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INSIDE THE ARCHIVE

SCOPING 1896 MAUSER ACTIONS

FIREARM BACKGROUND CHECKS INCREASE • THE AMT BACK UP RETURNS... ON STEROIDS • THE MARLIN/GLENFIELD 60...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 116

DIGITAL ARCHIVE EDITION

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FROM THE ARCHIVE

Firearm Background Checks Increase

BY AMERICAN GUNSMITH EDITORS AUGUST 2013

ORIGINAL PP. 2

From Daniel Xu, outdoorhub.com. In just the first two months of 2013, firearm background checks have jumped 54 percent from the same period last year. In the aftermath of the Newtown tragedy and the current gun control debate, firearms are still selling at a record pace and the Department of Justice is adjusting for the traffic. According to the Associated Press, The Justice Department will spend more than \$20 million on bolstering the current background check system.

The funds will be going towards improving data reporting in the National Instant Criminal Background Check System (NICS) so that background checks have a better ability to weed out applicants with mental health issues, felony convictions and domestic violence offenses. This announcement by the Department comes at a time when more and more people have begun purchasing firearms.

The Washington Times reports that last December and January were the highest and second highest recorded months, respectively, for application checks. While this trend is commonplace in all 50 states, Delaware, Alaska, Utah, and New Hampshire have led the pack with the highest rates so far. Congress is currently debating the need for an expanded background check system that will apply also to private sales in addition to federally licensed dealers.

This move is supported by gun control advocates as a step towards keeping guns away from potentially dangerous users. Others, like the National Rifle Association, believe that a universal background check would hinder law abiding gun purchasers and dealers, in addition to laying the groundwork for a gun registry. Individual gun stores owners have their own say.

The National Shooting Sports Foundation (NSSF), a trade association for the firearms industry, reveals that an online survey of 640 federally licensed retailers shows that dealers are heavily concerned with the expansion, and they're not happy about it.

In the survey 85.7 percent of retailers opposed the idea while 95.7 percent voiced that such expansions would not prevent firearms from falling into criminal hands. "The concept of universal background checks sounds appealing on the surface, but the details involved in what actually would be required on the part of firearms retailers to make it work are quite another matter," said Lawrence G.

Keane, NSSF senior vice president. "In fact, the obligations and burdens that would be put in place could be overwhelming for many of those who would be called upon to carry them out. It is unfair to call upon private companies, many of them quite small and with limited personnel, to conduct what essentially would be a function of government."

MACHINING

The AMT Back Up Returns... On Steroids

With some improvements already made and more to come, its newest in a long line of makers is no stranger to maintaining quality.

BY CHICK BLOOD AUGUST 2013

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The yarn-spinning potential wrapped around this handgun and its genesis could use up an hour of gun gabbing. For starters, AMT (Arcadia Machine and Tool) was merely one in the lengthy list of acquirees of AMC (Auto Mag Corporation.) The latter was established in 1970 by Harry Sanford with a factory opening in Pasadena, CA. His goal, bring forth a semi auto able to deliver the velocity and stopping power of a .44 Magnum revolver.

The debate still continues whether it was Sanford who designed the Auto Mag initially or Max Gera, head of the AMC design team. I've seen an impressive list of patents awarded to Sanford but they were for handguns later produced by AMT. These included the Hardballer, Lightning, 10mm Javelin and some AMT shoulder arms. At any rate, the debate will probably continue. Suffice it to say the Auto Mag was eagerly awaited for by the shooting public but the design team warned it couldn't be made and marketed at a profit.

They were right. They were also ignored by AMC investors. After a production run of less than 3000, the Auto Mag Corporation went bust. No surprise there. Consider these factors. The pistol was complex in the making. The desire to rush it out the door created quality problems. The ammunition for which most purchasers yearned, a wild-cat magnum .44 caliber 240 grain slug loaded in a cut down .308 rifle case called the .44AMP, was not commercially made. Which brings me to the bottom line.

At the original MSRP 380 is packing bigger punches with 9mm, .40 S&W, .38 Super, .357 SIG, .45 ACP and .400 Cor Bon. of \$217.50, \$1000 was lost on every Auto Mag sold! Even the most fanatic of hardline "Share the Wealth" politicians would have to admit no business could survive such a combination of horrors. The buzzards circled. The first of them to swoop and acquire a portion of the AMC remains was OMC (Ordnance Marketing Corporation.) This, eager readers, was where the OMC .380 Back Up pistol was born.

When AMT came on the scene to purchase tooling and rights, it became and has remained the AMT Back Up. That it still exists, through the reports of poor quality and frequent mishaps created by being tossed about from maker to maker, I find amazing. Fortunately, extinction was staved off when Hi Standard of Hamden, CT, a company known worldwide for the quality and accuracy of their .22 target pistols, entered the ownership parade. At the time the Back Up was a single action plagued with safety problems.

To overcome those problems it was converted to DAO. With the conversion came a truly terrible trigger pull. That reputation of Hi Standard continues with anew High Standard of Houston, TX, who revived the gun valley company by taking over manufacturing of the Hamden pistols and bringing back aboard the same tooling, component suppliers and a fair sample of the master gunsmiths that had made them legends. At this year's SHOT Show I spotted a large frame pistol on display at their booth wearing "AMT Houston,

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If cleaning fails to resolve the problem, it is not difficult to relieve a Back Up of all its parts for further investigation. Texas USA" on its slide. You guessed it. The Back Up is now riding to market from the Lone Star State. Gone is the problem of wimpy firing pins. All AMT pistols coming off the line now boast the same one in the .380 as used in the 9mm, .38 Super, .40 S&W, .357 SIG, .400 Cor Bon and .45ACP models. It has never broken.

They're working on that terrible DA trigger pull, too, and thinking seriously of design changes. One I'd like to see happen is the slide locking back after the last round. Another is a better sight set up. With the present one it makes no sense trying to aim a Back- Up. Even when the target is within seven yards, you point it. Field Stripping Remove the magazine, check the chamber and protect your eye sight. Closely inspect all pins to determine whether or not they're roll pins. If they are, follow Dr.

