The Gatalog
Presents:

Biden's Bane

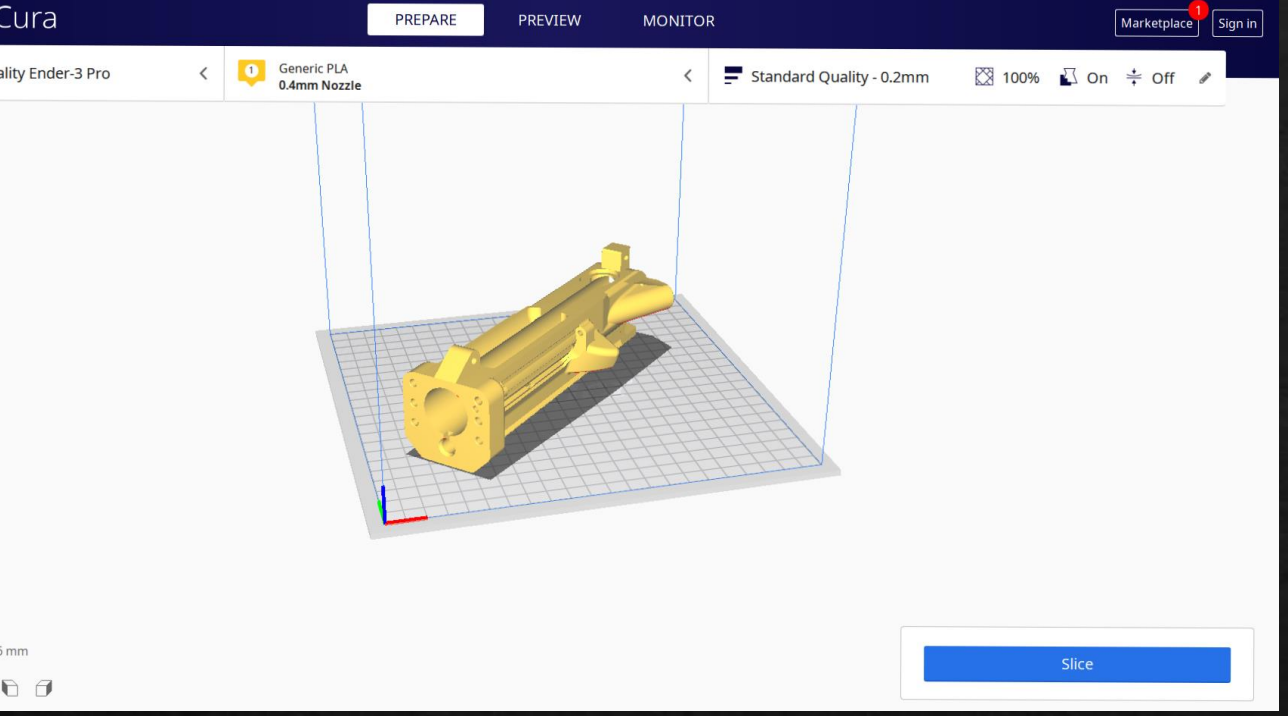
Printable AR15 Upper
Receiver

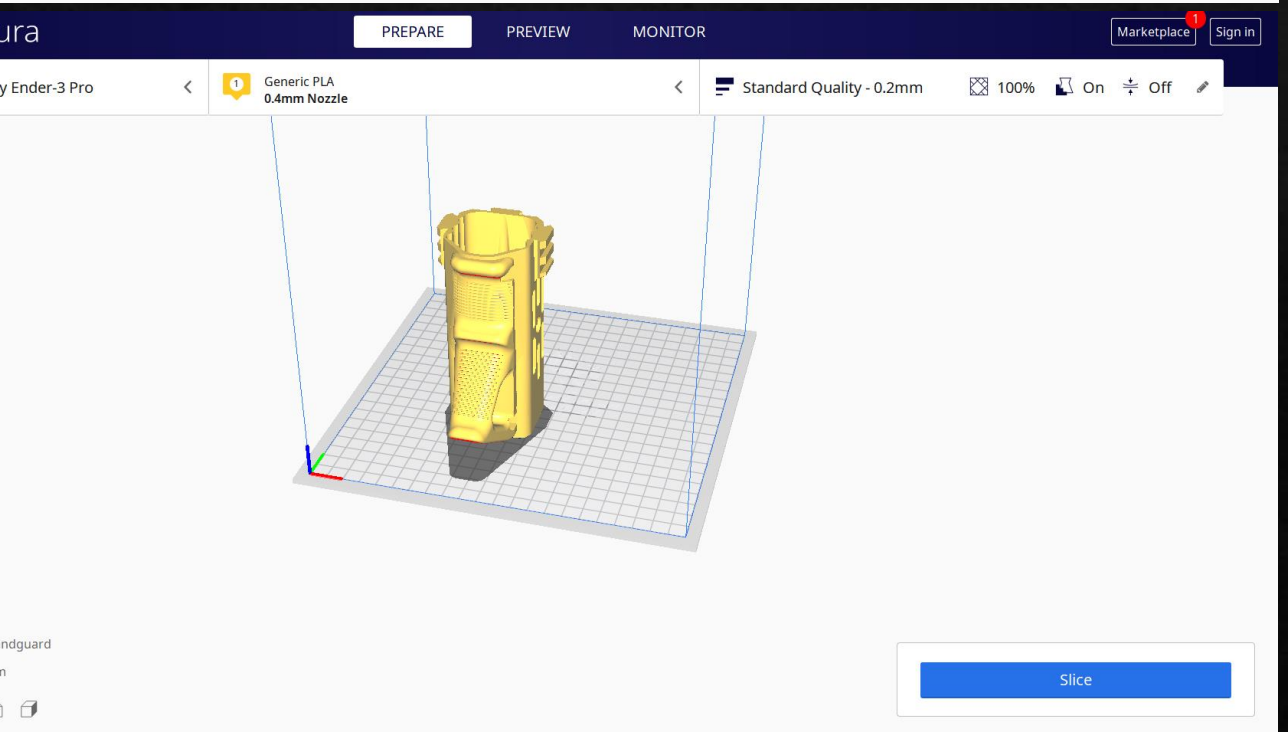
Material List:

- Ender3 or equivalent printer
- Roll of pla/pla+
- 5/16 OD .215ID Seamless stainless-steel tubing or the equivalent metal tubing
  - https://www.mcmaster.com/seamless-tubing/smooth-bore-seamless-stainless-steel-tubing/od~5-16/id~0-215/
- 8x2" 8-32 machine screws
- Metal Bushings (can use these or any of the printed bushings)
- Black-Anodized Aluminum, 1/4" OD, 3/4" Long, for Number 8 Size Screw (For UBAR takedown pin Lower Receiver)
  - https://www.mcmaster.com/93013A190/
- Black-Anodized Aluminum, 1/4" OD, 1/4" Long, for Number 8 Size Screw (For UBAR and others pivot pin Lower Receiver)
  - https://www.mcmaster.com/93013A424/
- Screwdriver
- Bandsaw/Handsaw (for metal tubing)
- File (recommended)
- hand drill (Strongly recommended)
- 8-10 inch long phillips driver (Strongly recommended)
- chisels (recommended)

Printed Materials

- Upper receiver
- Bushings (can use metal bushings)
- Handguard





Print Settings

- Place file in slicer with top of receiver down to print bed
- Layer height .2mm
- Infill 99%
- Heat 210c (or your preferred print temp)
- Walls 4-5

Build Overview

- Print desired upper, handguard, and bushings
- Cut a 1" length from the metal tubing, and deburr
- Hammer the 1"tubing into the 5/16 hole where the gas tube goes, if it does not fit run a 5/16 drill bit through it to widen the hole to the required dimensions
- Pre-thread the holes of the receiver and barrel nut by running the screws through
- Place barrel in front of receiver, should fit snugly (wont spin if correctly placed)
- Slide handguard over top of the barrel, it will line up with the upper receiver
- Put in the screws (preferably from the front but back is ok), if properly installed there will be no gap between barrel nut and receiver
- Install gas tube (can be a little tricky)
- Put in charging handle and BCG
- Put bushings in lower receiver
- Install the upper on the lower, and screw it in (make sure the bushings aren't pushed out)

