

**WARNING! These parts are intended for professional gunsmith installation only.
These parts require precise fitment to safely function in your firearm.
Improper installation and fitment may cause serious bodily injury or death.**

RPD SEMI-AUTO CONVERSION

These parts are intended for professional gunsmith installation only. The fire control group parts require precise fitment to function properly and safely in your firearm. The semi-auto modifications to the components of your RPD parts kit must also be machined to the specifications listed in these instructions. Additionally, due to the loose tolerances and wide range of variation in RPD parts manufactured all around the world, you may have to identify and make necessary adjustments in order to create a successful conversion.

Before You Begin...

1. You will at bare minimum need a milling machine. **A drill press with a X/Y table will not hold the tolerances needed.** Using a surface grinder to fit the parts of the FCG is also highly recommended, both for accuracy and surface finish.
2. Do not cut or shorten the included striker spring. Don't do it!
3. Check your recoil spring, it's probably almost 70 years old. It should be 12" in length or longer. If it's 11.5" or shorter you need a new one. We are working to have new recoil springs and other various parts for the RPD manufactured. These will be listed on our website when available.
4. The gas port in the barrel and gas block should be reamed to 5mm.
5. When shooting, oil the bolt and feed mechanism liberally. You can also lightly oil the links before loading. Cheap ISO 32 hydraulic oil works. Clean the gun regularly.

Tool List -

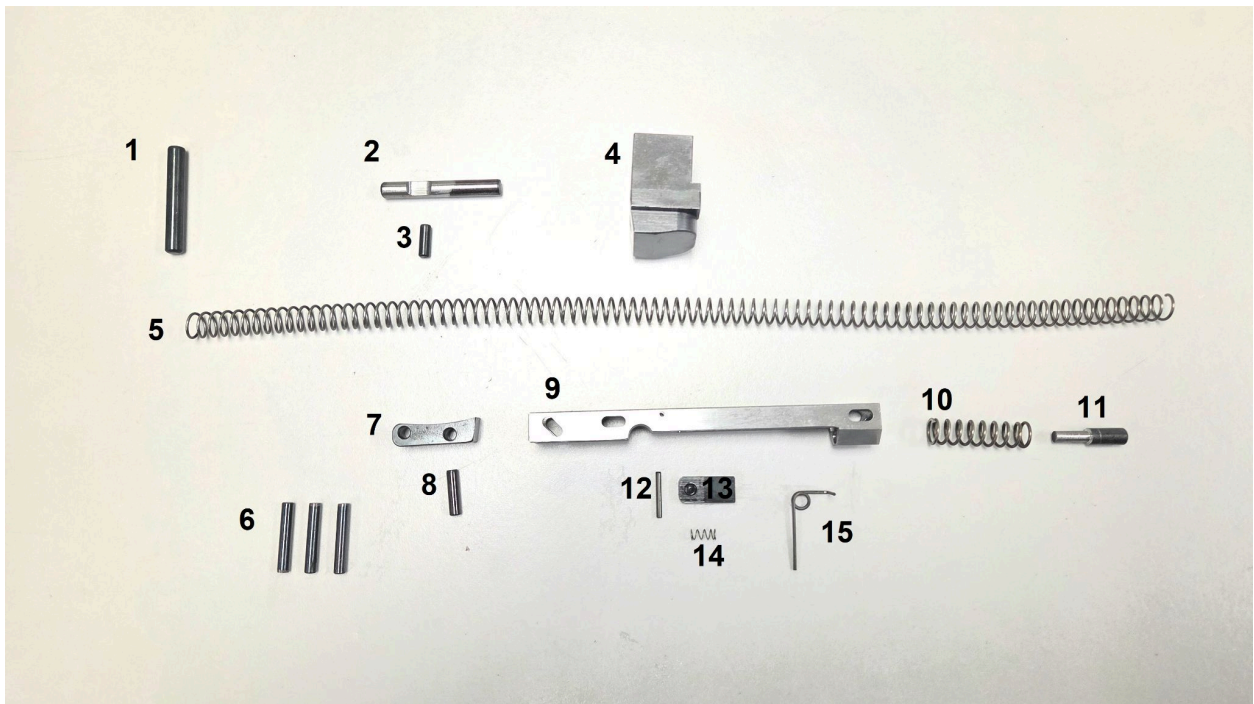
- 0.124" reamer
- 1/8" carbide end mill, extended length
- 1/8" or 3mm spotting drill
- #31 drill bit, screw machine length
- 0.1885" carbide reamer
- #14 drill bit, screw machine length
- #14 drill bit, jobber length
- 1/4" carbide end mill
- 5mm reamer
- 3/8" Ball Burr
- 0.1865" carbide reamer, for press in barrel installation only
- 2mm or 5/64" keyseat cutter (if needed for lower / upper fitment)
- .316" reamer (if needed for takedown pin hole)

Optional Tools to Make -

- 3mm OD x 7mm Pin (slave pin for assembly of trigger / spring)
- .124" OD x 1.5" Pin x3 (temporary pins for ease of fitting / testing the FCG)
- 8" extension for $\frac{3}{8}$ " ball burr

Parts List -

- See Image Below
1. Barrel Pin (for press in barrels only)
 2. Firing Pin Extension
 3. Retaining Pin, Firing Pin Extension
 4. Striker
 5. Striker Spring
 6. Lower Housing Pins, 3x, Retains Sear and Sear Bar Assembly
 7. Sear
 8. Sear Slider Pin
 9. Sear Bar
 10. Sear Bar Return Spring
 11. Sear Bar Return Spring Guide Pin
 12. Disconnecter Pin
 13. Disconnecter
 14. Disconnecter Spring
 15. Trigger Spring



Upper Receiver -

I will not go into great detail on the upper receiver and barrel assembly portion of the build. There are already some great guides out there that show the basics on Guns America and Weapons Guild Forum. I will just mention a few notes here on pitfalls we typically see when fixing builds or using new manufactured receivers.

- Gas Port

1. As mentioned previously you want to ream your gas block and gas port to 5mm. This gives the gun a little more power to overcome the extra resistance from the striker spring and mass of the striker. This is not harmful to the gun or too large for a semi-auto. The early Russian guns with DP style cupped gas pistons had 5mm gas ports, these were downsized as they updated and improved the gas system to what you see on most guns (Polish, Hungarian, Egyptian etc.). Even the first Type 1 AK47 had 5mm gas ports! If you leave your gas port at the original size it can be hit or miss reliability even on gas regulator setting 3.
2. If you are doing a short barrel build, you will also want to ream the subsequent gas port in the gas block that the gas flows through after leaving the gas regulator.

