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 200 Micron or smaller.
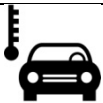
The Following parts however ARE REQUIRED to be printed at 100% infill: Bolt1, P1, P2, P3b, Ram2, Sear, and Spreader

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 stock becomes available. I'm producing these myself in what remains of my free time, but the intent is to have at least 2 blasters and 2 hardware kits in stock every week. Custom orders or pre-paid blasters will involve a 1 to 2 week lead time, but that ensures that you won't have to compete for limited inventory. Otherwise just check my eBay store every Weekend for inventory being added.

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 spring that is currently available for this design and use it. It is McMaster-Carr part# 9637K31
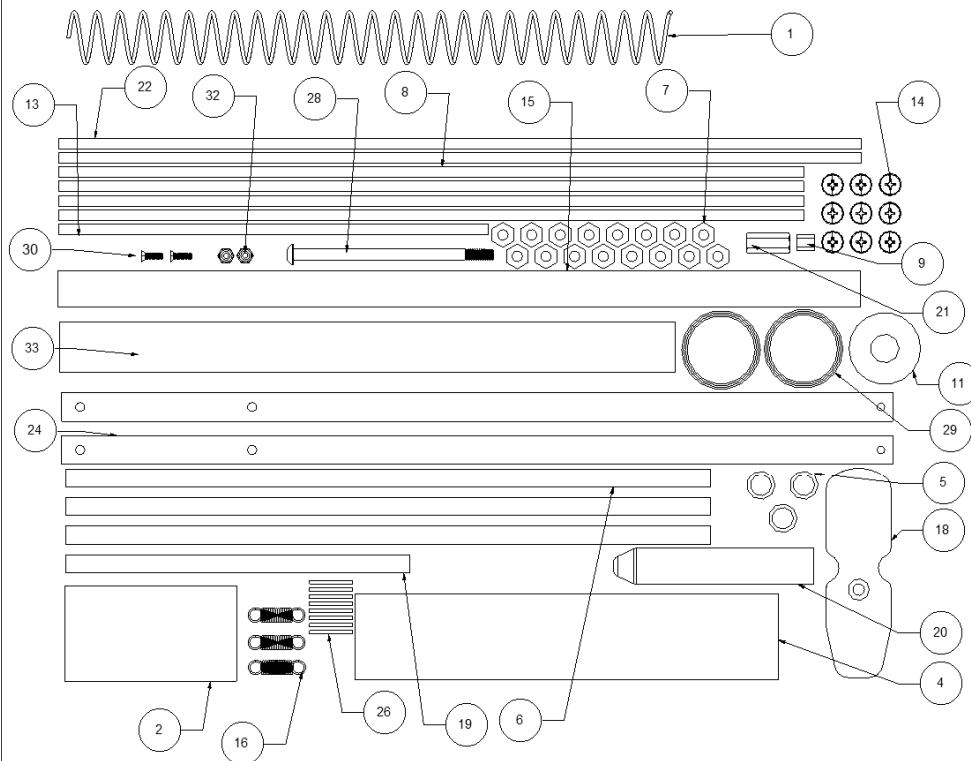
Item #	Quantity	Part Name
1	1	K25 Spring
2	1	StockSpacerAlt2
4	1	Plunger Tube
5	4	012 O-Ring
6	3	11.25" Spacer
7	16	Locking Hex Nuts
8	4	13" Threaded Rod
9	1	Grip Standoff
11	1	ShockPad
13	1	8" Threaded Rod
14	9	Screws
15	1	Barrel
16	3	Extension Springs
17	1	Buttplate
18	1	ButtplateFoam
19	1	6" Spacer
20	1	StockCore
21	1	Coupling Nut
22	2	14" Threaded Rod
24	2	BoltArm
26	8	Pin Short
28	1	Buttplate Screw
29	2	Dash 123 O-Ring
30	2	4-40 Short Screw
32	3	4-40 Lock Nut
33	1	Barrel Shroud

CALIBURN HARDWARE KIT

10/05/17
Printed/Cast Parts NOT included.
Tools needed: Philips Screwdriver, 3/8 Combination Wrench, 1/16" Allen Key, Needle-Nose Pliers

Here are the typical contents of the Hardware Kit as of 10/05/17.

To Assemble this blaster you will need a Slotted Screwdriver, Small Philips Screwdriver, 3/8 Combination Wrench, Needle-Nose Pliers (or hemostats), 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.
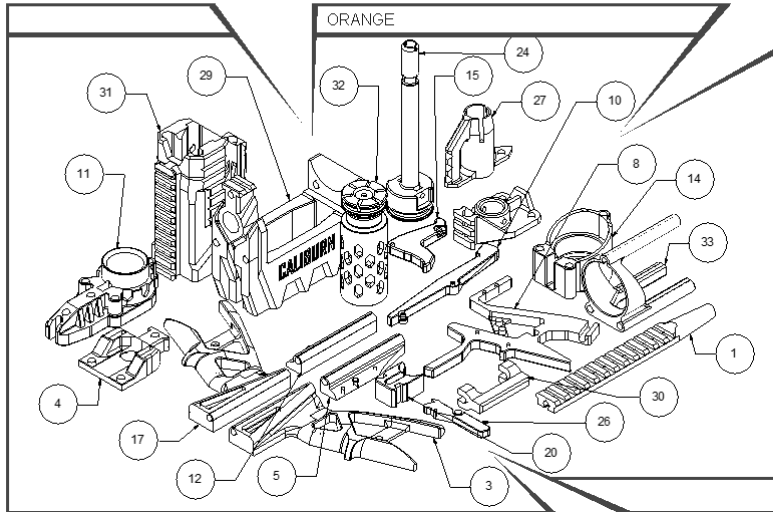
10/21/17

CALIBURN PRINTED PART SET

PRIMARY

ACCESSORY

ORANGE

SECONDARY

Item #	Quantity	Part Name	Infill %
1	1	rail_top	20
3	1	Grip4left	20
4	1	Spreader	100
5	1	GripSpacerLeft	20
8	1	Tguard2	100
10	1	Sear	100
11	1	Butt	20
12	1	GripSpacerRight	20
14	1	Stock_Alt2	20
15	1	TriggerAlt	100
17	1	Grip4right	20
20	1	DartGuide	20
24	1	Ram2o	100
26	1	MagRelease2	20
27	1	Muzzle Brake	20
28	1	Muzzle3	20
29	1	MagWell2	20
30	1	Jam2	20
31	1	Rail_Foregrip	20
32	1	Plunger	100
33	1	Ansuzalgiz2	20

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. Similarly the inside of the magwell
often times requires a few passes with a flat file to fit older mags.

- Captain Slug
http://www.captainslug.com

Above is a list of every printed part needed to assemble this blaster. The majority of the through holes should print to the require 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.
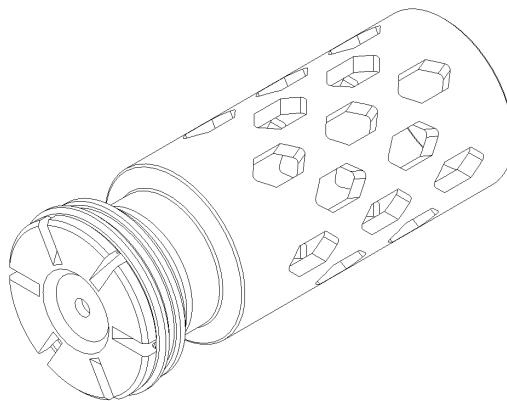

Add a Dash 123 O-Ring to the groove of the Plunger then set aside.

