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INSIDE THE ARCHIVE

SERVICING THE REMINGTON M504 BOLT-ACTION RIMFIRE RIFLE

NRA DISABLED SHOOTING SERVICES ENTERS SECOND DECADE • DEALING WITH SCREWED-UP SCREWS • SMOOTHING T...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 016

DIGITAL ARCHIVE EDITION

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IN THIS ISSUE

Contents

A complete guide to the searchable editorial work preserved from March 2005.

2 NRA Disabled Shooting Services Enters Second Decade

AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 2

3 Servicing the Remington M504 Bolt-Action Rimfire Rifle

CHICK BLOOD • ORIGINAL PAGES 3-7

8 Dealing with Screwed-Up Screws

DENNIS A. WOOD • ORIGINAL PAGES 8-11

12 Smoothing the Browning Hi-Power

CHICK BLOOD • ORIGINAL PAGES 12-15

16 The Improved Do-It-Yourself Barrel Vise

NORMAN E. JOHNSON • ORIGINAL PAGES 16-17

18 Working the Lightning Pump Action Rifle

DAVID R. CHICOINE • ORIGINAL PAGES 18-22

23 Reader Forum

AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 23-24

HISTORY

NRA Disabled Shooting Services Enters Second Decade

BY AMERICAN GUNSMITH EDITORS MARCH 2005

ORIGINAL PP. 2

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Most Americans are aware of the National Rifle Association's vigorous defense of the Second Amendment to the United States Constitution, their pioneering firearms-instructor training courses, and many historic competitions dating back into the late 19th century. But for the past 10 years, a lesser known NRA department has quietly been extending the shooting sports frontiers for all sportsmen, marksmen, and gun owners.

Officially established on January 1, 1994, NRA Disabled Shooting Services immediately went about developing the first totally new use for a rifle in over 100 years. Designated the NRA Rehabilitative Shooting Unit, the program utilizes a precision air rifle as a tool for physical therapists to use in the early rehabilitation of their post-injury inpatients.

Dave Baskin, manager of NRA Disabled Shooting Services, designed the program to give the supervising medical professional full control over all safety and performance factors during each shooting exercise, while working to improve the patient's eye-hand coordination, range of motion, trunk balance, breath control, concentration skills,

and self-confidence. There have been over 15 units installed in both civilian and veterans hospitals in the U.

S., and one at the National Rehabilitation Hospital of Ireland, in Dublin. It didn't take long before NRA Disabled Shooting Services recognized the need for a national resource center, where individuals and organizations could call for guidance with their disability-related hunting and shooting sports challenges.

By the end of 1994, over 1,000 callers had availed themselves of the opportunity to speak directly with Dave Baskin, and draw upon his more than 17 years of experience with adaptive hunting and shooting sports.

At present, NRA Disabled Shooting Services is receiving over 5,000 calls annually on subjects as varied as locating an outfitter who can accommodate a disabled hunter, adapting a gun to be operated by a sportsman with the use of only one arm, and advising a marksmanship instructor on how to work with a youngster in a wheelchair. In 1996, NRA Disabled Shooting Services developed what has turned out to be the most accommodating and progressive marksmanship competition in the history of the shooting sports.

The NRA-Beeman Grand Prix Championship is a 12-city rifle and pistol tour for marksmen with physical disabilities. Baskin developed the tour's format along the lines of the highly successful NASCAR Winston Cup auto-racing series, and the results have been dramatic in the areas of participant diversity, media interest, and sponsor recognition. The tour is conducted under a mathematical formula that allows everyone to compete for the top awards, regardless of gender, age, or disability.

In 2005, the NRA-Beeman Tour will bring its unique brand of shooting sports to major cities in Alabama, Arizona, California, Louisiana, Ohio, Oklahoma, Pennsylvania, South Carolina, Texas, and West Virginia. As NRA Disabled Shooting Services enters its second decade, it is currently working on technological advancements that will benefit the disabled population, the shooting-sports community, and the outdoor recreation industry in general.

To contact NRA Disabled Shooting Services, call Editor Keith Lawrence Technical

PEOPLE & COMPANIES

Servicing the Remington M504 Bolt-Action Rimfire Rifle

In addition to detailed disassembly/reassembly instruction for the Model 504, this report covers parts interchangeability, along with headspace and trigger-pull adjustments.

BY CHICK BLOOD MARCH 2005

ORIGINAL PP. 3-7

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An owner's manual is delivered with every new Remington Model 504. Like all similar booklets, it will not be studied by the owner and, in all likelihood, will be promptly lost. From that common scenario come many of the problems you'll encounter with the 504—and most other firearms. This, of course, is good for your bottom line; so don't be too hard on these gun owners, and be sure to listen patiently to their complaints, showing no sign of contempt for their carelessness.

Some of the problems with the 504 are certain to be ammo-related. That's because the owner's manual advises that the diet for factory testing the firearm was of Remington manufacture, and recommends its continued use. This is actually good advice. You see, small-bore guns are among the most finicky eaters—the 504 is no exception—and .22-caliber cartridges do vary dimensionally from maker to maker.

These variations may be slight, but the gun will show the difference by not shooting as accurately or by reacting in other unpleasant ways. Usually, the cure for minor small-bore problems is to try several different brands. The one that works best should become the gun's standard ammo. Another test, not solely for the

504, is to ask a customer complaining of feeding problems to load up a magazine as you watch. In every case, around should be inserted with pressure being applied exclusively to the rim.

When a clip magazine is correctly loaded, the forward three-quarters of the topmost bullet will protrude above the lips of the clip. Incorrectly loaded, nothing is visible. This indicates the bullet(s) have been pressed down by the nose and the rims are overlapping. What happens? Bolt override. No cartridge stripped off. No chambered round. Nothing but the dreaded "click" of a dry fire.

Of course, not having a magazine fully inserted causes the same problem, as do really dirty magazines or damaged magazine components. The owner won't know that. Since he never read the manual, he won't know how to properly clean his 504, including the bolt, magazine, receiver, and trigger assembly. You haven't read the manual either, but since you're reading this you'll know more about the gun than your customer. And that's the way it should be.

Field Stripping The chamber's empty, the safety is "on," the magazine has been

SERVICING THE REMINGTON M504 BOLT-ACTION RIMFIRE RIFLE CONTINUED

ORIGINAL PAGE 4

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removed, and you're wearing eye protection. Raise the cocking handle, pull it partially to the rear, depress the bolt stop on the side of the receiver, and slide the bolt assembly all the way out. There are two takedown screws; one (#37) is located forward of the magazine housing, while the other (#35) is just forward of the trigger. A 1/8-inch Allen wrench will remove both. There's no need to remove the rear guard screw. With parts #37 and #35 out, the action can be lifted from the stock (#28).

The receiver (#18) and trigger assembly (#17) can be cleaned as a unit. As you might expect, Rem Action Cleaner is recommended by the manufacturer. Spray both components inside and out with the cleaner. Place the safety in its "fire" position, and pull and release the trigger several times. The sear is clearly visible at the rear of the receiver (see photo). Holding the trigger to the rear, depress and release the sear at least five times. It should move freely in both directions.

Apply more cleaner, blow-dry the assemblies, and spray Rem Oil into both holes on the right side of the trigger assembly between the bottom of the safety and upper ledge of the trigger, plus on the area of the trigger-adjustment engagement screw (see diagram). Operate the safety lever a few cycles to en-

sure there are no hangups, then leave the safety in the "fire" mode. Pull and release the trigger. Do it again, and once again.

After being rotated into the uncocked notch, the head will clear the bolt plug which can be removed as described in the text. If it fails to return forward, or if the sear has failed to pop up completely during your previous test for free movement, the reassembled rifle may have to be returned to the factory or an authorized repair center. A call to will identify the nearest one. Then again, maybe you will be able to fix the problem after you read the rest of this article.

