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INSIDE THE ARCHIVE

DISASSEMBLY AND REASSEMBLY OF THE BERETTA CX4 STORM

SCTP KICKS OFF NEW SEASON • CONVERT BROWNING'S MANUAL SAFETY TO AUTOMATIC ON THE SUPERPOSED • THE U...

ORIGINAL METHODS. MODERN ACCESS.

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IN THIS ISSUE

Contents

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

-
- 2** SCTP Kicks Off New Season
AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 2

-
- 3** Disassembly and Reassembly Of the Beretta CX4 Storm
CHICK BLOOD • ORIGINAL PAGES 3-7

-
- 8** Convert Browning's Manual Safety to Automatic on the Superposed
SERGEY LYALKO • ORIGINAL PAGES 8-13

-
- 14** The Unique Ballester-Molina .45: Parts Replacement and Interchangeability
ROBERT K. CAMPBELL • ORIGINAL PAGES 14-15

-
- 16** Accurizing and Improving the Marlin 900-Series Rimfire Rifles
DENNIS A. WOOD • ORIGINAL PAGES 16-19

-
- 20** Making a Custom Hammer Spur
NORMAN E. JOHNSON • ORIGINAL PAGES 20-21

-
- 22** Reader Forum
AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 22-24

FROM THE ARCHIVE

SCTP Kicks Off New Season

BY AMERICAN GUNSMITH EDITORS JULY 2005

ORIGINAL PP. 2

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If its first event of the new season is any indication, the National Shooting Sports Foundation's (NSSF) Scholastic Clay Target Program (SCTP) is in for a big year. SCTP kicked off its third season in January with a hugely successful regional invitational competition at the Las Vegas Trapshooting Club. More than 130 young trap shooters representing 11 clubs in five Western states competed in the event, which was organized by Nevada state director Linda Hand.

That's double the number of participants of last year's event. The program closed out last year with 3,800 participants—a 20-percent increase over the previous year.

Developed in partnership with shooting-sports governing bodies, SCTP includes skeet, trap, and sporting-clays teams and helps to bring hundreds of new, young faces to ranges and clubs across the country. "We are confident that this program will continue to grow significantly this year," said Scott Moore, (NSSF) director of

promotions and special events. "The number of inquiries we're receiving from potential coaches has increased dramatically.

With the commitment of our partners, the ATA, NSSA, and NSCA, and the dedication and enthusiasm of many, many volunteers across the country, SCTP has a bright future." SCTP emphasizes safety, responsibility and good citizenship, as well as skill development. Based on SCTP's success, NSSF introduced the Scholastic Rifle Program last year. SRP is partnering with groups that have rifle programs, such as the 4-H, FFA, VFW, Jaycees, and the Boy Scouts of America.

Recognizing the tremendous positive impact that NSSF's Scholastic Clay Target Program (SCTP) has already had on the shooting sports in less than three years, a growing number of NSSF member companies are lending their support. The most recent of these is Sigarms, which has joined

SCTP as an industry partner and is offering a unique fund-raising opportunity for SCTP teams.

For a limited time, the company is making selected models of its Aurora TR over/under shotguns available to the teams at special pricing for fundraising purposes. Several other industry partners participate in SCTP's Support Package for new teams, including Remington, Federal, Fiocchi and Winchester, which are the program's official ammunition suppliers. White Flyer and Remington are the program's official target suppliers.

Created in 2001, SCTP is helping to bring a youthful look to ranges and gun clubs across the country. Designed to provide an "entry point" into the shooting sports with teams, coaches, and a competition framework, the program is now active in 40 states with nearly 500 teams. The NSSF and its partners in SCTP deserve the thanks of everyone in the industry for a job well done. Editor Keith Lawrence Technical

PEOPLE & COMPANIES

Disassembly and Reassembly Of the Beretta CX4 Storm

This politically correct carbine has found a home with more than a few police departments, and is becoming popular for home defense.

BY CHICK BLOOD JULY 2005

ORIGINAL PP. 3-7

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It's only a matter of time before civilian demand begins to build. The Beretta CX4 Storm is already getting a fair share of good ink in firearm publications. But why has it been called "politically correct"? Here's why. These days, a significant number of law-enforcement departments are required to coordinate their activities with boards comprised of civilian commissioners. Some of these men and women have been elected, while others have been appointed. Not all law-enforcement officers welcome this arrangement.

Others have learned, or are in the process of learning, to cope with the decisions of people who never have and never will write as much as a parking ticket, let alone take part in a hostage situation or drug bust. As it happens, the CX4 was conceived and designed by Beretta to overcome the objections of civilian boards to departmental plans for stashing AR-15s (gasp!) or M16s (gasp! gasp!) in police cars.

These objections, it seems, have been based on a perception that such weapons are too "military looking." This, apparently, makes a huge difference to civilian board members. The public votes, and commissioners who've been elected have a distinct distaste for being voted out. Moreover, commissioners who've been appointed frequently become overly concerned with the

future well-being of the elected politician who appointed them. Police chiefs, assistant chiefs, and supervisors are not elected to their positions.

Would you care to guess who wins the argument? Don't ask me why the public wouldn't feel that the Remington 40X or Remington Model 700 Tactical are too "military looking," despite the The disassembly latch, magazine catch, slide stop, trigger system, receiver rails, hammer, and levers between the hammer and trigger all require light lubrication after cleaning. fact that they are regularly modified, upgraded, and used in the armed services as sniper rifles.

And why do we never hear of the same fears regarding a police officer's duty sidearm, be it a Beretta, Glock, H&K, or other high-capacity semi-auto? And another thing, Mr. Commissioner, how about those weapons that truly are military, and are routinely borne into action by a small legion of police SWAT teams? I can't answer these questions, and I'm sure I'll never understand what pushes the public's buttons.

We'll just assume that the folks at Beretta have come up with something that solves a problem without creating other problems, and we'll end the discussion of politicians, police, and public perception. You figure it out—if you can.

DISASSEMBLY AND REASSEMBLY OF THE BERETTA CX4 STORM CONTINUED

ORIGINAL PAGE 4

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So... Just What Is the CX4? If it resembles anything with its huge grip cutout, the Storm brings to mind a Bull Pup. (Apparently, shoulder arms with big holes in their stocks aren't military looking at all.) Beyond that feature, there are few similarities. This Beretta is a semi-automatic blow-back carbine, available in 9mm x 19 Parabellum (Luger), 9mm x 21 (IMI), .40 S&W, and .45 ACP. Magazine capacity runs from 8 to 20 rounds depending on the caliber.

It fires from a closed bolt position down a 16.6-inch chrome-lined barrel impressed with six grooves and a right-hand twist. The front sight is fully adjustable for windage and elevation; the rear is a two-position foldable peep. A manual safety on the frame can be activated with the hammer cocked, and decocked with the bolt open or closed. In addition, there is an automatic firing-pin blocking device, a bolt-travel stop, and a safety on the hammer.

Overall length is 31.5 inches with zero to three stock spacers in place, and the unloaded weight is in the neighborhood of 5.5 pounds. Where permitted by law, the CX4 carbine can use the magazines from Beretta handguns, including the Models 92, 96, 98, as well as the Cougar 8000, 8040, and 8045 pistols. Its extraction, ejection, cocking handle, and manual safety are all easily reversible, but I'll get to that feature later.

Field Stripping Remove the magazine, check the barrel for obstructions, make sure the breech is empty, and put on your eye goggles. For field stripping, as with detailed takedown, work over a bench or table to prevent the loss of parts. Cock the hammer (#42) by retracting the bolt (#17) with the cocking handle (#31). Ease the bolt fully forward. Push out the disassembly latch (#58) in either direction.

