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INSIDE THE ARCHIVE

WORKING THE COLT PATERSON PERCUSSION REVOLVER

GUN SALES STRONG IN WEAK ECONOMY • DISASSEMBLY AND REASSEMBLY OF THE ZASTAVA M88 PISTOL • REBUILDIN...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 056

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IN THIS ISSUE

Contents

A complete guide to the searchable editorial work preserved from August 2008.

2 Gun Sales Strong in Weak Economy

AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 2

3 Disassembly and Reassembly Of the Zastava M88 Pistol

CHICK BLOOD • ORIGINAL PAGES 3-5

7 Rebuilding the “Battered” Revolver

ROBERT K. CAMPBELL • ORIGINAL PAGES 7-9

10 Back-Boring the Shotgun Barrel

MICHAEL R. ORLEN • ORIGINAL PAGES 10-16

17 Explaining Repair Costs To Your Customer

ARTHUR J. HUNT • ORIGINAL PAGES 17

18 Working the Colt Paterson Percussion Revolver

DAVID R. CHICOINE • ORIGINAL PAGES 18-22

23 Reader Forum

AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 23-24

FROM THE ARCHIVE

Gun Sales Strong in Weak Economy

BY AMERICAN GUNSMITH EDITORS AUGUST 2008

ORIGINAL PP. 2

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With gasoline at \$4 a gallon, the housing market in a serious slump, and a general feeling of “malaise” in the overall economy, you might think the firearms biz would be hurting, too. Not so, I’m pleased to report. Figures released by the FBI’s National Instant Criminal Background Check System (NICS) show 886,183 background checks were made on the sale of firearms in the last month for which we have statistics (May 2008). This is a 10.3-percent increase from the 803,051 checks reported in May 2007.

State figures show that background checks were up 8.8 percent over the same period. This increase is backed up by other key economic indicators for the firearms industry, including arise in excise taxes reported by firearms and ammunition manufacturers, an increase in small-arms production, as well as a small increase in hunting-license sales. Year-to-date figures show a total of 4,831,693 background checks reported by NICS.

At the risk of appearing to “preach to the choir,” it’s also interesting to note that the FBI’s recently released 2007 data showed a drop in violent crime (1.4 percent) over the previous year. The FBI also reported that homicides fell by nearly 10 percent in the 10 largest U. S. cities. The National Shooting Sports Foundation (NSSF) reports that, according to the latest data available from the Bureau of Justice Statistics, 91 percent of violent crime does not involve firearms. Rising gun sales and falling crime?

You just don’t get it, do you, Sarah? I’m not exactly sure why the firearms business is booming while most sectors of the economy are busting. (Historically, it doesn’t always work that way.) NSSF points to increased numbers of female gun buyers and an increase in the number of women enrolling in handgun-training classes. Certainly, that could account for a 10-percent increase. I can’t help but wonder, how-

ever, if there isn’t a connection to some collective anxiety over the rapidly approaching presidential election.

Personally, I’m not particularly worried about it. The country is not in the mood to listen to more 1990s-style anti-gun rhetoric. And any candidate smart enough to get elected is smart enough to realize that. I feel pretty confident that the next U. S. president will try to focus on issues that will help unite the country rather than divide it. Of course, I’m still going to vote for the “right” candidate. Need Some Extra Cash?

If you would like to turn your gunsmithing ideas and expertise into cash (we pay pretty handsomely), I would like to discuss your article ideas with you. Contact me, Keith Lawrence, Editor, at: American Gunsmith, Merritt Island, FL 32954; voice fax Editor Keith Lawrence Technical

PEOPLE & COMPANIES

Disassembly and Reassembly Of the Zastava M88 Pistol

This recently debuted combination of proven designs is an extremely reliable and economical personal-defense pistol. Here's the inside story.

BY CHICK BLOOD AUGUST 2008

ORIGINAL PP. 3-5

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Several times in previous articles in this series, I've commented favorably on the skills and imagination of the Serbian gunmakers. This pistol is no exception. While it borrows here and there from other highly successful handguns, it is a clone of none. It uses the great John M.

Browning's link-down barrel as a fundamental part of the design, adds a trigger bow that will fool you into believing it's identical to the one you see in an M1911, and then blends in a touch of Makarov, a drop of Tokarev, and a dash of Smith & Wesson revolver. At a casual first glance, it's easy to mistake the Zastava for yet another mirror image of the legendary Colt .45 ACP. It is not, of course, but that doesn't become obvious until you start to disassemble the M88.

And then the differences become immediately apparent and more significant as the takedown process continues. Let's take a

look at those differences as we disassemble the pistol. Field Stripping On the right side of the frame is the slide-stop retainer (#24). After the magazine has been removed and the chamber checked (it is empty, right?), the retainer is pushed to the rear. This unlocks the slide stop (#1). The slide (#3) is moved back slightly which allows you to push the stop out right to left.

With the stop removed, the slide assembly is pulled forward and off the frame (#30). There's a major glitch in the Zastava's owner's manual. It doesn't clearly explain the takedown of the slide assembly except to state that the recoil spring is very strong. That it is. In any case, the entire spring assembly (parts #17, 18, 19, 20, 21, 22, and 23) has to be removed ahead of the barrel (#13) and its bushing (#16). Otherwise, you'll never get the barrel and bushing out of the slide.

This omission is sure to give M88 owners fits' and likely to bring you some business. Be ready to solve the problem as the customer looks on. He'll be convinced you're a genius. Okay, budding geniuses, take a look at the schematic. The rear guide (#18) of the spring assembly is pinned to the center guide (#19) by a pin (#20). The rear guide will pivot on. Instead, it's a blend of several different handgun designs, all with admirable and extensive histories. that pin.

Raise the rear guide with the spring still attached to clear the barrel, and withdraw the recoil assembly from the slide. This frees up the bushing. You don't need a bushing wrench to rotate it until it can be easily pulled off. Pivot the barrel link (#14) flat to pass through the recoil-assembly tunnel before you slide the barrel out the muzzle end. Total time required to amaze onlookers: about 20 seconds.

DISASSEMBLY AND REASSEMBLY OF THE ZASTAVA M88 PISTOL CONTINUED

ORIGINAL PAGE 4

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This part serves as a good first clue that the M88 and the M1911 are not identical twins. Trust me, your brilliance at resolving a customer's quandary with the M88 will not go unnoticed. Eventually, I'm sure, the pistol's importer, European American Armory, will seek to have proper instructions for basic disassembly appear in the owner's manual. But for now, you're in on a secret most Zastava owners won't know. Detailed Disassembly Start with the slide by going after the safety (#10).

There's a black dot near the safety cutout in the slide. That dot doesn't represent the manual safety's "off" position (that's a prominent red dot). The black dot marks a depression for the safety detent (#12). The detent captures the detent spring (#11). Both are contained within the body of the safety. If you're not careful, both can depart for parts unknown when the safety is removed. In the next paragraph, I'll tell you how I avoided this potential problem.