Beyond Field Stripping To clean the bolt assembly, get a grip on the bolt body with one hand. With the other hand, grab the bolt handle. For what's next, I'll assume you're holding the bolt body in your left hand. Place your thumb over the bolt-stop slot. Looking downward, the bolt plug (#15) will be pointing away from your chest, and the lug on the firing-pin head (#14) will be easily seen. Look closer. There's a small, curved cut in the body where the lug seats. It's the cocked notch.

Angled toward you is a larger, V-shaped cutout just above the base of the bolt handle. This is the uncocked notch. Maintaining your

grip on the body and handle, rotate the handle upward a quarter turn to move the firing-pin head from the cocked to the uncocked position. The firing-pin head must be clear of the bolt plug before you can turn the plug counterclockwise and are able to lift it away. The entire firing-pin assembly slides out to the rear for individual cleaning and lubrication.

To clean the magazine assembly, use a small-blade screwdriver or small punch to compress the magazine spring toward its feed lips through the slot in the magazine housing (#39). Keep the pressure on while you slide the base from the housing. Control and slowly release the spring. Remove the retainer, spring, and follower. Beyond the Owner's Manual Disassembly of the Firing-Pin Assembly. Compress the spring by pushing on its retaining sleeve (#16), rotate the sleeve 90 degrees, and slowly ease off.

Be aware that the spring is under pressure and has to be kept that way before removing the retaining sleeve. Once the retainer is off, maintain control of the spring pressure while sliding it from the firing-pin shaft. Remove the firing pin from the shaft and slip off the mainspring sleeve. All non-restricted bolt and all firing-pin components are

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interchangeable at the gunsmith level. Disassembly of the Extractors. No pins retain the extractors (#8 and 9). Both are under tension from their individual springs (#11). One at a time, each extractor has to be swung outward approximately 90 degrees, but it's best to block their individual holes in the bolt face before reaching the full 90 degrees. Otherwise, the extractor plungers (#10) may depart the bench. These plungers are less than 1/2 inch long, are dull black, and wear a .060-inch-diameter boss at one end.

When lost, they'll become permanently invisible. The extractors are not interchangeable. Right is right. Left is left. Keep track of which is which. I might as well add a reassembly tip here: When replacing the extractors, I used a 3/32-inch punch to compress the plunger and spring after starting each extractor in its bolt slot. When compressed sufficiently, the plunger clears the rear of the extractor. I pressed down to seat it while simultaneously removing the punch. Magazine Housing/Ejector Disassembly.

Two housing pins (#24) are involved. Remove the forward one first to free the magazine-release assembly.

The housing 1 Barrel* 2 Bolt Stop 3 Bolt Stop Spring 4 Barrel Set Screw 5 Barrel Clamp Screw* 6 Bolt Stop Pin 7 Recoil Lug 8 Left Extractor 9 Right Extractor 10 Extractor Plunger (2) 11 Extractor Spring (2) 12 Bolt Body* 13 Bolt Cam Lock Assembly* 14 Firing Pin Assembly 15 Bolt Plug 16 Bolt Plug Ball Plunger 17 Trigger Assembly* 18 Receiver* 19 Ejector 20 Magazine Latch 21 Magazine Latch Spring 22 Magazine Release 23 Magazine Latch Pin 24 Magazine Housing Pin (2) 25 Housing Screw Lock Washer (4) 26 Housing Screw (4) 27 Magazine Box Assembly 28 Stock 29 Rubber Butt Pad 30 Recoil Pad Screw (2) 31 Swivel Spacer (2) 32 Rear Swivel Stud 33 Trigger Guard Screw Insert 34 Trigger Guard 35 Trigger Grd/Takedown Screw (2) 36 Escutcheon 37 Front Takedown Screw 38 Front Swivel Stud 39 Magazine Housing 40 Bolt Assembly 41 Receiver Plug Screw (4) 42 Barrel Guide Pin 43 Magazine Release Pin *Restricted

SERVICING THE REMINGTON M504 BOLT-ACTION RIMFIRE RIFLE CONTINUED

ORIGINAL PAGE 6

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Frequent checks are required in the process of working the Model 504 to ensure there is no interference with sear movement. screws (#26) come off next—and don't misplace their lock washers (#25). The rear housing pin retains the ejector (#19). It's drifted with a small punch. The ejector lifts out easily, and then you can get back to the release assembly. Drift out the latch pin (#23) to separate the latch (#20) and latch spring (#21) from the release (#22).

Here again, all parts are interchangeable and the housing pins are identical. Way Beyond the Owner's Manual Barrel Disassembly. Back out the barrel-clamp screw (#5) with a 10/32 Torx socket, loosen the barrel set screw (#4) with a 3/32-inch Allen wrench, and pull the barrel from the receiver. That's hardly a complicated operation, though be aware that the barrel-clamp screw and the

barrel are restricted parts. You won't be able to get replacements for either from Remington, so keep both under maximum security.

When you reinstall the barrel, after touching up a damaged muzzle perhaps, the trigger assembly has to be mounted to the receiver with its screws torqued between 10 and 15 foot-pounds, and there will be head space adjustments required. But that happens after you remarry the barrel to the receiver. The barrel design is intended to provide a slip fit between the barrel hub and the receiver's counterbore.

I should point out here that the barrel breach must be seated past flush with the face at the bottom of the counterbore. Details of barrel replacement and headspacing follow together, since they are critically interrelated. A Setting

Headspace. The safety remains in its safe position. A small amount of Loc Tite #648 is placed on the barrel clamp screw, and the screw started into the receiver but not tightened.

The bolt is inserted in the receiver, the bolt handle moved to its upward or out-of-battery position, and the barrel placed in the receiver. The barrel-guide pin (#42) must be in line with the slot on the low side of the barrel boss. Secure the receiver between protective vise jaws, and push the barrel inward by hand so the breech and counterbore are past flush. Keep pushing as you move the bolt into battery. Tighten the barrel-clamp screw somewhere between 115 and 124 foot-pounds. Stop pushing.

OPEN THE BOLT AND INSERT A "GO" GAUGE



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in the chamber. Factory specifications call for a .047-inch gauge. When you try to close the bolt, it may be stubborn or not close completely. Whatever you do, don't force it. The aforementioned specs lead me to believe .047 or even .048 is okay. Apply #242 Loc Tite to the barrel set screw and tighten it hand tight. But don't

overtighten; you might strip the threads. If you do, no sweat. The set screw isn't restricted. Trigger-Assembly Adjustments.

The sear should be checked for free travel after stock replacement, bolt-assembly work, reinstalling the trigger assembly to the receiver, or after you have adjusted trigger pull and/or travel. Remember, you can't purchase a complete 504 replacement-trigger assembly.

MAINTENANCE & REPAIR

Dealing with Screwed-Up Screws

Gunsmiths are routinely called upon to deal with rusted, broken, or missing screws. With the right tools and techniques, a tedious replacement job need not be an all-day project.

BY DENNIS A. WOOD MARCH 2005

ORIGINAL PP. 8-11

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One of the more perplexing aspects of gun repair is dealing with screws that somebody else has messed up. Whether the screw has rusted in place, has been stripped, had the head twisted off or chewed up, or is just plain missing, an annoyance like this will eventually find its way to your bench. Once you learn how to avoid producing these problems if they don't already exist, and you see a few techniques used to deal with the problems if they do, dealing with screwed-up screws will no longer be a major headache.

Driver Bits The most common styles of driver bits we use in our work are the flat blade, hex, cross, and Torx styles. We have no control over the manufacture of driver bits and the tolerances that are allowed during the machining process, nor do we have anything to say about the tolerances allowed by the screw manufacturers. All we can do is deal as best we can with what we get, and try to maintain the fit between the driver bit and the socket.

