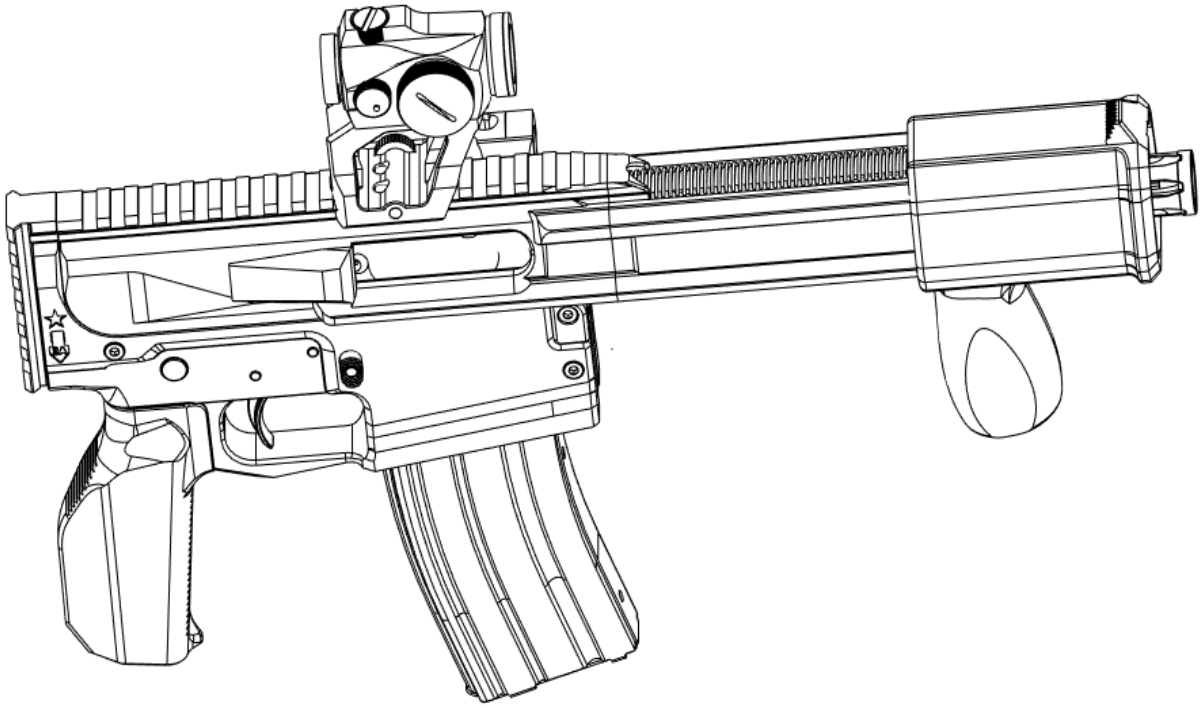
3D ARMS x MIDDLETON MADE

Apple Fritter/Pie Pump Action AR-15 - README



You are responsible for your own safety

Links:

- Odyssey:
  - Middleton Made
  - The Gatalog
  - Are We Cool Yet?
  - 3D Arms
- Paypal:
  - Middleton Made
- Instagram:
  - 3D Arms
  - Middleton Made
- FaceBook:
  - Middleton Made
- YouTube:
  - 3D Arms
  - Middleton Made

TLDR

If you want the threads exposed you need a 7.5” or longer barrel. If you want to comfortably use the beer brat style grips, you need an 8” barrel or longer.

If you like the barrel to end just past the handguard, the barrel lengths are included as the name of the handguard piece. You can always use a longer barrel than the name implies, however a shorter barrel may be unsafe.

The Fritter has recommended barrel lengths of 7.5-10.5 and the pie is for 11” and up, with the full length handguard being 12”.

Introduction

The Apple Fritter/Pie are pump action AR-15s designed as fun and simple projects using parts you may already have laying around. It can be printed in any AR-15 caliber that operates with a locked bolt. It has been tested successfully in 5.56, 7.62x39, 300BLK, and .458 SOCOM. It will not function with pistol calibers, however 22lr conversion bolts will work on the full length Pie, but not on any others.

If you post photographs or videos, we would love to see them. Feel free to tag us or send them to our social media pages.

Not Legal Advice

Free men don’t ask, and I’m not your dad. That being said, the upper receiver is understood to be 50 state legal at the time of writing this. Pistol/Rifle designations may be important in your state law so be sure to be informed. Some states currently regulate printing the “firearm” and therefore the lower may not be legal to print in your jurisdiction. Due to this, we have included an upper that can function with a mil-spec metal lower receiver, and another that can function with most popular printed lowers.

While we prefer printing the whole package, that may not be the best option for you.

Printing

Filament Type - PLA+, PLA PRO, Filled Nylons

For any parts that receive stress, do **not** use metallic, silk, glow in the dark, fluorescent, or any other “special” type of filament. Stick with regular, single color PLA+ or better. Print at your own risk.

Esun pla+ and Polymaker pla pro are generally recommended by the community.

Printing Instructions

3D Arms typically uses 10 walls, 99% infill, and tree supports. Middleton Made typically uses between 10-16 walls, 60-90% gyroid infill, tree supports, and a skirt. Support is recommended on all prints. Your printer and material may require different settings to get a strong and clean print.

Which Files to Print

Upper

There are three right eject uppers, and three left eject uppers that can be printed. The upper to be printed depends on what lower you will be putting it on; the included Apple Fritter/Pie lower, another printed lower, or a mil-spec metal lower. Left Eject uppers are not compatible with lowers that have a bolt catch unless you modify the catch, and a version of the lower without said catch is included. The standard Apple Fritter/Pie upper/lower is rated for all ar-15 calibers and has been tested up to .458 SOCOM. The upper compatible with other printed lowers, such as a UBAR or Hoffman lower, as well as the upper for mil-spec metal lowers are only rated for 5.56 and 300 BLK because the dimensional limitations of the take down pins result in a weak point. These two uppers are only included for convenience, and are structurally inferior to the standard option. That being said, the potential failure of the takedown pin holes is not a dangerous failure mode.

Bolt Carrier

If you are using the Apple Fritter lower, you can use our printed carrier, or you can chop a metal carrier and print a replacement gas key. If you use a lower with a buffer tube, you also have the option of using a metal carrier without chopping it. This unchopped configuration is compatible with super safeties and FRT style triggers resulting in a slam-fire-esque configuration.

Handguard

The name of the handguard is the minimum barrel length. The Pie uses two piece handguards labeled the barrel nut and the handguard. The fritter uses one piece or two piece handguards.

Lower

There are two lowers, one with and one without a bolt catch. The choice is largely preference, however the left eject uppers require a lower without a bolt catch (or you can dremel off the interfering portion of the bolt catch).

Pump

The Pie has one grip option, however the fritter has three options depending on your grip and aesthetic preferences. You can use a fritter forward grip on the pie, you will just need to adjust the length of the bcg threaded rod accordingly.

Print Orientation

All files will import into your slicer in the recommended orientation.