Dash 123 O-Ring

Ram2o

Shock Pad

4-40 Lock Nuts with
Nylon side facing ram
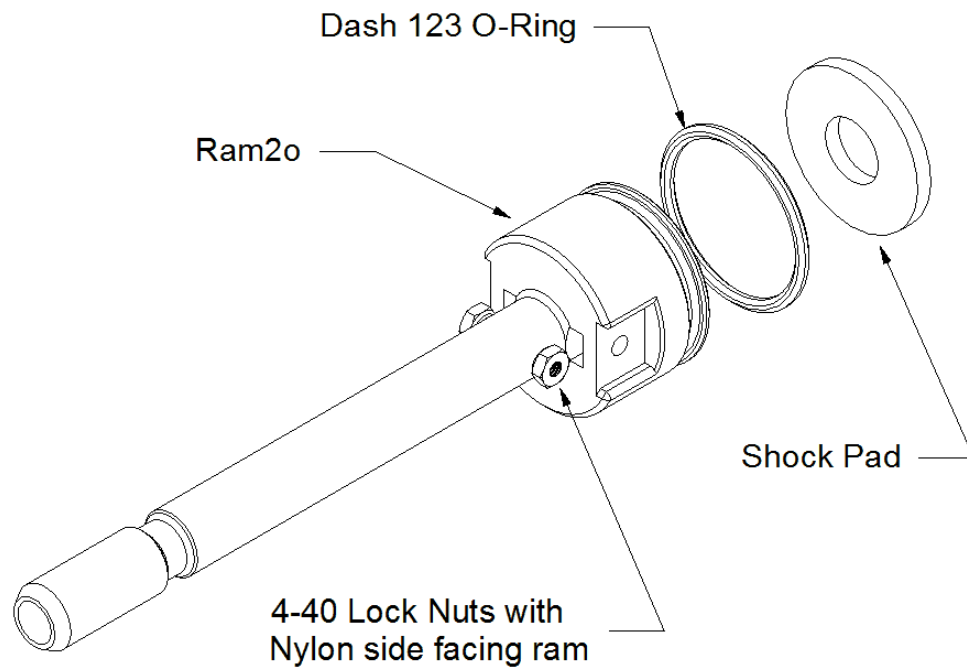
Adhered the Shock Pad centered onto the back of the Ram. Add a Dash 123 O-Ring to the groove on the Ram. Slide two 4-40 Lock Nuts into the slots in the front of the Ram so that their Nylon side is facing the center of the Ram.
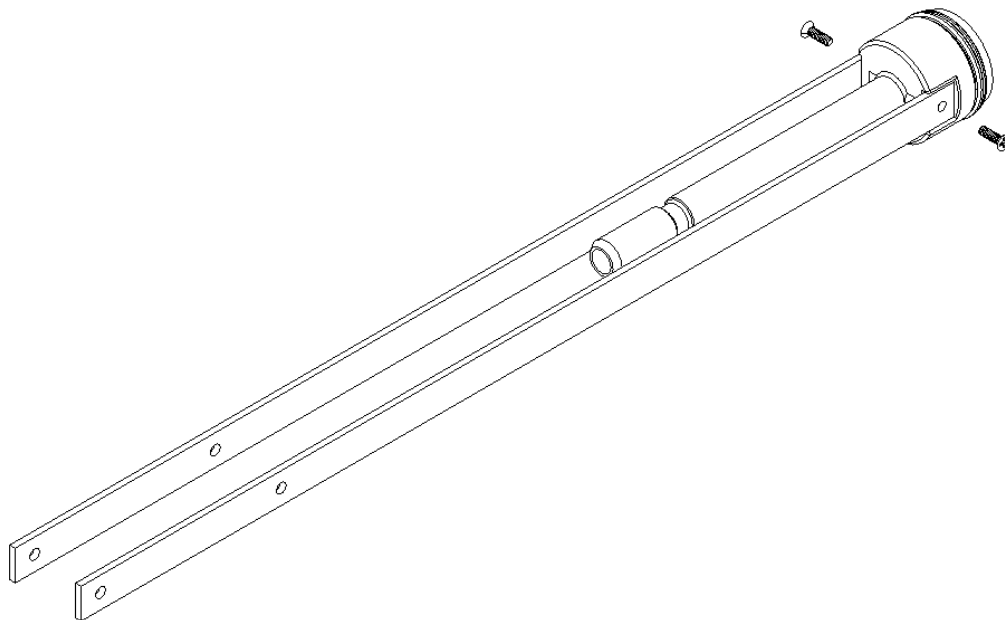
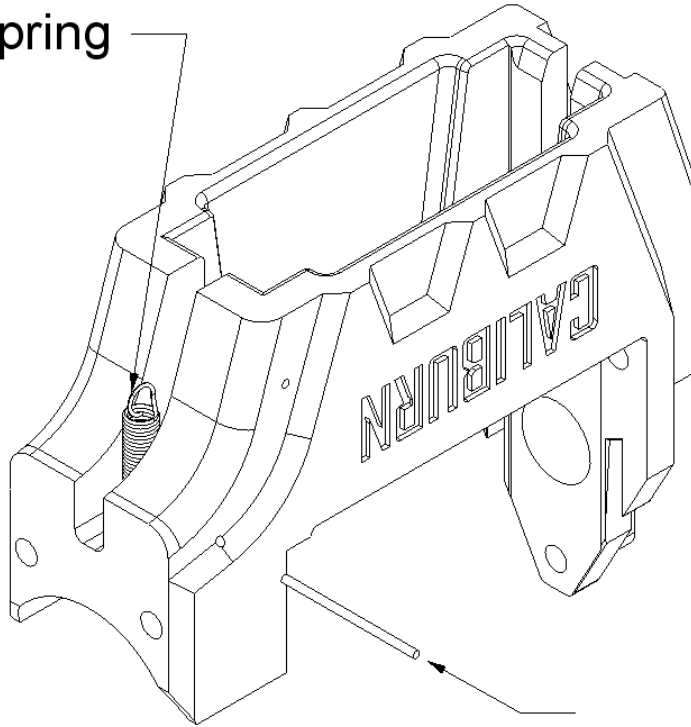Add two Bolt Arms to the Ram Assembly and secure them with two short 4-40 screws.
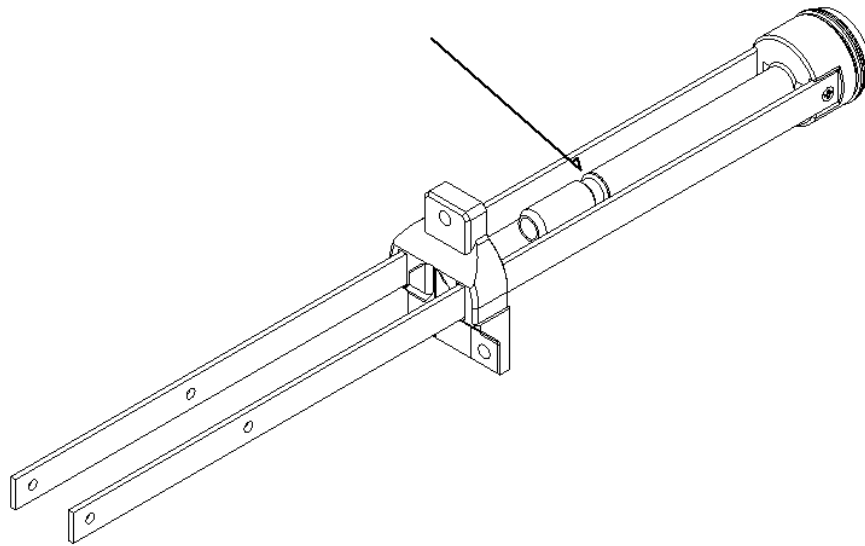
Slide a Spreader over the pair of Bolt Arms. Add an 012 O-ring to the undercut in the Ram. Set this assembly aside temporarily.
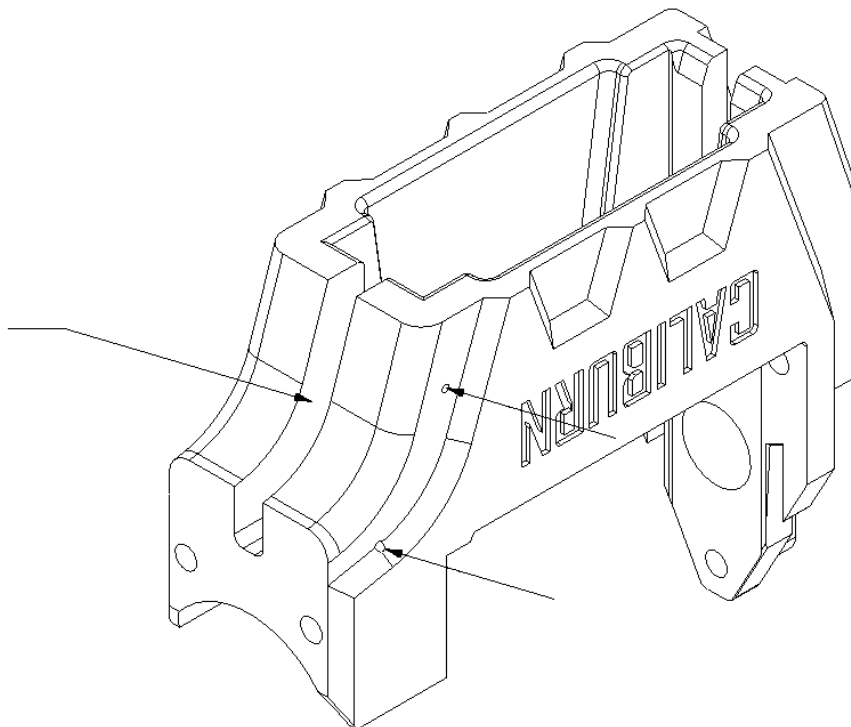
Use a Rectangular File or Knife to remove any scragglies or hair from the inside of the Magwell where indicated.

Extension Spring

Insert a Pin through the MagWell and through the loop of an Extension Spring. You may need to use a pair of needle-nose pliers to get the pin centered. Once it is centered you can push or pry it towards the bottom of the magwell.

Mag Release
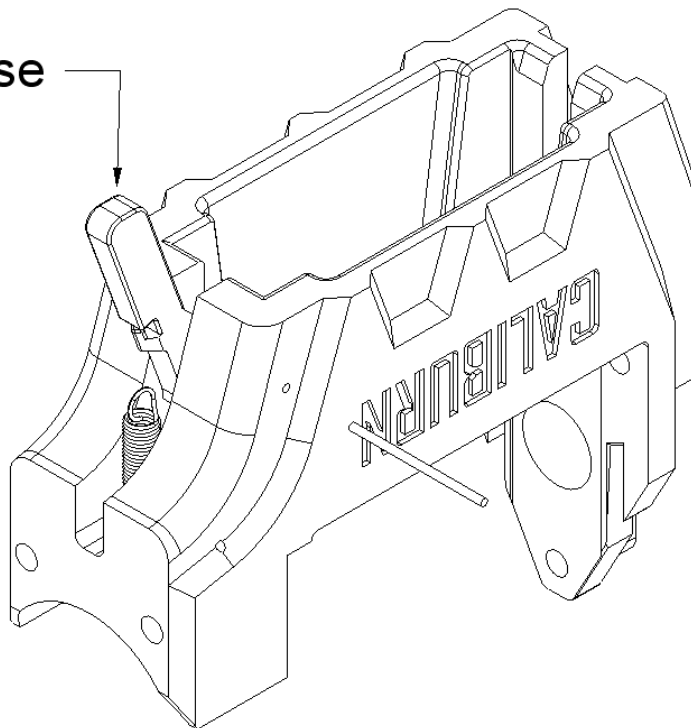
Do the same through the MagWell and the Mag Release.

Pull Loop
onto Hook
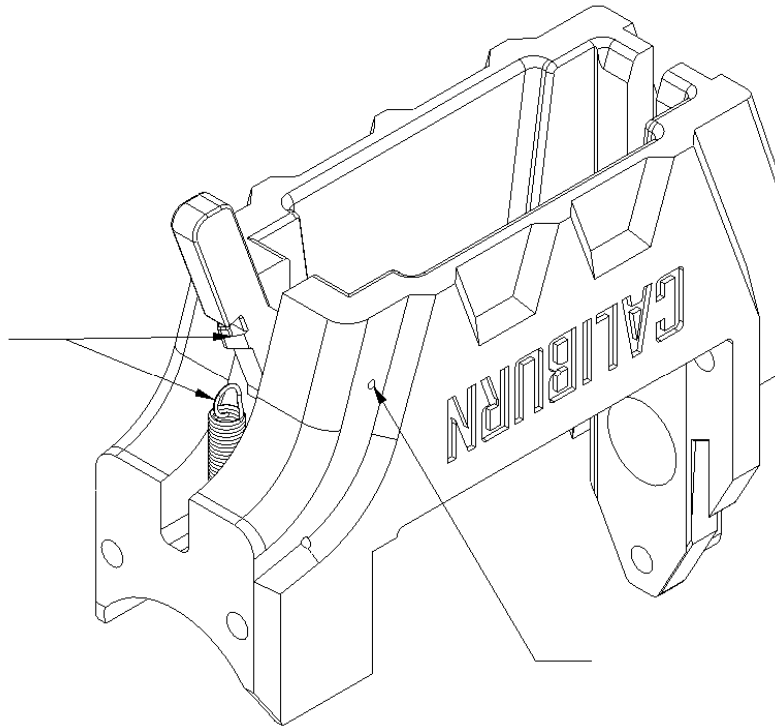
Pull the remaining loop of the Extension Spring onto the hook\peg on the Mag Release. Apply Super Glue to the indicated hole in left left side of the Mag Well or cut a very short section of Dash 123 O-Ring and plug the hole with it. If used, let the glue dry.