Preassembly Steps

- Clean off any support structure
- Test fit Charging Handle and check function. Clean or scrape if necessary
- Test fit Bolt Carrier Group and check drag. BCG should move freely
- Cut 1” long length of stainless tube and deburr

Cutting your Heat Distributor

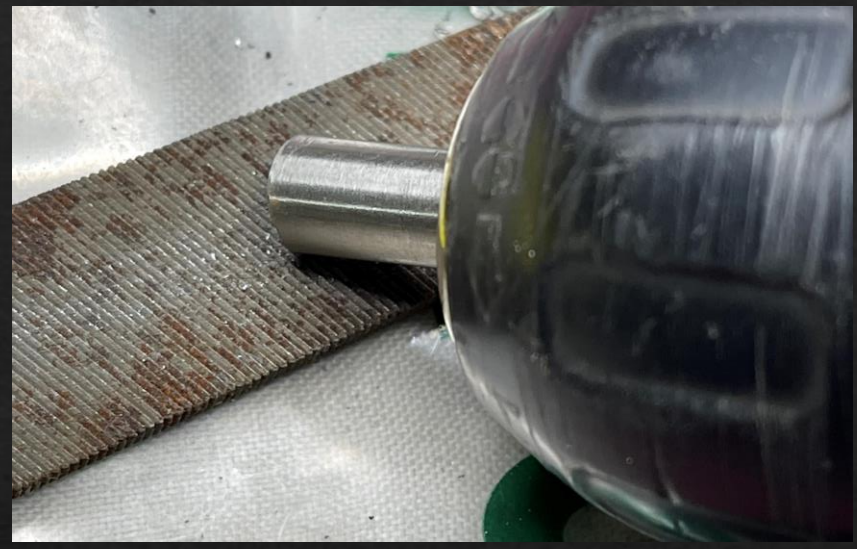
At the heart of the Bidens Bane build, is the unique mitigation of heat from the gas tube. This is accomplished by using a 1” long heat distributor. DO NOT ATTEMPT THIS BUILD WITHOUT IT. It is a critical component to the safety and longevity of this print. The tube in the link is a 5/16 OD .215ID seamless stainless-steel tubing. It is very hard and has good thermal quality.

Cutting your Heat Distributor

There are several ways you can cut your tube. A good quality tube cutter, cutoff wheel (WEAR EYE PROTECTION), or a simple hacksaw. Begin by securing the tube in a vise or clamp. Measure out one inch and mark where you will be cutting the tube. A light coat of oil will make the hacksaw work more efficiently. Slowly work your way through the tube until it is cut all the way through.

