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A TECHNICAL JOURNAL OF CRAFT, REPAIR & RESTORATION

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ARCHIVE ISSUE NUMBER

INSIDE THE ARCHIVE

DISASSEMBLY/REASSEMBLY OF THE REMINGTON MODEL 105 CTI SHOTGUN

SUPREME COURT TO RULE ON 2ND AMENDMENT • WHAT DO CUSTOM JOBS REALLY COST? • FINE TUNING MAGAZINES F...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 051

DIGITAL ARCHIVE EDITION

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FROM THE ARCHIVE

Supreme Court to Rule on 2nd Amendment

BY AMERICAN GUNSMITH EDITORS FEBRUARY 2008

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Just before this issue went to press, the U. S. Supreme Court announced its decision to take up the case of the District of Columbia v. Heller. As you may already know, the plaintiffs in this case have challenged the ban on guns in the nation's capital. Earlier last year, a lower court ruled in favor of the plaintiffs, affirming that the Second Amendment of the U. S.

Constitution protects an individual's right to keep and bear arms, and that the District's ban on handguns, firearms in the home, and possession of loaded or operable firearms for self-defense violates that right. The District of Columbia has appealed to the U. S. Supreme Court, which will begin hearing oral arguments sometime in early 2008. If you're not a citizen of the District of Columbia, you might think the outcome of the case is unimportant, but this case has possible ramifications for all U. S. citizens.

That's because the anti-gunners, led in this case by the mayor of Washington, D. C., Adrian M. Fenty, are arguing that the Second Amendment grants a right to the

states (to maintain a militia), but does not grant a right to the individual (to keep and bear arms). Last March, the U. S. Court of Appeals for the District of Columbia, in striking down the District's gun ban, held in the case of Parker v. D.

C. that "The phrase "the right of the people"...leads us to conclude that the right in question is individual." This was the second time in recent history that a federal circuit court upheld the longstanding belief that the Second Amendment was an individual right. In 2001, the U. S. Court of Appeals for the Fifth Circuit ruled in the case of U. S. v.

Emerson that "All of the evidence indicates that the Second Amendment, like other parts of the Bill of Rights, applies to and protects individual Americans. st time a Second since 1939. The on by the Supreme Court to rule definitively on whether the Second Amendment of the Constitution provides an individual right to keep and bear arms. "The firearms industry looks forward to the Supreme Court putting to

rest the specious argument that the Second Amendment is not an individual right, said Lawrence G.

Keane, NSSF senior vice president and general counsel. ells case will be the first time since has addressed the Second Amendment legal scholars and constitutional experts are on record as having concluded that the Second Amendment provides an individual right.

Such renowned scholars as Lawrence Tribe of Harvard, Akhil Reed Amar of Yale, William Van Alstyne of Duke, and Sanford Levinson of the University of Texas have all been vocal in their assertion that the Second Amendment secures an individual right to keep and bear arms. It's ludicrous, of course, to argue that nine of the 10 amendments that make up the Bill of Rights refer to the individual, but one't he Second Amendment'applies to the states. But ludicrous arguments are not unknown in the U. S. court system.

Nor are ludicrous rulings from the bench. Ergo, this one bears watching by us all. Editor Keith Lawrence Technical

PEOPLE & COMPANIES

Disassembly/Reassembly of the Remington Model 105 CTi Shotgun

Advertised as “the world’s most advanced autoloader,” this new scattergun can’t be dismantled like any other Remington gasoperated shotgun.

BY CHICK BLOOD FEBRUARY 2008

ORIGINAL PP. 3-7

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According to reports I’ve received, the 105 CTi is still a work in progress. By that, I don’t mean that any major overhaul is being considered; only that Remington may still be doing a little tweaking here and there that won’t dramatically alter the design. That tweaking is to be expected on a design that differs so markedly from other Remington gasoperated shotguns. For one thing, 105 CTi ejects spent hulls downward from the titanium receiver rather than sideways.

Another not-sonoticeable difference is an object identified as a “rate controller,” hidden within the stock. The closest thing to this part on the familiar Model 1100 or 1187 would be the action spring. The rate controller serves as a seat for the tail of the boltslide assembly, and does everything an action spring does. Plus, I’m told, it soaks up some recoil.

In addition, felt recoil is reduced by the combination of anew optimized gas system, an overbored barrel, a lengthened forcing cone, and anew convex recoil pad. Taken together, this makes 105 CTi the lightest, softest-shooting 12 gauge that Remington has ever produced. In operation, once the bolt has opened fully on the 105, the carrier pivots down to eject the hull and pickup a fresh round from the magazine. Then it pivots upward to position the shell in front of the bolt.

The bolt closes to chamber the round, unless that round is the last one in the magazine. In that case, the action locks open. Conversely, with the Model 1100 and 1187, fully opening the bolt ejects the hull from the receiver’s upper ejection port, lowers the carrier to pick up the next shell from the magazine, and raises the shell on the carrier for chambering when the bolt is released. And on the 1100-Series shotguns, the action closes after the last round is fired.

With the 105, something wonderful happens after cocking the gun, inserting a shell into the magazine tube via the bottom-loading port, and sliding the thumb down and out of the receiver. The carrier raises and the round is chambered automatically. The magazine can then be loaded with up to four additional rounds of the same size by pushing them into the mag tube one at a time, making sure each shell engages the feed latch to hold it in the tube.

If this feature offends a traditionalist, the 105 can be charged like its less sophisticated cousins. By that, I mean close the bolt by pulling the bolt and bolt release to the rear simultaneously, insert the shells into the magazine. Make no mistake about it, however; it is.

DISASSEMBLY/REASSEMBLY OF THE REMINGTON MODEL 105 CTi SHOTGUN CONTINUED

ORIGINAL PAGE 4

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Air drying and light lubrication are recommended after cleansing. The actuator is indicated by the letter "A." The completed head assembly is then inserted into the bolt slide as a unit. Atube, lock the bolt open, and press the bolt release and let the operating handle move forward to chamber the initial round. Basic Disassembly For obvious reasons, the oils and solvents mentioned in the owner's manual all bear the Remington name.

But, of course, the shotgun's owner probably won't bring you the manual along with the gun. So you don't have to limit yourself to the Remington brand. For example, the manual advises the use of Rem Oil on the outside of the magazine tube after it has been cleared of fouling and air dried. Personally, I like Elmer's Slide-All with Teflon as a lubricant between magazine tubes and their associated springs, which seems to do a good job of discouraging residue buildup.

Now, to begin the disassembly, put on your safety glasses and make sure the gun is empty. Then pull the operating handle and bolt release to the rear. Slowly allow the bolt to close. Turn the magazine cap counterclockwise to remove it, and then slide the forend off to the front. Grasp the barrel ahead of the gas cylinder and pull it from the receiver.

After starting the trigger-assembly pins out, push them completely from the receiver with a parallel-sided drift. Remove the trigger assembly downward.

Now, with the bolt still closed, give the operating handle a quarter turn counter-clockwise and pull it free. Insert your thumb into the bottom of the receiver. Push the bolt upward as you slide it and the actionsleeve assembly out of the receiver as a unit. Now slip the action spring off the magazine tube. Carefully spread apart the action bars to remove them from the bolt assembly. The actionsleeve seal and inner seal can be cleaned where they sit with a soft brush and some solvent.