Store Bought Parts:

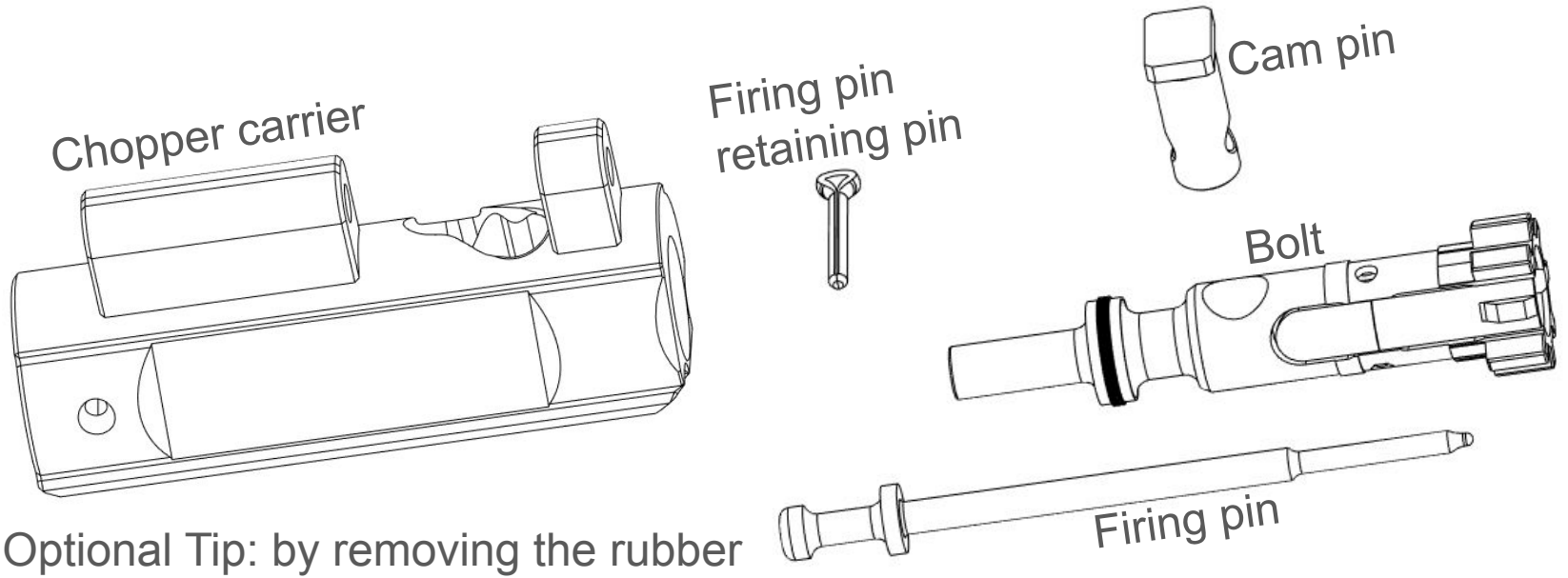
- AR-15 BCG minus carrier, Barrel, LPK.
- AR-15 low profile gas block (set screw style) or a welder to close the gas port. If the gas length of your barrel is mid length you will need a welder to close the gas port on the pie.
- 8-32 threaded rods (length varies based on handguard length)
- 4 8-32 nuts.
- 3 m4x25 socket head bolts and nuts
- Blue loctite (Strongly Recommended)
- Red loctite (Recommended if using a gas block)
- G17 or G19 recoil spring (optional, and depending on length you may want to cut the spring or use a portion of a second spring to increase tension)
- Liquid super glue (yes, I know, it sounds wrong)
- 5 8-32 x ½" Binding Barrels (McMaster Carr 98002A413)

Tools

- Wrench or pliers
- 4mm Allen key for m4 bolts
- Some means to cut the threaded rod. A dremel, a hacksaw, or a file would work.
- A set of standard (inch based) drill bits for reaming holes on the lower.

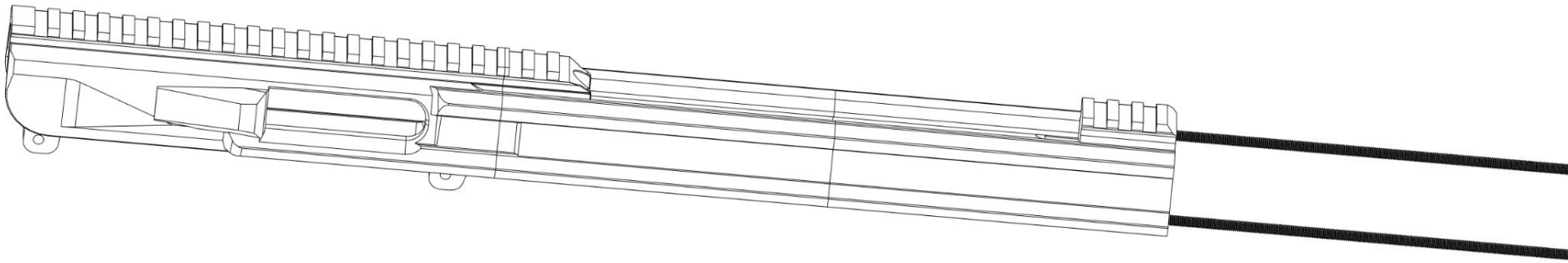
Assembly

Assemble as you would any other BCG. First the bolt, then the cam pin, then the firing pin, then the firing pin retaining pin.



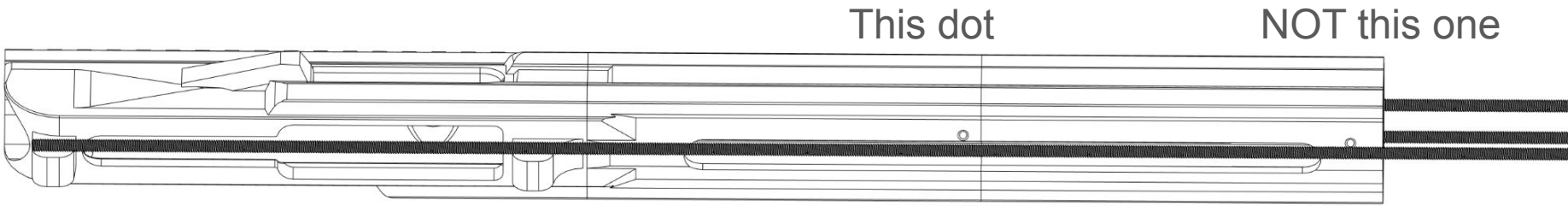
Optional Tip: by removing the rubber washer around the extractor spring, you can make chambering easier.

