, tips and techniques, and news items of interest to the gunsmithing community.

BY AMERICAN GUNSMITH EDITORS MARCH 2004 ORIGINAL PP. 12-15

Bore-Sighting and Scope- Mount Alignment with Lasers You'll probably agree that a concentrated beam of light capable of guiding a 500-pound bomb to a tank-size target from upwards of 10,000 feet is more precise than the human eye. If it weren't, the Norden bombsight would still be operational with the USAF. It follows then that the same beam of light could be used for more precise bore-sighting and aligning a scope base to the bore.

Bore-sighting as you probably know can be defined as aligning the aiming elements with the bore prior to firing a shot. What you may or may not know is that a scope or other sighting system not aligned with the bore can defeat the most fervently performed bore-sighting job. For many years, we used an optical collimator to check out sight/bore alignment, and were able to assure rifle owners they'd be "on paper" at 100 yards.

On the few occasions our assurance failed, we discovered the It's equipped with a 650mw laser delivering over 8 hours of use on two AAA batteries. reason to be either out-of-alignment receiver holes (drilled by someone outside the factory) or ring and base deficiencies. Since making adjustments in our bore-sighting equipment due to the discovery, we no longer assure being "on the paper." Depending on the known skill of the hunter or competitor, we can guarantee meat on the table and/ or tight target groups.

The additions made to the shop inventory were not cheap, but with increased business due to firearm performance—spelled "accuracy"—the investment has long since been amortized by greater rewards.

The first addition was a Laser Magic II scope-ring and base alignment tool (Stoney Point Products, New Ulm, MN 56073; The second was an SL-100 Mag Laser Bore Sighting System by Site Lite (Concept Development, Fountain Hills, AZ 85268; Both products are also available from Brownells Montezuma, IA 50171; We chose the SL-100 above others because it fits all caliber rifles, pistols, revolvers, .50-caliber muzzleloaders, and includes a 12-gauge/20-gauge shotgun adaptor.

This feature eliminates the need to purchase separate caliber-specific laser devices. Another positive factor is the ability of the Laser Magic II and SL-100 to work as a team to

Figure 1. Figure 2. Figure 3. provide the ultimate precision for scope installation and bore-sighting. Every step in the following, except for live-fire testing, must take place with the shoulder arm mounted level in all directions and secured in a rifle vise. We've found the use of a center bubble level to be an excellent and inexpensive assistant in leveling a gun. The Laser Magic II is used prior to mounting the scope, and is designed for either 1-inch or 30mm rings.

It has a built-in 650mw high-intensity laser powered by two AAA batteries (supplied), providing over 8 hours of continuous use. The unit is turned on by tightening its cap to make battery contact. The beam emitted is projected on a nearby wall. There are V-blocks supplied to correct the beam for straightness, and the beam itself has the form of a scope reticle.

When The center bubble level shown with it can be purchased in most hardware stores. the unit has been properly aligned by rotating it, the "reticle" will spin true and look very much like a four-spoke wheel rotating smoothly on its axis. After that, the Laser Magic is placed in the mounted scope rings, and a visual sighting is taken through the chamber to determine ring and base relationship to center bore. Any misalignment can be corrected by using the base windage screws or shimming the base(s) as needed.

At 25 yards, the "wheel" should be in line with your visual sighting through the barrel. At half that distance, the wheel should be 1 inch high of the bore. Then you replace the laser with the scope. Now that it's known that the scope is mounted center bore, place the target card supplied with the SL-100 at a distance of 25 feet from the muzzle. Besides the target card and a rigid carrying case, the SL-100 arrives with three adapters and 11 O-rings.

Adapter MA1 fits smaller calibers, adapter MA2 is for calibers .308 to .50, and adapter MA3 serves the shotguns. Specific directions for using each adapter and O-ring are included with the SL-100 so most of them will not be included here.

Suffice it to say for the moment that the .22, .308, and 20-gauge rings are never removed from their adapters; that all rings should be lightly greased before being inserted in the muzzle; and that, after bore sighting, the bore should be inspected to insure no rings have been left behind. Locate the top dead center of the barrel with—what else?—atop dead center finder (from Brownells) and insert the correct adapter/O-ring combination into the muzzle. Set the scope at its lowest power.

Line up the arrow on the laser unit with your top dead center mark, and switch on the beam. Adjust the position of the rifle to center the laser on its target card as shown by the dotted circle in Figure 1. The diameter of the circle will normally range in size from 1/2 to 3/4 inch. The firearm must not move, and the laser must stay centered on the target card while any focusing of the scope takes place. Align the scope crosshairs as shown in Figure 1 or Figure 2.

It's necessary to focus the scope on the laser spot to compensate for the lower velocities and heavier bullets of shotguns and blackpowder long guns respectively. Final scope adjustments must be made during alive-fire session with the first shots taken at no more than 25 yards. Keep in mind that the target card is calibrated for a scope height of 1.5 inches above the barrel (center-to-center of scope-to-bore).

For high-mounted scopes, anew elevation line must be drawn above the dotted line on the card to compensate for the difference. For example, if the scope is 2.5 inches center to center, mark a line 1 inch above the existing dotted line and adjust the scope elevation to match it. Handguns with red-dot scopes or lasers can be bore-sighted by placing the SL-100 laser in the bore, projecting its dot on any object from 25 to 75 feet away, and aligning the gun's sighting system with the SL-100 dot.

Due to bullet drop, this technique will not work well at ranges over 75 feet.