Blood's recommendations: Use a roll pin punch and only drift out the pin enough to free the part it is retaining. Follow this prescription and doing damage to the pin in reassembly will be eliminated. What you may have heard or read about basic take

down of a Back Up is slightly different in this particular case. The recoil spring in this pistol is quite strong. The take own pin notch at the lower left of the slide must be held in position over the pin in order to push it out.

Holding the slide with one set of fingers may be a painful problem at the very least. If that's true in your case, have a new five cent coin standing by. Pull the slide to the rear. Hold it as best as you can. Slip the nickel in between the breech face and bolt face. Allow the slide to trap the coin. It will be held in firmly but moving the slide slightly to get it centered over the pin will be come much easier. If for no other reason, you can grab the coin with pliers to gain some more leverage.

Doing anything remotely like that with the slide itself can only leave ugly stuff behind. You must push out the takedown pin (16) right to left but the pin is hidden under a sizable plate held in place by the right hand grip panel. After removing the grip and lifting off the plate, take memorable note of how the trigger bar spring (20) mates up with the trigger bar (26) and front of the magazine well.

I stress "memorable" due to the fact that you'll soon be turning the pistol over immediately after or during the removal of the take down pin. The slide (2) is moved off the frame (1) forward. Invert the slide to lift out the recoil spring (18), barrel (29) and recoil spring guide (9). You've gone as far as you have to go to prepa Back Up for cleaning. The majority of gun owners take pride in performing that task.

The pistol has been handed to you, therefore, because the owner has convinced himself something far more serious than dirt is making the pistol misbehave. Detailed Disassembly Let's start with the bolt. A 1/8th diameter pin (17) retains the firing pin (7) and its spring (21). It performs double duty as the firing pin stop pin. The stop blocks the firing pin when the trigger is completely pulled. The block (32) and its spring (31) will come out once the firing pin has been removed.

The extractor (6) is retained by another 1/8th" diameter pin (8). Drift the pin downward far enough to free the extractor and its spring (22). So much for the slide. Now, the receiver. The right hand grip panel is already set aside. Remove the left hand panel. Work-

THE AMT BACK UP RETURNS... ON STEROIDS CONTINUED

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A slave pin is recommended in building this assembly. ing from the right hand side of the frame, detach the trigger bar (26) from the trigger (5). Detach the trigger bar spring (20) from the trigger bar and frame. Set all those parts aside. The stud at the upper end of the trigger (5) serves as the trigger bar pin and a pivot for the bar. The hammer pin (11) goes

through and lines up, from left to right, the ejector (23), the hammer (4), a spacer (33) and the firing pin block lever (30).

The spacer is a restricted part but only shows up in older model pistols, usually those made in California and Utah. In current production pistols the spacer has been replaced with a stud on the lower right side of the hammer. In reassembly, I recommend you employ a

slave pin matching the diameter of the hammer pin. Start the slave in from the right, capture the firing pin lock lever, the spacer (if any), the hammer and ejector in that order. Push out the slave with the hammer pin.

The trigger pivot (15) is only 1/32" in diameter. Treat it kindly. The hammer strut pin (10) remains in the hammer. There's no reason why it should. Remove it, the strut

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(24) and the mainspring (19). Drift out the magazine latch pin (12) to free the latch (3) for removal. You have the gun totally stripped now and ready for a detailed cleaning. In the process, inspect the hammer strut, mainspring and rear inte- 1 Frame 2 Slide 3 Magazine Catch 4 Hammer 5 Trigger (Incl. Trigger Bar Stud) 6 Extractor 7 Firing Pin 8 Extractor Pin rior of the magazine well. What you are looking for are rub marks on any of the surfaces. If you find any, polish them before reassembling the pistol.

By doing so you may have encouraged a heavy trigger pull to ease up somewhat. The polishing has to be 18 Recoil Spring 19 Hammer Spring 20 Trigger Bar Spring 21 Firing Pin Spring 22 Extractor Spring 23 Ejector 24

Hammer Strut 25 Magazine Assembly 9 Recoil Pin 10 Hammer Strut Pin 11 Hammer Pivot Pin 12 Magazine Latch Pin 13 Grip Screws 15 Trigger Pivot Pin 16 Takedown Pin 17 Firing Pin Stop Pin executed carefully. All you're looking to accomplish is the elimination of friction between these areas.

Overdo it on the mainspring and you could weaken it. Really overdoing it on the mainspring could heat it up to the point of making it useless. AG AMT Back Up (Specifications subject to change without notice) 26 Trigger Bar 27 Grip Set (2) 29 Barrel 30 Firing Pin Lock Lever 31 Firing Pin Lock Spring 32 Firing Pin Lock 33 Hammer Spacer (If present)

FROM THE ARCHIVE

The Marlin/Glenfield 60

An amazing 11 million Glenfield 60's have been sold since its introduction in 1960, proving an inexpensive .22 semiautomatic rifle appeals to everyone except gun writers.

BY PAUL MAZAN AUGUST 2013

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Why in the world would anyone write about the Glenfield 60? It seems most gun writers won't. I can't remember ever seeing an article on them. Despite the almost universal disdain for the inexpensive .22 by the pros, people buy them and gunsmiths see them in their shops on a regular basis. While there are hundreds of accessories available for the more expensive Ruger 10/22, finding anything except factory parts for the 60 is nigh on impossible.

Still, with 11 million of them out there, every gunsmith, professional or amateur, needs to understand a little about them. I was able to pick up a used Glenfield from Gunbroker.com

for a \$67.00 bid plus \$25.00 shipping for a total All the splendor of an inexpensive .22 that has sold 11 million units. price of \$92.00 delivered to my favorite FFL holder at Family Pawn on Paris Road in Columbia MO.

Since I bring a lot of guns through their shop I have spent a lot of time and effort to cultivate a mutually beneficial business and personal relationship with the guys that keep me supplied with guns to renovate and write about. Fortunately that was an easy task as they are as friendly a group as I have ever done business with. What other semiautomatic .22 can you get at under \$100?

The gun I received was a newer model and my first task was to learn as much as I could about the gun and that starts with disassembly. I have three editions of the NRA Firearms Assembly books and the Marlin/Glenfield 60 isn't covered in any of them. Did I mention that most of the industry ignores inexpensive guns?

Searching my other reference material didn't turn up any information so I downloaded an exploded drawing from the Numrich Gun Parts site (gunpartscorp.com) and relied on pictures I took with my digital camera.

