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PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

A TECHNICAL JOURNAL OF CRAFT, REPAIR & RESTORATION

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INSIDE THE ARCHIVE

MANAGING YOUR PARTS INVENTORY FOR MAXIMUM PROFITS

CALIFORNIA SENATE PASSES MICROSTAMPING • DISASSEMBLY/REASSEMBLY OF THE SABRE XR RIFLE • TROUBLESHOOTING

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 048

DIGITAL ARCHIVE EDITION

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FROM THE ARCHIVE

California Senate Passes Microstamping

BY AMERICAN GUNSMITH EDITORS NOVEMBER 2007

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In one of the most recent legislative examples of “don’t confuse me with the facts,” the California Senate passed AB 1471 just before this issue went to press. This bill would require that firearms sold in California include a patented, sole-sourced technology known as firearms “microstamping.” In this process, a firearm’s make, model, and serial number are laser engraved on the tip of the firing pin. In theory, that information would then be imprinted onto any cartridge casing fired in the gun.

In passing this bill, the California Senate ignored the findings of a recently released state-funded study done by the University of California at Davis that called firearms microstamping a “flawed” technology. The study concluded that: “At the current time, it is not recommended that a mandate for implementation of this technology in all semi-automatic handguns in the state of California be made. Further testing, analysis, and evaluation is required.

The Senate’s vote, largely along party lines, not only contradicted recommendations of California’s university experts, but also a

peerreviewed study published last year that demonstrated the technology is unreliable and can be easily defeated in seconds using common household tools.

The author of that study, Professor George Krivosta, concluded: “Certainly this research has shown that implementing this technology will be much more complicated than burning a serial number on a few parts and dropping them into firearms being manufactured. Last May, the California Assembly passed AB 1471, despite mounting concerns that firearms manufacturers would stop sales in the state rather than bear the astronomical costs necessary for microstamping.

Manufacturers, including Smith & Wesson, Glock, Beretta, Sig Arms, and Kahr Arms, have sent letters to California legislators warning them that microstamping would force them out of the Golden State. Industry officials estimate microstamping would add \$200 to the retail price of a firearm. “Compelling the use of this unreliable patented sole-sourced technology will

dramatically reduce the product selection available to law-abiding consumers in California,” said Lawrence G.

Keane, National Shooting Sports Foundation (NSSF) senior vice president and general counsel. “Many manufacturers will choose to abandon the California market rather than incur substantial costs associated with complying with microstamping legislation, which would include purchasing (at monopolistic prices) very expensive equipment and patented technology and completely redesigning their manufacturing processes, plant, and equipment.

Officials from NSSF have promised to bring the issue of microstamping up to the Governor. “Yesterday’s vote did not make this unreliable technology work any better,” added Keane. “We will continue to educate the Governor’s office on the failures and dangers of microstamping, and we remain confident that, in the end, science and common sense will prevail over anti-gun politics. ation on the facts concerning microstamping, please visit Editor Keith Lawrence Technical

MACHINING

Disassembly/Reassembly Of the Sabre XR Rifle

Chambered for a hot new round and benefiting from the high technology applied in its manufacture, the Sabre is not just another AR-15.

BY CHICK BLOOD NOVEMBER 2007

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Let me begin by mentioning an article titled “Barrel-Making Goes High-Tech” that appeared in the May 07 issue. That article was an overview of Sabre Defense Industries and the company’s barrel-manufacturing technology.

The barrels used in the article to illustrate this technology were being made for the venerable Browning 50-caliber heavy machine gun—otherwise known to servicemen as “Ma Deuce.” As pointed out in that article, Sabre’s original purpose for coming to these shores was to manufacture premium variants of the AR-15 and M16 for the civilian, military, and law-enforcement markets, but the Pentagon’s need for large quantities of high-quality 50cal barrels pushed that project onto the back burner.

Now, however, with its 50-cal barrel production catching up with military demand, Sabre is now refocusing on the company’s original purpose, and is producing one humdinger of an AR-15, known as the XR-Series. As you probably know, multi-gun shooting competitions are held around the country under the auspices of the United

States Practical Shooting Association (USP-SA). According to my sources at Sabre, these matches are playing a significant role in driving the AR-15 market.

I was pleased to learn that the Sabre employees who actually work on and produce the XR series also fire them in these competitions. Can you think of a better way for a manufacturer to get quicker feedback on product performance? I can’t. The “hot new round” I mentioned in the subhead above is the Grendel 6.5 mm. I know, we all remember the Grendel semi-automatic pistol—an overcomplicated misery to work on—and no gunsmith I know was sorry to see it pass from the scene.

Happily, the ill-conceived and ill-fated Grendel pistol has nothing whatsoever to do with the new Grendel 6.5mm round. Invented by Bill Alexander of Alexander Arms, the Grendel 6.5 mm was designed specifically for the AR-15. Built on the phenomenally accurate 6mm PPC case and packing a 123grain Lapua Scenar bullet, the

Grendel 6.5 mm has a ballistic coefficient in excess of 500 and produces a muzzle velocity of 2,600 fps.

Its longrange performance totally dusts off the more commonly used 5.56 mm (.223), and it does so with half the recoil of the 7.62 mm Nato. The ammunition is currently Alexander Arms. Other sources include Ammunition, and I’m told Lapua will soon join the list. So now that you know a little about the cartridge, the competition it’s used for, and the gun manufacturer, how about some technical dope specifically on this XR rifle?

The upper and lower receivers are CNC-machined from forgings of 7075-T6 aircraft aluminum. Barrel blanks start out as heat-treated rounds of MIL-S-11595, a highvanadium steel alloy. Hole size, roundness and straightness are held to 0.0005 of an inch. Bore dimensions stay well beneath Mil Spec of plus or minus 0.0004 even after button rifling. Complete field stripping would include the boltcarrier assembly, handguards, buffer and action spring, as detailed in the text.

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F Not shown is the Mag Na Tip bit adaptor for the torque wrench. All are available from Brownells. fling and chrome plating. The plating itself is restricted to a thickness of 0.0013 to 0.0020 inch. At the appropriate time during the process, the barrels are stress relieved. The one I worked for this article was the XRAR15A3, which has a 16inch 1:7.5 twist barrel, an A2 flash hider, and an extended gas tube to reduce felt recoil. Its flat-top upper provides for the mounting of a wide variety of optics.

These features, along with its flip-up front and rear sights, make it an excellent choice for competition among other things. Let's start taking down this honey. Field Stripping This is one tightly put-together rifle, so resist all temptation to get brutal with it. After pulling the magazine and racking back the charging handle to make sure the chamber is empty, release the handle and move the selector lever to "safe." You accomplished two things by racking the right, and pull on it until it stops.

Pivot the upper receiver away from the lower receiver. Push the front pivot pin to the right, pull it until it brings you to a halt, and separate the upper from the lower. Next, grasp the charging handle and pull it rearward, bolt-carrier assembly (body) attached. Lift off the assembly and remove the charging handle from the upper. With a small punch, push the firing-pin retaining pin out, invert the carrier, and dump out the firing pin.