- Top cover / feed cam lever

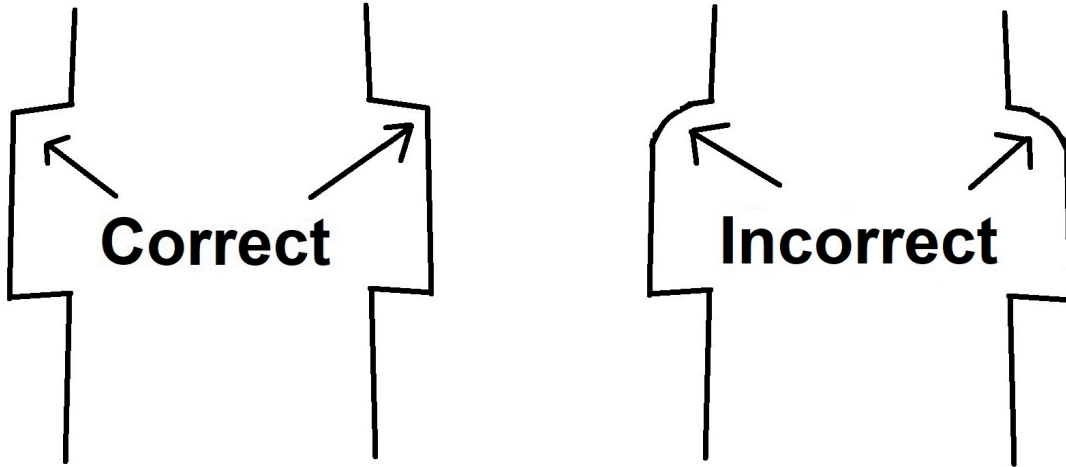
1. USA made receivers typically need a lot of fitting to work right. One of the less obvious is the large cut in front of where the top cover latches at the rear of the receiver. If this cut is not deep enough, the cam lever will bind in the area shown by the arrow below. It also helps to add a nice chamfer to this edge. You can check this by assembling and closing the top cover, leaving the bolt carrier and lower out, and sliding the feed pawl back and forth. The feed cam lever will also droop at the rear due to gravity, so you will want to check for binding with the gun positioned upright (as if it were being shouldered to fire).



- Headspace

If you have to set headspace, the first thing is to make sure the locking recesses in your receiver are cut correctly.

1. The cuts must be properly broached or cut with a sharp corner. There should be almost no measurable radius. This is only an issue with USA receivers, DSA are cut correctly, most others are not. See illustration below.



2. The cuts should be equal in length when measured from the chamber face (but you have not pressed in the barrel yet, so you can't measure this). Instead, put the locking flaps on your bolt, and slide this into the receiver without the carrier. Then open up the flaps and "lock" them into the receiver. While pushing rearward on the bolt, check each flap with a pick or screwdriver to see which is holding the pressure load. Ideally both should be equal, but this is rarely the case. At this point you can attempt to measure the gap from the unsupported locking flap to the recess cut in the receiver with feeler gauges. *You should make sure your ejector is properly fitted and does not interfere with the bolt before doing any tests for lockup or headspace!*

- A. Now that you have determined which side is holding the load, you should measure the length of your bolt locking flaps from the radius end to the farthest point of the locking surface. Is one longer than the other? If the flap that was holding the pressure load is longer, it can be shortened. If not, go to step B. below. I recommend shortening only by half of the measured gap in the unsupported locking flap, and then repeating the process until either both flaps are the same length, or both flaps support a load on the bolt face equally. You should use a surface grinder with proper setup to retain the correct angles and squareness of the faces to be ground.
- B. If the flap holding the load is the same length or shorter within .005", you may shorten it (no less than minus .005" the length of the other flap) if

this corrects the measured gap between the unsupported flap and the receiver recess.

- C. If the gap of the unsupported flap to receiver recess is too excessive to be fixed by the two steps above, the difference in the recesses must be corrected either by broaching / shaping or EDM.
- D. Then press in your barrel, and using a go-gauge, repeat steps above as needed. Once you are satisfied with both lockup and headspace, drill and pin your barrel.

- **Bolt Carrier Fitment - ALWAYS COMPLETE SEMI-MODS TO CARRIER FIRST!**

When cutting the bolt carrier rails and testing fitment in your new receiver, it is important to check the front section of the receiver where the carrier rails pass under the barrel / chamber area. It is common for the slots cut in the receiver to be misaligned here, causing binding of the carrier. Make sure to check the fitment with the bolt installed, and do not forget to check the ejector for proper fit as well!

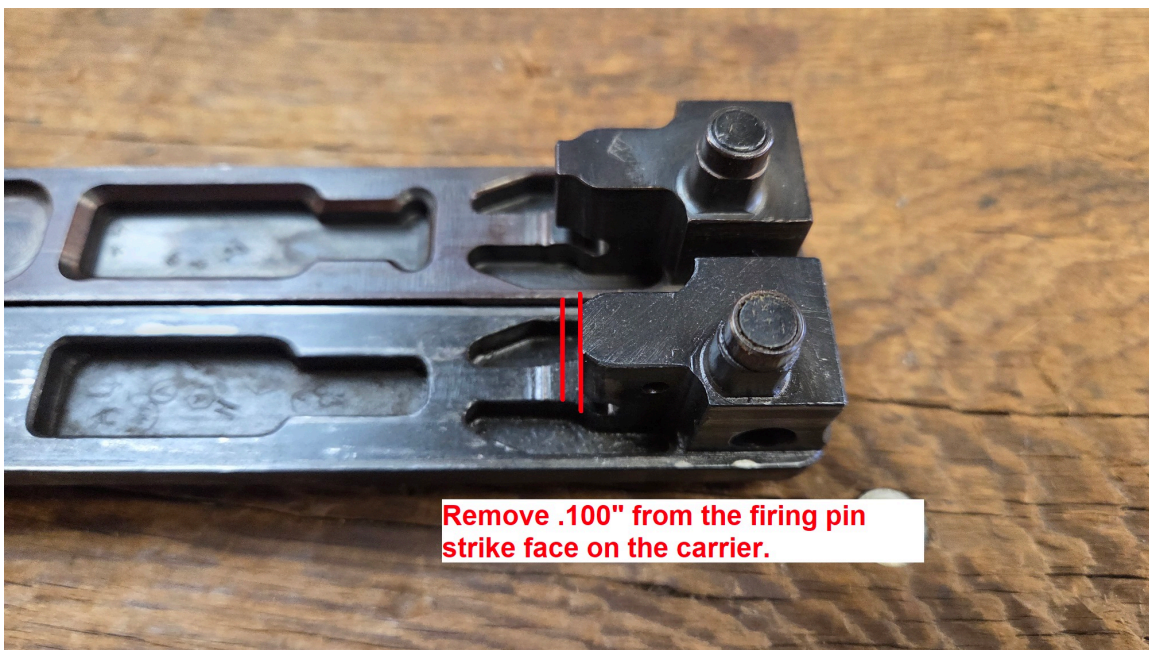


- **Bolt Carrier Modification**

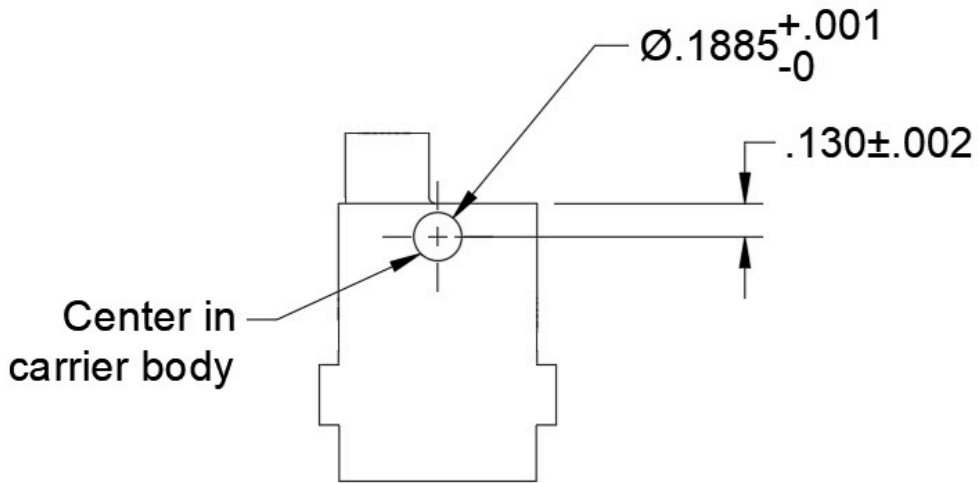
1. The first step is to mill off the catch for the original open bolt sear. You want to completely remove any ledge or lip no matter how small.



