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INSIDE THE ARCHIVE

WORKING THE BROWNING LEVER- ACTION BL-17

"FIRST SHOTS": A CHANCE TO GIVE HANDGUN SHOOTING A TRY • THE LONG AND SHORT OF SHOTGUN CHAMBERS • MA...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 027

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PISTOLS

“First Shots”: A Chance to Give Handgun Shooting a Try

BY AMERICAN GUNSMITH EDITORS FEBRUARY 2006

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There are 40 million Americans who actively enjoy target shooting and hunting. But for newcomers the biggest challenge is knowing how to get started. A new program from the National Shooting Sports Foundation (NSSF), “First Shots,” provides a free opportunity for newcomers to learn about the safe, recreational use of handguns. It’s also a chance to give shooting a try.

Partnering with shooting ranges, First Shots offers the public a chance to learn the rules and requirements of handgun ownership along with comprehensive information on safety, shooting sports opportunities, individual and group training, and range access.

It also answers new shooters’ questions regarding firearms and firearm ownership. “For many individuals, especially in states with more restrictive handgun laws, there is an aura of mystery surrounding handgun ownership,” said Cyndi Dalena, NSSF director of shooting-sports development. “First Shots gives range owners

and retailers an opportunity to educate the public on local requirements and offers newcomers a chance to try handgun shooting.” The program enjoyed a successful inaugural event at the Smith & Wesson Shooting Sports Center in Springfield, Massachusetts, last October.

More than 40 newcomers attended the event and virtually all of them expressed a strong interest in pursuing shooting in the future. “Our First Shots event was a great success,” said Peter Boruchowski, manager of Smith & Wesson Shooting Sports Center. “After the event, more than 75 percent of attendees either signed up for a range membership or additional training classes.

This program is a great opportunity to introduce a whole new group of people to the shooting sports.” First Shots is one of many NSSF programs working to increase awareness of and participation in the shooting sports. For more information about NSSF, visit

PEOPLE & COMPANIES

Working the Browning Lever-Action BL-17

The V-Max strikes again! Here's how to take down, reassemble, and troubleshoot the sweet little BL-17 and its cousin the BL-22.

BY CHICK BLOOD FEBRUARY 2006

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I won't get any arguments about how the Hornady V-Max .17-caliber bullet has turned the firearms industry on its ear. When it first showed up in a necked-down .22 Magnum case as the .22 HMR, its speed and accuracy all but totally derailed the .22 WMR. When it comes to velocity and accuracy, there is no comparison between the traditional .22 roundnose or hollowpoint pellets and the smaller, sharply-tipped V-Max.

Due to the popularity of the new round, a scramble was set off among gun manufacturers to get .17 HMR chamberings flowing off production lines. It's too bad that one classic—the Winchester 9422M—was deemed no longer competitive with the smaller Magnum and was discontinued. (No, mine isn't for sale and never will be.) That was only the beginning. Someone, perhaps a Hornady engineer if not Steve Hornady himself, figured the little V-Max would be equally successful in a .22 LR case.

Because of its higher internal capacity, the chosen case was the same one used for the CCI .22 Stinger. After being necked down for the V-Max, it became the .22 Mach 2, or Mach II, and the scramble was on all over again for all the same reasons. Among the problems encountered in overhauling .22 LR designs for the Mach 2 was the ballistic tip of the bullet.

In clip-fed bolt-actions or semi-autos stripping cartridges from clips, no insurmountable changes were called for other than providing heavier bolts, larger receivers to accommodate the bolts, and altering springs in semi-autos. And fresh barrels, of course, were required for any gun undergoing the downsizing. With tubular magazines, it was a different story. The tubes had an I. D. of .22 caliber to accommodate the case.

The smaller tip of the V-Max showed a decided tendency to poke its pointy nose between the inner Where the two rifles differ markedly is in the design of their magazines. 22-caliber clip-fed action to a .17-caliber hot shot. wall of the tube and the rear rim of the cartridge in line ahead of it. Jams, jams, and more jams resulted within magazine tubes and nothing got fed back into the receiver.

At least one manufacturer solved this problem very neatly by converting its tubular-feed semi-auto design into a clip-feed. But wait a second, you say. Why all this talk about the V-Max and a headline promising information on a BL-17 when the schematic shows a BL-22? I admire your perceptiveness, but there is a method to my apparent madness. It is simply this: The BL-22 and BL-17 are taken down, reassem

WORKING THE BROWNING LEVER-ACTION BL-17 CONTINUED

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bled, and their possible malfunctions corrected in the same manner. Their action parts are identical, including the carrier. Where the two rifles differ, besides their chamberings, is in the design of the tubular magazine. The BL-22 employs a setup with which you are no doubt familiar—an outer tube surrounding the magazine, follower, and follower spring, which are removed as a unit. The outer tube is held to the receiver by a screw (#42).

The BL-17 magazine is held captive in an adapter in the receiver with the same screw, but the outer tube slides forward, taking the follower and follower spring with it. The magazine tube itself is left attached. I'll restate that in terms of loading the rifles. With the BL-22, the inner magazine/spring/follower assembly slides from the outer tube until the magazine loading port in the outer tube is cleared to accept cartridges.

With the BL-17, the outer tube slides forward until the spring and follower have cleared the loading port in the magazine tube. There's plenty of engineering math ex-

plaining this "upside down" approach, and I'm not up to it. All I'll say is that the system works. The V-Max doesn't get nose in the tubular magazine of a BL-17.

Stripping Down for Cleaning-Plus For this type of clean up, I always remove the wooden stock of a rifle or shotgun and grips of the same material on handguns to protect them from contact with solvents. Consider doing the same so you can liberally flush out receivers and trigger mechanisms with little concern. As always, make sure the gun is empty, you're wearing eye protection, and there's no live ammo nearby before setting to work. Place the rifle, inverted, in a padded vise, gripping it in the forearm area.

Back out the buttplate screws (#07) and remove the plate (#06). Look down in the stock hole with the help of a flashlight to determine what type of head lies in waiting on the stock bolt (#59). The amount of space existing between the head and the wood must also be checked out. If you go after a slotted bolt head with the nearest screwdriver, you could wedge the blade between the bolt head and the wood. Turning a blade so entrapped can crack the wood.

If the bolt head is hexagonal, you could do the same if you attempt to forcefeed a socket into the stock. If you can't find a thin-wall socket, grind down the outer diameter of one that fits the bolt head, so that it makes no contact with the stock. Open the action by swinging the lever (#15 or 16) downward. With the BL-17, turn the outer magazine cap clockwise and slide it from the magazine until it comes to a stop against the muzzle clamp (#47).

With the BL-22, depress the latch at the knurled end of the inner magazine assembly and completely remove it toward the muzzle. Clean the barrel. The next step will underscore the need for stock/grip removal. Hold the rifle with its action tilted downward over a bucket. Using an aerosol can of Birchwood Casey's Gunscrubber or a spray bottle filled with gun solvent or mineral spirits, generously flush out the action. Using the same fluid, spray some into the magazine tube to clear it of any residue.