Screws with a single slot are most often used on firearms, and these seem to get the most abuse—usually from gun owners who use a tapered flat-blade driver bit. As the

screw is tightened into place, because of its shape the tapered blade creates a condition referred to as “cam-out.” A driver bit with flat sides that fits the slot as closely as possible for width and diameter will virtually eliminate cam-out or slippage. Screws manufactured with hex-socket heads require a hexwrench to turn the fastener into place.

These screws are most often seen on scope bases and rings, and are occasionally used to draw a barreled action into the stock. Under ideal conditions, hex-wrenches have a 60-degree drive angle. When tolerances become minimal on the hex-key and maximum in the hex-socket that receives the wrench, ugly things can happen. The 60-degree driving angle is lessened, and the hex-key turns the screw into place more on the points of the wrench where the sides intersect (see Figure 1).

This will cause the hex-key to start rounding over and, in an extreme condition, the wrench will round the hex walls in the screw. It's best to look over your hex-key to see that the corners are still sharp; if there are signs of rounding, either grind the end back to where corners are once again crisp or else replace it. Figure 1.

Standard Key Keep in mind that the depth to which the hex-key fits into the fastener socket can be a minimum of only .064 inch according to ASME B18.3-1998 (American Society of Manufacturing Engineers), so if the corners of the wrench begin to round over the wrench will begin to round the walls of the fastener socket. A hex-head screw with a hole that's become rounded will be a factor to contend with.

Leupold has been shipping the Torx-style fastener for quite some time with their scope bases and rings—along with the correct size wrench. Brownells has a replacement scope-base and ring-screw kit that comes with driver bits for this style fastener. The Torx-style fastener has multiple 15-degree driving angles which are less prone to rounding over, and allow tightening of the screw into place more securely. The cross-style of screw socket is seen occasionally on buttplate and grip-cap screws.

These are usually not much of a problem as long as the correct size bit is used. Most common sizes of cross-screw driver bits are the #0, #1 and #2. The tip

DEALING WITH SCREWED-UP SCREWS CONTINUED

ORIGINAL PAGE 9

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of the driver has a forward taper, so if some forward pressure is used to keep the driver bit in place the likelihood of cam-out is slight. Rusted and Busted When you're dealing with an obviously neglected firearm you'll often notice rust on the exterior. If rust is present on the outside, you can bet you'll find rust on the inside. When screws will not easily turn during takedown and there are visible signs that the screw could be frozen in place by rust, assume that it is.

A product that has helped me to free up screws rusted in place is called Kroil. I prefer the Aero Kroil, because I can direct the spray into areas that look as though they need it. This stuff is advertised as "The Oil That Creeps" and the description on the can says it will find its way into openings as small as one millionth of an inch. It's the best penetrating oil I've ever used, and has never removed or harmed any gun-metal finish.

If a screw remains stuck in place after the Kroil treatment and an overnight soaking, I'll use my heat gun on the frozen-in-place screw. Because we never know if somebody put thread locker of some sort in the threads, the heat will help to soften the thread locker and loosen those. Then they can be polished and blued. threads—or maybe even increase the opening to two millionths of an inch so that the Kroil can flow to the rescue.

After this treatment, the screw will normally come out with a properly fitted driver bit. Another trick to try is inserting a driver bit that fits the slot as closely as possible, and giving the back end of the bit a sharp smack with a hammer. This shocking action may move the screw down a bit and allow the penetrating oil to creep a little further in to help loosen any stubborn rust adhesion.

The type of screws used on firearms require more of a function fit rather than a class or interference-type fit, so there is some slight play between the screw and the receiving

thread. When tightened, gun screws pull up into place in the receiving threads leaving any tolerance that may be there at the bottom side of the thread. This often makes the screw susceptible to the "shock treatment." Kroil can also be used to clean carbon-fouled barrels.

It will get in between the fouling and barrel metal to loosen the hardened crud for removal, so this stuff is handy to have around. Broken screws can make the hair on the back of your neck stand to attention. Whether the head has been twisted off completely or half the head has walked off the job, the approach to removal is pretty much the same; obviously, we need to remove what's left of the screw so it can be replaced.

An example screws with stripped hex-sockets that can normally be easily removed are those on scope bases. The idea here would be to remove all the screws that can be removed with a well-fitting hex wrench, leaving the stripped-socket

DEALING WITH SCREWED-UP SCREWS CONTINUED

ORIGINAL PAGE 10

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screw for last. Measure the outside diameter of the socket head on one of those screws you have removed, and then choose a drill bit the next size smaller than this dimension. Set the barreled action up in your drill press so that it is tightly held with the head of the base screw as parallel to the drill bit as possible. Center the drill in the hex socket and feed the drill into the socket slowly until the head is drilled away. The base should then lift off the receiver leaving a threaded nub of the screw.

Carefully clamp a pair of locking pliers on what's left of the screw and turn it out. The heat from drilling will usually soften any thread locker that is captured in the screw threads, but if there was a delay in getting the pliers in place, you may need to apply some heat from a heat gun to re-soften the thread locker. Slotted screw heads can be a bit more difficult to remove if half the screw head has broken away or if the slot is so chewed up that a flat-sided bit will not do the job.

In these cases, I use a #1 screw extractor, commonly called an "easy-out." This tool has a left-hand fluted twist that, when turned with a tap wrench, digs into the side walls of a hole previously drilled into the broken screw head. The screw head is prepared for the easy-out by first drilling a starter hole

with the smallest center drill you can get your hands on. The one I use is a #11 that has a main body diameter of .125 inch.

The barreled action is set up in the drill press as previously mentioned, and this tiny center drill is centered over the screw slot. The idea behind this drill is to get it cutting as close to the exact center of the broken screw as possible, as this is basically a starter drill for a 5/64-inch-diameter drill. The reason to use the center drill is because it's short and stiff and will not wander around on your work the way a longer, small-diameter twist drill would tend to do.

Once you have the center of the screw spotted with the center drill, the 5/64 drill will follow the starter hole until you drill to a depth of 1/16 inch or so. Since the easy-out has a tapered configuration, the very end of it will only go into the 5/64-diameter hole a little bit. I normally give the top end of the easy-out a couple of taps with a 4-ounce hammer to get it seated in place.

Using a tap wrench clamped tightly onto the end of the easy-out and turning the tap wrench counter-clockwise will usually bring the screw out of place and allow you to breathe easily. Bugged and Battered We've all seen what can happen to screw slots when a poorly fitting, tapered flat-blade screwdriver has been used on them. The slot can get

twisted out of shape, and the top of the slot often becomes rolled over. The simplest solution here would be to replace the screw.

In many cases, replacement screws are not available and in other cases the owner wants to have the firearm's originality retained, so we would need a screw head that looks as close as we can get to the original. To return a screw with a chewedup head back to like-new condition, a plate must be made that supports the back face of the screw opposite the slot side. Drill a hole in a mild steel plate at least 1/2-inch thick, so that the outside diameter of the screw threads will fit through the hole.

Chamfer that hole or counterbore it so that the screw head will nestle in place. The next tools you'll need are a flat-sided needle file and a small ball-peen hammer. The idea here is to strike the rolled-over edges of the slot with a few taps from your hammer while rolling the hammer in a semi-circle toward the slot—kind of like scooping ice cream. The attempt is to cold-form the rolled-over slot metal back into place, and then to use the needle file to straighten out the side walls of the slot.

After you get the hang of this, it becomes much easier to do than it is to explain. Obviously, this procedure will only

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work with screw slots that are only slightly damaged. If the edges of the slot have been chipped away, it's definitely time to replace that screw. If you've ever tried to find single-slot, oval-head buttplate replacement screws, you already know how difficult that can be. Traditional steel butt-plates, whether flat or curved, normally use oval-head, slot-ted screws to fasten the buttplate to the back face of the stock. These screws are quite often found to be chewed up, broken, rusted, or missing.