Give the bolt-cam pin a quarter turn to clear the boltcarrier key, lift the pin free of the carrier, and remove the bolt to the front. Reach in with a small dowel or punch and

depress the buffer-retainer pin. Hang onto the buffer; it's keeping a mighty strong action spring inside the receiver extension. Ease both components out. At this point you can give the piece a really good cleaning, but I feel there are a few specifics concerning the task that are well worth mentioning.

Cleaning Tips Working from breech to muzzle through the upper receiver, swab the bore with CLP (the manufacturer's recommendation). If using a sectional rod, back off the last segment (the first to enter the barrel), and make it two turns from tight. Whether you choose a sectional, one-piece, or flexible rod, when you attach a brush or jag to it, let it be two turns from tight. Why? Becharging handle: You checked the chamber, and you cocked the bolt which you have to do anyway to move the selector lever.

C Now place the butt of the rifle on your benchtop, press down on the upper hand-guard snap ring, and lift off the guard. Push the rear takedown pin to the cause the brush or patch will clean better if it's allowed to rotate as you pull it through the bore. Of the three cleaning accessories, I prefer the Otis Technologies kit for cleaning chromelined bores. Sabre Defense must agree. They packed a kit for the caliber with the rifle they sent me.

The kit, typical with Otis, comprises a generous length of plastic-coated, aircraft control cable with a caliber-specific brass receptacle at one end for attachments. Those attachments and a brass Thandle fixture thread onto the cable. With the muzzle pointing down, I carefully lowered the cable

through the barrel, avoiding contact with the bore. Sissy stuff? Not if you're as concerned as I am about scratching a chromed bore.

When two or three inches of the cable extended from the muzzle, I loosely attached a brush to the cable's breech receptacle, secured the T-handle to the muzzle end at the upper, and pulled it through. With a badly fouled bore, this would have to be repeated at least twice at an absolute minimum. I attached a brush matching the chamber dimensions to a pistol-cleaning rod, doused it with CLP, and inserted it from the rear of the receiver. Rotation no back-and-forth action, please, will do the job.

Then it's back to the Otis rig, this time fitted with a patch loop and a wet patch. Several of these are pulled through, followed by dry patches, until the last couple come out clean. One more patch or cotton swab follows carrying a few drops of quality lube. The lube can also be used to deposit a light coating on your cleaned chamber, the bolt-locking lugs, and the insides of the upper. We're not through yet. Clean off all bolt surfaces, and lube the firing pin and its recess in the bolt carrier.

Use additional lubrication on the outside of the bolt-cam pin, firing-pin retaining pin, bolt-assembly cam-pin hole, bolt rings, and the outside of the bolt assembly. Go after any powder residue with a CLP-soaked toothbrush or acid brush. Lube any moving parts you have scrubbed off. Clean all surfaces of the bolt carrier. Finally, use a pipe cleaner to reach into the carrier



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Sabre XR-Series Semi-Automatic Rifle (Specifications
subject to change without notice)

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5 mm (A) is midway in size between the standard .223 (B) and the 7.62 mm Nato (C). key and put one drop of oil inside the key and to lube the exterior of the carrier. The rifle is now clean enough to function without any problems related to dirt. Detailed Disassembly You may want to make separate copies of the schematics included here and refer to them individually as you work with the respective assemblies.

You'll notice there are no parts numbers on the drawings, so the usual numbers will be missing from this text. There's no need for them because labels on the drawings identify each component. I like this format and it certainly saves time, since it eliminates the constant cross-referencing between a number on a drawing and the name in a list of parts. To disassemble the barrel assembly, compress the delta ring to the rear, pivot the lower handguard halfway to maintain pressure on the ring, and take off the guard.

Now remove the upper handguard. A starter punch gets the gas-tube roll pin moving from left to right. Switch to a roll-pin punch to drift the pin out fully. Rotate the gas tube a little, move it to the rear of the barrel, then pull it free. Press down on the barrel nut and withdraw the barrel to the front of the assembly. It is a friction fit. When a match barrel is involved, it is secured with Lok Tite, but don't panic's abre doesn't use the red stuff on this union.

Gently heating the receiver or the barrel will break the bond. To remove the spring clip at the rear of the barrel nut, a small pin

punch or a set of snap-ring pliers can be used to dislodge the pin from its groove. On some XR rifles, the front sight base is secured to the barrel with two tapered pins. These are started left to right with a pin punch, and then drifted totally out with a cup-pin or straight-drive punch. On the XRAR15A3, the base is attached with four socket-head screws running through two brackets.

Routinely, there's no need to remove the base. If it's damaged, however, the flash hider has to be taken off the barrel first. This is done with a thin 3/4-inch wrench (knuckle-buster variety), turning the flash hider counter-clockwise as you look at the muzzle. The sight can now be rotated and carefully driven off the barrel. The other reason you might have for getting the sight out of the way is if you ever need to get at the handguard cap. The sight retains it.

Pictured here along with other needed tooling is an AR-15 receiver action block (Brownells #702-003- 015) that protects the upper when it's locked in a vise. Following the instructions that come with the action block will make your life easier as you continue on with the disassembly of the upper, bolt, and bolt carrier. In field stripping, you took out the bolt cam and removed the bolt.

Let it rest while you undo the bolt-carrier key screws and take off the key. (Note: These are staked in on both sides at the factory and must be similarly restaked in re-assembly.) The bolt gas rings are next. There are three of them, and each has a

gap. Ascribe will help in getting them off the back end of the bolt. Just remember when you reinstall them that those gaps must never be aligned. The middle ring's gap is positioned at 12 o'clock, with the rings fore and aft of it at 3 and 9 o'clock.

It's your choice which goes at 3 and which at 9, but if you ignore the noon, three, and nine rule, the rifle will short cycle. It's a gas system thing. And one of the primary causes of malfunctions with any AR- 15 is "someone" disassembling the rifle and then carefully aligning these gaps during re-assembly. The extractor and ejector assemblies are retained by two pins.

Start them downward, but before drifting them out completely, you must be prepared to capture the ejector and its spring along with the extractor spring and its insert. With the latter, put some pressure on the extractor and ease it plus its related small parts away from the bolt as the pin is removed. Unless the ejection port cover, spring, pin, and pin-retaining clip have been run over by an 18-wheeler, leave them on the upper assembly. The reason is the spring.

It has to be wound before being reinstalled in the cover, then held in position and speared by the cover pin. The spring will naturally attempt to unwind all by itself while you try to keep it from doing so. The forward assist itself presents

DISASSEMBLY/REASSEMBLY OF THE SABRE XR RIFLE CONTINUED

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no similar problem. Press in on the plunger, start out the pawl-spring roll pin, and keep pressing on the plunger while drifting the pin completely out. This gives you free access to the balance of parts in the assembly. Unless there's some serious damage, I advise against a takedown of the rear sight. As you can see, there are numerous tiny components, and every one of them is easily lost. If a sight gets broken, replace the whole thing.

If it gets dirty, run the elevation knob up as far as it can go, grab a can of Gun Scrubber or brake cleaner, an acid brush, and apply both to the crud. A light lubrication after this cleaning will enhance further sight function. Regarding the lower, install an AR-15 magazine filler (Brownells) in the receiver and clamp it between padded vise jaws bearing on the magazine well. Release the tension on the hammer and ease it forward into the fired position.