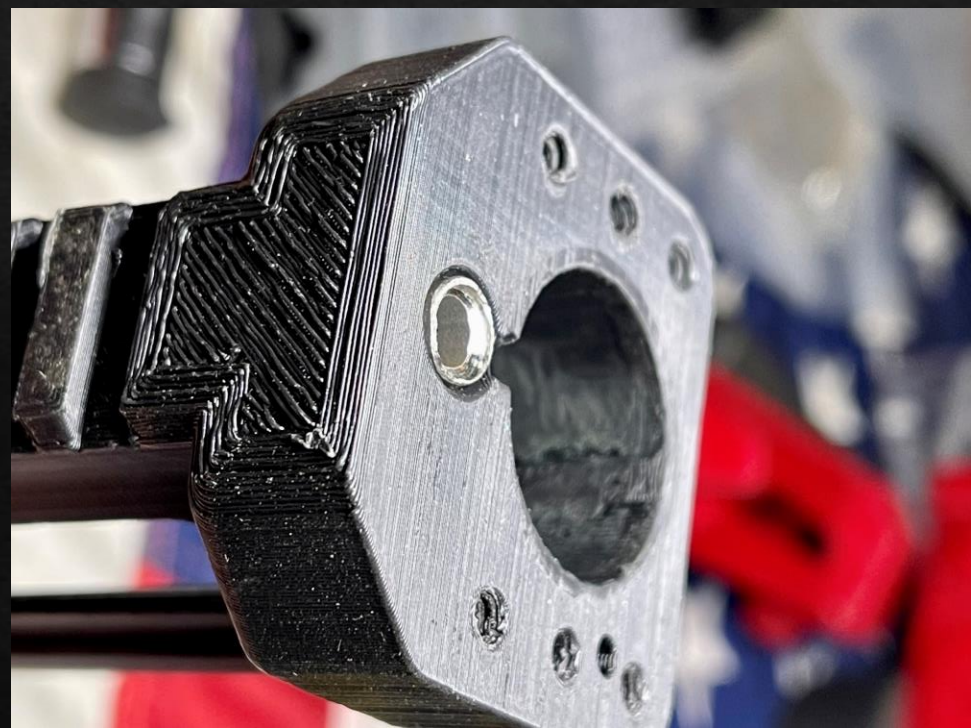
Deburring your Heat Distributor

After you have cut your heat distributor, it is important to deburr before installing into the receiver. A 9/32” drill will deburr the inside and leave a nice chamfer. The exterior edge can be deburred with a file. Chuck the heat distributor in a hand drill and spin the outside edge along the file until smooth. Be sure to deburr both ends, inside and out.



Installing the Heat Distributor

Take a 5/16” drill bit and chase the hole for the distributor. Then stand the receiver up on its end and start the section of tube in the hole. Taking a small hammer, tap it into place. Seat the tube flush or slightly inset with the face of the receiver.