Slide the upper part of the carbine forward and off its lower part to separate the barrel assembly and receiver from the stock. Fully retract the cocking handle to align its stud with the circular cutout in the cocking slot. Pull out the handle. (This may take more than a just a slight tug.) At this point, the bolt is no longer retained in the receiver by the cocking handle and could fall free, but you won't let that happen because you'll slide the bolt rearward and out first.

In reassembling after field stripping and cleaning, cock the hammer after holding the trigger (#37) fully to the rear. The hammer will remain cocked when the trigger is released. Align the bolt rails with their guides in the receiver, and run in the bolt until the hole in its body matches the circular part of the cocking slot. Insert the cocking handle completely, with its curved face toward the front of the carbine. Push the handle forward in the receiver until it comes to a stop.

Reassemble the upper to the lower, hold them together while you reinstall the disassembly latch, and pull the trigger to release the hammer. Detailed Disassembly The bolt assembly should be sitting on your work area with you looking down on it. The cocking handle has been removed previously, and I'll assume the bolt resides in a carbine sold to a right-handed shooter. This places the ejector (#29) and its spring (#26) on the lower right side of the bolt body.

Press inward about 1/8 inch on the rear end of the ejector/ ejector spring. With your other hand, grab the retaining clip (#19) and lift it off straight up. This will uncover the recoil-spring assembly (#18, 20, and 21) with the buffer (#22) still attached. In my opinion, the buffer ought to be made of sterner stuff. Until it is, it should be inspected for battering after 1,000 rounds and replaced if necessary. The recoil spring should be replaced after 3,000 rounds as part of regular maintenance.

Lift the recoil assembly from the bolt body. Stand the assembly on its muzzle end, compress the spring a little, press down on the buffer, and rotate it off the mainspring guide. The guide stop is an index piece and will slide off. Remove the ejector and its spring from the bolt. Do the same with the extractor (#28). It's located directly across from the ejector on the opposite side of the bolt. The



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1 Barrel 2 Barrel Bushing 3 Upper Casting (not for sale)
4 Front Swivel 5 Front Swivel Spring 6 Front Accessory
Rail 7 Front Sight 8 Front Sight Base 9 Front Sight
Guide Bushing 10 Front Sight Guide 11 Front Sight End
Cap 12 Front Sight Screw 13 Front Sight Plunger 14
Front Sight Spring 15 Rear Sight Pin 16 Rear Sight 17
Bolt 18 Main Spring Guide Stop 19 Extractor Retaining
Clip to change without 20 Main Spring Guide 21 Recoil
Spring 22 Buffer 23 Firing Pin 24 Firing Pin Catch
Spring 25 Firing Pin Catch 26 Ejector Spring 27 Firing
Pin Plunger 28 Extractor 29 Ejector 30 Ejection Port
Cover 31 Cocking Handle 32 Firing Pin/Bolt Stop
Spring 33 Trigger Group Housing 34 Trigger Bar 35
Trigger Spring notice) 52 Magazine Insert 53 Magazine

Latch 54 Magazine Latch Retaining Plate 36 Trigger Bar
Pin 55 Magazine Latch Spring 37 Trigger 56 Bolt Stop
Release Lever 38 Trigger Pin 57 Disassembly Catch
Spring 39 Bolt Stop 59 Inertia Bolt Stop 40 Safety
Spring 60 Inertia Bolt Stop Pin 41 Hammer Pin 61
Safety Button 42 Hammer 62 Accessory Rail Screw 43
Hammer Spring 63 Side Accessory Rail Kit 44 Firing
Pin Catch Lever w/2 Screws 45 Lower Receiver/Stock
64 Top Accessory Rail Kit 46 Cheek Rest w/3 Screws 47
Cheek Rest Retention Pin 65 Top Accessory Rail
Washer 48 Recoil Pad 66 Bottom & Side Accessory Kit
49 Stock Spacer Screw w/4 Screws 50 Rear Swivel Pin
67 Stock Spacer 51 Stock Sling Plate Beretta CX4 Storm
Semi-Automatic Carbine (Specifications subject

DISASSEMBLY AND REASSEMBLY OF THE BERETTA CX4 STORM CONTINUED

ORIGINAL PAGE 6

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ejector-port cover (#30) is removed by inserting a small drift punch from the left side of the bolt, and pushing the cover out to the right. The firing-pin plunger (retaining pin), part #27, is drifted out in either direction. The firing pin has a couple of steps at its rear. Press fully forward on the back of the pin (#23) with a punch to release the firing-pin catch spring (#24) and firing-pin catch (#25). You may have to repeat the press-in a few times.

If the catch and catch spring don't fall out on their own, they can be picked out of the bolt. The spring can fly, so watch out. The firing pin and its spring (#32) are removed to the rear. The front flat on the pin is there to accommodate the firing-pin plunger when it's reinstalled. When disassembling the trigger group, the bolt stop (#39), stop-release lever (#56), and trigger spring (#35) are key elements.

A strong little bugger, the straight leg of the trigger spring engages a groove in a flat stud on the bolt stop. Use tweezers or a dental pick to move that leg out of the groove and to the right. Slide the For reasons explained in the text, the author envisioned possible breakage problems and fabricated tooling to prevent such an occurrence. bolt stop a little to the rear. It's held in the assembly housing by two slots located in the front plus the release lever.

Move the lever to the rear, pull it out, and you'll be able to free up the bolt stop. The latter serves a purpose other than stopping the bolt. It wears a dimple about half way back to lock the safety (#61) in place. When you've taken out the stop, you can take out

the safety. Later, or sooner as the case may be, the safety can be reversed for left-hand operation simply by turning it end for end.

The next step is to insert a finger—or a wooden dowel if your finger's too short—into the magazine well to contact the front of the trigger housing. Push up on the housing to get it started and lift it from the rifle. Drift the trigger pin (#38) right to left. The trigger bar (#34), trigger spring, trigger-bar pin (#36), and trigger come out as a unit. The trigger bar fits in a slot in the underside of the hammer. It also engages the firing-pin catch lever (#44).

Here's a little more detail about the trigger bar's multiple function. When the trigger is pulled, the bar moves the catch lever forward to engage the hammer pin, and moves the hammer out of engagement with the sear (#33). In the CX4, the sear is an integral and permanent part of the trigger housing. That's why you don't see it floating around as a separate component on the schematic. The trigger acting on the catch lever also raises the lever's nose so it disengages the firing-pin catch from the firing pin.

The hammer spring (#43) has curled ends on both sides of its coils. The ends find a home in the housing. Carefully evict both ends by squeezing them together, then drift out the hammer pin (#41) so you can remove the spring and hammer. The safety spring (#40) rests in a trigger-housing slot and is lifted out from the left-hand side. Now locate the two parts #54 on the schematic. The one at the back of the housing is the catch-lever guide plate.

Get it started upward with a screwdriver blade until you can pull it all the way out with long-nose pliers. The other #54 is associated with the magazine-catch button (#53). It's adjusted at the factory depending on the pistol magazine to be used with a given carbine, and there's nothing you or I can or should do to readjust it. This brings us to the magazine catch and disassembly of the lower assembly. Pull the catch spring (#55) straight out and push the button out of the lower from either side.

The catch, like the safety, is reversible and doing so is accomplished in alike manner. Earlier, I mentioned the CX4 was designed to employ Beretta pistol magazines. That's very true, but all Beretta pistol magazines are not the same. Along with the magazine catch's factory adjustment, the magazine insert (#52) is also changed to accommodate the differences. The carbine I worked with here carried an insert and catch accepting the 9mm Model 92 or Model 96 magazine.

A 9mm Model 8000 (Cougar) magazine would require another insert and another catch adjustment. If it ever gets damaged, changing the insert is no big deal, though. There's a small working space between the tab on top of the insert and the back of the magazine well. Push forward on the tab to extract the insert from the bottom of the grip. Moving along to the front of the lower, you'll see the inertia bolt stop (#59) and its two springs (#32).

These appear to be the same as the firing-pin spring, hence the same part number.