About the hammer: It contains a crimped-in J-spring that should be left as is. Also, the tail of the hammer spring exerts pressure on the groove in the trigger pin, which, by the way, is identical to the hammer pin. Give the hammer pin a nudge with a drive punch. Remember those springs mentioned and hang onto the hammer while you drift the pin the rest of the way out. Depending on the nature of the screw head, along-shank hex wrench or hollow-ground blade driver undoes the grip screw.

The safety-detent spring is housed in the grip, so be careful when separating the hand hold from the lower. The safety lever has to be rotated to a place halfway between "safe" and "fire." Press inward on the opposite side of the lever to get it moving, and then pull it from the receiver. The safety detent is pushed downward and out

of the lower with a length of drill rod or a parallel-sided drift. Note on the schematic that a couple of springs are placing tension on the disconnecter/trigger assembly.

When you push the trigger pin through the lower, leave the drift in place. Hold onto the disconnecter as you remove the drift, at which point you'll feel the spring tension fighting you. Control it and maintain control as you ease the assembly down and out. The trigger-spring coils have been squeezed together before being placed between the upper "ears" of the trigger. Don't yank out the spring.

Slip a small-blade screwdriver or piece of shim stock between one ear and a coil of the spring, and compress the coils slightly before removal. Avoiding damage to the finish on the lower when removing the bolt catch requires some preventive measures, but before getting into those details the stock has to come off. Back out the buttplate screws. The butt-cap spacer will either stay stuck in the stock or fall off. It rarely remains attached to the receiver extension.

Once the stock is gone, the takedown-pin detent and spring will be exposed. Take them out and remove the pin. Now back to the bolt catch. Its roll pin is located in a manner such that getting it out forces you to lay your punches, both starter and roll, parallel to and up against the side of the receiver. The possibility of marring the finish is obvious, so lay down a strip of duct tape or a couple of strips of masking tape before you put the punches to work toward the rifle's muzzle end.

Press in on the magazine catch to the maximum and begin to unwind it. The shaft of the catch, threaded on one end, runs through the catch spring and ends up retaining the catch button. Once parted from

the catch, both spring and button will drop from the lower. Next insert a short length of straightened paper clip into the hole in the front pivot pin. Use it to rotate the pin, depress its detent and spring, and pull out the pin. And, yes, both the detent and spring will take off big time if you let them.

What you're left with at this point is a detail-stripped upper, barrel assembly, and a lower with the barrel extension still attached. The extension is torqued on and can be cleaned out where it is. If you have a torque wrench, though, and the extension is damaged enough to require replacement, take a quick reading on the inch-pounds it's been tightened to and match that in reinstallation. Otherwise, I suggest you leave it alone. Speaking of torque wrenches, you'll find a specialized one pictured.

It's built to tighten the carrier-key screws to their specified 35 inchpounds. When it reaches that point, the wrench turns freely and tightens no more. It's not the cheapest of hand tools, but when equipped with its Mag Na Bit adapter (sold separately), it's perfect for properly resetting those key screws before they're re-staked. Reassembly Tips Normally I provide some tips, but this time I'm going to suggest you get a book from Brownells. It's written by Walt Kuleck, a Ph.

D. with Fulton Armory, and Clint Mc Kee. In 150 pages, they take you step by step in clear pictures and succinct text through the assembly of an AR-15. The tools you'll need are also described. After reading the book myself, I feel confident in saying any gunsmith who was handed a box of parts adding up to a complete AR-15 could put them together and end up with a safe, perfectly functioning rifle. I

PEOPLE & COMPANIES

Troubleshooting Cycling Problems on the Remington 742

This semi-automatic centerfire is a favorites of deer hunters. Once the mechanics of the rifle are understood, some simple steps will ensure that it performs properly when called upon.

BY DENNIS A. WOOD NOVEMBER 2007

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As sure as there will be another tomorrow, I can count on several Remington Model 742 semi-automatic rifles to show up in my shop needing some sort of attention right after deer season ends around here. The 742 is a very popular choice with deer hunters in this area. Made from 1960 until late 1980, the M742 was produced in chamberings to satisfy the need of a variety of users, from .243 caliber on up to the venerable .30-06.

In normal use, there are a number of things that can go wrong with the Remington 742, and then there are problems caused by those who don't quite understand how this rifle should operate. Diagnosing Malfunctions The rifle's owner is the best source of information

when it comes to determining what's not working as it's supposed to. The place to start is where the customer directs you.

Questions to ask are: "Will the rifle fire?" "Does it fail to close and lock closed?" "Does it fail to feed, fire, and extract the empty?" But don't trust the owner's Top Bottom answer implicitly. Sometimes you'll have to test fire the rifle and see for yourself what you're dealing with and exactly what's wrong. The first step in the troubleshooting process is a complete takedown and cleaning. This gives you a chance to look everything over for any obvious signs of damage as well as broken or missing parts.

If, for example, the problem is a bolt that fails to close or closes with a sluggish action, you'll want to pay particular attention to the

action spring and action bars during the takedown and cleaning procedure. Look the action spring over to see if the spring works freely over the gas tube, and check to see if the action bars are rubbing too much along the inside as they are worked backward.

If the action bars are bowed outward, they'll need to be straightened so they slide without resistance when worked by pulling the bolt handle backward. If the action spring is pitted from rust, it's best to replace the spring. Inspect the retaining pin for the bolt handle to see that the bottom of this pin is flush or slightly below the outside diameter of the bolt carrier. If this pin sits too high, it can rub on the

TROUBLESHOOTING CYCLING PROBLEMS ON THE REMINGTON 742 CONTINUED

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top of the magazine and impede bolt movement during the firing sequence. Take a look at the disconnecter in the trigger group to see that the forward leg is flat to the receiver wall so that it functions correctly. If it's bent inward or outward, straighten it so that the front end of the disconnecter will ride on the action bar as it's supposed to. Also make sure that the ejectionport cover slides back and forth freely as the action is hand-cycled.

These covers are plastic and over time will often get brittle and break. Brownells sells a one-size-fits-all replacement ejection-port cover. Feeding Failures If the rifle fails to feed correctly, the first suspect would be the magazine. Inspect all the magazines the customer uses in this rifle. If the magazine assembles too low in the receiver, try a magazine latch

with the next higher number. If the magazine feed lips are damaged, you can waste a lot of time trying to get the lips back to where they should be.

In this case, I think it's This is almost certain to cause malfunctions. time to replace the magazine. We often wonder how sticks, deer hair, and pine needles find their way into a rifle action. When fully charged spare magazines are carried in a coat pocket, any debris that can get into the pocket will migrate into the magazine. And then, as the rounds are cycled from the magazine into the action, this debris will go along for the ride.

I tell my customers to carry spares in a magazine pouch, or if they must be carried in a pocket to seal them up in a Ziplock sandwich

bag, preferably, one that hasn't previously been occupied by a sandwich. Push the follower on the magazine down with your forefinger to see if you can feel any rubbing or hesitation with the follower coming back up quickly. If you detect rubbing when the follower returns, it will need to come out of the magazine for some polishing.