Finally, there's one hard and fast rule: Regardless of the bore-sighter used, always insist that your customer makes the final, live-fire adjustments with the first shots taken at a 25-yard range in order to cover such variables as parallax, bullet spin, internal/external ballistics, and personal anatomy.

If You Can't Dunk-Kit, You Can Poly Dunk-Kit Over 10 years ago, Bill Laughridge, head honcho of the Cylinder & Slide Shop Fremont, NE 68025; and well known to his peers in the Pistolsmiths Guild, developed a cleaner-lubricant called Dunk-Kit. It worked so well in his busy operation he decided to market it. The product eliminates much of the mess involved in cleaning and lubing dirty handguns, and it sold well.

There was only one question in the minds of some users: The stuff worked great on metal, but would it harm polymer-frame guns? Well, if the pistol was intended for military use, the answer was "no," because martial solvents are much harsher than anything contained in Laughridge's mixture.

Having seen the result of car The only additional supplies required area bore brush and toothbrush. buretor cleaner being sprayed on a plastic trigger housing, we can understand why the question arose. (It melted it into a useless, formless mass.) To relieve any doubts, Laughridge developed another proprietary solution—Poly Dunk-Kit. How's it used? In the same way its predecessor is used. You take off the grips, open the action, and immerse the gun for 15 minutes.

Take it out of the bucket, use a bore brush in the barrel and an old toothbrush to scrub rails, breech, and cylinder faces. Put the piece back into the bucket long enough to float off what's been scrubbed loose, and allow any gunk to settle to the bottom of the bucket. Remove the gun, wipe it down with paper towels, and you're done. No need to lubricate. A light film of oil will be left behind.

If you want cleaner than that, detail strip the gun after the initial dunking, scrub all the parts individually, and return them to the bucket for a few minutes of bathing before drying them off. If you're concerned you'll have to fish around to recover a rebound spring, firing pin, or sear from the bottom of the bucket, you can rest easy. Install apiece of 1/4-inch-mesh hardware cloth formed to fit the bucket and raised above its bottom on 1/4-inch-thick metal or wooden spacers.

This accomplishes two things: Whatever sludge floats off after the individual parts scrubbing will not settle back onto the parts and will settle to the bottom of the bucket below the mesh, and all parts will be retained on the mesh. Recovery is a simple matter of removing the mesh from the bucket. No fishing required. Poly Dunk-Kit is available in several sizes up to 55-gallon drums for high-volume operations. For additional information and pricing, contact the Cylinder & Slide Shop.

Durable Shotgun-Gauge Adaptors from Gauge-Mate Gauge-Mate has launched anew line of shotgun gauge adaptors. These adapters can add versatility, convenience, and ease of shooting to your customers' favorite guns, transforming a single gun into an all-in-one firing powerhouse Available in 11 sizes from 10 to .410 gauge, Gauge- Mate's gauge-adapter tubes allow then firing of a smaller-gauge shell without impacting performance.

Uses include lessening the loud, intimidating kick of larger gauge shells, making a shotgun more effective for target shooting; for training bird dogs and gun novices; or for teaching gun-safety courses. Skeet and trap shooters may appreciate them as well. These unique adapters feature patent-pending "Extractor-Grip" technology that allows for quick and expedient spent-shell removal. Gauge-Mate's adapters are manufactured from corrosion-resistant stainless steel rather than less durable aluminum or carbon steel.

As a result, these adapters can handle any size field or target load as well as environmentally-friendly steel shot. Gauge-Mate adapters are afford ably priced, and can be purchased by calling or by visiting

AG Author Pens Holster Book R. K. "Bob" Campbell, a frequent contributor to these pages, has announced the upcoming release of his newest book, Holsters for Combat and Concealment. Campbell is well known in the magazine and police field; has published over 500 articles, columns, and reviews; has served as a peace officer for 23 years; and holds a degree in criminal justice.

His book covers holster geometry, fitting individuals for the correct holster, concealed-carry holsters, police-service holsters, shoulder holsters, crossdraw holsters, ankle holsters, and others. Each type and their proper selection is covered in depth.

We're pleased to report that Passport holsters and concealment devices, designed by American Gunsmith editor Keith Lawrence, and manufactured by Passport Sports, Inc. (www. passport–holsters.com) are featured prominently in Camp (www. passport–holsters. com) are among those featured in Bob Campbell's latest book. bell's book. Advance copies, signed by the author, are available from MHC Tactics and Consulting Spartanburg, SC 29301) for $22 plus $3.95 shipping. Make your check or money order payable to R. K.

Campbell.

D&L Sports CQB Iron Sight For AR-15/M-16 Flat Tops Dave Lauck, another frequent contributor to American Gunsmith, designed this heavy-duty sight set to be, in his words, "as fast as a pistol and as accurate as a carbine." The rear sight allows for three interchangeable center-sighting devices, an open top notch, and an open top notch with night inserts. (The notch sighting devices are designed for use when the rear sight is mounted at the front end of the upper receiver.) The rear sight is also available with an aperture (ghost ring) center-sighting device for mounting at the rear of the upper receiver.

The rear sight is fully adjustable, then lockable with a series of 17 lock screws. This in effect creates an extremely durable and precisely zeroed fixed sight which can withstand the rigors of police, military, and serious competition use. It also creates a sight that is very difficult for unauthorized personnel to tamper with. The sight is triple cross-bolt mounted on Colt-spec A3 flat tops and features protective base material around the center aiming device to ensure field durability.