If you removed them, or they come off in the cleaning process, I hope you paid attention to their original location so you can get them properly reinstalled. Detailed Disassembly To disassemble the bolt, compress the firing pin (#16) with your thumb and pull out its retaining cotter pin (#17). Ease the pressure on the firing pin and remove it from the assembly. Slip the firing-pin spring (#18) off the pin. Invert the bolt assembly and tap it on the bottom until the bolt-cam pin (#5) can be removed.

Separate the bolt head (#6) from the locking ring (#26). To clean all these elements, spray them with solvent and brush if necessary to remove all residue. Wipe and air dry before applying a light coat of gun oil. The trigger assembly is officially called "the firing mechanism" or "firecontrol system" and is officially "not yet approved for gun-shop repair." That also means you can't buy parts for it. You can buy a complete replacement assembly, but parts? No way, no how.

And with the possible exception of a couple of wire retaining clips, the trigger assembly on the 105 CTi doesn't remotely resemble the assemblies of the 1100 or 1187. Sure, an experienced gunsmith could figure out how to take it apart, but why bother? If a damaged piece were to be discovered, a whole new assembly would have to be ordered anyway.

So this begs for an answer to a serious question: Since we're not allowed to take it apart, and since trigger assemblies are prone to attract dirt and debris in any shotgun, how can we detail clean it? Answer: Look at the accompanying photo and reach for an aerosol can of gun-action cleaner. Spray it into the assembly at all the points indicated, paying particular attention to the actuator. Even better, immerse the entire group in a bucket of Poly Dunk. In case you missed our report on it a

while back, Poly-Dunk is a top-notch cleaning compound available from A Dunking, air dry the unit before applying a light coating of lubrication at the same locations shown for cleaning. A Few Words from the Soapbox Let me change the subject for a few paragraphs to discuss this policy of “not approved for gun-shop repair.” This legal department ass-covering policy is not exclusive to Remington; in fact, it’s spreading through the industry.

Some manufacturers’ Smith & Wesson comes immediately to mind’ve carried litigation concerns so far as to eliminate the schematic drawings from their owner’s manuals. Frankly, it doesn’t matter what’s eliminated or what wording is added; gun buyers have a habit of taking brand-new firearms out of their boxes and taking them apart to “make improvements” even before firing them.

That’s why we have so many gun owners coming in our doors with plastic bags full of parts and pleas to “put it back together.” Putting it back together’and putting it back together prop- Remington Model 105 CTi Autoloading Shotgun (Specifications subject to change without notice) 1 Action Sleeve Assembly 2 Action Sleeve Seal 3 Action Spring 4 Barrel 5 Bolt Cam Pin 6 Bolt Head 7 Bolt Slide Assembly 8 Carrier 9 Carrier Pivot Pin, Left 10 Carrier Pivot Pin, Right 11 Carrier Spring (2) 12 Extractor 13 Extractor Pivot Pin 14 Extractor Spring 15 Feed Latch 16 Firing Pin 17 Firing Pin Retaining Pin 18 Firing Pin Spring 19 Forend 20 Front Sight 21 Gas Cylinder Seal 22 Gas Cylinder Spring (2) 23 Inner Seal 24 Interceptor Latch 25 Latch Retaining Screw (2) 26 Locking Ring 27 Magazine Cap 28 Magazine Follower 29 Magazine Spring 30 Magazine Spring Retainer 31 Middle Sight 32 Operating Handle 33 Rate Controller 34 Receiver/Magazine Tube Assembly* 35 Recoil Pad 36 Recoil Pad Screw (2) 37 Stock 38 Stock Attachment Nut 39 Stock Washer 40 Trigger Plate Assembly* 41 Trigger Plate Assembly Pins (2) *Restricted

DISASSEMBLY/REASSEMBLY OF THE REMINGTON MODEL 105 CTI SHOTGUN CONTINUED

ORIGINAL PAGE 6

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erly'was one of the primary reasons why this monthly series of disassembly/re-assembly articles was initiated almost 15 years ago. In all that time, not one of those articles has been mentioned, let alone involved, in a law suit. There's a reason for it. None of them have described taking a firearm down or reassembling it in any manner other than that practiced by factory repair personnel.

As a result, it grinds my gizzard when I see statements like "not approved for gun-shop repair." Even worse perhaps are the prohibitions on schematic drawings, which make it difficult for the dedicated and careful gunsmiths who make a living by keeping firearms functioning reliably and safely. Trigger Smoothing with "The Slurry" This tide of secrecy is not going to turn anytime soon, and I'm sure we're going to see more and more riveted-together trigger assemblies and a lengthening list of restricted parts.

I do, however, have a solution for the problem of heavy, rough triggers. Well, it's not exactly a solution. It's more of a slurry. When it's possible to disassemble the offending assembly, resolving a complaint about a trigger that's "too rough" or "too heavy" is often simple. When disassembly has been made impossible, I've developed a technique I call "the slurry." The technique works, and to some extent helps to defeat the gun manufacturers' restrictive policies.

Here's how "the slurry" works: You'll need one each of Brownells 555 Black, 555 Gray, and 555 White polish. All are fine grit, the black being less fine than the gray, and the white being the finest of the three. You'll need a quart of mineral spirits or K1 kerosene, a kitchen grater or serrated knife, three small jars with screw-on lids, paper towels, and a tongue depressor. Okay, got that?

Many years ago, I asked the corporate attorney for a leading firearm manufacturer if he thought it was wise for this magazine to follow factory-only practices in our reporting. His response was: "Wise? Hell, it'll probably save me weeks in court every year." It seems to me that not only allowing but assisting the gunsmith to do his job efficiently and effectively could save a manufacturer of firearms a lot of money in legal fees. Reassembly Tips Position the bolt-locking ring with the small lug on top (see photo).

Place it flush on the bolt head and install it in the bolt slide as a unit. Insert the cam pin, point first, through the top hole in the bolt slide and align the Now carefully scrape each bar of 555 until you have about three ounces of fine shavings from it on the napkin. Pour 1/4 ounce of mineral spirits into each jar, and add half of the black, gray, and white shavings, each into their own jar.

Cap the jars and allow the compounds to soak up the solvent for an hour or two, stirring on occasion with the tongue depressor until there are no lumps and the consisten-

cy is like catsup. These mixtures can be individually fed into and extruded from a Brownells 10cc disposable syringe (#801-100-610AA). Which slurry center hole of the pin to accept the firing pin. Reassemble its spring to the firing pin, install in the bolt slide, and through the hole in the cam pin.

Compress the firing pin and insert the cotter pin to retain it. When you go to work on the action-sleeve assembly, place the inner seal with its flat side to the rear, then slide the action seal on with its angled side facing the inner seal. Snap the action seal into place. After both action bars are attached to the bolt slide, install the action spring on the mag tube before placing the action-sleeve assembly over the spring and tube.

Before reinstalling the bolt in the receiver, you have to push the carrier upward from the loading/ejection port. Now move the action-sleeve as you use first depends on how rough the trigger feels, but the gray followed by the white will usually do the job. In the case of the Remington Model 105 CTi, refer to the photo and caption concerning points of cleaner application. Insert the tip of the syringe and push out a small amount on each surface or area indicated.

With the trigger mechanism out of the shotgun, switch the safety to "off." Place your thumb over the hammer and pull the trigger. Con-

DISASSEMBLY/REASSEMBLY OF THE REMINGTON MODEL 105 CTI SHOTGUN CONTINUED

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sembly toward the receiver and guide in the bolt assembly. You'll depress the action bars into their receiver slots as you do this or you'll run into resistance if not a refusal on the part of the bolt. Also, make certain the tail (action link) of the bolt assembly trol the hammer as it disengages the trigger to move to its fired position fully forward. Recock the trigger with the hammer and repeat.