The magazines for these rifles are quite easy to disassemble once you understand the method. To remove the follower, tilt the rear end of the follower downward while lifting on the left front end of the follower, then turn this side up and out of the magazine. The rear of the follower is then turned downward so that it becomes free from the pin on the boltrelease button/lever. Clean out all the pocket lint, sticks, and other debris

TROUBLESHOOTING CYCLING PROBLEMS ON THE REMINGTON 742 CONTINUED

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Often, this condition never gets any worse than what's seen here. Inside the magazine box and wipe the inside surfaces with a light coating of oil. Look over all the outside edges of the follower that ride along the inside walls of the magazine box for any signs of burrs or rough edges from the stamping die. If these edges feel rough, a once-over with a fine file will remove the rough spots, and then give the edges a dressing with 400-grit emery paper or polish on a power buffing wheel.

To get the follower and spring back into the magazine box, you first pinch the bottom of the follower spring up toward the underside of the follower with your forefinger and thumb. Make sure that the shank of the magazine-release lever is up toward the top of the rear opening in the magazine box. Tilt the

follower so that the hole in its left rear end goes over the shank of the magazine-release lever, and work the rear end of the follower into the magazine box while maintaining the pinching of the follower spring.

Push the front of the follower spring down into the magazine box, tilt the right front end side down and into the box, and then the left front end. Once you do this a couple of times it becomes a simple operation. Bolt Lock-up Failure If the bolt head fails to lock up completely, we need to check the bolt latch to see if it's broken and needs replacement. If the barrel nut is loose, this could be another reason why the bolt head is not able to get locked up correctly.

Check the locking-lug recess in the barrel shank to see if there is anything captured in this recess that could prevent the bolt head

from rotating into place. A major problem I've seen over the years involves rifles in .30-06 caliber. Many of these rifles show excessive signs of "bolt over-rotation." This is caused by the over-rotating of the hardened bolt head when it's in its most rearward position in the receiver. There will be obvious peening marks as shown in the photo.

Some rifles show this peening condition to be far worse than others, and the only thing we can do about it is to make the owner aware of the condition. In some cases it will get no worse than what it is, and in other cases it will scrape the receiver. I've seen one case where the peening was so drastic that the impression caused by the over-rotation of the bolt head was deep enough to retain the bolt head to the point where the bolt carrier was unable to bring (continued on page 22)



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the rifle back into battery. Once the bolt is removed from the receiver, check the front face of the bolt head to see that there is a smooth transition for the cartridge head over the rim of the bolt head and extractor. If there is a “step,” it should be removed carefully with some very judicious stoning. Use a punch to test the ejector head to see that it’s moving freely forward and backward in its residence.

Inspect the inside of the bolt carrier to ensure there’s no gunk in the area of the firing pin, and make sure that the firing-pin spring is in place. Check the firing-pin nose for any deformation that could prevent it from poking out the front end of the bolt head. Sometimes, a bent firing pin can be straightened, but often it may break during the straightening process. When reassembling the bolt, make sure that the bolt-latch detent pins are correctly installed in the bolt head.

The little spring goes in first, and then the detent with the spherical head goes in the detent hole toward the front face of the bolt head. The spring goes in first for the rear detent, and this pin is flat on each end so it doesn’t matter which end enters first. Inspect the

Trigger Group It’s a good habit to look the trigger group over thoroughly. In the example shown here, somebody clipped several coils off the sear spring and then stretched it out a bit.

As you can see, the rear leg of the bolt latch does not touch the front end of the disconnecter. This attempt to achieve a lighter trigger pull resulted in very little to no tension on the disconnecter, causing the trigger to fail to release the hammer on occasion. This condition can also cause the hammer to fail to engage the sear and can lock the hammer in the cocked position. Clipping coils from this spring is not a good idea, and the owner was advised that his attempt to reduce trigger pull was not a good plan.

This spring was replaced with the correct factory spring. Conclusions Although this article was specifically about troubleshooting the Remington Model 742, most of these safety and function checks apply to other semiautomatic rifles’ particularly with regard to the importance of a thorough takedown and cleaning. It’s like an old gunsmith once told me: “If we don’t take care of our customers, somebody else will.” I

METALWORKING

Managing Your Parts Inventory For Maximum Profits

With the proliferation of gun-parts magazines, catalog retailers, and gun-accessory websites, your profitability depends more than ever on an intelligent control over your parts inventory.

BY ARTHUR J. HUNT NOVEMBER 2007

ORIGINAL PP. 11-15

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If you know anything at all about merchandising, you know you need to control—and I emphasize control—the volume of parts you stock. Of course, there are certain things you must keep in inventory, like screws, springs, pins, as well as a variety of metals for making custom parts. But I am not talking about those things here; what I am talking about are more expensive parts, like sights, mounts, grips, recoil pads, and the like.

The gun-parts distributors who read this will hate me, but it's in keeping with my continuing crusade to make a profit—and keep that profit—that I'm forced to commit these words to paper. First and foremost, you must realize that trying to keep a complete stock of parts for even the most popular or often-repaired firearm is not only expensive, but unnecessary. Nevertheless, if you repair a popular gun that needs a new extractor, you probably don't want to order just one.

If you know you use six of these a year, buy four rather than six, and keep them in inventory. For one thing, extractors are cheap, and you probably can't order just one anyway, since there likely will be a minimum charge from the factory. So to

keep your costs down, either buy enough extractors to meet the minimum or add something else that you know you'll sell within a year. Service on most parts—whether directly from the factory or a parts house—is usually a three-to-four-week process.

Most gun owners know this, so there is usually no hurry on the part of your customer. When you order more expensive parts only when you need them for a job you're working on, you have an immediate turnover which is profit right now. You're not tying up your money in the expectation that a particular repair will come in—which, of course, might never happen.

In other words, when you attempt to carry an inventory of more expensive parts you're essentially gambling with your money, playing the odds that someone will come in who needs them. You make money only on parts that sell—even if you get great satisfaction in looking at those drawers full of iron. What really tells you if your parts supply is making you money or not is accurate record-keeping.

Take an inventory, price it out, and create a daily-weekly-monthly sheet that shows what you've sold from that business and

the type of work you do will obviously factor into this, so there is no set formula that can be followed; and if you specialize in a particular type or brand of gun, that will also play apart in determining the size and type of inventory you keep.

A “good inventory”—“once you determine what that means for your operation”—will help not only in maximizing your profit, but will help to reduce the turnaround time on a given repair, which also helps to maximize profit. An accepted rule of thumb for any retail operation is that the inventory should turn over at least twice a year. Remember, those drawers full of parts don't make you any money until they go out the door. Let's suppose you have \$5,000 worth of parts in stock and only sell \$2,000 per year.

This is not smart, and certainly not profitable. One of the greatest dangers for the small shop is a large inventory of sights, particular inventory. Sure this is a little work, but you will learn the truth about the value of your inventory and whether it's making you money or costing you money. You'll know for sure if it pays to carry apart in inventory or not. The size of your

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ly pistol sights. These are not only expensive, but can sit on your shelves for years. If you feel you need to stock sights, pick the brand you like best and buy one set each for the most popular guns. When you sell one, order another, but keep records of your inventory. The same is true of scope mounts. These can really kill you. Check your records for the last year and determine the models and types that you've actually sold. These are the only ones you need to keep in stock.