DISASSEMBLY AND REASSEMBLY OF THE BERETTA CX4 STORM CONTINUED

ORIGINAL PAGE 7

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The spring is strong and stiff. Expect a bit of a struggle when reinstalling it. The inertia bolt-stop assembly is a unique feature of the CX4 that interfaces with a hole in the bottom of the bolt body. The system was designed to avoid a potentially deadly situation—if and when the butt end of the carbine is ever used to beat open a door. During the course of the beating, it was foreseen the bolt could be jarred back far enough to eject around but not far enough to pick up the next one from the magazine.

The result? The officer doing the beating charges into the room with an empty gun—with the distinct possibility that the bad guy is waiting inside with a loaded one. What keeps that from happening is the way part #59 moves to the rear on an inclined plane, enters the hole in the bolt, and keeps the bolt from moving. I'll tell you how to separate #59 and both parts #32 from the lower; just make sure you never let this carbine leave your bench without them in it. Notice part #60, the inertia boltstop pin.

It's a roll pin, and you know by now I never recommend their complete removal. Leaving a small section of the pin in its hole makes reinstallation much easier and is extra insurance against damage to the pin itself. Okay? Okay. Move the bolt stop to the rear, align the pin hole, and drift the pin right or left until you can pull the stop from the front of the lower. After you dump out or pick out the springs, there's not much left of the lower except the stock spacers.

You'll need no advice from me on how to get them off and on. Now we come to the upper front end. The barrel (#1) is held in

by its bushing (#2). Outside of the factory, no tool is available to undo the bushing, and Beretta USA prefers that you make no attempt to remove the barrel anyway. But what the heck; I'm going to approach their position with a worst-case scenario. Suppose that somehow the muzzle end has been mangled. Was it dropped from a height onto solid concrete? Was it squeezed in a vise?

Was it slammed in a car door? Who cares. It's a mess, and through great good fortune you have a replacement. All that remains is to make the bushing tool. I see this as being patterned after a forend-removal wrench used on shotguns. It will span the bushing and have two studs that engage the bushing notches. Undo the bushing, pull out the old barrel, put in the new barrel, replace the bushing, and check the headspace. Need I say more?

Carbines ordered in with an accessory rail (#64) arrive with it already attached to the upper casting by three screws (#62). Carbines not so ordered have only the front hole pre-drilled and tapped. Such carbines in no way ace you out of any profit you may gain from the purchase and installation of atop rail. The upper-housing casting is only 2mm thick where the two rearmost screws are located.

Attach the rail using the single screw hole, position it on the housing, and rely on the two rear screw holes in the rail as your locators. Choose a drill that fits the screw hole. Turn it, by hand, to penetrate the housing and reach for two top accessory rail washers (#65). "Washers" is somewhat misleading.

They're more like T-nuts and trying to hold them in place while turning in the screws could become your worst nightmare. They could, if it weren't for a little tool that comes with every CX4 carbine.

Officially, it is called the "front-sight adjusting tool," but it has a semicircular end that fits over the barrel. This is most fortunate. The foremost of the two rear screws is located immediately above the barrel. The T-nuts, or washers if you prefer, are nevertheless a neat idea for no other reason than they eliminate the need for tapping. The CX4 I received didn't have a Picatinny-style rail (#6). If you get one in that does, the front swivel (#4) and swivel spring (#5) are keyed to the rail.

Loosen the swivel, pull the rail fully forward, press down on the swivel, and turn it 90 degrees counterclockwise. The rail comes all the way out, and goes back in by reversing the process. Still more attachments are present on the schematic. They are bottom-side accessory-rail kit (#66) and aside-access rail kit (#63). The two can work together, but I'm told the side kit can be installed on the gun without the bottom kit. I suppose it depends on how much "stuff" is going to be hung from a carbine.

With all attachment rails in place, I'm betting the weight of a CX4 can be brought up to the neighborhood of a dozen pounds. Maybe more. I'll never know. I didn't receive a bottom kit or aside kit, and I have no intention of attaching any extras. (continued on page 19)

DISASSEMBLY AND REASSEMBLY OF THE BERETTA CX4 STORM CONTINUED

ORIGINAL PAGE 19

Even without having the parts on hand, it seems pretty clear how they fit together, and I have no problem suggesting you call Beretta if you need help. I bet you won't hear: "Return the gun to the factory" from whoever is on the other end of the phone line. Not this time. Reassembly Tips Mentioned earlier was the fragile nature of the bolt buffer. To be more precise, it's the delicate construction of the T-shaped stud holding the buffer to the guide rod that concerned me.

The stud shaft is plastic, of small diameter, and is inserted into the rod—rather than being made of metal and threaded in like the tip on a cleaning rod. Either that arrangement or being manufactured as an integral part of the guide rod would be much stronger, I think. The existing configuration fairly screamed "watch out for a broken-off stud." So I sketched, fabricated, and used a little jig that allowed me to better control the stresses on the stud during reassembly. You might want to do the same.

Initially, I drilled through the center of a 2- x 4-inch hardwood block with a 1/4-inch bit. (Steel or aluminum stock would be stronger, of course.) Then I used a 5/16-inch bit to enlarge the hole, leaving a 1/8-inch-thick, 1/4-inch-diameter ridge, or "recoil-spring stop," within. The guide rod would pass through the 1/4-inch hole. The guide rod and spring, being in combination 5/16 inch in diameter, would not.

A vertical slot was cut straight down through the wooden block to intersect the outermost walls of the 5/16-inch hole, and the hole was touched with a countersink. If metal had been used, a ball end mill would be employed for this purpose. Next, I secured the block in a vise. The buffer end of the guide rod, sans buffer, was fed straight in and I took care not to crimp the recoil spring throughout the process.

When the end of the guide rod protruded from the opposite side, I maintained pressure, slid on the buffer, and turned it to capture the stud. I did not ease off totally on the spring until I'd raised the assembly upward through and clear of the slot. The buffer must not be allowed to impact the guide rod at any time. The two have to be eased back together. Done correctly, the "T" end of the guide-rod stud will retain the buffer on the recoil-spring assembly, and reassembly of the bolt can proceed.

One other less complex tip is in order that involves the firing-pin catch spring. There's a hole in the bolt body immediately above the firing-pin tunnel. A straightened-out length of paper clip or small pin punch should be inserted in the hole as a guide when reinstalling the firing-pin catch and spring. This will both protect and help align the parts. I further advise that a dab of grease be applied to the spring seat in the catch. This will help hold the two parts together as you work with them.

I'VE SELDOM SEEN A LITTLE COIL OF METAL SO INTENT ON ESCAPING. •

HISTORY

Convert Browning's Manual Safety to Automatic on the Superposed

This well-respected shotgun can be updated and made safer for hunting with this relatively simple and straightforward safety conversion.

BY SERGEY LYALKO JULY 2005

ORIGINAL PP. 8-13

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The history of the safety as a device for preventing an accidental discharge starts long before the powder era. Even ancient wall-piercing and ballistic machines had them. Their role was not only the prevention of personal injuries, but also to avoid the waste of labor invested into loading these machines. One other often-overlooked role of safety is the prevention of self-disclosure due to an unprepared and unwanted shot.

The complexity of safeties on mechanical weapons has grown over the years, and reached a quite sophisticated level on crossbows of the late 14th century. The appearance of the powder and primitive firearms did not eliminate the need for an effective safety; on the contrary, the personal danger of an accidental blast grew, as did the danger of giving away one's position by unintentional noise.

Since then, safeties on guns went through an evolution of changes, with many famous gunmakers competing for the best designs. From early on in this process, there was an

effort to devise a reliable automatic safety. The principle behind the automatic safety is that the weapon goes on safe before or at loading, independent of any action on the part of the shooter. Thus, the just-loaded gun is always on safe, and requires the shooter's action to make the gun fire. This way, one can not forget to put the gun on safe.