The front sight designed to compliment this rear sight features the same durability factor. It replaces the fragile front post on AR-15/M-16 rifles that commonly snaps off under hard use. This more durable blade front sight fits standard front sight towers and allows for a night-sight insert to be installed. The design of this sight set allows for pistol-shooting speed in CQB environments, yet maintains the three-point contact and accuracy of the carbine.

Shooters who choose the notchstyle center sighting device and forward-mounted rear-sight position will be able to use optics in conjunction with the D&L Sports sight set. The sights were designed to be mounted and zeroed, then have their settings locked in order to always have dependably zeroed back-up sights on the firearm. There is ample room behind the forward-mounted rear sight to allow the mounting of Aimpoint, Tripower, Acog TA01, and other similar-size optics.

D&L Sports Inc. produces a special ring mount for Aimpoint and Tripow er sights which positions the optics at the perfect height for high-speed sighting and allows use of these iron sights right through the optic tube in the event of electronic failure. The ring mount is rugged, quick to attach and detach, and holds two extra Aimpoint batteries. For more information, call D&L Sports at or visit ■

RIFLES

Troubleshooting the Steyr 1895 and 95/34 Straight-Pulls

Developed from the earlier straight-pull designs of 1886, 1890, and 1895, Hungary armed its troops with these unusual rifles until they were doomed to extinction by the ubiquitous '98 Mauser.

BY RUSSELL CORBITT MARCH 2004 ORIGINAL PP. 16-21

After the collapse of the Haps burg Empire in 1918, the new nation of Hungary retained the M1895 rifle and carbine, still chambered for the 8x50R Austrian/ Hungarian cartridge. World War I illustrated the shortcomings of the older round, and in 1931 a more powerful cartridge was introduced— the 8x56R, designated the 31M. The vast majority of existing Steyr rifles and carbines were rebarreled to use this new cartridge, and new rifles and carbines were built at the state arsenal in Budapest.

The new weapons were reportedly plagued with extraction problems, attributed to the higher pressures achieved in the 31M cartridge. These problems were amplified by the straight-pull action, which doesn't have the powerful primary extraction of a Mauser-type turnbolt. The design went the way of the dodo bird in 1940, when Hungary began manufacturing (under German "supervision") a redesigned rifle barreled for the 7.92x57 "S" cartridge and using Mauser-type charger loading instead of the Mannlicher clips.

To me, this rather discredits the idea that alleged extraction problems were related to chamber pressures, as military 8mm Mauser ammo operates at substantially higher pressures than the 31M and has considerably less body taper, both of which are factors that would seem to exacerbate extraction problems. Many existing rifles were converted by rebarreling and modifying the magazine, but most of the carbines were tossed into storage.

A number of M95 and into the hands of various and sun dry combatants during WW II, such as Yugoslavia. Basic Disassembly Refer to the exploded parts diagram for parts nomenclature and identification. Ensure that the weapon is unloaded by opening the bolt (#2) and examining the chamber and magazine. If there are cartridges in the magazine, press the clip catch (#15) located inside the trigger guard, and the clip will eject out the top of the action.

If the bolt is locked, release the safety (#9), the serrated lever on the left side of the bolt handle root, by pushing it down toward the stock. The safety on the M95 and 95/34 can be applied whether or not the striker is cocked, and locks the bolt in both cases. Push the trigger (#25) forward and remove the bolt assembly by pulling the bolt handle straight back. Remove the machine screw through the front band and push the band off the wood. The front band may or may not have a bayonet lug.

The odd-looking piece with the knob on the end attached to this band is a stacking stud, used in a similar fashion to the stacking swivels on other rifles. Loosen the clamp on the second band, but don't mess with the "nut." The clamp screw is threaded into the other side of the band and the "nut" is merely a cylindrical piece of steel staked onto the screw to prevent its loss. Remove the machine screw through the rear band and slide the band off the wood. Loosen the two small screws on the

Far The flat on the striker must be aligned with this in order to insert the assembled bolt head into the bolt body. clamp immediately behind the rear sight. Raise the rear sight leaf, and carefully work the upper handguard forward until it's clear of the clamp and can be removed. Remove the front and rear guard screws (#17 and #19).

Use a well-fitted screwdriver, as the rear screw often has some peening or bradding where the bolt rides over it, and both screws may be frozen in place with old lubricants that have turned to stone. Don't remove the large-headed screw on the bottom of the magazine assembly (#24) at this time. The bottom metal (#16) and barreled action (#32) can now be removed from the stock. Bottom Metal Disassembly Remove the small screw at the front of the bottom metal (#18).

Using a screwdriver, push down on the follower base (#22) in front of the follower arm (#20e). The follower base and follower assembly will move out of the bottom metal, and you can then see how the rear of the The back of the head is against the bolt body, the locking lugs are perpendicular to the handle, and the ejector notch is away from the extractor opening. assembly is keyed into the bottom metal. Remove the large-headed screw on the bottom (#24) and pull the large flat spring (#21) out.

Push the hinge pin (#23) out. Should you need to remove the screw holding the follower itself (#20b), be sure to re-stake it when you put it back in. To remove the clip catch, take the screw (#18) just in front of the trigger opening out, clamp the spring and catch together in one hand, and pull out. Further disassembly should not be required unless you need to replace a spring, remove rust, or refinish the parts.