You'll be repeating this 50 times or more as the slurry polishes the interior and seats in the end of the action plunger (rate controller). Align the operating handle holes in the bolt and receiver, insert the operating handle, and lock it in place with a quarter turn clockwise. Pull critical engagement surfaces of the assembly. Afterwards, flush out the polish with solvent, air dry, and lightly lubricate the mechanism.

If you don't like the 50-time manual operation of the trigger assembly as detailed above, there's an alternative. You could charge the magazine with four, 12-gauge snap caps and then cycle the bolt and pull

the trigger through at least 25 "rounds." Better still, you could go to a trap range and have some fun. The slurry has worked for me in the handle back about an inch, hold it there, and rejoin the barrel to the receiver.

In the process, guide the gas cylinder over the mag tube and spring, and then slip the forend on over both and replace the mag cap. Don't overtighten. Finally, when reinstalling the trigger assembly, you must make sure the assembly's activator is positioned above the interceptor latch on the receiver's lower left side. Secure the trigger assembly with its front and rear pins. Now check the gun for proper function with dummy rounds and wipe off any fingerprints.

Lightly lube all metal surfaces, and then lockup the Model 105 until its owner arrives with a wad of cash to pay you for your labors. I many different situations. Recently, injecting it into a permanently enclosed rifle trigger smoothed up the trigger significantly. In another instance, the double-ac-

tion pull of a law-enforcement duty pistol felt immeasurably lighter after a dab of the black mixture was applied to the upper mainspring strut, its seat in the hammer, and the strut itself.

The owner of a lever-action Marlin believed the gun suffered from lagging lock time. It was easily sped up with the application of the gray slurry to the firing pin, firing-pin spring, and firing-pin tunnel within the bolt. And the White 555 slurry put a final, brilliant polish on the sear/hammer engagement surfaces of a M1911 trigger job I recently finished. In addition, I've found it unsurpassed for polishing the flats of small parts on a true surface.

Of course, either snap caps or some other means of protecting firing pins'including their temporary removal'was taken each time the slurry was used. As a final, comforting thought on this subject, the use of this technique is unlikely to result in voiding a factory warranty.

FROM THE ARCHIVE

What Do Custom Jobs Really Cost?

Like any businessman, the gunsmith can easily find himself in the “Chapter 11 Club” if he fails to estimate the cost of custom work carefully or if he extends too much credit too freely.

BY ARTHUR J. HUNT FEBRUARY 2008

ORIGINAL PP. 8

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There are many potholes in the road to success and many traps a gunsmith can fall into that will unintentionally lead to poor business judgment. Among these are eagerness to get a job of considerable dollar size, the desire to create something to be proud of, the wish to compete with the best, or even the attempt to prove to yourself and your customers that you're not just a good gunsmith but a true artisan.

All of these sound like reasonable goals for a gunsmith, but if you think about it, any of these can cause a gunsmith to lose focus on what's truly important for success in business. Chapter 11 bankruptcy was created because all businessmen occasionally use poor judgment and some eventually need to be rescued from their suffering—even if that suffering is passed along to their creditors. You can join the Chapter 11 Club very easily, and the following scenario will explain just how easy it is.

Let's take a hypothetical situation. Your gunsmithing business has been moving slowly ahead every day. If you keep detailed records—and you should—you can tell week by week and month by month what you did in labor, parts, gun sales, and so forth. Now, do you remember what Abraham Lincoln said about lawyers? He said “A lawyer's time is his stock in trade.” If you simply substitute the word “gunsmith” for “lawyer,” you have your business in a nutshell.

So, for this article, we'll concern ourselves with time—or, in other words, labor—and how to make sure you get paid for it. Let's assume that this month is on par with last month, and then a customer walks in with

an old military rifle, a Mauser 98. He's all fired up to have it rebarreled to a different caliber. He wants a trigger job. He wants anew sporter stock, new sights, maybe a scope, recoil pad, and sling swivels. And he wants the stock checkered and his name engraved on the magazine floorplate.

Naturally, you're delighted at the prospect of the job. Here's that big-volume project that will put you way ahead of last month. But hold on a moment'd o you remember those pitfalls we talked about at the beginning of this article? Let's say your customer accepts your price for the job, hands you the gun, and tells you to go ahead and get started. You say “thank you,” of course.

But first—if you have the IQ of a headspace gauge—you say “the price I quoted you will require a 50-percent cash advance.” This is even if you are well capitalized. Why? Read on. You have in your hands a rifle that, in the best case, is worth about \$100.

And you're going to have to lay out hard cash for the following: 1) A stock blank or semi-finished stock, and if you are not a stock man, you'll have to pay someone for the inletting; 2) anew barrel, either put on by you or you'll be sending the receiver out to have one put on; and 3), the sights, swivels, recoil pad, and whatever else you've agreed to install.

If your customer wants to see the gun after it is rebarreled and inletted to check the stock fit, someone has to put up the cash to get the gun to this stage. If it's his money, you don't have a problem. But if it's your money, you've just signed an application for

membership in the Chapter 11 Club. All you need for full membership is a few more deals like this one and you are in. The amount of labor you anticipate and the margin of profit you expect to make on the deal both affect the up-front deposit.

The deposit should cover all the parts you'll have to purchase, the shipping charges and phone calls, plus your labor to get the gun to the rebarreled-and-bedded stage. If you do this, you haven't lost anything. That's good and shows you're thinking. The balance of the work should be broken down into at least two equal payments that will be due when certain work has been completed. In other words, this situation is similar to building a house.

The builder gets a down payment to start, a second payment when the frame is up and the roof is on, and balance is due when the job is finished. This last gap between the second payment and the final payment is nothing but “open credit”—so be careful. Now you might disagree with me because you customized a rifle for your good buddy and he paid you when it was done.

Swell, but suppose you have \$200 or \$300 out of pocket and your good buddy loses his job, his wife leaves him, or heaven forbid he has a heart attack and drops dead. Is his wife going to honor his gun debts? No. So where are you now? You've unwittingly extended credit and you just ate it. We all have to remember one thing. We didn't ask the customer for this job. He asked you to do it. And when you're asked to build something for (continued on page 14)

someone else, you're not being asked to pay for it or any part of it in advance. If the deal is not profitable and insured against loss, who needs it? The only real collateral you have for any job in your shop is the market value of the gun you're repairing. If your repairs exceed the value of the gun, you must get a deposit. Take the rebluing and restocking of a singlebarrel rifle as an example. Your labor plus the out-of-pocket money you have to spend for the stock can easily exceed the value of the gun.

Should, for any reason, your customer decide not to pick the gun up and you're forced to sell it to get your money, you're bound to be the loser. Without a deposit, what you're doing is extending credit with poor collateral and taking a big chance. The high-dollar jobs are no different. As long as we deal with people, we need to protect ourselves. This is only good business.

Don't think that, just because the gun is expensive and the customer drives a Mercedes, that he can't fall on hard times, die, or simply change his mind about paying your bill. So, if you haven't already, establish a policy on repairs or custom work that protects you. Customers often get carried away with excitement over a job, but see things differently when the bill has to be paid. Stop the problems before they start. Run your business so that you are solvent at all times.