Feel free to do as I did or come up with your own solution. The firing pin (#8) has to be fully depressed before the safety assembly

can be pushed and pulled out of the A B slide. Since I don't have three hands, I placed the slide inside a large, clear plastic bag and used abroad-face Starret punch to push in the pin and hold it inward. With my hand, slide, and punch inside the bag, I positioned the slide flat on my bench with the safety upward.

I could then grasp the thumbpiece between my fingernails, rotate it, and pull it out. Of course, the spring and detent ball flew from the safety body as expected, but at least they remained inside the bag.



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This leaves the extractor (#5) and extractor spring (#7) still to be removed. Though the extractor pin can be drifted in either direction, I recommend it be moved upward from inside an inverted slide. There's no need to drive it out completely. Just drive it far enough to free the extractor parts.

A few words about the M88s sights: The front and rear are drift adjustable, but their dovetails are unique to the M88. (The pistol shoots well, but it's not a target gun.) If anyone ever requests that you install adjustable sights, night sights, or anything other than the factory originals, you'll have to file and fit them to the existing dovetails or else mill anew set of dovetails in the slide.

The M88 leans strongly in the direction of a reliable, economical personal-defense pistol, so it's unlikely you'll be asked to install target sights. Nevertheless, you should be aware of what it takes to replace the factory sights if you're ever called upon to do so. Now, moving onto the frame, you can lift out the entire firing mechanism if it hasn't already fallen out on its own. Getting the grips off has to happen next, and they're attached in a most unusual manner.

In the first place, the grip locking-lever 1 Slide Stop 2 Front Sight 3 Slide 4 Rear Sight 5 Extractor 6 Extractor Pin 7 Extractor Spring 8 Firing Pin 9 Firing Pin Spring

10 Safety 11 Safety Detent Spring 12 Safety Detent 13 Barrel 14 Barrel Link 15 Link Pin 16 Barrel Bushing 17 Recoil Spring 18 Rear Guide Rod pins (#36) do not unscrew. In the second place, they don't come out at all.

The pins serve as pivot points for the left locking lever (#35) and the 19 Center Guide Rod 20 Rear Guide Rod Pin 21 Front Guide Rod Plug 22 Front Guide Rod Pin 23 Guide Rod Bushing 24 Slide Stop Retainer 25 Trigger Spring 26 Trigger 27 Magazine Release 28 Magazine Release Spring 29 Magazine Release Button 30 Frame 31 Trigger Spring Pin 32 Magazine Block Safety 33 Magazine Block Safety Pin 34 Left Grip 35 Left Grip Locking Lever 36 Grip Locking Pin 37 Right Grip 38 Right Grip Locking Lever Zastava M88 Semi-Automatic Pistol (Specifications subject to change without notice) 39 Sear & Hammer Housing 40 Hammer 41 Hammer Spring 42 Hammer Pin 43 Hammer Spring Detent Spring 44 Trigger Disconnect Lever 45 Sear Pin 46 Hammer Plunger 47 Sear 48 Sear Spring right locking lever (#38).

Both levers can be seen by holding the frame upside down and shining a light into the magazine well. The left lever is T-

PISTOLS

Rebuilding the “Battered” Revolver

Even with revolvers designated as “Magnum caliber,” full-power loads eventually take their toll. And once a revolver starts to “shoot loose,” the problems can be quickly compounded.

BY ROBERT K. CAMPBELL AUGUST 2008

ORIGINAL PP. 7-9

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Over the years, I’ve sparked a few debates with my opinion of Smith & Wesson’s K-Frame Magnums’ hat opinion being that they’re not built for extensive use of full-power Magnum loads. But it’s not hard to find shooters who disagree with me. Some tell me they’ve been using “Elmer Keith Memorial loads” or factory Magnums for 30 years or more without ill effects.

While I suppose this is possible, I think most gunsmiths would agree that the lightweight K-Frame Magnums are subject to more rapid wear than the heavier N-Frame Magnums. I suspect that, in many cases, the fact that the typical shooter doesn’t know what “ill effects” to look for has a lot to do with why he doesn’t seem to find them. In this article,

we’ll look at what some of those effects can be, and discuss some ways they can be corrected.

While my discussion will center on the K-Frame S&Ws, the basics apply to any Magnum revolver. To start off, I think we can agree that the K-Frames are basically “.38 frame” firearms, while the N-Frames are “.44 frame” firearms, and firing a lot of full-power Magnums will batter even these larger revolvers. They don’t blow up very often, of course, but they can become rattling wrecks. The recommended procedure for a .357 magnum revolver is to fire it for practice with a ratio of about ten .38s for every Magnum.

By the time you see the handgun in the shop, it is too late for this advice to be of any assistance, but They should be examined closely. If it’s not badly damaged you may be able to fix it. That said, the process of rebuilding a

Magnum revolver is relatively simple’especially if the wear is not excessive. In much the same way that a small hole in adam can become a major breach in a hurry, once wear on a revolver reaches a certain point, it accrues rapidly.

The first and most obvious sign of wear is a battered and mushroomed cylinder center pin. As a result of this, the center pin may stick in the extractor rod. In order to address this wear, I’ve removed and reshaped the center pin, but a reshaped pin never seems to hold up for very long. Once a center pin becomes worn, the wear accelerates quickly. A new center pin is the answer. On numerous occasions, I’ve seen forcing cones that have cracked due to a heavy lead buildup.

The culprit seems to be lead bullets that are too soft, and heavy loads pushing those soft bullets at velocities well over

REBUILDING THE "BATTERED" REVOLVER CONTINUED

ORIGINAL PAGE 8

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This is often an indication of heavy wear. 1,000 fps. The lead builds up overtime, eventually resulting in excessive pressure. If you catch the problem in time and the customer is willing to pay for corrective gunsmithing, a bit of reaming of the forcing cone is a great aid to the Magnum revolver.

The breech can be opened to about .15-20 over bore diameter in both .357 and .44 caliber revolvers. (Interestingly, I can't recall seeing a problem with the .41.) By relieving the breech, much of the concern for overpressure is relieved as well. If the forcing cone has already cracked, the barrel must be replaced. There have been numerous design improvements in Magnum revolvers over the years'which is a tipoff that the manufacturers have seen problems with their products.

But there are an untold number of older revolvers around and even the newer ones are subject to wear (depending a great deal on the habits of the shooter). One problem I've seen with some Magnum revolvers was the failure of the bolt to properly hold the cylinder. As a result, the revolver would fire, the hand would turn, and the hammer would fall again on the same cylinder. Older revolvers can be fitted with an oversize bolt stop from Brownells.

This part is still available and would prove to be a life saver for many wellworn revolvers. Magnums absorb a lot of inertia, and this explains the next problem I'll cover. For various reasons, the sideplate screws of Magnum revolvers often work loose. The front plate yoke screw is usually the first to go.