Well-known automatic designs include Joe Manton's "gravitating safety" which appeared in 1815, Purdy's grip safety, and W. W. Greener's "butt safety bolt" introduced in 1879. At the same time, some prominent gun enthusiasts expressed opposition to the automatic safety. Interestingly enough, Greener was among them, even after developing his own version of the automatic safety. The other prominent opponent of the automatic safety was Elmer Keith. His opinion is so radical that it's worth quoting here.

The following quotation is from his book *Shotguns* by Keith: Automatic safeties, which go on "safe" whenever the gun is

opened, are a fine thing for the beginner or the man or woman who hunts but seldom, as the gun then thinks for the hunter. For the experienced hunter or shooter, automatic safeties are a damned nuisance and should never be tolerated any longer than it takes to get yourself to a gunsmith and have the link removed, making the safety nonautomatic.

The dispute between advocates of automatic and manual safeties does not seem to be that sharp nowadays. However, the popular opinion remains that automatic safeties are a must for hunting and optional at the shooting range. This attitude is understandable, since, during a hunt, an accidental shot can cost the life (of a human); while, at the range, an automatic safety may cost the score.

Be that as it may, as I mentioned in my article on converting the safety on the Daly over/under in the September 2003 issue, I am converting as many Figure 1.

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automatic safeties to manual as I am converting manual to automatic. The Browning Superposed is a well-respected and popular shotgun, and many older shooters will eventually pass this gun along to their children and grandchildren. This helps to explain why some of these shooters are interested in installing an automatic safety on the Browning Superposed, as well as Miroku's Charles Daly and other guns. The conversion of the safety to automatic on the Charles Daly was described in my previous article.

In fact, that article was introductory to this one, since I intended to bring the issue up and discuss it for some other guns before touching on the most popular shotgun in America, the Browning Superposed. Weapons designed by the genius John Moses Browning are very difficult to alter without spoiling them. It's also a great responsibility for any gunsmith to try to upgrade the function of those weapons.

The major mechanical principles of the Superposed were laid down by John Browning, but the gun still was not in production at the time of his death in 1926. The responsibility for finishing the design and starting the production were acquired by his son, Val A. Browning. The single largest problem for Val was the design of a reliable single-trigger mechanism. After a number of attempts, a successful solution was found and patented in 1938. This latest design combines the selector mechanism with the safety-button.

The distinguishing feature of this design is the utilization of the leafspring. Later, the same safety-selector principle with a leafspring was implemented on Miroku's Charles Daly, and I've used essentially this same procedure for installing an automatic-safety conversion on this Miroku gun. I've wondered what John Moses or Val might have said about this safety, and what kind of arguments they might have had for implementing a manual safety rather than an automatic.

I could not, however, find any references to the matter. In any case, in Figure 2, the post-Browning period, there were attempts to provide an automatic safety on the Superposed. Some involved complicated mechanical additions to the action, requiring significant wood removal and sophisticated milling of the frame. None, I believe, were as simple as the procedure I've developed.

When I first started thinking about this conversion, my focus was on avoiding any changes to the original parts, including the wood of the stock around the action. My intentions were good, but there is no spare space inside the action at all, and the conversion of the safety into automatic assumes that some additional parts will be introduced into action for transferring motion from the bottom bolt to the safety button.

The bottom bolt is the only part that moves backward with turning the top lever for opening the gun. The safety button also has

to move backward. This is why the bolt is the best candidate for feeding this motion. The other solution would be to mill the frame for reaching the column of the top lever and feed the motion from it, but this change to the original frame would be too dramatic and not in keeping with my original intentions.

Below is a step-by-step description of my conversion of the manual safety into automatic on the 20-gauge Browning Superposed. This action is the smallest, of course, and the most difficult to deal with. The Main Principal This conversion uses the tiny spaces between the hammers and sears for transferring motion of the bolt to the safety leaf spring by means of flat steel bars. Figure 1 shows this principal schematically. The safety spring is much more accessible than the button itself.

In addition, the button has both linear and cross motions, while the spring moves only along the action. As you can see in the photos, another advantage of employing the spring is that Bar 2 can be held in place by this spring without any additional joints, which is critical for saving space. Another critical feature of this safety conversion is the slot in the top strip of the frame. It allows for a rigid positioning of Bar 1, the bottom of which is attached to the bolt, while the top slides in the slot.

It also provides the bed for Bar 2, and allows for a hingeless front joint between Bars 1 and 2. Finally, the rear end of Bar 2 is held in the slot by the leaf spring.

CONVERT BROWNING'S MANUAL SAFETY TO AUTOMATIC ON THE SUPERPOSED CONTINUED

ORIGINAL PAGE 10



Figure 3. Figure 4. The result of this design is that the overall thickness of the whole device is equal to the thickness of the steel bars themselves, which is a mere 0.031 inch. Preparation of the Bolt There is a certain variation in shape of the bolt-tail on different Browning Superposed guns. However, there is not enough material on any of them to install Bar 1. Figure 2-A shows the bolt a with portion of metal removed for placing the small block. Figure 2-B shows the block brazed into this space.

Please note that this treatment of the bolt does not diminish the reliability of this part, since only a front part of it is actually locking the barrels and accepts the punch during the shot. Figure 5. Figure 6. The block should be

reshaped, slotted for Bar 1, and drilled for roll pins as shown in Figure 2-C and 2-D. The small holes (f) are for the roll pins holding Bar 1. In Figure 2-C, you can see arched recesses on the sides of the block.

These are needed for clearance space for the mainsprings when the hammers are cocked (see Figure 9). The best way to drill holes f is before removing metal for the arcs. During drilling, Bar 1 should be inserted into the slot and fixed in the correct position. The most practical method is to drill one hole through the block with the bar inserted, install the roll pin, and then drill another hole. The Bars The bars (Figure 3) are made with Starrett's 1/32-inch oil-hardening steel.

After shaping, they're hardened and tempered to a spring-like hardness. Bar 1 has two teeth. Tooth A serves two purposes. First, it pushes Bar 2 backward and puts the safety on; and second, this tooth is plunged into the slot for stabilizing the bar's movement. Tooth B pulls Bar 2 to its initial position with the bolt going forward. This also clears the way for the safety button to be moved forward.

Note that Bar 2 does not have any attachment to the frame—other than sitting in the slot between Bar 1 and the safety spring. There is a certain freedom in shaping Bar 1, but my choice is to “swanneck” the bar in order to avoid contact with the sears. Figure 4 shows Bar 1 and the sears installed in the action without the hammers and springs.

CONVERT BROWNING'S MANUAL SAFETY TO AUTOMATIC ON THE SUPERPOSED CONTINUED

ORIGINAL PAGE 11



Figure 7. The Frame Slot The slot in the top strip is the only modification of the original frame. Figure 5 shows how the slot can be cut. The best results can be obtained by cutting the slot with a milling machine. For this purpose, the frame should be secured horizontally in the vise, the stone or T-cutter installed in the chuck, and adjusted in height so that it is right between sears. Once the frame is secured in this manner, a slow feed will do the job.

Figure 6 shows the slot with hammers and safety spring installed. Final Assembly After preparation of the block, brazing to the bolt, cutting the slot, and shaping the bars, everything is ready for installing this conversion. First, Bar 2 should be put into the slot, then Bar 1 installed so that it engages Bar 2 with

its teeth, and sits in both the top and bottom slots. At this time, two roll pins should be installed for rigidly attaching Bar 1 to the bolt.

Next, the safety button and safety spring are put into place. This step is shown in Figure 7. It's important to prepare all parts so that there is no linear looseness in Figure 8. the joints. Otherwise, the movement of the bolt would not be sufficient for moving the safety button back far enough. Figure 8 shows the rear part of Bar 2 with the sears and spring installed. Note the tight contact between Bar 2 and the spring. Finally, Figure 9 shows the whole assembly with the hammers cocked.