Dry fit your upper and handguard like so with a couple threaded rods

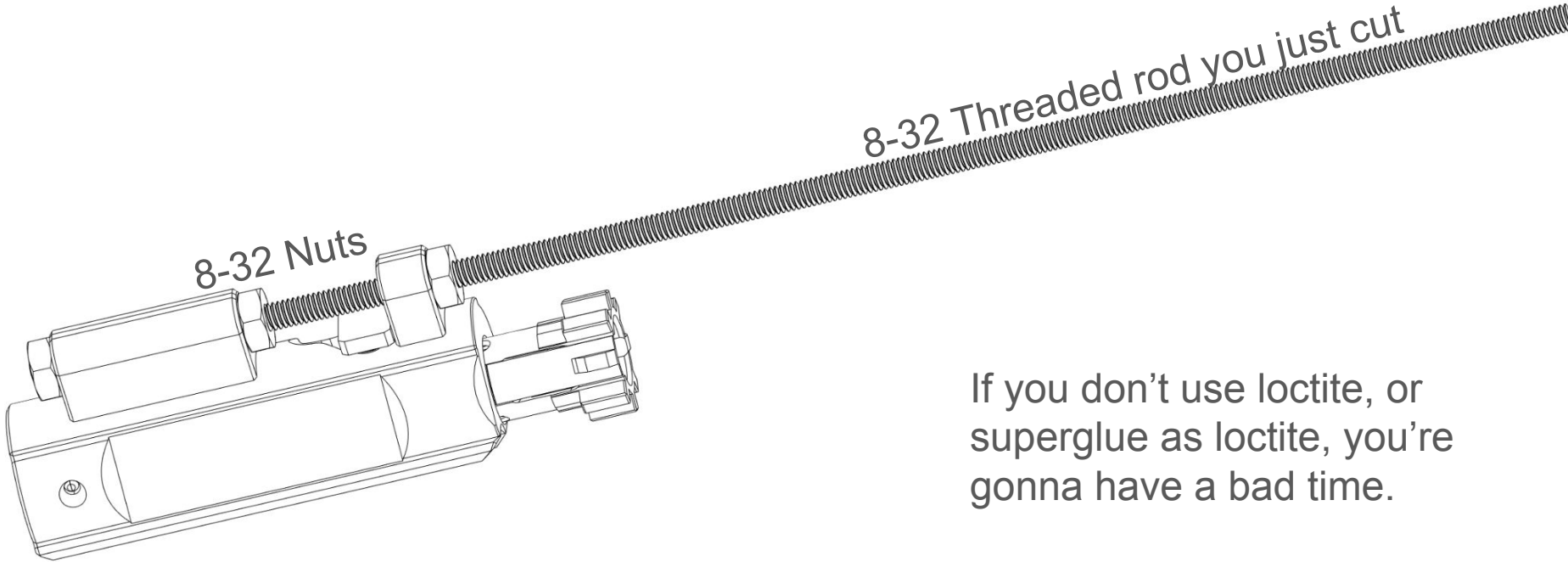


This is a Pie handguard, but the concept is the same for the fritter

Line a rod up with the rear lug on the upper (as shown), and then mark where the closer dot on the underside of the handguard is. This is an appropriate length for the BCG - forward grip connection. On The 12” pie (as shown) there isn’t much room to deviate in length, however on all other handguards excluding the 7.5” fritter there is room to cut shorter and I am marking the longest option.

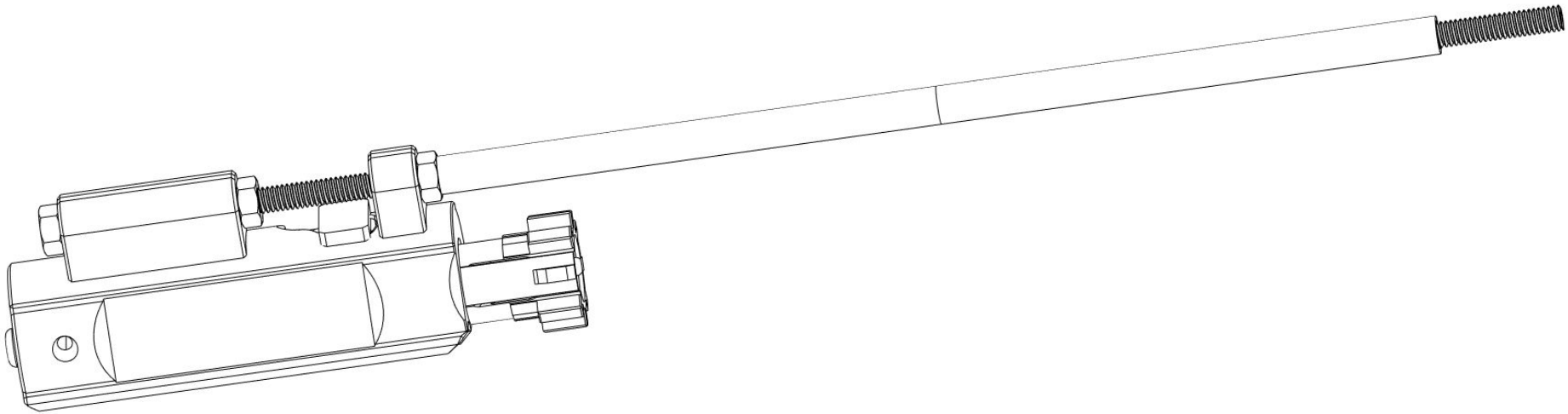


Assemble as shown, using loctite on the 8-32 nuts.

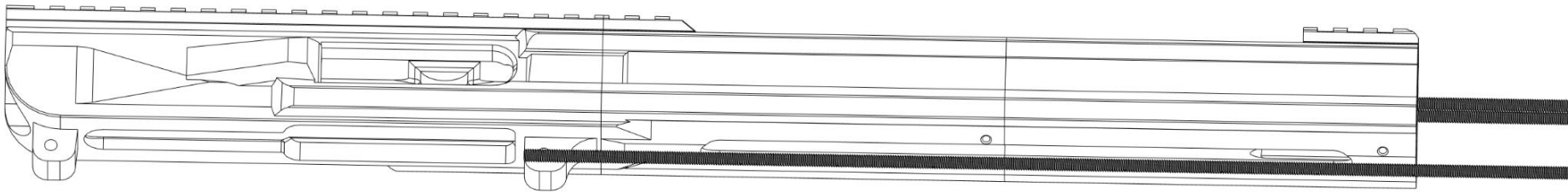


If you don’t use loctite, or superglue as loctite, you’re gonna have a bad time.

You may now install the threaded rod sleeves.