Tightening and thread-locker work'up to a point'but replacement of the screw may be necessary to prevent wallowing out the sideplate.

And don't assume when you're handed a revolver that the screws are in the correct tunnel. When it comes to cylinder and crane malfunctions, the cardinal rule is to completely and carefully clean the revolver first. Besides the lead buildup problem, Magnums also use a relatively slow-burning powder that flakes and builds up to a varnish-like finish. A common problem in the K-Frame Magnums, including Models

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13, 19, 65, and 66, is "endshake." Endshake is simply the cylinder exhibiting excessive back-and-forth motion on the crane. Once endshake develops, it becomes progressively worse. Misfires may even occur due to the forward movement of the cylinder when the primer of the chambered cartridge is struck.

When I am checking for ignition reliability, I don't use live ammunition but prefer to use Nevertheless, these are lightweight revolvers and the pounding from Magnum loads is sure to take its toll. empty cases primed with CCI Magnum primers. These are hard primers because they're designed to contain Magnum pressure, and thus they're the standard you should use. If the revolver cracks these primers, you're in good shape. This test is also helpful when performing a trigger job.

The simplest solution to endshake problems is to fit bushings to the cylinder. Once the cylinder has been checked for endplay, you will need to disassemble the cylinder, crane,

and center pin. I get my bushings from Power Custom. These bushings are dropped into the front of the cylinder's center hole and then checked for a perfect fit. Sometimes a number of bushings are required. The ejector rod should slide over the bushings but should not bear against them.

The standard procedure is to fill the cylinder with bushings until it no longer revolves, and then remove one of the bushings. These little bushings are a great product and will easily give you a tight barrel/cylinder gap. Another common problem is a forcing cone that has become worn and actually rubs against the cylinder. I have seen this occur in sub-Magnum calibers, but the Magnums take more battering. The forcing cone could be uneven. When this occurs, the forcing cone can be carefully filed.

This must be done evenly in order for the cylinder to rotate properly. Unlike my aforementioned experience with reshaping of a

center pin, when a forcing cone is reshaped, the revolver seems to function well for many hundreds of rounds. Although I have more experience with Smith & Wesson revolvers, I've worked with many of Taurus' smallframe revolvers chambered for the .357 Magnum.

It seems that the additional lock on the crane of some of the six-shot variations goes along way in fighting wear (and possibly in increasing accuracy as well). The mid-frame Taurus revolvers use a lockwork like the Smith & Wesson, and some seem to display wear on the ratchet rather quickly. This is similar to the wear seen on S&W J-Frame "Chief's Special" revolvers that have been fired a lot. If the .38-caliber version shows early wear, it's only reasonable to assume the Magnums will wear more quickly.

All of this taken together means that the gunsmith who is prepared to work on Magnum revolvers will probably not run out of work anytime in the near future.

SHOTGUNS

Back-Boring the Shotgun Barrel

Today's skeet, trap, and sporting clays shooters are convinced of the benefits of back-boring. Thus, offering back-boring as a service can, of course, benefit the gunsmith as well. Here's how it's done.

BY MICHAEL R. ORLEN AUGUST 2008

ORIGINAL PP. 10-16

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Simply defined, back-boring is the enlarging (by reaming) of the barrel's diameter from the front of the chamber forcing cone to the choke's forcing cone. This is normally accomplished on the lathe using a reamer with a tapered leading edge to form or blend into the choke forcing cone. The reamer is driven by hand—as much as 40 inches long—attached to the lathe spindle. Back-boring can also be done with hand-powered equipment. This is not a new practice.

British gunmakers started using this technique in the late 19th century. Back then, they called it freeing (not to be confused with free-boring), but this practice soon lost favor in light of the development and refinement of the fixed choke. Early in the 20th century, the technique resurfaced. The A. H. Fox Company in Philadelphia had a shotgun-bore mechanic named Burt Becker, whose experimentation with back-boring produced some of the best long-range waterfowl shotguns of their time.

These were the Super Foxes and the HE-Grade Fox shotguns, with bores as much as .014 inch oversized. Perhaps it's the common cycle of the back-boring trend, or maybe just clever marketing by modern

shotgun manufacturers, but today's shotguns seem to be sold on the benefits of back-boring in certain sporting applications. It's possible, I suppose, that back-boring has finally found a permanent place on our list of optional features for the shotgun bore.

Both Remington and Browning now offer over-bored barrels in their target guns. This may fool some gun owners into thinking their trap and sporting-clays guns are obsolete, and indeed many will trade in perfectly good and serviceable guns and barrels to obtain this "new" feature. Other gun owners will simply look for a gunsmith who can back-bore the barrels on their favorite shotguns.

In fact, the shotgun-bore mechanic who can perform this service for today's target shooter and sportsman will find a rapidly increasing awareness of the benefits of back-boring among his customers—as well as an expanding market for this service. But there are other reasons why the gunsmith should be familiar with this technique. One of the more useful applications of back-boring is in shotgun restoration.

Many older shotguns—especially older side-by-side models—have been subjected to corrosive propellants, corrosive primers, and years of neglect that have left their bores rough and pitted. In the repair or restoration of these older shotguns, a new bore surface is always a good idea. In much the same way an engine mechanic will overbore the cylinders of an internal-combustion engine for a better piston-ring seal, the bore mechanic can renew a pitted bore surface, improving its appearance and wad seal.

When back-boring for restoration, it's important to adjust the choke diameters as well. Remember that the choke constriction is the difference between the bore diameter and the exit diameter. Increasing the bore diameter has the same effect as closing the choke, and after the bore is restored by back-boring, an equal amount of material must be removed from the choke if the final constriction is to remain as it was originally.

Many older shotguns have been sawed off for one reason or another at some time in their history. Back-boring can give these otherwise cylinderbore barrels some degree of choke. Just stop the reamer about 2 inches from the muzzle, and you'll have a

BACK-BORING THE SHOTGUN BARREL CONTINUED

ORIGINAL PAGE 11

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constricted area at the end of the barrel. You may have to adjust the choke constriction by your choice of reamer size. With all older shotguns brought in for restoration, be sure to measure the chambers before starting any work on the barrels. Many of them are short by today's standards and will have to be lengthened to 2-3/4 inches. With the chamber lengthened, back-boring completed, and the choke adjusted, you have given the inside of your customer's barrel a completely new surface from forcing cone to muzzle.

This is a service your customer is sure to appreciate. The back-bore reamers and handles I use are made by Clymer Manufacturing and Loon Lake Precision. This is not in any way an endorsement, more a point of reference, as I will be both picturing them and referring to techniques in their care and use. They are of very high quality, but surely the reamers and handles made by your favorite tool maker will do the job and can be easily adapted to these instructions.