Conclusions Nowadays, automatic safeties are considered to be the standard for hunting firearms. This has encouraged many hunters to look for a conversion of a manual safety to automatic on such guns as the Browning

Superposed, Miroku's Charles Daly, and others that were originally designed with a manual safety only. This conversion is quite simple in principle, and requires making only three small parts.

It also requires minimal changes to the original parts, thus making it possible to remove the new parts at a later date and return the gun to its original condition. Figure 9. As outlined here, this manual-to-automatic safety conversion has proven to operate reliably on several guns. Care must be exercised during the final adjustment of the parts to a particular action, especially to eliminate any looseness in the three joints.

If the safety button does not travel all the way back, the fault will usually be found in sloppiness in one or more of the joints. ■

MAINTENANCE & REPAIR

The Unique Ballester-Molina .45: Parts Replacement and Interchangeability

At first glance it might appear to be just another M1911 clone, but there are some differences you should be aware of before agreeing to repair or rework this Argentine military pistol.

BY ROBERT K. CAMPBELL JULY 2005

ORIGINAL PP. 14-15

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After 30 years of using, dissecting, repairing, and improving the 1911, I thought I'd seen it all. Of course, whenever I come to a conclusion like that I'm always wrong. That point was brought home to me recently when I had my first experience with the Ballester-Molina .45 semi-auto. While some of this information may be old hat to experienced gunsmiths, I'm guessing that some of the younger readers in particular may not be familiar with this pistol.

The Ballester qualifies as a "1911," as I define it, but it's not one of the more common variations on John Browning's design. It differs from the 1911 tribe more than most, being quite similar to various Star pistols. Let's look at a bit of history before going more deeply into the Ballester. Most of us are familiar with the Argentine Modelo 1927, a license-built Colt clone originally adopted for issue to Argentine troops.

The Colt was adopted by Argentine forces in 1914, with the Modelo 1916 being the first type that was widely issued. Over 10,000 of these pistols were delivered by 1919. The Modelo 1927 is simply an Argentine M1911-A1. With the adoption of the Modelo 1927, Argentina produced almost 75,000 of these clones under its license from Colt. The 1911 was well respected by the Argentine forces, but some members of the military hierarchy had their own ideas about what makes a good combat pistol.

They elected to simplify the design; whether this was a genuine improvement, a means of producing the pistol quickly for less money, or to sidestep the license agreement is not clear. It's likely that a combination of all three ideas factored into the decision to modify the original design. The resulting pistol is seen as an improvement by some, while others believe the Ballester lacks the Colt's refinements. The Ballester was produced by HAFDASA or Hispano Argentina Fabrica de Automoviles, SA.

This firm There are numerous differences in mechanical particulars. was founded by Messieurs Ballester and Molina to build cars and other vehicles, including diesel buses. A French engineer named Rorice Rigaud was employed by the firm at the time and was instrumental in designing the pistol. The first design team, consisting primarily of Rigaud and Carlos Ballester Molina (a member of both the Ballester and Molina families) began working on a 1911 variant in 1936.

Among the other weapons manufactured in Argentina by this firm was a version of the Beretta 1918 submachine gun. The simplification of the 1911 pistol was accomplished while maintaining the general feel and appearance of

THE UNIQUE BALLESTER-MOLINA .45: PARTS REPLACEMENT AND INTERCHANGEABILITY CONTINUED

ORIGINAL PAGE 15

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This linkage seems to be quite robust in action, with many examples surviving hard use. The 1911 Colt, but the differences are considerable. These differences are most apparent in the frame. However, it should be cautioned that the only interchangeable parts between the Ballester and the Colt are the barrels and the magazines. So let's take a look at the main particulars of the Ballester-Molina. First, and most obvious, the Ballester does away with the 1911's grip safety.

The wisdom of this decision is debatable; many shooters, myself included, feel that the grip safety is an important advantage of the 1911. Still, this change definitely makes for simpler assembly with less hand fitting. The B-M pistol also uses a pivoting trigger similar to that installed on a number of modern race guns.

The trigger-to-hammer arrangement is similar to that found on the Browning Hi-Power, but the Ballester is more efficient in this area because it does not have to run around a tangent as a result of a thick double-column magazine. The pivoting trigger is generally as smooth as the 1911's sliding type, and some believe it is superior in issue form. There is no trigger stirrup in this type of action.

It's often noted that slide serrations of the Ballester differ considerably from the 1911, but this difference is of little practical con-

cern to the gunsmith. As a result of the new trigger arrangement, the hammer strut of the Ballester is shorter than the 1911. And there are other differences. The firing-pin stop is not recessed into the slide, the mainspring housing is integral to the frame; in other words, it is of the arched type and cannot be changed.

Also, you should note that Ballester slides will fit on the Colt frame, but loosely. Colt slides will not fit the wider Ballester frame. When working a B-M, be sure to check for a too-long firing pin. Even though these older pistols have inertial firing pins that are shorter than the firing-pin channel, it's not uncommon for Spanish and South American pistols to have a firing pin that's too long. It is a simple matter to check for this dangerous condition.

With the slide locked to the rear or off of the gun, place a pencil or blunt object hard against the back of the slide and observe if the firing pin will protrude. It should not. If it does protrude past the firing-pin channel, then the pin will need to be shortened or replaced. The magazine-release button appears to be standard Colt, but it differs in certain particulars. The safety is considerably different from the Colt's.

The pin that holds the slide-lock safety is larger, and the safety can be applied with the hammer down or the hammer up, a result of changes in the lock work. The safety

bears upon the hammer, locking it directly. The extractor is not standard 1911, although with some fitting it may be possible to make the standard 1911 extractor work. The disconnecter is a simple piece of flat steel that is dovetailed into the right side of the receiver.

It works like this: When the slide is out of battery, the disconnecter is forced down, and when it is forced down it moves the actuating bar out of engagement with the sear. When the slide returns to battery, the disconnecter then moves upward into its recess in the slide. With the disconnecter out of the way, the actuating bar is then free to act upon the sear and fire the gun if the trigger is pressed.

Since my first experience with the Ballester-Molina, I've been fortunate to have the opportunity to work on several more of these pistols in order to broaden my knowledge. The first warning I would offer to gunsmiths who attempt to work on these pistols is that there are few parts available, and many of the parts you can find are not new. As for improvements, the standard 1911 sights we like to add to the Colt and its near clones will fit the Ballester, though some machining (continued on page 19)

THE UNIQUE BALLESTER-MOLINA .45: PARTS REPLACEMENT AND INTERCHANGEABILITY CONTINUED

ORIGINAL PAGE 19

will probably be required. The same goes for match-grade barrel bushings; be ready to do some fitting. Colt or Bar Sto barrels will fit the Ballester, if so desired. I've read that most of these pistols will feed hollowpoint ammunition as issued, and it seems they are more likely than military pistols of U. S. manufacture to do so. Nevertheless, they are not completely reliable with every type of ammunition.

Certain types of hollowpoint ammunition will often take a nose dive when feeding into the Ballester's chamber. So, if the pistol will be used with exotic bullet styles, it will need a careful chamber polish. When working with the trigger action, it should be noted that the parts are tough but are still breakable. A friend of mine used his already well-worn B-M pistol until the sear broke. When he could not find a replacement, he eventually made one himself, a tiresome effort.

When working with the trigger action of the Ballester, the movement of the trigger, draw bar, and slide-mounted disconnect should be studied. Remember, the trigger pivots rather than slides straight to the rear. In this regard, it differs even from the Star pistol that the Ballester-Molina is supposedly modeled after. The mating surfaces of the hammer and sear can be polished, but the Argentine metal is harder than Colt's of a similar vintage, and can be difficult to polish correctly.