THE MARLIN/GLENFIELD 60 CONTINUED

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Careful stoning of these two parts can improve trigger quality. Removal of the barreled action from the stock is as simple as removing two screws. The rear trigger guard screw and the take down screw located on the bottom of the stock just ahead of the trigger guard hold the stock and action together. Once that is accomplished you will find all the working parts located in a subassembly attached to the receiver by three machine screws. Removal of these separates the subassembly from the receiver.

The subassembly itself is held together by clips on the end of through pins. Before attempting to disassemble it, I highly recom-

mend taking some clear pictures of the location of the parts and springs. It's not really all that difficult but once the e-clips are removed it seems to simply fall apart, dumping parts on the bench and making you wish you had paid more attention to how it all went together. The most common ailment of the 60 is a broken recoil buffer.

This is a nylon piece located at the rear of the subassembly and no further disassembly is required to remove and replace this part. I decided early on that I wanted to disassemble the subassembly and clean up the edges on A solution was needed to mate the two. all the stamped parts, as well as do some trigger

work to make the pull lighter and smoother. The internal parts are stamped so a little deburring goes along way to making large improvements in the feel of the trigger.

The trigger presses on a transfer bar that is mounted to the side of the assembly and has to slide forward to disengage the sear. Deburring that transfer bar so it slides smoothly will help improve the trigger. On most semiautomatics I will polish the feed ramp with a Dremel

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The sides of the Glenfield 60 stock will have to be narrowed with a rasp to fit into the inletting, tool and a Cratex rod but in this case the feed ramp is part of a casting and plated. Since the plating provides the only hardness the ramp has, breaking through the plating would accelerate wear so it was left as it came from the factory. Sometimes the best course of action is to leave well enough alone. In other words the feed ramp ain't broke so don't "fix" it!

The trigger itself is also a plated casting with a grooved face. I did use the Dremel and smoothed the grooves off the face of it just because I prefer a smooth trigger. If you choose to do the same confine your efforts to just the face of the trigger where your finger contacts it so that the rest of the assembly

doesn't wear as the gun is shot. If there is one thing I really don't like about this gun it is the stock.

The stock is birch that has been stained to a sort of walnut-like color and decorated with impressed grip enhancements. The forend and pistol grip may have oak leaves or squirrels or lines or stars and lucky shamrocks for all I know pressed into the wood. They simply look cheap to me. I suppose it should look cheap, as that is what the gun is intended to be but I just had to do something with it.

I searched all my sources for replacement stocks and all I could After carefully narrowing the Glenfield stock and matching the length it is glued into the 10/22 stock locat-

ing it even with the Ruger inletting. Wood will have to be removed from the top and bottom of the Ruger stock to get them to match. come up with were factory replacements and laminated thumbhole stocks from Boyds' and Brownells. Personally, being old, traditionally minded and left handed, laminated thumbhole stocks are not my choice.

Unable to find a walnut replacement stock, I started wondering if carving one from a blank was my only option. If you have ever attempted to make a stock from a blank you will understand my reluctance to tackle the project on an inexpensive .22. If you have never attempted it my advice is, don't. Save the time and effort for restocking some fine old rifle or shotgun that is long out of production and needs a stock.

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While pouting over the firearms industry's prejudice against cheap .22's, southpaws and old men, I remembered that I had a Ruger 10/22 stock laying around. Although it was also birch, I thought it might be interesting to see what I could do with fitting the Glenfield 60 to it. A short search later turned up the 10/22 stock and comparing the 60 to the inletting showed some major work was going to be necessary to fit the two together.

Marlin uses a bare minimum of wood in their stock and Ruger uses way more than is needed. The Ruger receiver is wider and deeper than the Glenfield, making it look like the Glenfield would drop through the Ruger stock. My first thought was that I would have to fit a piece of wood into the Ruger inletting and then inlet the Glenfield barrel and receiver

into it. Then it suddenly occurred to me that I had a chunk of wood already inletted to the Glenfield.

I cut the original Glenfield stock in front of and behind the inletted portion, squared up the Ruger stock inletting to accept the Glenfield center stock section after slimming it a bit and glued it in place. It wasn't quite that easy but it was sure faster than inletting the action in from scratch.

Now I attacked the Ruger stock like a crazed beaver and cut a channel for the tubular magazine, added some wood to the sides of the barrel channel so the Glenfield barrel would fit and took a rasp to the outside of the stock, slimming it to the Glenfield's dimensions. Still not happy, I jeweled the bolt, thinned the buttstock, carved out a pistol Here I use

aboard clamped to the table of the drill press to keep the lines straight. This is a feature that was popular in the 60's and 70's but not seen very often today.

If it is a look you like it is very easy to do. grip, fitted a grip cap, fluted the comb and bedded the action with Brownells Acraglas Gel. Things were starting to look up and the rifle was taking shape. Jeweling metal was very popular in the 60's when this model was introduced but isn't often seen today. The process is really quite simple. Chuck around abrasive in your drill press, align the work-piece so you can move the piece in straight lines and make overlapping swirls.

Each circle overlaps half of the previous swirl and half of the swirl above it. Unfortunately, in my enthusiasm for

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the project, I forgot how hard it is to sand rasp marks out of birch and the sanding process to ready the stock for finishing took longer than all the other work. Note to self: Next time find a walnut stock! A coat of stain, a few coats of tung oil and, as a final touch, a fake forend tip which was a very easy addition. After the stock finish is dry, determine how long a forend tip you want and mark the stock next to the barrel channel. Take a strip of masking tape and mask off the edge of the forend tip.

Rough up the finish and use either paint or a permanent marker to color the tip of the stock. Be sure to color it from the tape forward so the color doesn't seep

under the tape. Remove the masking tape and you're done. This may sound like a lot of work to do on an inexpensive .22 but it does yield a unique and pleasing rifle without the custom price tag. I ended up with a most interesting hybrid Glenfield 60 mated to a Ruger stock. I call it a Gluger.

AG Mated to a modified 10/22 stock, the Glenfield 60 takes on the look of a whole different rifle. The Ruger stock has been slimmed to match the contours of the Glenfield receiver and has been fluted at the comb, a pistol grip carved out and grip cap installed.