Bolt and Trigger Disassembly The bolt assembly is the most complicated part of this rifle, but by paying careful attention to how it comes apart, the job of putting it back together and troubleshooting it will be made much easier. When the bolt is removed from the rifle, the bolt head (#4) should be out from the body (#3) about 1 inch, the ejector slot in the bolt head face is down, and the extractor (#11) is over the right-hand lug. First, snap the bolt head back into the body by twisting it counterclockwise.

If the bolt head snaps back into the body when the bolt is removed, don't worry—we'll deal with that later. (This is probably the cause of some of the rifle's problems.) Holding the bolt body firmly in one hand, pull the cocking piece (#8) out until it is clear of the bolt body, and swing the safety lock (#9) in so that the safety holds the cocking piece out. Keep pressure on the safety so that it stays engaged, and unscrew the cocking piece.

There will be an audible snap when the cocking piece releases the striker (#5). Next, twist the bolt head clockwise out past the normal open position until the locking lug passes under and then clears the extractor. At this point, the bolt-head assembly and extractor should pull free of the bolt body. Note the comparative positions of the bolt head and body. Unscrew the striker-spring retainer (#7), taking care to contain the retainer when it comes free; it's under

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Original caption: Above top: After the bolt head is correctly installed, it is rotated back out to this position and the extractor is started into its opening. Above bottom: Rotate the bolt head counterclockwise, simultaneously pushing it and the extractor toward the bolt body. The locking lug is aligned with and passes through the recess in the extractor. considerable spring tension. You can now remove the screw (#10) and the safety lever if you wish. The trigger assembly in this rifle design has several functions.

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It has trigger, sear, ejector, bolt-body lock, and bolt stop—all in one small and innovative package. Push the retaining pin (#12) out and withdraw the assembly out the bottom of the action. Lift the sear (#26) out of the housing (#27), push out the ejector pin (#29), and drop out the spring (#28). Miscellaneous Disassembly The rear sight is straightforward; remove the spring screw and punch the pivot pin out, taking care to retain control of the sight. Drift the spring forward out of the sight housing.

The small screws in the handguard clamp can be removed, freeing the clamp. If band removal is necessary, you must remove the front sight (#31) from its base. I can't see that it makes any difference which direction the sight is driven. Be careful, as the front sight's dovetail is much smaller than the usual American-type cuts. It closely resembles the small Mauser dovetail.

Dressing one end of the dovetail on the sight may be necessary to allow removal, as many specimens I have seen have very beatup and bradded ends. Reassembly Tips Putting the pieces back together is very much the reverse of taking it apart. However, some sticking points require a bit of attention and patience. If the rifle is having extraction problems or has very stiff bolt operation, don't reassemble the bolt until you have read the section on bolt problems in the Troubleshooting segment.

It's time to lube the bolt assembly and other parts such that they will not need messing with for years. When reassembling the bolt and trigger/sear assemblies, resist the temptation to use grease anywhere—it will turn to concrete later. Instead, make a paste of molybdenum disulfide and light gun oil. The moly is available in powdered form from several reloading suppliers and is usually used to coat bullets. The best applicators I have found are plumber's flux brushes.

They are dirt-cheap from Brownells under the part numbers 080-001-024 (24-count, $2.61) and 080-001-144 (144-count, $10.78). You may want to get some latex exam gloves and a dust respirator to handle the moly—it's some of the nastiest stuff there is, and somewhat toxic to boot. Under no circumstances should you allow the moly dust to become airborne; it starts becoming hazardous at levels as low as 5mg/ cubic meter in air. That ain't much, folks! Keep your brush wet with oil and work only with the paste.

However, moly disulfide is 10 times more "slippery" than graphite, and it works into the metal's pores over time. (It works into your skin's pores considerably faster.) Even after the oil evaporates away, the bolt will still be slicker than you can believe. It is also relatively impervious to water and temperature extremes, as well. By the way, don't wear light-colored clothing when working with powdered moly. It works into fabric pores, too. Instantly.

While you have the trigger assembly apart, give it a moly treatment before reassembling. Coat the bolt head's cam surfaces thoroughly, and plaster some on the striker spring and spring retainer. Work another batch inside the bolt body. Stuff a brush full into the locking lug recesses inside the receiver, and along the left-hand lug race. Then brush some on the extractor in the areas that are inside the bolt body—not on the hook area.

Begin by placing the striker spring over the striker (if the spring has an open end, put it toward the collar on the striker). Insert the striker into the bolt head and install the spring retainer. Tighten the striker-spring retainer fully, then back it off a bit until the cam grooves are aligned with those on the bolt head. Take care when reassembling the bolt. Pay attention to which way the ejector slot in the bolt head faces, and which way the flat on the striker faces.

Putting the bolt head assembly in 180 degrees off is possible. Remember that the bolt head will rotate 180 degrees as it is installed. Look inside the bolt body. The hole at the back for the striker to protrude through has a flat spot on the bolt-handle side. Align the flat on the striker with the ejector notch on the bottom of the bolt head, and insert the bolt head assembly into the bolt body carefully with

the flat on the striker aligned with the flat in the bolt body. The ejector cut in the bolt head will be approximately aligned with the extractor hole in the bolt body at the start of engagement. With a bit of wiggling, the bolt-head assembly will slide into the body and rotate counterclockwise as it moves toward the body. When fully inserted (bolt head is "in battery"), the assembly should look like the accompanying photo. If it doesn't, the bolt head is in backwards.

