

CALIBURN ASSEMBLY INSTRUCTIONS



The Caliburn is a Mag-Fed Pump-Action Homemade Nerf Blaster design released as a Public Domain license file set by Captain Slug (<http://www.captainslug.com>).

You are welcome to and encouraged to modify the files in any way you want. The Majority of the parts can be printed with infill as low as 20% in PLA, but I would recommend printing in layers of 300 Micron or smaller.

The Following parts however ARE REQUIRED to be printed at 100% infill: Sear and Spreader

This Blaster is also offered in a version you can machine out of polycarbonate if you are interested in crafting one from scratch. The write-up and machining templates for that version are available at: <http://captainslug.com/caliburn.html>

Hardware kits and Full Blasters are available for sale as made-to-order items. I'm producing these myself in what remains of my free time.

<https://www.etsy.com/shop/CaptainSlug>

<http://nerfhaven.com/forums/topic/27193-caliburn-mag-fed-pump-action-springer/>



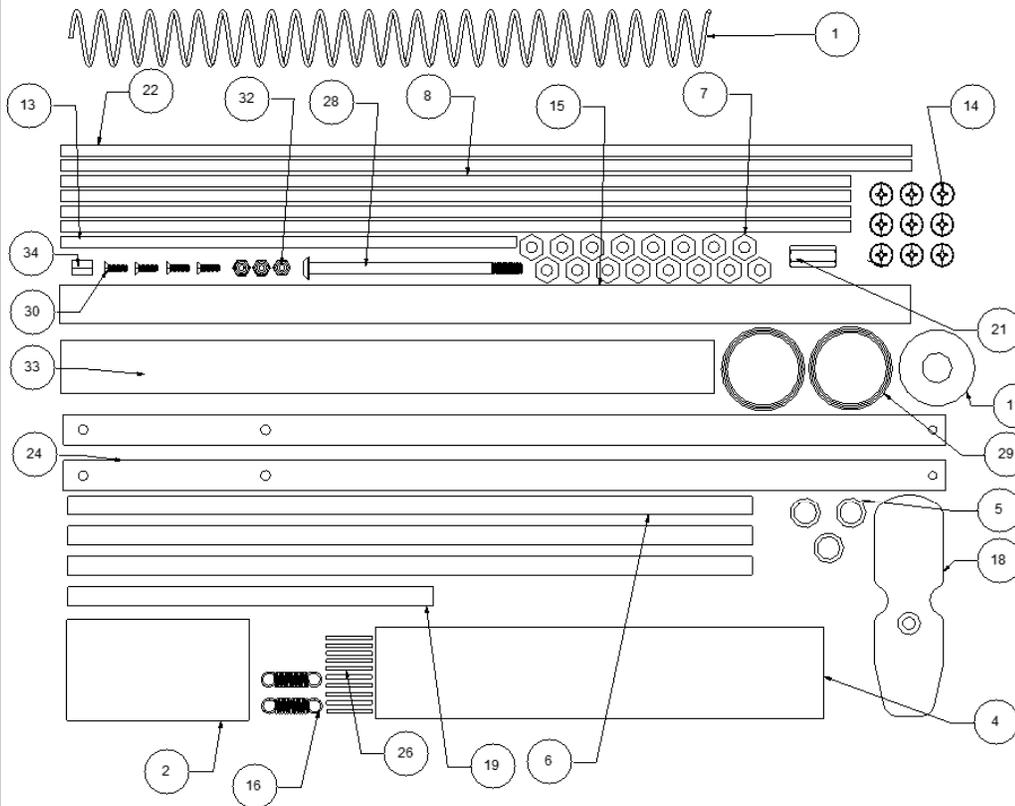
DO NOT STORE IN TEMPERATURES ABOVE 100F. Storing the blaster inside of a car in warmer months will cause the printed parts to distort or warp beyond their intended shape. If you have to store one in a vehicle, store it in the trunk.



DO NOT use this blaster for indoor wars or wars involving very short distances. The muzzle velocities this design can reach are between 150fps and 210fps depending upon the darts used and the spring installed. If indoor use is intended, obtain the lower fps springs that are currently available for this design (K31 and 788) and use them.



DO NOT Insert or Remove a Magazine while the breech is closed. Many aftermarket magazines are a tight fit over the RAM portion of the breech and doing this will likely cause the end of the RAM piece to break off.



Item #	Quantity	Part Name
1	1	Spring
2	1	StockSpacerAlt2
4	1	Plunger Tube
5	4	012 O-Ring
6	3	11.25" Spacer
7	16	Locking Hex Nuts
8	4	13" Threaded Rod

11	1	ShockPad
13	1	8" Threaded Rod
14	9	10-32 Screws
15	1	Barrel
16	2	Extension Springs

18	1	ButtplateF oam
19	1	6" Spacer
21	1	Coupling Nut
22	2	14" Threaded Rod
24	2	BoltArm
26	10	Pin Short
28	1	Buttplate Screw
29	2	Dash 123 O-Ring
30	10	4-40 Short Screw
32	6	4-40 Lock Nut
33	1	Barrel Shroud
34	1	4-40 Standoff

CALIBURN HARDWARE KIT

02/27/18

Printed/Cast Parts NOT included.

Tools needed: #1 Philips Screwdriver, Slotted Screwdriver, 3/8" Combination Wrench, Small Needle File,

The above hardware list are the MINIMUM quantities required for assembly. I typically include extras of the majority of the items.

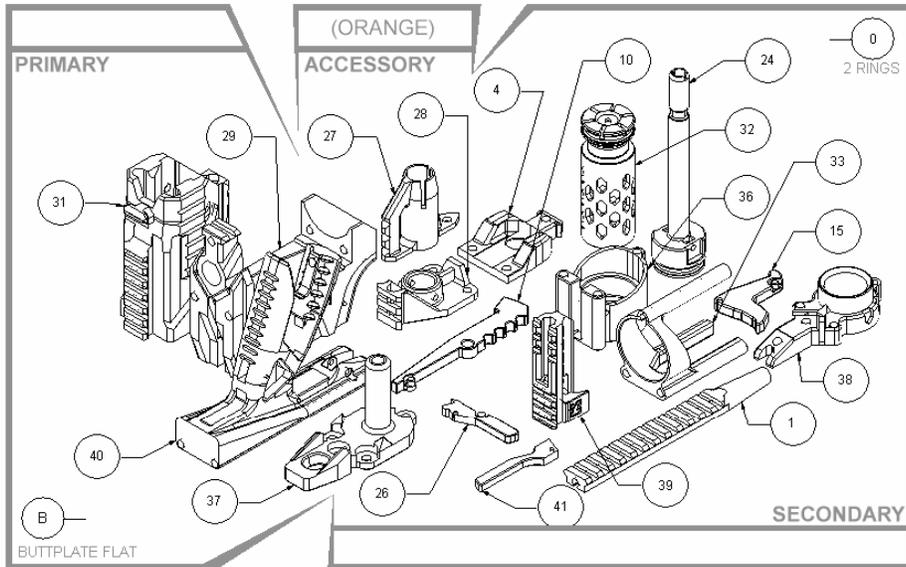
To Assemble this blaster you will need a Slotted Screwdriver, Small Philips Screwdriver, 3/8 Combination Wrench, Needle-Nose Pliers (or hemostats), Round Needle File, and in some cases super glue.

The Plunger Tube in the Hardware Kit does come pre-lubricated. But it's also a good idea to have extra lubricant on-hand for the Plunger Tube and I would recommend only using clear Silicone Grease such as Oatey's brand #30219. Any clear 90% silicone grease will work fine so long as it does not include any additives. NEVER USE SILICONE LUBRICANT FROM AN AEROSOL CAN. The propellants used in those are harmful to plastic parts.

ALSO AVOID DRY-FIRING THIS BLASTER EXCESSIVELY. Firing without a dart in the barrel will add unneeded wear on this blaster, especially if the higher load rating springs are installed. Also do not pull the trigger with the foregrip in the rearward position (with the breech open). The breech being slammed closed by the main spring is very likely to damage both the breech itself and the magwell.

CALIBURN PRINTED PART SET

12/22/17

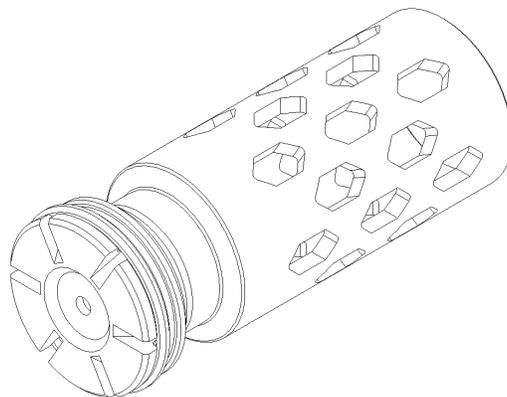


Item #	Quantity	Part Name	Infill %
1	1	rail_top	20
4	1	Spreader	100
10	1	Sear	100
15	1	TriggerAlt	20
24	1	Rem2o	20
26	1	MagRelease2	20
27	1	Muzzle Brake	20
28	1	Muzzle3	20
29	1	MagWell2	20
31	1	Rail_Foregrip	20
32	1	Plunger	20
33	1	Ansuzelgiz2	20
36	1	Stock_ALT5	20
37	1	BackButt	20
38	1	FrontButt	20
39	1	DartJam	
40	1	Grip5	
41	1	Tguard5	

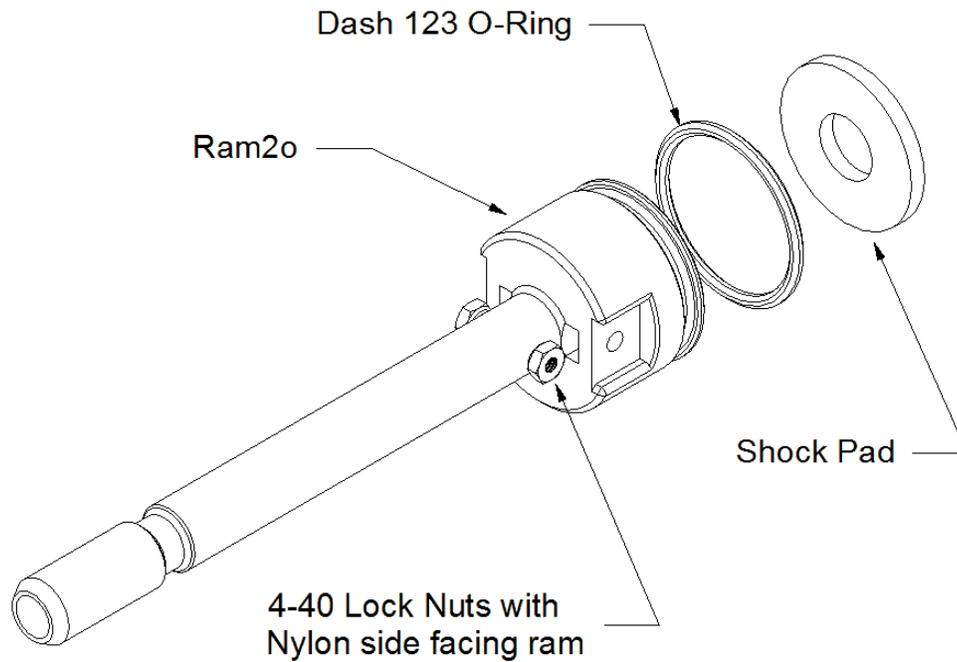
Note: Print layers should not be any larger than 300 microns.
 Parts were designed for PLA filament, but can be printed using ABS without issue. No support material is needed.
 Most of the parts should print to tolerance on their hole diameters, but results may vary so expect to have to touch up some of them with a round needle file or a drill bit OR scale the parts up by 1% to 2%.
 Similarly the inside of the magwell often times requires a few passes with a flat file to fit older mags.