Substitute screws can be found, but most often they are made of brass, stainless steel, or zinc-plated mild steel. You will also find replacement screws that have the cross-type (Phillips) head, but if you're striving to maintain the look of originality, those just won't do. I stumbled onto a technique for using oval-head mild-steel screws that are zinc plated. Many times these screws can be used to replace bugged up originals, but they just don't look right with the shiny zinc plating.

While trying to find a quick bluing solution that would cover the zinc plating, I found that Birchwood Casey's brass black will actually remove the zinc plating. I use an empty 35mm film canister, filled about three-quarters full with the brass black, and drop the zinc-plated screws into the solution. Put the lid on and swish the solution around so that the screws get completely covered. After about five minutes, pull out the screws and clean them off with a paper towel and look for any remaining zinc plating.

If you see any of the plating remaining on the screws, give them another quick swish-around in the brass black solution. These

screws will look nice and black when they come out of the solution, but the finish will not stay on the screws permanently. Don't leave the screws in the brass black too long. During my experiments with this process, I left a couple of screws in the solution overnight and it began to eat the base metal and ruined the screws.

As long as you remove them from the solution in time, you'll have screws that can be polished and blued by whatever means you prefer—and for a very cheap price. Missing Screws Sometime we come across a firearm with a missing screw and need a means to determine the thread dimensions so it can be replaced.

This can be a challenge when you're dealing with an obsolete or foreign firearm. "Facsimile" is a product I've used many times in the past where no blueprints were available and parts needed to be reverse-engineered so that I could get a print drawn up and produce the parts. I now use this product to make castings of threads, and it also works great for making very accurate chamber/throat castings. If you're interested in acquiring the Facsimile kit, contact Flexbar Machine Corp.

Islandia, NY 11749; www.flexbar.com). When I come across a firearm with a missing screw and don't have any information at hand concerning the screw size, I'll make a casting of the receiving hole with Facsimile. This quick-setting compound is very simple to use, and provides a molded clone of the missing screw thread. There are several preparatory steps before the compound is poured into place. Adam needs to be placed on the off-side of a throughhole thread.

This can be a piece of tape or modeling clay—anything to keep the compound from flowing through when in the liquid form. The threads in the receiver then need to be coated with the release agent that is provided in the kit. I then use an old cartridge case as an extension on the outside of the receiver with modeling clay packed around the area where the case meets the receiver face to prevent leakage.

The Facsimile powder is then mixed with the liquid catalyst until you achieve a smooth consistency that flows easily in one of the small paper cups provided with the kit. This mixture is then poured through the cartridge case slowly so that the compound can fill the threads. It takes 10 minutes or so for the thin compound to harden up to the point where the cartridge case extension can be turned out with the perfectly replicated threads.

All you need to do now is to measure the outside diameter of the threads with a micrometer and the number of threads per inch with a thread-pitch gauge, and then you can begin the lathe work. Conclusions With the techniques outlined above, removing troublesome screws doesn't need to be an arduous affair. Nevertheless, finding replacement screws can mean spending a lot of time on the phone with parts brokers to see if they have what you need—if they even know what part you're referring to.

Most often the phone bill will mount up and it's very difficult to tack on the cost of a replacement screw to the bill. With tricks like using Facsimile and custom-blued hardware-store screws, you can keep these costs to a reasonable level. ■

PEOPLE & COMPANIES

Smoothing the Browning Hi-Power

When you get involved with the Hi-Power, you'll begin to understand why most gunsmiths think of it as one of the toughest pistols to upgrade.

BY CHICK BLOOD MARCH 2005

ORIGINAL PP. 12-15

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The handgun originally called the Browning 9mm Parabellum and more widely known now as the Browning Hi-Power was the innovative gun inventor's final pistol development. Presently sold by Browning Arms Company as a sporting and defensive weapon, it is the standard military sidearm of several NATO countries, and is still being manufactured by Fabrique Nationale, Belgium. There's no need to describe the takedown of the pistol for the purpose of this article.

The NRA Guide to Firearms Assembly or Gun Digest's book of disassembly/reassembly dedicated to pistols do that very well—with the exception of the firing-pin block, which has been added to the newest version of the Hi-Power, the MK III. I'll cover that feature because it is pertinent to the project being undertaken here.

If you have a need or desire for a more in-depth look at the original Browning, send a check for \$3 made out to The Commissioner of Patents and Trademarks, (Washington, DC 20231), and ask for a copy of U. S. Patent #1618510 granted February 22, 1927. You can do the same for any firearm wearing a patent number. I'm not ashamed to admit that I've done this

many times when no other references were available to detail how a gun operates or how its parts relate to one another. Why the Heavy Trigger?

In this case, the blame for the heavy trigger can't be laid entirely on an overly cautious legal department. The Hi-Power was designed to be a battle weapon demanding zero ignition failures. As a result, the Browning has a reputation for a heavy, sometimes gritty trigger pull, and it takes a pretty sturdy thumb to cock the hammer due to the husky mainspring.

The MK III I received was no exception. (I'm talking single-action here.) The pull was scratchy, in excess of 10 pounds, and cocking the hammer nearly popped a tendon in my aging thumb—and then there were the imprints of serrations on my palm after racking the slide with the hammer down.

The question in my mind was: "Does it really have to be this way?" I reasoned that any query made to Browning regarding trigger-pull reduction would probably raise the issue of warranty violation, and I would be admonished for having the audacity to rework the pistol rather than to loose several

hundred rounds downrange to "smooth it up and wear it in." (We've all heard words to that effect when advised not to return a gun to the factory or an authorized service center.) In this particular case, time did not allow me the luxury, or fun, of blasting four or five boxes of FMJ at helpless paper targets.

My customer had secured a concealed-weapon permit almost simultaneously with his purchase of the pistol, and due to circumstances known only to him, he was most anxious to holster his new Browning. (In retrospect, "anxious" is a gross understatement.) I've believed for awhile that the best custom parts made for the Hi-Power are available from Bill Laughridge, the "head honcho" at Cylinder & Slide, Inc. Fremont, NE 68025; www.cylinder-slide.com).

His catalog is crammed with neat stuff for the Browning and the M1911. It costs a mere and refundable five bucks, and you'd do yourself a favor by having one on hand. (Incidentally, Bill was elected Pistolsmith of the Year for 2005 by the American Pistolsmiths Guild.) The similarity and simplicity end when it comes to trigger work.

SMOOTHING THE BROWNING HI-POWER CONTINUED

ORIGINAL PAGE 13

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The match-grade sear lever (arrow) was among those parts not used for reasons explained in the text. As soon as my order from Bill arrived, I opened the drawer labeled “tooling” and pulled out Ron Power’s Power Custom Series I stoning fixture. An article on this unit appeared here awhile back. The fixture has been my right and left hand for hammer/sear/ trigger work, and has been used with over a dozen different guns.

You’ll find it and a list of its firearm-specific adaptors in Brownells catalog Ron provides extensive instructions with every fixture, so I’ll skip the details of how to use it this time around. Planning the Job With the Customer I was sure he didn’t want to be packing a trigger pull in excess of 10 pounds, so most of the components I ordered from Bill Laughridge related to reducing it.

One exception was an extended slide release—a drop-in substitute for the factory part and a highly recommended remedy for a stubby right thumb. Prior to installing any of the performance-enhancing parts, I arranged a short conference with the gun owner to go over various options open for the work that lay ahead. His choices will become apparent as I take you through the overhaul. Let me say this first.

I was fortunate that this particular Hi-Power hadn’t fallen under non-experienced hands for a “trigger job” involving reworking of the factory sear. More about that sear a little later, but over-cutting it can lead to

a serious bending of the sear pin. This happens when too much material is removed from the sear, resulting in a lack of support for the pin which is under tremendous pressure from a 32-pound hammer spring. I assured myself that the pin wasn’t bent by rolling it back and forth on a true surface.