If you did not remove the safety, take care when the striker's threaded end comes through the back of the bolt body—the safety needs to be in the "off" position. Don't worry about the extractor until you get the bolt head oriented properly. When the bolt head is installed correctly, turn it clockwise out to just past the normal "open" position, slide the extractor into place, and rotate the bolt head counterclockwise while pushing in on the extractor and bolt head until the head is next to the body.

If you get the bolt head started correctly, but the striker flat is not aligned with the corresponding flat in the rear of the bolt body, use a small flathead screwdriver through the back of the bolt body to turn the striker until it comes through the hole. (That's why the striker is slotted.) With the bolt head against the body, thread the cocking piece onto 1 Barrel 2 Bolt Assembly (complete) 3 Bolt Body 4 Bolt Head 5 Striker (firing pin) 6 Striker Spring 7 Striker Spring Retainer 8 Cocking Piece 9 Safety 10 Safety Screw 11 Extractor 12 Sear Assembly Retaining Pin 13 Clip Catch Spring Screw 14 Clip Catch Spring 15 Clip Catch 16 Magazine Housing/Trigger Guard 17 Front Guard Screw 18 Magazine Housing Cross Screw 19 Rear Guard Screw 20 Magazine Cartridge Follower Assy. the striker several turns.

Then use the safety to hold the cocking piece out and screw the cocking piece on until the striker's end is approximately flush with the end of the cocking piece. Align the sear engagement lug with the notch in the bolt body and release the safety, controlling the cocking piece until it is at rest against the bolt body. Put a bit of moly/oil 20a Follower 20b Follower Screw 20c Upper Follower Spring 20d Upper Follower Spring Screw 20e Follower Arm 21 Follower Assy. Lower Spring 22 Follower Base/Mag.

Housing Filler 23 Follower Assy. Retaining Pin 24 Follower Assy. Lower Spring Screw 25 Trigger 26 Sear 27 Sear/Ejector Housing 28 Sear Spring 29 Ejector Pin 30 Ejector 31 Front Sight Blade 32 Receiver paste in the safety notches and on the sear engagement lug of the cocking piece, and paint the back sides of the bolt head's locking lugs. Rotate the bolt head back out until it snaps into the "open" position, with the locking lug under the extractor.

It will be more difficult to operate now that the cocking piece is installed.

When reassembling the sear/ejector unit, install the sear first. It may be necessary to fabricate a slave pin to hold the sear in place as you install the spring, ejector, and ejector pin. The large head of the sear-assembly retaining pin goes to the right of the receiver (as shown in the schematic), but the stocks are usually inletted on both sides for the pin, and you may find one installed the other way. No matter, it can usually go either way. The bolt assembly will slide back into the rifle now.

Line up the guide lugs on the bottom of the bolt body with the grooves in the receiver, and push the bolt home. Holding the trigger forward when reinserting the bolt is usually not necessary, but may help. If you removed the safety screw, re-stake the screw head after you have completed the final reassembly. Problems and Troubleshooting As mentioned in the opening lines, these rifles reputedly have problems with spent cases becoming stuck in the chamber.

I have not experienced any trouble with my 95/34, but it has a large chamber that would be difficult to stick a case in without splitting the brass. If extraction problems or sticky bolts are experienced, look first to pitted chambers or chamber necks from indifferent cleaning after firing corrosive ammunition. These guns often have huge chambers, and will usually not mind a bit of aggressive wire brushing, steel wooling, or even sanding to remove pitting.

Much like an SMLE, the chamber's tolerances and dimensions are almost an afterthought, since the cartridge headspaces on the large rim and reloading was never a design consideration. If the chamber is okay, strip the bolt assembly and clean/lubricate it as described above. Examine the locking lugs and the cam grooves on the bolt head for evidence of burrs or foreign material. Hot reloads (if using reloads) would also be a suspect.

This cartridge operates in the 40,000- 45,000 CUP class, and you can't load it to duplicate your .338 Win Mag. Also, remove, clean, and lube the trigger/sear/ejector assembly. In use, the sear/ejector housing is raised against a lug on the underside of the bolt body when the trigger is pulled, locking the bolt body shut as long as the trigger is held. If the sear/ejector housing is not returning completely to its "released" position, it will lock the bolt body, just as it is supposed to.

Stiff bolt operation with an empty rifle is usually a result of a buildup of debris in the bolt-body's cam tracks and/or a maladjusted extractor. Clean the disassembled bolt parts thoroughly with a solvent and dry them off. It may be necessary to use some elbow grease (or power tools) to remove all the encrusted crud and varnish. Examine the extractor's tail end.

The extractor has a ridge at the back end which engages slots in the bolt head and locks the head in place until you exert enough force on the bolt to snap the ridge out of the slots. It should be well defined and free of burrs. The ridge should be distinct but smooth—slightly rounded, not sharply pointed. The extractor tail should have a very slight curve "inwards" toward the ridge, like a 1911-type extractor. This provides the force that keeps the bolt head locked.

Too much curvature or damage to the ridge can cause difficulty when initially opening the bolt and during the last bit of movement that closes and locks the bolt, no matter what you lube the thing with. Too little curvature or a worn ridge causes the bolt head to fail to lock, usually manifested by the bolt head not staying locked out when you remove the bolt assembly or are trying to replace the bolt assembly back into the rifle.

A bolt head which does not lock open properly snaps out of the slot and tries to close. This causes the locking lugs to drag on the lug races and torques the bolt body, making the bolt stiff and difficult to operate. In either case, extractor tension adjustment (or replacement, if it is broken or too worn to work properly) will usually solve the stiff bolt problem.