- Captain Slug
 Assembly Instructions: <http://www.captainslug.com/nerf/Caliburn3DPAssembly4.pdf>

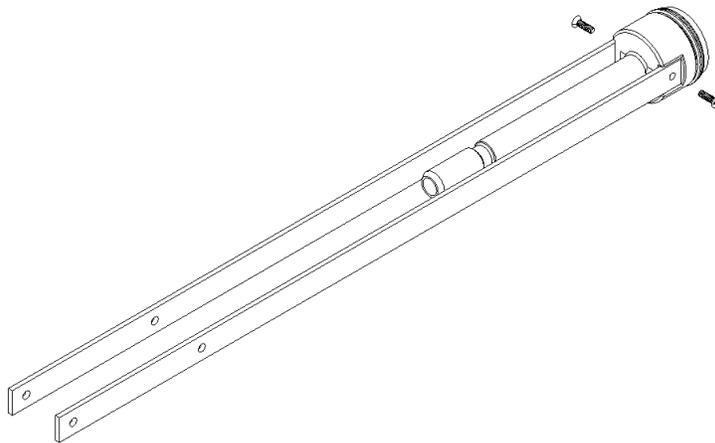
Above is a list of every printed part needed to assemble this blaster. The majority of the through holes should print to the required tolerance, but you will likely have one or two that may require minimal filing. Also make sure to trim off any burrs or oversized edges.



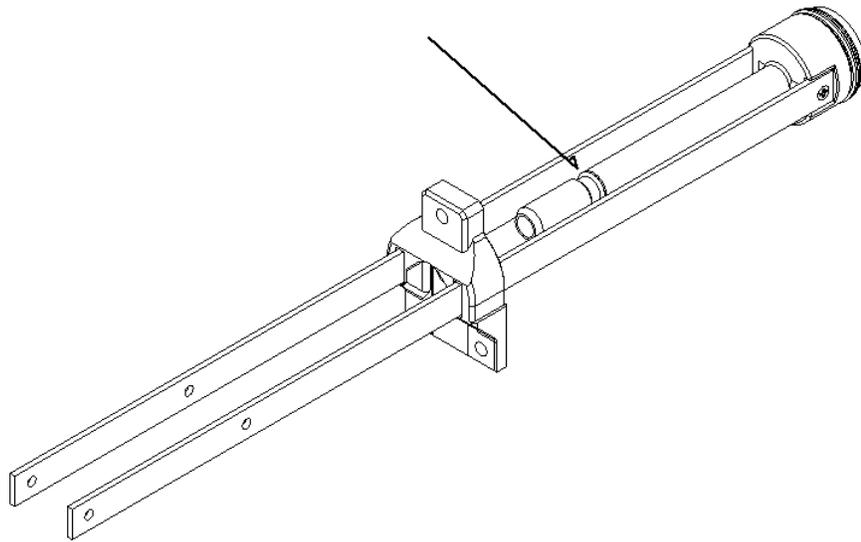
Add a Dash 123 O-Ring to the groove of the Plunger then set aside.



Add a Dash 123 O-Ring to the groove on the Ram. Slide two 4-40 Lock Nuts into the slots in the front of the Ram so that their Nylon side is facing the center of the Ram. You will need to align the sides of the hex nuts parallel with the slots in order to get them in. You may also need to use a screwdriver to force them into the slots. Lastly, adhere the Shock Pad centered onto the back of the Ram.

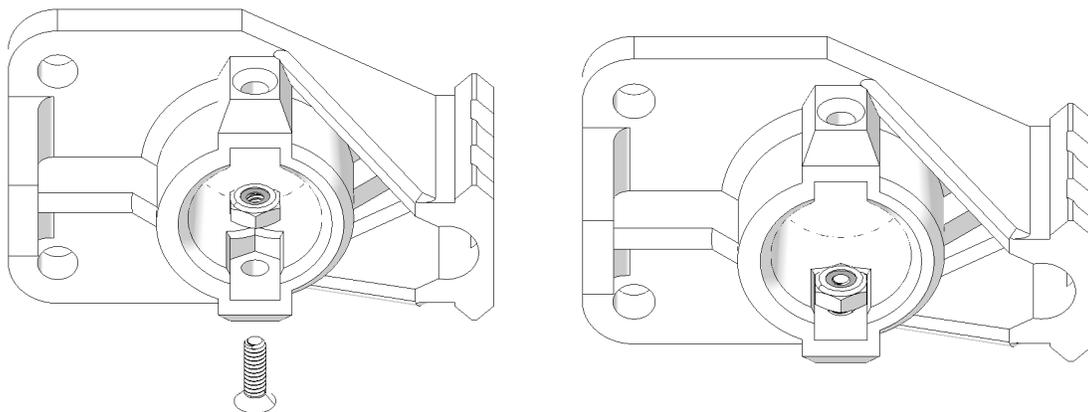


Add two Bolt Arms to the Ram Assembly and secure them with two short 4-40 screws. If the hex nuts aren't fitting in the slots snugly and are rotating when you try to tighten the screws you may need to wedge a small slotted screwdriver between them and the inside of the slot in order to continue tightening the screws.



Slide a Spreader over the pair of Bolt Arms. If you purchased the UPGRADED ramrod you can add an O12 O-ring to the undercut in the Ram. The BASIC ramrod that is typically included does not include this feature and therefore does not need an o-ring.

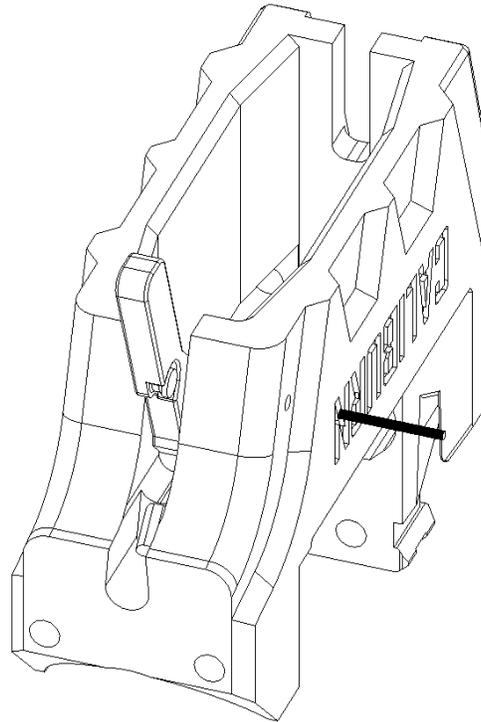
Set this assembly aside temporarily.



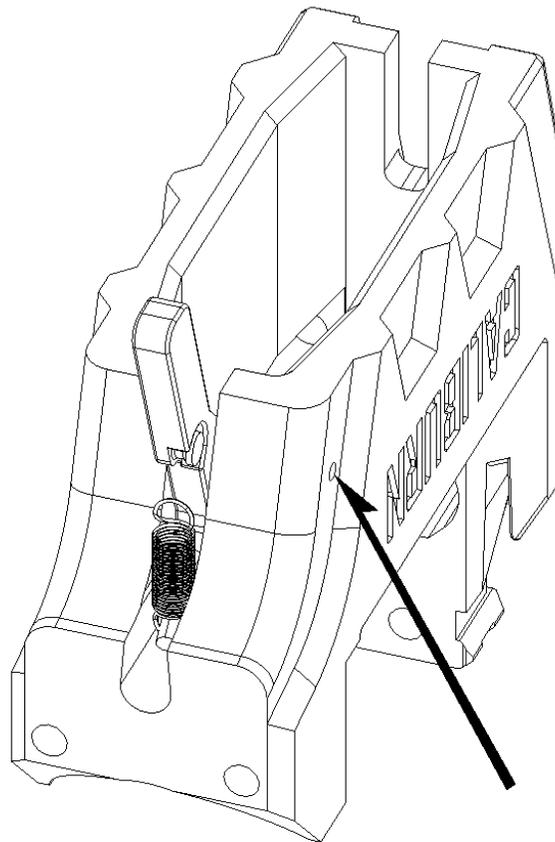
Take Muzzle4 and hold it sideways. Place a 4-40 screw onto the tip of a #0 or #1 philips screwdriver and feed the screw through the hole in the side of Muzzle4. Use your other hand to slide a 4-40 lock nut onto the end of the screw so that the nylon locking element is facing upwards. Turn the screw into the lock nut until the tip of the screw starts to engage the nylon locking element.

Repeat this process for the opposite side of Muzzle4, then set it aside.

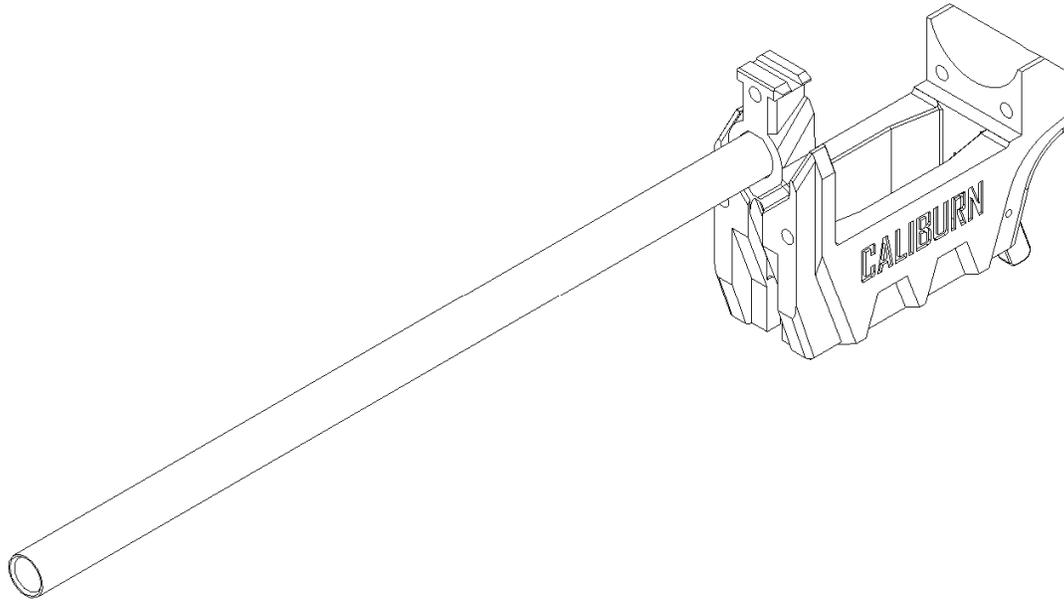
Inspect the Muzzle Brake part for a similar feature. If it includes one perform this step on it as well.



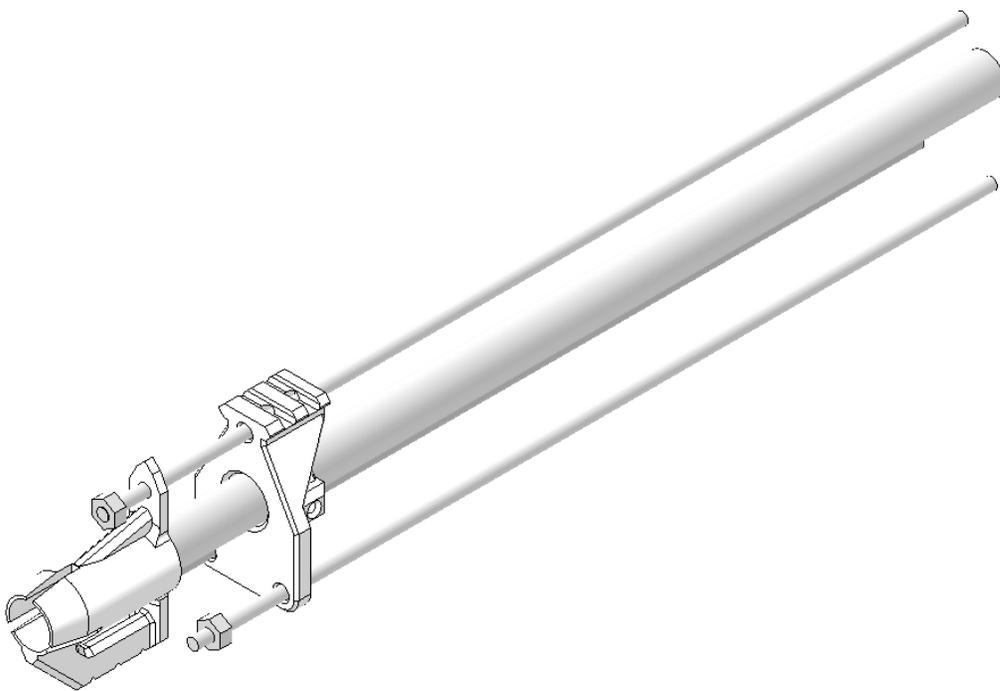
Insert a Short Pin through the MagWell and the Mag Release. You may need to use an extra short pin and a hammer to lightly tap it through the MagRelease.