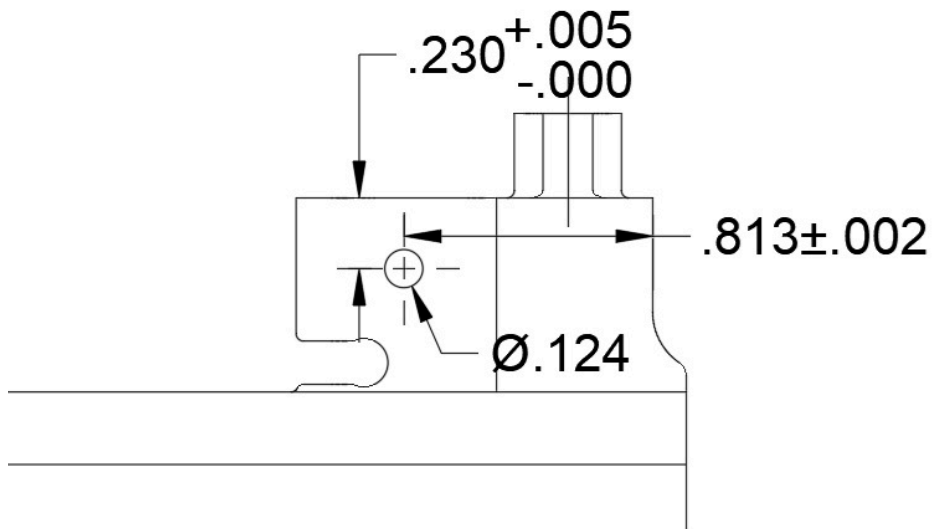
2. Cut .100" off the strike face on your carrier where it contacts the firing pin.



3. Next, drill and ream the holes for the firing pin extension. The hole should be .130" down and centered in the carrier body. The carrier is fairly hard so use a good quality cobalt or carbide #14 drill. You want to keep this hole as straight as possible, start with a screw machine length drill and go from there. Use a .1885" reamer to finish the hole for a slip fit. *If you have a gen 2 Russian carrier with the extra guide rollers, you will need to purchase the angled firing pin extension and use a different set of prints.*



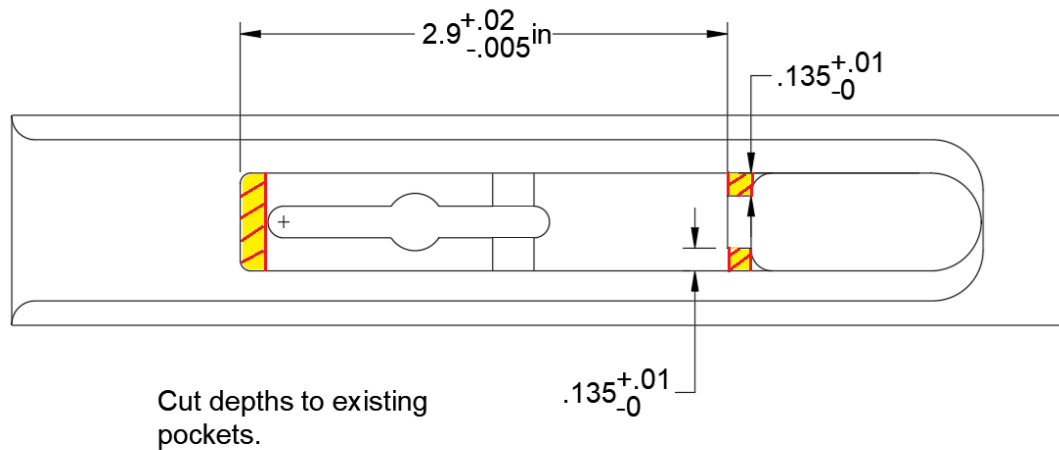
4. Make the .124" hole for the retaining pin on the carrier.



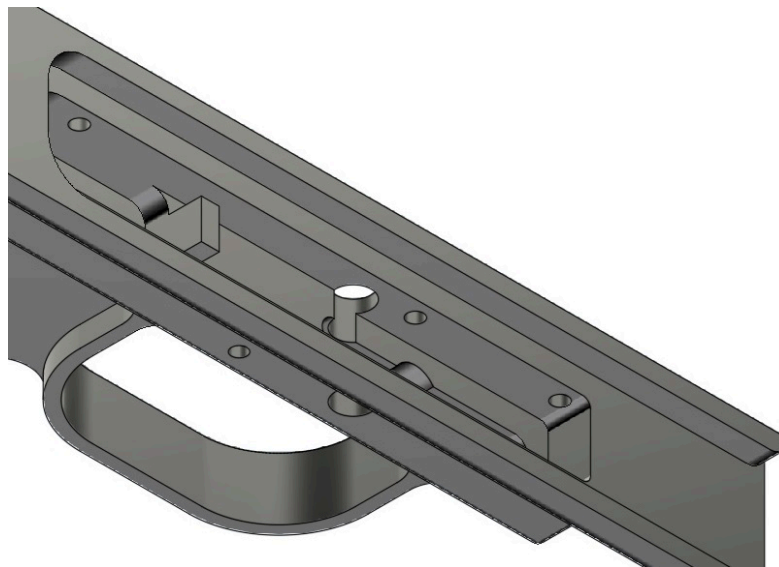
5. The last step for the carrier is to cut the guide rails to fit your receiver. This varies depending on your receiver. On DSA receivers you will cut the rail to a width of .202" +/- .004". If you are doing a reweld, you will leave the rails the original width and cut the length for whatever denial system you are doing at the front of the receiver. Always make sure you do your denial clearance cuts on the bolt carrier last! Otherwise you are potentially turning the carrier itself into a machine gun.

- **Lower Receiver Modification**

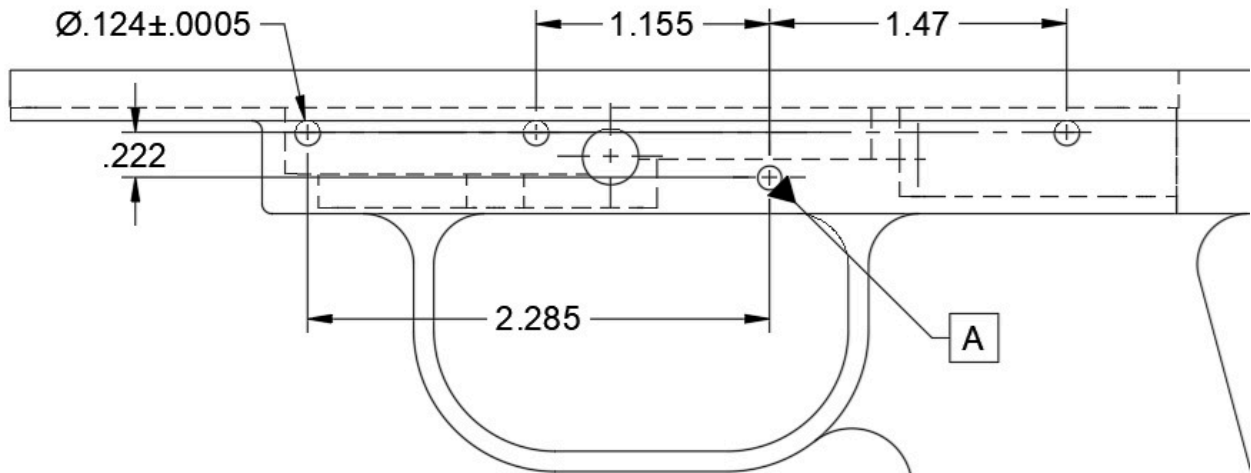
1. First, completely disassemble your lower, removing the stock, grips, and all small parts.
2. Mill out the recess in the fire control group pocket for the sear and sear bar using a 1/8" end mill. *Be sure to do this before fitting / cutting the lower to the upper! Don't accidentally create a machine gun!*



You are just removing the areas marked in yellow. Cut no deeper than the corresponding pockets.