To adjust the curvature, simply hold the hook end of the extractor in your hand with your thumb in the middle, and press the tail end against the work bench, bending it ever so slightly in whichever direction it needs to go. It doesn't take much; this is not a job for a 500-pound gorilla. You can assemble and test, using a bit of gun oil as lube, until the head stays locked out and medium hand pressure causes it to snap back.

Rotating the locking lugs clockwise (from the front) cams the head back out, and it should lock with a "snap" when the extractor is aligned with the right-hand lug. When it all works well, disassemble the whole thing again and reassemble/lube as described above. These rifles usually have the same long, gritty trigger common to many military rifles. There is not a lot that you can do, because the sear

is spring-loaded to allow the bolt to ride over it during operation and then pop up to catch the sear surface on the cocking piece. Changing the angles of engagement between the sear and cocking piece can result in a serious problem.

The closer you get the angles to achieving a nice pull and let-off, the more likely it becomes that the cocking piece will simply push the sear down and ride over it, causing a rather unpleasant condition known as "accidental discharge." Do trigger work judiciously or not at all, depending on your level of skill and understanding. Feeding problems can arise from several sources. First, this particular action design does not lend itself to "wimping" the bolt. During operation, the bolt must be forcefully operated.

Bolt-action rifles with fixed ejectors depend on rapid and positive bolt manipulation to eject the spent cases. In this age of the semi-auto, it seems that no one knows how to use a bolt rifle anymore; in operation, the bolt-action rifle should not leave your shoulder. This gives you a solid backstop to pull the bolt against, and a firm hold on the forend keeps the rifle in place while returning the bolt to battery.

Grabbing the bolt knob "overhand" with your thumb toward the bolt provides more power to open and shut the bolt than the more familiar "underhand" approach used on turnbolt rifles, as there is no need to lift the bolt handle with this design. Secondly, this design seems to be very particular about cartridge overall length (OAL). Checking a selection of original FMJ cartridges, OAL is almost exactly 3.00 inches, regardless of date or manufacturer. The magazine will take a bit more in the way of longer rounds, and the longer the better, as far as feeding is concerned. Shorter rounds or cartridges loaded with blunt-pointed bullets have a very pronounced tendency to "nose-dive" and jam against the edge of the feed ramp. If you're having this problem, you can try a couple of ways to make the rifle eat what you want to feed it: 1. Very carefully open up the rear of the feed lips on a magazine.

Try this, opening the lips a bit at a time, and working forward in small increments. This trick allows the cartridge to move forward under less tension from the clip until the nose of the bullet is on the feed ramp. If this solves the problem, all clips used with this ammunition need to be individually modified. This modification does not affect feeding with regular (original) FMJ ammo. 2. The rifle's magazine-follower assembly may be suffering from weakened springs.

If the rifle is giving trouble, even with original FMJ in all clips, the upper follower spring (#20c) is the most likely culprit. Try re-arching the spring carefully and see if that cures the feeding ills. If so, spring replacement is in order. If you can't find replacement springs, it is possible to anneal, reshape, temper, and draw the existing spring, or you can try making your own. Many owners are dissatisfied with the sights, especially on the 95/34 carbines.

It's possible to modify the existing rear sight to allow a more realistic 100-yard zero, but the notch is barely visible over the front receiver ring. Similarly, building the front sight up higher than it already is would make the gun appear to be a sailboat in disguise. You have several other options. Aside-mount scope base can be modified and installed, allowing the use of a conventional scope. Or, you could adapt a Weaveror Picatinny-type base to replace the rear sight and use a dot sight or LER scope.

Another solution is to tailor reloads to shoot to zero at 100 yards with the ladder up, using the "300" V-notch. Conclusions Overall, no straight-pull rifle of any design has had much of an impact on either military or sporting users. Straight-pulls are generally more prone to problems than turnbolt rifles (especially from a military viewpoint), because of relatively weak primary extraction and susceptibility to debris.

In addition, the Mannlicher clip-feed system—although used in several rifles adopted by major powers—was still inferior to Mauser's magazine design because the Mauser could be loaded and used without the clips. Nevertheless, the 1895 and 95/34 carbines now being imported in great numbers are priced right, they're compact, light, and generally very handy.

Ammunition is something of a problem, but reloadable brass is readily available and I expect manufacturers will tool up for the cartridge and take advantage of the niche market, just as they have for the 7.62x54R, 7.7 Jap, 6.5 Carcano, 7.65 Argentine, and several other vintage military rounds. If you do much work on military-type weapons, one of these is sure to cross your bench before long. ■

MAINTENANCE & REPAIR

Reader Forum

BY AMERICAN GUNSMITH EDITORS MARCH 2004 ORIGINAL PP. 22-24

Rimfire Ruger I have a Ruger 10/22 rifle in my shop. The problem is ejecting unfired shells if not emptied while shooting. The only brand of shells it has problems with is CCI 22 LR. The customer had replaced the barrel with an aftermarket barrel from Butler Creek approximately three years ago, but didn't notice any problems until recently. I have tried the barrel on another 10/22 receiver, and have the same problem. Any thoughts on this problem would be appreciated.

Mark From your description, we're not sure exactly what the problem is. However, since it only occurs with CCI ammo, we suggest your customer avoid the use of CCI in the future. Rimfire firearms can be extremely picky when it comes to ammunition. **Slow-Cycling Remington** I have a Remington 1100 that had a broken gas-piston assembly and a damaged link. I have replaced these as well as the action spring. Now the action is slow to return, and sometimes it needs assistance.