MAINTENANCE & REPAIR

Custom Firing Pin For A Stevens Single Shot Rifle

Finding a firing pin for an old Stevens single shot rifle was unsuccessful. Making one turned out to be a viable alternative.

BY NORMAN E. JOHNSON AUGUST 2013

ORIGINAL PP. 12-13

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Tasked with repairing an old Stevens single shot, I could not locate a needed firing pin replacement and decided to make one. The diameter of the main firing pin body is 0.227 inches, so I elected to use a section of 15/64 (0.234) inch drill bit shank for the part. The drill bit shank was of ideal hardness without being brittle and was easily machined with carbon steel tool bits. The drill bit was chucked in the lathe as the shank and firing pin end were turned to specification before removing.

The firing pin hole was carefully measured and found to be 0.092 inch. It is important that the firing pin fit properly with as little clearance as 234") down to 0.227" diameter. The piece is completed before removing it

from the lathe chuck. The firing pin nose point radius is clearly shown here with its halfcircle configuration, possible to avoid gas or particle blow back as a result of excessive clearance here. For this reason the firing pin should obturate the hole in the breech face.

The protrusion of the firing pin nose, beyond the breech face, was also measured and total firing pin length was found to be 0.188 inch. Forward travel of the firing pin is stopped as the spherical shaped main body bottoms out in the firing pin well. Proper radius is applied at this juncture of the firing pin body during the machining operation. The firing pin should extend approximately 0.075 inch beyond the breech face on firing and must be checked accordingly.

Having determined firing pin length, the nose must be properly shaped for efficient primer function. There remains different thinking in the area of firing pin nose configuration. Assuming the firing pin spring or hammer spring delivers enough impact to fully crush the primer wall against the anvil, both the elliptical (oval), or spherical (round) nose will accomplish efficient primer ignition. However, one must guard against too pointed a nose on the firing pin or primer wall perforation may ensue.

This is particularly true where high cartridge chamber pressures may exist. Conversely, the more spherical firing pin nose tends to more fully close off the firing pin hole in the breech

CUSTOM FIRING PIN FOR A STEVENS SINGLE SHOT RIFLE CONTINUED

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face at full impact and during peak breech pressure. Whereas the oval or more pointed firing pin nose would tend to allow the primer wall to extrude more along the firing pin nose and along the inner wall of the firing pin hole in the breech face. This may account for some of those perforated primers that occur with only moderately high pressures. These are things to consider as the gunsmith making and installing a replacement firing pin.

With the dimensions at the front end of the firing pin determined, the main body is cut to length, which is 0.735 inch on the Stevens rifle. The main body is then rounded off to avoid sharp edges where the hammer strikes it. Next the groove is cut along the firing pin body for the firing pin retaining screw. This screw hole is threaded from the top of the re-

ceiver immediately above the firing pin hole. I used a 1/8 inch carbide end mill to cut the groove in the firing pin body, which I cut to a depth of 0.100 inch.

The existing firing pin had a milled flat spot fully across the top radius which I felt I could improve upon. My primary reason for making a groove at exact retaining screw diameter was to restrict rearward firing pin travel beyond firing pin nose-breech-face clearance. This, in itself, helps to prevent perforated primer material from entering the firing pin hole as the firing pin is driven to far rearward.

Further, the hardened firing pin retaining screw serves as a positive firing pin stop as the slot radius and screw radius fit perfectly together. This is important in the event of a

major primer gas leak preventing the primer from being driven too far rearward. The inner firing pin body radius controls this depth and should be approximately 0.075". A more pointed firing pin may tend to cause primer perforation, particularly where higher breech pressures are generated.

The firing pin has no return spring and travels freely inside the breech. I applied a couple drops of oil to it for free travel and tested it for function. The firing pin functioned without flaw. Primer indentation was perfectly centered and formed a nice sphere at proper depth. Conclusions A seemingly minor job like replacing a firing pin on a single shot firearm must be performed correctly or some unanticipated problem can arise. While replacing such a firing pin, improvements over factory issue can be made. AG

FROM THE ARCHIVE

Damaged Screw Heads

Few things make an otherwise good gun look shabby more than buggered screw heads. Here's how to address them.

BY ROBERT K. CAMPBELL AUGUST 2013

ORIGINAL PP. 14-16

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If there is anything that will make a gunsmith feel like an amateur it is damaging a screw head. We have all done it, if we'll admit to it, although we like to think that such mistakes are in our past. Just the same, a damaged screw head isn't always something we can avoid. Screws are run in too tight, screws are cross threaded and sometimes corrosion has taken its toll. When a screw head is damaged, no amount of custom grips or refinishing will make the pistol or rifle look right until the screw head is addressed.

A damaged screw head really takes away from the appearance of a quality firearm but even a working gun or a hunting gun need not look shabby. When we are working with a period-correct restoration, the appearance of the screw heads becomes ever more important. The firearm needs to look as if it walked off the showroom floor or just left the factory. While we have done our best to repair a firearm, a set of botched screws is the mark of a gun butcher rather than a careful gunsmith.

Even if the piece came into the shop in bad shape and we have restored it to the best of our ability, if the screws arrived on our bench beat up we get the blame if the firearm leaves the shop with buggered screws. Let's look at the damaged screw head and arrive at a means to make it right. A buggered screw head is often an indica-

tion that the rest of the gun is abused as well. Even though we have made certain that the piece is repaired correctly, we cannot really claim a restoration without fixing the screw heads.

Gun screws are unique to firearms. The hardware store is no help. Brownells is an excellent source and the original manufacturer sometimes has the screws on the parts list. The rub is you cannot run to the hardware store and find the right part and the old time gunsmith with a boxes of spare screws is increasingly rare. These little items are a big problem to find sometimes and it behooves us to learn to repair the head of the screw itself.

You also have to learn how the screws are timed, that is, how the screws are properly aligned in the slots. This is pretty important and when you see a high quality firearm with the slots running correctly it projects the correct symmetry for a firearm. We have all done it—I certainly have—and you feel like a duffer when you damage or round off a screw head. Some screws are specially angled and a few have a special finish or engraving. It is darned difficult to clean up a mess with one of these.