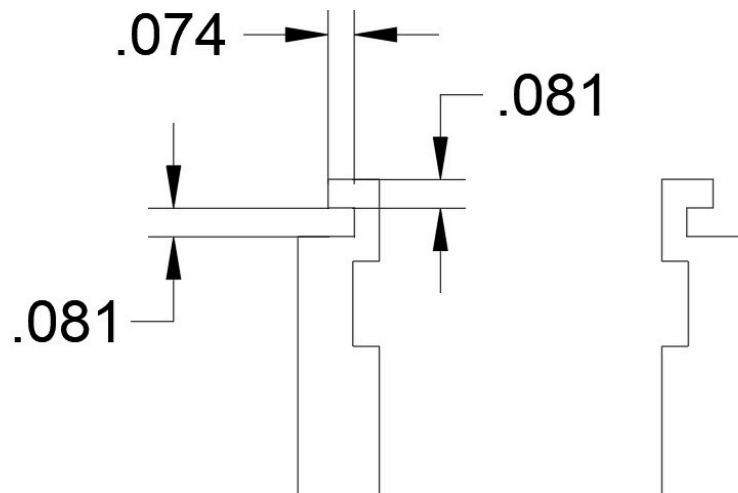
3. Next, drill your holes for the sear and sear bar pins. These should be interference fit for the $\frac{1}{8}$ " dowel pins. Because the holes are located in a contoured area of the lower, you will need to first plunge with a $\frac{1}{8}$ " end mill to clear out the radius area and get a nice flat spot to start drilling. Then start with your center drill, then drill and ream to size. Flip the lower over and do each side separately, otherwise, the bit will wander when you hit the other side of the pocket and the holes won't be perfect.



All tolerances +/- .001 unless otherwise noted.

Use trigger pin hole as datum.

4. Fit the lower to the upper. You will have to cut off part of the front to match your upper and then chamfer the inside rails on the lower to fully seat it.
5. The rails on the upper often require machining to get everything right. It's common for the lower to slide on tight and then pinch the receiver together, causing the bolt or carrier to drag. You should be able to slide the lower on and push in the takedown pin with no effort whatsoever. The groove in the upper needs to be $.081$ " wide and $.074$ " deep. Check the width of the "rail" as well to make sure it is not too tight in the corresponding groove in your lower. See picture Below.
6. Ream the takedown pin holes if needed with a $.316$ " reamer, it's supposed to be a slip fit for the 8mm pin.

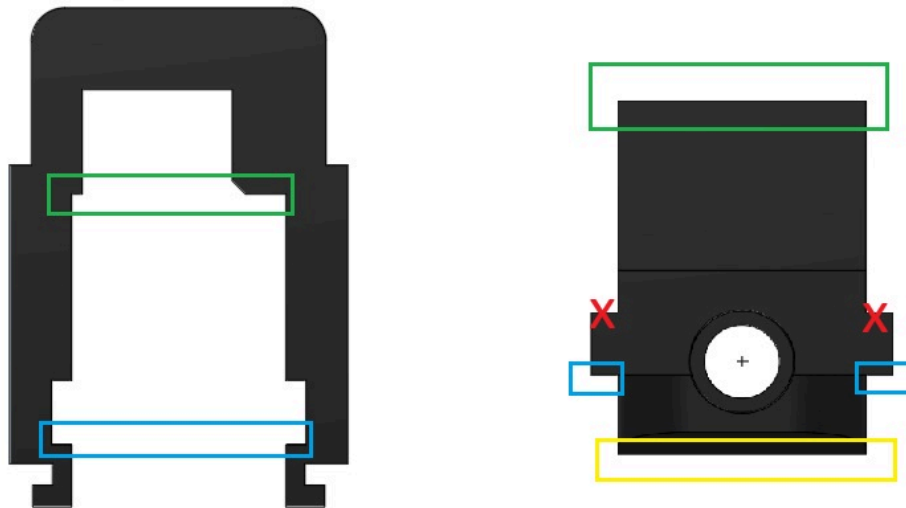


7. Chamfer the edge of the hole for the recoil spring rod in the lower. Use the $\frac{3}{8}$ " ball burr on some kind of extension. I use a collet type $\frac{1}{4}$ " tap extension, but one could easily be made drilling and taping an appropriately sized piece of tube with a set screw.