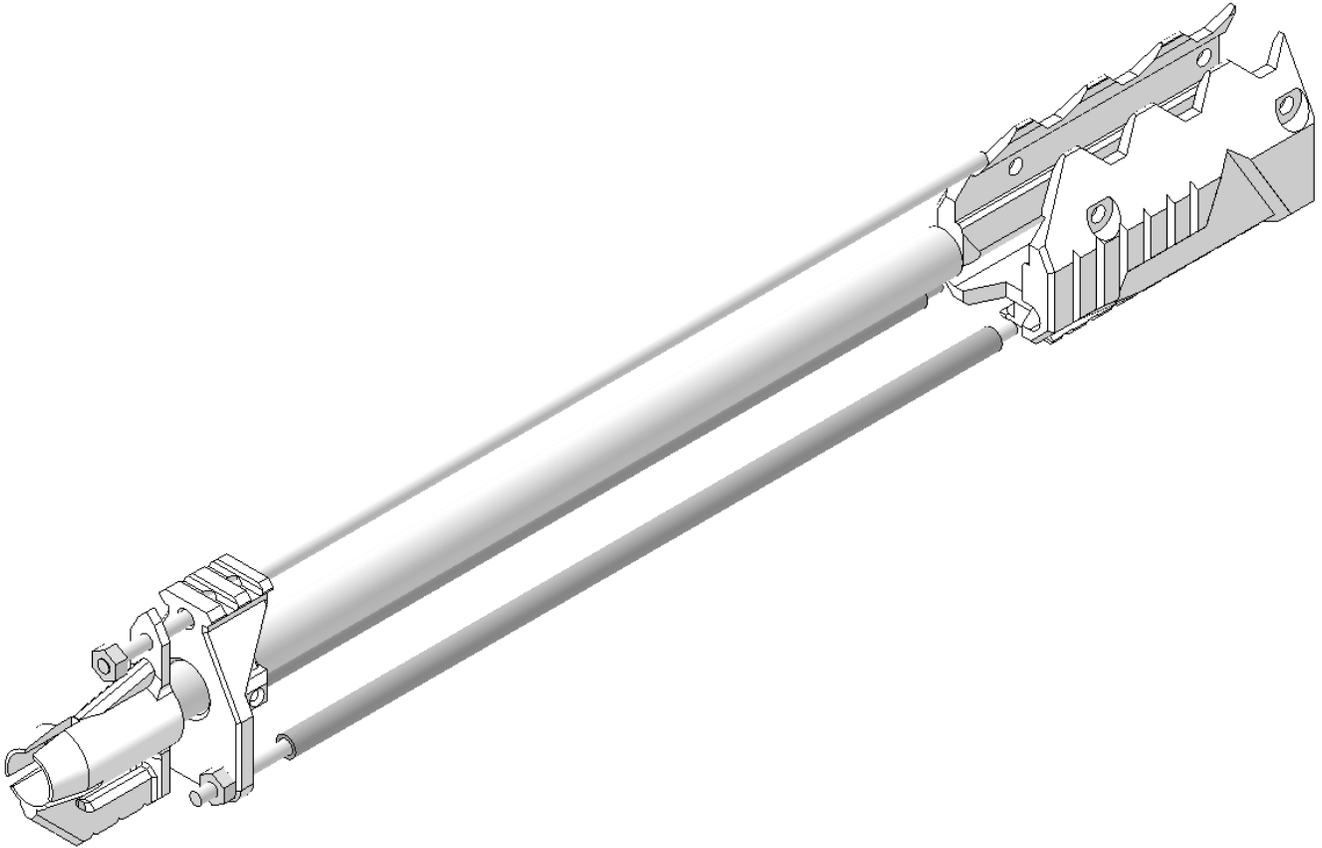
Fish one end of an extension spring onto the hook inside the back of the Magwell. Pull the remaining loop of the Extension Spring onto the peg on the Mag Release. Drive a 4-40 screw into the holes in both side of the Magwell to retain the short pin. **DO NO OVERTIGHTEN THESE SCREWS.**



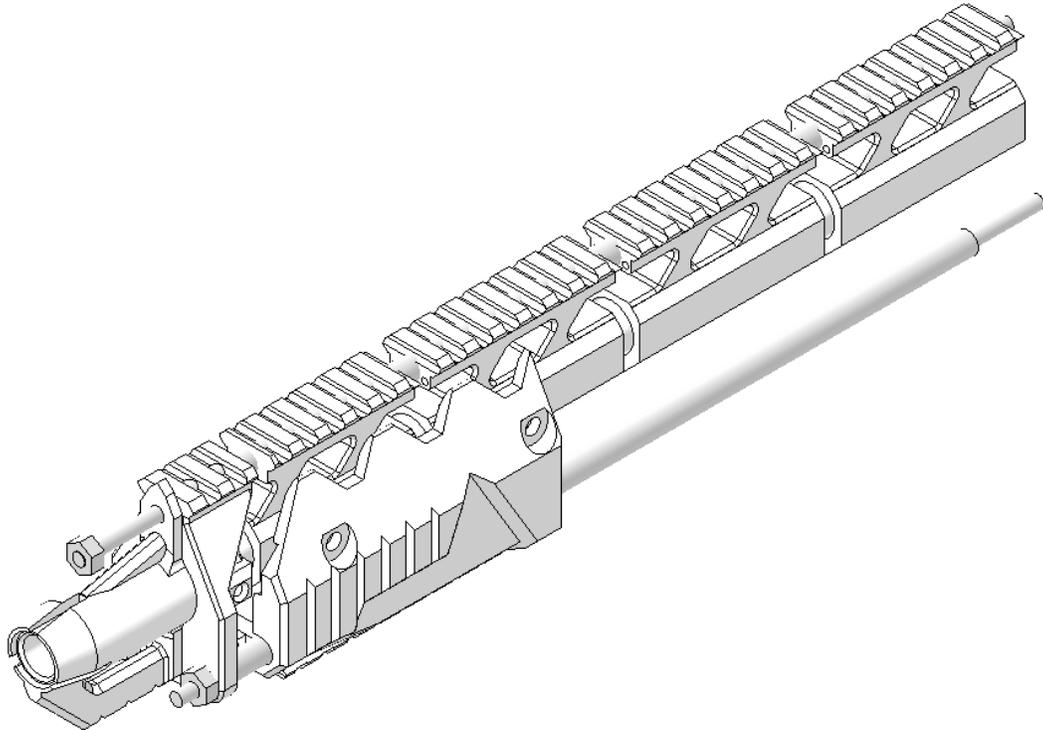
Install the Chamfered side of the Barrel into the Magwell to check the fit. **You may need to file this hole out with a Round Needle File prior installing the barrel.** The inside of the Magwell can be rested on the edge of a desk or table in order to push the Barrel in. After confirming the fit, remove it from the Magwell. Set the Magwell aside.



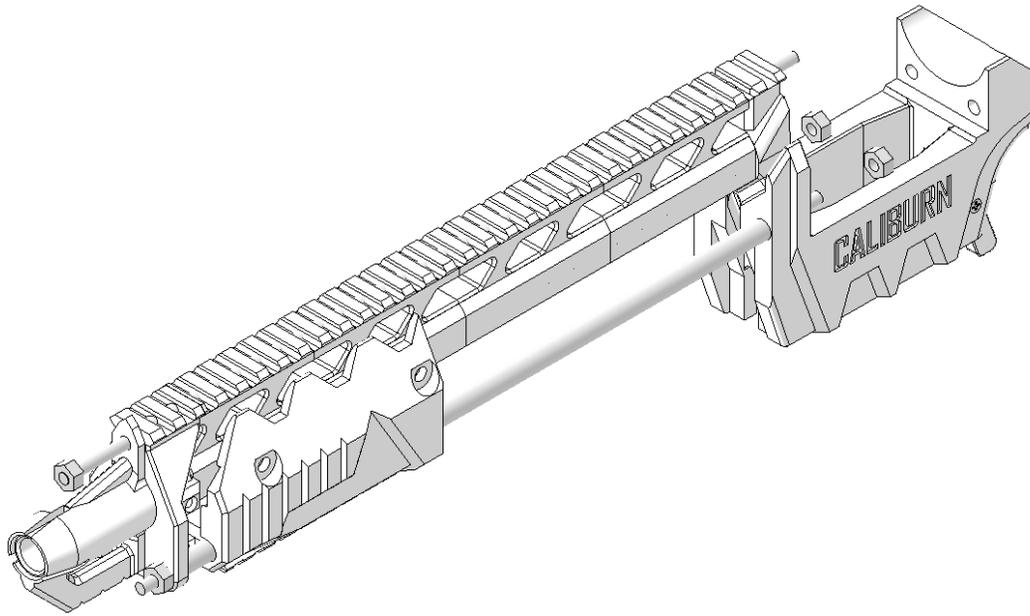
Slide a 14-inch threaded rod through the top hole of the MUZZLE BRAKE and MUZZLE parts. Slide the Barrel through both. Slide two 13-inch threaded rods through the lower pair of holes in the MUZZLE. Add a hex nut to the front end of each threaded rod.



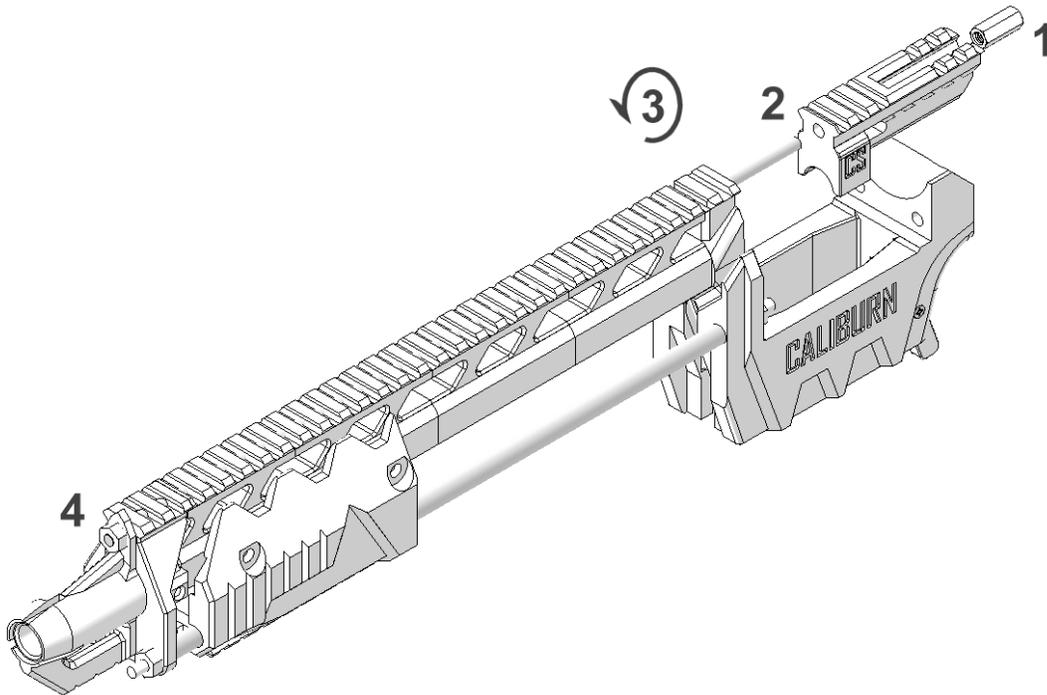
Slide two 11.25 inch length spacers onto the lower threaded rods. Also slide the FOREGRIP onto them.