The Clymer/Loon Lake 12-gauge tool handle is 5/8 inch thick (.625). The first accessory you'll need to operate it is some sort of guide to hold the handle centered in the chamber. In 12 gauge, this can be made very easily. Take an old piece of 20-gauge barrel and use an adjustable reamer (the same one you use for 20-gauge choke adjustments) to open its bore to .626 inch and cut off a 3-inch section. They need not be expensive; these are made by Skeet's Gun Shop.

Now measure the outside diameter of this piece (it should be .725 inch or so) and find or size a piece of 12-gauge barrel to fit over it. (For this, you'll need your 12-gauge choke-adjusting reamer.) This piece should have the same .001-inch clearance over the 20-gauge piece as the 20-gauge piece has over the tool handle. Now turn the outside of the 12-gauge barrel to .795 inch, and save a 3-inch section. Clean and oil your chamber-guide pieces and slide them down the tool handle.

This type of handle guide 'with the pieces well oiled' will ensure a good bearing surface as the tool handle turns and will prevent scoring of both the tool handle and the chamber. Back-boring is an operation best performed on the lathe, as a constant feed rate is critical to a good finish, and a good finish is critical to shotgun-bore performance. Nevertheless, there are gunsmiths who do this operation with power hand tools, and I must confess I've done some barrels in this way myself.

One reason for using hand tools is simply for the These were made by gunmaker John Britt. The wooden knob must turn freely. practice, and I've used hand tools on a couple of bolt-action shotguns that were too bulky to be done in any other way. So, although I'd prefer to see this done on a lathe, I will include some instructions on back-boring using a

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1/2-horsepower hand drill as a power source. Set up your practice barrel (I urge you not to skip this step) in a wellpadded vise. (Two pieces of 2x4, well grooved from constant use, work very nicely.) If increasing the length of the forcing cone is part of the job, this should have already been done.

This will enable your chamber guide to start a little more deeply within the chamber. (Unless you have a 5/8-inch chuck on your drill, you will have to turn the last inch of your tool handle down to 1/2 inch.) Squirt a good amount of high-quality cutting oil (four or five squirts from your oil can should be enough) toward the first 4 inches of bore. Insert the back-bore reamer, but apply no inward pressure at this time. Slide your chamber guide into position. Now it's time to mark your tool handle.

Put a piece of masking tape on it about 4 inches from the rim cut. This is as much as you'll be able to cut at a time without risking your reamer becoming overloaded with chips and gouging the bore. Start your drill but don't exceed about 75 rpm, and hold tightly while applying firm yet even inward pressure. When you've cut 4 inches, withdraw the tool under power until the back of the reamer contacts the chamber guide.

Clean and re-oil the bore, clean the reamer and wipe it with a shop rag, re-mark the tool handle, and make another cut. Under no circumstances should the tool be allowed to cut into the section of barrel within the vise jaws. There is a certain amount

of "crush" at this point and running the reamer to this position will certainly result in some degree of distortion.

When the tapered tip of the backbore reamer has just started to blend into the fixed choke, or when you're within 1/4 inch of a screw-in choke seat, you're done. Clean the bore and hold it up to a light for inspection. What you want to see is a reasonably smooth bore finish, with no reamer gouges or chatter marks. If you've gouged it, the damaged sections will require excessive polishing, and your chances of producing a consistent diameter throughout the bore after polishing are slim.

If you need more practice, grab another old barrel and try again. Although it can be done, using a drill motor to power the reamer is more a matter of "feel" than anything else, so my written instruction can only help so much. Beyond the instructions in the last few paragraphs, only experience and practice can produce an acceptable job. Back-boring can also be done without power tools.

A bit of practice and some time to develop a good sense of "feel" will be needed, but a crank handle can be easily made (see photo) and an excellent finish can be had by careful hand rotation of the boring equipment. You'll be surprised how quickly a back-boring reamer progresses down the bore with light pressure and hand power. Cutting no more than 3 inches at a time and withdrawing the tool to clean chips and re-oil the bore will result in a smooth bore surface that will require very little polishing.

The flutes on the Clymer or Loon Lake back-bore reamer have a lefthand spiral, and there are eight of them for stability. The recommended depth of cut is from .005 to .020 inch. Optimum feed rate will vary between .008 and .016 inch per revolution (depending on the depth of cut). The reamers are designed to rotate at a maximum speed of 75 rpm. As you can plainly see, the best way to maintain these parameters accurately is by back-boring on the lathe.

If your lathe apron has a travel of over 30 inches and you have a coolant-recirculating system, you have it made. If, like so many gunsmiths, you have a smaller machine, perhaps with no provision for coolant recirculation, you can still perform this service very well. Next I'll give some instructions for back-boring with these smaller machines without a coolant system.

If you're fortunate enough to have a large lathe, you'll quickly realize the advantages of the larger equipment and be able to skip many timeconsuming steps. You'll need a tool-post-mounted milling fixture. An adequate device is made by Palmgren, and can be found in the Brownells catalog at an extremely modest price, considering the versatility of this tool. Mount the milling vise on your tool post.

The instructions say to clamp it down with a tool-post ring, but I've found that an upside-down tool holder secures it nicely. You can hold your back-bor-

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ing tool handle either with a 5/8-inch collet or in a three-jaw self-centering chuck. In the initial setup, remember my warning about letting the tool enter the area of the bore being “crushed” by the vise. This can be avoided by mounting the barrel at the chamber. Again, if lengthening the forcing cone is part of this job, do it first. The more of the chamber-guide bearing surface actually engaged, the truer your setup will be.

Put your tool handle through the headstock, allowing the tool to protrude about 12 inches, and tighten the collet or chuck for now. Squirt plenty of high-quality cutting oil (Brownells Do-Drill or dark cutting oil) in the first 4 inches of the bore. Guide the chamber over the reamer until the forcing cone and reamer touch. Then push the chamber guide into the chamber. The tool and barrel assembly will now stay unsupported.

If your lathe has along enough bed, the muzzle can be held in position with the tailstock center, and the milling vise’s lower jaw can be raised to meet the barrel. Once the barrel is set up, the tailstock is removed. If you’re using a lathe with a shorter bed, you’ll need to “find” the muzzle’s center point. Grab the muzzle and get a feel for how much play there is in your unsupported barrel, then hold the barrel in the center of that play. Raise the lower jaw of the milling fixture to meet the barrel.

Now tighten down the milling vise, and loosen and then retighten the bolt controlling the tilt of the vise. This will correct the

“tilt” and align your bore to the secured tool. Check your setup with a level on the outside of the barrel. Engage your backgear and set your lathe to run below 75 rpm. (I like to run mine at 60 rpm.) Set your feed rate. If you have a bore of .729 inch and you’re boring to .740 inch, you’re making an .011-inch cut. This puts you right in the middle of the recommended feed rates.

I use a feed rate of .014 inch per revolution, as I always like to be sure the flutes are adequately loaded to prevent chatter. Note a spot on your ways about 4 inches from your apron and mark it with your finger. This is how far you will go with each cut. Turn on the lathe and engage the drive. When you have cut to the mark on your ways, release the drive and back out the tool under power. But don’t remove the barrel from the milling vise!