The first thing we must do is to make certain that the screwdriver tip fits the slot. Some of us still grind our own. W. R. Grace & Co. makes a wonderful gunsmith screwdriver kit featuring blued screwdrivers with

well scalloped handles. I treasure my set. The Chapman Professional Gunsmith Screwdriver Set is a classic that we all must have on the bench. It is cheap insurance to very carefully and lightly touch the screwdriver to the screw to be certain it fits.

If the proper fit isn't in the house then grinding a screwdriver to the proper size is the safest way. After a time, you will have on hand a number of custom screwdrivers. They may not always be pretty but they are handy. There is only one formula for the blade geometry in a correctly fitting screwdriver. The blade tip must be perfectly square to fit in the screw slot. The sides must be polished and smooth. When grinding, be certain you have maintained a slight radius.

The will act as a buffer that prevents the sides of the screwdriver from scratching and cutting if the tip is allowed to slide in the screw head slot. Avoid Chinese flea market screwdriver blades because the steel has to be good in order to hold some flex in it when we are working with a particularly recalcitrant screw. Flex is good, snapping under pressure is not. After a time you will have a credible set of screwdrivers.

Note that just because a screwdriver fits the first time it may still need to be re-ground, cleaned up and reshaped. The screw heads are perfect and they overlap. It would be a tragedy to bugger them up!

DAMAGED SCREW HEADS CONTINUED

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The perfect screwdriver must be used for access and removal. The screws are clocked pretty close and show no signs of poor handling from time to time. Actually grinding the screwdriver head is an exercise in the gunsmith's art. Take the screwdriver tip up and hold it just above the handle. Some modification is needed for a shorter screwdriver, but I don't have much use for the truly short versions. The hand may be stabilized against the table in most situations.

Some left and right play is all right but the tip must not move up and down or there is a good chance the end product will not be viable for use. Understand the difference between a chisel grind, a convex grind and a high grind because you are looking to finish up with a hollow grind. Do not allow the tip

of the screwdriver to turn plum purple or red or the temper will be lost and the screwdriver tip will deform when you are attempting to remove a screw that is dug in tight.

Grinding is an art form that produces true custom results. After finding a driver with the perfect fit, carefully try to break the screw loose. A bit of penetrating oil goes along way in loosening the screw if the screw is stuck. If the screw head is already damaged, well, a good screwdriver is irrelevant except when you place the repaired screw back in the slot. If the screw head has not lost its shape completely the screw head may be recut with a properly sized file.

The easiest thing is sometimes to replace the screw by ordering anew one, but it all depends upon your time and the expense in-

volved in ordering. The bend will work OK but be careful dressing the screw and making certain that the screw is returned to its correct position. screws. Frankly, sometimes I have been surprised at the worth makers put on their parts. There are good sources for screws but the repair of a screw head is always an option.

Specific files that are designed to slotting screw heads can be expensive but then they are awfully handy when needed. It might seem like a lot of work at the time but screw heads that are less than perfect will attract a lot of attention and detract from the gun. You might think that if you do a good job nobody will know except you and the customer but in the gun community good work is appreciated and rarely goes unnoticed!

DAMAGED SCREW HEADS CONTINUED

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Make it yourself and be ahead of the game. It's well over fifteen years old and still works just fine. The correct tool for the job is important. Another problem with screw heads is simply getting the screw out of the gun. There are a number of cures, including soaking the screws in penetrating oil and even applying heat. You can even put a gun part in the freezer and attempt to heat the screw while the receiver is cold to get a screw out. If that doesn't work, we'll go to other options.

The simplest is leaving the screw alone, provided the gun functions. If a badly-stuck screw simply must come out, a good cure is to warm the receiver and then cool the screw with liquid nitrogen or dry ice. You are expanding the hole with heat and shrinking the screw with cold. Another option to convince apart to break loose is lots of oil and steady pressure. After liberally applying Kroil, tap

the screw gently with a wooden mallet, hold your mouth just right and often it will break loose.

Avoid such mistakes with the correct gear. The screwdriver head on the left needs to be reground, the one in the center is OK and the one on the right is chipped and needs to be discarded. An excellent repair for badly messed up screws is to use the drill press. Turn it off and do not use power. Secure the part on the drill press and be certain the offending screw is vertical.

Grind a good screwdriver tip and use the drill press to keep the screwdriver tip hard in place on the screw and apply pressure until the screw breaks loose. You will need to apply penetrating oil first and be certain the screwdriver tip is a good fit. If you don't get it out at least it is on the drill press and you can proceed to drill the thing out. Another

remedy for a stuck screw demands a careful hand. This will usually ruin the screw but that might be your only recourse.

Take a file and raise a tiny wedge on the screw head. Then take a sharp screwdriver and use a mallet to drive the screwdriver into the raised portion of the screw head. Tap the screw in the correct direction to loosen the screw and drive it out. The screw will be buggered but this works to remove it. A good forty years ago as a teenager I walked into a shop to have a revolver repaired.

The man behind the counter took one look at the revolver and said, "This gun has been gone into." I replied, "Yes and you are the one that fixed it!" Don't be embarrassed in that manner. There are more glamorous things to be done with a firearm and many that are more profitable but nothing that will come in handy as often as handling screws and screw heads. AG

FROM THE ARCHIVE

Scoping 1896 Mauser Actions

Drilling and tapping for Weaver bases on 1896 Mausers.

BY WENDELL DEANER AUGUST 2013

ORIGINAL PP. 17-22

Look for it only in books, for it is no more than a dream remembered, a Civilization gone with the wind... —Margaret Mitchell I have been accused of being mired in the past. I admit I still think Elvis is The King and Frank Sinatra is the Chairman of the Board. I like older movies best and I still open doors for ladies (when I can find one.) I'm fairly optimistic about the future but I think all that will be decided long after I'm gone, so I don't worry about it too much. I did get a small shock the other day.

I found out B-Square has stopped manufacturing most of its line of gunsmithing tools. I already knew that their nifty little barrel vise and bushings were no longer available. Now it seems their scope mounting jig has went the way of the Dodo. This jig was about perfect for doing the job of drilling and tapping the holes needed in military rifle actions for scope mounting. It not only made it easy to this job well, the jig was inexpensive. Now it's gone. Oh, the humanity!