When working with the Modelo 1927 pistol, I've found it more profitable to simply replace parts to achieve a smoother operation than to attempt to work with the original Argentine steel. This is not an option with the much different Ballester. In this case, the gunsmith will probably have to work carefully with the stock parts to achieve a crisp let off. In my experience, shooters who use this gun extensively find it to be reasonably accurate and generally reliable.

If the gun is in good shape, there is no reason it cannot serve as a recreational shooter or even a home-defense handgun. After all, it is—or was at one time—a high-quality military .45 auto. But having been in military service, many of these handguns are worn from years of use. Many, according to my sources, were in use from 1939 to 1982. That's quite a spread of years, especially considering the pistols were probably fired in yearly qualification.

Overall, the Ballester-Molina is quite a handgun—well made of good material—but it does not offer the interchangeability of parts with the M1911-A1. If you take on the task of repairing or reworking one of these, don't count on dipping into the 1911 bin for spare parts. You will have to scrounge a bit or else be very creative. But that, of course, is why we get the big bucks, right? ■

PEOPLE & COMPANIES

Accurizing and Improving the Marlin 900-Series Rimfire Rifles

The recent series of rimfire rifles from Marlin Sporting Arms have several improvements. With a little bit of tweaking, these rifles can become even more accurate and more pleasurable to shoot.

BY DENNIS A. WOOD JULY 2005

ORIGINAL PP. 16-19

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The Marlin Firearms Company has been around for quite a number of years and has put out some outstanding firearms, especially considering the company's reasonable pricing structure. The project we will be dealing with here involves the latest Marlin, the Model 917V in the recently introduced .17 HMR and .17 Mach II calibers. The plan is to bed this rifle so that the mating of the barreled action to the walnut-stained birch stock remains stable and peak accuracy is achieved.

Then we'll see what can be done with the fire-control system. Taking the Measurements/Bedding the Action The large screw just in front of the magazine cutout in the stock draws the rear end of the barrel down into the stock. As you can see from the accompanying photo, the wood has already been compressed somewhat from the assembly process at the factory. The plan now is to prevent any further compression of the wood fibers in this area that would create havoc with the bedding.

We need to remove the stock from the barreled action to take a few measurements. By now you should be very aware of the need to ensure that the magazine and bolt

have been removed, and that you're working with an empty chamber. Before removing the stock, be sure to go through that routine. Looking down into the stock of this rifle you'll observe that the front takedown screw has a receptacle for the threaded extension dovetailed into the bottom rear of the barrel.

With the depth-recording stem on your caliper, measure the depth of the large hole from the radiused face of the barrel channel down to the shoulder of where the smaller hole begins. Record this dimension. On this stock, the depth measured .844 inch. Next, measure the length of the threaded receptacle that's dovetailed into the barrel. Measure from the bottom rim of the receptacle to the top of the barrel radius. In this case, that measurement was .498 inch.

Subtract this dimension from the depth you found the stock hole to be (.844) and we have one of the lengths we need to make the front pillar. In this case that length is .346 inch. Measure the diameter of the larger end of the hole in the stock. Figure 1. Front Pillar for Marlin 900-Series Rimfire Rifles

ACCURIZING AND IMPROVING THE MARLIN 900-SERIES RIMFIRE RIFLES CONTINUED

ORIGINAL PAGE 17

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For this stock, that hole diameter was .500 inch, but it was somewhat eccentric, so I turned one end of the pillar's outside diameter to .495 inch to achieve a slip fit. The smaller end of this hole measured around 7/16 (.437) inch, so the end of the accommodating pillar was turned to .420 inch, again to achieve a slip fit. The reason I maintained the stepped hole in the stock was to give a base for the pillar to sit on while the bedding compound hardened (see Figure 1).

The front pillar was a straight sleeve, 1/2 inch in diameter, with a .375-inch through-hole. The lengths of both of these pillars will vary somewhat and will need to be trimmed to fit at the bottom of the stock as close to flush as possible. Once you are satisfied with the fit of both pillars it's time to permanently set them in place. Coat the outside of each

pillar with whatever bedding compound you prefer and let the bond set up, at least overnight.

The next step in the process is to bed the action to the stock in the two areas of the pillars. Remove some of the wood around the pillars to a depth of around 1/8 inch, but stay at least 1/8 inch from the upper edge of the stock in the area where the action rests. The idea here is to give the action a firm place to sit and maintain its position in the stock once the action screws have been turned tightly into place.

T-900 Fire Control System The engineers at Marlin have developed anew trigger and safety system that's being used on all of their bolt-action rimfire rifles. This trigger system is a well-thought-out design (except, perhaps, for the plastic trigger). On the 917s I've

worked on, the plastic trigger had quite a bit of side-to-side wobble. My electronic trigger-pull gauge measured the pull at 5 pounds 9 ounces using the average of five readings.

Rifle Basix, Inc. of Charlotte, North Carolina, markets a CNC-machined steel trigger that has a range of adjustment from 14 ounces to 2 pounds, yet the sear maintains a good, safe purchase. We've all read about how aftermarket parts "drop in" with little or no gunsmithing required. Well, this trigger does just that; it actually does drop in and replacement is extremely easy. Again, after making sure you are working with an empty chamber, remove the bolt and magazine before any take-down is started.

PUSH THE SAFETY FORWARD. TIGHTEN THE BARREL UP

ACCURIZING AND IMPROVING THE MARLIN 900-SERIES RIMFIRE RIFLES CONTINUED

ORIGINAL PAGE 18

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in your padded-jaw vise and situate the action so that the trigger is facing you so you can work on it. You'll notice a tiny E-clip at the bottom of the trigger housing on the left side just above the trigger. Using a small flat-blade screwdriver, push this clip rearward until it pops off the trigger pin. The trigger pin should now push through to the right side of the trigger housing. The factory plastic trigger can now be removed.

The instructions included with the Rifle Basix steel trigger recommends that the threads on the sear-adjustment screw be upset or crimped lightly—very lightly. I don't know how to measure "lightly" to any degree that would get the intended results, so I went at this step very cautiously.

Using a pair of needle-nose pliers with a set of wire-cutting jaws, I did a very light pinch between opposing threads around 1/4 inch

from the opposite end of the hex socket, and then tried the modified sear-adjustment screw in the front receptacle of the trigger housing to see if there was some resistance to turning. If you look closely, the photo below will show you what the crimp should look like. The idea behind the crimping process is to secure the sear-adjustment screw temporarily in place.

Once you have achieved safe sear engagement, place a dab of thread locker in the threads where they protrude out the bottom of the trigger. What worked best for me was to install the trigger with the sear-adjustment screw in place in the trigger housing, and then replace the retaining pin and E-clip. This may require that you wiggle the safety back and forth a bit until you can get the trigger-pin hole aligned and the trigger installed.

Then slide the weight-of-pull spring through the hole in the rear of the trigger, followed by the weight-of-pull adjustment screw. Insert the bolt into the action and try cocking the bolt. If sear adjustment is too light, the striker will follow forward as the bolt is lowered. Adjust the sear-engagement screw either in or out until the bolt closes safely and sear engagement is solid. Conclusions The final step is adjusting the trigger pull to the weight you desire with one of the hex wrenches Rifle Basix provides.

I was able to achieve a safe pull weight of 1-1/2 pounds with this trigger with a solid sear engagement. The combination of pillar bedding and the Rifle Basix trigger improves accuracy and makes the little Marlin a real joy to shoot. ■

FROM THE ARCHIVE

Making a Custom Hammer Spur

Sometimes the smallest part added to a gun can enhance shooting ease, safety, and enjoyment. If you can't find that special part, making your own becomes the only practical option.