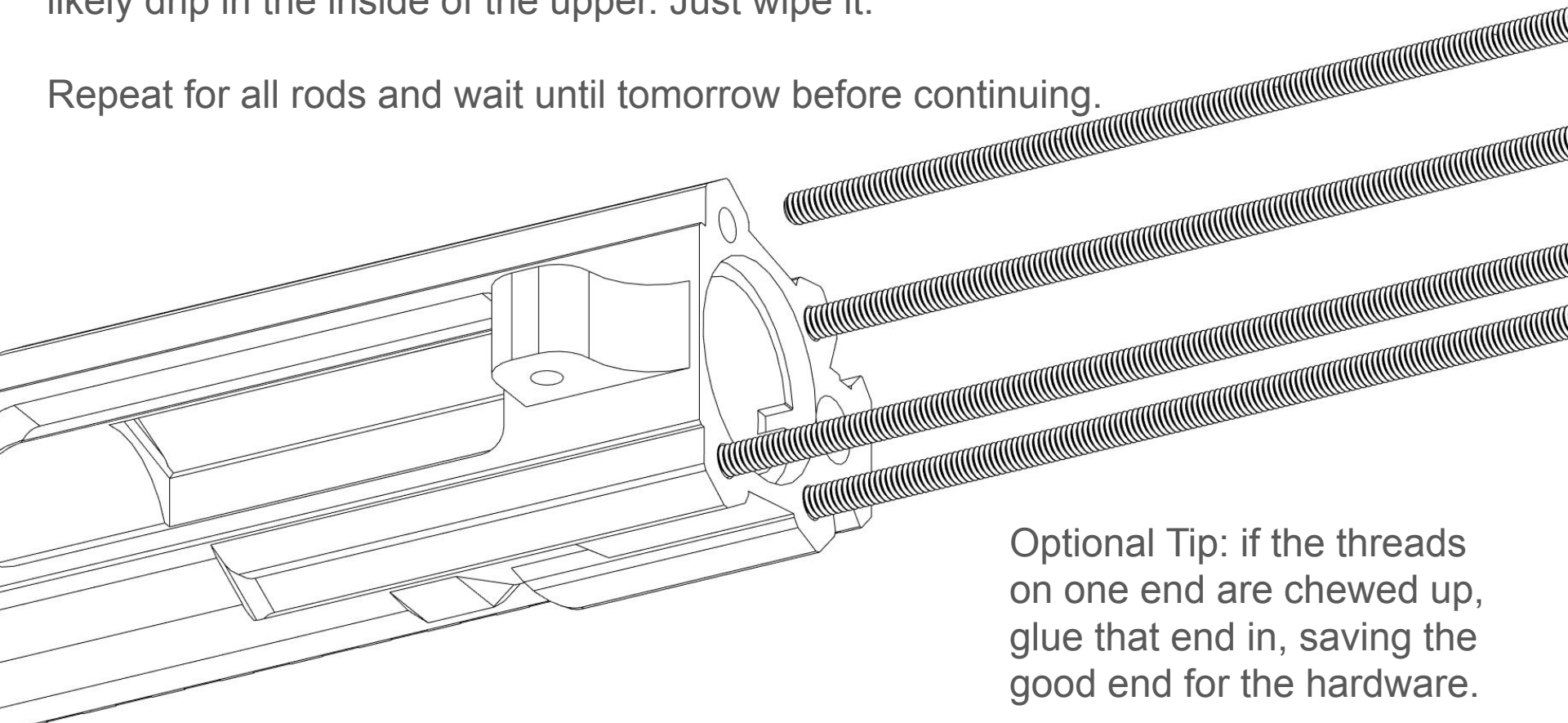


Now line another rod up with the front takedown pin. Using the front dot, you will cut 4 rods to this length



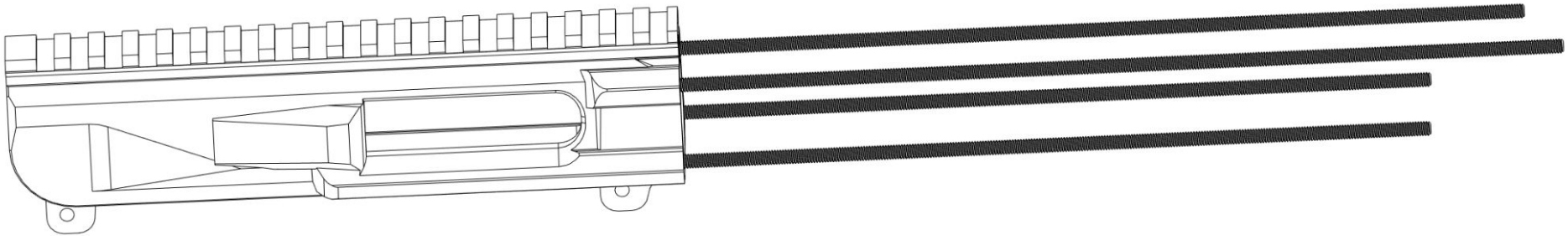
Fill the hole with liquid super glue (do not use gel) and insert the threaded rod as far as it will go. Clean up the excess. Some will likely drip in the inside of the upper. Just wipe it.

Repeat for all rods and wait until tomorrow before continuing.



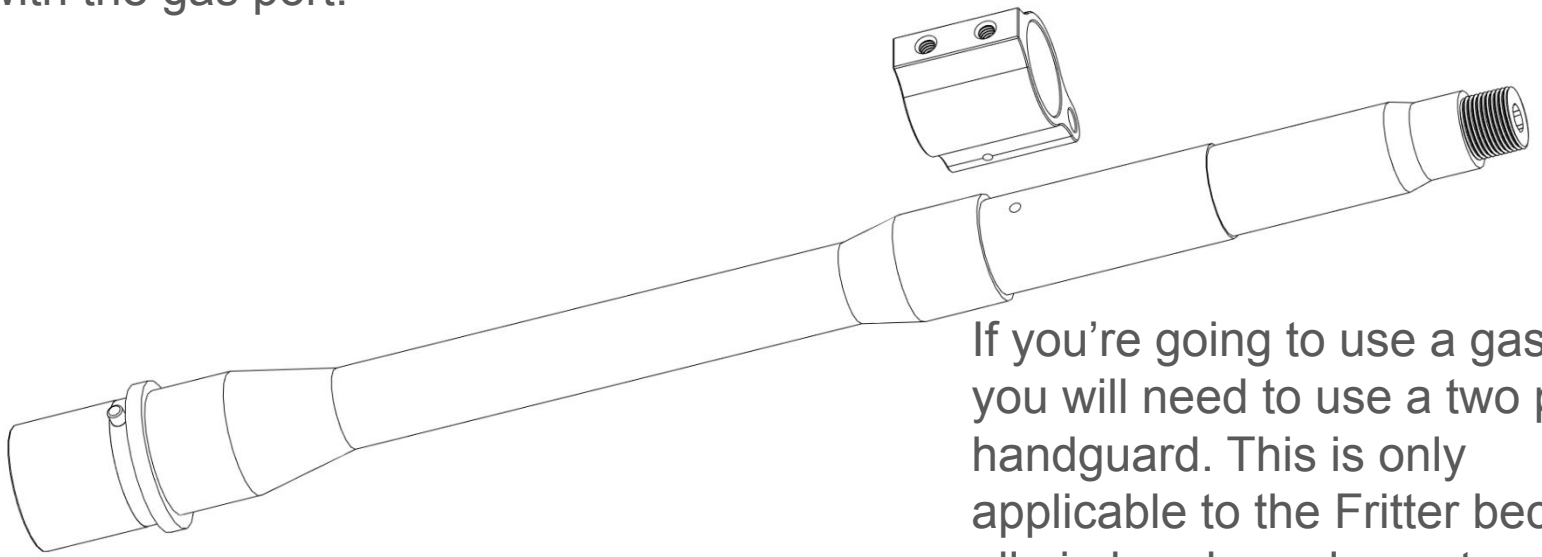
Optional Tip: if the threads on one end are chewed up, glue that end in, saving the good end for the hardware.

The rods will be staggered, this is done for ease of assembly.



Now we’re going to block the gas port.

I typically put a small weld over it, but if that doesn’t work for you, then a low profile gas block installed upside down will block the hole. The rear screw aligns with the gas port.