After a total takedown of the pistol, and smoothing up the few rough spots I discovered (excluding any on the OEM hammer and sear), I relegated the latter two components to a home in my parts inventory. The factory sear is a casting, and would not hold its edge after stoning. The new sear is CNC milled to precise tolerances, heat treated to 52RC, and certain to indefinitely maintain the stoning given its engagement surfaces.

The Laughridge sear, 54.5RC hammer, and target spring set had been voted “in.” The wide combat trigger and light trigger-pull sear lever were voted “out” by my customer, in spite of their potential contribution to a lightened trigger pull. He had his reasons. In his mind they were irreversible, and any protest I made fell on deaf ears.

After assuring him the pull would not be as light as it might be if he dropped his objections to the two components, I caved to the old adage: “The customer is always right.” When it comes to guns and gunsmithing, following that adage is not always the best solution, but I understood his concerns and abided by them. In the case of the combat trigger, I even tended to agree with him.

Its installation would have involved defeating the magazine disconnect and would have made it possible to fire the pistol with the magazine out. This would void the factory warranty and only take the trigger pull down by about 1/2 pound. His objection regarding the lightpull sear lever was based on pure cosmetics. He wouldn’t budge, but I’ll take you through how the job should be done, because this lever is key to reducing the pull beyond hammer/sear stoning and spring replacement alone.

Before tackling the lever, however, all work with the hammer/sear/springs must be completed and thoroughly function checked with the pistol assembled. Installing the Sear Lever This job requires some work with a milling machine. It doesn’t have to be computer controlled, though that feature would be nice. Gut the slide and secure it on its side in the machine’s vise, square to the drilling head.

The lower slide rails must be maintained parallel to the axis of the cutter, otherwise known as the 2.45mm drill supplied with the lever. Use it to locate the existing sear-lever pin hole in the slide. Rotate the drill 180 degrees by hand to ensure the alignment. Make absolutely certain you measure the hole placement exactly, and double check everything before the actual drilling begins. Replacement Browning slides cost dearly. Okay, you’re assured. Lock the mill table and reset the dials to zero.

SMOOTHING THE BROWNING HI-POWER CONTINUED

ORIGINAL PAGE 14

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The lined area on the honing stone atop the fixture indicates the length of shim stock to be epoxied to the bottom of the stone to protect the fixture's roller. Unlock the table, move the drill bit .250 inch to the rear of the slide, and relock the table. Replace the present bit with a #1 center drill, and start your new hole through the slide serrations. Switch back to the 2.45mm bit, and drill all the way through at 660 rpm, using a constant flow of cutting oil.

Remove the slide from the machine and deburr the holes in both sides. There are enough variations in slides to require precise fitting to a given pistol, so the match-grade sear lever is oversize in length and thickness to facilitate this. The nose end (front) of the lever is enlarged. Beware of the firing pin; its spring transforms it into a dangerous weapon. Eye protection is mandatory, allowing it to be fitted so the sear is able to clear full-cock engagement with the hammer.

Behind the nose, the angle is left thick enough to allow exact fitting to the lever's trough in the slide. There's no easy way to do

this. You have to fine file a little, stone a little, try the fit, insert a magazine, cock the hammer, slip the slide on the frame, pull the trigger, and see if the hammer falls. If it doesn't, the sear and hammer are still engaged. File a little more, stone a little more, until the engagement is broken.

After that you have to be sure the nose of the sear lever rides below the flat surface of the slide. If it's above, the lever can strike the trigger bar as the slide goes forward and disengage the sear from the hammer. To correct for a high sear lever, a small amount of bending is permissible and necessary. Clamp the front end of the lever between padded vise jaws and tap the rear, or paddle end, lightly with a small hammer.

This bending has to be done in small increments, accompanied by frequent checking with the lever installed in the slide to see that the sear still clears the full-cock notch. (Having a well-made, properly fitting sear-lever slave pivot pin would be highly useful, what with all the taking down and putting back together.) Don't meddle with the OEM

sear-lever spring. Cutting coils off it will cause the lever to "float" downward while the slide is moving forward and could allow the sear to disengage.

A pleasant plus with the Laughridge match-trigger lever is that it can be installed in older Brownings not equipped with a firing-pin block by filing off the paddle-shaped end. Installing the Hammer and Sear By following the disassembly instructions in the aforementioned reference sources, you've taken apart the sear, hammer, and safety portions of the frame. What you were not informed of is the terrible consequence awaiting the uninformed disassembler within the slide of any Browning with a firing-pin block.

It is the firing-pin spring. The thing is so strong it can raise a blood blister if you're foolish enough to try and stop the firing pin as it is launched from the slide with your thumb. Anytime you are removing the firing-pin assembly, there's only one way. First, if you haven't been wearing

SMOOTHING THE BROWNING HI-POWER CONTINUED

ORIGINAL PAGE 15

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This hi-tech Hi- Figure 1. Power disassembly/assembly tool is made from a #12 common nail. It slips over the hammer stem and under the beavertail to maintain compression on the mainspring. The tool lets you get rid of a clamp and gives you more room to work. eye protection all along, you should be. Second, the slide is placed upside down on your bench. Third, the nose end of the sear lever is depressed to clear the firing pin and the pin itself is pressed inward through its stop plate with a punch.

Fourth, use the punch to lever the stop plate upward enough to capture the firing pin, which is still under pressure from its almighty spring. Fifth, place a large wooden block behind the slide. Sixth, keeping your fingers clear of the firing pin, continue to move the stop plate upward with the punch and be prepared to duck. If the wood block is hard enough, the firing pin will not be driven too far into it.

You have to be almost as careful when installing the new spring, but compared to the factory monster, it's a pussycat. Now remove the strut/mainspring assembly from the factory hammer by driving out the strut pin. Be sure to attack the pin from its smaller diameter (dimpled end) to avoid

tearing off the head on its larger-diameter end, and use a nylon bench block as a base for the removal.

You have also, by following the instructions accompanying the Power Custom Series I stoning fixture, polished the hammer full-cock notch and recut the sear. (Note: Never cut the nose of the sear to be narrower than the cocking notch.) When you install the strut on the new hammer, do it so the Below left and Internally, the two have become (continued on page 17) very different animals. large-diameter head of the strut pin seats in the countersink on one side of the hammer's pin hole.

Reassemble the back end of the pistol in reverse order, place the slide assembly on the frame, insert a magazine, and check the work done so far. Rapidly pull the Browning's slide all the way to the rear and let it slam forward. Did the hammer follow down? Maybe you overdid things in the stoning fixture and the sear isn't completely engaging the full-cock notch. Is the sear spring installed correctly? Hammer follow can also be caused by a lack or loss of sear-spring tension.

Increase it by removing the spring, placing it on edge on a sheet of paper, and tracing the spring outline along one side. Then use

your fingers to bend the upper section of the spring toward the front of the pistol. Don't use pliers or wrenches on a sear spring, please. Double check the thumb safety. You want to be absolutely sure it will block the sear when it's engaged. Cock the hammer, pull the trigger, and release the safety. The hammer shouldn't follow.

If it does, the safety isn't moving far enough up into its slide cutout to block the sear. This happens occasionally due to differing tolerances. Correcting for it calls for the removal of a small amount of material from the safety stud. Figure 1 shows the proper area to be reduced, and you'll usually only need to take off a couple of thousandths. To double check your work, reassemble the fire-control system. The safety moves into its slide cutout? Good. But is it blocking the sear like it's supposed to?