In many areas, the large chain stores like Wal-Mart and K-Mart carry things like sling swivels, choke tubes, recoil pads, scopes and scope mounts. In most cases, you can't sell these items for the same price that they do. Therefore, you'll want to avoid keeping an What? Fifteen Dollars for a Screw?

While we're on the subject of the gunsmith's parts inventory, we should spend a few moments thinking about those parts

that can't be easily obtained with a simple phone call to the order desk at a gun factory or parts house. Sure, you're going to keep an inventory of small parts' screws, springs, pins, and so forth. But what about that oddball screw for an unusual or older firearm that isn't just a phone call away? Is \$15 a fair price for the screw you have to make from scratch? The answer is: No, \$15 is too cheap.

Think about it. If you order that screw, you've got along-distance phone call to make, a shipping charge to pay, even before the screw gets to your bench. Even if you get the screw from a nearby hardware store, you can't drive very far these days for \$15. This brings me to another area where the gunsmith has an advantage that he can exploit' that he must exploit' over his competitors in the gun-parts business.

And that, of course, is that unavailable part for a discontinued firearm' of which there are thousands inventory of parts that anyone can buy cheaper from Wal-Mart. The one thing that these chain stores can't do is offer installation. But don't be too hard on your customer is he buys a scope at a discount chain store and brings it to you for installation. After all, he's no different from you' he wants the best price he can get.

And keep in mind that when that gun starts to malfunction, he won't be taking it to Wal-Mart to get it fixed; he'll be bringing it back to you. There's little that the gunsmith can do about the fact that his business in accessories and parts is shrinking because of the merchandising that's going on. Gun stores and gunsmiths have no control over who can stock and sell these items. Since the introduction of publications like Shotgun and thousands. Can a gun owner walk into Wal-Mart and have a custom screw turned?

Of course not. I'll use the example of making a screw here, but the same logic applies to any otherwise unavailable part. So is a \$15 screw expensive or cheap? Let's look at the facts. First off, you have to have a lathe, the proper steel, the proper dies, a micrometer, a steel ruler, some cold blue, not to mention a fair amount of know how.

The lathe can run anywhere up to \$10,000, but let's assume you have a good used one that might have sold for \$2,500 to \$3,000. (A good bench lathe can be had for that.) The steel, if bought from Brownells, is the least expensive item on our list, but you probably ran out of the size closest to the head diameter, so you need to use a larger piece than necessary. The dies can run anywhere from \$4 to \$15, and the handle a little more. Micrometers, even the good 1-inch digital run \$60 to \$75.

So taking just these items into consideration, we're already around \$3,000 in equipment to make a screw that we have no dimensions. News and the creation of zillions of gun-parts and accessories websites, the world has become aware of the fact that most parts can be purchased directly without an FFL. But the gunsmith still has one leg up, and that's installation, repair, and custom work.

That's where the gunsmith market will be for some time to come, and that must be factored into the inventory you keep on hand, since more and more gun owners are going to be buying these parts this way and then asking a gunsmith to install them.

Unfortunately, there's no price protection offered to the gunsmith by any of the parts houses. This means that where once we would have ordered apart and added the shipping and a small markup for a little profit, now we've lost the advantage. Now everyfor.

And we haven't even factored in the cost of your education in using this equipment. Before we begin, we make a sketch, determine the approximate length, threads, diameter, and type of head. Let's say it is a fillister head, head thickness unknown, with a length overall of 3/4 inch and with 1/8 inch cut to 5/40. We turn a piece of metal down, cut longer threads than necessary, then cut them off so only 1/8 inch of thread is left, then turn the head down to the correct diameter.

In this case, we'll say we were lucky and found a number drill that when squared off on the smooth end, fit the hole. We have to leave the new screw-head diameter long enough so that we can cut the new screw off, reverse it in the chuck, and by fitting the new blank head in the piece that it will go into, we can make around mark to show the length. By being careful, we can then cut the head down to the proper thickness. Now we can use a screwslotting file and hopefully get the slot centered in the head.

THEN WE HAVE TO SPEND THE TIME IT TAKES TO

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MANAGING YOUR PARTS INVENTORY FOR MAXIMUM PROFITS CONTINUED

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one knows what these parts cost, and no one wants to pay us more than the parts house gets for a given part. This brings me to my final piece of advice: Don't try to be a parts house yourself—not unless you want to go into the parts business instead of the gunsmithing business. In other words, my advice to gunsmiths is: Don't sell parts separately, without installation. First off, you have the problem of competing on price that I've just outlined.

Second, if the part is coming from your inventory and it's a hard-to-find part, you are hurting yourself if you sell that part without the additional profit you'd make on the installation. You're in the business of repair, and you install all parts that you sell. And finally, never order expensive or unusual parts unless you have blue it, of course, and to admire it. Now, let's see how much money we lost. Yes, lost.

If you charged \$15 for this screw, used all the equipment that I listed, and it took you somewhere between 30 and 45 minutes, you did indeed lose money. First off, that lathe, dies, and micrometer are not going to last forever. They have to make money for you. If you charge as much as your local machine shop does (he probably doesn't have the taps and dies that you do), which is about \$50 an hour and you charged \$25 for the screw plus your minimum of \$25, you would have a \$50 ticket.

So even \$25 would be relatively cheap for a custom-made screw. If you had built a custom firing pin for your customer and charged him \$50, he wouldn't give it a thought. Because in his mind, building a custom firing pin is different than making a little old screw. But, in fact, the custom screw could be a more time-consuming project than a firing pin.

Despite the fact that people think of screws as being cheap, if one isn't available and the the gun in your shop and the full amount of the part has been paid in cash up front. So where does this leave us? If we do a repair job that calls for a part available from a parts house, and the customer has the catalog or looks at the website, you're not going to be able to charge more for that part (like we should be able to do). You'll have an unhappy customer on your hands who thinks you're trying to rob him.

But I have away of handling this. The customer can buy all of the parts he wants from whomever he wants, and I will happily put them in for him. But I will also guarantee you that the customer will pay me a profit on those parts that's hidden in the final bill. We'll get into the specifics of that in a future article. I gun and its parts are discontinued, a custom screw is a piece of custom machine work, and must be priced accordingly.

Try to explain to your customer that you're bringing a gun back to life that can't be used without that screw. The gun may have only cost \$50 when it was new, and for the first time in 50 years it needs \$50 worth of work. I wish I could keep my old car going for the same years-to-dollars ratio.

In the final analysis, while it's very satisfying to make a customer happy by repairing his prized gun, you can't work for nothing, you can't replace your lathe for nothing, and you can't spend satisfaction at the grocery store. You deserve to be paid a fair wage for a fair job. Remember, if you work cheap, then the world will laugh at you for your stupidity. Charge a fair price and everyone will realize you're the first-class craftsman that you truly are.

And if all else fails, do what I've done for the last 50 years: Tell your customer that if he can't afford to pay a fair price for your work, then don't bring you his guns.