Blow dry and check for any remaining gunk and, if necessary, repeat what you've just done. Your goal is a barrel with a bright bore and an action that produces no detectable gritty feel whatsoever. That's what I mean by "cleaning-plus" and it's worth a few bucks extra because it will take you about 10 to 20 minutes more than the basic once-over-lightly.

Detailed Disassembly As you continue stripping the rifle, figure out a method for identifying the various small springs you'll be removing so they don't get mixed up in re-assembly. Once again, don't be confused by the schematic. I've admitted that it's of a BL-22 instead of a BL-17. The reason: There were no schematics of the .17 when this was written, and none appeared in the owner's manual for the rifle. Already explained is that both rifles take down the same except for their tubular feed assemblies.

Also note that you'll find two part numbers appearing here and there. Stay calm. They're only used because one of them applies to a Grade I and the other to a Grade II rifle. They have nothing to do with where the parts live or their function. One example of this is the takedown screw (#62, 63). It backs out from the right side of the receiver (#49, 50). If the screw resists coming all the way out, gently tap the rear of the frame (#34) forward.

Place the hammer at half-cock and open the action until the rear of the bolt aligns with the front of the hammer. This disengages the locking block (#38) from the receiver. The frame assembly can now be removed by pulling it straight to the rear. In this process, the ejector (#21) and ejector spring (#23) might fall out. If they don't, lift the ejector and its spring clear of the pin (#22). This pin is built into the receiver and should not be removed.

To separate the bolt (#01) from the frame, move it forward, lift it free, and slide the locking block out of the bolt assembly. The firing-pin retain

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01 Bolt* 02 Bolt Actuating Pin 03 Bolt Assembly Kit*
04 Bolt Cover Plate 05 Bolt Cover Pin 06 Butt Plate 07
Butt Plate Screws 08 Butt Stock, Grade I 09 Butt Stock,
Grade II 10 Carrier 11 Carrier Guide Pin 12 Carrier Pin
13 Carrier Spacer (not shown)* 14 Carrier Spring 15
Cocking Lever, Grade I* 16 Cocking Lever, Grade II* ing
pin (#28) is drifted out using a 3/32-inch-diameter
punch. This frees the firing pin (#27) and its spring
(#29).

When and if servicing of the extractor is required, the
bolt coverplate (#04) has to be taken off by inserting a
screwdriver in the locking-bolt slot and gently prying
upward on the plate.

The extractor (#24), spring (#26), and plunger (#25)
are accessed by 17 Cocking Lever Pin 18 Cocking Lever
Stop Screw 19 Cocking Lever Link 20 Cocking Lever
Link Pin 21 Ejector 22 Ejector Pin 23 Ejector Spring 24
Extractor 25 Extractor Plunger 26 Extractor Spring 27
Firing Pin 28 Firing Pin Retaining Pin 29 Firing Pin
Spring 30 Forearm, Grade I 31 Forearm, Grade II insert-
ing the blade of a small screwdriver under the extractor
and prying it outward.

The spring and plunger will want to fly out of the bolt
body unless they're fouled in place. A plastic bag placed
over the bolt as you work will prevent their loss. Check

the bolt-activating pin (#02) and the lower center edge
of the bolt.

Unless the edge is broken or worn, 32 Forearm Band 33
Forearm Band Pin 34 Frame* 35 Frame Insert Pin 36
Hammer Assembly* 37 Hammer Pin 38 Locking Block
39 Lock Insert (not shown) 40 Magazine Assembly 41
Magazine Tube, Outer 42 Magazine Tube Retaining
Screw 43 Mainspring* 44 Mainspring Follower* 45
Mainspring Guide* 46 Mainspring Guide Pin 47 Muzzle
Clamp 48 Muzzle Clamp Screw 49 Receiver w/ itted
Barrel, Grade I** 50 Receiver w/ itted Barrel, Grade II**
51 Sear* 52 Sear Link* 53 Sear Link Pin 54 Sear Link
Spring 55 Sear Pin 56 Sight, Front 57 Rear Sight
Tension Spring (not shown) 58 Rear Sight Assembly 59
Stock Bolt 60 Stock Bolt Lock Washer 61 Stock Bolt
Washer 62 Take Down Screw, Grade I 63 Take Down
Screw.

Grade II 64 Trigger, Grade I* 65 Trigger, Grade II* 66
Trigger Pin 67 Trigger and Sear Spring *Factory or au-
thorized-gunsmith service only. **FFL required. leave
the pin alone. A damaged bolt should be replaced, and
there are two kinds of bolts. Anew-style bolt has a fir-
ing-pin slot measuring about .070 inch wide in its face.
Old-style slots are about .100 inch wide. Since old-style
bolts and firing pins are no longer available from
Browning, both components must be replaced if either
is damaged.

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There is no interchangeability between the old and the new. This doesn't always result in your having to hunt down replacements in the aftermarket or to arm wrestle Browning for anew bolt. Sometimes, the thing messing with firing pin travel is merely a burr in the bolt face. This you can stone out and polish. After a close look at the locking block for signs of wear, move on to the frame assembly. You're almost ready to drift out the carrier pin (#12) left to right with a 1/8-inch punch.

On the schematic, you'll see an unnumbered part immediately to the rear of the carrier (#10). This part is identified as a carrier spacer (#13) on the parts list. It only shows up on older BL-22 rifles. Newer rifles in both calibers are equipped with a hammer block (a.k.a., "carrier spacer") which is not shown at all in the drawing. It's recommended, therefore, that you thoroughly memorize the relationships between the spacer, carrier, and carrier spring (#14) before removing them from the frame.

After you have, and only then, drift out the carrier pin and carrier-guide pin (#11). The same methodology should be followed if you encounter an older BL-22 equipped with apart #13. For primary cocking lever and trigger disassembly (see Figures 1, 2, and 3), the hammer must be lowered fully to its fired position prior to drifting out the cocking-lever link pin (#20) left to right.

Do the same with the cocking-lever pin (#17), then take out the cocking-lever link (#19), mainspring (#43), and mainspring follower (#44). Figure 1. Drift out the hammer pin (#37) and sear pin (#55) left to

right. Leaving the hammer's mainspring guide (#45) attached, remove the hammer assembly (#36), sear (#51), and trigger/sear spring (#67). There's no real need to back out the lever-stop screw (#18) unless a replacement is called for.

Complete the cocking-lever disassembly as follows: Drift the trigger pin (#66) and sear-link pin (#53) left to right with your 3/32-inch punch. Remove the trigger assembly (#64, 65) followed by the sear link (#52) and sear-link spring (#54). Everything's out of the frame now, and you're holding a gutted receiver. Still attached are the barrel, forearm, tubular feed elements, sights, muzzle clamp, and forearm band.

After drifting out the front sight right to left with a brass punch, back out the clamp screw (#48) and slide the muzzle clamp (#47) off the barrel. On a BL-17, this step is necessary before you can clear the upper, outer tube from the rifle. On a BL-22, it gives you access to the lower, outer tube. The forearm (#30, 31) is retained on the rifle with the forearm band (#32).