Cock the pistol, engage the safety, look down into the frame so you can see the hammer/sear interface, and pull the trigger. The sear should not move. When sear and safety are properly fit in a Browning Hi-Power, the sear must never move up to expose any of itself above the hammer full-cock notch. That's not quite all there is to checking the thumb safety. Will it move up enough in its cutout to lock the slide open? If not, the sear nose

SMOOTHING THE BROWNING HI-POWER CONTINUED

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has been shortened excessively in the stoning process. Throw out that sear, replace it with anew one, and let the added expense be a lesson to you. After all this work is done and confirmed functionally, install the new sear lever as previously described, replace the brute firing-pin spring with the spring received from Bill Laughridge, completely reassemble the pistol, and run yet another function check.

The Final, Full Measures Test fire the pistol using a two-hand hold with only three rounds in the magazine for the first 50 rounds of testing. Sound like a pain? Could be, but if the overhauled Browning is going to go full-auto, it's better if it does so with three rounds instead of a full magazine to feed the eruption. The bottom line on this re-

work: What came in with a 10-plus-pound trigger pull went out with a safe and smooth 6 pounds that felt more like 4-1/2 pounds.

But I insisted the owner bring the gun back after 100 rounds so I could reweigh the trigger and make adjustments, if necessary. He wanted to know why. I answered: "Because it's a Browning Hi-Power." ■

TOOLS & FIXTURES

The Improved Do-It-Yourself Barrel Vise

This simple version of the barrel vise is cheap and easy to make, and will perform as well or better than any barrel vise you can buy.

BY NORMAN E. JOHNSON MARCH 2005

ORIGINAL PP. 16-17

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In the March 2003 issue, I wrote about a barrel vise I designed that consisted of two solid-aluminum halves with grooved, halfmoon channels held in alignment by four bolts located at the extreme corners. Opposing rubber pads were positioned in the grooves, which clamped the barrel as pressure was applied to the jaws with a heavy-duty bench vise. The new and improved barrel vise detailed in this article has the same basic function, but is easier to make and use.

Like the earlier vise, I use it often for removing and reinstalling switch-barrels on test rifles, and it has served me well. Barrel torque in the range of 100 to 150 pounds is frequently applied, but this vise is capable of double that application of torque, if needed. To make this barrel vise, you'll need two 6-inch pieces of 2- x 2- x 3/16-inch steel angle. Mill the rounded inner corner of the angle iron to form a perfectly square 90-degree angle.

This is to allow the bench-vise jaws to contact the barrel vise squarely. Then, from a piece of 1-1/4-inch I. D. steel pipe with 3/16-inch wall thickness, cut a piece 6 inches in length. This will form the barrel-vise jaws when cut to form. Cut two lengthwise pieces from the pipe 1-3/4 inches of the circumference. This will leave an open surface in each of the two semi-circular pieces approximately 1-1/4 inches wide.

With the pieces formed, grind or buff the rough corners and edges from the pieces in preparation for welding the parts together. The semi-circular vise jaws are welded to the angle iron so the linear parts are flush end to end. The convex radius of the vise jaw is held against one leg of the angle iron so the top of one edge is flush with the top of the angle iron. I drilled and tapped 1/4-inch countersunk screws to hold the pieces in alignment while welding. These can be ground off later.

After welding, the pieces are cleaned up and buffed, and can be milled square at the ends so they look better. I then filled the unsightly weld groove with glass bedding material. After a bit more clean up, I painted the two jaw halves black with high-temp engine paint. The overall grip of the padded jaws is improved by tapering the concave vise jaws a small amount. The average rifle barrel taper difference at mid barrel over a 6-inch span is approximately 0.080 inch in overall diameter.

Thus, removing about 0.040 inch from each jaw with a ball end mill from one end to the other will improve overall barrel purchase. For padding, I simply cut a 6-inch length of heavy-duty rubber hose. Neoprene hose would also suffice. I made a lengthwise split in the hose material, which resulted in two equal-sized pieces. This works much better than simply opening Thick rubber hose is used as padding between the vise jaws and gun barrel.

THE IMPROVED DO-IT-YOURSELF BARREL VISE CONTINUED

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This type of vise is extremely durable and pressure applied to the gun barrel is limited only to the duty rating of the bench vise. The concave vise jaws are directly in line with the pressure created by the bench vise. If the parts are clean and dry, the holding power of the vise jaws will accommodate nearly any gunsmithing application. the hose up on one side and slipping it over the barrel. Two pieces just seem to work better.

With the newly manufactured vise jaws ready for use, each one is placed across the open jaws of the bench vise, ready to clamp onto

the rubber-padded gun barrel. This unit will handle all size barrels from standard to target or bull barrels. I recommend cleaning the barrel and rubber padding for greater holding strength. I use a quick wipe with lacquer thinner, or you could even roughen the inside of the rubber with a coarse wire wheel to produce fresh live rubber.

Be sure all traces of dirt or abrasive are removed from the rubber, or they could cause microscopic scratches. I tried bonding the rubber pads to the metal jaws, but this didn't work very well. The flexing of the rubber un-

der pressure works the material enough to loosen the pads. To keep the rubber from slipping, I rough ened the metal jaws with multiple center-punch marks; this works well to help hold the pads in place.

This simple barrel vise has proven to be highly effective for removing and reinstalling many types of rifle barrels. It's easy to make and to use, saves me time, and has never done any damage to a barrel. ■

PEOPLE & COMPANIES

Working the Lightning Pump Action Rifle

These disassembly instructions work for both the original Colt Lightning and the high-quality reproduction made in Hartford, Connecticut, by U. S. Firearms Manufacturing Co.

BY DAVID R. CHICOINE MARCH 2005

ORIGINAL PP. 18-22

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The pumpor slide-action Lightning Magazine Rifle was manufactured by Colt Patent Firearms from 1884 until about 1904. The Lightning was well known for its ultra-fast, short-stroke “trombone” action and its compact size. Indeed, the Lightning was really quite an incredible gun then, and still is today.

The Lightning Magazine Rifle was manufactured in three distinctly different frame sizes: the smallframe, which was chambered for .22 rimfire; the medium-frame that was intended for pistol-size rounds; and finally, the large or so-called “express frame” to fire some of the powerful full-size rifle cartridges used in the late 1800s. Colt’s pump rifles were high-quality products.

They’re unlike the Winchester pump rifles most of us are familiar with; nevertheless, they were made with the same kind of fine workmanship, as you would expect from the folks at the old Hartford Colt plant. The modern-made copy of the Lightning shown here is manufactured by U. S. Firearms Mfg. Co. in Hartford The “new” Lightning replica is offered only on the medium-sized frame and is available in .38 WCF, .44 WCF, as well as in .45 Colt caliber. U. S. Firearms Mfg.

Co. (USFA) offers the rifle in grades ranging from a plain 20-inch round-barrel carbine, up to a 26-inch-barrel rifle in round, octagon, or half-round/half-octagonal configurations. Stocks are available in straight or optional pistol grip, with or without checkering, and

in Top of page: Unlike so many replicas of 19th century weapons, the Colt Lightning medium-frame pump rifle is being reproduced by U. S. Firearms and made entirely in America. Author photos. several grades of wood quality.

The USFA Lightning is of excellent quality, and a close look shows that it really is a kissin’ cousin of the original medium-frame Colt Lightning. It’s so close, in fact, that disassembly procedures for the two rifles are identical. USFA manufactures the new rifle entirely in the USA, and

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1 Receiver 2 Left Ejector 3 Right Ejector 4 Ejector Screws (2) 5 Loading Trap 6 Loading Trap Spring 7 Loading Trap Spring Screw 8 Loading Trap Stop Screw 9 Sideplate Screw from what I have seen I can tell you that, like the original, it is beautifully machined from solid-steel stock and beautifully finished with what is obviously painstaking care.