MAINTENANCE & REPAIR

Installing a Timney Trigger on the Ruger Model 77 Mark II Rifle

An aftermarket trigger can eliminate creep and over-travel as well as providing a means for adjusting pull weight. Some, like this Timney, can be fitted with hand tools, although a mill is helpful.

BY NORMAN E. JOHNSON NOVEMBER 2007

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The Ruger Model 77 MKII trigger assembly is a basic three-piece design including the sear, trigger, and spring. The factory-installed trigger on the Mark II has no provision for adjustment, except for what can be accomplished with spring replacement. For the best accuracy and ease of use, this rifle fairly begs for a highquality aftermarket trigger assembly. My personal choice for this rifle is appearance to the original factory parts.

Both the trigger and sear offered for this model are cast of 440C stainless steel hardened to 58-60 RC and surface ground to exact geometric tolerance. Timney provides comprehensive instructions for installation of the Ruger M77 MKII trigger and sear. Removal of the old parts from the receiver is simple. Each is held in place by a free-float-

ing pivot pin. First, the trigger-retaining pin is pushed out, and then the trigger falls free of the hanger along with the spring.

The Right and far The sear-adjusting set screw on the Timney is not clearly seen in this profile view. sear is then removed by pushing the pivot pin outward and lifting the sear upward from its milled slot in the receiver. Installation of the new sear, spring, and trigger are performed in the reverse order. With the Timney trigger, there's a spring included that provides an adjustment between 1-1/2 and 2 pounds.

For a heavier pull, the original Ruger trigger spring can be used, although to a degree, at least, this defeats the purpose of installing a custom trigger. The trigger spring is adjustable from below with a screw on the lower side of the trigger. An Allen wrench is provided for this purpose. The rifle can now be

cocked and fired, but the safety will not work at this point. The next step is to double-check the sear-trigger engagement. Timney has a unique method of adjusting this.

A small set screw protrudes diagonally through the front portion of the sear enabling it to push on the trigger. The set screw is readily accessible through the firing-pin slot in the bolt channel. Through trial and error, the sear can be precisely adjusted with a small Allen wrench. However, the sear engagement has been factory set, so unless you are knowledgeable in this area, leave things alone. Any final adjustment and fitting of the safety must be performed after the sear is adjusted.

Both the sear and trigger are highly polished on the working surfaces for a smooth, crisp release.

INSTALLING A TIMNEY TRIGGER ON THE RUGER MODEL 77 MARK II RIFLE CONTINUED

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The two floating pins at the side of the action are pushed out to remove the trigger and sear. The rotary trigger-locking mechanism engages the tab on the trigger, preventing the rifle from firing. The Timney's safety function works on the same principle. The set screw and nut on the trigger tab are used to adjust over-travel. With the trigger and sear in position and adjusted, it's time to fit the safety and trigger assembly. While this is not especially difficult, it does require extreme care.

First, the bolt is installed with the trigger and sear cocked. You'll note that the safety cannot be engaged at this point. Metal must be removed from the safety tab of the trigger where the rotary safety selector makes contact. In the instructions that come with the trigger, mention is made of using a file here. On the trigger I installed, 0.035 inch of metal had to be removed from the safety tab before the safety selector could be turned into position.

In my experience, 0.035 inch is a lot of filing to do while still keeping the surface on the safety tab square. Instead, I used an end

mill with the trigger held perfectly square in a mill vise. Re- The Timney sear shows the rounded set screw protruding through, which is used to precisely adjust sear/trigger engagement. I moving too much from the safety tab" even as little as 0.005 inch too much" can render the safety ineffective, so proceed with caution.

With the safety tab properly fitted, try the action and trigger several times. Use the slam-fire maneuver as the bolt is opened and closed rapidly. The rifle must not discharge. Also, place the safety in the "on" position and pull the trigger. Then release the safety to see if this would cause the gun to fire. It should not, of course. Try all these things several times to be certain the gun is safe. Further adjustments can be made after the safety is properly fitted but before the action is replaced in the stock.

These would include the adjustment of trigger overtravel and the trigger spring. It may be necessary to inlet the stock below where the overtravel adjustment lug enters the stock before the action is placed in the stock. A small, sharp chisel is probably all

you would need for this. The over-travel adjustment consists of a lock nut and set screw located at the left side of the trigger that come in contact with the action. This setting is made by trying the screw contact as the rifle is cocked and fired.

Lock the nut after the desired trigger travel is attained. The action can then be placed in the stock, ready for use. Conclusion Converting an essentially non-adjustable, 5-pound factory trigger to a safe and crisp pull weight of 1-1/2 pounds is sure to make your customer happy, and it's relatively simple to do with this innovative design by Timney. Just for your information, Timney will install the trigger for \$30 plus \$8 to cover the return shipping.

Since it would cost at least an additional \$8 to ship the rifle to Timney, with no guarantee of how long it will be before the rifle is returned, my feeling is that you should be able to charge \$50 or more for the installation. And that's not too bad for what should be less than a hour's work.

PISTOLS

Upgrading the Arcus Pistol

There's profit in reworking this imported Hi-Power clone, and for the most part, you can use the same techniques and aftermarket parts you'd use on the Browning original.

BY CHICK BLOOD NOVEMBER 2007

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In June 1923, a patent application was filed for a 9mm Parabellum semi-automatic pistol. The patent (#1618510) was granted in February 1927, just three months after the inventor's death. Here's how that gun is described and how it works: It is recoil-operated with a locked breech, an exposed hammer, and reloads itself after each shot until the magazine is empty. The ribs on the barrel's breech end engage similar grooves in the slide that firmly lock the two together at firing.

The breechblock is integral with the slide, thereby sealing the breech against forces expected when the gun is discharged. Recoil continues with the breech sealed until the bullet exits the bore. At that millisecond, the rear of the barrel is cammed down to disengage it while the slide and breech block continue to the rear. Extraction, ejection, and reloading of the pistol from a fixed magazine are close to being identical with the inventor's other breech-type pistols.

Its safety systems block the hammer, sear, and include a magazine disconnect. Sound familiar? It should. It was the last semi-auto handgun designed by the immortal John M. Browning. Initially produced in quantity by Fabrique Nationale in Belgium as the GP 35, the pistol is far better known as the Browning Hi-Power. The gun remains in production with a retail price of around \$800. That's for anew-in-box, untouched pistol.

The pistol pictured here is a clone of the original Browning design with the exception that its thumb safety blocks the hammer rather than the sear. Outside of that and some minor cosmetic refinements, the Arcus has been made by the Bulgarian company with the same name since 1994. It's produced quite nicely, I would say in both single-action (Model 94) and double-action (Model 98) versions. The latter has an additional "firingpin safety mechanism." By that, I assume the manufacturer means "firing-pin block."

Both models are sold for import to these shores. The Model 94 I worked with for this article was imported by Century Arms, Inc. Although there are other sources of Arcus pistols, I have a good reason for including Century Arms' phone number in the previous paragraph. The reason is that the price of a Browning Hi-Power is too high for some customers to bear. But you can suggest that the customer buy an Arcus, and save him about \$500 over the cost of a Browning.