You can provide the excellent work and service your customer wants, but you're not a lending institution. Protect yourself with up-front deposits, and you'll never wake up to find you've become a member of the Chapter 11 Club. I

FROM THE ARCHIVE

Fine Tuning Magazines For Reliable Feeding

Gunsmiths should be pleased that the ever-increasing price of replacement magazines is making repair a feasible option once again.

BY ROBERT K. CAMPBELL FEBRUARY 2008

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While some magazines remain affordable, there are some that are pretty pricey and others that are hard to come by. Just this last week, I ordered a Heckler & Koch P7 magazine for \$60, and I've had a Walther PPK/S .22 magazine on back order for four weeks. Thus, it seems, whatever we can do to keep older magazines working is well worth the effort. A look at the construction of the typical magazine tells the tale.

While some are better made than others, they're all made of stamped sheetmetal, which is never going to last as long as a carefully forged firearm. The magazine's lips are subject to wear and damage, and its spring has a finite service life, so it's not unusual for a magazine to need repair or replacement before any other part of the handgun begins to give trouble. Let's look at the construction of the magazine. Sheetmetal forms the walls of the magazine.

Inside, the follower controls the feeding of cartridges, while the follower spring or magazine spring provides the energy for feeding. The magazine spring must work properly from almost no compression with

one round loaded to full compression with 15 or more rounds—which is not an easy job for a spring to do. While the mag spring provides tension, the feed lips keep the cartridges in line, ready to be bumped into the feed ramp by the automatic pistol's loading block.

A weak magazine spring can allow the bullets to be jolted downwards in recoil. The slide will then travel forward and not load around into the chamber. Likewise, too heavy a spring can result in too much pressure against the feed lips and a reluctance to feed. Spring and follower problems can even result in gouges in the feed ramp if the follower jumps forward in recoil. Also, a weak spring might not properly feed the last round from the magazine.

Most of these problems can be addressed and repaired by the knowledgeable pistol-smith. Whether to repair or replace a magazine is a decision that should be made with several criteria in mind. Availability is probably the first consideration, and cost is the second. How the magazine is used is also a consideration. The competition shooter will probably prefer to repair an expensive mag-

azine rather than replace it. When a failure-to-feed problem is encountered, the magazine is the first thing to look at.

Sometimes, magazine problems are more obvious, such as a mag that fails to hold and falls out of the pistol. I've seen this in several The standard magazine (bottom), the Wilson Combat mag (center), and the Cobra magazine (top) all differ slightly in overall length. pistols in the past few months. Let's look at failures to feed first. As a general rule, a bullet that butts into the feed ramp and fails to feed is being released too early. This is a magazine-related problem.

If the magazine lips are too close together, the bottom of the feed ramp is struck. If they're too far apart, the bullet strikes near the top of the chamber. The cartridge should drag a little on the feed lips but not too much. For example, magazines for High Standard .22 automatics are usually set with a .236- to .238-inch width between the lips. And with any magazine, the lips must be symmetrical. The feed lips must be opened if the bottom of the ramp is being struck, and closed a bit if the top of the

FINE TUNING MAGAZINES FOR RELIABLE FEEDING CONTINUED

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chamber is being hit. Working the feed lips demands a bit of finesse. For opening lips, I've been using my Caspian gunsmith tool lately. Pliers with sharp needle noses are also well suited for close work. When closing the lips, I use a Quinetics bullet puller. Unconventional sure, but for a very slight movement, this light and handy tool works just fine. It's made of a lightweight synthetic material, and the handle offers excellent control. When using the pliers, go slowly and carefully, working a little at a time.

Some magazines are not properly tempered and the lips will snap. The most recent surgery of this type I performed was on a Browning Buckmark magazine. I'm certain the problem was caused by leaving the magazine loaded for long periods of time, and/or by slamming a loaded magazine home on a closed bolt. Loading the magazine into a pistol with the bolt or slide locked back helps to limit wear on the magazine, especially if fully loaded high-capacity magazines are used.

Of course, few .22-caliber magazines can be considered "service grade," and the Buckmark's units are no exception. In this particular case, one magazine worked just fine. While designed primarily for working with the M1911, this tool is helpful with many other types of handguns. Note the integral bushing wrench. While the other had

been damaged. Fortunately, I had a "template" to use in the form of the serviceable magazine. The repair was a simple matter of raising one lip and then the other almost imperceptibly.

Most of these problems are perfectly visible in dryfire with dummy rounds, and once cured, dry-fire analysis shows the improvement. Don't overlook the fact that only one lip may be damaged. This is especially true with heavier magazines that are dropped. When a loaded magazine is dropped, there is much more force exerted on the feed ramp lips. It may land on only one side and the other be undamaged.

Double-stack magazines are supposed to be more durable, with stronger lips to withstand the pressure of the strong follower spring, but they're not immune to damage. Recently, I examined a Glock magazine with a substantial nick at the very top. I carefully trimmed the polymer away and smoothed the magazine. The owner informed me that a handload had ruptured, blowing the case head out, and ejecting the magazine. He was fortunate that a slightly damaged magazine was the sum of his problems.

Polymer magazines are not exempt from damage. There are also the occasional nicks and burrs on feed lips of all types of maga-

zines that cause problems. These can be isolated and repaired. Sometimes magazine problems are not what they seem. Grip screws that are too long or a magazine riding on the trigger stirrup can produce drag. Feed problems may be related to the cartridge overall length (OAL) or improper sizing. These need to be eliminated.

A problem seldom encountered with quality magazines but once the bane of GI magazines is still encountered with Star, Llama, Astra, and Tokarev pistols. The follower may run forward. When under pressure, it's fine. But when there is no longer any pressure on the follower, it will protrude forward from the magazine. This can cause a problem when removing the magazine and the sheetmetal follower may even take a gouge out of the aluminum feed ramp on certain pistols.

The follower most often will rise too high in the front. In this case, the follower can be bent and adjusted for the proper attitude. Dents in the magazine can also impede the follower's movement. If the dent isn't deep enough to affect the cartridges, the follower can be trimmed a bit, as I did once on an ancient Ruby magazine with good results. In many cases, it's easier to file the follower than to remove a dent from a magazine body. Working on feed lips doesn't usu-

FINE TUNING MAGAZINES FOR RELIABLE FEEDING CONTINUED

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22-caliber magazine has feed lips that re-curve and can present a challenge to the gunsmith. Above center: The magazine follower can sometimes protrude from the magazine. If the follower is actually loose, it can snag on the feed ramp. 22-caliber magazine feeds at a slightly high angle. A spare magazine of proper proportions is a good aid when reshaping a magazine. ally require the magazine to be completely disassembled.

You can depress the follower with a dowel, and then run a punch through the magazine's witness holes (on magazines with such openings). Since it's best to bend a little and check feeding after each "tweak," it's much easier to pin the follower than to completely disassemble the magazine several times. Simply stripping and cleaning a magazine can often work wonders. I've used a product from Krunch Products called Mag Slick with good results. As a bonus a certain lubrication is added.

Testing a magazine spring is difficult to do by feel, unless the spring has truly gone south. Whenever possible, comparing a used spring to a new spring is the best way to reveal a loss of length or strength. A loss of an inch or more means the spring is well worn. I order my springs from W. C. Wolff at gunsprings.com. On the subject of springs, a too strong or too weak recoil spring can confuse the issue. An 18-pound Commander .45 spring is normal, as is a 16-pound Government Model .45 spring.