Drifting the band pin (#33) left to right frees up the forearm and leaves you with either a magazine (BL-17) or outer tube (BL-22) still attached to the receiver. They are each taken off by removing their retaining screw (#42). Inspection of Parts There will never be a better time to examine several components which may, or may not, need replacement. Figure 2. Thoroughly go over all the pieces taken from the cocking-lever assembly for signs of wear, deformation, or alteration.

Pay special attention to the lever itself. If it's bent, the rifle may not lock up completely. Unfortunately, it's pretty difficult to determine whether or not a lever is bent without making aside-by-side comparison between it and an unused one. In any event, never attempt to straighten out a bent lever; install anew one. See that both studs of the cocking lever link are intact and tight. If loose, missing, or if the link itself is bent, anew link will have to be fitted. I'll get into how that's done directly.

Don't overlook the possibility of frame cracks in the area of the stock bolt, and make sure the insert pin (#35) is seated firmly and intact. Adjusting the Cocking-Lever Link If the Browning's link has to be replaced, fitting it will be required. With the cocking lever closed, depress the carrier and position the carrier-guide pin under the front end of the cocking-lever link. If the pin won't fit under the link, maintain the hammer in the half-cock position and fully close the lever.

Remove the link pin left to right. You open the lever only enough to remove the link, then close it again. Remove material from the link at the point of interference. Usually, this means from the pointed end rearward about 1/4 inch. When properly adjusted, there should be about .030-inch clearance when the guide pin is under the link, as well as between the link and the cocking lever when the lever is completely closed. Figure 3.

WORKING THE BROWNING LEVER-ACTION BL-17 CONTINUED

ORIGINAL PAGE 7

Reassembly Tips The Bolt Assembly. After placing the firing-pin spring in the bolt horizontally, install the firing pin and its retaining pin. Check for free movement and return to the rear by the firing pin under pressure from the spring. In the following order, place the spring, plunger, and extractor in the bolt. Hold the extractor against the bolt with your thumb and push the part into its bolt recess with a 1/8-inch punch. The Cocking Lever.

Position the trigger/sear spring into its hole in the top of the trigger-slot cutout in the lever. Insert the trigger, align all pin holes, install the pin, and stake it in place to avoid loosening. Place the searlink spring, small end upward, in its recess atop the trigger. Orient the sear link above the spring, compress the spring with the link, and install the link pin. (As you've discovered, it's a roll pin, and I should have mentioned this sooner. They're a pain to reinstall and they're easily damaged.

I always advise, wherever possible, not to remove them completely but only enough to free the part they retain.) The Hammer and Sear. The sear is to be placed in the frame with the trigger/sear-spring hole to the rear and the sear's rounded edge upward. Engage the spring and compress it with the sear. Maintain the pressure as you pull the hammer fully to the rear. Release the sear. The object of this somewhat fussy step is to have the hammer hold the spring compressed between the sear and the rear of the frame.

You can't let go of the hammer just yet. The Cocking Lever and Link. The hammer is still being held to the rear. The cocking lever and cocking-lever link pins are started in right to left. Rotate the cocking lever downward and position the stud of the lever link in the elongated hole on the right side of the lever. Maintain that engagement, align all holes, and push the pins in to be flush. (I never said this would be easy.) Mainspring and Mainspring Follower.

Browning technicians use a special tool, unavailable to the public, to accomplish this assembly but you can do it by following these instructions to the letter: Hold the frame upright. Raise the end of the mainspring guide and place the mainspring on the guide. Holding the hammer assembly with its stud (guide) pointing downwards, introduce it into the frame from the top. Close the cocking lever.

Slowly push the hammer forward just enough to allow the bottom of the mainspring follower to align with its cocking-lever recess. "Encourage" the follower to enter the recess with a finger. When the follower drops in, put a slight rearward pressure on the hammer and open the cocking lever. Maintain the rearward pressure as you put your little finger to work nudging the mainspring upward to align it with the end of its guide. When they're aligned, pull the hammer back to half-cock.

Keep the hammer in that position or the trigger/sear spring could get disengaged. You'd better be sure that spring remains positioned squarely between the sear and the back of the frame before closing the cocking lever. If it gets dislocated, the entire frame has to be disassembled/reassembled except for the sear. (Usually, this dislodging occurs because the hammer was allowed to slip forward during reinstallation of the mainspring-guide assembly.

But you wouldn't let that happen, so close the cocking lever and get on with the job. The Bolt. Position the carrier-guide pin under the front end of the cocking-lever link. The rail on the leftfront end of the bolt is placed in its frame slot and the bolt lowered into the frame. It's a good idea to check for any interference between the top of the locking block and the bottom of the bolt at this time. To make the check, fully cock the hammer and take a magnified look at the Browning's block and bolt.

Soon thereafter, peek through its hole in the frame to assure yourself there'll be no interference between the locking bolt and

the take-down screw. If you suspect any trouble spots, relieve them carefully with a fine stone. The Ejector. The spring fits over the pin, and the ejector fits over the spring on the same pin. If you don't find that getting these little bits back into the rifle isn't a two-tranquilizer tweezer-assisted operation, I missed my guess.

Trouble: Possible Causes and Cures When a BL fails to feed and jams, the reasons include a bent cocking lever, burrs in the cartridge-head slot of the bolt face, a broken firing pin, and a burred chamber. Having already discussed what to do with a bent cocking lever, I'll skip to a damaged bolt face. It can be smoothed up with very fine filing, stoning, and polishing. A broken firing pin is—surprise-surprise—replaced.

It might be possible to iron out any burrs raised at a chamber's mouth, but an internally damaged chamber should be touched up with a .22-or .17-caliber sporting chamber finishing reamer. More often than not, failures to extract are due to broken or weakened extractor components or their improper installation. Other possibilities exist, however. The chamber might be too tight, too fouled, too large, or the bolt may not be locking up enough for the extractor to engage the shell rim.

Replace any broken parts along with any you suspect aren't up to par. Clean and polish a dirty or pitted chamber, and caress it with your finishing reamer. If the chamber is enlarged, though, options become more complicated. Boring out the barrel then relining and rechambering it is one of those options. Rebarreling is another. Neither is inexpensive. All is not lost, yet. The cure for a bolt not fully closing might be as simple as filing down the cocking-lever stop pin.

Or, you may have to sleuth out exactly what's causing the problem. Has a burr been raised on the bolt ways or bolt face? If so, stone it away. (continued on page 16)



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A worst-case scenario would involve headspace, specified at .043 to .051 with commercially available gauges. (More about that condition in the following section on ruptured cases.) But if you have a current FFL, you can purchase a fresh receiver with fitted barrel. All it takes is a bit of your customer's money. A rifle with a broken ejector pin, a worn ejector, or a missing ejector spring will fail to eject. None of those parts are restricted.

A rifle failing to cock indicates a missing or improperly positioned sear spring or possibly a weak sear spring. By the way, the latter can be replaced with a trigger spring. Ruptured cases are consistently traced to excessive headspace. Some times, they are due to ammunition. If the cases keep blowing out with several brands, you have to consider installing anew bolt. That won't be easy. Bolts are on the restricted list at Browning.