And then you can suggest that he use some of that savings to pay you to make some upgrades to the Arcus pistol. In fact, he might get carried away with the upgrades as some customers do and you could make a lot more than if you'd sold him a Browning in the first place. This limits to some degree the steps you can take in performing a significant upgrade to its function as a personal defense handgun.

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While it's advertised and sold as a "true clone" of the BHP, I was anxious to find out if the Arcus would accept parts made to the Hi- Power specifications. These would include the aftermarket upgrade components sold by Slide that I want love, as well as the non-restricted items that are available from Browning and Brownells. Since I didn't have a Hi- Power in the shop at the time I was writing this, I asked Jim Garthwaite, Pistolsmith of The Year for 2006, to help me out.

Jim builds top-notch custom Hi-Powers and usually has more than a few on hand. He sympathized with my predicament and agreed to check out the Arcus Model 94. I shipped the Arcus to Jim's Pennsylvania base of operations, and just in time for me to complete this article, Jim emailed me with his observations. I'll condense those observations here and add some additional information gleaned from my discussions with the technicians at Cylinder & Slide who work on BHP pistols everyday.

So here's the deal: Most BHP parts will interchange nicely with an Arcus. But there are some exceptions. The sear lever in the pistol presents problems (to be discussed later) and the Arcus barrel is .650 shorter.

A BHP barrel will install in the slide and will work, as long as there's no objection to the muzzle not being flush with the end of the slide.

If this is judged to be unsightly by the custom- Arcus Model 94 9mm Semi-Automatic Pistol (Specifications subject to change without notice) 1 Slide 2 Barrel 3 Frame 4 Slide Stop 5 Retaining Plate 6 Firing Pin 7 Firing Pin Spring 8 Firing Pin Retaining Plate 9 Extractor 10 Sear Lever 11 Sear Lever Pin 12 Disconnecter Lever 13 Front Sight 14 Rear Sight 15 Recoil Spring 16 Guide 17 Guide Spring 18 Guide Ball 19 Trigger 20 Trigger Pin 21 Trigger Spring 22 Trigger Lever 23 Trigger Lever Spring 24 Magazine Latch 25 Sear 26 Hammer 27 Safety 28 Follower er, the Browning barrel would have to be cut back to the proper barrel length and recrowned, with shorter recoil springs installed and the recoil guide shortened accordingly.

All this is possible and not too difficult to accomplish. What isn't so simple is modifying the frame's recoil lug. No small task that. Extremely precise measurements of the barrel's recoil lug must be taken. After that, the frame lug has to be machined, stoned, and polished just as precisely. The

question that must be asked is this: Since adapting a BHP barrel to the Arcus frame is unlikely to produce a significant gain in accuracy, is the added expense really worth it?

Because there's nothing wrong with the Arcus barrel and because the pis- 29 Follower Spring 30 Magazine Housing 31 Magazine 32 Sear Spring 33 Strut 34 Main Spring 35 Follower Spring Support 36 Magazine Bottom Plate tool is intended primarily for close-in personal defense, I would say "no." On the Other Hand" But I'd answer with an unequivocal "yes" if the customer asked me for a smoother, crisper, lighter trigger pull. Here you have some choices.

The original Arcus trigger system components appear to be machined of good quality material, so you could opt to work with them. Or you could substitute and rework Browning factory parts, assuming that the factory sear and hammer aren't castings. If they are, they won't hold their tolerances for an extended period of time after stoning. Or the better option would be to use nothing but aftermarket upgrade components."

UPGRADING THE ARCUS PISTOL CONTINUED

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Complete “how to” instructions are widely published and not included here for that reason. I’ll tell you why I’d go in that direction. The Cylinder & Slide sear is CNC-milled, treated to 52 RC, and will maintain the stoning applied to its engagement surfaces indefinitely. That stoning on the sear and other trigger-system parts would be accomplished with the help of an old friend of mine’t he Ron Power Custom Series I Stoning Fixture.

I’ve used this tool for hammer/trigger/sear work on more than a dozen different handguns, and my confidence in and satisfaction with this tool is complete. There’s nothing more that needs to be said about this tool; Ron provides comprehensive instructions with every fixture he or Brownells ships out.

In addition to the sear, I’d order a 54.5 RC hammer, and an extended slide release and springs’which I did for this Arcus.

I did not include a wide combat trigger, however, since installing such a trigger would have made it necessary to defeat the magapoint “A” identifies the nose, and point “B” is the paddle. Installation of this significant upgrade is not recommended with the Arcus pistol for reasons stated in the text. The feeler gauges and adaptors are not included with the fixture. All adaptors are firearm specific. B Azine disconnect, and I never defeat a safety or any part of a safety system on any gun.

Caution on Cutting the Sear The Ron Power instructions will provide the step-by-step “how to” information, but be careful not to overdo it. And watch that sear pin. It’s under plenty of pressure from the hammer spring

and removing too much sear material will allow the spring to win. The pin will become bent. Cut a little, install the sear and carefully cock the gun. If you meet up with stiff resistance in the cocking, back off quickly.

Remove the pin and roll it on a true surface such as a square of plate glass to ensure no bend is present. Then, maybe, you can stone the engagement surface a wee bit more before running another test. I know that all this installing, disassembly, reassembly, and testing is tedious and can wear you down. Do it anyway. Almost nothing can ruin this particular upgrade like a bent sear pin. Every tolerance you’re working toward will be thrown out of whack. Install a New Sear Lever?

If the Arcus was a clone of the Browning Hi-Power Mark III, there’d be no problem with installing anew sear



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The removal of very little material will be all that's required. lever and no reason not to, and the trigger would be further improved. But with a Mark II clone such as the Arcus, that isn't the case. There's no accommodation for the bend in the lever or the paddle that serves as a firing-pin stop in the Arcus (see the photo above). Sure, those modifications could be made by machining a cutout in the center rail of the slide for the bend, and grinding off the paddle. But I chose not to do that on this pistol. Why?

The reason I chose not to install the lever was the fact that the out-of-box trigger pull on the pistol was not that unpleasant. it was a reasonably clean-breaking 7 pounds“ not 8, 9, or 10”and that was decreased to an

infinitely smoother and crisper 5 pounds as a result of the stoning, spring work, and polishing I did. Actually, the pull felt more like 4 pounds. But make no mistake about it'on a Mark III or a Mark III clone, the sear lever would have improved even on that.

A Final Check-Point Does the thumb safety move into its slide notch? Good. It's supposed to. But when it does, is it blocking the hammer? Insert a magazine, cock the hammer, and pull the trigger. If the hammer follows, the safety isn't moving far enough up into the slide. The photo shows the area that material should be taken from. Usually, it only amounts to a couple of thousandths. Need I say go lightly with a smoothcut file and check your progress often? I thought not. I

READER FORUM

Reader Forum

BY AMERICAN GUNSMITH EDITORS NOVEMBER 2007

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New Ammo for Old S&W? I recently acquired a Smith & Wesson .32 Hand Ejector Model of 1896 or .32 Hand Ejector 1st Model in .32 S&W Long, serial number 16939. Since it was probably made about 1900, is it safe to shoot this with modern smokeless ammunition or would it be better to just retire it? Any advice in this matter would be greatly appreciated. There are distinct differences between the 1896 and the HE 1st Model. The '96 is the first swing-out-cylinder revolver made by S&W, and had no thumb piece.