End of barrel
with inside
Chamfered

Should be close
to flush with inside
of Magwell
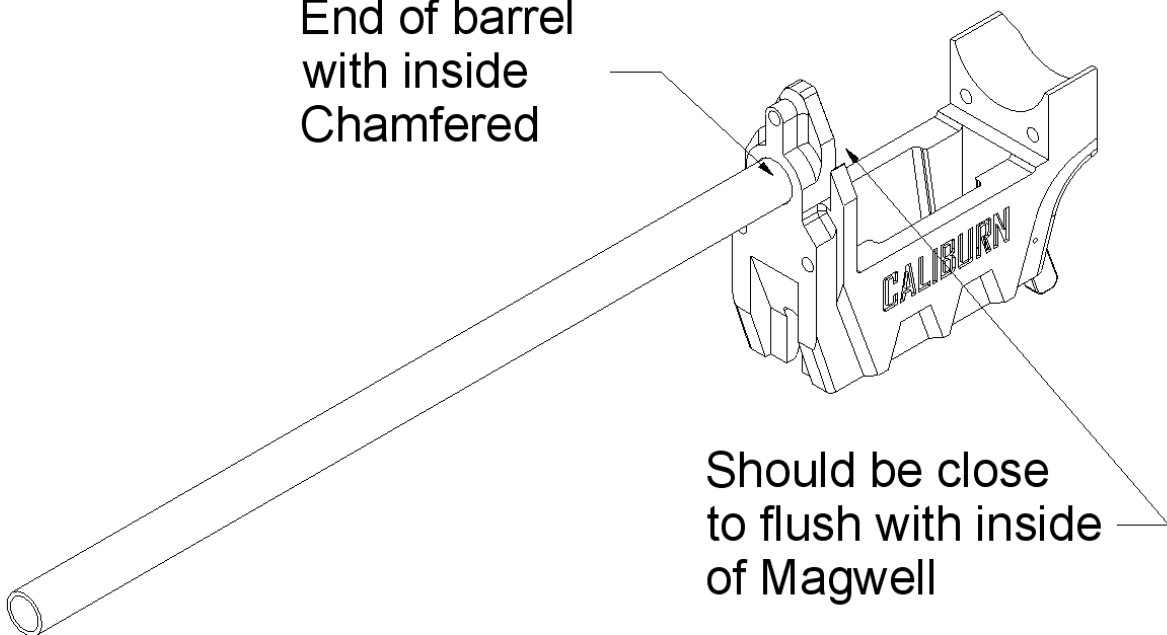
Install the Chamfered side of the Barrel into the Mag Well. You may need to file this hole out with a Round Needle File prior installing the barrel. The inside of the Mag Well can be rested on the edge of a desk or table in order to push the
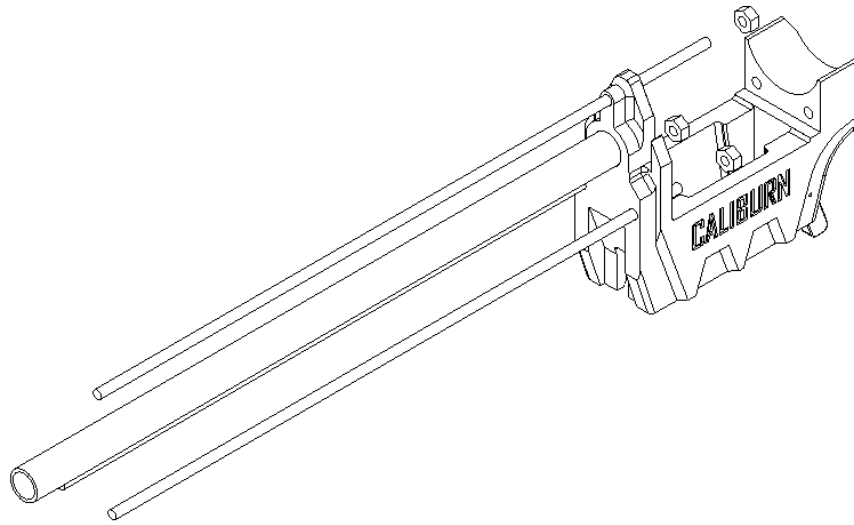
Slide two 13-inch length threaded rods into the lower holes at the front of the Mag Well. Slide one 14-inch length threaded rod into the upper hole at the front of the Mag Well. Add a hex nut to the inside end of each.
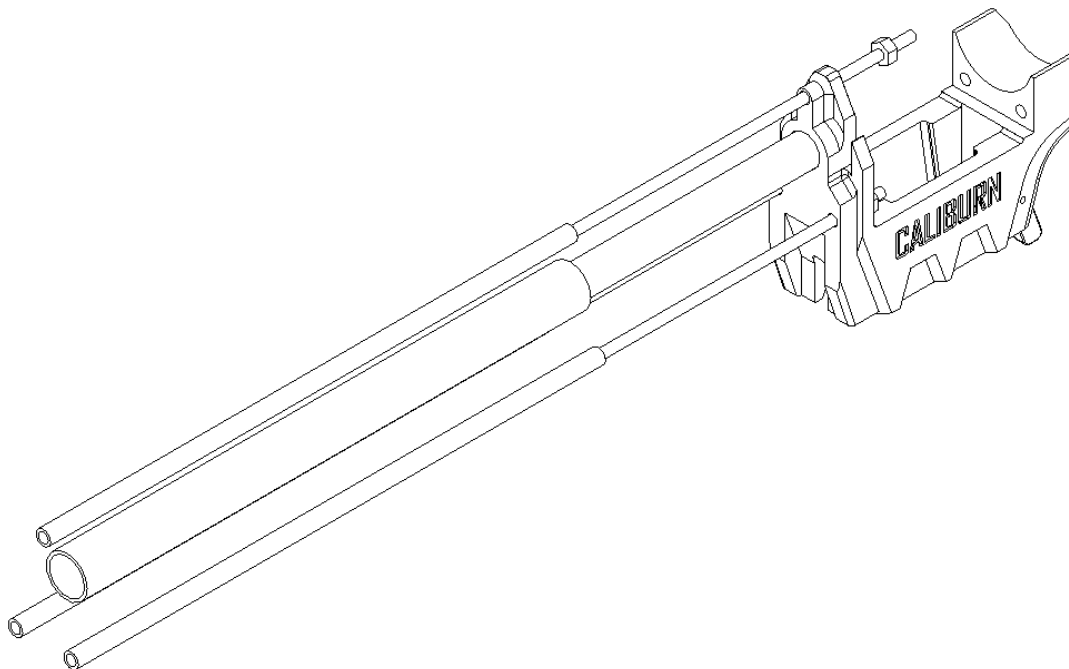
Slide three 11.25 inch length spacers onto the threaded rods. Also slide the Barrel Shroud over the barrel.
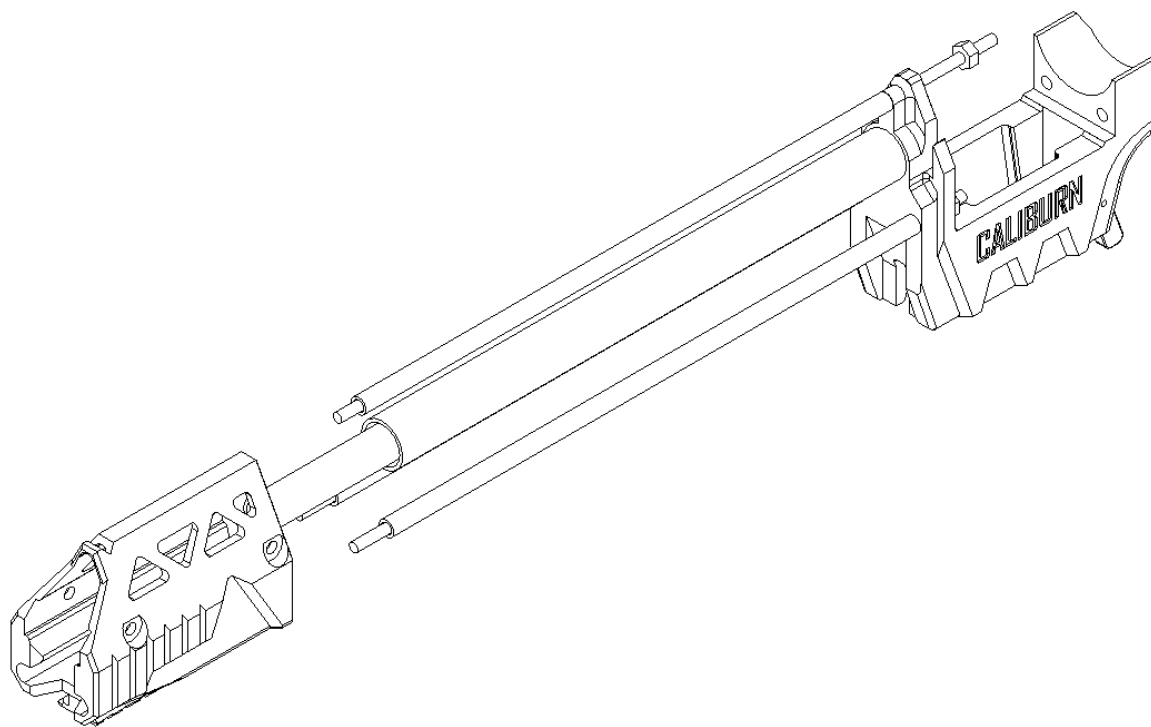
Slide the Foregrip over the now covered threaded rods and the barrel.
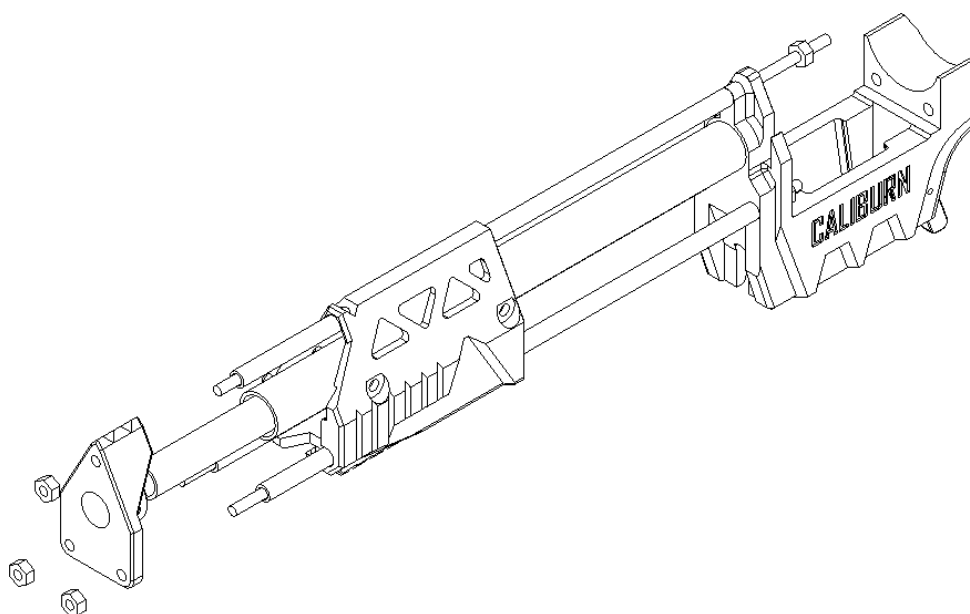