Then again, you could make do with the existing bolt, remove the barrel, face off the receiver, shave the barrel shoulder, remarry the two major rifle components, and hopefully bid farewell to ruptured cases. To paraphrase

a previous statement, all it takes is more of your customer's money. The good news is deep pockets aren't necessarily required to cure failures to fire. Replacing a broken firing pin or spring is no big deal.

Parts replacement gets a bit more expensive when a sear link isn't making contact with a sear or when the cocking lever is bent. Let's think on the positive side. For one reason or another, you've installed anew lever stop screw. That screw is protruding just enough to prevent the lever from fully locking up the bolt. As a result, the bolt is sitting too far back from the case head for the firing pin to impact the primed rim. You know what a possible cure is, but I'll mention it again anyway.

File or stone the head of that screw down bit by bit until the lockup problem goes away and takes with it any failure to fire. Sometimes, you can get lucky. I've tried to give you a solid overview of servicing Browning small-bore lever-actions. As usual, if you have questions or need further clarification, call me on the Hot Line or send an email. ■

MAINTENANCE & REPAIR

The Long and Short Of Shotgun Chambers

Older shotguns made for paper-hulled shells frequently don't shoot worth a hoot with today's plastic shotshells. Here's why and what you can do about it.

BY RUSSELL CORBITT FEBRUARY 2006

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I see a regular stream of older shotguns brought in for work. In many cases, they are suffering from what appears to be moderate abuse, with symptoms like loose lockup, worn hinge pins, and broken locking blocks. Many of the owners of these old shotguns are convinced that they are somehow inferior or defective, since they don't seem to hold up, even with relatively light loads.

Others don't understand how their fathers and grandfathers fired these old scatterguns as much as they did, considering the recoil they produce. Well, in most cases, these old guns are finely made, and they definitely didn't beat up the user then as much as they do now. Que pasa? It all has to do with the chamber and chamber throat's forcing-cone dimensions. Older shotguns were designed for the shells available at the time.

Additionally, many old shotguns have short chambers, such as the 2-9/16-inch 12-gauge shells available many years ago. Any old shotgun without specific chamber-length markings may have a short chamber. When shotshells were metallicor paper-hulled and used fiber

wads, the forcing cone in front of the chamber was very short, typically 1/4 inch or less (see Figure 1). This was done to assist the wad in sealing the propellant gases behind it, reducing blow-by of the powder gases and subsequent voids in the shot swarm.

Modern plastic hulls are much thinner than their paper counterparts, and plastic wads expand to seal the bore much better (protecting the shot from contact with the bore and disturbance from leaking propellant gases). All-plastic shells, when fired in an older chamber designed for paper-hulled shells, encounter a "step" at the end of the hull which acts as a bore constriction. Now look at Figure 2.

Chambers optimized for all-plastic shells have along, gently tapered forcing cone which allows the wad and shot cup to clear the open end of the hull with no bottleneck. This, in turn, eliminates a sizable pressure spike that would cause increased recoil, breakage, and function problems. It also reduces shot damage from battering in the forcing

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cone, contributing to better patterns. This is not some foggy theory—it's the reason many modern shotguns have oversized bores (generally referred to as "back-bored"). Forcing cones in modern shotguns can be 1-1/2 inches or longer. Paper-hulled shells fired in modern chambers leak gas around the wad, contributing to bore leading as well as deforming pellets and opening patterns.

Old chambers which are too short for modern all-plastic shells don't allow the end of the hull to open fully, causing an even more severe bore constriction than the one depicted in Figure 1. Using heavy modern shells in a short chamber can cause anything from punishing recoil to a burst barrel. Interestingly enough, some trap and skeet folks deliberately use either paper-hulled shells or plastic shells loaded using fiber wads in shotguns with modern chambers.

The purpose of this is to open the shot swarm as much as possible, giving wider patterns. This works acceptably for clay pigeons, where only a visible piece needs to be broken off in order to score, but it's not the best approach for actual wingshooting. Hunters would definitely prefer to put as many pellets as possible (within reason) into the target to ensure a clean kill.

The difference in forcing cones is easily seen by comparing anew shotgun barrel to a barrel made before, say, the early 1970s, which is known to be unmodified. The new barrel's chamber gradually tapers into the bore, often so slowly that it appears that the barrel is chamber-diameter until the choke's forcing cone. Older barrels will have a sharply defined shoulder at the end of the chamber, resembling a chamber designed for metallic cartridges.

Lengthening the chamber and/ or the forcing cone is easy and can be quite profitable. Chamber and forcing-cone reamers from several manufacturers are available from Brownells. They are easily turned with a large tap wrench or by using a low-speed 1/2-inch drill and a suitable drive adapter. The reamer is employed to change the forcing cone Figure 2. from a relatively abrupt shoulder to a gradual taper into bore diameter.

Some of the reamers available are double-duty—they can be used to reshape the forcing cone or to lengthen the chamber and its attendant forcing cone. Chamber length is checked or monitored using a suitably-sized chamber gauge (also available from Brownells). Once the chamber and/or forcing cone is properly reamed, it's a good idea to polish the newly cut area to remove

tool marks. Scratches or roughness will accumulate plastic-wad fouling that acts as a bore constriction and is difficult to get out.

To do the polishing, you can spring for suitable hones, or you can do as poor folks do and use split dowels and progressively finer grades of emery cloth. One final note: Simply lengthening a shotgun's chamber to the next available standard length does not mean that the shotgun can be safely fired with the longer shells. First, shotgun barrels are quite thin and lengthening the chamber may result in a barrel rupture if there is insufficient "meat" left after cutting.

Second, repeating shotguns usually use different receivers and shell-handling parts for longer shells. For instance, attempting to use 3-inch shells in a shotgun designed for 2-3/4-inch shells will almost always result in jamming and other operation problems. Ejection port size, ejector location, shell latches, inter rupters, and/or carrier dimensions are generally shell-length-dependent.

You can shoot shorter shells in along-chambered shotgun, but trying to make a short-chambered gun shoot long shells is largely a waste of both time and a good shotgun. ■

FROM THE ARCHIVE

Make a Universal Scope-Reticle Adjuster

Here's how to make a scope-reticle adjusting tool, and why you'll find it indispensable.

BY NORMAN E. JOHNSON FEBRUARY 2006

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The seemingly simple job of adjusting a scope reticle shouldn't pose any problems, but with some scopes it can. The reticle-adjusting slot on some scope knobs is hard to turn and doesn't seem to fit any coin really well.

Sometimes the correct amount of adjustment isn't easily applied and the scope-adjust Below center: Both ends of the shaft are slot-

ted as described in text—one end for the adjusting disk and the other end for adjusting the raised-rib type of knob. ing slot becomes damaged in the attempt, particularly on those knobs made from soft aluminum. The advantage of a wellmade scope-reticle adjuster is the ease and convenience of applying a precise amount of calibrated control to both the windage and elevation on a scope.