Clean out the chips by pushing a patch through the barrel from the muzzle, and re-oil. Brush the reamer clean and then wipe it with a shop rag. During this operation, you’ll have to loosen the collet or chuck and extend the tool several times. As your tool approaches the muzzle, observe its position with a flashlight. You’ll want to stop the feed when the tapered front end of the tool just begins to blend into the existing choke.

If the barrel has screw-in chokes, be careful to stop the reamer before it reaches the choke seat. I like to stop about 1/4 inch before the seat. If all has gone well, you now

have a nicely back-bored barrel. If you kept the reamer clean and properly oiled during the operation, there are no gouges. If the reamer was properly loaded, you should find no chatter marks. And if you were careful in mounting the barrel in the milling vise, you haven’t left a single mark on the barrel’s bluing.

You may see evidence of where you started and stopped the operation on the walls of the bore, but these are very shallow imperfections and will disappear in the polishing process. A well-polished finish is crucial to shotgun bore and choke performance. If you don’t believe me, take the practice barrel you just back-bored out to the range and pattern it before you begin the polishing process. Then pattern it between each successive polishing step.

What you’re going to find is that choke performance and pattern density improve with each successively finer polishing operation. That’s because the better the surface of the bore is polished, the less disruption there is to the protective shotcup. There are a number of flexible honing systems and oils on the market, but I’ve found none that work as well as this homemade fixture. To make one that fits 16- and 12-gauge bores, go to your local hardware store and buy several 48-inch pieces of 5/8-inch hardwood dowel.

For 20-gauge bores, I recommend a piece of 1/2-inch aluminum rod, as a 1/2-inch hardwood dowel will not have adequate strength. You will also need emery cloth in coarse, medium, and

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fine grits, as well as Scotch-Brite pads in both medium and fine grit (green and gray). Hold a piece of dowel or aluminum rod vertically in your bench vise and slit it down the center with a hacksaw (about 3 inches). Remove your milling attachment and crank the apron to the left, well out of the way. Lock the dowel in your three-jaw chuck, leaving enough dowel exposed to polish the whole barrel. Disengage the back-gear and lock the spindle. Adjust the speed. You'll want to polish at a relatively high speed.

Now take a piece of coarse emery cloth (often you can start with medium) about 3 inches wide by about 8 inches long, and insert one end in the dowel slit and wrap the rest clockwise around the dowel (as you face the spindle). You'll have to experiment with the length of the emery cloth. You want it to fit relatively tightly in the bore, but if it's too tight, the hardwood dowel will fail. Wear safety glasses when doing this, as an exploding dowel can send splinters all over the place.

There will be a lot of heat generated by polishing, so a pair of leather work gloves is also a good idea. Spray penetrating oil down the bore, place the chamber over the end of the fixture, hold on tightly, and turn the power on. Polish, slowly and evenly, from the forcing cone to the throat of the choke. The barrel will get very hot during this process. Once you've gone end-to-end twice, turn off the power with the fixture still inside the chamber.

Re-oil the barrel and turn the emery cloth around, using the unused end that had been inserted in the slit, and polish once more. Never turn on the power without the paper end started in the chamber and be sure to turn the power off before removing the barrel completely. Now you've polished twice with coarse cloth. Clean the bore and hold it up to a strong light for inspection. There should be no evidence of the reamer at this point.

Actually the bore will look very good now, probably better than many factory barrels. Re-oil the barrel and repeat the polishing process with medium and then fine emery cloth. The medium and fine grits should require much less polishing than the coarse cloth did, since you are only polishing to remove the sanding marks left by the previous emery cloth. Be sure to move the barrel evenly across the polishing fixture. You are trying to maintain an even bore diameter throughout.

A little practice will give you the feel you need to do this. When you're finished polishing with the fine cloth, you'll have an excellent finish. As good as your polished bore finish is, it can be improved a bit by further polishing with Scotch-Brite pads. You'll need to spread the slit in the dowel a bit with a small knife or screwdriver to install the Scotch-Brite and wrap it clockwise as you face the spindle. You want the Scotch-Brite to fit relatively tightly in the bore.

Insert the Scotch-Brite in the chamber and turn on the power. Polish the barrel end to end, dry, first moving it slowly and then rapidly. This will produce across-hatch pattern in the polished surface. This type of polishing pattern will be the least disruptive to the protective shotcup, and will soon disappear with a little use. A medium (green) pad will give you a beautiful bore surface, but you may choose to follow this up with a fine (gray) pad.

Another method of producing a good final finish is dry polishing with medium emery cloth fitting very tightly in the bore. Some gunsmiths prefer this method for its speed. As the cloth "loads up," it will burnish the surface of the bore. A good back-boring job will polish up in about 10 minutes. One other note: If your customer is interested in having screw-in chokes installed in his barrel, this service will have to be done before backboring.

This is the best way to ensure a good pilot fit and to avoid exceeding the maximum bore diameter at the choke seat. What you've just produced is a barrel bored to your customer's exact specifications, with a mirror finish inside from end to end. There are not many shotgun manufacturers who take this care in producing their product. One look down the bore of a Remington, Ithaca, or Winchester will prove this. You could even offer a polishing service alone.

Your customers who own shotguns with factory barrels will find that polishing will improve their shotguns' performance even without back-boring. I

MAINTENANCE & REPAIR

Explaining Repair Costs To Your Customer

Compared to just about anything else—a car, a washing machine, or an electric toaster—maintaining and repairing a firearm is dirt cheap; it's all in how you explain it.

BY ARTHUR J. HUNT AUGUST 2008

ORIGINAL PP. 17

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Every so often your customer will question the amount you are charging for a particular repair. You should be prepared to give him an answer that truly explains why the cost is what it is. I approach it this way: We all know what inflation has done to prices. If the gun was purchased 10 or 15 years ago, its price has probably doubled or tripled; and if it's 20 or 30 years old, a comparable new gun sells for as much as five or even 10 times as much.

So you can't blame the customer if he balks at paying \$200 to repair an old gun that cost him \$75 when it was new. Of course, if you know the customer well, it wouldn't hurt to remind him that, back in the day when he paid \$75 for a new shotgun, he was working for something like \$2 or \$3 an hour. (And so were you.) No so anymore. Today's gunsmith can hardly keep a shop open charging less than \$35 an hour.

But here's an even better approach, particularly if you don't know the customer well: Tell him to divide the repair cost by the number of years he's owned the gun. If he's owned the gun for 20 years and he's looking at a \$200 repair bill, that means his cost of maintenance is \$10 a year, and once it's repaired, his gun will be worth, say \$275. That means it's basically cost him nothing to own the gun for 20 years. Now compare this with what he's spent on automobiles over the last 20 years.