Although I have briefly written about this subject in the past I wanted to do a complete article showing how to do this job with this particular tool. Despite the potential change in availability, I'm going to anyway. This jig is available on the used market and other, similar (and more expensive) jigs you can buy operate on the same principles. Plus, I don't own the other ones, so that will have to be left until I get some discretionary income— money, as some call it.

First, as hinted in the quote above, are there any convertible Mauser actions available anymore? The answer is yes, thought they aren't as cheap as they used to be. They rest in closets, dusty parts of gun shows and used gun areas at your local shop. Sometimes you find one that has already been to the sporterizer and back. It still has the turned-down, stepped military barrel and trigger, even the original front and rear sight. The stock is pure cut-down military—hardly a candidate for collecting.

I inspected two the other day at my local dealer. Both were as advertised above and, to my surprise, they still retained the military safety despite being scope mounted. On one, the safety was unusable because it wouldn't clear the scope while the other sported laughably high set of see-through mounts for clearance. The only problem now is price. In years past, I've bought bunches of 98 Mausers for \$85—not actions, shootable rifles! The most I've ever paid for a Model 96 rifle is \$135.

I think those days are over but there are still bargains if you hunt hard enough. I will pick one up when I run across it. Mitchell's Mausers have made a business of supplying milsurp rifles that have been refurbished and are now stating for the umpteenth time that what they have in stock are the last. I just got on their website and, wouldn't you know it, they found some more. Anyway, I don't think these rifles are candidates for sporterizing anyway since they are fine shooters as is.

Also, since Mitchell's has refinished them the collector value is in the toilet. But they are what they are and anybody wanting to

purchase a shootable Mauser should consider these. I just got my last issue of Military Surplus magazine. Apparently they think it's over. Well, there's always a little left even if it's not enough to support a magazine. Regardless, I will plow ahead. If you are sporterizing a '96 Mauser, the job is not complete without drilling and tapping the action for mounting a scope.

That is not to say there is anything wrong with any sort of iron sights. I learned how to shoot with open sights. Scopes were a luxury when I started and not all that reliable at the time. Most of us hunters felt comfortable using a good iron sight on our deer rifles. Scopes were expensive. Scopes fogged. Scopes lost zero and couldn't be depended upon during bad weather—which was most of the time we hunted.

Nowadays, these concerns are about as important as the last whitetail flag you saw bounding down the ridge away from you. Scopes have been proven for years, and older guys like me need them. Why do I need a scope if I learned how to hunt with iron sights and am entirely competent using them? Because my eyes are older and I can't see as well as I used to.

I still use iron sights for the range and enjoy using them, however, kids I've taught to shoot have all used scopes before I taught them how to use the older sights. Some people mandate using iron sights to teach children shooting before moving up to scopes. Baloney. Scopes are for amateur shooters and iron sights are for the more experienced. Kids like to hit what they are aiming at and they can by using

SCOPING 1896 MAUSER ACTIONS CONTINUED

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scopes, usually right away. Don't discourage a young person by insisting they learn using the same old tools you did. Save that for when it's time. After gaining experience shooting optics, many of the kids ask me if they can try the iron sights I'm using when we go to the range. So far, all of them have picked it up right away. It's not rocket science. When I started to put together some custom rifles for my grandsons I pondered this question.

My personal preference for one of these guns, if I'm ever able to build one for myself, is a nice Lyman receiver sight with an appropriate faux ivory bead up front. It might be something different for you but I just want to have one. I can imagine myself stalking through the steaming jungle on the trail of the wary

tiger with just my trusted bearer and my reliable Mauser for company. My kids have been using iron sights for many years but I know they prefer a scope for hunting.

Contrary to my custom rifle preferences stated above, so do I. If using iron sights on my rifle, I have to limit myself to probably no more than big deal in most places out east but where I am hunting the range could be much longer and I can limit myself to shooting within range. I once read a book about a famous safari of Teddy Roosevelt in the early twentieth century. Apparently, in those days they thought nothing of firing ten or twenty rounds at an animal to bring it to bag. I see things differently.

I am using 1896 Swedish Mausers for these two rifles. One is about finished. The other is headspaced and Both are used to make the holes for a Weaver base. rebarreled but not yet stocked. Drilling and tapping for these old military rifles can go easy or the other. Some, although I have never encountered any, are supposed to be case hardened and very difficult to drill. I use titanium-tipped drills for this process and have never had a bit of trouble going through these actions.

I wonder sometimes if somebody made this malarkey up and decided to print it. Of course, you can't just take a hand drill and start whacking away. A jig is necessary to do this job. One of the least expensive is the B-Square scope jig. Unfortunately, I they have discontinued this product. Forster,

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the Cadillac of jigs, is still available (Brownells #319-400-000AH) for a hefty \$456.99 and Williams Gun Sight Company offers a jig for \$149.99 (Brownells 962-368-980AH.) This job needs to be done on a drill press. I prefer to set up on a milling table because it's easier to move the piece without getting it out of alignment. If you don't have a milling machine, small milling tables are available from such sources as Enco to fit your drill press.

However, I suggest only using a floor mounted press to have the necessary clearance to support a milling table, vise, jig, etc. Drill presses are not made to be milling machines as they can't stand up to the sideways stresses involved in some operations but for jobs like these they can be invaluable. To start,

your action must be stripped bare of trigger and bolt. The jig itself consists of a solid steel bar (Bore Align Arbor) that fits inside the action and two flat pieces milled from aluminum.

The bottom piece (Base Block) is for holding the jig secure against the receiver. The top pieces (Jig Bars) have holes to fit drill and tap guides and actually locate the scope-mount holes. They are marked "S" and "M" for identification. Also included with the kit are two "V" bushings to hold the bottom and top parts of the jig together along with two Allen cap screws and an appropriate wrench. A #31 drill bushing and #31 drill come with this kit.

The tap, also included, is a 6x48 and, curiously, the instructions do not mention that it comes with its own #27 bushing. 275 inches.

Save the 3-In-One oil for other jobs. While on this subject, as I have lamented before, the instructions suck. That is not to say there is not a lot of good information included, just that too many manufacturers don't bother with more than a minimum number of drawings and/or pictures of how their products are supposed to be set up.