Even if you have but a single scope to work with, making the tool will be worth your effort. The cost of the materials is negligible and the fabrication takes only about an hour or so. Making the Tool There is some leeway in making the scope-adjusting tool. Here is how I did it: First, I cut a piece of 1/2-inch-diameter brass or stainless rod to about

MAKE A UNIVERSAL SCOPE-RETICLE ADJUSTER CONTINUED

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2-3/4 inches in length and knurled a 1-inch section at one end. Brass is easier to work with. Then I made a shallow slot about 0.185 inch wide and 0.125 inch deep at the knurled end. This slot is later used to adjust the raised bar on the non-slotted-type adjusting knobs used on some scopes. With this end of the adjusting tool completed, I milled a narrow slot in the opposite end of the shaft for the coin-like adjusting disk. I milled this The thickness of each step is described in the text.

Below center: Here, the scope-reticle adjuster is being used on a Redfield scope with slotted adjusting knobs. slot 0.075 wide by about 0.625 inch deep. Then I drilled a hole to tap for an 8-32 screw thread. I carefully drilled a #8 hole near the end in one side of the fork and at the opposing side of the fork I drilled a

#27 hole for an 8-32 thread. Then I threaded the hole. Following this, I beveled the larger hole with an 82-degree countersink for an 8-32 socket-head screw.

The adjusting disk was then made from a piece of brass the same thickness as the slot in the shaft (0.075 inch). This I cut from a piece of bronze shaft using a cutoff tool. But before cutting the piece, I drilled a hole in it to fit an 8-32 screw. Finally, the coin-like adjusting disk was placed in the mill vise to cut variable thicknesses at triangular positions. This was done so the disk will closely fit the adjusting-knob slot of various scopes.

I cut these to three triangularly positioned thicknesses of 0.065, 0.070, and 0.075 inch. (The average coin-slot width found on most scopes is around 0.073 inch.) Of course, the

slotted end of the tool is used to turn the raised-bar, non-slotted adjusting knobs. The screw was then cut to length and tightened to position. If things are made to close tolerance, a light torque of the screw will provide some resistance to the adjusting disk as it is turned.

Conclusion The universal scope reticle-adjusting tool has proven to be handy in adjusting most types of scopes. It is particularly useful for the sighting in of a rifle from the bench. Once the first sighting shot is found on target, simply return the scope reticle back to the aiming point and, without moving the rifle, carefully adjust the reticle to bisect the bullet hole. The next shot will find the scope close to being sighted in—and you'll save a lot of ammo in the process. ■

FINISHING

Applying Custom Camouflage Finishes with Dura Coat

With the Dura Coat system, there's no longer any reason why you can't offer in-house custom camouflage finishes.

BY CHICK BLOOD FEBRUARY 2006

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The Dura Coat system is a sprayon/bake-on finish that's getting high praise from law-enforcement agencies and military units for its resistance to lubricants, cutting oils, bore solvents, impacts, marring, abrasion, moisture, and chemicals. A product of Lauer Custom Weaponry (www.lauerweaponry.com), Dura Coat is ideal for use on all parts of a firearm and—here's where the camouflage comes in—it's available in 50 stock colors, making possible an infinite number of color/ camo combinations.

The neat part is you can invent your own designs using 3M blue masking tape and 3 or 4 Dura Coat colors, or you can go all the way with a Camo Pak kit, allowing you to deliver the latest thing in camouflage: Mirage Flage.

Have you seen this stuff? The U. S. military's newest fatigues are imprinted with a variety of Mirage Flage patterns. There's a design to hide the troops in every type of battlefield. On one segment of the TV show Mail Call on The History Channel, the subject was camouflage.

They "showed" GIs planted here and there in a lightly wooded area wearing one kind of pattern or another. No kidding, the men and women wearing Mirage Flage were virtually invisible from as close as 15 feet from the camera! And so were their weapons. From now on, the ever-wary wild Included are all the colors needed to complete the chosen design, plus a can of Tru Strip degreaser, hardener, and a roll of male and female stencils.

Dura Coat reducer is usually sold separately. gobbler or trophy buck will have to be much more wary of the hunter wearing and bearing Wilderness Mirage Flage. Just take a look at the photos on the opposite page. Although the photos are in black and white, they'll still give you a monochromatic idea of what you'll be able to offer your customers—and these are just a small sampling of the Camo Pak kits available. Preparation for Finishing A total takedown of the firearm is required.

Pins and other small parts left behind will bleed oil and can cause chipping in the final finish. Even since the banishment of trichloroethylene, I've looked around for a substitute and may well have found its equal with Tru Strip. This product

APPLYING CUSTOM CAMOUFLAGE FINISHES WITH DURA COAT CONTINUED

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is applied to degrease and remove dust from all surfaces after they've been blasted with 120-grit aluminum oxide at 60 psi. A clean surface is as critical for the application of Dura Coat, just as it is for bluing. Next, plug or mask off any areas you don't want to coat. These would include scope lenses, the engagement surfaces between sears/hammers, strikers/triggers, and other places where tolerances are tight.

Once all prep is complete, thoroughly mix your chosen base color by shaking the container for 3 to 4 minutes after hearing its enclosed ball rattling. Now you add the hardener. Adding more than specified here will result in a glossier finish. The best way to combine color and hardener is with kitchen measuring spoons at a ratio of 1 part hardener to 12 parts color. For example, 4 tablespoons of color and 1 teaspoon of hardener mixed together will result in about 4.5 ounces of coating.

This is enough for two or three shoulder arms. Three tablespoons of color and a half teaspoon of hardener would easily coat one rifle or shotgun. The mixture can be applied by airbrush, automotive spray gun, a high-volume-low pressure system, or an airless paint sprayer—as long as the larger spray gun's nozzle patterns can be adjusted down to airbrush proportions. Test on a piece of scrap metal or plastic.

If it fails to spray the coating evenly, add Dura Coat reducer a little at a time to thin out the color mix, increase the pressure, or do both. Depending on the Camo Pak pattern chosen, you'll receive a kit with all the necessary colors along with a mailing tube containing the stencils needed to create it. There are two types of these stencils. (Let's see if I can be politically correct here.) Some are male, die-cut, and are found at one end of the roll of stencils.

Others are female, die-cut, and come in diecut squares at the opposite end of the roll. After lifting off a male stencil, you can also

use the opening left in the stencil roll as a female stencil. Or vice versa. This is even more feasible when creating an original pattern and not following the predetermined design of a Camo Pak. Note: Under high-humidity conditions, I advise you to blot the stencil on a clean, dry towel before applying it to the gun.

Finish Application Here, I'll be explaining the working up of a Wilderness Mirage Flage pattern, using the required male/female stencils as provided in the Camo Pak. Okay, let's do it step by step. First, spray the entire gun—at least the barrel, receiver, stock, and detached scope—with the base color. Use smooth, even passes and a firm wrist 2 to 6 inches from the workpiece.

Optimum overall thickness is 1 mil, but the coating can and should be laid on thicker than that in highwear areas like handgrips, corners, and safety switches. To speed up drying, place the



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Carefully cutting out the blank area remaining on the roll will provide a female stencil of the same pattern if such is desired. Under high-humidity conditions, the stencil should be lightly blotted on a clean towel before being applied to the gun. components in your kitchen oven, set the oven at 110 degrees, and bake for 15 minutes. While waiting, prepare your second color, and clean out your sprayer and your primary color container with Dura Coat reducer.