Slide the Muzzle onto the end of the Barrel, then fit the ends of the Threaded Rods through it. If included, slide the Muzzle Brake piece onto the barrel and upper threaded rod. Add three Hex Nuts and tighten the lower two.
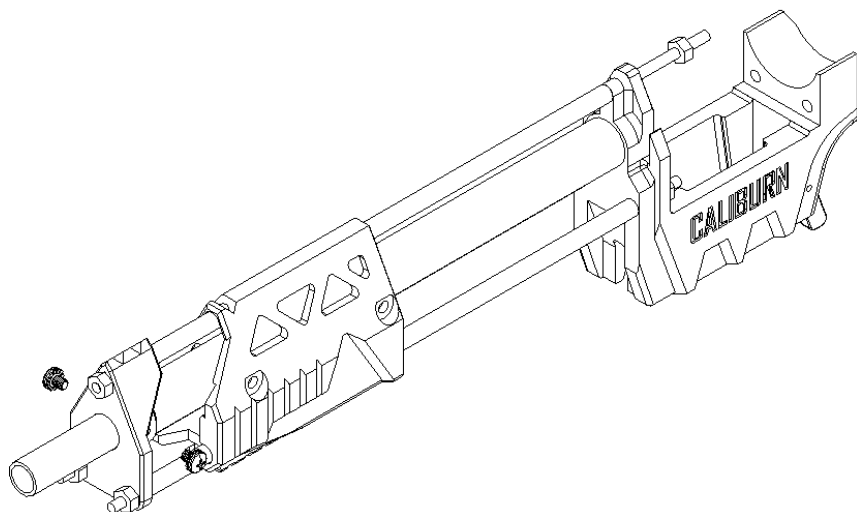
Confirm that the Barrel is still flush with the inside of the Mag Well. The Barrel can be secured using two 1/4" length screws if it has been tapped for them. Otherwise the barrel needs to be glued to the Muzzle using Super Glue or a strong epoxy such as Devon Plastic Weld or Plexus MA310.
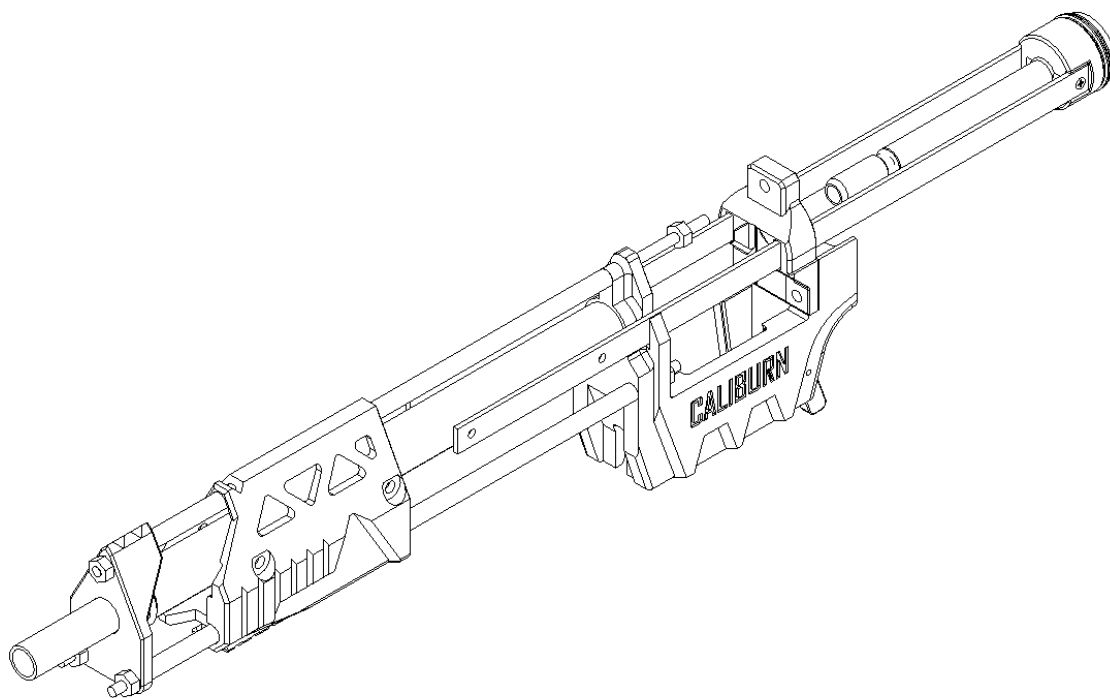
Install the Bolt Assembly by sliding it into the Mag Well from Above. Make sure that the Spreader part is ahead of the lip at the back of the Mag Well.
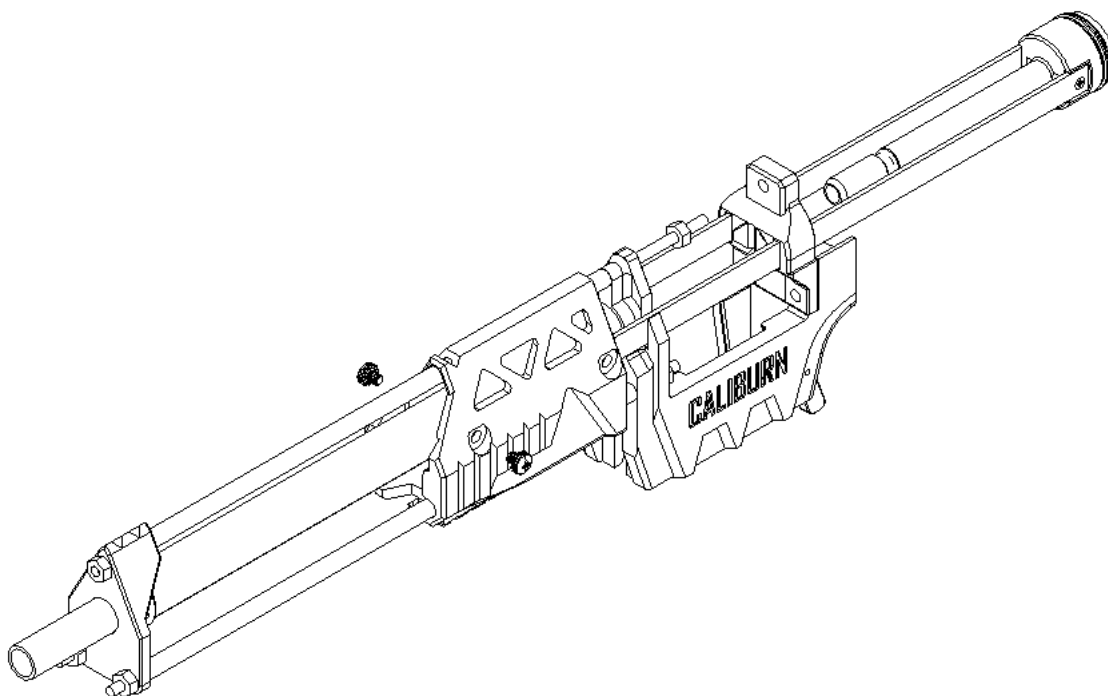
Slide the Foregrip back over the aluminum straps (Bolt Arms) until the threaded holes line up with the holes in the Foregrip. Secure them together at the front pair of holes using two 1/4" length screws. You may need to use a second scredriver or other hand tool to push the aluminum against the inside of the Foregrip so the screw can reach it.
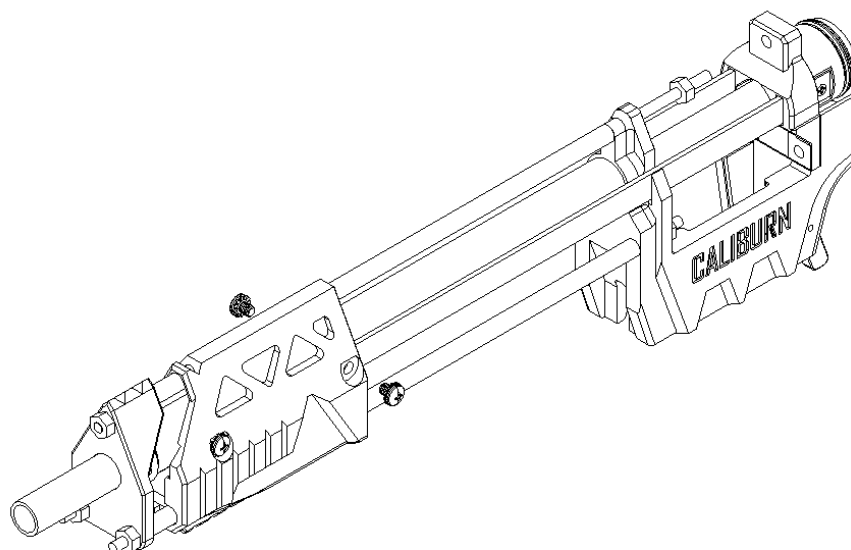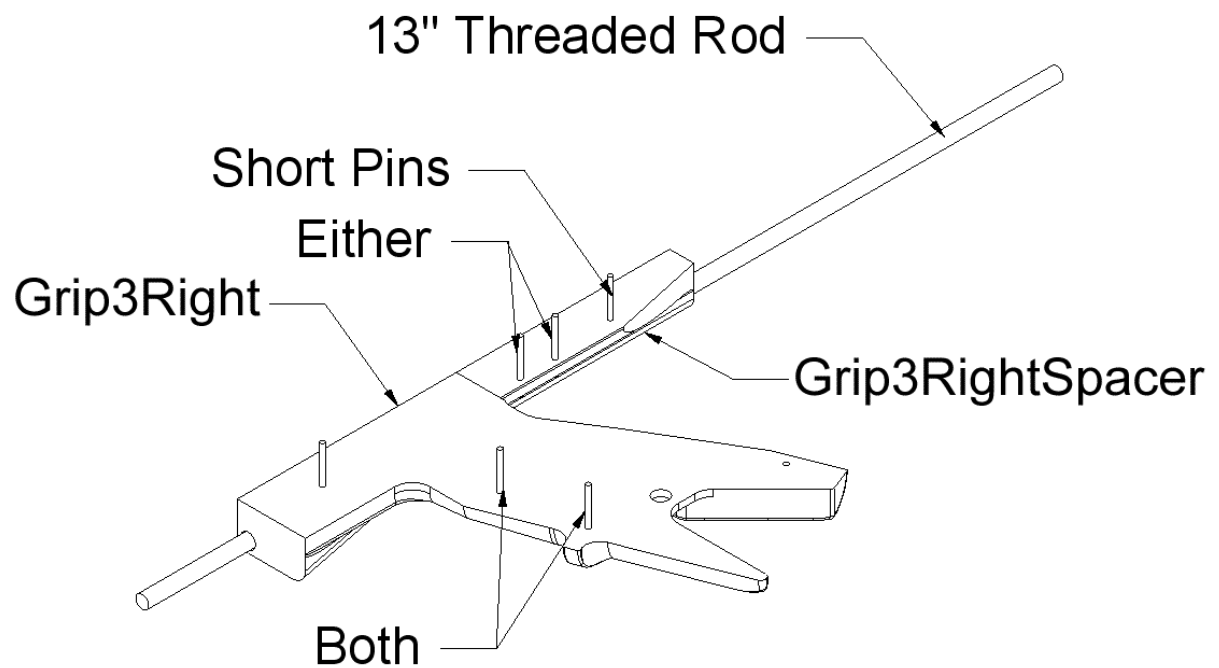