If I take out the fire-control assembly it works fine, and when I use the fire control out of another 1100 it works fine. Some ideas please. I also have an 11-87 that short cycles. I cleaned the action and now it doesn't cycle at all. Thanks. On the 1100, the action bar is probably binding on the fire-control assembly (a.k.a. the trigger mechanism), but not on the others you have tried.

Mark the trigger housing with Dy Kem, assemble the shotgun, cycle the action, disassemble, and check to see where the contact is taking place and relieve the area. We doubt the action bar is bent, since it works with the substitute assemblies you've tried. Regarding the 11-87, is the piston and O-ring assembled correctly? Check the owner's manual. Also, the 11-87 barrel is designed to allow the interchange of 2-3/4- and 3-inch field loads. It will short cycle with target loads.

Ranger Shotgun I have a Sears Ranger Model 102.25 12-gauge pump shotgun that is not feeding properly. I've cleaned the gun throughout, but the timing on the feeding mechanism seems to be off. All I know about the gun is that it was made by Stevens and is similar to the Model 520. Any comments or ideas on how to fix this would be helpful. Corey The Sears 102.25 was a Browning-designed Stevens Model 520. It went out of production over 80 years ago. As we see it, therein lies your problem.

The carrier mechanism is worn out. There is likely to be considerable wear related to the action bar and its groove in the receiver. Sorry we can't be more specific, but it's more guesswork than not on a gun as old as yours. The good news is that Jack First may have parts. .17-Cal 10/22? With the onslaught of the .17 HMR, is it possible to transform the 10/22 LR to .17? Thanks. Transform? No, the .22 LR barrel and chamber are all wrong for the .17 HMR.

The .22 LR rotary magazine is wrong for the .17 HMR, and the .22 LR receiver is wrong for the .17 HMR. However, Ruger announced at the National Firearms Wholesaler Show in Phoenix that a Model 10/17 would be available after January 2004. Loose-Barrel Beretta I live in waterfowling country (Maryland's Eastern Shore) and have a customer with a Beretta 391A Extrema. The barrel has loosened at the threads. The threads are in perfect shape.

After talking to him, it seems this has happened before and to other hunters in the area as well. Beretta sent him anew barrel the first time, but that one has loosened too. These guys are shooting the Hevi-Shot 3.5-inch loads, so the guns are taking a lot of abuse. Have you heard of this before? If so, are there any updated service methods or techniques to remedy this? I thought I would ask you guys before contacting Beretta, since this replacement barrel has the same fault. Thank you for your help.

Kerry We haven't heard of a recurring problem. The gun was made for 3-1/2-inch shells. We wonder if the Hevi-Shot loads are hotter than others. Noting your comment that the barrel threads are "perfect," can the same be said for the receiver threads? If they're messed up, no amount of barrel replacement is going to resolve the issue. If they're okay, try applying blue Lok Tite to both threaded surfaces.

Red Lok Tite would be stronger, but the trouble with the red stuff is the amount of heat required to defeat the bond once it's set up. Enfield 22 Trainer Rifle I have acquired an Enfield rifle chambered in 22. The stock has been kind of butchered but the rifle looks in good shape.

The markings on the receiver by barrel are “crown” over “3L” over “13.” Then, there is a crown over “GR” over crossed swords over “P.” There is also a “BNP,” and on the strap by the trigger guard is a crown over “GR” over “1918.” On the forward end of the bolt it has stamped “22 no. 2.” I know this seems like a bunch of garble. The biggest problem is it is missing the magazine. The hole looks to be the same size as the regular Enfield, in fact, I tried the one out of my No. 4 Mk1 and it seems to fit.

So it must have had one that closely resembles the original magazine, but has a smaller one inserted for the .22 cartridge. Numrich does not carry the one I need, although they do have one for a similar rifle made by Beretta.

Do you know where else I can try for a magazine? I would appreciate any help you can offer. Lowell T. Check with Tom Forrest in Lakeside, California We think he'll be able to help you. Dragoon Info I bought a Virginian Dragoon .44 Magnum. It is marked Interarms Alexandria Virginia USA; Pat. No. 3,803,743, dated Apr 18, 1974, Serial # 520611. It's a stainless-steel model with a 7-1/2 inch barrel. It is Mag naported and in very good condition. I can't find anything written about the Virginian Dragoon before 1976.

I would like to find information about the value of the gun and any other information available. Stan Nelson Kemmerer, Wyoming The barrel length tells us you have a Virginian Dragoon with a last suggested retail price of $315. Present value, depending on condition, runs between $210 and $265. Some of these revolvers were made by Hammerli in Switzerland. If yours is among them, it may be worth more. Interarms has ceased operations as most folks know, but the gun is patterned after the Colt SAA.

We can't ensure parts interchangeability, however. Rattling Thompson I have been a member of the association for many years now, and your articles have been very helpful to me in repairing my guns. But I need some help with a Thompson Center Encore in .25-06 caliber with a heavy barrel. I have been trying to check the headspace on this gun using Forster gauges. It closes on the no-go and the field gauges. There must be another way.

The gun is new and groups around 3 to 4 inches at 100 yards with all brands of factory ammo. I can put around in the chamber and close it, then shake the gun. You can here the cartridge moving back and forth, so I thought headspace. Any info you can give on this problem would greatly be appreciated. Keep the good articles coming. Bryan If the gun closes on a no-go and/or field gauge, there's a headspace problem. Gauges are the thing to use when checking for this condition.