You can spend \$20,000 on a car, spend \$2,000 a year maintaining it, and sell it in 5 years for maybe \$5,000. The comparison makes that \$200 repair bill seem pretty in-

significant, doesn't it? In fact, you could tell him that the maintenance cost on his gun is actually so low that perhaps you ought to charge him more. He won't want to hear that, but if he has the brains of a spent primer he'll quickly decide to spend the money and leave the gun with you.

Anyway, my point is that, given the way they hold their value and the low cost of maintaining them, guns are a great investment' and they deserve to be treated as such. If you run into a true tightwad, don't whip a dead horse. The owner of a broken or malfunctioning gun needs to have the repair done for, without it, he has nothing but a handful of iron and he knows it. Besides, think of how many cases of beer he's bought in the last 25 years and what he's got to show for it—empty bottles and a big belly.

Actually, I don't suggest you mention that to him, but you might keep it in mind. In any case, if he thinks your price is too high, don't get excited. Show him some of the guns you keep around the shop. Let him see just how nice your refinishing is and how slick your action work is. But don't apologize for your price. And above all, don't start cutting your price. You've done all you can and now it is up to him. If you're still holding his gun in your hands, it's a lot easier for him to tell you to go ahead.

He has, in his subconscious, already let go of it. Hopefully he'll begin to realize that your price, when amortized over the life of the gun, is pretty damn cheap and with a

little luck you could still get the job. Remember, you're the craftsman, the gun guru, the gun doctor; you don't have to defend yourself in anyway. With all that said, there are jobs you won't want to take and there are times to say no to a repair job.

In the past, we've talked about knowing what your skills are and sticking to your area of expertise. This time, however, I'm thinking about those jobs that are based solely on your customer's nostalgia for "dad's old gun" or "my first gun" or "a trophy I brought back from the war." I am not unthankful for this type of business if I'm going to get paid for it, but you have to be careful that you don't get caught up in the customer's nostalgia.

Remember, your time is valuable and restoring old guns is a time-consuming enterprise' and it's often impossible to know what problems you might run into once the gun is apart and you're committed to do the job. If you're working for someone who's willing to spend whatever it takes to restore his heirloom, that's one thing. But if the customer is one of those cheapskates we talked about, you might come to regret taking the job.

Nevertheless, when you do finish a restoration for the right type of customer, be sure to keep some Kleenex handy because he's likely to shed a tear or two when he picks up his beautifully restored gun. And, heck, seeing his reaction, you might need a Kleenex, too.

PEOPLE & COMPANIES

Working the Colt Paterson Percussion Revolver

Although you may never see an original, there's a very good chance you'll eventually be handed a replica of Sam Colt's very first repeating firearm. These instructions will work with either.

BY DAVID R. CHICOINE AUGUST 2008

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Original caption: Right top: This is a shootable, modern replica of the Colt No. 5 or Texas Paterson—one of the earliest of all revolvers produced in Italy by Pietta. Right bottom: Without caps, no percussion revolver can be fired, so before disassembly, always look at the nipples to be sure there are no percussion caps on them.

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This was it! Colt's original production revolver was the weapon that started revolver manufacture and the gun that would revolutionize firearms forever. Sam Colt's revolver was first patented in England in December 1835 and then patented in America a year later in 1836. These revolvers were produced at Colt's factory in Paterson, New Jersey—from which they acquired the now popular title of "Paterson Colts"—from 1836 until 1842.

Today, we can only imagine the reaction these repeating weapons must have caused in the 1830s. Remember, at this time, the best

firearm anyone could buy held a single shot (or two shots, at best, in a doublebarreled gun). These very first Colts were manufactured in several sizes and variations, although the total numbers of all types manufactured were limited to just a few thousand. Colt assigned the revolvers numerical model names from the No. 1 through the No. 5 to designate their size.

THEY RANGED FROM THE SMALLEST (NO. 1), A TINY POCKET

Author photos. pistol of .28 caliber, up to what has become known as the Texas Paterson or No. 5, which was the largest

frame size and made in .36 caliber. Regardless of the size or caliber, Paterson revolvers were all percussion ignition and were equipped with fiveshot cylinders. Some Paterson revolvers had attached loading levers and some were made without levers. Original Pattersons often turn up as cased sets, sometimes equipped with extra cylinders or even an accessory barrel of a different length.

As you might guess, because of the limited numbers that were manufactured and all the time that's passed' not to mention their unique and sig-

WORKING THE COLT PATERSON PERCUSSION REVOLVER CONTINUED

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nificant place in history'original Colt Paterson revolvers are quite rare. As such, they are highly prized by collectors, making them valuable in the extreme. As a consequence of this high value and extreme rarity, the only Paterson revolvers most of us will ever see are replicas. Fortunately, however, there are enough good replicas on the market today to satisfy the whims of the modern-day shooter who yearns to see what it must have been like to actually fire a Paterson.

The revolver pictured here is a modern-day replica of the .36-caliber No. 5, or Texas Paterson. It was manufactured in Italy by Pietta. This particular revolver has the long, 9-inch barrel and was made without a loading lever. Disassembly procedures for the Paterson replicas are virtually identical to that of the original Colt revolvers.

Takedown Instructions Since any Patterson you encounter is likely to be a replica, to avoid confusion in the text that follows, I'll use the parts nomenclature used by Uberti, another Italian maker of Paterson replicas.

1. Before beginning any disassembly, be absolutely sure this revolver you are about to handle is not loaded. Hold the revolver firmly by its grip, keep your fingers away from the trigger (#10), and point the muzzle in a safe direction. Pull back on the hammer (#2) until you hear one audible click.

This takes the revolver to the loading position.

Now check to be sure that the cylinder (#5) is unloaded by carefully examining the rear of the cylinder at each chamber to ensure there are no percussion caps on any of the nipples (#14) and then, looking at the front of the cylinder, make sure that there are no charges in the cylinder's chambers. (A good indication that a chamber is loaded would be bullets or balls showing at the front end of the chamber, or if the front of the chamber is covered with grease or a wad.

If there are percussion caps on the nipples, you should consider this a loaded firearm and should not attempt further disassembly. A loaded revolver can be emptied by taking the gun to a range where it can be safely fired until it is empty. As an alternative, the cylinder can be carefully removed without firing the revolver. To render the revolver safe for further operations, remove the cylinder by following the instructions in the next step below. 2.

The barrel (#3) can be separated from the frame (#1) by first pushing or driving the wedge (#4) out as far as it will move towards the left side of the barrel.

Often, the wedge will be so tight that it won't move by hand pressure, so you may have to use a small nylon drift punch struck

by a small hammer to break the wedge free. (I like to use a nylon punch for this because it lessens the chance of damaging either the wedge or the surrounding metal.) The hammer (#2) should remain in the loading position so that the cylinder will rotate freely.