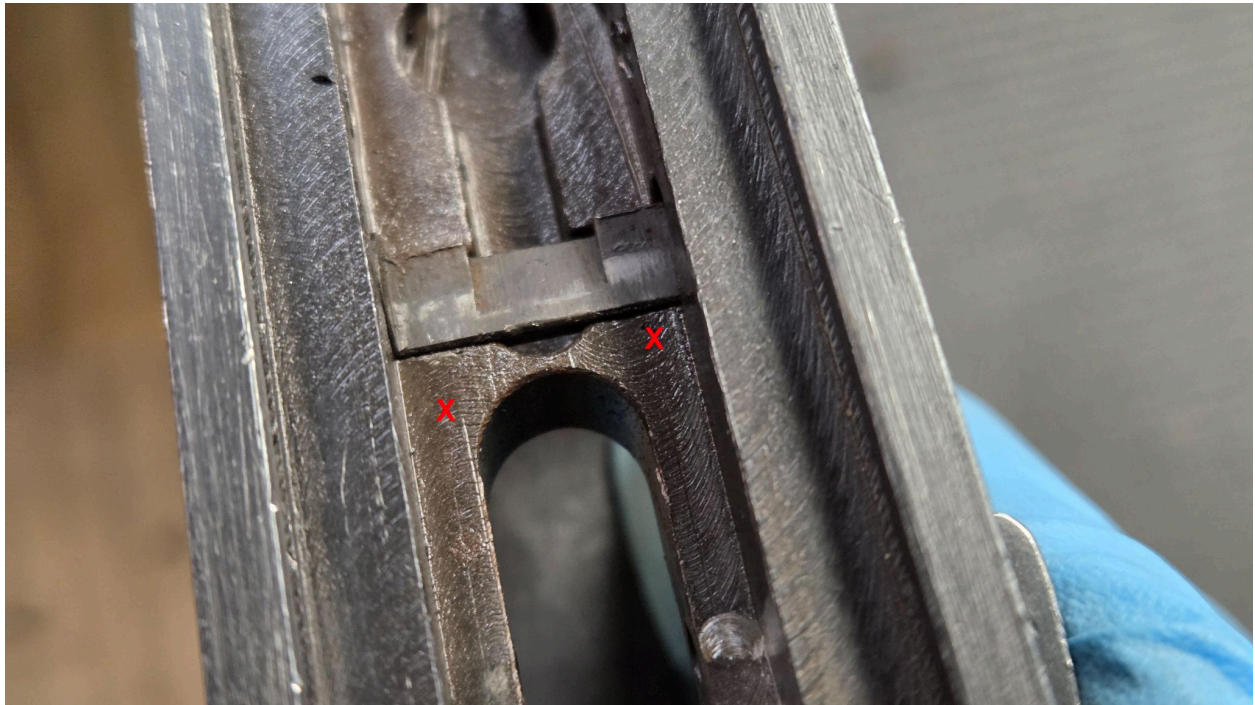


- **Fire Control Group**

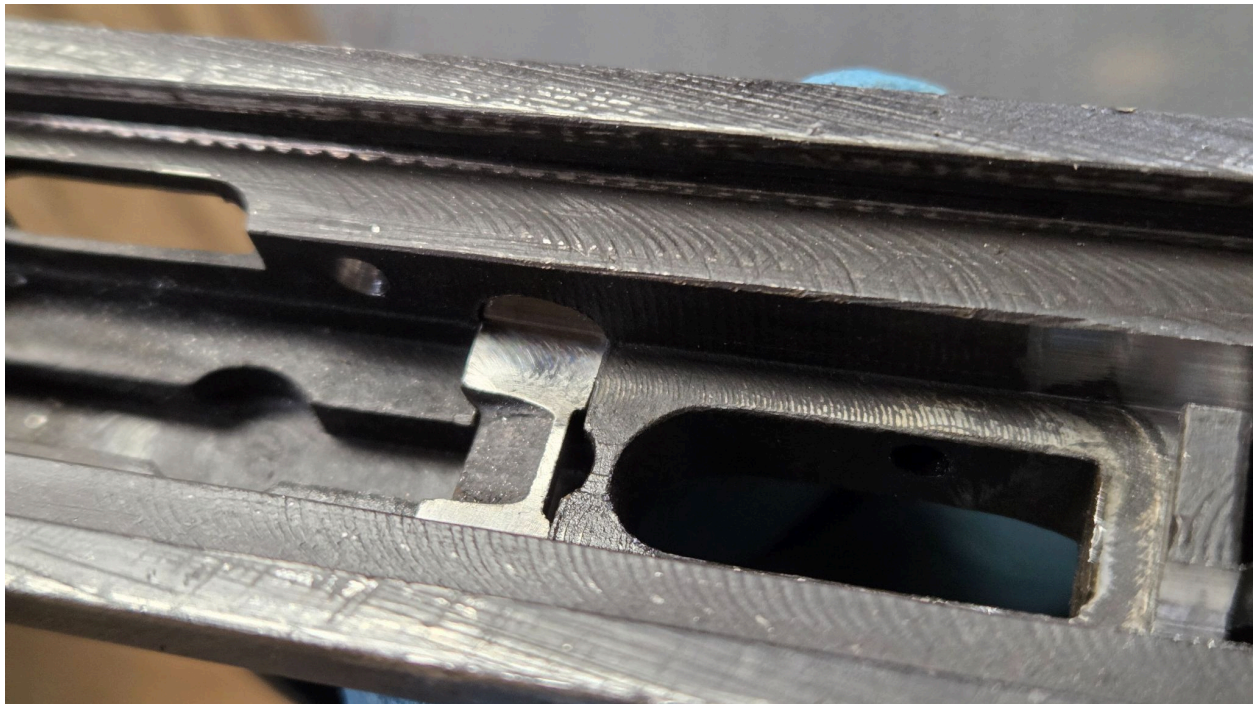
1. Check the fitment of the striker block in the upper receiver. This should take very minimal work, if any, but it needs to be done in a certain order. Make sure you order the correct striker, we have a version for original receiver rewelds and one for USA receivers.
 - Check for clearance at the top of the striker. See area marked in green in picture below. Modify this area of the striker first if needed, .01" of clearance is adequate, the only thing that matters is that it doesn't touch.
 - Check the rail fitment. If the guides on the striker are too tall for the rails of your receiver, only modify the bottom face marked in blue on the striker. **Do not remove too much!**
 - The bottom surface marked in yellow will be fitted later, however to start, this surface should not protrude past the bottom of the receiver.
 - Do **not** modify the "top" of the guide surface marked with the two red x on the striker.



2. Next, we will move back to the lower and check that the safety does not protrude any higher than the shelf behind it when in the fire position. If this sticks up too high it may bind on the sear bar.



Safety placed in fire position may protrude past the shelf marked with red X.



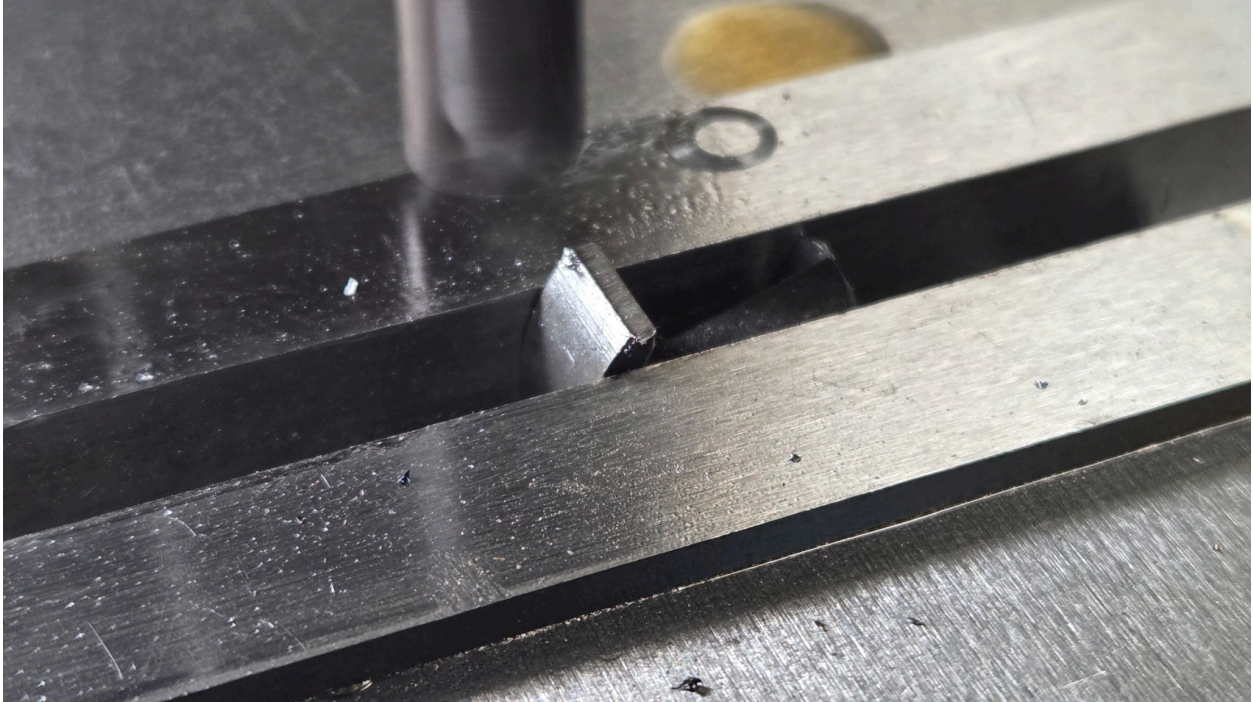
Machine the safety so it will not interfere with the sear bar when in the fire position.