Slide the Foregrip forward. Secure the back half of the Foregrip with two more 1/4" length screws.
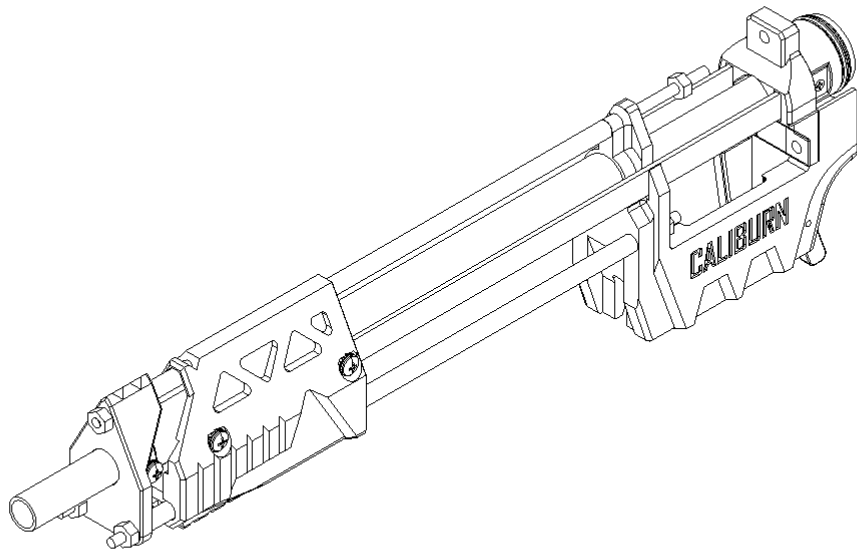
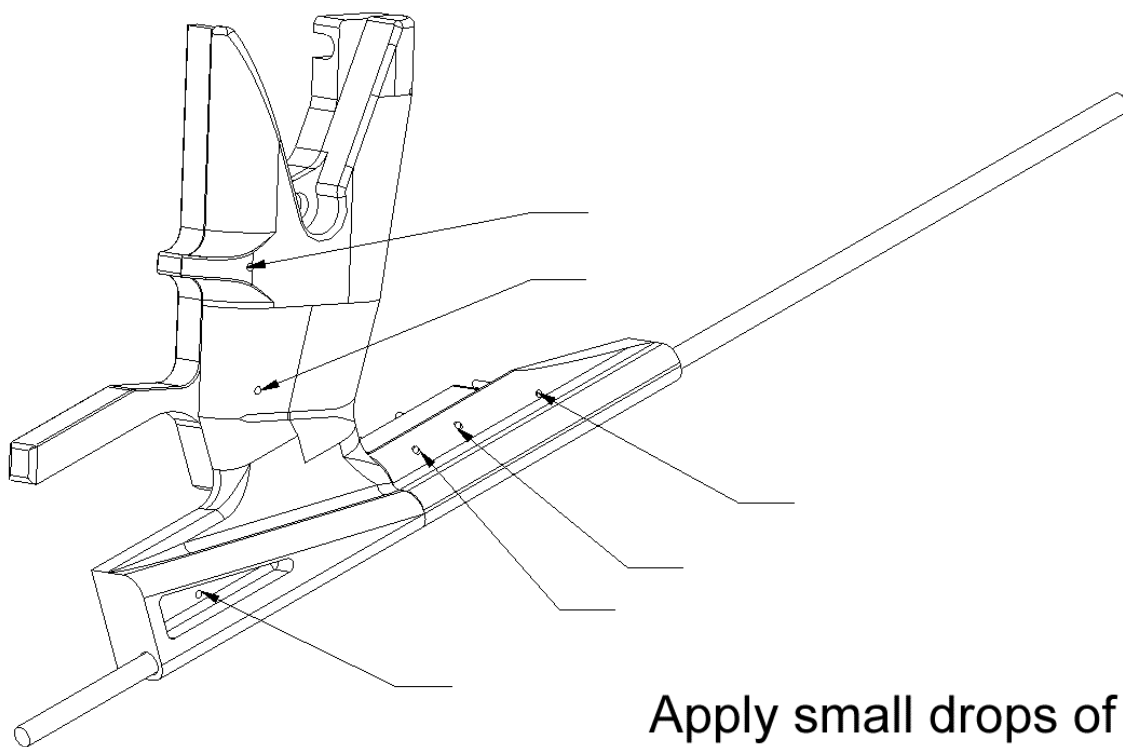The assembly of the front half of the blaster is now complete.
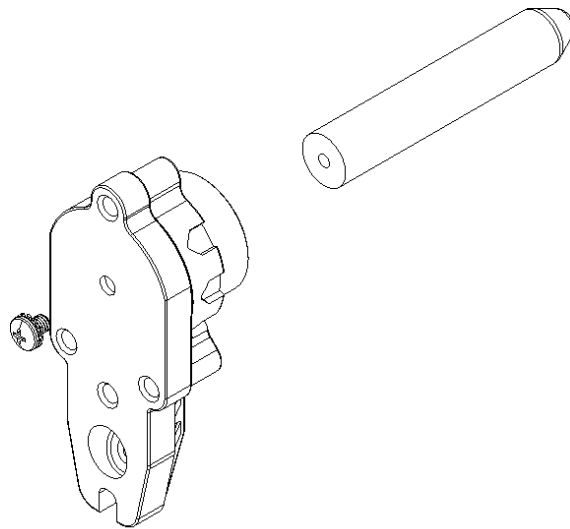
Attach the Stock Core to the Butt piece using a Short Screw.

13" Threaded Rod

Short Pins

Either

Grip3Right

Grip3RightSpacer

Both

Slide the GripSpacerRight and Grip3Right onto a 13" Threaded Rod. Add Short Pins to most of the small holes as shown.
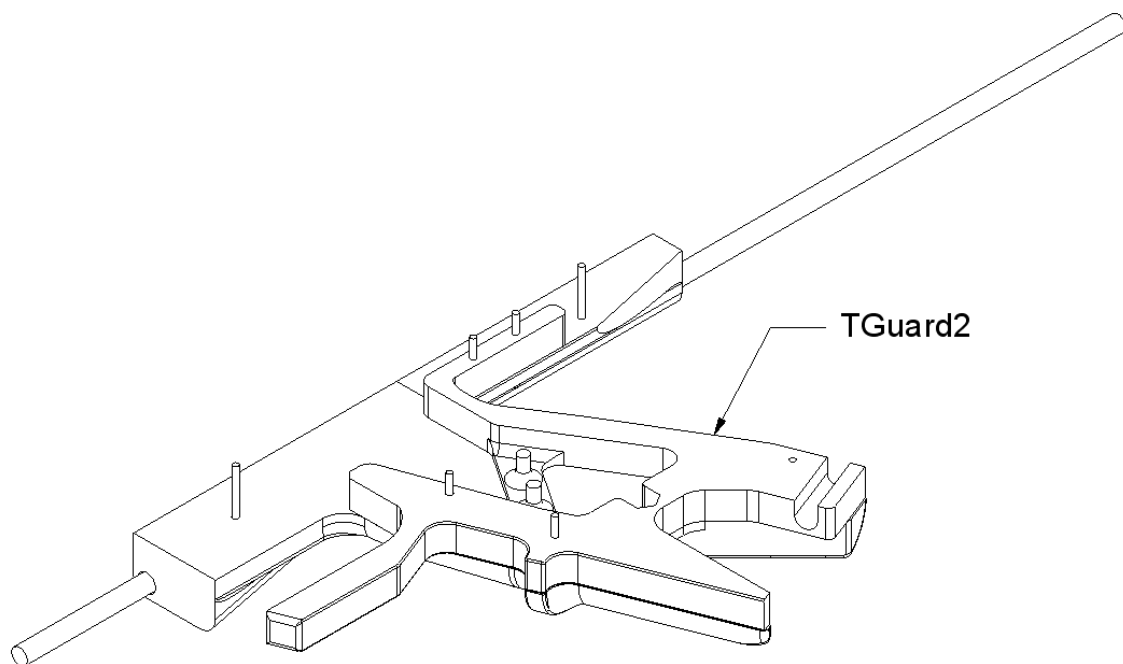
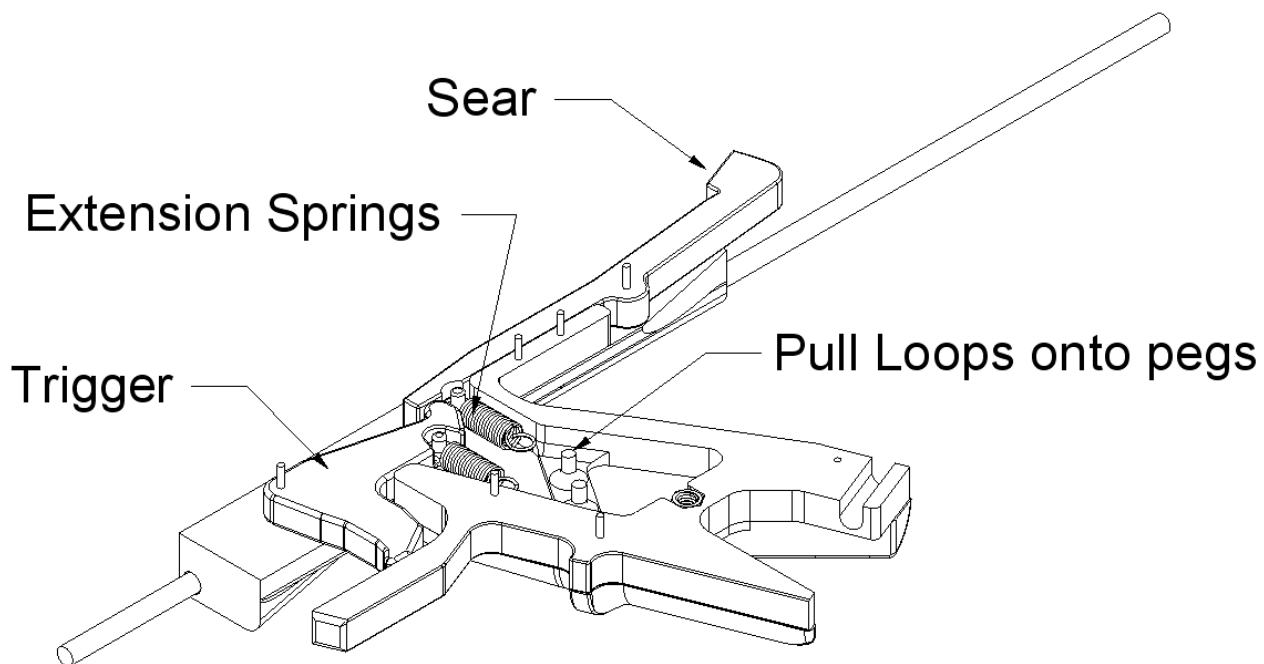TGuard2

Slide TGuard2 onto the pins.