If the revolver is equipped with a loading lever (not illustrated), rotate the cylinder so that the rammer pin contacts the cylinder between two chambers, then operate the rammer so that the barrel loosens and moves forward from the frame slightly.

On revolvers without ramrods, once the wedge has been removed, hold the gun by the barrel, muzzle up over a well-padded bench top. (I like to place an old bed pillow on the bench for this.) Use a plastic mallet to strike the front face of the cylinder a few short, sharp blows to cause the frame and cylinder to fall back down onto the padded bench. The barrel can now be removed from the frame by pulling it straight forward.

The cylinder assembly is now free to be removed from the frame by pulling straight forward and off the base pin (#21). Colt called this part an "arbor." 3. Disassembling the barrel and cylinder is the next step. The wedge is removed from the barrel by first un-

WORKING THE COLT PATERSON PERCUSSION REVOLVER CONTINUED

ORIGINAL PAGE 20

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screwing and removing the wedge screw (#33) from the left side of the barrel, then pulling out the wedge. If your gun is so equipped, the loading lever is removed from the barrel by unscrewing and removing the loading-lever screw. The only disassembly possible on the cylinder is the removal of the percussion nipples (#14). This step is accomplished by using a special tool called a "nipple wrench." Percussion nipples are screwed in and have righthand threads, meaning they unscrew in a counter-clockwise direction.

On original Colt and other vintage percussion revolvers, the nipples are probably hand fitted to each specific chamber, so care should be taken that these nipples are reinstalled in the exact chamber they came from. 4. To remove the grip, grip strap, and the mainspring, start by pulling the hammer all the way to the rear and In this photo, the handspring is still within the frame, but the screw that holds it (far left) has been removed.

The leaf-type spring shown above the frame is the handspring, which fits in from the rear (left). holding it with your thumb. Maintain

control of the hammer and then pull the trigger (#10), allowing the hammer to ease all the way forward by slowing its motion with your thumb. Unscrew and remove the two backstrap screws (#32) from the top-rear of the backstrap (#8.) Next remove the single connect screw (#455) from the butt (bottom) of the backstrap.

The backstrap and the one-piece grip (#11) can now be removed by pulling them down, then to the rear as a unit. Once the backstrap and grip are off



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Colt Patterson Percussion Revolver (Specifications subject to change without notice) (Uberti Nomenclature) 1 Frame 2 Hammer 3 Barrel 4 Wedge 5 Cylinder the frame, the grip itself is pulled down slightly at the top to separate it from the backstrap, then straight forward off the backstrap. The main- 7 Hand 8 Backstrap 10 Trigger 11 Grip 12 Bolt 14 Nipple 15 Front Sight 18 Hand Spring spring (#20) should be detached from the stirrup (#115) before it can be removed from its seat on the frame.

Removal is accomplished by pressing 20 Mainspring 21 Base Pin 28 Cylinder Pin Lock Pin 32 Backstrap Screw 33 Wedge Screw 37 Hammer Screw 38 Trigger Screw 40 Bolt Screw 112 Stirrup Plug (pin) 115 Stirrup 125 Hand & Sear Spring Screw 174 Sear 175 Sear Spring 214 Frame Plate Screw 455 Connect Screw 492 Breech Assembly 612 Frame Plate 613 Toothed Rack (ratchet) 614 Toothed Rack Link 615 Toothed Rack Link Pin 616 Toothed Rack Latch 618 Sear Lever 620 Sear Pin 621 Sear Screw 622 Breech Screw 623 Trigger Spring down on the upper portion of the mainspring using both thumbs. (Often the springs can be so stiff that a small machinist's clamp is needed to

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compress the spring. Pad the frame with a leather strip to prevent marring it.) Once you have the mainspring compressed enough, the stirrup is pivoted forward and the spring is released. Now the spring will slide down far enough so it can be unhooked from the mainspring seat and removed. 5. Before disassembling the action, carefully note the position of all the associated parts for later reassembly. Unscrew and remove the two breech screws (#622).

One breech screw runs straight up from the bottom of the frame, located just behind and to the left of the trigger. The other breech screw runs up at an angle. This one is accessed inside the right-hand grip circle, at the lower-rear portion of the frame. The breech assembly (#492) with the base pin attached is now free to be removed by pulling it straight up and off the frame. Further disassembly of the breech is not recommended unless you are a skilled gunsmith with experience with Patterson-type revolvers.

Next, loosen the hand and searspring screw (#125). You'll find this screw located just behind and below the hammer, facing up.

Unscrew and remove the hammer screw (#37), and then lift the hammer straight up and out the top of the frame. Be aware that the hand (#7) will come with it. The hand-spring (#18) will now slide to They are shown here laid out as they were disassembled from the frame. the side, and can be lifted up and out of the frame opening. 6.

As in the previous step, before disassembling the bolt and the trigger, pay careful attention to the relationship of the parts. (A drawing or, better yet, a digital photo will aid in later reassembly.) Unscrew and remove the two frame-plate screws (#214) from the bottom-front area of the frame while, at the same time, maintaining a downward pressure on the frame plate (#612.) After the screws are out, turn the frame right-side up.

The frame plate can now be lifted straight up and off the frame, which will expose the bolt and trigger mechanisms. The trigger spring (#623) is now loose, so it can be lifted up and out of its seat with the frame (paying attention to its position for later reassembly). Now loosen the bolt screw (#40). This will be the tiny screw nearest

the top of the frame. The bolt (#12) can then be lifted straight up out of the frame opening.

The rear and lower of the two tiny screws in the right side of the frame is called the sear screw (#621). Once this screw is loosened by several turns, the sear/trigger-bar assembly (#618 & #174) can be lifted up and out the top of the frame. Now unscrew and remove the trigger screw (#38), which is the forward-most screw located in the right side of the frame. Once out, the trigger (#10) can be lifted up and removed from the frame. Finally, unscrew and remove the hand and searspring screw.

You will then be able to lift the hand and sear spring (#19) up and out of the frame. You shouldn't run into any serious snags with reassembling the revolver, assuming you've made sketches or taken photos of the relationship of the parts noted above. Generally, all you have to do is reverse the order of disassembly. I

MAINTENANCE & REPAIR

Reader Forum

BY AMERICAN GUNSMITH EDITORS AUGUST 2008

ORIGINAL PP. 23-24

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Early on during my work on some of these, I attempted to correct the problems by recutting or making some changes to the engagements that had already been made by someone else. Most of these attempts resulted in the replacement of the parts. The hammer and trigger engagement is super, super critical to the ignition of the primer. Do you have or know of any good way to lighten these triggers and keep them functional?

The normal way of stoning and polishing only takes minute changes to render the gun unusable with misfires. Thanks. Don't be discouraged. When "someone else" has performed butchery, you can never tell whether they just stroked away with a file or built up the engagement angle and then lopped it off. We did an article on the SB1 in October 03. It was based on the NEF Pardner, but that rifle is mechanically the same as the Handi Rifle and other H&R single-shots.