The Biden's Bane uses 8-32 machine screws, both to mount the barrel nut to the receiver, and the upper to your lower. Later assembly steps are made easier by pre-threading all the holes. Begin by taking one of your 8-32 machine screws and run it into and back out of the first hole. Repeat this for all six barrel mounting holes, and then the two lower receiver mounting points.

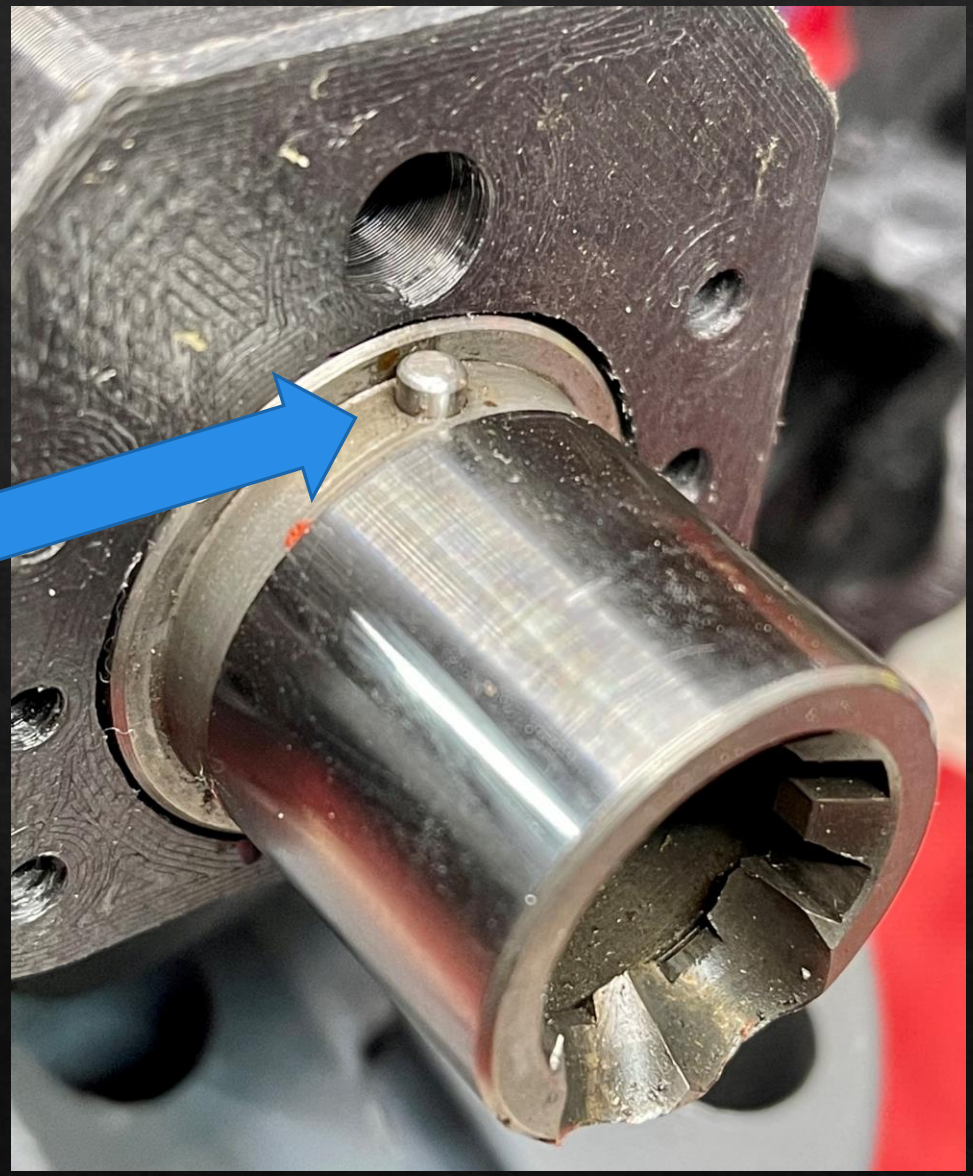
Repeat the same threading process using the 8-32 machine screws for the handguard. Aligning the lead thread between the halves is not necessary.