3. The trigger needs to be cut for the return spring.

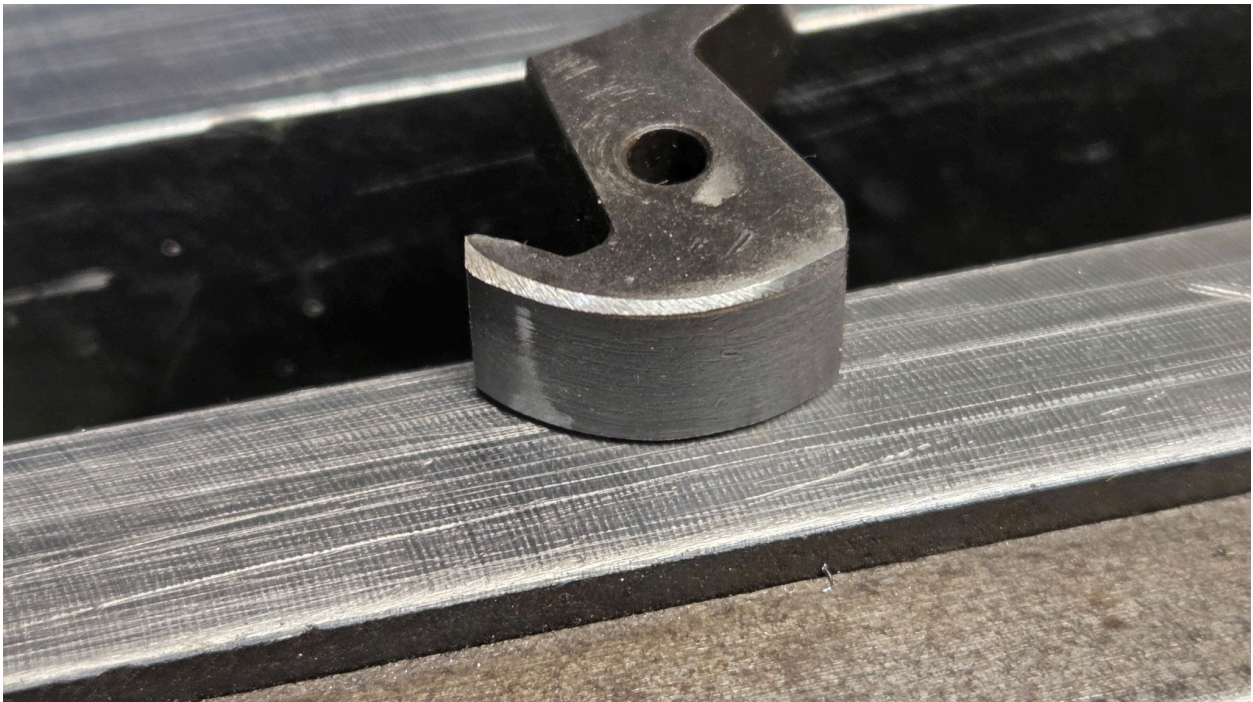
- Setup the trigger so the back flat edge is 25 degrees offset from the Y axis.
- The first cut is milled using a ¼" end mill. Zero all axis on the hole for the trigger pin. Move off the part in the -Y axis direction only. Feed down and then mill back to zero. Repeat until depth of cut is .125"
- For the second cut, keep your axis at zero on the original trigger pin hole. Cut to a depth of .045" and mill -X until your cut contour aligns with the "hook" that interfaced with the old sear. You do not want to cut into this hook at all.



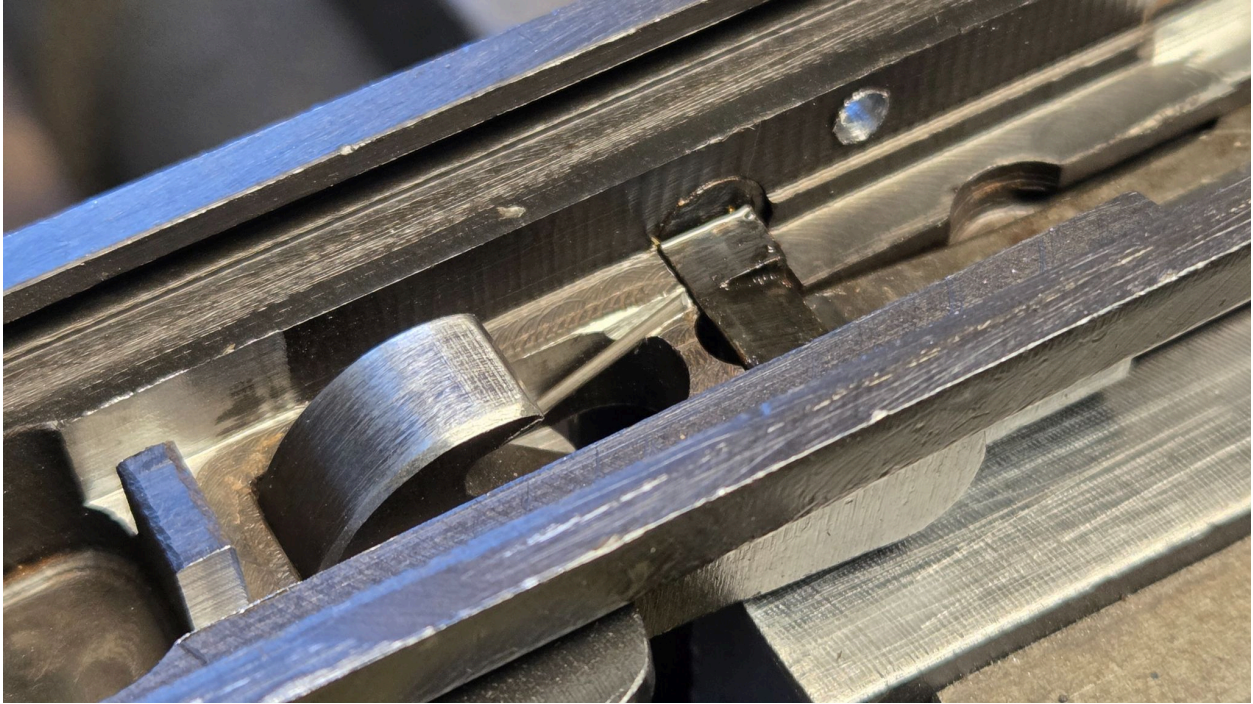
4. Cut the trigger "hook" to interface with the new sear bar / disconnecter.
 - Lay the trigger across the full length of its backside in the mill vise and cut .020" off the hook to start (we may remove more later). Break all sharp edges after milling.



5. File a chamfer along the top contour of both sides of the trigger.



6. Cut a small notch in your lower for the leg of the trigger spring to rest in. A dremel with a large cutoff wheel works fine.



7. Assemble the trigger spring using the slave pin. The first time you do this the spring will compress some, this is normal. Cut the straight end of the spring so it does not protrude past your notch in the lower and into the safety like the image above. Cut the end with the 90 degree bend so that it does not protrude past the right side of the trigger when assembled in the lower.