The article concentrated on reassembly, because almost anyone's owners included can get the rifle apart only to be totally at a loss getting it back together. The misfires you're seeing resulting from light hits on the primer could be due to home-grown trigger jobs. It's also possible the hammer spring has been reinstalled incorrectly (refer to the aforementioned article). And what's "normal" when stoning or polishing depends on the amount of abnormal attention paid to engagement angles instead of friction reduction.

You did not mention a key element—the trigger spring. After a thorough job of reducing friction by polishing the sides of all interacting firing-mechanism parts, try nipping one coil from the spring (with a back-up spring on hand). This has proven successful at

lightening the pull while not negatively affecting primer impact. Mossberg 500 Ejection Problem I have a Coast to Coast Model 660 pump-action shotgun that I bought from a friend at work.

Even though I can't find across reference listed in the Numrich catalog or on their website, I identified it immediately as a Mossberg Model 500. I know the quality of the Mossberg name, because I have one that I shot when I was eight years old and has been handed down to me by my father. I suspect that I got the opportunity to buy this gun due to the fact that it had extraction problems from the first trip out, and I later found it had been owned by a couple of other coworkers as well.

I don't know if this is true Mossberg, or some sort of clone or copy as disassembly and inspection showed softer, weaker, or poor-quality parts, and the receiver had a purplish hue. I have since reworked the gun and gave it a Cerama Coat finish. The gun looks and works great now, and the only thing lacking is ejection at times. For lack of a better way to explain the problem, it seems to me that the ejector doesn't always pop the rim off the left-side extractor soon enough to get the shell out the ejection port.

I'm guessing that if it were a little farther forward, or a little more material on the face, it would give it the timing it needs to perform these functions. I suppose I could compare it to the one from my original Mossberg, and I thought about just ordering a replacement from Numrich to see if that does the trick. What would you suggest? Thank you for your time and consideration. We have no information on Coast to Coast shotguns in our files.

If the Mossberg ejector fits or can be made to fit with a slight modification, that would probably be a better solution than trying to overhaul the factory original—particularly considering your comment about the substandard materials used in the gun. Refinishing Rem 541-S Stock I am getting ready to refinish the stock on a Remington 541-S custom sporter rifle. The rifle has what appears to be a rosewood forend tip, but after close inspection I find that it is made of plastic.

What's the correct procedure for stripping this stock without ruining the tip with stock stripper? Can the tip be removed and then reinstalled after stripping the wood? The simplest means is to mask off the entire tip with masking tape overlaid with clear plastic 3M tape like that used to seal shipping boxes. We don't specifically know how the tip was attached. The factory might have doweled it in place, glued it on, or counterbored it for a screw and a plug.

Come to think of it, rosewood sounds like a pretty pricey option for along-out-of-production .22. That makes us think this tip may have been added later. That being the case, your guess is as good as ours regarding how it was attached. Saiga AK Problems I currently have a Saiga AK chambered in 7.62 x 39. I'm trying to remove the front sight/band in order to thread for a muzzle break/flashhider.

The problem is the front part of the sight band must be cut off in order for the threads to be of the correct diameter, which I suppose was done on purpose in order to conform to the

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(continued from previous page) Clinton "assault-weapon" ban. I've removed the two drift pins and have used both Kroil lubricant and a moderate amount of heat, but I can't seem to move it at all. I'm concerned about damaging the barrel if I use too much force and/or heat. I'm wondering if it's silver soldered or if some type of adhesive was used. Any suggestions? Thanks. We've seen many methods of attaching the sight band on AKs. We assume it depends on the specific factory in which the rifle was produced.

The band might be sweated, shrink fit, press fit, brazed, or soldered. We don't, however, think yours is being stubborn because of an adhesive. We suggest you contact Keith Billado, who is a very knowledgeable "smith when it comes to these off-shore AKs. He's with Century Arms Tell Keith we gave you his name. Remington M31 Assembly I have a Remington Model 31 (Series 1941) shotgun that won't lock up. I bought anew action bar, lock, and spring from Numrich.

Do the legs of this spring go inside the trough in the bottom of the hammer? Do both legs go over the hammer pin or under? Or does one leg go over and the other leg go under? When I got this gun, the top leg of the action-bar spring was missing. The new spring has offsets like it wasn't

meant to go down the side of the hammer and I don't think there is room for it there. Also, I don't know how the trigger lock should be positioned.

I got a Gun Digest assembly/ disassembly book from Brownells, but it doesn't cover the Remington Model 31 and the NRA book doesn't show the position of the above-mentioned parts. Can you help me or steer me to a book that covers the Model 31? I need help. Thank you.

Jimmy Ward San Saba, Texas According to an ancient Remington Field Service Manual which is about to crumble if we don't perform some restoration work't he upper leg of the action-bar spring goes over the hammer pin and the lower leg goes beneath it to engage the action-bar lock. You could probably get a copy of an owner's manual from Remington. We realize it won't give you the whole assembly/disassembly procedure, but it might help with parts orientation.

For example, the trigger lock is placed in the back end of the large slot on the right side of the trigger plate, with the bend in the lock toward the inside of the slot. It's retained by the trigger lock pin. Converting a Yugo Mauser I have a Yugoslavian 98 Mauser that I would like to use to build a 7mm Rem. Mag.

I know these receivers area little shorter than the standard Mauser, but it seems as though the Rem. Mag. will still have enough room to feed without cutting any of the ramp away, which I definitely do not want to do. Do you know of any reason why this type of Mauser receiver could not safely be converted to a 7mm Mag.? I have all my receivers re-heat-treated by a business here in Salt Lake City that specialized in this kind of work. I'm relatively new at doing conversions, although I have done a few so far.

I'm looking for advice (negative or positive feedback) from someone who is more knowledgeable than myself. You didn't mention the present caliber of your 98, but the first thing you need to do is to contact S. A. A. M. I. and check the chamber pressure of the Remington Magnum against the pressure of the round for which your rifle is presently chambered. We're pleased, by the way, to hear that you're having your receivers heattreated.

For the most part, Yugoslavian Mausers are well made, but workers forced to produce weapons for the Nazis during WWII found ingenious ways to sabotage what was coming off the production line. Some of these doctored rifles, quite unintentionally, survived the war, so you are welladvised to continue your habit of heattreatment.

SEARCHABLE ISSUE RECORD

Archive index

Gun Sales Strong in Weak Economy American Gunsmith Editors	2	Explaining Repair Costs To Your Customer Arthur J. Hunt	17
Disassembly and Reassembly Of the Zastava M88 Pistol Chick Blood	3-5	Working the Colt Paterson Percussion Revolver David R. Chicoine	18-22
Rebuilding the "Battered" Revolver Robert K. Campbell	7-9	Reader Forum American Gunsmith Editors	23-24
Back-Boring the Shotgun Barrel Michael R. Orlen	10-16		

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