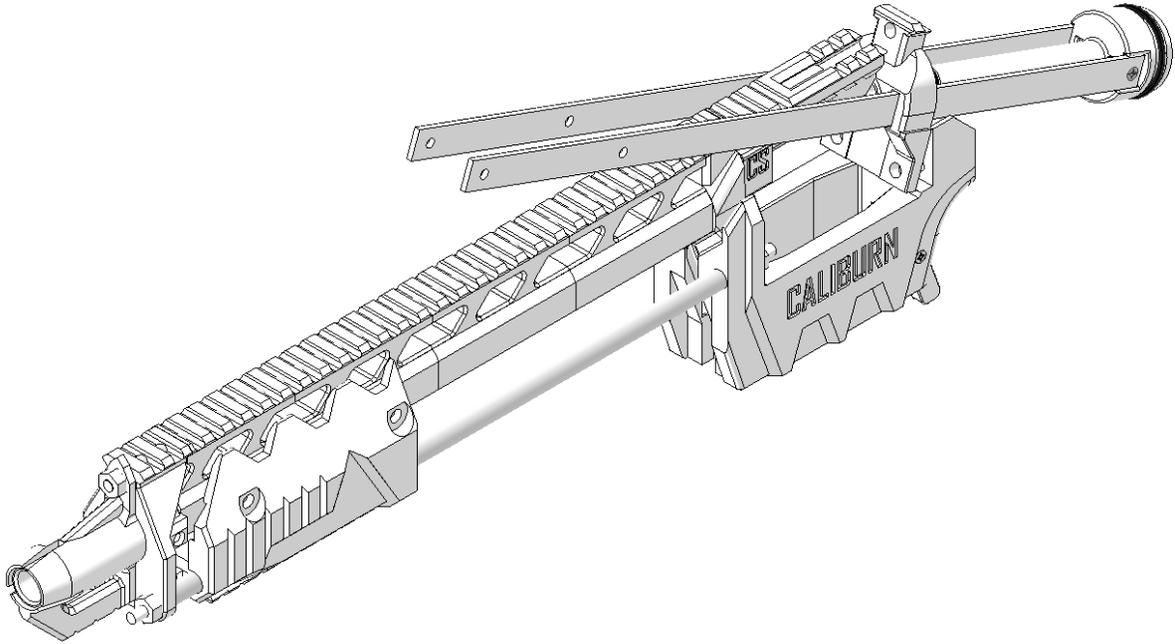
Slide the Barrel Shroud over the barrel and upper threaded rod. You have the option of pinning the segments together with short pins if desired.
If you do not have the printed segments slide the separate barrel shroud over the barrel and the third 11.25-inch spacer onto the upper threaded rod.



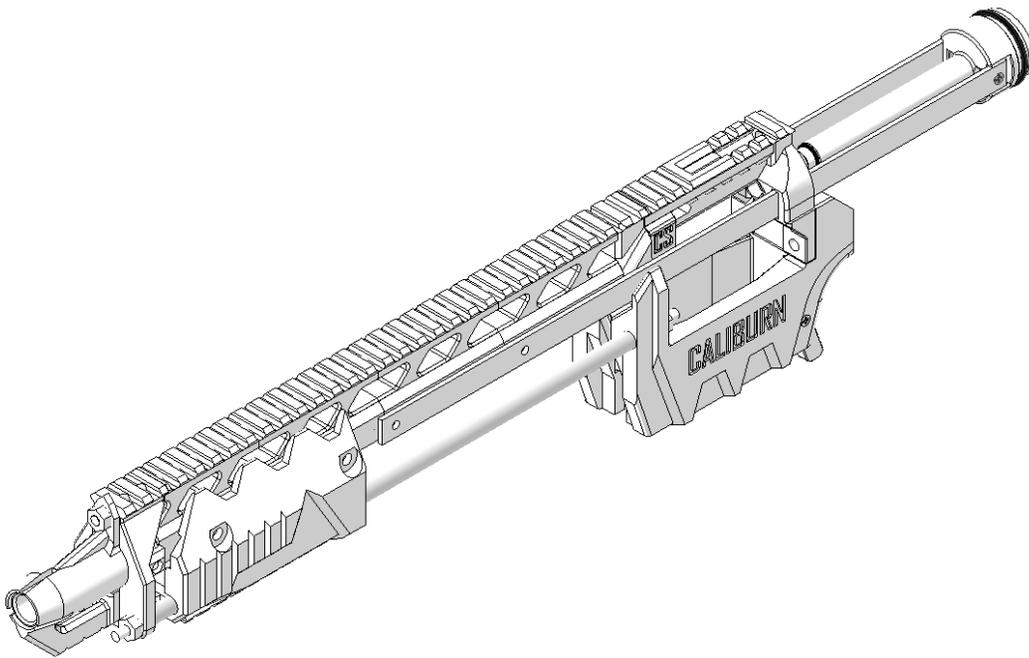
Slide the exposed threaded rods through the pair of holes in the front of the MAGWELL. Also slide the barrel into the magwell and check that it is flush with the inside. Add a hex nut to each threaded rod and tighten them.



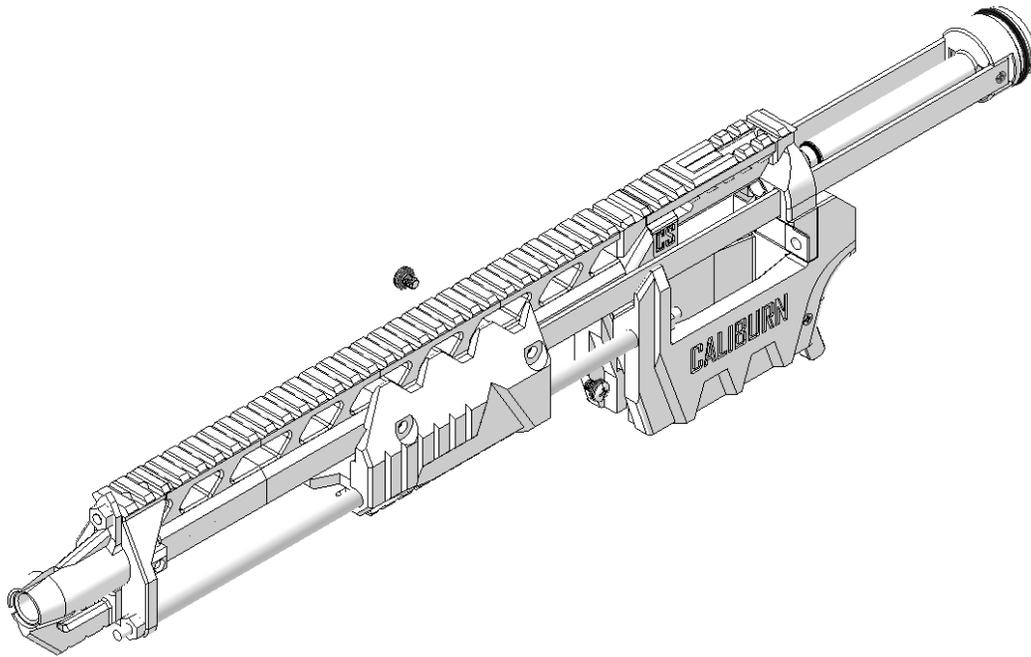
Slide a coupling nut into the slot in the DartJam piece. Then slide the DartJam onto the exposed threaded rod until the coupling nut runs into it. Use the DartJam as a wrench to screw the coupling nut onto the end of the threaded rod a few turns. To tighten the rest of the way use a 3/8" wrench on the top hex nut at the muzzle end.



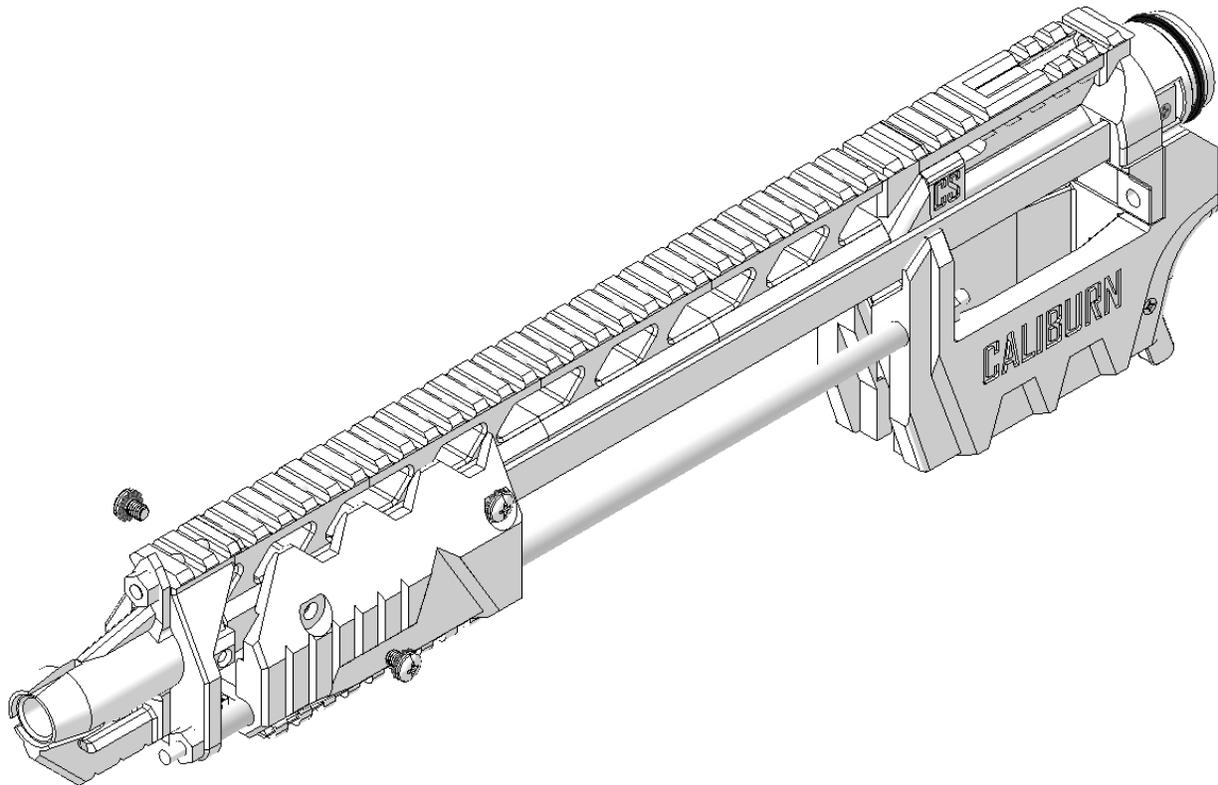
Install the Bolt Assembly from above at an angle that allows the Spreader to get inbetween the rear lip of the Magwell and behind the DartJam.