8. Now we should only have the safety, safety spring, trigger, and trigger spring installed. At this point we will begin test fitting the sear bar assembly. This is where the three undersized assembly pins in the tools list come in handy, otherwise you will be driving the press fit dowel pins in and out every 5 minutes.

- Remove the disconnecter from the sear bar assembly.
- Install the sear bar assembly with the three dowel pins but without the sear bar return spring. Safety should be on fire.
- Slide the sear bar back and forth and check for any areas that might be binding. The sear bar should have free movement. Address any areas as necessary. Double check the ends of your trigger return spring. *On rare occasions you may have to mill one or two shelves inside the lower deeper for clearance. If your sear bar holes are not aligned right, you will run into problems with the pins binding in the sear bar.*



9. Check that the safety locks the sear bar in the safe position. If it is too tight, you may have to remove a small amount of material from the sear bar. If you have an early Russian model, the safety may need to be cut to match later generations of safety.

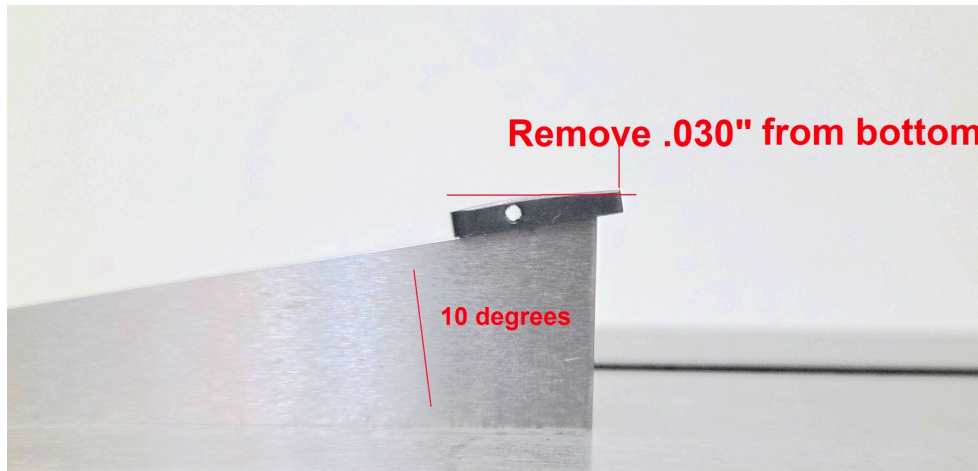


Early safety pictured on the left will need to be modified like the right safety.

10. Install the sear bar return spring. With the disconnecter still removed, and the safety on fire, check that pulling the trigger **does not** move the sear bar. The trigger should only move the sear bar when it engages the disconnecter. If that is not the case, it is usually a burr or something that needs to be removed from the sear bar, or material needs to be removed from the top contour of the trigger.
11. With the disconnecter and sear bar return spring removed from the sear bar, we will now test the fit of the bottom surface of the striker.
 - Assemble the bolt group and striker in the upper receiver.
 - Push the sear bar forward and slide the lower onto the receiver, do not install the recoil spring or extension rod yet.
 - Through the top opening of the receiver, move the striker and bolt group back and forth. The striker should not catch on anything unless the sear happens to pop up. The bolt group should not catch on anything whatsoever.
 - Carefully mill or surface grind material from the bottom of the striker until there is no binding on the lower parts. Do not remove more than .005" at a time!
 - Install the recoil spring and extension rod. Do not install the striker spring. Repeat the above test and check that the striker does not bind on the extension rod. If it binds, most likely the rod is bent.

12. Now it is time to fit the disconnecter. This is the most critical part for reliable function of the system. If you remove too much material, you will have to start over with a new part.

- **The disconnecter in this kit is machined to the same dimensions as previous kits by other manufacturers. It is oversized so that it can be fitted to these older builds with parts that may have been modified differently than what we have previously instructed, most notably the trigger. If this is the case for you, we recommend using the instructions provided by these manufacturers.**
- If you are doing a new build, the first step is to set up the disconnecter offset 10 degrees from the top face and remove .030" from the bottom. See *picture*

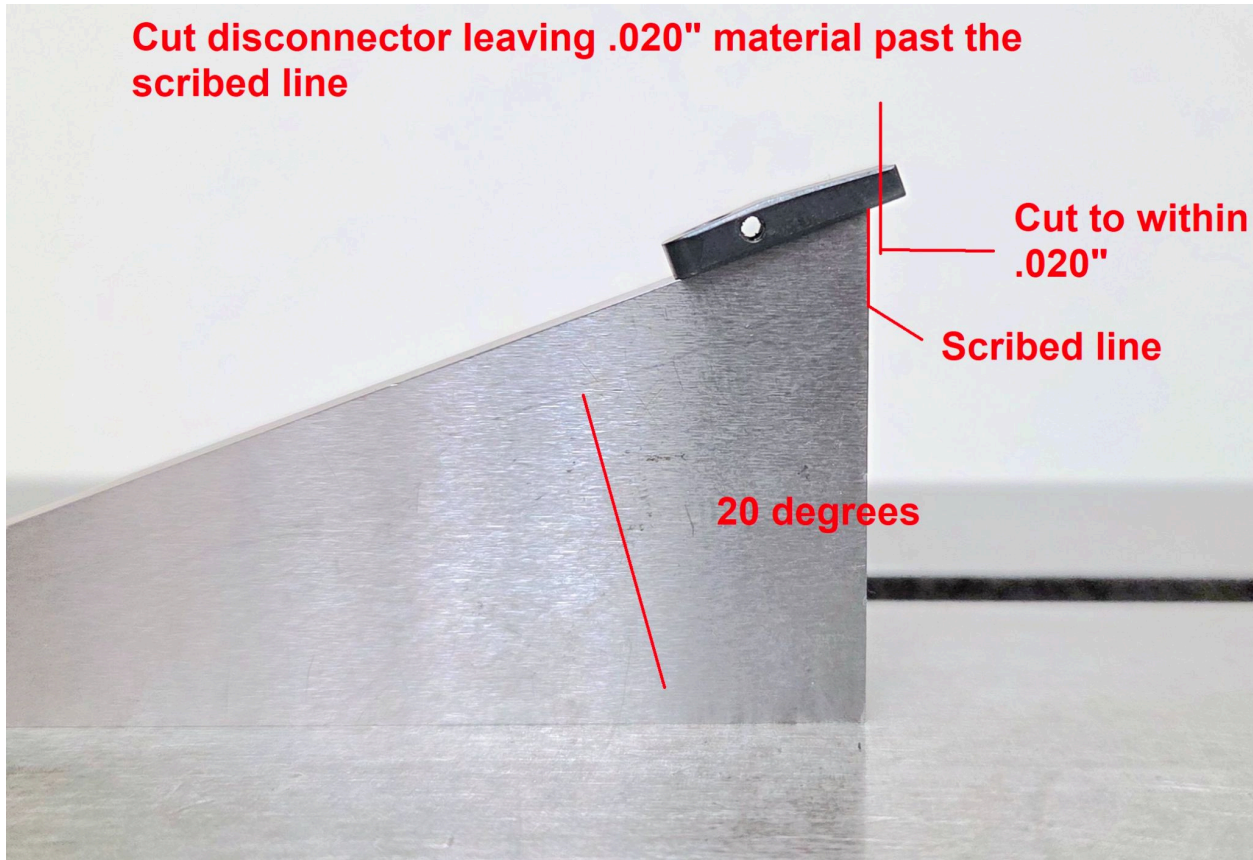


Removing material from the bottom surface, setup at 10 degrees as shown, is how we adjust the disconnecter height for striker reset.