Apply small drops of super glue and let it dry

Flip the assembly over and make the ends of the pins flush with the exterior surfaces. Apply a drop of Super Glue to each of the pins and let it dry. This will keep the pins secured to the Right half of the grip assembly.
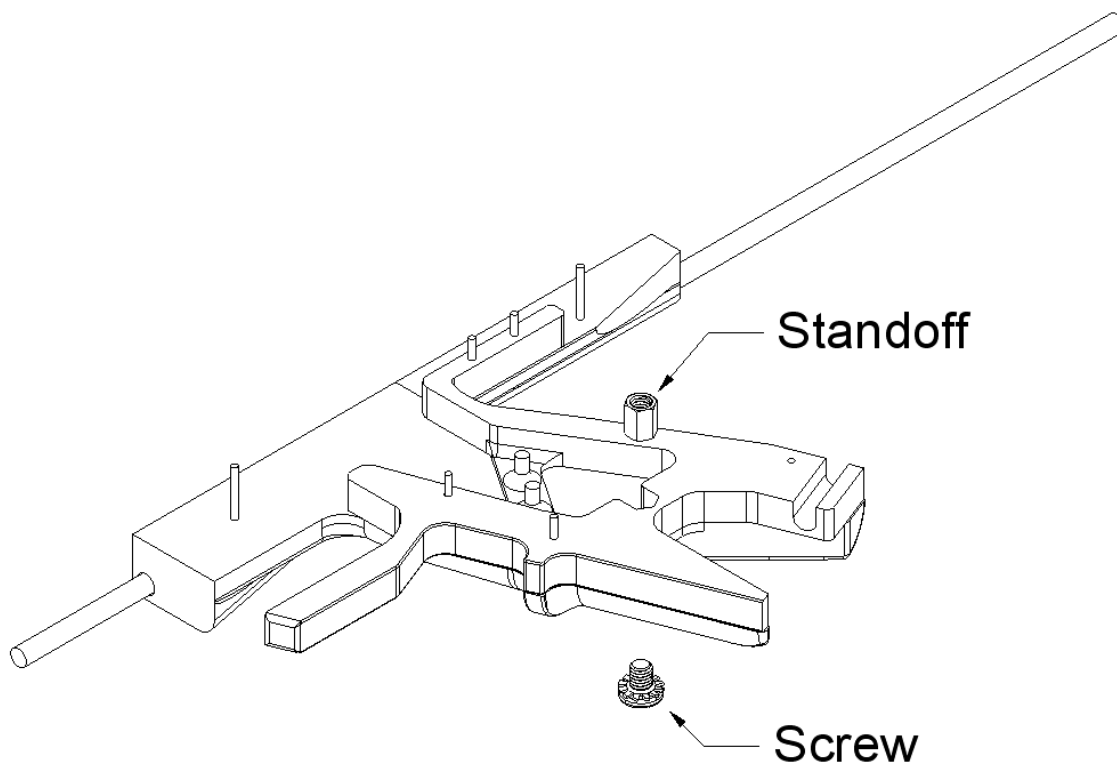
Standoff

Screw

Add the Standoff and Screw into the cutout in Tguard2.

Sear
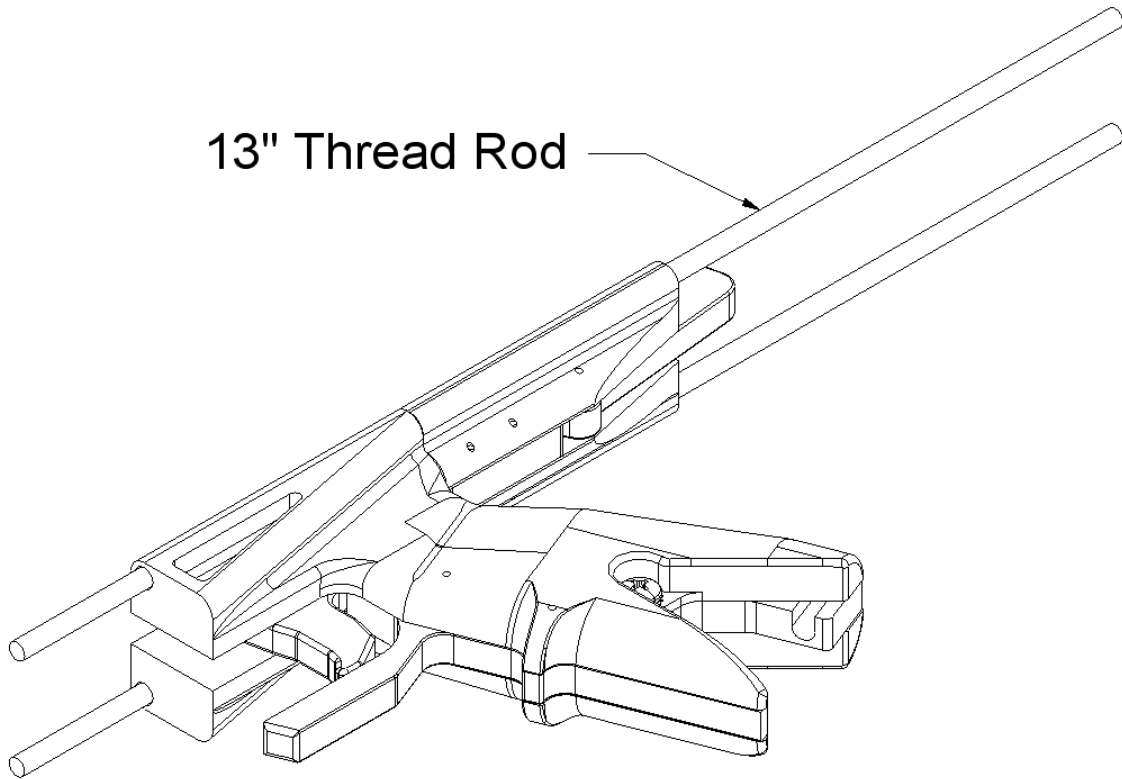
Extension Springs

Trigger

Pull Loops onto pegs

Slide the Sear and Trigger onto their pins. Put the loop of an Extension Springs onto the peg of each. Pull the opposite loop onto the pegs of TGuard2.
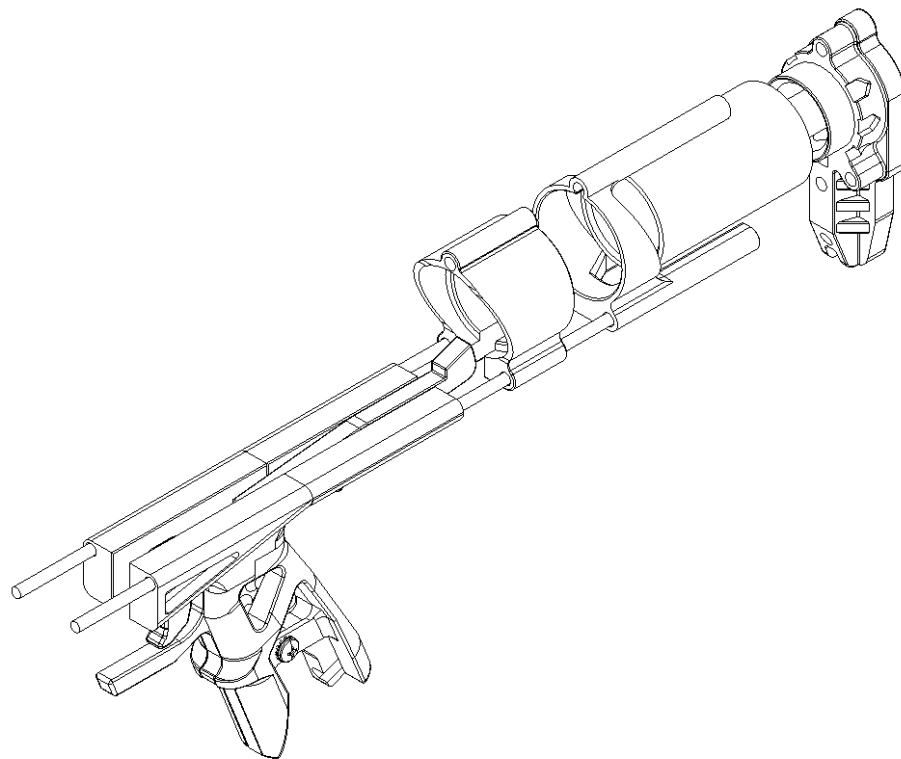