Randomly select one or more of the male “peel ‘n spray” templates from your stencil roll and position on the base colored items. Spray overall with your second color, dry in the oven, clean up, and prep the next color. Apply more male templates, and spray, dry, clean, and prep your next (accent) color. Now remove all the templates, select and apply the female templates as dictated by the design. Apply the accent color, dry in the oven, clean up your spray tools, and remove the female templates.

Finally, spray overall with Dura Coat clear in your choice of matte, satin, or gloss. After 20 to 60 minutes of air drying, the gun can be reassembled. Conclusions This same clear coat, I’m told, can be sprayed on an out-of-the-box blued barrel and the barrel will never

rust. On stainless steels, the clear coating promises an end to oxidation worries and greater protection against those bright “wear” marks that are such a pain to blend back in with the original finish.

Another interesting product in the Lauer lineup is Dura Fil, a surface filler that’s spray-applied to lightly pitted metal and scratched or slightly scored wood surfaces, thereby smoothing them out prior to any color coating. You don’t have to dive in big time with Dura Coat, either. An introductory kit contains colors, hardener, reducer, and a can of aerosol propellant for the included airbrush. This kit will finish a couple of long guns and lists for \$71.99 in a catalog published by Lauer Custom Weaponry.

If you go to www.lauerweaponry.com on the web, and click on Dura Coat in the top bar and Camo Paks in the drop-down menu, a listing of the numerous available camouflage patterns will be displayed on the left side of your screen. Each time you click on the name of a Camo Pak, a photograph of a gun will pop up, with that design applied in full color. If that doesn’t inspire you to start up an in-shop custom-finishing operation, I don’t know what will. ■

PEOPLE & COMPANIES

Disassembly/Reassembly Of the Ruger KP345 .45 ACP Pistol

Ruger's new addition to the P-Series incorporates some interesting features as well as a durable and lightweight polymer frame.

BY DAVID T. CHICOINE FEBRUARY 2006

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First introduced in 1987, the Ruger P-Series pistols were the first firearms to be manufactured at Sturm, Ruger's new Prescott, Arizona, plant. The P-Series was the result of a development program to build a state-of-the-art pistol with features designed by practical shooters, that would offer excellent reliability under harsh conditions.

Since the P-Series pistols were introduced, they've seen extensive use by law enforcement, government agencies, and sportsmen all over the world, and have gained a good reputation for their rugged durability. As we have come to expect from Ruger, the pistols are also being steadily improved and the new KP345 is one outgrowth of that. Ruger's new KP345 is a double/single-action, semi-automatic, and uses an eight-round, single-stack magazine in .45 ACP caliber.

The new pistol features a slimmer, contoured, satin-finished polymer frame with a newly re-contoured checkered grip for improved control. Also featured on the KP345 is the exclusive Ruger "camblock" design to reduce felt recoil and frame stress. In addition, the KP345 comes with a nice array of other features like a more rounded trigger and guard, redesigned high-visibility white-dot sights, a loaded-chamber indicator, and an internal lock.

The KP345 is available with a manual safety or de-cock only, and with a blued or stainless top end. My test gun was stainless-steel version, equipped with the ambidextrous manual safety and a Picatinny-style accessory rail made integral with the frame. KP345PR, P345PR, and KP345DPR models all come with the Picatinny-style accessory rail that is neat and unobtrusive. In an effort to comply with some state and local laws, Ruger has added a key-operated internal lock to the KP345 pistol.

This lock can be operated when the safety is in the "on" position by inserting the supplied key through a hole in the right-side safety lever; turning the key as far as it will turn in a clockwise direction locks the manual safety in the "on" position.

I had the opportunity to shoot the KP345 pictured here extensively, and He found it to be an easy-to-handle, comfortable, and accurate pistol. all three shooters involved in the tests were impressed with the new Ruger's performance and accuracy, as well as its easy handling qualities. The KP345 was easy to shoot, has a very comfortable grip and points well.

One thing I especially appreciated was the lack of any "mushy feeling" from the grip frame twisting in the hand like I've experienced with some other polymer-framed .45s. In

DISASSEMBLY/REASSEMBLY OF THE RUGER KP345 .45 ACP PISTOL CONTINUED

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Doing this and removing the slide stop will allow the slide/barrel assembly to move forward and off the frame. fact, if it weren't for its light weight, I would have to say the feel of this pistol during firing is very much like that of a more rigid, steel-framed semi-auto. Disassembly Instructions 1. First, always be sure the weapon is unloaded.

Grasp the pistol around the grip, being careful to point the muzzle in a safe direction and to keep your fingers away from the trigger (#34.) Engage the safety by rotating the safety lever (#18 and #19) down, until the white dot appears through the hole in the left-hand safety lever (#19.) Remove the magazine by depressing the magazine latch (#39), allowing the magazine (#56) to be removed from the bottom of the grip. Hold the pistol firmly around its grip and pull back the slide (#1) all the way.

Visibly check the chamber while the slide is open to make sure no cartridge remains in the barrel. 2. With the magazine removed and the safety in the "on" position, remove the slide by drawing it to the rear and push up on the slide stop (#54) to lock the slide in place at the rear. Use a pencil with a rubber eraser to reach down into the top of the slide and push the ejector (#46) forward and down until it locks in the down position. Doing this will later allow the slide to move forward off the frame.

Hold the slide firmly while you push down on the slide stop to release the slide. Let the slide move forward slightly, just until the two vertical takedown marks on the left side of the slide and the frame are in alignment. In this position, push the slide stop out of the Ruger's frame from right to left. Allow the slide to move forward and pull the slide assembly all the way off the frame. 3.

Remove the camblock and barrel by turning The punch above is sitting in one of the two holes the ejector pivot mounts in. the slide upside-down on the bench and lifting up the rear end of the camblock assembly (#27 to 30) to disengage it from the seat with the barrel. Make note of its position for later re-assembly. Pull the camblock/ recoil-spring assembly off to the rear. Pull the rear of the barrel (#31) away from the slide and toward the rear to remove it from the slide.

At this point, the pistol is disassembled far enough for normal cleaning and maintenance work. 4. Disassembling the frame is not an undertaking I would suggest for an amateur. While it's not a particularly complicated weapon, disassembling the KP345 requires that the gunsmith pay careful attention to details and proceed slowly. One other word of caution: If you're not one of those rare

DISASSEMBLY/REASSEMBLY OF THE RUGER KP345 .45 ACP PISTOL CONTINUED

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1 Slide 2 Front Sight 3 Extractor Pivot Pin 4 Loaded Chamber Indicator Spring 5 Loaded Chamber Indicator 6 Magazine Disconnect 7 Magazine Disconnect Spring 8 Firing Pin Block 9 Firing Pin Block Spring 10 Firing Pin Block Plunger 11 Rear Sight Assembly 12 Rear Sight Lock Screw 13 Extractor 14 Extractor Spring 15 Safety Lever Spring 16 Safety Lever Retainer 17 Safety Strut 18 Safety, Right 19 Safety Assembly, Left 20 Safety Detent Plunger Spring 21 Safety Detent Plunger 22 Lock Pin 23 Lock Plunger Detent Spring 24 Lock Detent Plunger 25 Firing Pin Spring 26 Firing Pin 27 Recoil Spring 28 Buffer Spring 29 Camblock 30 Slide Stop Detent 31 Barrel 32 Trigger Bar Spring 33 Trigger Bar 34 Trigger 35 Trigger Plunger Spring 36 Trigger Plunger 37 Hammer Assembly 38 Hammer Pivot Pin 39 Magazine Latch 40 Trigger Pivot Pin 41 Blocker Lever 42 Sear Spring 43 Sear 44 Ejector Spring 45 Ejector Pivot