Study the instructions thoroughly, don't get lost and use your common sense. The instructions tell us that, "All Year Mausers – Bar 'M'." Well, they are half right. Use the "M" bar to space the two front holes but to install Weaver mounts on the 96s, I found I had to use the "S" bar to space the rear bridge holes. The rear bridge does not have to be altered to install the one piece, one

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It only needs one hole drilled in the rear of the receiver instead of two. It works very well but adds weight. Try not to put any flats on the receiver with the grinder and leave enough room to work it by hand. rear hole Redfield JR mounts. For the two-piece Weaver mounts, if you want to use two mounting holes you must grind down the charging holder used for loading the rifle with stripper clips.

Also, the pin on the front of the "S" bar had to be tapped in so as not to interfere in setting up the jig and the rear pin tapped down to locate the jig. These pins are used to stop the jig from going too far forward or backward when mounted in the action. I couldn't find anything about this in the instructions.

What they do say is, "On Mauser type rifles the Weaver block must be filed or ground on its forward edge to fit the rear bridge and clear the bolt handle." Their answer is to only drill one hole for the rear base and grind the front and back off to fit. Poppycock! I assume they haven't tried it my way. To be fair, I guess they had trepidations about instructing to grind down the action itself. My pictures will show how this job can be done with this tool much better than I can explain it.

What it amounts to is replacing the "M" bar with the "S" after the two front holes are drilled and tapped. I leave the jig mounted on the milling table and use a Tru-Tapper to hold the tap in the chuck of the mill. This holds

the pieces in alignment as well as If you don't have one and want to make your own, see my article in the May 2010 issue of American Gunsmith, "Building a Mauser Holding Fixture." Notice the rear pin on the "S" jig bar has been tapped down and is resting against the back of the receiver.

This gives the proper clearance for the #55 Weaver bases. possible and lessens the possibility of broken taps. As with any tapping operation, use good cutting oil like Liquid Wrench, not oil like 3-In-One. Although it's rated for tapping, I think Do-Drill is best left for the drilling operation. Go in a few turns and back off so the chips can come out, continuing this process until the tap

SCOPING 1896 MAUSER ACTIONS CONTINUED

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The rear of the action is to the right in this picture. Tighten everything securely. Now, I guess you could run everything by hand but it's like that story about a gentleman opening a house of ill repute and trying to conduct business before hiring the ladies. It doesn't work very well. through. I use a # 31 titanium-coated drill bit (Brownells 361-661-031) and their premium 6- 48 3-flute plug tap (748-001-648) to make these holes.

As I have stated these actions need to have the rear bridge altered by grinding down the stripper clip holding piece so the Weaver base will fit. This could be done with a file if you don't mind waiting forever to get done but I prefer a tablemounted grinder of 6-8 inches. I have several grinders and the one I

use in the shop most often has coarse and medium wheels attached. Use the coarse wheel to bring the piece down quickly and stop just before you contact the main area of the rear bridge.

Use the medium wheel to smooth it out and then finish up by hand with a good file. What you are doing is simply lengthening the mounting area of the rear bridge following the original contour. As near as I can determine using dial calipers, you will add about 0.275" of extra length to the rear bridge. The two holes on the Weaver 55 base will then have plenty of purchase and the base will not hang off the rear end. This does not weaken the action in any significant way.

This operation has scared a lot of people because if you screw A little bit of touch-up polishing and bluing will finish this job. It looks as though it was custom fitted to the action. It was, except the action was fitted to it. it up the action is pretty well ruined. Also, you must not heat the action too much by the grinding process. There is usually no need to re-heat treat these actions as long as we don't fire them up unreasonably with jobs like this. Use a good pair of gloves for protection.

Go slow and check your work often. Roll the piece over the grinding wheel. Don't try to just bore

right in because that is sure to cause a flat that is difficult to remove. I usually have a cloth soaked with water nearby to help cool the hot spots, making it easier to continue working in a reasonable amount of time. Just don't let this part get red. With the flat started, continue by filing with a bastard file. I prefer using a second cut. Be especially careful filing the sharp edges, making sure they remain sharp. I file from the inside to the outside using two hands to carefully level the cut.

The top of the bridge is joined to the back in the original contour. You can do this job after you drill the front bridge holes but I prefer to do it as a first step. Maybe I'm superstitious but I want to do one job at a time. Grinding and filing is one job and setting up a jig and drilling is another. It's kind of the same thing as fully setting up the outlines of checkering on both sides of a stock at the same time, before the actual Complete your American Gunsmith collection. Or read up on a special subject!

A LIMITED NUMBER OF THE FOLLOWING

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PEOPLE & COMPANIES

Reader Forum

BY AMERICAN GUNSMITH EDITORS AUGUST 2013

ORIGINAL PP. 23-24

Winchester M10 And Parts A customer recently brought me a Winchester Model 10 that is locked up. I have cleaned it thoroughly but it remains nonfunctional. Can you recommend a resource for a schematic so I can detail strip it? Also, I need parts for the following guns: 7.65 caliber Spanish pistol, Colt Model 1888 .41, and a French pinfire pistol made sometime during the American Civil War.

Otis Fansler Bruceton Mills, WV The Model 10 fails to show up as such in the Standard Catalog of Firearms, The Winchester Book or The Blue Book of Gun Values. It does show up in Volume II of Jack First's Catalog of Parts There is no schematic there-in. That appears in the NRA Guide to Firearms Assembly, hard cover edition. Disassembly instructions accompany the drawing. What our research did turn up besides the preceding was: The Model 10 was the last in a series of Police rifles that started with the Model 1907.

The rifle was cursed with a "special" cartridge, the Winchester Self Loading (WSL). It can be hand made today by carefully cutting an extractor groove forward of the case rim in a .357 case. In view of all we have read about the round, it was a miserable flop. As for parts, try Jack First again for the Colt, takes photos of the Spanish and French pistols. Send them with your request for additional information to the NRA Museum, Waples Mill Road Fairfax, VA, 22030. Include a stamped, self-addressed return envelope.

Don't expect to get a parts source for the offshore guns. You'd be better off getting a complimentary copy of the Brownells parts source list for out of production guns. AMT Backup In read your article on the AMT Backup in the April 2013 Issue of American Gunsmith and have since found out that the model worked on was an AMT .380 BACKUP II and was available only

through a factory special order. This information was taken from Catalog. Hope this sheds a little more light on the subject.