It was produced from 1896 to 1903 and chambered for .32 S&W. The serial number of your S&W .32 Long indicates it was made in 1903 or 1904. The cylinder stop of these revolvers is located in the bottom strap rather than the top strap, and the cylinder is released by moving the frame-mounted thumb piece forward. At one time, both the .32 S&W and .32 S&W Long were blackpowder cartridges. The former used 9 grains, the latter 13 grains. Later, both employed smokeless powder as a propellant.

Rather than hanging up your gun, we suggest you speak with a couple of powder and/or bullet manufacturers regarding blackpowder-equivalent smokeless loads. But don't fire currently manufactured factory ammo until the manufacturer assures you it is safe to do so. A further check on pressures might also be in order with S. A. A. M. I. Newtown, CT 06470) Misfeeding Marlins I have three Marlin Model 1892 and 39 rifles in of various vintages that do not feed from the tube magazines through to the chamber. Any ideas?

Thanks. It would be helpful to know whether you have a Model 39, 39A, or 39AS, but with any of these we'd be suspicious of the cartridge stop. That is, unless you're dealing with something like a bent magazine-tube receiver throat, a damaged follower, or a usedup magazine spring.

These possibilities could also apply to the Model 1892, which has a cartridge stop called the "magazine cartridge cutoff." We tend to believe, however, that you'll find the cause for your feeding problems by conducting a close inspection of the magazine-tube assembly, with special attention paid to its back end. What Are These Things? Can you identify the items in the attached photograph? The top three are plastic, with tapered edges. They are marked A, Z, and C.

They taper in different directions, A&Z taper toward the rounded end and Ctapers toward the straight end. The lower piece is steel and is marked C SX on one end, and Z DX on the other end. When inverted, the ends are marked Z SX & C DX. Benelli has not responded to my two email requests to identify these parts. Thanks for the help. Go to Benelli USA on the web. Click on "parts & accessories." Under that, click on "miscellaneous," and scroll down. The parts are shims.

The group reproduced here is used to adjust stock drop, change the sighting plane of the gun, and adjust it to a shooter's physical characteristics and shooting style. The other photo you sent shows the "Comfor Tech" shims, which are used to adjust both drop and cast-in or cast-out. All of these shims are model specific. Remington M513 Trigger Job I'm looking for an article on doing a trig-

ger job on a Remington 513T target rifle. It has a 6-pound pull now' hardly a match trigger.

I've never done a trigger job on a 513, only on the 40X, and I would like to bring it down to 2 pounds or less. Thanks. Larry Krause Mountain Home, Arkansas We haven't done an article on the 513 yet, or anything about working on its trigger. Though, sadly, the rifle went out of production in 1969, there are still a good number floating around. One club we know of uses the rifle in its 50-participant junior program every year.

The main reason we haven't covered it is because complete information on disassembly/reassembly appears in Brownells Encyclopedia of Modern Firearms (along with instructions for a large number of other out-of-production guns). If you have the book, you'll note that the firing system of the 513 presents no great mysteries. The sear is attached to the trigger and engages the firing pin.

Polishing the sear/firing-pin engagement angles and, possibly, cutting one coil off the trigger spring should be all that is necessary to lighten the pull. The book, by the way, specifically addresses how to adjust trigger travel on the 513. If you don't have a copy of the book, borrow one. If you can't manage that, Brownells still shows it in their catalog. No, it's not cheap, but it will spare you much grief when an older rifle comes in your door.

Franchi Firing Pin I need a firing pin for a Franchi Black-Magic Game Model 12-gauge semiauto, which appears to have been imported by American Arms. I tried

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(continued from previous page) the usual places including Numrich, Jack First, and Bob's Gun Parts, with no luck. I believe it could be duplicated if I had the whole pin or the specs. Any help would be appreciated. Henry Smith Ft. Worth, Texas Unfortunately, gun manufacturers don't give out blueprints for gun parts. Adding to the complication is the fact that Franchi shotguns are now brought in by Benelli USA Hopefully, they'll be able to steer you to a complete firing pin for your American Arms-imported Franchi.

It's worth a call to find out. Unsafe Ithaca Safety I have a problem with an Ithaca model 37 12-gauge pump shotgun. The gun came into my shop in bad shape. The slide was jammed and unable to operate. On taking it apart, I discovered the hammer strut was bent in a Vshape, so I ordered a replacement. The new part came and was straight, so I installed it. So far so good. Now the shotgun would operate but while doing safety checks I discovered that the hammer would release when the safety was in the "safe" position.

Checking the safety showed some wear, so I replaced it and its spring. Still the hammer would drop when the safety was on "safe." I checked the trigger and it too was worn, so anew trigger was ordered. Still the hammer was dropping when the safety was on'with only moderate pressure on the trigger, I might add. I recut the trigger-sear

notch in the hammer. No help there. So I got out an Ithaca from my personal vault and took it down. I noticed right away that the hammer strut on my Ithaca had a bend in it.

The new one I ordered from Gun Parts was straight. My question is: Are there two different hammer struts, one for old models and one for new models? Or are you suppose to bend the strut to fit when you install it? And could there be some other reason why the hammer will drop with the safety on? The safety on the Model 37 blocks the trigger, not the hammer, so you need to consider other possibilities for hammer drop/slippage.

These would be a worn sear nose, a weak trigger spring, a bent slide stop, and/or a broken hammer bar (strut). We have no history indicating an engineering change in the hammer bar. All schematics in our files show a straight one. You may want to inquire about such a change with the current manufacturer of the Model 37, Ithaca Gun USA H&R Indexing Problems I have in my shop a nine-shot H&R .22-caliber rimfire revolver, Model 939, serial #U18885. There is one position that does not come into alignment and lock in the cylinder-stop assembly. (It doesn't rotate far enough.) The lever that rotates the cylinder seems to have some wear, but it functions properly on eight of the nine chambers. I suspect the problem is in the extractor.

My questions are: 1) how to identify the problem tooth on the extractor; and 2) a possible fix for the problem (peening or whatever). Looking in the Gun Parts catalog, it appears the cylinder and extractor are sold as a complete unit. If at all possible, I would like to spare the customer this expense. Thanks. Production of this revolver ceased in 1982. It was called the "Ultra Sidekick," and was an extended barrel, vent-rib version of the Model 929.

You can identify which cylinder has the problem by cycling the gun one cylinder at a time and marking which chambers do not fail to rotate completely. Insert dummy rounds or spent .22-caliber cases in all cylinders to prevent damage to the firing pin, hammer nose, and chamber edges. More often than not, timing problems indicate a high ratchet.

In your case, the ratchets are integral with the extractor/ejector star. (See Gun Digest's book on disassembly for revolvers in order to separate the star from the cylinder.) An article in the September 02 issue covered the tooling and techniques required to swage down a high ratchet. The same article touched on timing problems due to the revolver hand. The same tool used to swage a ratchet is used for adjusting a hand by bending it.

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