Assembling the Receiver

Test fit barrel in handguard. Make sure mounting ring can fit flush in the recess. If the ring is not flush, inspect the recess for support residue or trash. Clean this recess and confirm the ring will be flush.

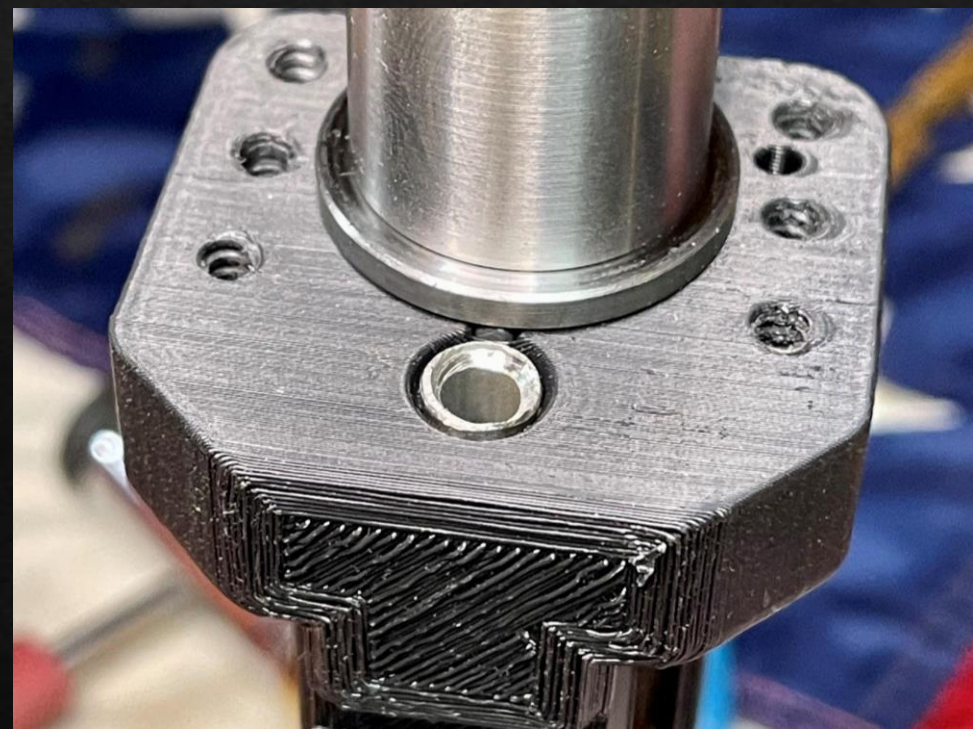
Assembling the Receiver

- Make a note of the key on the outside of the barrel
- This will mount in the keyway on the receiver
- Align the key to the keyway as close as possible BEFORE mounting the barrel in the receiver



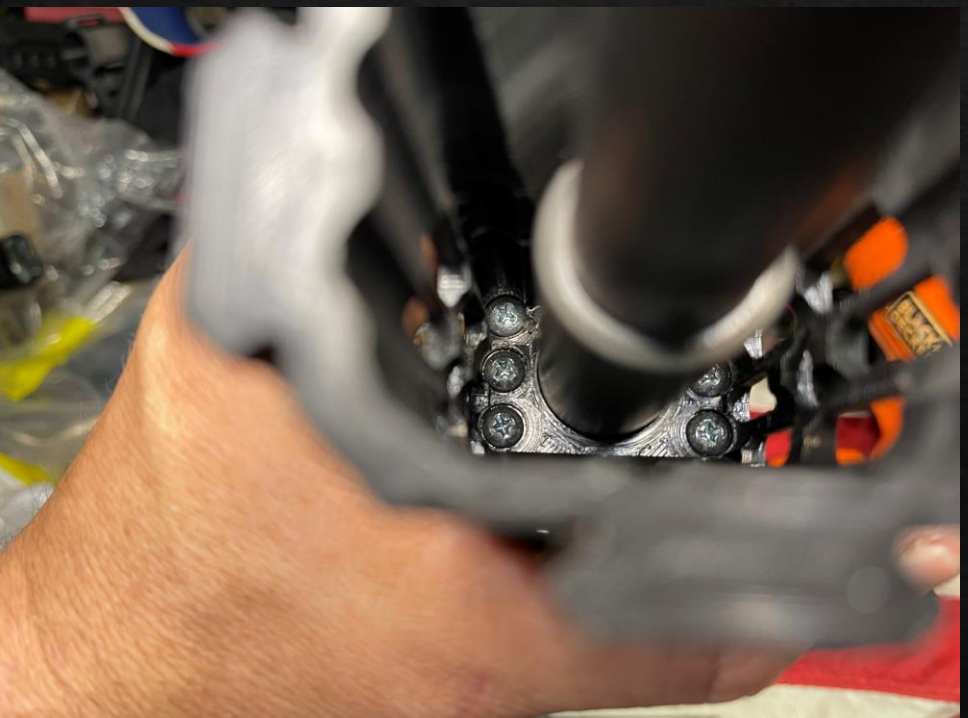
Assembling the Receiver

- Standing the receiver up on end, start the barrel into the receiver. Try to keep the key aligned to the keyway as you drive the barrel in. Use a rubber mallet or take precautions not to damage the end of the barrel you are striking. This should require moderate force to mount. Light force is ok. Too heavy force may crack the print. Slight hand fitting can be accomplished by filing or sanding the receiver.



Assembling the Receiver

- Standing the receiver up on end, slide the barrel nut/handguard over the barrel and into place. You should have a good seam, and little to no gap.



Assembling the Receiver

- While putting pressure down on the handguard, begin to drive the first screw. Get the screw started and steadily run the screw down all the way. DO NOT OVERTIGHTEN THE SCREWS! Set your clutch on your drill so it slips before it overtightens. (I set mine at 18 out of 23) Overtightening the screws will crack the print.
- Repeat for all six screws. (I like to do the top two first. The middle two second. And the bottom two last) The seam should be tight and no gap.