When it comes to other types, consult the manufacturer or W. C. Wolff for the proper spring weight. Mismatched springs can be a nightmare. While you can tune a pistol for +P loads or for light loads, you want to be certain the piece functions with standard loads and standard springs first. Won't Stay In/Won't Come Out Over the past year, I have seen several pistols with problems related to the magazine release.

An ex-German-police Walther PP in .32 ACP worked fine with one magazine, but the second magazine occasionally bolted from the magazine well. The problem was a wallowed-out magazine-catch cutout. I welded the notch up slightly, and polished it to factory specs, using the working magazine as a template. It was not a pretty solution, but it worked. The second example was a Star Super that dropped the magazine every three rounds or so.

The owner didn't want to spend any money on this one, and I assume it was probably dumped at a gun show and became someone else's problem. In another case, a 1911 that was built at considerable expense, with a first-class frame and slide and a Bar St barrel, dropped the magazine the first time it fired. Another similar pistol refused to drop the magazine until I exerted extraordinary force on both the latch and the magazine.

Sometimes, the magazine catch will be worn or of poor quality and will press the magazine sideways, resulting in poor reten-

tion. You need to carefully and slowly move the magazine in the well and press the latch to determine if this is the case. Usually this or an adjustment of the magazine-catch tension screw will help remove a stuck magazine.

A cure for a magazine latch that bites too deeply into the magazine cutout is to file or polish the catch on the opposite side of the button where the latch captures the magazine. That's the little spot on the inside where it meets the magazine. M1911 Magazines Magazines for the 1911 are plentiful, and range in quality from dismal to outstanding. Three types of followers are used: the flat, the convex, and the rounded style, with the latter two being the most desirable.

GI magazines seldom feed semi-wadcutter or jacketed hollowpoint ammunition acceptably. Work on the feed lips can help sometimes, but is not always a reliable cure-all. The worst reliability problems come from standard magazines that have been modified with cut and weakened springs to accommodate an eighth round. Personally, I don't believe a seven-round magazine can be successfully modified to retain an eighth round.

The Wilson Combat magazine set the standard for modern magazines, with a stainless-steel body that's .1 inch longer than the GI magazine and an eleven-coil magazine spring. The Virgil Tripp Cobra maga-

FINE TUNING MAGAZINES FOR RELIABLE FEEDING CONTINUED

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zine is even longer".3 inch longer than the Wilson Combat body'and has a thirteen-coil spring. While the Cobra mag looks promising, the Wilson Combat magazine is easily the most proven 1911 magazine ever made. Extended Magazines and Others I've spent considerable time experimenting with 10-round extended magazines, including the Metalform units. In short, I've found them to be reliable and to work fine in all applications.

I think that the longer magazine with a stronger spring helps to solve the 1911 mag's basic engineering problem. However, the extra magazine length causes problems of its own. I've tested several eight-round 1911 magazines that lock in fine and extend only slightly from the magazine well'not much more than the GI mag'and are sometimes a bit tight. I noticed under intense light and magnification that they put a bit of a polish on the ejector.

While they functioned, I'm certain that contact with the ejector can't be a good thing. Extended magazine pads are another matter. These are often the sole cause of Glock magazine problems. I've lost count of the magazine extensions I have seen break or come loose. The factory H&K pads seems to be fine, but most of the others I've seen are problematic. Adding two rounds while retaining the original spring seems a bit of a stretch to me. When testing a magazine, I like to keep a standard of comparison on hand.

For example, I recently tested a custom 1911 a friend was thinking about purchasing. The pistol featured two original magazines that had been modified with a spring kit and follower. When the loaded magazines were inserted and the slide dropped, there was a "ka-chung" sound, combined with what seemed to me like heavy and slow travel. At about the third round in hand cycling, the sound gave way to the familiar effortless 1911 cycling.

I took two Checkmate magazines, which are about as close to GI/Colt specifications as you can get, and loaded these with the same Winchester ball ammunition. This time, the cycling was almost as smooth as if I were racking the slide with no magazine and ammunition at all. My point is that'before you waste time evaluating any cycling problem'it's good to try a benchmark magazine of known performance for comparison purposes. When working with magazines, consider the ammunition to be used.

A handgun should run with all good factory ammunition, and the 1911 runs well with GI magazines and the standard 1.230-inch overall length cartridge. Shorter rounds such as deepseated 200-grain SWC bullets and especially the 185-grain bullets are the ones that give trouble. Our work would be easier without such ammunition. Recently, I've noted a problem that seems to be specific to SIG pistols. SIG maga-

zines, in both .38 Super and .45 ACP, tend to be very tight with regard to overall cartridge length.

I tested the first batch of a major company's 230-grain JHP, and the SIG P220 magazine would only hold three cartridges. More than three and the length of the cartridge impeded function. The company changed the OAL of the cartridge soon afterwards. SIG magazines seem to be durable, but after hard use, the single-column mags for the P220 and the P225 tend to begin failing to lock the slide open with the last shot. The dimensions don't allow a simple cure that I'm aware of.

The Desert Eagle has demonstrated a similar problem, but the DE magazines seem to respond well to standard repair techniques. The knob or protrusion on the Desert Eagle that locks into the slide lock may need to be peened in ordered for the slide lock to work properly. As a final note, let me share my latest experience with magazine troubleshooting. On this pistol, cases were dropping into the magazine well, mostly on the last shot, making it appear as if the magazine was producing a problem on the last round.

The real culprit turned out to be a recalcitrant extractor. I had to fiddle for awhile with this one. Fortunately, most cycling problems't he ones that are magazine-related, anyway'are relatively simple and straightforward to repair. I

FINISHING

Finish-Crowning the Rifle Barrel

The “major” recessed or concave barrel crown is only the beginning of the job. For good accuracy, the rifle or pistol barrel also requires “finish” crowning as a necessary part of the overall muzzle finish.

BY NORMAN E. JOHNSON FEBRUARY 2008

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We commonly hear claims that the “concave muzzle crown,” the “target crown,” or some other type of major crowning produces superior accuracy. Nevertheless, my tests prove that the type of major muzzle crowning used on rifles and pistols does not significantly affect overall accuracy or performance. The final “finish crowning,” however, is a different matter. Common sense tells us that there must not be any abrasions or rough edges surrounding the periphery at the muzzle where the bullet makes its departure.

What I call “finish crowning” will take care of these rough edges, and can be easily applied to new firearms (when required, as is often the case) or to any firearm where the muzzle undergoes major crowning during routine barrel work. With even the sharpest lathe bit, the recessed cut at the major crown will leave rough edges at the barrel mouth, making finish crowning a necessary step.

Fortunately, finish crowning is easy to do, requiring only a few basic items found in most shops, and very little time or skill is required to do a perfect job. Performing the Finish Crown To perform the finish crown, you’ll need a small electric hand drill, some kind of

a crowning ball, and a mild abrasive paste. I’ve found that J-B Bore Cleaner (sold by Brownells) works fine as an abrasive.