Grip3LeftSpacer
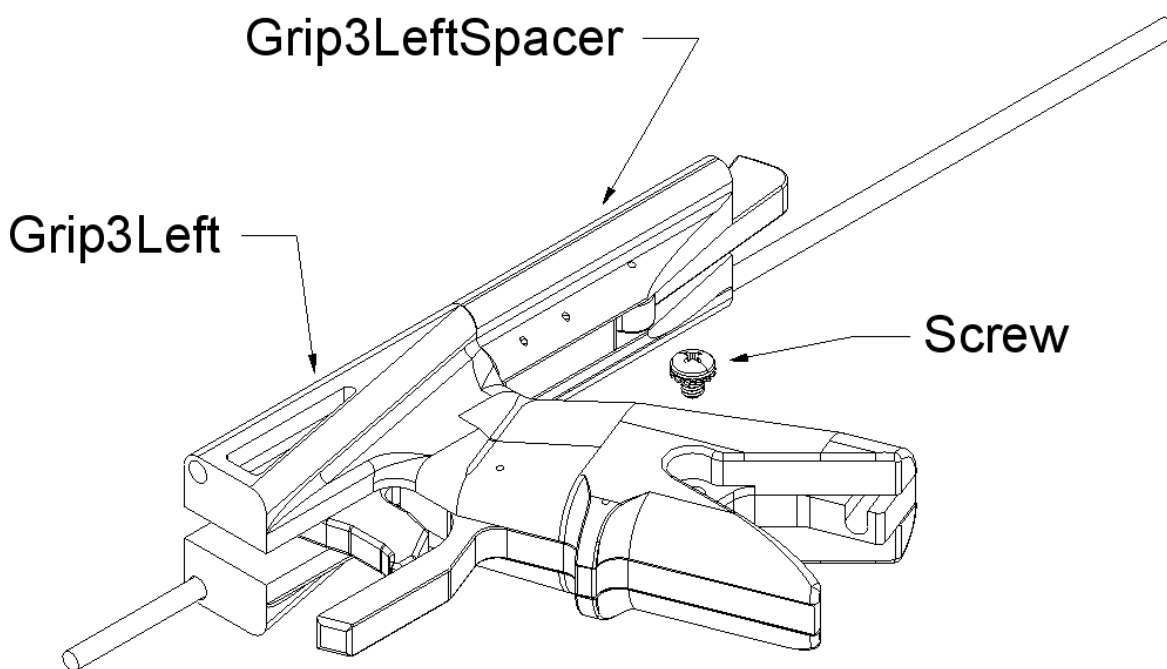
Grip3Left

Screw

Slide Grip3Left and GripSpacerLeft onto the peg and secure it with a Screw.
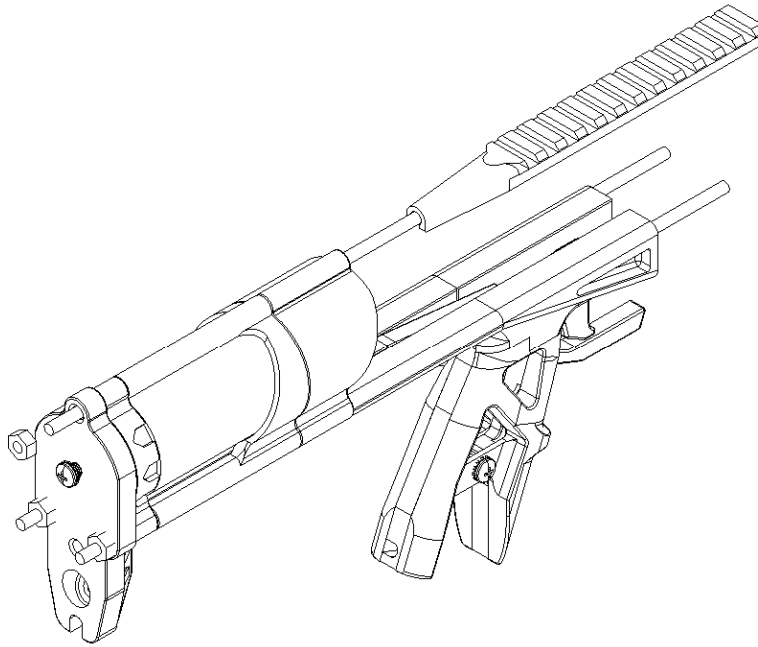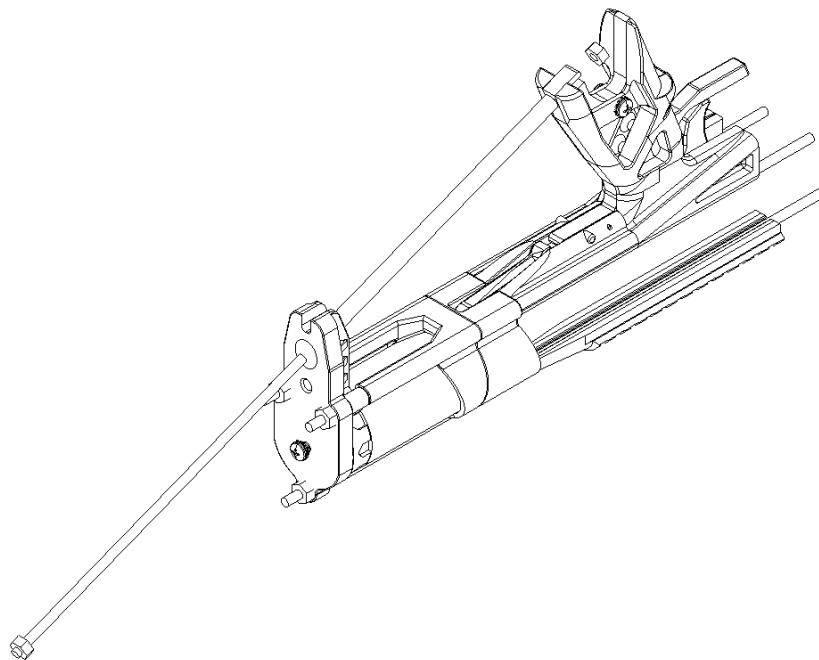
13" Thread Rod

Slide a 13" Threaded Rod through Grip3Left and GripSpacerLeft


Slide the parts shown onto the 13" Threaded Rods. They include Stock_Alt2, Ansuzalgiz2, Stock Spacer (clear), and the Butt assembly from earlier.

Add a 14" Threaded Rod, Rail Top, and three Hex Nuts.

Wedge the 6" spacers inbetween the heel of the Grip and the front angled surface of the 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 Butt. Add a Hex Nut to the opposite end of the 8" Threaded Rod and tigthen.
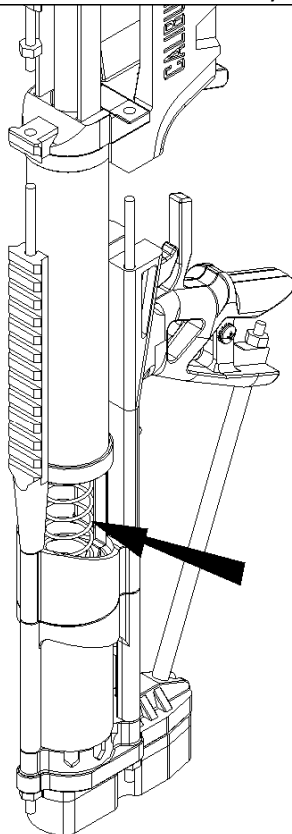
Buttplate
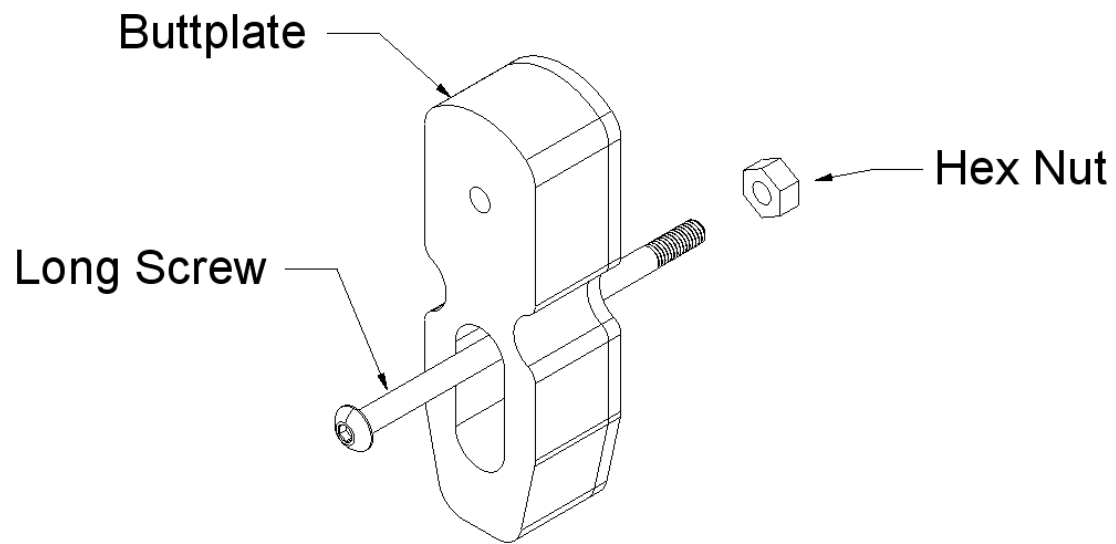
Hex Nut

Long Screw

Add the LONG Screw THROUGH THE FOAM and a use a Hex Nut to secure it to the Buttplate (or a Printed Alternative). Then Tighten the hex nut.
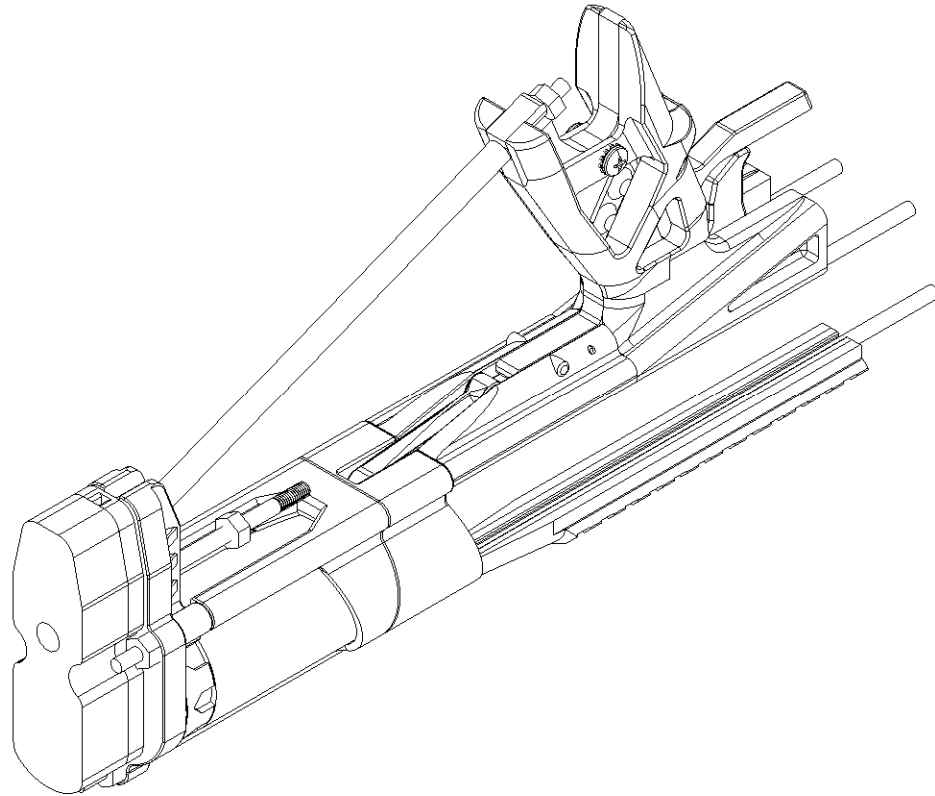

Add Buttplate to Butt. Secure with one or more Hex Nuts. Adjust to your desired spacing.
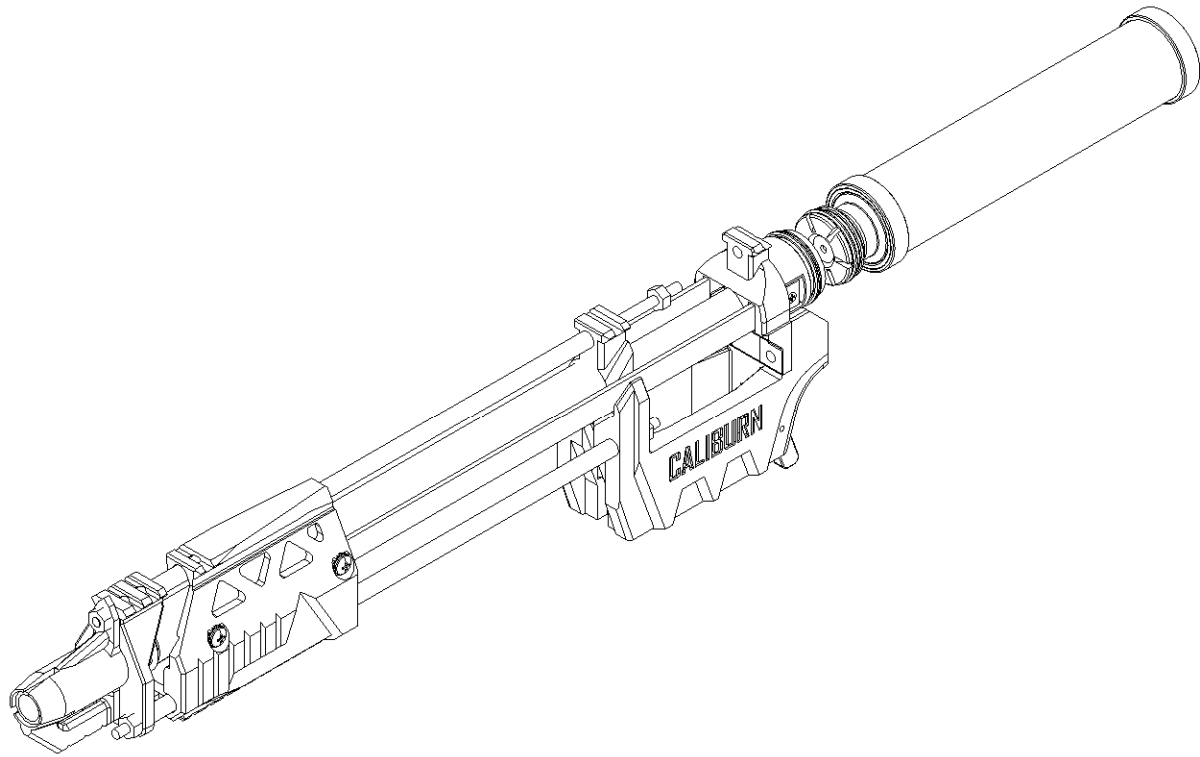
Slide the Plunger backwards into the Lubricated end of the Plunger Tube. Wiggle the Plunger Tube onto the O-Ring at the back end of the Ram Assembly.