I was fortunate to find an AMTII four gun shows ago and really like the pistol. From author Wendell Deaner. I have two of these pistols in my possession at the moment. One was manufactured in Covina, CA and the other in Irwindale, CA. Neither is marked BACKUP II. Unless the distributors had ordered them as a special lot, neither were special order. They both have the double safety and extended finger grip on the magazine. Both are single action. Go figure.

After working on guns for more years than I want to count I have come to the conclusion that anything is possible as far as variations are concerned. Barrel Extension Reviewing the response given from author Joe Carlos to reader George Bruno in the June 2013 issue Reader's Forum ("Barrel Extension," page 23), it appears that Mr. Carlos is not familiar with the Buffer Tech recoil buffer to which Mr. Bruno refers.

I'm not entirely sure what effect it might have on function but it certainly won't influence felt recoil, at least in my opinion. Your friend's concern about "timing" likely has to do with possibly changing the point at which the bolt unlocks and opens. I'm not seeing that either, though I'm willing to learn. "Timing" is one of those terms that has very different meanings for shooters and gunsmiths depending on the firearms context. In Mr.

Carlos's article, he is referring to the relationship between the barrel extension pin and the gas port in the top of the AR barrel. The two must be in line for the gas tube to come straight back through the upper receiver. If the barrel extension pin, which establishes the rotational position of the barrel, and the gas port are not in line, the gas tube has to bend around to make into the upper receiver.

If you center the gas block or front sight so that the gas tube has a straight shot, the gas port won't be centered in the gas block/front sight base gas admittance hole and the rifle may not work at all. If, under these conditions, you center a front sight block on the gas port, then not only is the gas tube no longer straight but also the front sight is canted. You may then wonder why the rear sight doesn't have enough windage adjustment to get on target.

Al Borsari Cocoa, Florida The canted front sight situation is a great segue into another use of "timing." If the barrel of an M1 or M14/M1A isn't "straight up" when tightened into the receiver, the front sight will be canted. This happened so often with the product of a major manufacturer that a prominent custom builder of M14s offered a service to correct the "timing" of these "overclocked" (screwed in too far) or "underclocked" (screwed in not far enough) barrels.

Why were the barrels consistently screwed in too far when overclocking was the problem? The barrel shoulder was set a bit too far back. Keep in mind that the M14/M1A and AR-type rifles are completely different kettles of worms. Mr. Carlos's work with the AR's barrel extension is valuable and useful but not at all applicable to the Garand-designed M1 and M14. Walt Kuleck From author Joe Carlos. Regarding "timing" of the extensions, I am hoping that Dr. Kuleck's and my explanations have made this clear.

If not, my e-mail address is Regarding M1A recoil buffers, in the first inquiry I had recommended the mercury recoil reducers that fit in the stock. It appears from the response by Dr. Kuleck that what was originally asked is about the buffer offered by Buffer Technologies.

READER FORUM CONTINUED

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All shooters are familiar with recoil. Recoil is governed by physics and it can be calculated. Julian Hatcher first wrote a book back in 1947 that many of us still refer to on such topics, Hatcher's Notebook, and he devotes all of Chapter 12 to "The Theory of Recoil." What we shooters and hunters feel regarding recoil, however, is often a bit more subjective than a formula from a book.

The shape of the stock, the position that the shooter is in, use of a sling for support, etc. all enter into "felt recoil." "Secondary Recoil Pulse" also enters into this subjective category. With a manually operated firearm the recoil experienced is that addressed in Hatcher's Notebook. With semi and full automatic firearms there is also Secondary Recoil Pulse.

Semi autos have slides, bolts, carriers, operating rods, pistons and other action parts that move on their own when the bullet leaves the end of the barrel. These action parts mostly move to the rear in order to extract the fired casing from the chamber, eject it, and pick up and chamber a fresh round from some sort of magazine, recock the hammer mechanism, etc.

In order to accomplish this the rearward movement must be stopped somehow and reversed to end up with the firearm in battery and ready to fire the next round. Often, the rearward movement of these action parts is stopped by hard metal to metal contact. Examples you may be familiar with are in the 1911 semi auto pistols where the back of the recoil spring tunnel

hits against the frame. In the AR-15 that I work on the back of the buffer hits against the rear of the buffer tube in the stock.

According to information on the Buffer Technologies web site, in the case of the M1A the bolt actually hits the "horseshoe" part of the receiver and bottoms out. They also indicate metal to metal contact between the op rod to the front of the receiver. As you may imagine all of these parts crashing to a halt by slamming into another part of the firearm results in a considerable jarring effect that the shooter feels and, as I understand it, some refer to this as Secondary Recoil Pulse.

Regardless of what name one gives it, different firearms will exhibit different amounts of this pulse and shooters will feel it in varying degrees. Obviously, it causes further movement of the firearm on top of the pure recoil and this makes recovery longer for the shooter, which isn't good.

Since Secondary Recoil Pulse and the regular recoil caused by accelerating the bullet are happening within milliseconds of each other, the shooter can't much differentiate between them and he just feels "kick." Various smart guys have invented devices to lessen this Secondary Recoil Pulse. In the AR-15 there have been a number of devices invented that look a lot like automotive shock absorbers. They replace the standard buffer. I have tried a number of them and found some to really reduce what I feel as recoil.

Buffer Technologies markets such a unit that they call an Enidine AR-Restor Hydraulic Recoil Buffer. You can find other units of similar construction in Brownells catalog that work with AR-15s and even AR-10s. Lower cost spongy materials have been used for decades. They are usually thin and are often placed between the two parts of the firearm that crash together to soften the blow.

I remember these first being offered in 1911 pistols with early advertising by firms making the 1911 unit being directed mostly to the longevity of the firearm versus recoil abatement. There is a current version offered on the Buffer Technologies web site. I believe the M1A unit falls into this general category. The web site says it eliminates the hard contact between the operating rod and the receiver.

In order for these recoil devices to work, they often retard complete movement to the rear of some part that the firearm that the designer meant to have the full range of movement per his original design. Every firearm is a little different because of the stack up of manufacturing tolerances involved. So introduction of a foreign part that may cause one person's gun to jam may not do so in a different gun of the same make and model. As a writer I try not to make decisions for the reader.

I see my position and that of the American Gunsmith as providing you with the pros and cons of various topics so you can make an informed decision. AG

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