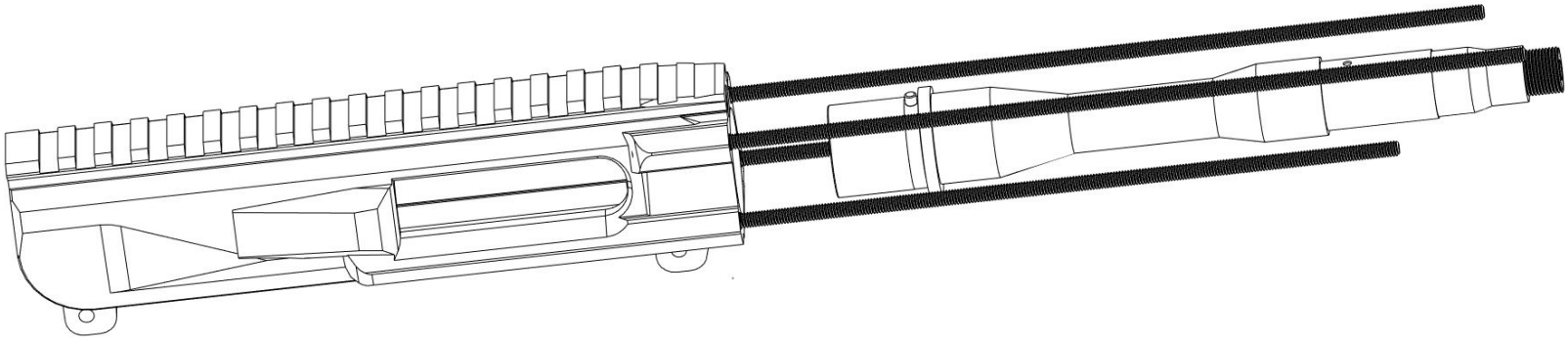


If you’re going to use a gas block you will need to use a two piece handguard. This is only applicable to the Fritter because all pie handguards are two piece.

Insert the barrel.

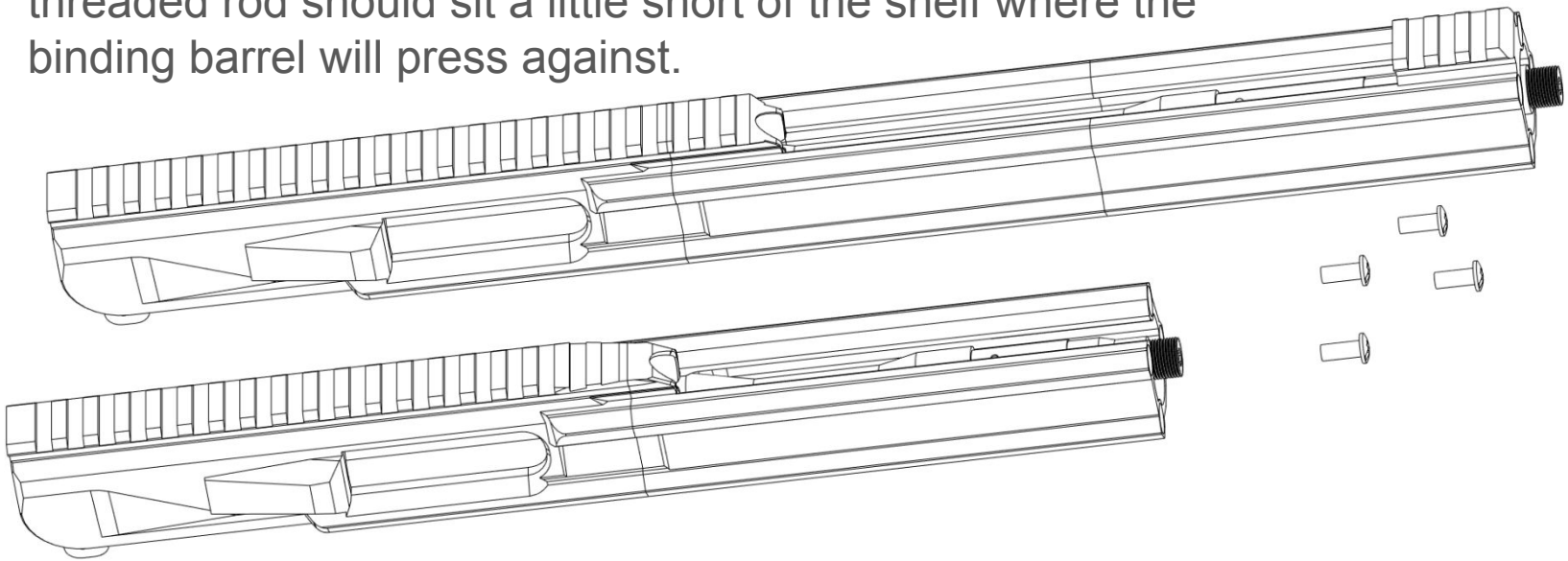
I highly recommend using JB weld to epoxy bed the barrel into the upper. This becomes more important the less snugly your barrel fits into the upper.

Install the handguard immediately and clean the excess JB weld (Sometimes it is easier to clean up after it cures. Dealers choice)



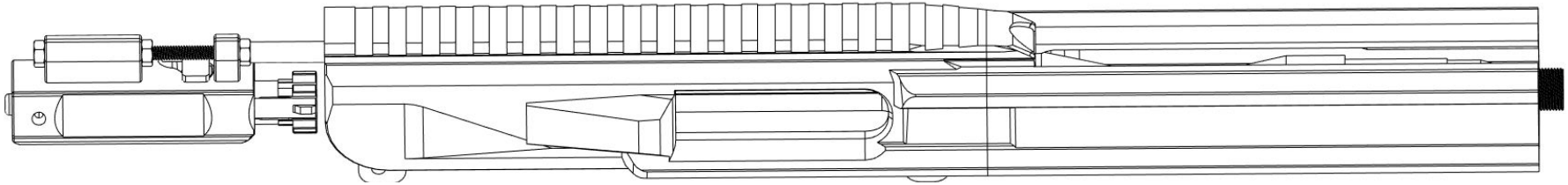
Tighten handguard down with 8-32 x ½” Binding Barrels.

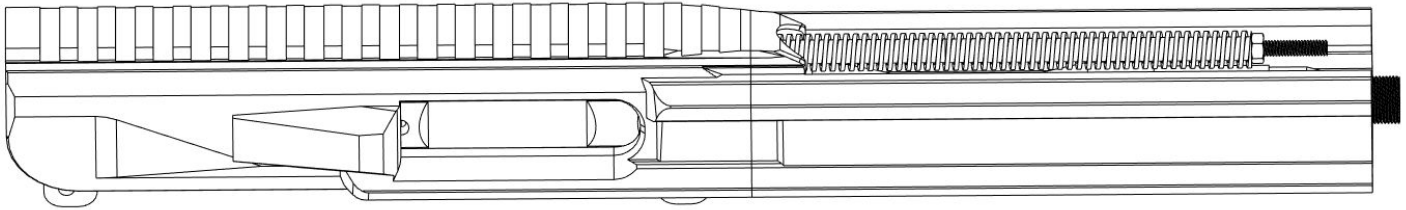
You will notice they are inset different amounts. The threaded rod should sit a little short of the shelf where the binding barrel will press against.