BY NORMAN E. JOHNSON JULY 2005

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After adding a low-mounted scope to this single-shot gun, there remained one problem. The scope tube cleared the hammer by scarcely 1/4 inch. Further compounding the problem, the underside of the arched hammer, when cocked, cleared the receiver by only 3/16 inch. Looking through recent catalog listings of available hammer spurs showed none that would fit my needs. This led me directly to the shop to make a custom part, and resulted in a perfect part.

The few pennies the new hammer spur cost is hardly worth mentioning. A cutoff tool is used to shape the aluminum spur. The hole is drilled at this stage, but left untapped. Cocking the hammer on this old, single-shot required considerable pull, and the hammer's inertial force with the added weight of a steel spur would have produced excessive impact on the primer. For this reason, I chose cast aluminum as the ideal material for the part.

I chucked a piece of 1/2-inch aluminum stock in the lathe, and completed all but the hammer slot without removing the part. To make

a hammer spur like the one shown here, start with the aluminum stock in the lathe, and turn the piece to the desired diameter. Then drill a #29 hole in the part, hold it with a live center in the tail stock, and knurl a 3/4-inch section. After knurling, tap the hole into the part for the set screw that is used to attach the spur to the hammer.

I used an 8-32 socket-head screw for this purpose. The threads could also be tapped later, after the hammer slot

MAKING A CUSTOM HAMMER SPUR CONTINUED

ORIGINAL PAGE 21

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This type of hammer spur encircles the entire end of the hammer, providing a positive attachment. is cut into the piece and the final shaping is completed. With the hole drilled and tapped, remove the piece from the lathe. I then milled flat spots opposite the knurled end of the spur, in preparation for making a square throughhole in the part. This square hole should match the outside dimensions of the hammer. This is easier to perform before cutting the part from the stock shaft.

A small end mill can be used to hog out most of the material in the hole, followed by a cleanup and squaring with a small, square file. Take the time to make the hole corners nice and square where they fit the hammer.

The finished part is then returned to the lathe and cut off to the proper length. A lathe cutoff tool serves this purpose.

A shallow detent in the side of the hammer for the set screw (along with some thread locker) will help to prevent loosening • of the hammer spur during firing. This simple project produced apart that I was unable to purchase. The attachment end of the spur encircles the hammer, adding strength to the part. Cocking and releasing the hammer then becomes an easier and safer operation.

PEOPLE & COMPANIES

Reader Forum

BY AMERICAN GUNSMITH EDITORS JULY 2005

ORIGINAL PP. 22-24

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Intermittent Remington I got in a Remington Model 700 .30-06 last week that would not fire, according to the customer. He said it happens all the time. The firing pin drops, but not hard enough to fire, though it leaves an indent in the primer. Part of the problem I found (I think) was that the barrel, stock, and magazine floorplate did not mate properly. The customer did not own up to anything like dropping it or stepping on it or warping the stock somehow.

The screws were very tight, appearing to cause binding of the bolt. This sounds weird, I know. I did some working to make them mate better, and then went to the range. When I fired it, it fired 13 times out of 16—an intermittent problem. The three that did not fire left an indent in the primer without going “bang.” I took the bolt apart and everything looked fine there. I didn’t want to touch the trigger mechanism because I know Remington seals it. Any ideas on this problem?

I can only think that the trigger mechanism is somehow screwing up intermittently. Thanks for any ideas you can give me. Joe The four possibilities you can readily do something about are short firing pin, a binding firing pin, a damaged firing-pin assembly, or faulty ammo.

If the problem is caused by something in the firing mechanism (trigger assembly) the work will have to be done at the factory or by a factory-authorized service center. That is, unless your customer wants to spring for an aftermarket trigger.

Several appropriate ones are offered by Brownells. Jimmy Cracked Cone I have one that is beyond me at the moment and hope you can help. First, remember this is a \$150 gun, but one I like. The revolver is an Astra .357, 4-inch barrel, the type with the wheel in the grip frame for changing spring tension and setting trigger pull. It’s not my first choice for personal defense, but an interesting recreational gun. I fired six 125-grain Federal .357; buck and roar as normal.

Then I fired six 110-grain JHPs, which are noticeably lighter in recoil, and had difficulty opening the cylinder. I discovered that the forcing cone is cracked! Actually, a piece is missing; about a half crescent is gone from the left side. The frame and cylinder are okay. Obviously, I need a barrel, but cannot find one anywhere. What can I do? A local retired ‘smith advised me to remove the barrel, shorten it, and rethread the forcing cone. But I don’t quite get it.

READER FORUM CONTINUED

ORIGINAL PAGE 22

I would also have to cut the ejector-rod shroud, and that seems like a lot of machine work that I'm not set up to do. I checked with quite a few places, but most say: "Yeah, we had Astra barrels a few years ago, and sold them all for twenty bucks." Any advice is helpful. At this point, I suppose I could sell the gun for parts, but it is a really neat revolver. If it was a customer's gun, I'd probably tell him to throw it in the lake and be thankful if it doesn't hurt him when he lets go! R. K.

If you can't turn up what you need at a gun show or by scouring Brownells Parts Source List for out-of-production firearms, you might have to contact some barrel makers. Before you do that (or throw it in a lake), check out Brownells' kit for facing and chamfering forcing cones. It might be possible to weld up the crack in your forcing cone and reform it with the kit. Get a Grip I hope you can help me find a set of grips to fit a CDM .22 LR derringer. The grips that came on the pistol are ivory colored.

I also need a hammer spring. Under the handle is labeled "Firearms International Corp" Washington, DC. Thank you. Charles Firearms International was an importer and assembler of guns. It became briefly associ-

ated with Israel Arms, Ltd. Presently, a company bearing the name has headquarters in Houston, Texas. They don't make derringers, preferring to concentrate on exact duplicates of Hi-Standard .22 autos as they were once made in Hamden, Connecticut.

Perhaps Cobra Enterprises a current manufacturer of derringers, could guide you to a spring and/or the grips. Hammer-Spring How-To I have one quick question. What's the trick to depressing the hammer spring (and keeping it depressed) on a Stevens 311 when installing anew hammer? I'm ready to make a pencil holder out of it. I enjoy the hell out of your magazine. Thanks. Danny First, fabricate a "spanner" from aluminum bar stock. Its form is basically a two-prong fork, 12 inches long.

Each prong should be configured to capture a main-spring plunger and used to compress them simultaneously while the hammer(s) are being installed. The receiver should be secured between padded vise jaws that will serve, more or less, as a third hand. If the spanner sounds too difficult, a single rod of aluminum with its end configured to capture a plunger will also serve. Use of the rod requires installation of one hammer at a time. Old Remington/New Wood?

FROM THE ORIGINAL PAGE

I am trying to locate a complete buttstock and forearm set for an old Remington Model 14-Ain .30 Remington for a customer. I've checked Gun Parts Inc. with no luck. Any idea who might have a set or any stock company that would have an unfinished blank set I could fit to the 14-A? Thank you kindly for your assistance. Steve Patterson Okanogan, Washington

THIS DIGITAL ARCHIVE PRESERVES THE RECOVERABLE SOURCE TEXT.

READER FORUM CONTINUED

ORIGINAL PAGE 23

The American Single Shot Rifle Association might be able to direct you to one of their members who has an original set. Boyds Gunstock Industries or Wenig Custom Gunstocks may have blanks that would be suitable, and either company could produce a semi-finished or unfinished set. In the latter case, it would be more economical if you had pattern to guide them so they wouldn't have to start from scratch. Astra Cylinder Stop Can you give me any help in locating a cylinder stop for the Astra .357.

This gun is a Smith & Wesson copy, but I'm not sure which one—possibly a Model 10 or 13. I'm not sure if any parts are interchangeable. The original part is missing, so I have nothing to compare it to. Thanks. James M. Your Astra is probably a heavier frame than the Model 10 due to the caliber. Jack First lists the cylinder stop for the Astra .357 in the company's newest catalog.