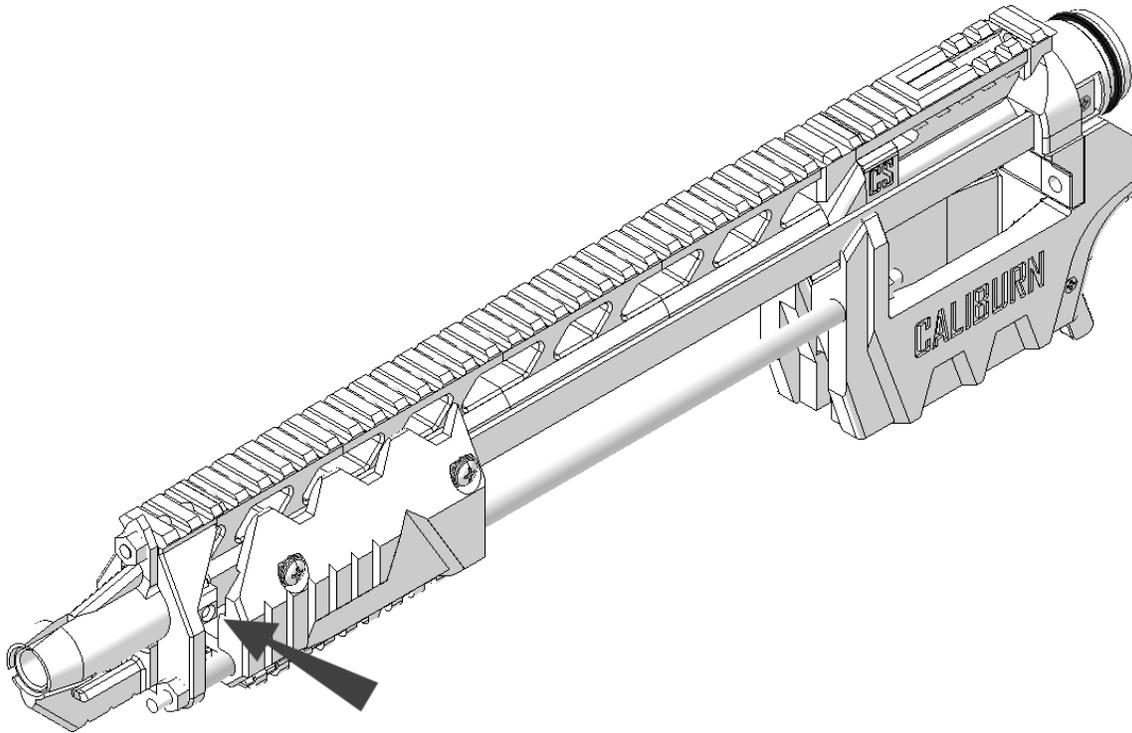
Rock the Bolt Assembly forward to drop the aluminum strap into the open slots at the front of the magwell.



Slide the Foregrip back over the aluminum straps (Bolt Arms) until the threaded holes line up with the holes in the Foregrip. Secure them together at the rear pair of holes using two 1/4" length screws. You may need to use a second screddriver or other hand tool to push the aluminum against the inside of the Foregrip so the screws can reach it.

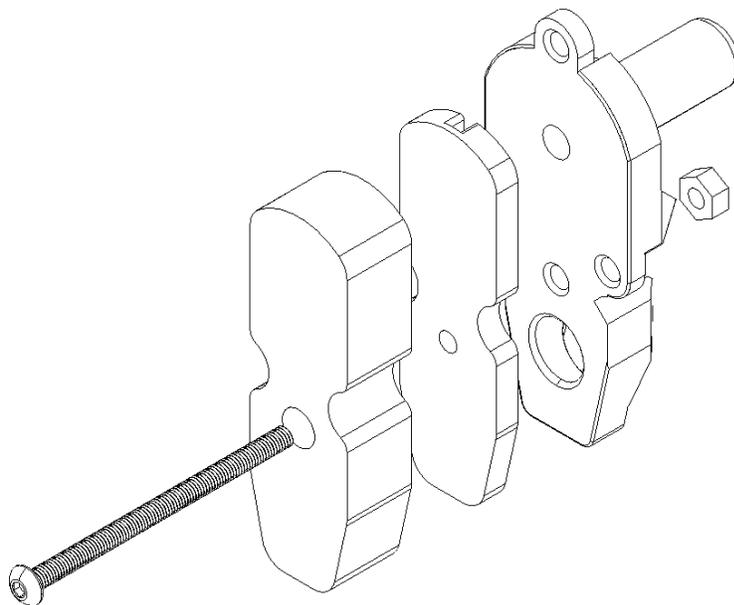


Secure the front half of the Foregrip with two more 1/4" length screws. Then slide the Foregrip forward.

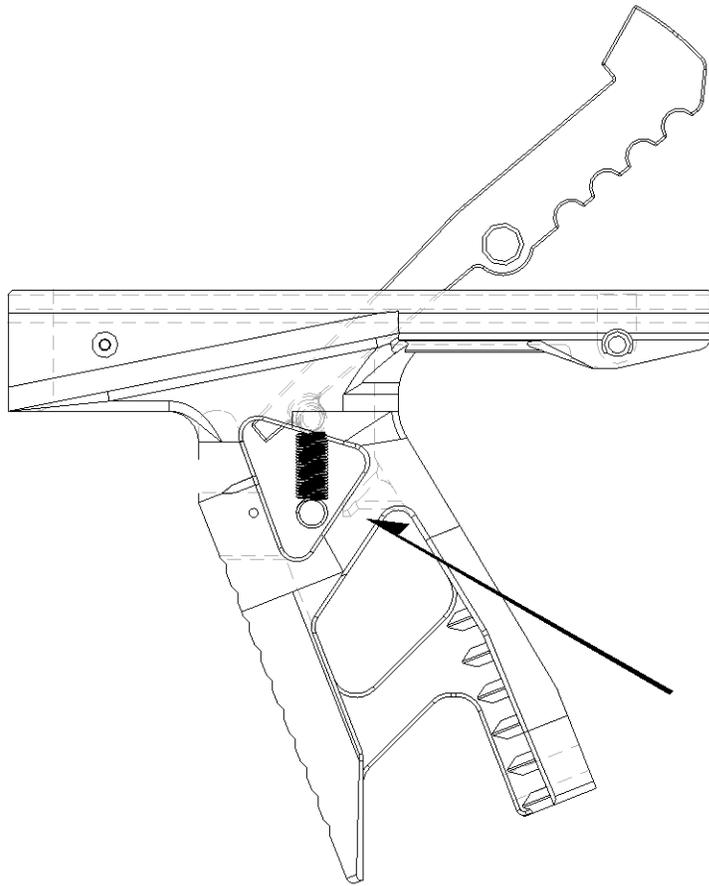


Confirm that the Barrel is still flush with the inside of the MagWell. The Barrel can be secured by tightening the 4-40 screws on both sides that were previously installed in Muzzle4.

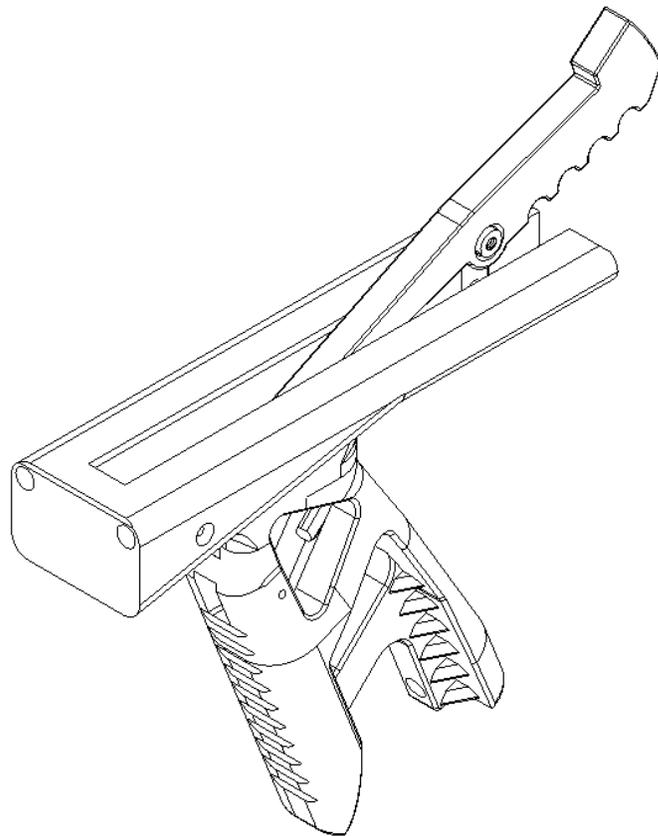
The assembly of the front half of the blaster is now complete.



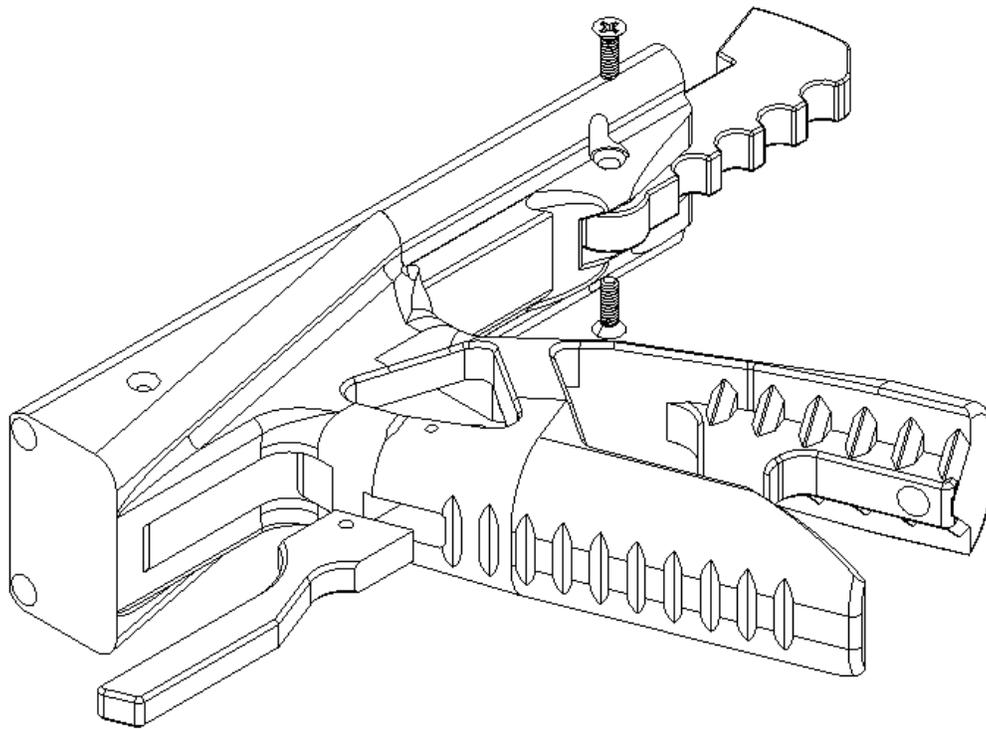
Adhere the Buttplate Foam to the Buttplate. Attach the Buttplate to "Back Butt" using the Long Screw and a Hex Nut. Set aside for later.