For the crowning ball, all you need is a roundhead, slotted brass wood screw or machine screw of proper size, cut down with the shank remaining. Screws in sizes 8, 10, 12, and 1/4 inch will handle most of the bores you’ll get through your shop. As a ballpark size, I use a screwhead diameter of 0.300 inch for 22 caliber to 6mm, 0.350 inch for .25 caliber to 7mm, and 0.395 inch for .30 caliber up to 8mm. For larger or small continued on page 21)

FINISH-CROWNING THE RIFLE BARREL CONTINUED

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er calibers than those listed, just be sure the crowning ball is at least 0.030 inch larger than the bore being crowned. To get started, place the crowning ball (round-head brass screw) in the electric drill chuck and apply a liberal amount of the abrasive material both to the screw head and at the mouth of the bore. Hold the barrel upright and, with gentle pressure, apply the rotating screw head squarely against the bore mouth.

Align and hold the drill as straight as possible to the barrel, and slowly rotate the barrel as the drill is turning. After applying the crowning ball for 15 or 20 seconds or so, remove the drill and wipe off the case mouth. Carefully inspect the muzzle crown with high magnification to see how the bevel is forming. Then apply the rotating crowning ball as the barrel is turned

until a nice smooth bevel is completed. For a good finish-crowning job, I like to see at least a 0.020-inch bevel at the edge of the muzzle.

Then as a final measure, I lappolish the bore mouth using a tight patch coated with J-B Bore Cleaning Compound on a cleaning-rod jag. The entire bore should then be cleaned in preparation for test firing. As test shots are fired, you'll notice the petal-like powder fouling patterns that form at the periphery of the crown. These should be nice and even as they form.

Conclusion At a cost of less than a dollar and a few minutes of your time, a professional finish crowning can be applied to any gun barrel.

As a final measure to assure accuracy and prevent muzzle damage, all barrels should have this treatment. I

HISTORY

Working the Sharps Model 1874 Rifle

The most popular single-shot rifle of 150 years ago is arguably still the most popular single-shot of today. That's known as "withstanding the test of time."

BY DAVID R. CHICOINE FEBRUARY 2008

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The name Christian Sharps ranks among the most famous names of all firearms inventors. History regards the rifles he designed as some of the best, most reliable firearms ever made. Since the 1850s, when Christian Sharps designed his falling-block, breech-loading singleshoot rifle, Sharp's rifles have played apart in the history of America and Built in Italy by Pedersoli and supplied

courtesy of Cimarron Firearms, this Sharps Model 1874 replica is a faithful copy of the original. much of the rest of the world.

The Sharps' action was first designed as a breech-loading percussion rifle. This system was drastically improved by the genius of Richard Lawrence of the Robbins & Lawrence Armory in Vermont during the mid- 1850s. Sharps rifles went on to play an

important role in the American Civil War, serving both sides equally as well, and in the process gaining a reputation for strength and absolute dependability.

The well-known Sharps nickname, "Old Reliable" which later appeared on the Model 1874s barrel, is said to have come from satisfied Civil War troopers. It's

WORKING THE SHARPS MODEL 1874 RIFLE CONTINUED

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impossible to estimate how many Sharps rifles have been manufactured and how many exist today, but more than 100,000 Sharps rifles and carbines were purchased by the Union during the Civil War. Because its action was a breechloader to begin with, the Sharps rifle made the transition into the new metallic cartridges in the 1870s with very little alteration required. These breech-loaders quickly became popular with hunters and long-range shooters.

One glaring advantage of the Sharps action was its great strength and the ability to handle virtually any metallic cartridge known in

the days before the turn of the 19th century. During the period of westward expansion, the Sharps gained still another reputation across the American plains in the 1870s and 1880s, where the cartridge versions of the famous rifle became popular with buffalo hunters. By the 1870s, the day of the repeating rifle was dawning, and the proverbial handwriting was on the wall.

The popularity of single-shot rifles began to wane. The Sharps company, however, refusing to move into repeaters, instead laid their hopes on a highly advanced new hammerless singleshot action designed by Hugo

Borchardt. Despite the novel features of the modern Borchardt design, the Sharps Rifle Company soon followed the path of several others and passed into oblivion in 1881, but not before leaving behind an incredible legacy through their remarkable rifles.

The disassembly procedure that follows here will work well for most of the side-hammer Sharps rifles and

WORKING THE SHARPS MODEL 1874 RIFLE CONTINUED

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carbines manufactured from 1851 on. This includes the percussion models as well as most of the modern-made Sharps replicas. The Illustration included here is from The Gun Digest Book of Exploded Firearms Drawings, 2nd Edition, edit Murtz (DBI Books Inc., Disassembly Procedure 1. For safety's sake, before handling any firearm, let's be sure it is unloaded.

Hold the rifle around the barrel and wooden forearm with your left hand, and keeping your fingers away from the trigger and pointing the muzzle in a safe direction, pull back on the hammer (#24) until you hear one audible click. Next, open the action by pulling the lever (#14) all the way down with your right hand. Look into the rear of the barrel to be certain there is not a cartridge in the chamber. If a cartridge is present, reach down and remove it by pulling the cartridge straight out the rear of the barrel.

If you find any live ammunition, I suggest you remove it to a separate location well away from your bench. 2. Disassembling the action begins with unscrewing and removing the two lock-plate screws (#46) located on the left side of the receiver (#8). Carefully pull the lock-plate assembly (#26) out from the right side, being careful not to splinter the wood at the edges of the lockplate. Now unscrew and remove the forend screws (#3 and 4), pull down on the forend, and take it off the barrel.

With military models you must depress the band spring(s) and slide the band(s) forward and off the barrel before the forend can be removed. Next, unscrew and remove the lever-spring screw (#6), and then lift off the lever spring (#7). Push in on the leverpin retainer plunger (#10) located on the forward end of the right side of the receiver, and then rotate the lever-pin handle (#9) toward the front until the lever pin becomes unlocked from its mortise in the receiver.

Pull open the lever and remove the lever pin (#9). The lever and the breechblock (#18) can now be pulled down as an assembly and taken out through the bottom of the receiver. On metallic-cartridge models, the extractor (#13) can be lifted out of the receiver bottom. 3. To remove the buttstock, unscrew and remove both the guard-plate stock screw (#38) and the guard-plate receiver screw (#39) from the guard plate. Then, unscrew and remove the front and rear guard-plate screws (#35 and 36) from the top receiver tang.

Carefully pull the buttstock toward the rear until it and the guard plate (#37) come loose and can be removed. The guard plate can now be pulled straight down and out of its inletting in the buttstock. 4. To disassemble the lock plate, begin with the hammer (#24) all the way forward. Using either a main-spring vise, a machinist's clamp, or a small C-clamp, compress the mainspring



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1 Barrel 2 Front Sight 3 Front Forend Screw 4 Rear Forend Screw 5 Barrel Stud 6 Lever Spring Screw 7 Lever Spring 8 Receiver 9 Lever Pin 10 Lever Pin Retainer Plunger 11 Lever Pin Retainer Plunger Spring 12 Lever Pin Retainer Plunger Spring Screw 13 Extractor 14 Lever 15 Lever Toggle Link Screw 16 Lever Toggle Link 17 Upper Toggle Link Screw 18 Breechblock 19 Firing Pin Plate 20 Firing Pin Plate Screw 21 Firing Pin 22 Firing Pin Screw 23 Rear Sight Detent 24 Hammer 25 Tumbler Screw (#34) enough so that the stirrup (#31) can be rotated out of the mainspring ears.