Assembly 50 Hammer Spring 46 Ejector 51 Hammer Strut 47 Magazine Latch Spring 52 Hammer Spring Seat Pin 55 Frame, with Accessory Rail 48 Hammer Spring Seat 53 Sear Pivot Pin (2 req'd) 56 Magazine, Complete, 8-shot 49 Hammer Spring Detent 54 Slide Stop Assembly 57 Internal Lock Key Ruger KP345 .45 ACP Semi-Auto Pistol (Specificationssubjectto change-withoutnotice) three-armed gunsmiths or don't plan and assembly operations are defiparts out as they are removed and in to grow another arm any time soon, nitely three-handers! the same order they were removed.

I try to have a partner there with you, Also, if you've never done this suggest you use an unoccupied part because several of the disassembly before, I would advise laying the of the workbench and a sheet of

DISASSEMBLY/REASSEMBLY OF THE RUGER KP345 .45 ACP PISTOL CONTINUED

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white paper. Start by making a steel slave pin that is .075 inch in diameter and .620 inch long with rounded ends. Use this pin to push out and replace the front sear-pivot pin (#53). Use a small straight pin punch to push out and remove the rear sear-pivot pin (also #53). Carefully lift out the blocker lever (#41), the sear (#43), and sear spring (#42) as an assembly. Notice the positions of these parts, especially where the spring bears, for reassembly.

With the hammer down, push out the hammer-spring seat pin (#52) and slide the hammer-spring seat (#48), detent (#49), hammer spring (#50), and hammer strut (#51) out through the bottom of the grip frame. Using a pin punch, push out the trigger-pivot pin (#40) from left to right, keeping your finger over the top of the trigger to prevent the loss of the trigger plunger (#36) and its spring (#35). Lift the trigger up and work it out of the frame, the trigger bar (#33) will pivot up with it.

Once the trigger is almost clear of the frame, it can be pulled to the right side off the trigger. Their removal isn't complicated, but does require thoughtfulness. bar and lifted out of the gun. Pulling up on the front of the trigger

bar while pushing down on its rear enables the trigger bar and the trigger-bar spring (#32) to be lifted forward and up, out of the frame. Note the hole in the frame where the trigger-bar spring is seated for reassembly.

Hold the ejector (#46) forward slightly, and use a softwood block to part the right frame side. At this point, you will see that the hammer-pivot pin (#38) has jumped out slightly. Grasp the end of the hammer-pivot pin and remove it. The hammer assembly (#37) can now be lifted straight up and out. Now look down from the top at the right edge of the magazine well and you'll notice a small, bright spring. This is the magazine latch spring (#47).

Use a pick to pull the top of the spring out of its seat in the frame and then pull the spring straight up and out. The magazine latch (#39) can be pushed out from left to right. Notice the small hole in the magazine latch where the magazine-latch spring must return to on reassembly. I don't recommend removal of the ejector assembly unless some thing is actually wrong that needs repair.

However, if for some reason you must remove it, start by mounting the frame in a padded vise; use caution that you don't tight-

en the vise enough to crush the frame. Using two small punches, push in on both sides of the ejector-pivot assembly (#45). These are accessed through the sides of both grips as shown in the photo. Carefully push the ejector assembly forward and work it out and up through the magazine well. Set this aside as an assembly.

For reassembly, note its position and the position of the spring ends which both face down, into the mainspring housing well. To reassemble the ejector assembly into the frame, insert the assembly into the magazine well and push the left side of the assembly against the left side wall of the frame.

Now use a .035-inch-thick feeler gauge or a small stainless rule to depress the right side of the ejector pivot assembly, and holding it depressed, move the assembly toward the pivot-pin holes in the frame until the pivots align with the holes. Then slide the rule or gauge out and allow the pivot pins to pop into their holes. Be certain that you have aligned the spring ends so they point down, into the mainspring-well opening. 5. To disassemble the slide, mount it



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in a well-padded vise, using caution so that you don't over-tighten the vise and crush the slide. Loosen the rear sight-lock screw (#12). Using a soft drift punch and hammer, carefully drive the rear sight assembly (#11) off from left to right. The sight base is longer than it is wide, and you'll have to tap alternately front and rear to keep it moving. Move slowly as you do this because three separate coil springs, all under tension, will become exposed as you slide the sight farther over to the right.

Be sure you keep these springs captive and be careful to notice their positions for reassembly. The springs will appear in this order as the sight slides from left to right. Once the rear sight is off, lift out the firing-pin block (#8), the loaded-chamber indicator (#5) and the magazine disconnect (#6), carefully noting their positions for reassembly. Turn the slide upside-down. Using a cup-tipped pin punch, push down on the leg of the safety-lever spring (#15) that holds the safety-lever retainer (#16).

At the same time, use your third arm, or have an associate use a sharp dental pick to push on the side of the safety-lever retainer to start it moving toward the

outside of the slide. Once it's clear of the slide, remove the safety-lever retainer and lift out the safety-lever spring. Pull the safety assembly out to the left; use caution, there is a spring-loaded plunger (#20 and 21) on its bottom side that will jump out as the safety lever clears the side of the slide.

The safety strut (#17) is now free and can be lifted out the top of the slide. Push the safety lever (#18) into the down position until it can be pulled off the slide. Notice it has a small leg that has to align with a cutout in the slide before it will come out. The firing pin (#26) and its spring (#25) can now be pulled out through the rear of the slide. Be sure you make note of its position for reassembly.

The extractor (#13) can be removed by using a special roll-pin punch to drive out the extractor-pivot pin (#3). The extractor spring (#14) will come off with the extractor. I've never been a fan of reusing roll pins and strongly recommend that you purchase anew extractor-pivot pin for the pistol's reassembly. Reverse these assembly procedures to reassemble the pistol. ■

READER FORUM

Reader Forum

BY AMERICAN GUNSMITH EDITORS FEBRUARY 2006

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Jamming Marlin 1894S I have a Marlin 1894S in caliber .44 Magnum. Occasionally, when the lever is lowered, it cannot be moved back to the firing position. The lever and bolt have to be removed in order for the carrier to drop down to the firing position. Thank for any suggestions you can offer. Jack Roche You have what is known as a "Marlin jam." It happens when the timing of the carrier is off and a "letting in two" (rounds) from the magazine occurs.

The condition is worse with .44 Special rounds fed in a .44 Magnum rifle. The condition is correctable with the proper tooling. Fortunately, a set of full instructions on how to accomplish the fix is shown on the Single Action Shooting Society web site by clicking on "Marlin Jam." The instructions, written by an engineer, will tell you how to bend the carrier upward and eliminate the double feed. Loose Llama As a current member, I enjoy your useful articles, especially the answers to the gunsmith questions.