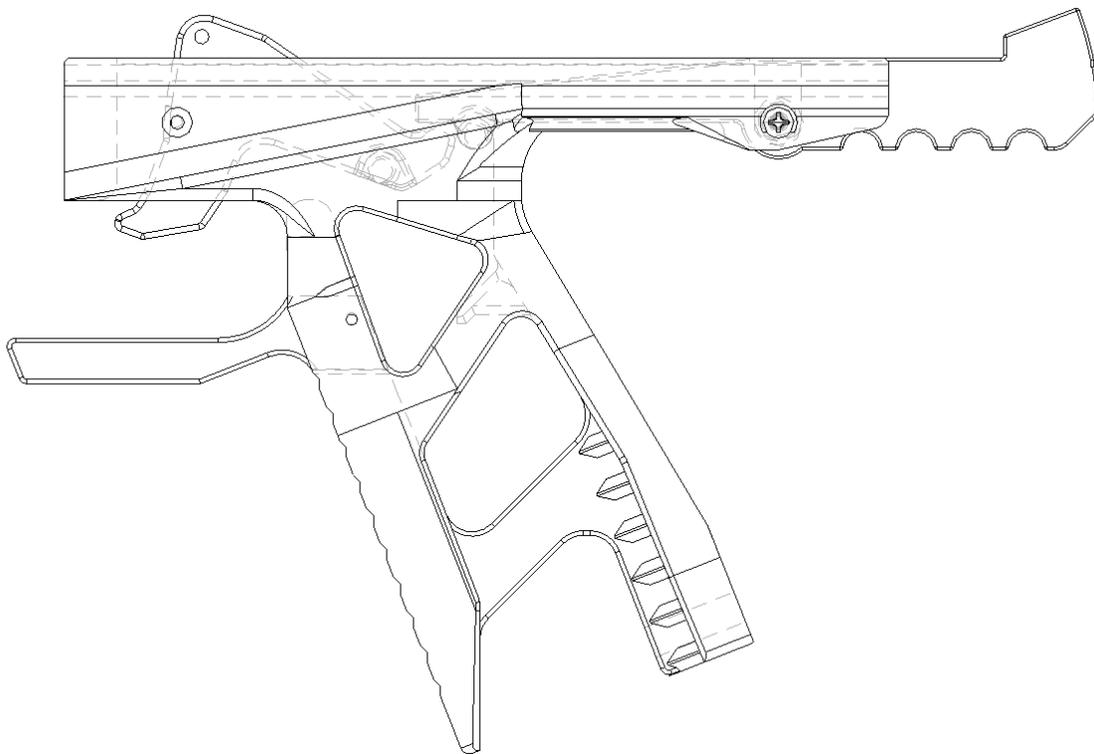
Add an extension spring to the peg on SEAR and use SEAR to fish the extension spring into the grip. Push the loop of the extension spring onto the hook inside of the grip.



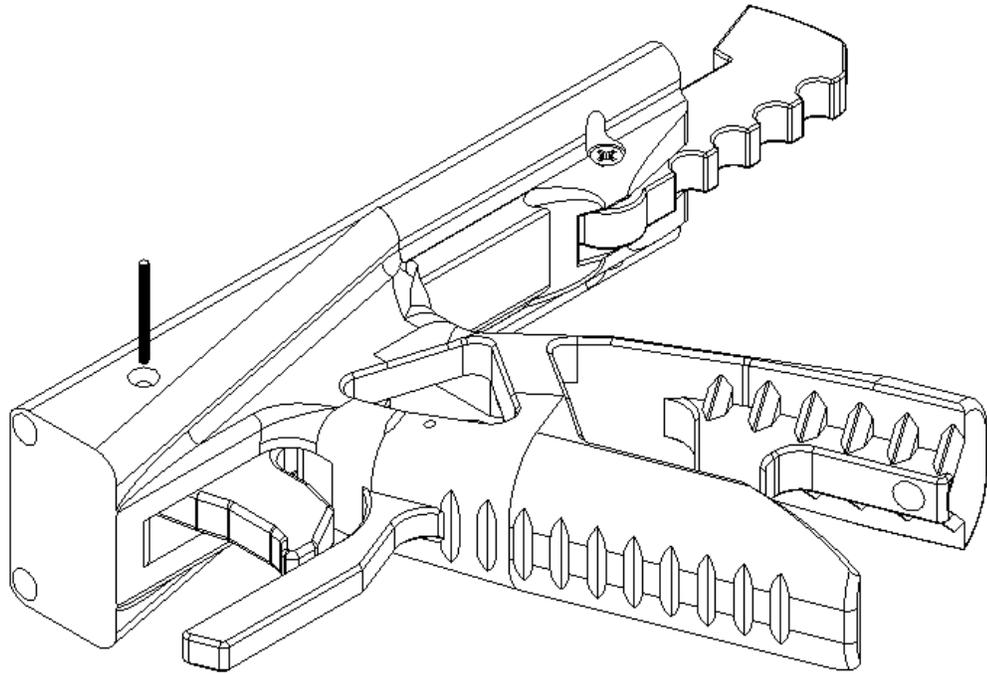
Insert the 4-40 standoff into the center hole of the SEAR and pivot it down towards the back of the grip.



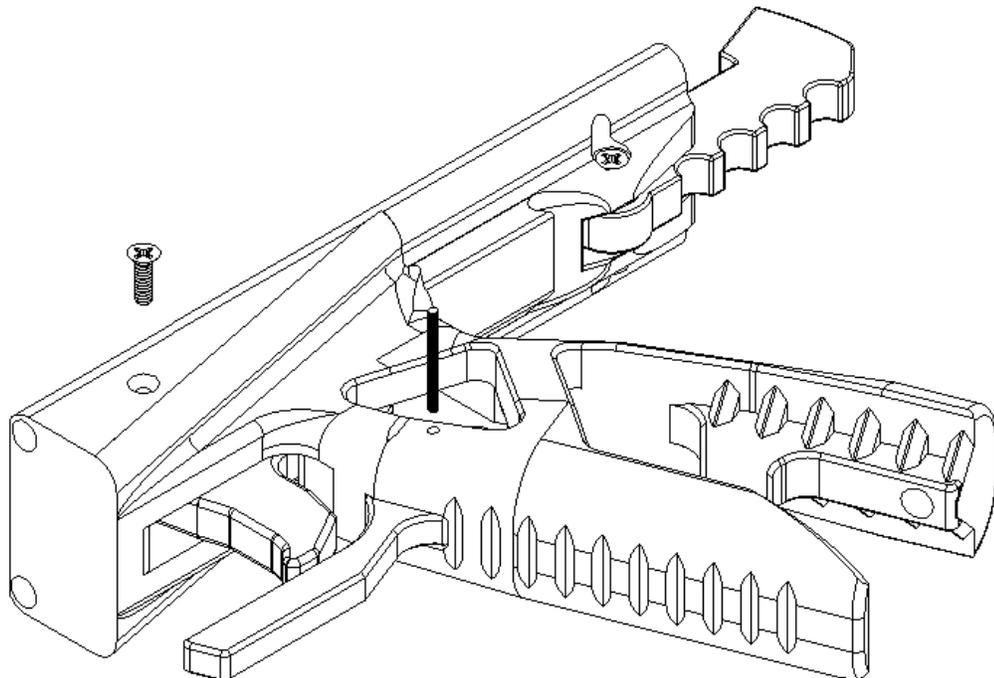
Use two short 4-40 screws to secure the standoff to the back of the grip. Slide the TGUARD5 piece into the slot in the front of the grip.



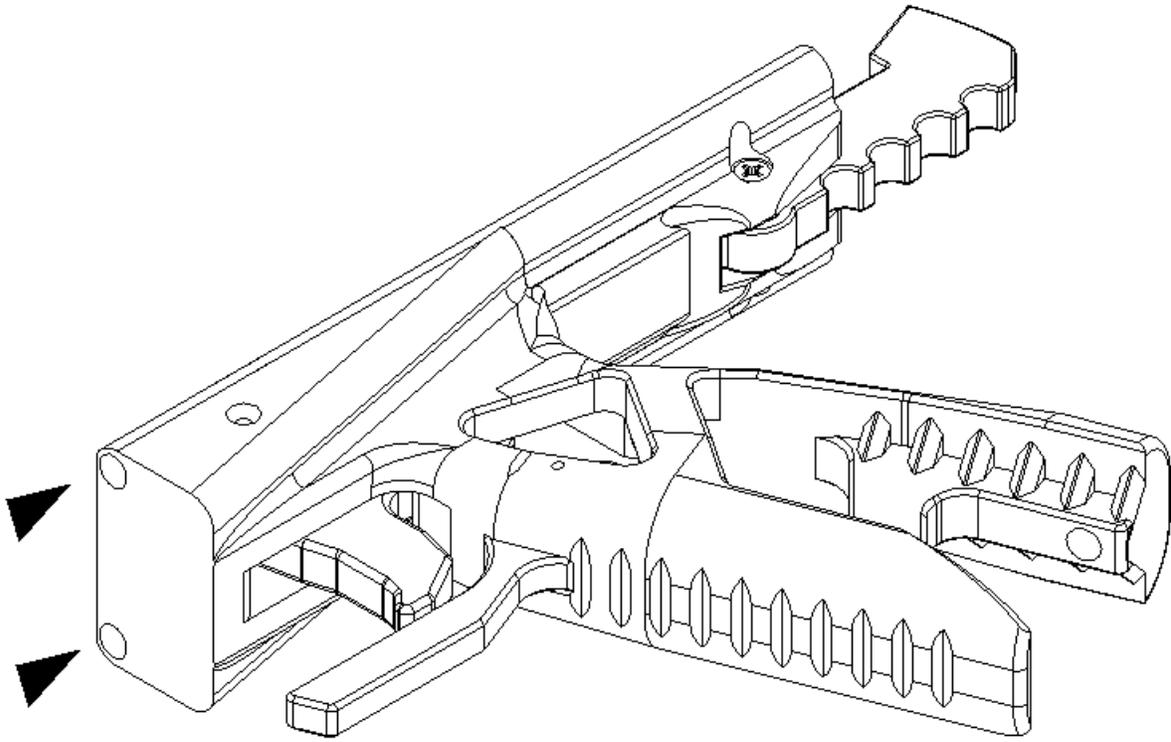
Fish the TRIGGER in through the front of the grip. You may need to pivot the SEAR back in order to get the TRIGGER in place. Once in place, the bump on the back of TRIGGER needs to sit underneath the front lip of the SEAR.



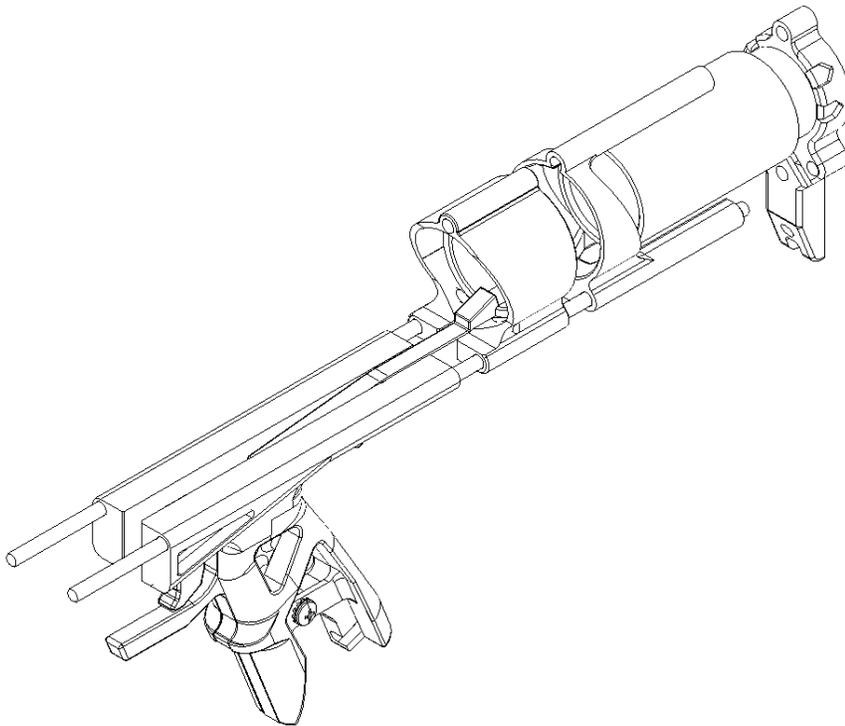
Slide a Short Pin in through the side of the grip and through the hole in the TRIGGER. You may need to use a 1/16" drill bit or another Short Pin and a hammer to lightly tap it through the trigger.