Then unscrew and remove the mainspring screw (#33). The mainspring is now free and can be lifted up and off the lock plate. Unscrew and remove the tumbler screw (#25) from the center of the Sharps Model 1874 Single-Shot Rifle 26 Lock Plate 27 Tumbler 28 Bridle 29 Bridle Screw 30 Stirrup Screw 31 Stirrup 32 Sear 33 Mainspring Screw 34 Mainspring 35 Front Guard Plate

Screw 36 Rear Guard Plate Screw hammer (#24) and pull off the hammer (see note below). Next, remove the three bridle screws (#29) and the bridle (#28).

The tumbler (#27) and the sear (#32) can now be lifted off the rear face of the lock plate. Make note of their positions for reassembly.

Note: If the hammer will not come 37 Guard Plate 38 Guard Plate Stock Screw 39 Guard Plate Receiver Screw 40 Trigger Spring 41 Trigger Spring Screw 42 Trigger 43 Trigger Screw 44 Rear Sight Assembly 45 Rear Sight Mounting Screws 46 Lock Plate Screws 47 Rear Sight Detent Spring off the tumbler after you have removed the three bridle screws, reinsert the tumbler screw into the center of the hammer, leaving it about one full turn from bottomed out.

Holding the lock plate in your hand, strike the tumbler screw a few blows with a plastic mallet to break the hammer

WORKING THE SHARPS MODEL 1874 RIFLE CONTINUED

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loose from the tumbler. Once it's loose, follow the instructions above. 5. Disassemble the breech bolt by first removing the lever (#14) by unscrewing the lever-toggle link screw (#15) and then pulling the lever down away from the breechblock (#18). The lever-toggle link (#16) is removed by removing the upper toggle-link screw (#17). On metallic-cartridge models, the firing-pin screw (#22) and the firing-pin plate screw (#20) can now be removed.

The firing-pin plate (#19) will slide off the breechblock and the firing pin (#21) can now be lifted out from the rear. On the Pedersoli-made Sharps rifle, the firing pin disassembly is different from that of American-made rifles. The Pedersoli doesn't use a firing-pin plate screw, and the firing pin is a two-piece unit.

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By holding forward on the firing pin and then sliding the firing-pin stop plate to the left, the firing pin, firing-pin nose, and the firingpin spring can be withdrawn out toward the rear of the breechblock. 6. The disassembly of the remaining parts is as follows: The guard plate is removed by unscrewing and removing the trigger-spring screw (#41) and the trigger spring (#40). The trigger (#42) can be removed by unscrewing and removing the trigger screw (#43). The trigger is now free to drop out from the bottom.

The buttplate can be removed by simply unscrewing the two buttplate screws and lifting the buttplate off the stock. Reassembly of the rifle, as you might suspect, is simply a matter of reversing the order of the steps above.

MAINTENANCE & REPAIR

Reader Forum

BY AMERICAN GUNSMITH EDITORS FEBRUARY 2008

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Don't Short-Stroke It My customer is complaining his Winchester Model 1894 jams when he short strokes it. I've taken it down several times and can find nothing wrong. Any ideas? Paul Le Barge Sandusky, Ohio We've seen this "malfunction" when attempts were made to discharge an 1894 in rapid fire.

The gun was never originally designed to be short cycled and requires a complete cycling of the lever to lower the locking bolt, which allows bolt movement to the rear of the receiver to cock and prep the rifle for firing. (See U. S. Patent # 524702 for a full explanation of the action sequence.) Continued short stroking of the rifle can damage the lever, the linkage between the lever and locking bolt, the locking bolt, the bolt, and even the bolt ways in the receiver.

You should advise your customer of the potential dangers of short cycling. We hope no permanent damage has been done to this noble descendant of the legendary Model 1873. Light Hits on Primer? I have a customer who says his reloads aren't touching off in his S&W .500, although they work fine in his S&S .500 rifle. No problem with factory ammo in the revolver. What can I tell him?

Bob Smith Waco, Texas Maybe your customer is seating his primers a tad too deeply or has backed off the main-spring tension to the point that it's not hitting the

primer hard enough to touch it off. There are differences in primers, too, you know. Weight is one. Hardness is another. A rifle chambered for S&W .500, you say? We've only heard of one that hasn't blown up in attempts to make it swallow the round. It's made by Wild West Guns in Alaska.

They're a specialty operation producing a premium product and selling it at a premium price. Let's put it this way. If your customer can afford a custom-built rifle, he should be able to afford to use factory ammo in both it and his revolver. Rough H&K P7 I'm having trouble with an H&K P7M13. I noticed that the trigger pull was quite rough. After removing the grip panels, I noticed the cause of the problem.

With the gun cocked, pulling the trigger causes the "transmission lever" to ride up onto the side of the disconnect instead of below it. The gun still functions fine, but the trigger pull is badly affected. There are very apparent wear marks on the side of the disconnect and on the top edge of the transmission lever. The worn areas appear rounded, thus allowing the transmission lever to ride up onto the disconnect. I purchased this firearm new in 1989 and have only fired approximately 500 rounds through it.

I read the P7 article in the August 93 issue, but this problem was not covered. Have you ever seen this problem in a P7 pistol? Can it be corrected or should I just replace the above mentioned parts as the article seems to suggest when working the P7? What's a good parts source for the P7? Any help would be greatly appreciated. We've not encountered this problem, and find it a bit surprising, because the H&K tends to avoid any poorquality materials in producing their firearms.

The P7, however, being somewhat more mechanically complex than most pistols, must be kept clean and properly lubricated internally. Any metal part carrying a gritty deposit that comes into regular contact with another metal part during the normal function of the gun will result in wear on one or both components. Once worn sufficiently, they will not interact properly, if at all. The article advised replacement rather than attempted repair of P7 components.

We still do, and the best source for factory parts we know of is H&K, now in Trussville, Alabama Remington M788 Extractor I'm having trouble installing a riveted extractor in a Model 788 Remington 7mm-08. Brownells told me it took the same one as the Model 700. I've tried about four of them without any luck. I saw a gunsmith link on the internet and they said the 788's extractor was different from the Model 700's. Do you know if they're different? Thanks.

The original, riveted Model 700 extractor was discontinued in 1980 and replaced with a rivetless variation. Until that time, both M700 and M788 extractors had the same part number and were interchangeable. The only riveted M700 extractor still extant is used in the bolt of a large Magnum caliber, which your rifle is not. You can get an extractor and some extra rivets, just in case, from Gun Parts Corp. or Jack First. To install the extractor, drive the rivet inward from the bolt.

Dislodge and remove the old extractor from inside the bolt rim. Squeeze the ends of the new extractor together to tension the part. (We'll tell you how to achieve the proper tension in the next paragraph.) Flatten the end of the new extractor (the end opposite the rivet hole), place the extractor inside the bolt rim, and align the extractor/ bolt-rivet holes.

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Insert anew rivet with its head inside the bolt rim and support the head with round steel stock as you peen the protruding end of the rivet to secure the extractor to the bolt.

Smooth the peened end to blend with the outside of the bolt. Now, for proper tension, install the bolt in the receiver and invert the rifle. Chamber a fired case. Close the bolt and then open it. The extractor should hold the case as long as the ejector hasn't been installed.

If the case snaps free with difficulty after minor finger pressure is applied, the extractor is too tight, and must be tapped back

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READER FORUM CONTINUED

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under the bolt rim with a soft metal punch. If the case falls free, the extractor is too loose, and must be pulled from under the rim slightly to increase tension. Should this fail to correct the problem, it may be necessary to remove the extractor, squeeze it again, and reinstall it. Once the tension is satisfactory, smooth up the arc of the extractor claw to blend perfectly with the bolt rim. Visible Loader Takedown Have you ever done an article on the Stevens Visible Loader?