Assuming you used JB weld on the barrel, wait 24 hours before continuing.

On this next step, the Pie requires removing the front half of the handguard to install the forward grip and BCG. The Fritter does not.



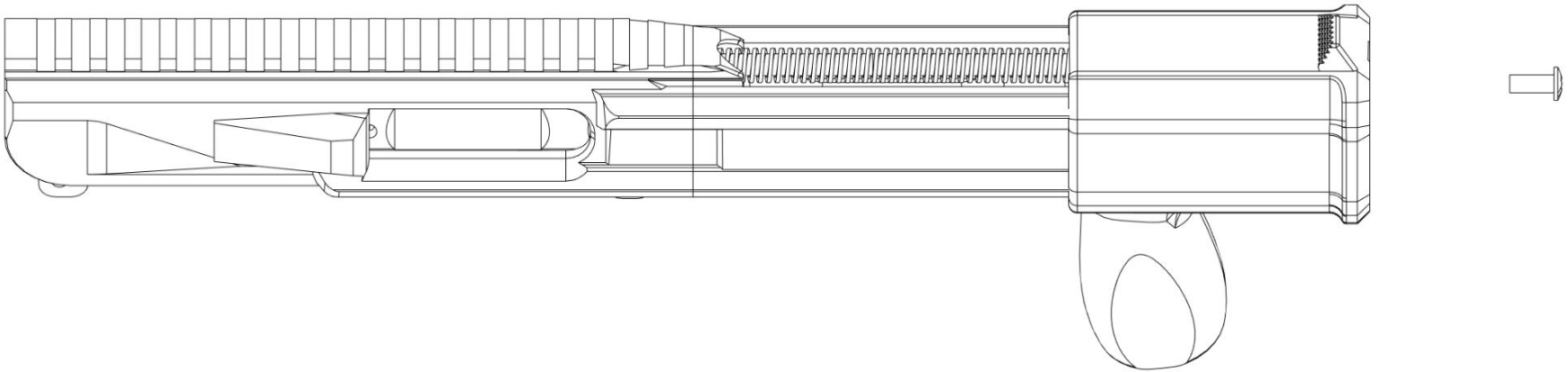


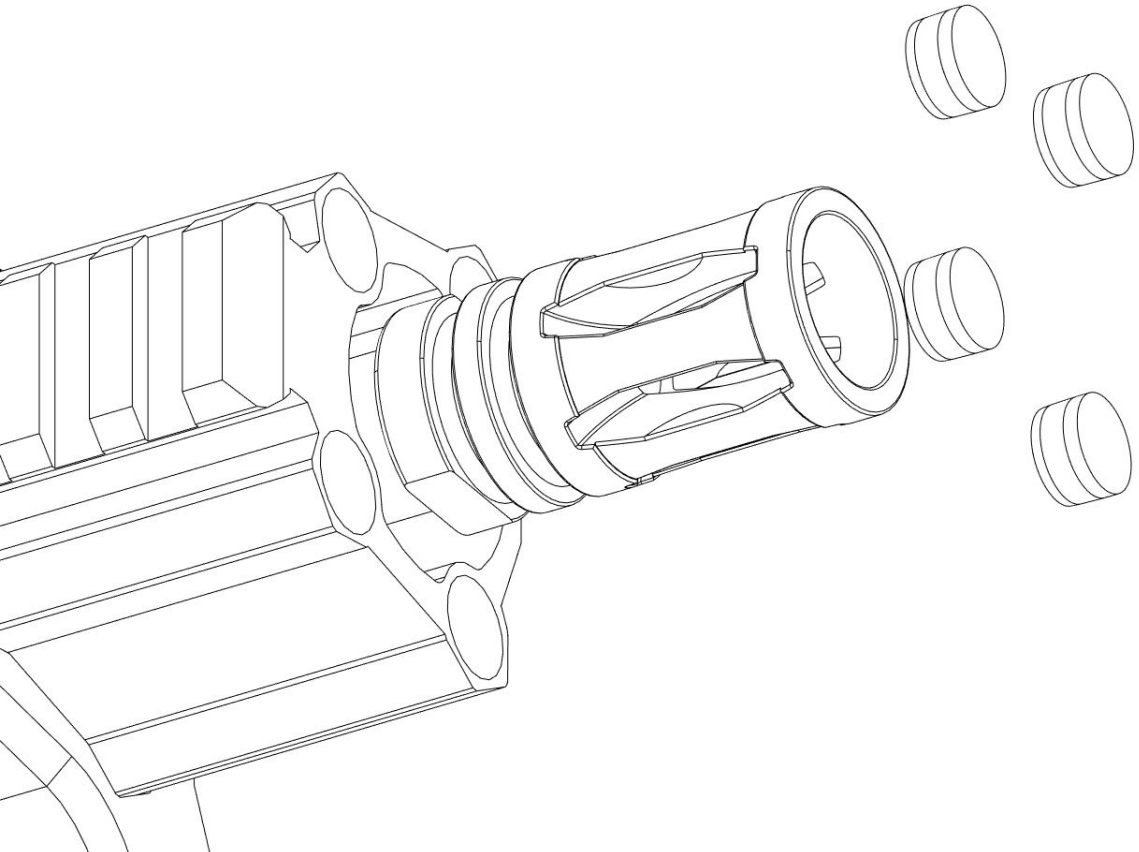
Add an 8-32 nut on the end

Optional: Install a G19 or G17 recoil spring to improve the pump-feel. Depending on the length you may want to shorten the spring (reduce tension) or add a portion of another spring (increase tension). A cut end should face the receiver.

Connect the forward grip with another 8-32 x ½” Binding Barrels.

For the pie you can now reattach the front portion of the handguard.





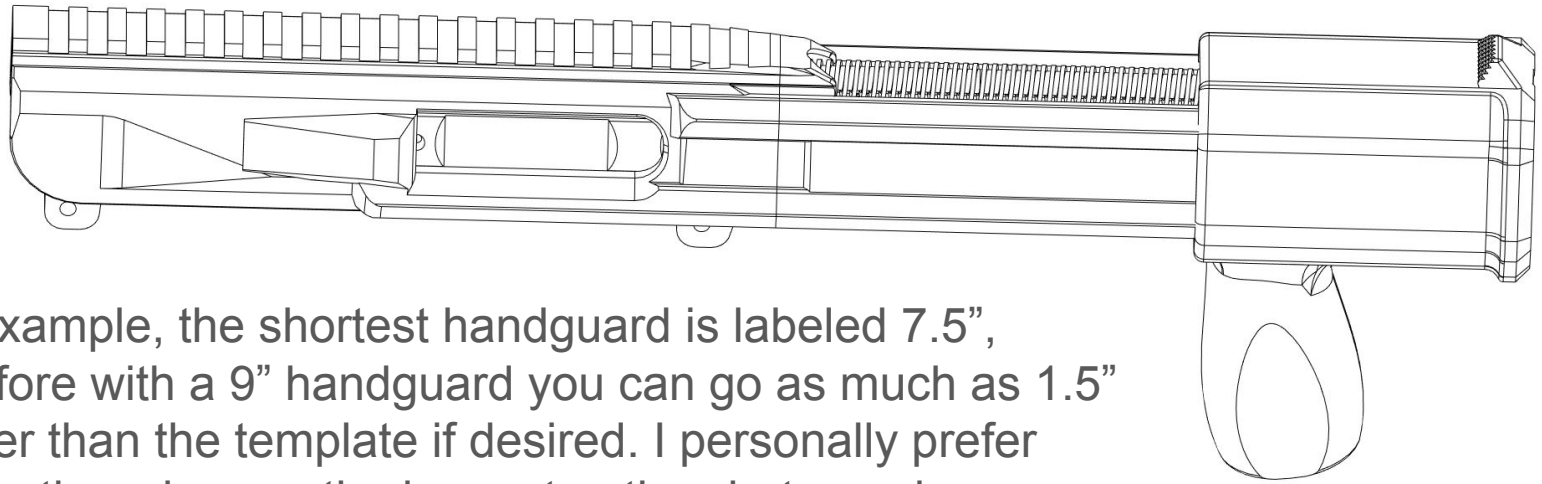
The handguard plugs can be used to hide the hardware on the front and are strictly aesthetic.