- Next, install the disconnecter and sear bar into the lower. With the safety on fire, pull the trigger and using a needle, scribe a line on the disconnecter where the edge of the trigger hook meets it.



- Now that we have a reference to cut the disconnecter length, set up the disconnecter 20 degrees offset from the top surface, with the bottom of the disconnecter facing upwards. Cut the disconnecter leaving .020" material past the scribed line. Break all sharp edges with sandpaper. This cut is the first step in how we regulate the trigger engagement.



- Re-assemble the lower and test the trigger. We want the trigger to smoothly engage the disconnecter and push the sear bar forward.
 - If the trigger binds at the start and does not push the sear bar forward, the first step is to add a small radius to the bottom edge of the trigger hook.

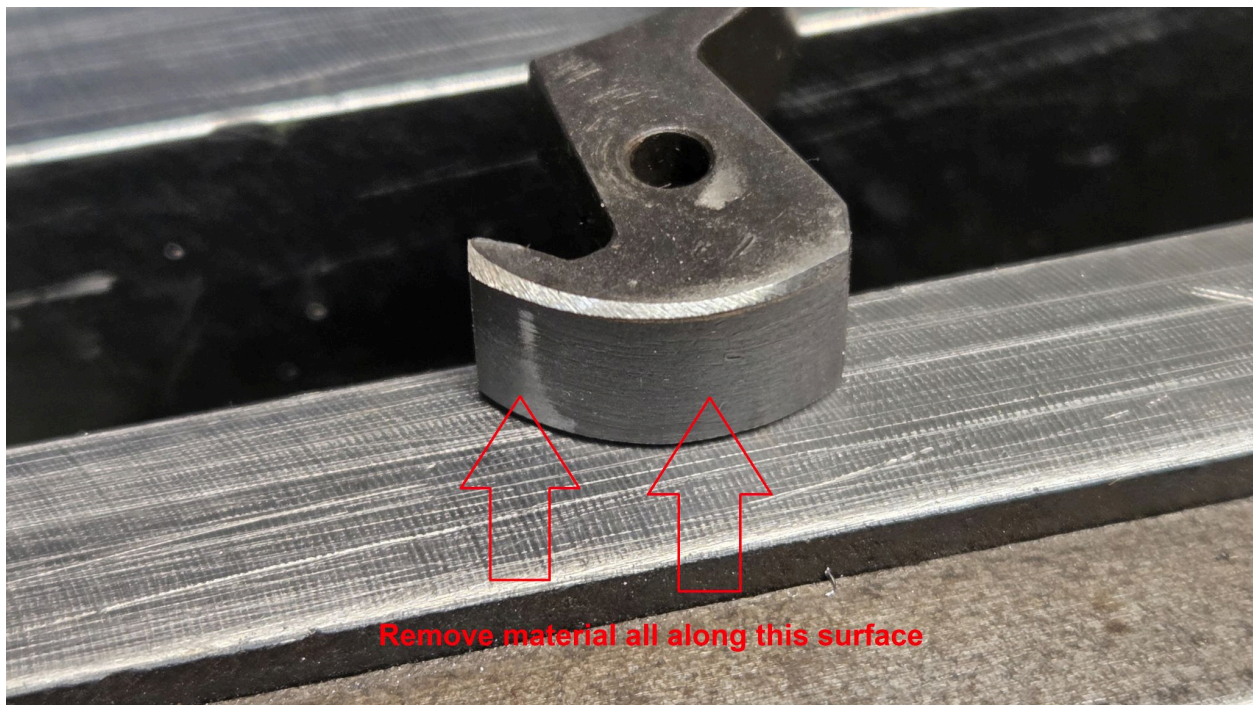


- Re-assemble
 - If the trigger still binds at the start, shorten the disconnecter another .010". Break all sharp corners with sandpaper.
 - If the trigger continues to bind at the start of engagement, repeat these two steps one more time. Do not exceed a trigger radius as shown in the picture above.
 - If the trigger continues to bind at the start of engagement, remove .005" from the end of the disconnecter and break all sharp edges.
 - If the trigger continues to bind at the start of engagement, repeat step #4 of the FCG fitting, however this time only remove .010" from the trigger, and then add a radius.
 - Repeat these two steps as needed until the trigger begins to engage the disconnecter smoothly and pushes the sear bar forward. Do not shorten the disconnecter past .550" length. *It is unlikely that you will need to repeat these steps more than once.*
13. Once initial disconnecter engagement is smoothed out, we want to make sure that when the trigger is pulled it drops the sear below the sear bar before automatically resetting at the end of trigger pull. If this doesn't happen, it's likely the disconnecter or trigger has had too much material removed.
14. Assemble all parts onto the lower including the recoil spring assembly. Assemble the upper on to the lower to include the bolt, striker, and striker spring. **Make sure the firearm is unloaded!**

- Check that the striker is held back by the sear after cycling the bolt quickly.
- Check that the striker is released when pulling the trigger. If the striker is not released, you may remove up to .010" from the bottom of the striker as needed. **Never remove material from the sear.**

15. Cycle the bolt and reset the striker. We will now slowly pull the trigger and hold it at the point where the striker is released. Hold in this position and cycle the action. The striker should engage the disconnecter and release the sear bar from the trigger..

- If it does not, we have two options. One is to remove material from the bottom of the disconnecter, as we did at the beginning of step 12. This allows the disconnecter more engagement with the striker.
- The other option is to remove material from the top contour of the trigger as shown below. At this step you really just have to use your judgement based on what the parts are doing, but I usually start by removing another .002-.005" from the bottom of the disconnecter, and from then on remove material from the trigger only. Unless the striker is barely moving the disconnecter, it's usually the trigger. This especially if you had to repeat step #4 more than once.



16. Cycle the bolt and reset the striker again. Now we will slowly pull the trigger and watch until it almost releases the striker. You want it just right on the edge and hold it there while you cycle the bolt. Make sure the striker resets the sear bar with the trigger in this position. If it does not, remove more material from the top trigger contour and repeat until it resets.

17. If you are using the undersize test pins, remove them and install the 1/8" dowel pins. Run all these tests with the striker again just to double check the slight difference in pins does not change anything.
18. Check the function of the safety again. The sear bar should not move and the striker should not release when on safe.
19. Install the firing pin extension into the bolt carrier. Make sure the firing pin extension is a slip fit and doesn't bind in its length of travel. *Do this last, for safety and so you are not dry firing these parts while testing.*
20. It's a good idea to disassemble the bolt / firing pin and make sure there is no cosmoline before test firing. This can cause light primer strikes.
21. Assuming you have completed the rest of the build, you are now ready to test fire.
 - Never shorten the striker spring. If you have weak feeding or the recoil spring extension doesn't have enough force to close the bolt, it's a recoil spring issue, or an issue with feeding or drag somewhere. Sometimes link belts can cause issues as well. Some Russian belts are overly tight and cause problems even in our full auto guns.
 - Light primer strikes are not a striker spring issue, you don't need a stronger one. If it's not the striker dragging on something, it's almost always an issue with weak feeding / cycling causing the bolt carrier to not fully close, and then the striker loses most of its energy slamming into the back of the carrier and forcing it closed.

Individual parts are available upon request.

We will not assist with semi-auto conversions over the phone. If you require consulting services relating to gunsmithing or machining please email us first.

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