If you have, I would like to get the disassembly and reassembly info from you. I have one in my shop for a clean and oil, and it looks like one I'll need instructions for. Thanks. Roy Dunlap, among innumerable others, has referred to this rifle as the "Miserable Loader." It appears to have been an attempt to transform the venerable Stevens Favorite into a pump gun.

We've never done an article on it, but there is a parts drawing (no schematic) in volume 2 of the Jack First catalog. They may have some parts for the gun; if not, try Popperts. If you can get the wood off, you can give the rifle a better-than-good internal clean-up. You'll need a gallon of mineral spirits and a rubber squeeze bulb. Use the bulb to thoroughly douse the interior of the rifle. Let it soak in for about 30 minutes, and then flush away the loosened fouling with more mineral spirits.

You may have to do this three or four times before all residue has been removed. After that, dry the rifle with compressed air and lightly lubricate it before reinstalling the wood. Hammer Follows Down I have a Model 190 Winchester .22 auto in my shop. The hammer follows the bolt down. I've replaced the disconnecter and sear, but it still does the same thing. Any advice you could give me would be greatly appreciated. Thank you.

The Model 190 was the last in this series of small-bore autoloaders, which went out of production in the late 1960s. Fortunately, that was in the era of schematics, and one appears in Jack First's catalog, volume 2. With rifles as old as this one, even if it was well cared for, wear is almost certain to be a problem. Start your research by examining the schematic; in particular, the hammer and all parts associated with it. Why?

In most guns with a "hammer follows down" problem, it can be traced to poor engagement between the sear, which you have already replaced, and the hammer; or, on guns so discharged, between a sear surface and a striker. If the hammer and its related parts—including the safety—are sound, what you might be dealing with is a worn bolt, or worse. Worse would be worn boltways in the receiver that are allowing the entire primary ignition system to ride forward. Heavy-Up the Encore Trigger?

I recently had a customer bring a Thompson Center Encore rifle in for trigger work. The firearm has a smooth, light pull, and the customer would like the pull weight increased. He says it's so light that when he shoots it with gloves on he can't feel the trigger pull and has missed several deer. Has American Gunsmith ever done an article on adjusting the trigger pull on an Encore? If so, can you tell me what issue it's in? And if not, will you be doing such an article in the near future. Thank you.

We ran a takedown article on the Encore back in September 00. That's when we discovered that the Encore is no cinch to disassemble and reassemble. The simplest way to resolve your deer hunter's problem would be to take a pair of scissors and cut off part of the index finger of his hunting glove.

If he insists on a heavier trigger pull, we suggest you remove the mainspring (hammer spring) from the action and send it to Wolff Springs Newtown Square, PA 19073), and ask them for a heavier spring. (Be sure the gun owner keeps the factory spring for future use.) This fix is preferable to making adjustments to the hammer/sear engagement because it's easily reversible. Adjustments would not be so easy to undo. S&W Model 10 Project I bought an S&W Model 10 as a project gun.

When I took it apart to see why it wouldn't fire, I found that the trigger lug was broken off. How do I replace it, or do I have a "parts gun"? We think what you're calling a "lug" is actually the trigger stud, which is an integral part of the frame like the hammer stud. The stud is not replaceable, but if you have the entire piece, you may be able to TIG weld it back onto the frame. Alternately, you could silver solder it back on; but, either way, be prepared to reblue the revolver.

You did say it was purchased as a "project gun," right? Winchester M1400 Takedown I need the disassembly directions for the magazine tube of the Winchester Model 1400 MKII. Also, I need to know if it is pressed in or screwed in. Thanks. Bill Higgs Scipio, Indiana Complete instructions on taking down the tube contents appear in Gun Digest's book on disassembly/reassembly for shotguns from Krause Publications. Regarding the second part of your question, some were threaded in and some were pressed in.

It depends on the magazine throats in the gun. A one-piece throat indicates a threaded

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(continued from previous page) tube. These tubes can be backed out with a strap wrench. Two-piece throats, one upper and one lower, indicate a press fit, which complicates things. In that case, purchase a spare mag-tube cap and replace the original. Make a slide hammer that fits over the tube. This can be made from a length of galvanized pipe, with some extra weight taped to the outside of the pipe.

Use a rubber or rawhide mallet to drive the tube into the receiver until the throats can either be fished out or fall out. Pull the tube from the receiver. To replace the tube, install the slide hammer over it and start the tube into the receiver. Position the throats above and below the receiver, and ram the spare cap with the slide hammer a couple of times (not too hard—you just want to capture the throats).

Once that's done, continue ramming the spare cap until the throats are fully seated and the tube is firmly seated in the receiver. Remove the spare cap, the slide hammer, and reinstall the original mag-tube cap. The proper depth location of the Winchester's new tube can be ensured by scribing a light line on the original factory tube prior to its removal. Then scribe another line on the replacement to match it.

Lockin' Up Rossi I have a Rossi Model 971 revolver, stainless steel/nickel plated, in .357 Magnum with a 4-inch barrel. It's a great revolver that I purchased used. The

problem is that after about 15 or 20 shots, the cylinder locks up and will not rotate. There is no visible endshake, and I am unable to see more than a few thousandths space between the cylinder and barrel. The problem seems to clear up after a thorough cleaning, but will recur within the same time frame.

Do you have any suggestions on how to resolve this problem? Finally, would you have any suggestion on adaptive tooling for the handicapped? I have arthritis and tremors in both hands, which can be very limiting at times. By the way, your magazine is great and provides a huge amount of information for a beginning gunsmith. Thank you. Julian Harper Enoch, Utah The Rossi revolver is so close to being a clone of the Smith & Wesson that you can follow the same troubleshooting practices you'd use for an S&W revolver.

In a Smith, there may be no visible "cylinder end shake," but there may be "yoke end shake." This can cause the same set-back upon firing as cylinder end shake. Yoke end shake can be corrected by installing a #2 yoke screw or a bearing washer if the yoke is loose in the frame.

Also, peening the yoke at its muzzle end sometimes helps. Of course, a bent yoke will cause eccentric cylinder rotation and subsequent binding. A bent yoke must be straightened. A faulty hand spring can also cause the hand to skip on a cylinder, there-

by failing to rotate it. Replacement of the spring could be required. A stuck cylinder stop will prevent rotation. Repair or replace it. A bent extractor rod means hard rotation or no rotation at all. Straighten or replace a bent rod.

Insert a feeler gauge from both sides to check the gap between the cylinder and the barrel. The correct front gauge is .004 to .006 inch. An uneven hand face will reveal itself if the gauge reads higher on one side than it does on the other. Rear gauge, meaning head space, should be read from the sideplate side of the frame. Figure .060 inch as "go" and .064 inch as "no go." In the latter case, fired shells could set back and bind against the recoil plate.

And if you're using reloads, make sure the primers are set flush and don't protrude from the rear of the case. A worst-case scenario when the revolver fails to gauge is a stretched frame, due to the use of overly hot loads. If corrective measures are possible at all, they would have to be performed at the factory. Finally, we recommend you purchase Jerry Kuhnhausen's book, *S&W Revolvers: A Shop Manual* (available from Brownells).

Unfortunately, we don't know much about adaptive tooling for the handicapped, but we do know gunsmiths who have fabricated larger handles for their tools to ease the problem of arthritic hands.

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