Due to creep it’s best to add these a few days after assembly, so that if you need to tighten the rods a little (you will), you can.

A light smearing of super glue will ensure they don’t pop out under recoil.

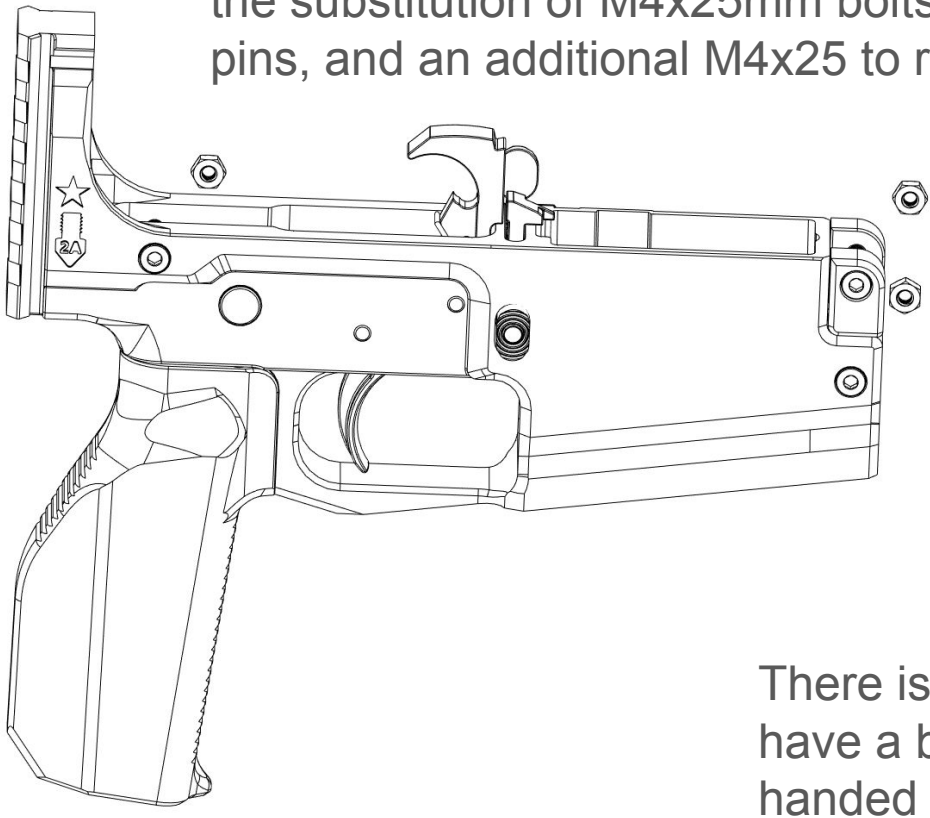
This is what your completed upper should look like.

Remember that for the Fritter, there are many different handguard lengths and on all but the shortest model, you don’t have to have the grip as far forward as the template will show. Cutting the BCG rod shorter will move the grip rearward.



For example, the shortest handguard is labeled 7.5”, therefore with a 9” handguard you can go as much as 1.5” shorter than the template if desired. I personally prefer having the grip near the longest option, but you do you.

The lower assembly is generally the same as any AR lower with the substitution of M4x25mm bolts for the takedown and pivot pins, and an additional M4x25 to retain the front dovetail