Now I find that I need to submit one to you for your help. I shoot a Llama Minimax II 10shot subcompact in .45 caliber. I thoroughly enjoy it with one small exception. After a few rounds, the slide stop walks out. The result is embarrassing for me, but provides other range shooters with a moment of mirth as I attempt to gather up the slide, springs, and other parts that have been launched downrange.

The last time this happened, I reassembled the gun and began firing again, this time taking care to push on the slide stop after each round. While working the slide to clear a stuck round, the slide stop again just fell out, leaving me with the slide in one hand

and the balance of the gun in the other. I am beginning to tire of the laughter. It seems to me that even with a loose fit, the slide stop should have enough tension placed on it by the plunger, the barrel link, and recoil springs to stay put.

What am I missing? I've contacted Brownells who directed me to Import Sports so I have a parts list that does not include a barrel link. Numrich was not able to help either. Jim Gowan We scoured our files looking for a schematic for the Minimax II. We discovered none, but all other Llama .45 ACP pistols show a barrel link. We then spoke with gunsmith James Watson at Walker Arms who services Llama and Bersa pistols for Import Sports. He insists your pistol has a barrel link.

Let's say it should have one, because that's what holds the slide stop in unless both components have damage or serious wear. He went on to say you should speak with Dee at Import Sports Call her attention to the missing link on your parts list, then order one plus a link pin and new slide stop. Continuing with his helpful commentary, Watson expressed a willingness to correct the problem with your pistol under warranty, if you'll ship it to him at Walker Arms 870, Selma, AL 36701).

Misindexing Blackhawk I'm hoping you'll be able to help me solve a problem with a Ruger New Model Blackhawk single-action revolver in .45 LC. The problem is that during rapid engagement of the hammer, one chamber overtravels and does not index or bolt up properly, causing the firing pin to drop on the rim instead of the primer. All of the other chambers align and lock up prop-

erly. If the hammer is cocked slowly, the chamber in question usually indexes and locks up properly.

I've checked the cylinder cut for burrs and polished it to ease engagement. The hand (pawl) has been checked and polished also. The cylinder ratchet appears to be okay—no burrs or dings. The latching-bolt spring and plunger have been checked and appear to be working fine.

There is no evidence of binding or dragging of parts. The revolver is relatively new but out of warranty. Could the cylinder cut be at fault? I would appreciate any assistance. Thank you. George Ohara Refer to the January 2002 article titled "Picking Apart the Peacemaker." Though not specifically addressed to the Blackhawk, it covers problems similar to the one you describe and their solutions.

Parts Challenges I am a certified gunsmith in my first year of practice, and finding parts is the hardest problem I encounter. I have dealer listings, Brownells catalog, and Numrich books, but still can't find parts for afield-grade Charles Daly auto in 20 gauge. I've tried their web site, but can't get through with email. I need a bolt handle or cocking lever—whatever you want to call it. Also, I need parts for a weird one. It's an Erma Werke, with "Model KGP69" on one side and "La Dist. New York" on the other.

The pistol is chambered for .22 LR and is built like a German Luger. I need a magazine and an extractor for it. Any suggestions will be greatly appreciated. Scott For Daly parts, send an email to jim Erma parts used to be available from Mandells in Scottsdale, Arizona. We haven't been

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(continued from previous page) able to contact them for over a year and assume they've left the firearm business. Get a free copy of Brownells Parts Source List for out-of-production firearms and see what you can turn up there. Ortgies Pistol I have what appears to be a World War II-era Ortgies pocket pistol, blue finish in .32 ACP caliber.

I have replaced the magazines (it came with a .380 magazine), and these seem to feed adequately after minor adjustments to the base of the magazines (hand cycling, not yet fired). I'm in the process of replacing the barrel, as the original seems to have a headspace problem in that the chamber depth is slightly less than the length of the cartridge.

Also, with the original barrel, when fully chambered, many rounds (even contemporary ones) allow the bullet to engage the rifling (with some effort), leaving slight marks on the bullet and case lip. The new barrel seems to be properly headspaced. Is it practical to polish the feed ramp in the frame and that in the barrel to allow more consistent feeding? If done, is it necessary to leave the factory "lip," such that the ramp in the frame is "stepped" slightly to the rear of the ramp in the barrel?

Is it safe to carry this pistol with around chambered (action components seem to be operating properly), with the grip safety engaged, or is it possible for the striker/firing pin to become dislodged from the sear and fire the weapon? With the grip safety engaged (pistol unloaded, with empty magazine installed), the trigger (or sear/discon-

nector) seems to be effectively blocked. However, I wonder if it would be too easy to inadvertently disengage the grip safety even in a secure holster.

The weapon seems to be well fitted and rather tight. I question whether the barrel it came with was original, as it is unmarked, although that may not be determinative. Do you have any info or manual for this weapon, or diagrams showing the functioning of the internal mechanisms? P. S. I was able to test fire this weapon before sending this message. The new barrel shoots to point of aim. However, none of the three magazines will feed truncated-nose jacketed hollowpoints.

The original mag (marked .380, with what appears to be a stylized "D" logo) will chamber and fire hardball only, with an occasional jam on the last round. The two replacement magazines work better with hardball, but jam frequently, nosing the cartridge down more or less perpendicular to the feed ramp. Any help or advice will be appreciated! Ralph Himelick The German-made Ortgies went out of production in 1926. It was made in three calibers: .25 ACP, .32 ACP and .380.

Full instructions for disassembly/reassembly appear in the NRA Guide to Firearms Assembly along with some information on the safety system. Make a chamber cast and measure it against OAL data appearing in numerous reloading manuals. It is possible the headspace problem you mention is related to a mix-up in the barrel that came with the pistol. We wouldn't tamper with

the throat of the pistol beyond a very slight radius. The Ortgies didn't have a "ramp" like the Model 1911.

And unless it is equipped with a thumb safety (some models were), we would advise against carrying it loaded and in battery. As for your use of truncated nose bullets, remember, they didn't exist at the time your pistol was made. For reliability, stick with FMJ. Non-Ejecting Mossberg I recently got in a Mossberg Model 835 Ulti Mag pump shotgun chambered for 2-3/4-, 3-, and 3-1/2-inch shells. At first, it wouldn't eject 3-1/2-inch shells after firing; now it's having trouble ejecting the shorter 2-3/4s after firing.

The customer is using Federal shells; the 3-1/2 inch are Premium Mag 2 ounce. The right-hand extractor doesn't show any signs of wear. The only thing I can see that could be the problem is maybe the spent shell casing has expanded to where it has become a tighter fit from the unfired shell. There doesn't seem to be any problem unloading an unfired shell; in fact, the loaded shell can be put into the barrel and it falls out freely. Any advice would be greatly appreciated.

Mark Wiggins We wanted to double check our response with the Mossberg technicians at the NRA Show in Houston before getting back to you. We did so, and they confirmed that you should polish the chamber, which may be a little tight. If that fails to resolve the problem, you may have an older model, in which case you'll need to replace the right-hand extractor.

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