AR-15 Feedback Some comments on the question titled "AR-15 Bolt Carrier" in the November 04 issue: I checked the pictures referred to by Joe Grisafi in his question about Colt bolt carriers. If you examine the two bolt carriers illustrated on the Brownells web site, you'll note that the carrier Joe refers to as "full moon" is in fact the bolt carrier for the blowback 9x19mm Colt Carbine and Submachinegun, not a .223 rifle or carbine. The bolt-carrier key is reduced to a simple guide lug.

There is no separate bolt, as the 9mm carrier is also the bolt; the extractor is pinned right into the bolt/carrier.

Now that we've cleared that up, Joe has, in fact, discovered that over the years Colt modified the AR-15 semi-auto bolt carrier from modestly extending the sear trip area in the original first-production SP1s, to

longer and longer sear-trip extensions, to the full cutout Joe calls the "half moon." The details of this evolution over the years can be found in *Black Rifle II* by Chris Bartocci, published by Collector Grade Publications.

Essentially, Colt progressively lengthened the sear-trip area until they removed it entirely at the behest of the BATFE. The "half-moon" carrier Joe finds in the 20-inch upper he reports in his letter is the current Colt bolt carrier, which is why it is shown in Brownells' schematic. The reasons for the changes to the bolt carrier have nothing to do with basic function. They were responses to the BATFE's increasing scrutiny of the AR-15's potential for conversion to select fire using [after-market] parts.

In principle, an AR-15 rifle or carbine should function properly with any of the semi-auto carriers Colt produced. The bolt carrier shown in the schematic is used by Colt for both 20-inch rifles and 16-inch carbines. Joe does not state whether he swapped the bolt carrier only or the complete bolt-carrier group (which never should be done, except perhaps for the briefest possible test) between the uppers in order to check function. I suspect he swapped the complete assemblies.

In either case, it's unlikely that the gas tube or any part of the gas system in front of the bolt-carrier gas key is at fault. Something is grossly out of whack if the bolt carrier comes back only half way. The bolt gas rings could be the culprit, but not only because of gap alignment.

When disassembling the bolt carrier assembly, if the bolt falls out of the bolt carrier rather than requiring at least a little force to pull it out, the rings may be worn out, allowing the gas to escape before the gas can do its work. Make sure that the

carrier key is dragging on the gas tube as the carrier reciprocates. One cause often overlooked is the carrier key itself. It's not unusual for the carrier-key screws to loosen, allowing enough gas loss to prevent function. I've run across a carrier-key screw that was broken, so even though the head was properly staked, the head wasn't connected to the shaft of the screw! The rifle wouldn't function, just as Joe described. In my opinion, the configuration of the bolt carrier is immaterial to this case.

If the upper works with the alternative bolt-carrier group, the problem can be isolated to the bolt-carrier group. If the upper works with its original bolt in the alternative bolt carrier, we've isolated the problem to the bolt carrier. Check the carrier gas key very carefully, and make sure that the carrier isn't binding in the upper. An AR-15 in 16- or 20-inch works fine with in-spec new parts. Remember, this is the 40th anniversary of the original Colt semi-auto AR-15 SP1.

If an AR-15 malfunctions, the cause is never arcane. Simply isolate the problem and repair or replace the faulty component. Working on these rifles is more like old-fashioned auto repair than gunsmithing, but without the hand-fitting. Just use good parts from a reputable supplier! Walt Kuleck Fulton Armory Thanks, Walt. We're looking forward to seeing your troubleshooting article on the AR-15. We know you're busy, so we and our readers will try to be patient. Stuck Live Round? Yikes!

Here's a good one for you: I have a client that brought in a Remington 700 Sendero in 7mm Magnum with alive round jammed into the chamber. He was given some reloads by his cousin (ain't family wonderful?) and he really tried his best to cham

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(continued from previous page) ber the first round, with no success. The bolt is almost but not quite far enough forward to rotate it down into the locked position, and he tried to unstick the bolt and extract the round by using a hammer on the bolt handle. His hammering was vigorous enough to have left dents on the knob, but failed to budge it. My feeling is that the cousin probably only neck-sized some fired brass from his own rifle, and my client has the "wedgie from hell" as a result.

I immersed the receiver in a jug of WD-40, and plan to keep it there for at least two weeks to dud the primer out, and I think I'm going to pass on the hammer-on-the-handle option when I start to do the extraction.

My thought is to use an arbor press to put pressure to bear on the bolt handle. (I'm hoping that this will apply enough force but gently enough not to damage the bolt or rip out the extractor.) This seems like a better idea than putting a rod down the bore and trying to tap the round out of the chamber that has the mass of a bolt clamped behind it; I just don't trust the situation enough to want to get my body parts in line with a potential discharge.

Does this sound like I'm on the right track, and do you have any helpful hints? Since this is going to put a dent in the elk hunt (this fellow lucked out on the draw for next week), I doubt he'll try shooting someone else's reloads again. But, of course, the world is full of folks with friends who own

reloaders. Anyhow, I appreciate any input and wisdom you can pass on. Bill Rather than giving you a short answer here, we'd prefer that you read an article we ran on removing stuck live rounds in the March 98 issue.

If AGA Customer Service can't provide you with a reprint of the article, let us know and we'll mail you a copy. And, given the friends-with-reloading-equipment problem, we'll consider revisiting the subject of live-round removal in a future issue. Mismarked Savage? I recently had a Savage Model 219B, marked .22 Hornet, in my shop with what the customer described as a broken firing pin. Upon inspection, I discovered that the firing pin was missing and the firing-pin stop was bent back into the action.

This should have sent up a red flag right away, but I was eager to see if I could duplicate the problem. I ordered a rifle firing pin and firing pin screw from GPC. After installing the new parts, I test fired the gun. The firing pin broke and was sent back into the action with enough force to break the firing-pin screw and cock the hammer. The primer was penetrated.

I won't go into too much detail here regarding all the experimenting I did attempting to come up with the right firing-pin length and hardness, but I made enough metal shavings for my wife to knit a heating stove had she had been of mind to. Having failed to come up with anything that would fire the gun without the results mentioned

above, I decided to slug the chamber. My slug didn't even look like a .22 Hornet, and it didn't match the specs for a .222.

I hate to bring this up, but could the gun have been marked wrong? I dimly recall a bulletin appearing in an NRA publication regarding Savage having marked some chambers wrong. Could the gun have been chambered for the Savage .223? The customer took the gun to another gunsmith and was told that the gun was worn out. No, I didn't charge the customer for all my work. I had fun doing it. Thanks for any input you may have. Johnnie E. Boggs Gassaway, West Virginia Anything is possible.

The probability of mismarking is a question that would be best answered by Savage or the Savage historian. Call Savage and ask for help or for the phone number of the historian. Measuring Headspace Is there a simple example of Remington 700 headspacing? I am confused with how some gunsmiths get their dimensions. Thanks for the help. Love the magazine. Jim Some gunsmiths use shims they fabricate after measurement experimentation.

The "no-wasted-effort" practitioners among us use "go" and "no-go" gauges of the proper caliber. The answer on proper headspace comes quickly and easily. If the bolt closes on a go gauge, you have no problem. If it closes on a no-go gauge, a headspace problem exists. These gauges are available from Brownells, and should be part of your tooling inventory.

SEARCHABLE ISSUE RECORD

Archive index

SCTP Kicks Off New Season American Gunsmith Editors	2	Accurizing and Improving the Marlin 900-Series Rimfire Rifles Dennis A. Wood	16-19
Disassembly and Reassembly Of the Beretta CX4 Storm Chick Blood	3-7	Making a Custom Hammer Spur Norman E. Johnson	20-21
Convert Browning's Manual Safety to Automatic on the Superposed Sergey Lyalko	8-13	Reader Forum American Gunsmith Editors	22-24
The Unique Ballester-Molina .45: Parts Replacement and Interchangeability Robert K. Campbell	14-15		

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