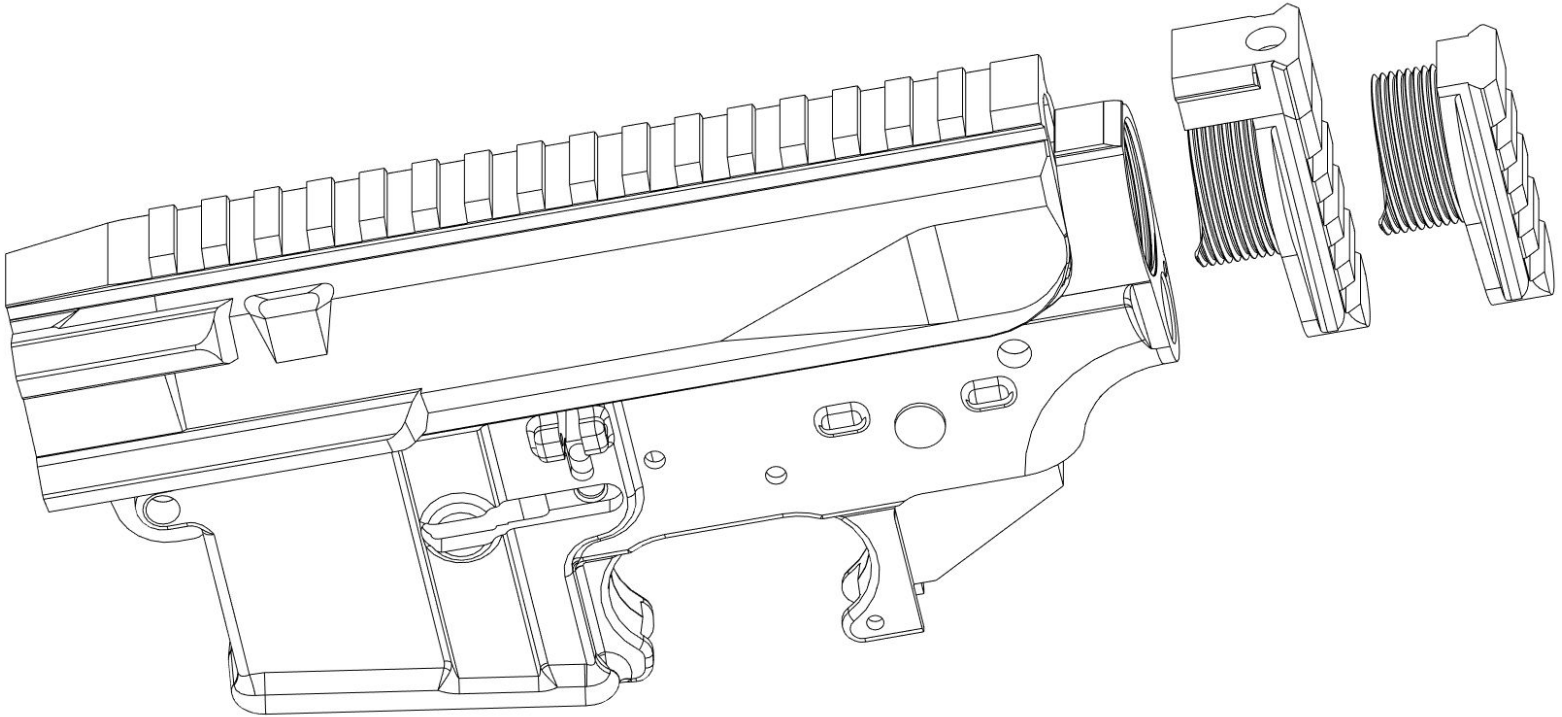
M4 Nuts

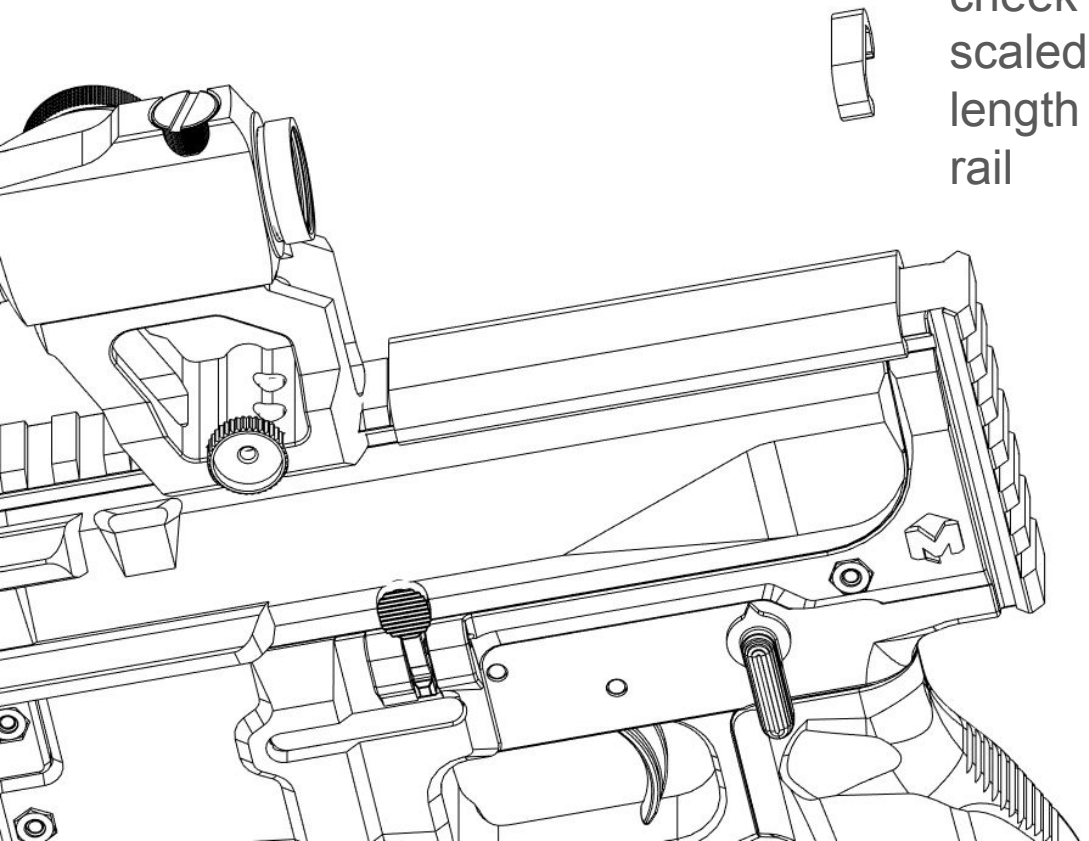
There is a version of the lower that doesn’t have a bolt catch if you prefer (the left handed upper requires no bolt catch)

Congratulations!

Now put a stock/brace on it, suppress it, and vote from the rooftops.

If you’re using a metal lower, there are two printable buffer tower to pic rail adaptors, one using two pieces connected with an m4x25 to match the contour of the upper, and the other matching the contour of the lower for use with other uppers.





If you want to try making a cheek pistol, this piece can be scaled (Z only) to whatever length needed to cover the top rail

FAQ/Troubleshooting

Q: I have a suppressor and it's not whisper quiet, why is that?

A: Ensure the gas port is blocked. If so, then try subsonic ammo.

Q: it takes a lot of force to push the BCG fully into battery

A: This is partially due to the design of the AR15 bolt, which normally has a lot of momentum as it chambers. You can take the rubber washer out from around the extractor spring or clip the spring slightly if needed.

Q: What if I don't fully seat the bolt and then pull the trigger?

A: A dead trigger will result. The firing pin cannot reach the primer unless the carrier is in the forwardmost position. You will have to charge the weapon, ejecting the live round, and rechamber a new round. This will be a common occurrence at first, but once you get a hang of the gun it should stop occurring.

Q: I'm scared of an out of battery detonation. What prevents that?

A: For the firing pin to reach the primer, the bolt has to have rotated and then be pushed all the way forwards. If the bolt has rotated, the lugs are locked. This prevents an OOB. If you were to pull the pump back 1mm (0.04") the firing pin would not be able to reach the primer, yet the lugs would still be locked. A dead trigger would result.

Q: My bolt turns prematurely resulting in it getting stuck, and not chambering rounds

A: Take the bolt out of the bolt carrier and find a spring that slides over the stem (portion that enters the carrier) then reassemble. If cut to the right length, this will provide forward tension to the bolt and should fix this issue. I was never able to replicate the problem, but I did test the fix with a clip of spring from a CMMG 22lr magazine spring. Ensure the bolt still has full range of motion within the cam slot. If you do this, you will need to apply forward pressure to the pump when firing or you will have a dead trigger. This is because the spring will try to push the bolt and carrier apart, pushing the pump handle backwards which results in the firing pin not reaching the primer.

Q: I have a stuck casing, can I mortar it?

A: I mean… it's your gun, but go easy because it totally might break. That's how two people broke an earlier weaker version of the gun. Best of luck.

Q: I am getting light strikes and dead triggers. What it do?

A: The most likely reason is that you're applying rearward pressure to the pump grip while pulling the trigger. With most long guns that would be a good habit, so you are likely doing so without realizing it. Pulling rearward pulls the carrier rearward and now the firing pin can no longer reach the primer. Good practice with the Apple Fritter is to push forward with the forward hand and pull back with the trigger hand.

Q: There is a gap between the upper and the first portion of the handguard, why is that?

A: In the upper, the indentation for the flange of the barrel is too shallow. This could be from your support settings, but regardless, scraping lightly with a chisel to deepen this pocket will fix the issue. Don't remove too much, as this is what is clamping your barrel. If it is too loose, you will suffer accuracy issues.

Q: How can I improve the accuracy?

A: Epoxy bed the barrel into the upper. I recommend JB weld.