Disassembly of the USFA and Colt Lightning Rifle, Medium Frame For safety's sake, the gunsmith should always make certain any firearm is empty before attempting to take it apart. Start by pointing the muzzle in a safe direction as you are picking the rifle up—a direction 10 Hammer 11 Hammer Roller 12 Hammer Roller Pin 13 Hammer Safety Pin 14 Hammer Pin 15 Tang 16 Tang Screw 17 Trigger 18 Trigger Spring where no one would be injured if the rifle was to accidentally fire. 1.

Hold the rifle with your right hand by the grasping the stock around the wrist, at the same time being careful to keep your finger away from the trigger (#17). Next, operate and open the action by grasping the forend stock wood (#47 and #48) with your left hand, and pull this all the way to the rear. This opens the action.

Look into the chamber at the rear of the barrel and be sure there is no 19 Trigger Spring Screw 20 Mainspring 21 Mainspring Screw 22 Magazine Stop Spring 23 Magazine Stop 24 Magazine Stop Spring Screw 25 Bolt 26 Top Cover 27 Top Cover Screw 28 Extractor 29 Extractor Pin 30 Firing Pin 31 Firing Pin Lever 32 Firing Pin Lever Pin 33 Slide 34 Carrier 35 Carrier Screws (2) 36 Locking Brace 37 Locking Brace Pin 40 Barrel 41 Magazine Tube 42 Magazine Tube Spring 43 Magazine Spring 44 Follower 45 Magazine Lug 46 Rifle Tube Screw 47 Forend Stock Wood, right 48 Forend Stock Wood, left 49 Grip Escutcheon (4) 50 Grip Screw (4) 51 Buttstock 52 Buttplate 53 Buttplate Screw (2) 55 Trigger and Stop Pin (2) cartridge present.

Also, examine the top of the carrier (#34). This is inside the open action and directly in front of the open bolt (#25). If there is a cartridge present here, there may be more cartridges in the magazine tube. All cartridges must be removed to render the rifle safe. If you do not feel competent to continue, leave the rifle with the action open; this is a safe position, because the rifle cannot be fired unless the action is closed. To unload a loaded rifle, be careful to keep the muzzle pointed in a safe

WORKING THE LIGHTNING PUMP ACTION RIFLE

CONTINUED

ORIGINAL PAGE 21

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Notice the hammer is cocked and the carrier is in the up position. direction, and slowly slide the action closed. Doing this will chamber the cartridge, so be aware: The gun is now loaded and ready to fire. Using the right hand which is holding the stock, use your thumb to grasp and control the hammer while at the same time you pull the trigger, releasing the hammer. Slowly and carefully ease the hammer all the way forward with your thumb.

Now operate the slide action again and the cartridge you just chambered will be ejected from the rifle. Repeat this operation until the magazine is completely empty and no more cartridges appear in the carrier area. An alternate method to unload the Lightning is to leave the action open and complete the second part of the disassembly operation detailed in the next paragraph.

This operation will disassemble the magazine components, and allow you to dump the cartridges in the magazine out through the front

of the magazine tube onto your workbench. After this, operating the action once—all the way closed and open—will remove the last cartridge (the one on the carrier) from the action. 2.

To remove the buttstock and magazine-tube assembly, use an appropriately sized screwdriver to loosen and remove the tang screw (#16) and pull the buttstock assembly (#51) off toward the rear of the rifle. The buttplate can be removed by unscrewing and removing the two buttplate screws (#53) and lifting off the buttplate (#52). Next, with the rifle version, loosen and remove the magazine-tube screw (#46) from the front end of the magazine tube.

Hold your thumb over the magazine plug (#42), and pull the front of the magazine tube (#41) down away from the barrel until the plug is released. Ease the magazine plug forward and withdraw the magazine spring (#43) and the follower (#44) out the front of the tube. With the carbine version, loosen

and remove the magazine-tube screw (#46) while holding your thumb over the magazine-tube plug (#42.) The magazine plug, magazine spring (#43), and follower (#44) can now be removed out through the front of the tube.

Unscrew and remove the magazine-band screw and slide the band off the front. With both versions, you'll pull the magazine tube (#41) straight forward and out of the rifle, being careful to note its position for later re-assembly. 3. To break the action apart, open the action by moving the forend to the rear, leaving the hammer cocked. Then move the forend forward slightly, so the action remains about halfway open.

Remove the two sideplate screws (#9) from either side of the receiver. (These are the rear-most screws located on each side of the receiver.) The trigger-plate assembly, which is called the tang (#15) can be withdrawn by pushing it forward and down and out of the receiver (#1).

WORKING THE LIGHTNING PUMP ACTION RIFLE CONTINUED

ORIGINAL PAGE 22

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4. The receiver can be disassembled by sliding the bolt assembly (#25) all the way to the rear, and using an appropriate pin punch to drift out the locking-brace pin (#37) from left to right (through the holes provided at the rear of the receiver). Withdraw the bolt out the rear of the receiver, and lift the locking brace (#36) out through the receiver bottom. After removing the loading-trap spring screw (#7) and the loading-trap spring (#6), the loading trap (#5) will fall into the receiver for removal.

Make careful note of the position of the spring for reassembly. Remove the two ejector screws (#4)—one on either side of the receiver—then lift out the ejectors (#2 and #3). Make a careful note of their positions and be certain the ejectors are reassembled into the correct sides. The magazine lug (#45) can be removed from the barrel by pushing it out either side. 5. Unscrewing and removing the top-cover screw (#27) and lifting off the top cover (#26) is the first step in disassembling the bolt.

Use a pin punch and hammer to drift out the firing-pin lever pin (#32), and remove the firing-pin lever (#31) out the bottom of the bolt (#25). The firing pin (#30) can be withdrawn out through the rear of the bolt. Again, make careful note of the position of these parts for reassembly. Drift out and remove the extractor pin (#29) and you can then lift the extractor (#28) off the bolt. 6.

To disassemble the tang-trigger group, slide the forearm forward and pull the trigger (#17), allowing the hammer (#10) to go forward. Unscrew and remove the four grip screws (#50) from the forend wood, and lift off the left (#48) and right (#49) forend stocks. Unscrew and remove the main-spring screw (#21) and the mainspring (#20).

Unscrew and remove the trigger-spring screw (#19), and lift out the trigger spring (#18.) Then you can drift out the hammer pin (#14) and lift out the hammer (#10.) Next, unscrew and remove the two carrier screws (#35) from each side of the tang, and lift out the carrier (#34). Drift out the

trigger pin and the magazine-stop pin (both are #55). Move the slide (#33) to the rear slightly, and tilt the rear of the magazine stop up enough to allow you to lift out and remove the trigger.

Once you have the Lightning's trigger out, move the slide farther rearward and continue to tilt up the rear of the magazine-stop assembly (#23), at the same time pushing the front of the magazine stop down until it becomes disengaged from the slide. Remove the magazine stop from the tang (#15), being careful to make note of its positioning within the slide for later reassembly. Move the slide forward and out of the tang.

Finally, remove the magazine-stop spring screw (#24) from the bottom of the magazine stop, and lift off the magazine-stop spring (#22.) As always, you simply reverse the disassembly procedure when you're ready for reassembly. ■

PEOPLE & COMPANIES

Reader Forum

BY AMERICAN GUNSMITH EDITORS MARCH 2005

ORIGINAL PP. 23-24

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Savage Side-Mount After reading the May 2004 issue of American Gunsmith, I thought I should send this information. At the end of the article on Remington Models 14 and 14-1/2, Mr. Edwardson advises to be sure to check headspace. In 1954 or 55, I had a Model 14 come into my shop that was pushing the primers out about .017 inch after firing. It showed no damage or setback on the locking surfaces. A hard-chrome facing bolt would cost \$20 per .001 inch at that time.

Checking with an old gunsmith friend, he advised that the 14 and 14- 1/2 were designed for the fired case to move back to the bolt face, and to polish the chamber. After polishing with 320-grit and oil, the primers were normal. I know this gun was used for many years with no problems. Also in the Reader's Forum, you stated recently that you didn't believe aside-mount base is available for a Savage Model 340.