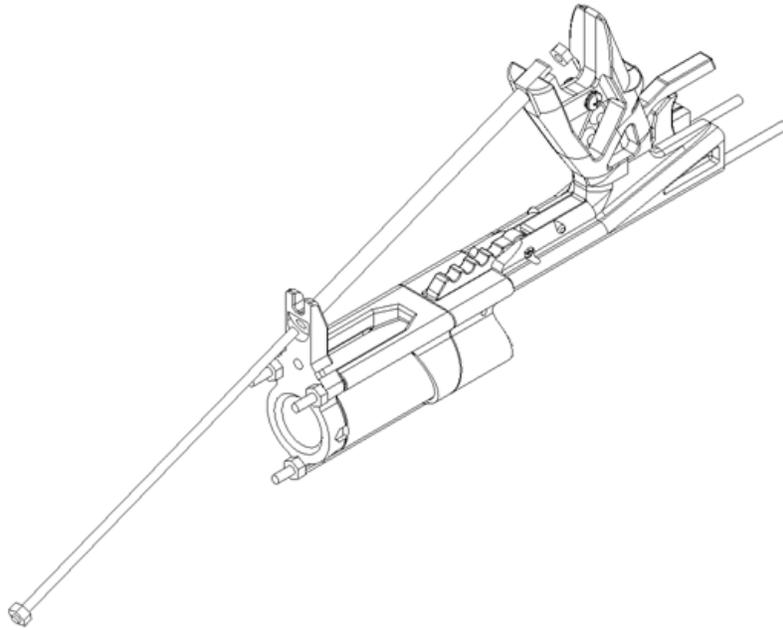
You can use a 4-40 short screw on each side of the grip to retain the Short Pin for the trigger. Insert another short pin into the grip and through the TGUARD5 piece to secure it. Tap it into place lightly with a hammer if needed. If the fit was too loose, apply from super glue and set it aside to dry.



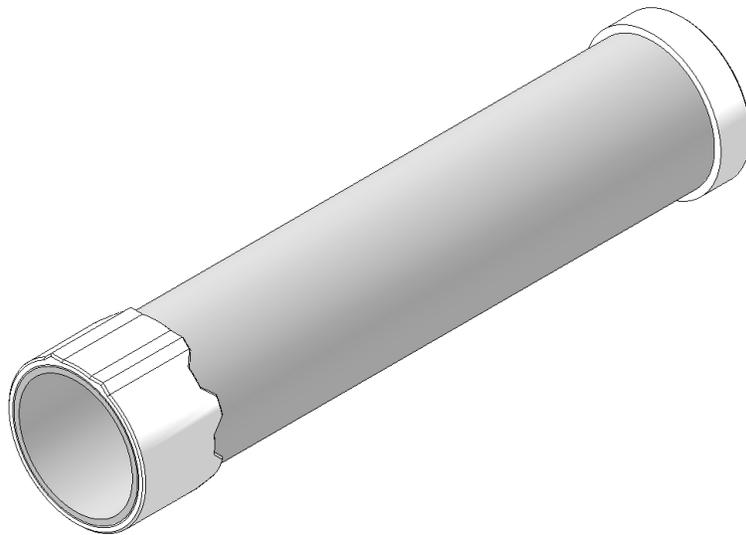
Slide a 13" Threaded Rod through Each Grip panel



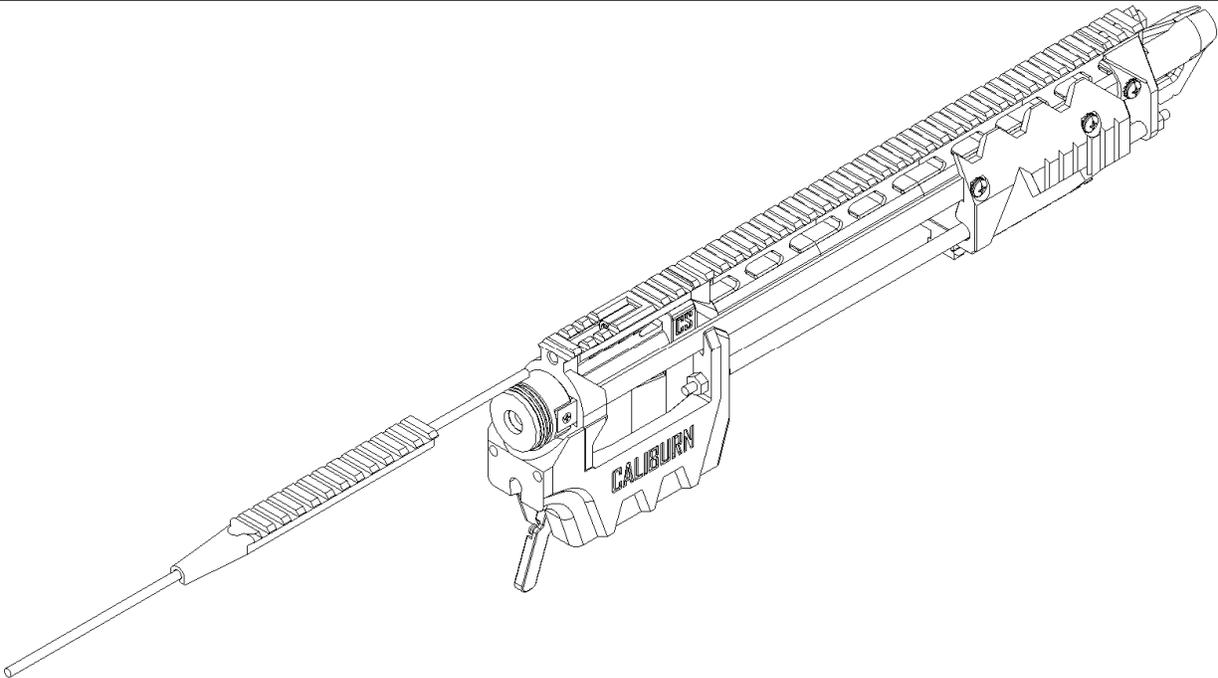
Slide the parts shown onto the 13" Threaded Rods. They include Stock_Alt5, Ansuvalgiz2, Stock Spacer (clear), and "Front Butt".



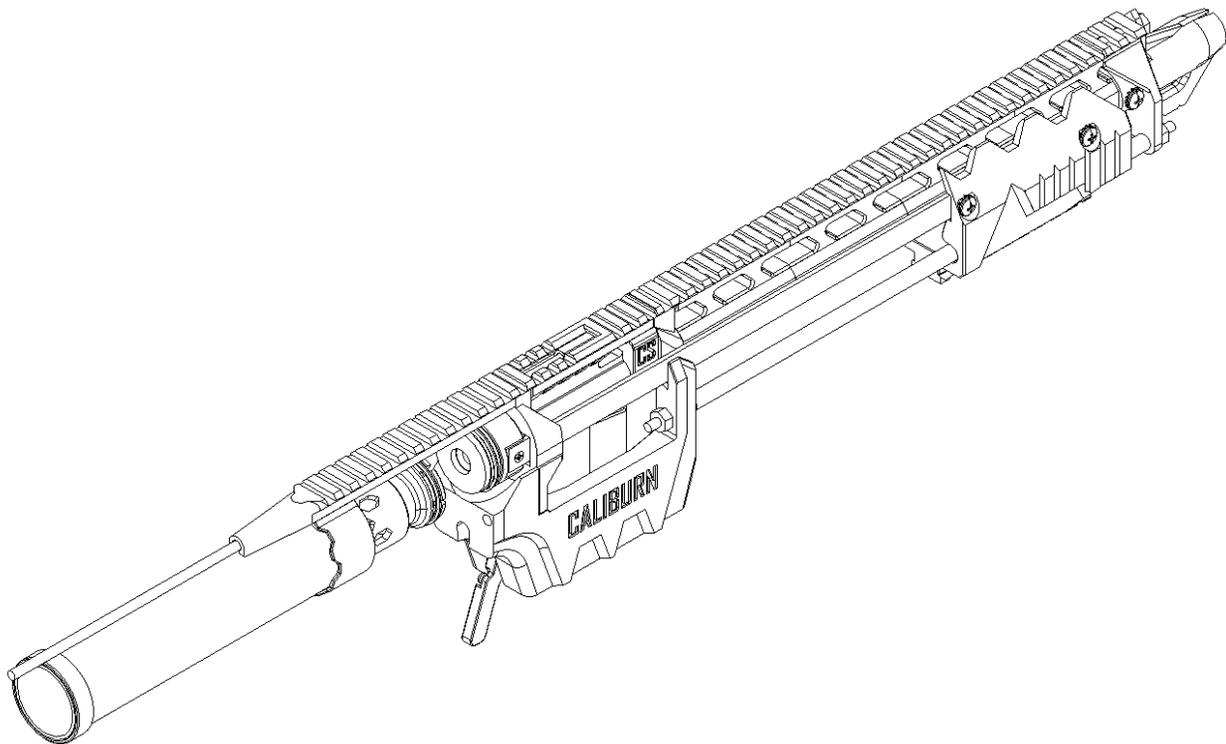
Wedge the 6" spacer inbetween the heel of the Grip and the front angled surface of the "Front Butt". Add a Hex Nut to the very end of the 8" Threaded Rod and then slide it in through the counterbored hole in the "Front Butt". Add a Hex Nut to the opposite end of the 8" Threaded Rod and tighten.



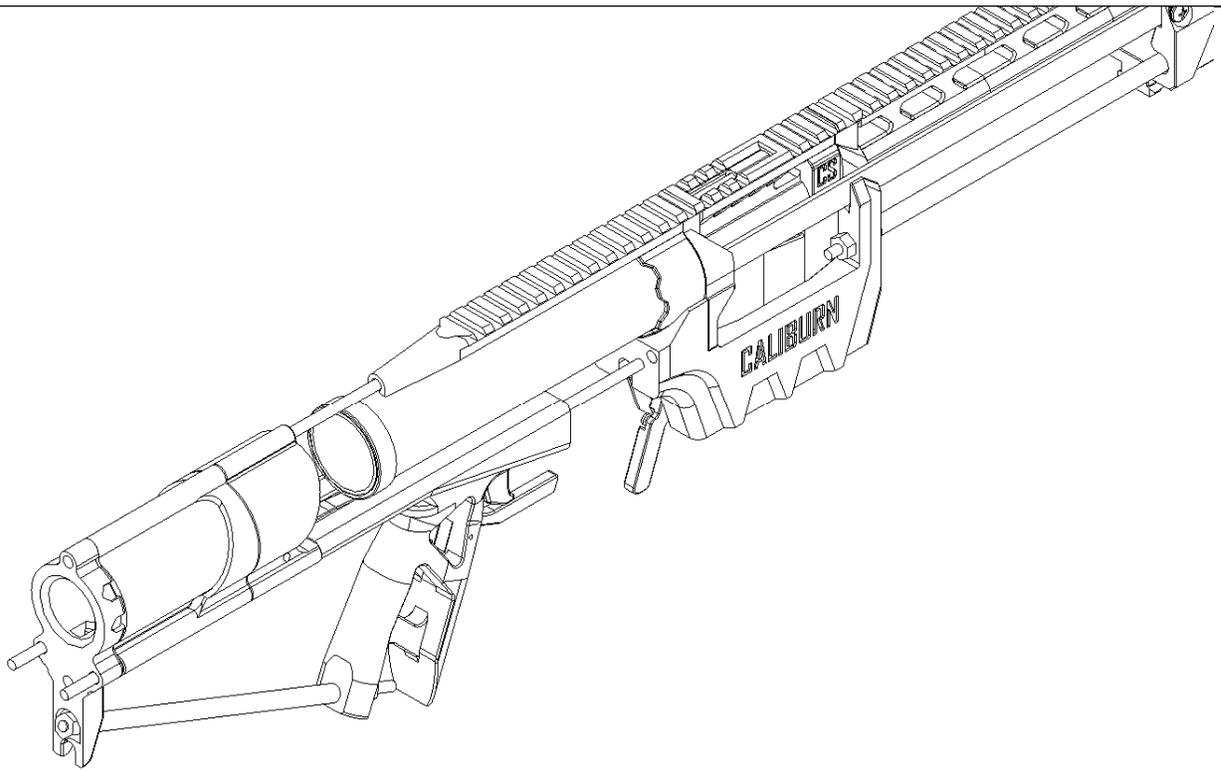
Install the "Ryan Tube" and Ring pieces onto the ends of the plunger tube. You may need to tap them into place using a hammer, or use super glue to secure them depending upon how your printer tolerances are. After the glue has dried apply some clear silicone grease to the inside at one end of the plunger tube (if it is not already present).