Assemble Gas Tube and Gas Block

- Hopefully, you have an assembled gas tube and block. If you do not, and it is your first time, be patient, as it can be tedious. You must insert the tube into the block with the gas hole down, align the roll pin hole, and drive the roll pin in. The gas block is an odd shape and does not like to remain in place while said pin is being driven. There are many videos on the web that can help guide you through this part.

Install the gas block assembly

- Thread the gas tube through the heat distributor while sliding the gas block over the barrel.
- Seat the gas block into position. Usually there is a shoulder on the barrel that the block will rest against.
- Install the two set screws for the gas block. Make sure these are tight.

Install the charging handle and bolt carrier group

- Align the ears of the charging handle with the slots in the rear of the receiver
- Press the charging handle down into the channel for it. Put it an inch or so into the receiver
- Insert the bolt carrier group into the rear of the receiver. The top of the bolt should align with and into the charging handle. You should be able to push the bolt into closed position

Prepping the UBAR lower

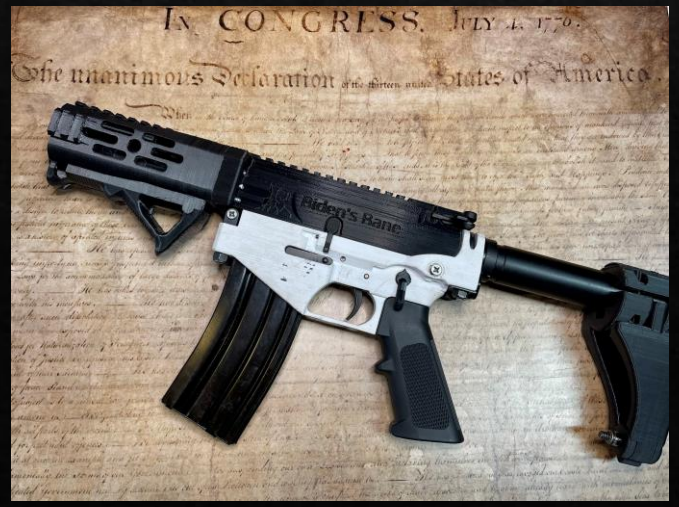
- Take two ¾” long bushings and install in place of the rear takedown pin. Make sure the bushing is flush with the inside wall of the lower receiver.
- Install two ¼” long bushings in the front eyebolts in place of the pivot pin

Prepping the Hoffman lower

- Take two ¼” long bushings and install in place of the rear takedown pin. Make sure the bushing is flush with the inside wall of the lower receiver.
- Install two ¼” long bushings in the front section in place of the pivot pin

You’re almost done, Jack!

- Place printed or Aluminum bushings into lower receiver (remove pins first)
- Attach Upper to your lower using 8-32 screws
- Cycle the action manually (W/O ammo) to check function.



Troubleshooting:

- My Charging Handle is hard to install

  Use a punch to press the 'nubs' of the handle into the channel. Make sure you are aligned with the pathway for the 'nubs'

- My charging handle is hard to draw or has excessive drag

  Inspect channel and roof of receiver for support remains. scrape or clean. Also verify upper is not warped. If warped, reprint w/ glue stick

- My BCG has excessive drag or is hard to release from lockup.

  Check for any support residue or warping. Apply a light coat of oil and work the action manually until function improves.

- My heat sink tube is tight. Can I use moderate to heavy force to install?

  Yes, however check the tube and inside of receiver for filament residue scraped off during install

- My barrel is tight, and hard to install

  You can sand/file/Dremel material away until fit improves. Only remove a small amount at a time and retest fit.

- My handguard will not mount flush to the receiver

  Check the recess in the handguard where the barrel ring sits for support residue/trash. Scrape or sand if necessary.

  Check both faces for warping/squareness. Sand or file if necessary

  Inspect screw holes for excess material pushed out during the threading process. Clean if necessary

- My print cracked. Will I die if I use it?

  No. But be smart about what you put it through while you reprint.

Credits:

- Co-op
- Dr Death
- Generalscotty-alt
- UberClay
- Gerald.katz
- Ethan.hall