Is there any sign of case expansion, primer cratering, or hard extraction? The shaking noise you're hearing might come from an oversize chamber, in which case extraction would be quite a problem. Since the gun is new—and presumably still under warranty—we suggest it be returned to the factory for a complete checkup. UFC Double Wing I have a Universal Firearms Corp. Model 2021 "Double Wing" 20 gauge in the shop (manufactured by Armas Erbi). Do you know where I can get disassembly and parts info?

I can't find any information on this shotgun other than that listed in the 2002 Standard Catalog of Firearms. The trigger for the left barrel is mushy, and doesn't let off crisply like the right barrel. Also, do you know where I can get grip screws for an Astra 300 or drawings for the grip screws so I can make them. Thank you. Douglas What you need is the address of the original overseas manufacturer. From that source, instructions and drawings might be available.

Write to the NRA Museum (Waples Mill Road, Fairfax, VA 22030) for the address. Astra Sport (Apartado 3, 48300 Guernica, Spain) is the contact for the screw drawing or screws. But have you tried a hardware store? Most carry both standard and metric machine screws.

Norinco Sight Replacement I have been having trouble replacing the rear sight on a Norinco AK-47. The leaf spring that holds the rear sight in place is too strong. I can't push the old rear sight down far enough to turn either pin out of the hole. Is there a tool to momentarily hold the spring down? Or is there a better way to do this? I would appreciate any information you can give me.

Matt There is no ready-made tool we're aware of, and since you have a Norinco, we can only guess what the Chinese may have used as a leaf spring. However, you might try temporarily rigging a C-clamp, using wooden blocks to protect the receiver. Did you know that Gun Digest's book on disassembly of centerfire rifles has complete instructions on the AK-47 and its many clones? Also, a videotape on the rifle is available from the American Gunsmithing Institute H.

Schmidt Revolvers I have been confronted with a number of H. Schmidt revolvers. I know they were made in 1968 in Germany. Just what type of metal is the frame, and how were they blued? I also have a Dan Wesson that I am having a devil of a time trying to get the Packmyer grips off without destroying them. I have removed the grip screw and had the grip soaking

(continued from previous page) in WD-40 for two weeks. No luck yet. We assume you're facing an HS-38 in .38 Special. If so, it's a solid-frame revolver, but we have no information on what they were made from or how they were blued. We suggest you write the NRA Museum to secure the address of Herbert Schmidt of Ostheim an der Rhon. Then write there for the specifics you seek. Hopefully, the factory is still operating. Do you suppose someone expoxied on the grip? Sure sounds like it.

We've never met a set that hung onto a grip frame the way yours do. If epoxied, or otherwise glued on, heat might break the bond. Too much heat, though, and you'll damage the grips. Similar damage can result from some harsh solvents. Custom Mauser I want to build a Mauser 98 in .35 Whelen. I've got R. A. Walsh's book on building rifles, but he does not say which manufacturers not to use. Also, I have heard that some Mausers have an extra locking lug, but I'm not sure which ones have that. Do you know?

Is it safe to use a Turkish or Yugo rifle action? Thanks. Write to S. A. A. M. I. Newtown, CT 06470) and confirm the suitability of the .35 Whelan for a '98. We'd be a little concerned if the receiver you plan to use is Yugoslavian and was made during WW II. The Axis powers used slave labor to build their military arms back then, and sabotage was not uncommon. An Oberndorf action, even one that was Turkish made, would be safer.

Turkish Army orders kept the Mauser factory open over some lean years prior to the Turks taking on the manufacture of the rifles themselves. After their German supervisors/teachers had departed, continued production resulted in some odd-ball stuff —like small-ring barrels on large-ring receivers—but we haven't heard anything about blown actions. Reluctant Restorer I was recently approached by my mother-in-law to repair/restore a couple of old firearms. One is an Ithaca M-49 .22-caliber lever-action single-shot.

The other is a J. C. Higgins (Sears Roebuck & Co.) Model 21 .410 pump shotgun. These are not worth anything, and they've been neglected to the point that I really dread messing with them. I wouldn't even accept the responsibility, but they were my mother-in-law's fiance's first rifle and shotgun when he was a little boy, and they asked me to fix each firearm up as a personal favor. Since I haven't learned to say no, I need the schematics, a parts list, or maybe some disassembly instructions for each of them.

Thanks. Mitchael have a schematic on the Ithaca and are sending you a copy since you thought to include your snailmail address with your email. The gun went out of production in 1979. The present value in excellent condition is about $150. The J. C. Higgins is a Hi-Standard Flite King, out of production since the mid 1970s. An article, parts list, and schematic appeared in our November 1996 issue. The current value in very good condition is about $200.

Finding parts for either/both guns is likely to run up your phone bill. Marlin/Sears Double I am looking for assembly/disassembly diagrams and a book for a Marlin model 90DT "double trigger" shotgun. I have one in my shop for repair, and I have not been able to get any info on it. Any help will be appreciated. Robert The Model 90 over/under was made by Marlin at the request of Sears Roebuck. These guns had the prefix of 103 in their serial numbers, and were not stamped with "Marlin Firearms" until after 1945.

The gun has a malleable iron receiver and soft-soldered barrels/ribs. They have not been made since 1963, and there are no schematics on the gun. Before continuing with any repair, we suggest you contact the Marlin Firearms Historian North Haven, CT 06473) regarding the shotgun's ability to handle modern loads.

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