Numrich Gun Parts catalog #25 lists a Weaver on page 816, and Brownells catalog #56 lists them on page 290, both for 1-inch scopes. Hope this helps someone. Ike Wickwire Corry, Pennsylvania "Designed" to allow the fired case to move back into the bolt face? We had to check that one out with our contacts at Remington.

Their response: "There was never any intention of designing in what amounts to excessive headspace or an oversize chamber." It's quite possible that the old Model 14 that came in to your shop had a burred or otherwise damaged chamber which your subsequent polishing eliminated. The hull had been expanding as usual in the chamber, but the burr or damage or dirt did not allow it to expand as much as it should and pressure

built up. This occurred, by the way, in a few Remington Model 700 rifles with burred chambers.

The condition also causes bad extraction. Thanks for your helpful information regarding the side-mount base for the Savage 340. We received numerous comments on its availability and attempted to pass them along to the reader who made the inquiry. Unfortunately, our emails to him kept getting kicked back as "undeliver able." Hopefully, he'll read your letter in this issue. Remington Mag Tube Removal I've been searching for away to remove a Remington Model 17 magazine tube.

It's a great old gun; it has a cracked forend, but is not beyond repair—if I can get it off. And leads for new wood and a schematic would also be greatly appreciated. Jim Pry out the magazine-spring retainer from the front end of the tube. Release the spring and follower. Take out the magazine-stop screw from the left front end of receiver. After inserting a wooden dowel to prevent crushing, hold the tube between half-round vise jaws formed to fit it perfectly, and unscrew receiver to the left.

Schematics postdate this shotgun, but a parts drawing is shown in Jack First's catalog and try Boyd's Gunstock Industries for the wood. Helwan Trigger Work I have an Egyptian Helwan 9mm semi-auto on the bench. It was new out of the box and, for a mass-produced Third World military/police weapon, not bad despite lots of rough parts and frame tooling marks. My research says that for all intents and purposes it is a Beretta Model 51, but surely does not have the same level of finish work. My job was to smooth it up.

The trigger was very stiff and had lots of drag. I polished all of the camming action, sear/hammerlock/trigger bar, hammer, and pins. The pull was much improved and smooth. The problem I have is as follows: I cycle the slide back to cock the gun, then put the safety on.

I can pull the trigger gently and the sear will not disconnect, but when I pull it real hard, the sear will disconnect but the safety will hold the hammer back. I then have to recock the hammer to reconnect the sear. After much study, I cannot see how the safety can hold the sear from unlocking. What am I missing? It's a good shooter, and I want the customer to have a safe weapon. As always, thanks for your help. Al Skuce The Helwan is an exact copy of the Beretta 951.

It was made in Egypt, so Arabic markings and production quality are the only differences. The safety doesn't act on the sear in the Helwan. It blocks the hammer. When the pistol is fully locked, the trigger bar forces the sear back to disengage the hammer; but if the safety is "on," the hammer will not fall. What you seem to have done with your "hard pull" is create a misfire condition so far as the gun is concerned. It is not a DA pistol. The hammer must be recocked manually and the safety "off" in order to fire.

Ward's Texas Ranger Parts? I need to find a couple of parts for an old shotgun, and I'm hoping you can help. It is a single-shot 12-gauge with hammer. "Texas Ranger, Montgomery Ward" is stamped on one side of the barrel, with "1929 Model" stamped on the other side. I've searched page after page of the Numrich catalog looking at pictures, but I can't seem to find this particular style of shotgun. I need only the mainspring and

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(continued from previous page) maybe some parts for the ejector. I assumed it was probably made by Savage/Stevens, but nothing in that section of Numrich quite matches. Can you give me an idea where I might find parts for this gun, or at least something that might work? I tried making a mainspring from Brownells compression-spring assortment, but none of them are quite strong enough. Thanks for your help. Zeke Corder We have a question for you: Is the hammer you mention exposed or otherwise?

In any case, we were unable to find a "Model 1929" in any cross reference for Montgomery Ward shotguns. We suggest you send a photo of the gun to the NRA Museum (Waples Mill Rd., Fairfax, VA 22030) along with a stamped, self-addressed envelope. When the manufacturer has been pinned down, maybe we'll be able to help you further. In the meantime, don't fire a modern load in the gun.

Winchester 59 Bolt Problems I'm working on a 12-gauge Winchester 59 that refuses to hold the bolt open either manually or after the last shot is fired. Any suggestions you may have would be greatly appreciated. Also, do you have any idea where I might find a disassembly manual for this shotgun? Rick Huggins Check to see that the buffer lock is adjusted to allow the pawl notch in the bolt to override the pawl by about 3/32 inch. To do this, open the bolt manually and allow it to remain open.

Tighten the buffer until it just takes up on the inertia rod. (There should be a slight right slide movement to avoid jamming when this has been done correctly.) Now back off the buffer plug until you see a pair of holes in the closing-spring tube align with the buffer-lock slot in the plug. Locate the lock in one side using pliers, and snap the other end in with a screwdriver. The only service manual on the gun was produced by Winchester when it was part of Olin.

It's no longer available, but the M50 and M59 were almost identical twins. Winchester 1895 Parts I am attending The Pennsylvania Gunsmith School and have a project in the works. It's an 1895 Winchester Carbine chambered in .30 Army; I'm refinishing the metal and restocking it. It was a very poor example of the 1895, so I hope to do it justice in putting the firearm back into presentable condition. Now for my question: Can I get disassembly information and a good diagram for it somewhere?

A problem I anticipate is reassembly of the box magazine in the receiver. I also need the upper handguard springs and rivets as well as the saddle ring. (This is a military carbine.) Any help will be greatly appreciated. John Tereska Winchester did not provide a saddle ring on this carbine unless they were special-ordered that way. Perhaps you can forego the trouble of finding one. Unless U. S.

Repeating Arms in New Haven, Connecticut, can supply a drawing, send a check for \$3 to the US Patent Office in Washington, DC. Request a copy of patent #549,345 dated 11/5/1895. It will contain drawings (not to scale) of the gun along with a full description of exactly how it operates. In addition, since you have a military model, contact the U. S. Army Ordnance Museum in Aberdeen, Maryland. They may also have some information for you.

For parts, call Brownells and ask for a free copy of their parts source list for out-of-production firearms. Ruger Barrel Removal Can you give me any insight on removing the barrel from a Ruger No. 1 rifle? I have the correct tools—action wrench, barrel vise, lead shims, etc.—but can't get it to budge. I've soaked the thread area for three days with a good penetrating oil, and it still won't turn. Is it necessary to pour some molten lead blocks to get it off? Any suggestions will be appreciated.

Bob Ruger is known for tight barrel installations. The only exception to the rule is the 10/22. Supporting the receiver with a correctly fitting action wrench is critical, and you will very likely need a cheater bar on the wrench handle while protecting and solidly securing the barrel in your barrel vise. We recommend the Brownells Action Wrench System with blank blocks you machine to perfectly fit the receiver, and we've found that, once started, Ruger barrels turn off without further trouble.

SEARCHABLE ISSUE RECORD

Archive index

NRA Disabled Shooting Services Enters Second Decade **2**
American Gunsmith Editors

Servicing the Remington M504 Bolt-Action Rimfire Rifle **3-7**
Chick Blood

Dealing with Screwed-Up Screws **8-11**
Dennis A. Wood

Smoothing the Browning Hi-Power **12-15**
Chick Blood

The Improved Do-It-Yourself Barrel Vise **16-17**
Norman E. Johnson

Working the Lightning Pump Action Rifle **18-22**
David R. Chicoine

Reader Forum **23-24**
American Gunsmith Editors

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