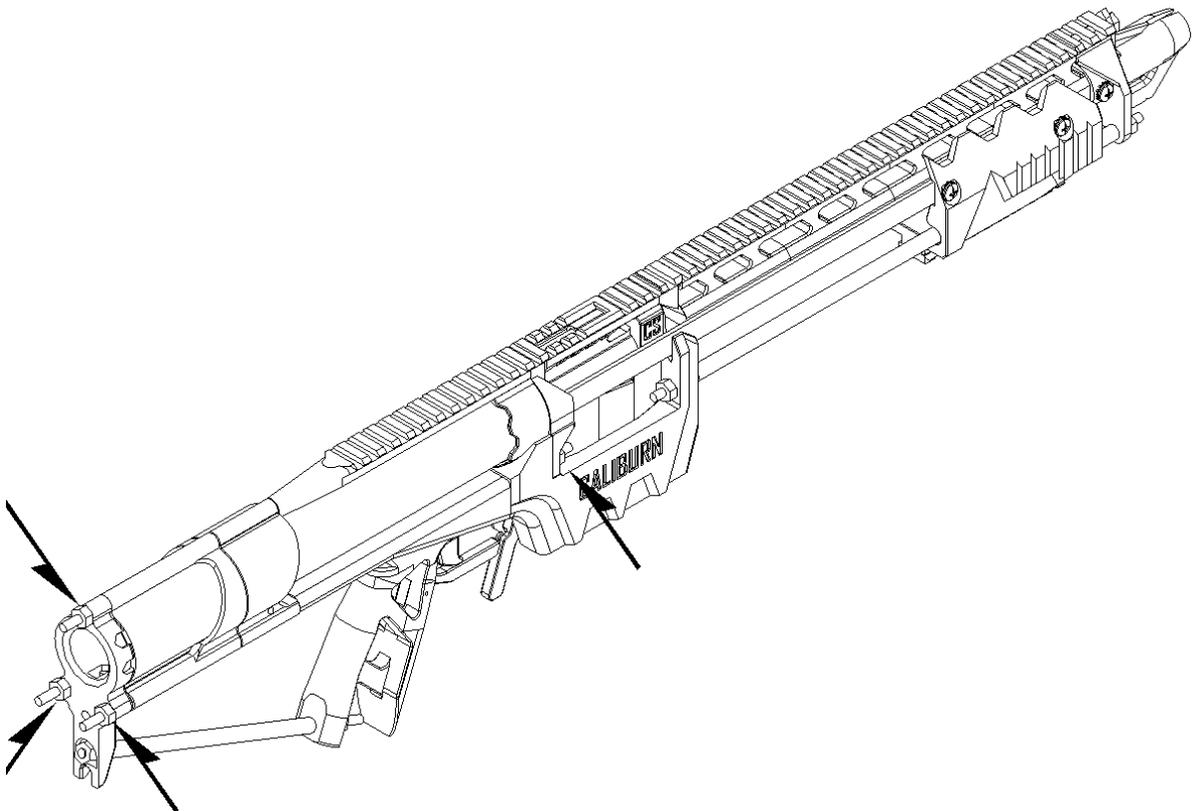
Slide another 14" threaded rod into the back of the Front Assembly and screw it into the coupling nut by hand. 4 or 5 turns should be enough.
Then slide the RAIL_TOP assembly onto the threaded rod. The RAIL_TOP sometimes is printed in two halves that will need to be slid together with a pair of Short Pins.



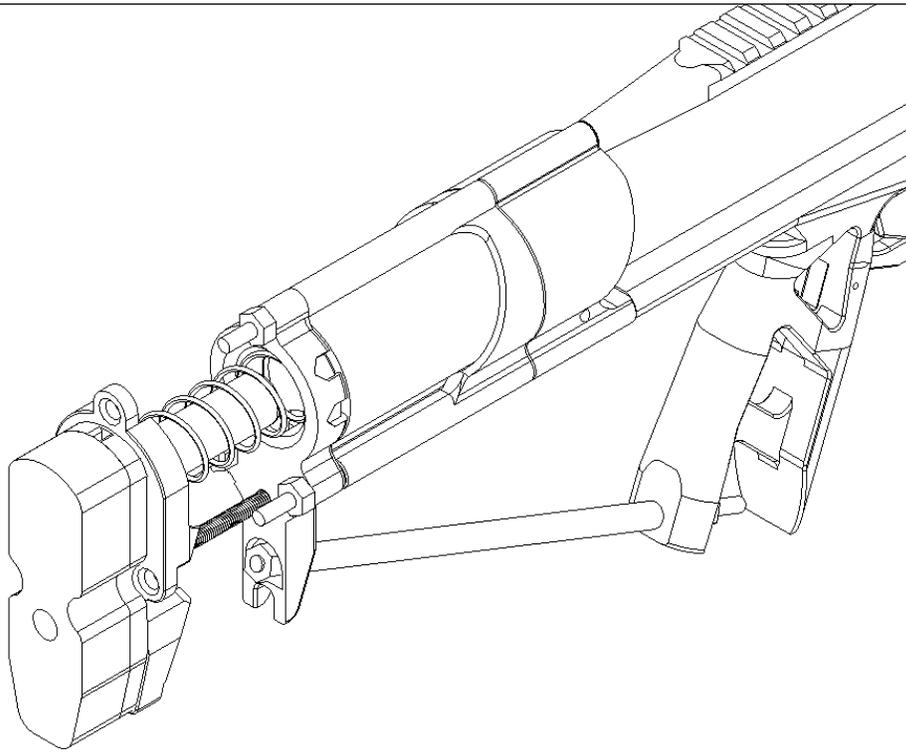
Slide the PLUNGER backwards into the lubricated front end of the PLUNGER TUBE assembly, then slide the PLUNGER TUBE assembly forwards onto the back end of the BOLT assembly. You may need to push the o-ring in a few spots to get it to cooperate.



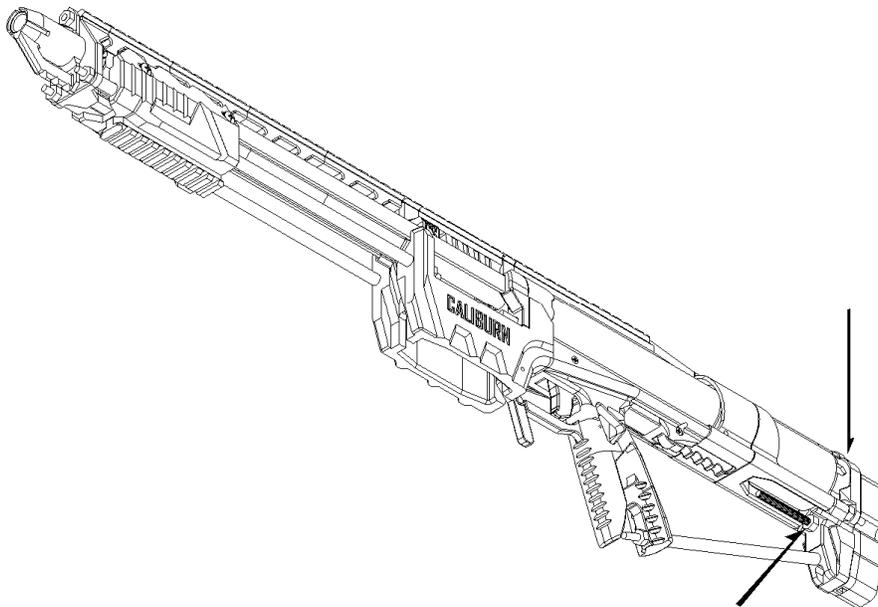
Slide the two assemblies together.



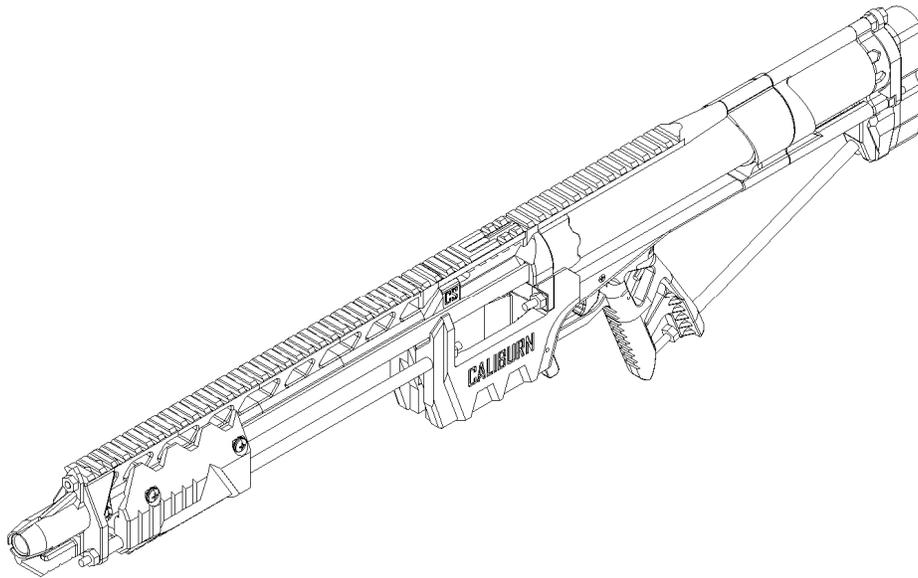
Add hex nuts to the exposed threaded rod ends ahead of and behind the stock assembly. Tighten the hex nuts at the rear of the stock assembly.



Install a main spring of your choice into the back end of the stock. Slide the Buttplate assembly long screw through the hole in the stock, the post onto the mainspring, and then the holes onto the exposed threaded rods.



Add a hex nut to the exposed upper threaded rod and tighten it. Add a hex nut to the long screw and tighten it.



Slide the foregrip back to compress the mainspring until the plunger gets engaged on the Sear. With the breech no OPEN install a Magazine loaded with darts. Slide the foregrip all of the way forwards to chamber the dart in the top of the Magazine. You can load up to four darts into the barrel at a time if desired by cycling the Foregrip back and forth multiple times prior to pulling the Trigger. **ONLY PULL THE TRIGGER WHEN THE BREECH IS CLOSED.** If you do not have a dart loaded in the barrel and need to pull the Trigger to de-prime the blaster, plug the end of the barrel with your finger before doing so.

Replacing the Main Spring does not require full disassembly of the Blaster. You just need to reverse the last 2 steps in these instructions in order to take the buttplate off.

The Blaster and Hardware Kits are shipped with K26 and K25 springs. The K25 is rated slightly lower than the K26. The alternate spring options are the K31 and 788 which both have to be purchased separately or opted for as a replacement. Either are recommended for indoor use, or for younger players.

To reduce the performance of the Blaster by 10% to 20% the Ram can be operated with the O-Ring removed/absent without any issues.