Rest the Buttplate against a chair or table and drop a Main Spring into the Stock. Carefully lower the Plunger Tube and Front Assembly over the Main Spring.
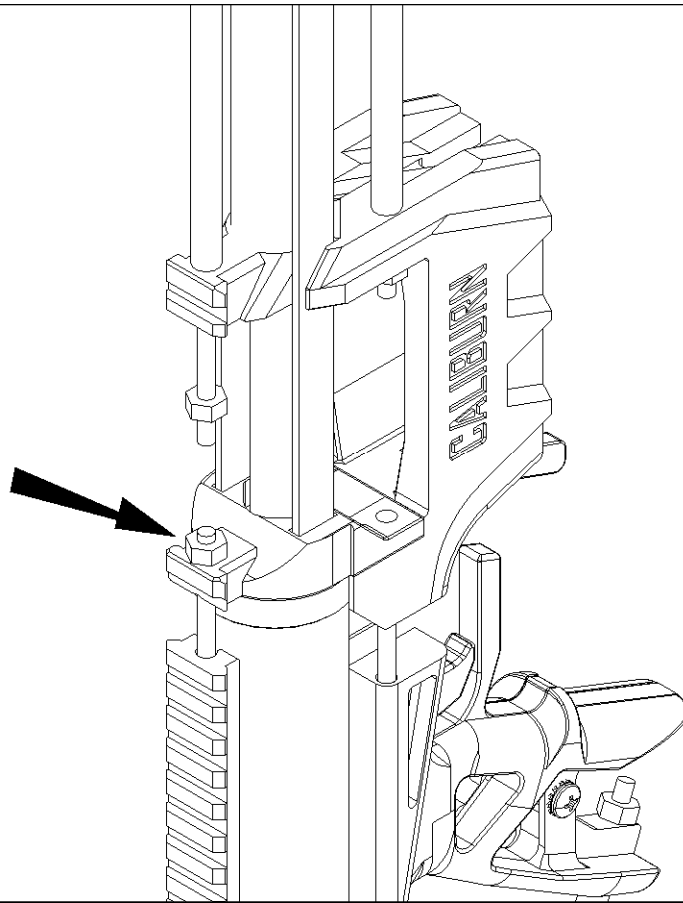
Feed the 14" Threaded Rod through the top hole of the Spreader and add a Hex Nut.
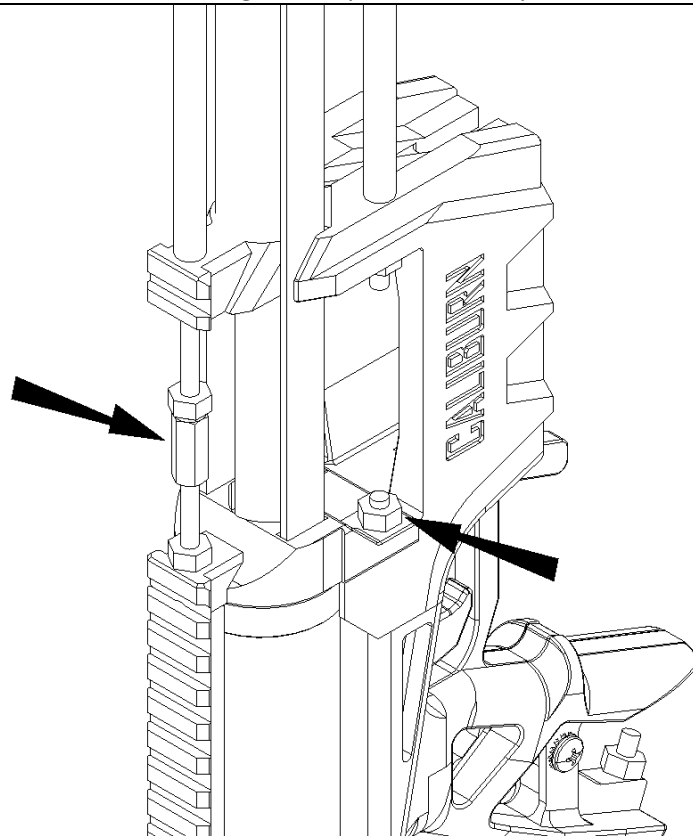
Also add the Coupling Nut to the 14" Threaded Rod, then guide the 13" Threaded Rods through the lower holes in Spreader and add Hex Nuts to those as well. Use the Coupling Nut to connect both 14" Threaded Rods together.
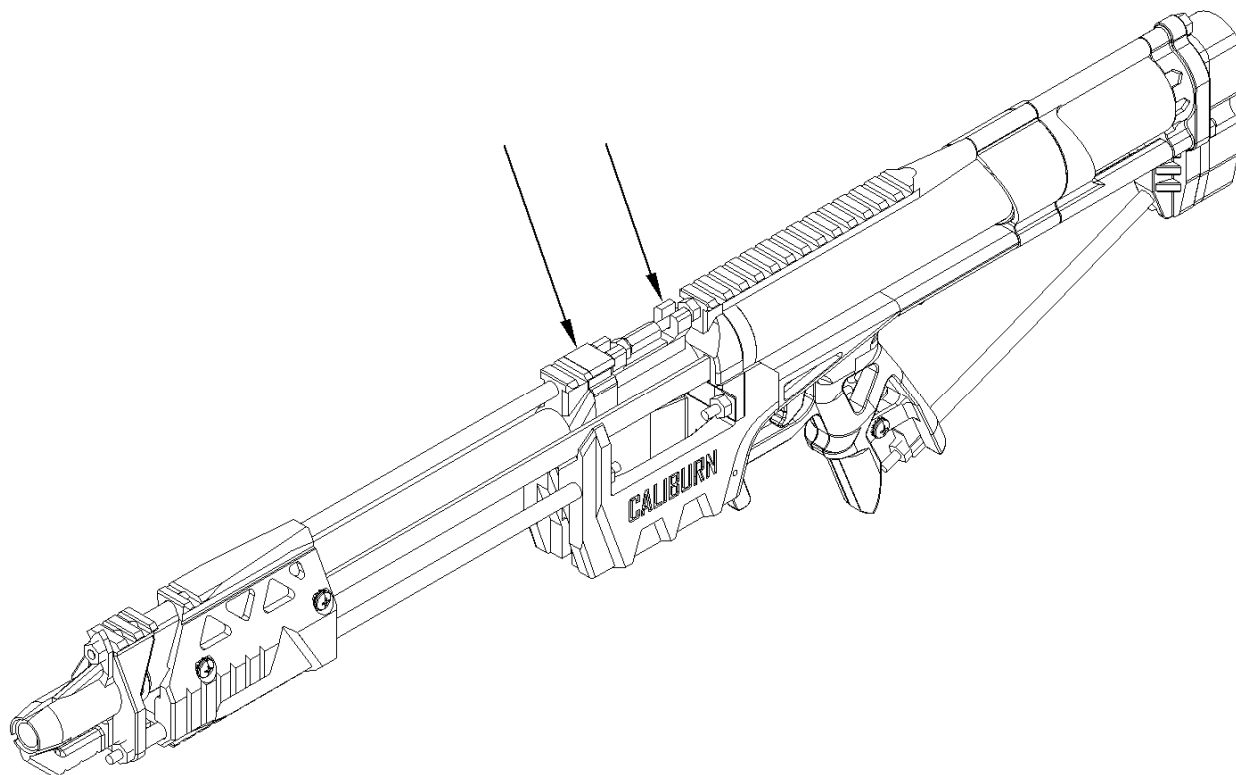
You will need to adjust the positioning of the upper 14" Threaded Rods for this next step, which is why they have not yet been tightened. Slide the Dart Guide onto the front 14" Threaded Rod from the top. Slide the Jam onto both from one side so that the front Hex Nut is behind the tab towards the front of the Blaster. Then rotate the Jam piece until it is oriented vertically.
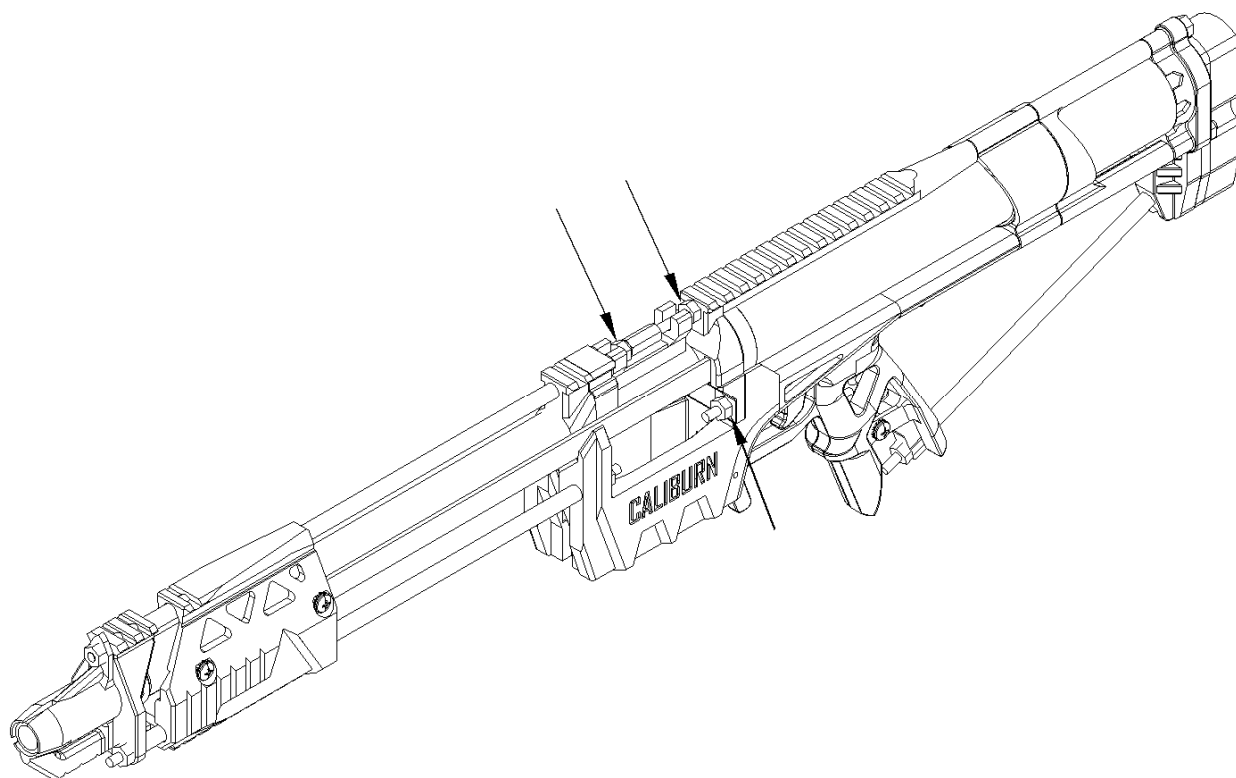
Tighten both of the lower Hex Nuts against Spreader until all of the components of the rear assembly are pulled together firmly. Tighten both Hex Nuts up top. One against the front tab of Jam, the other against Spreader.
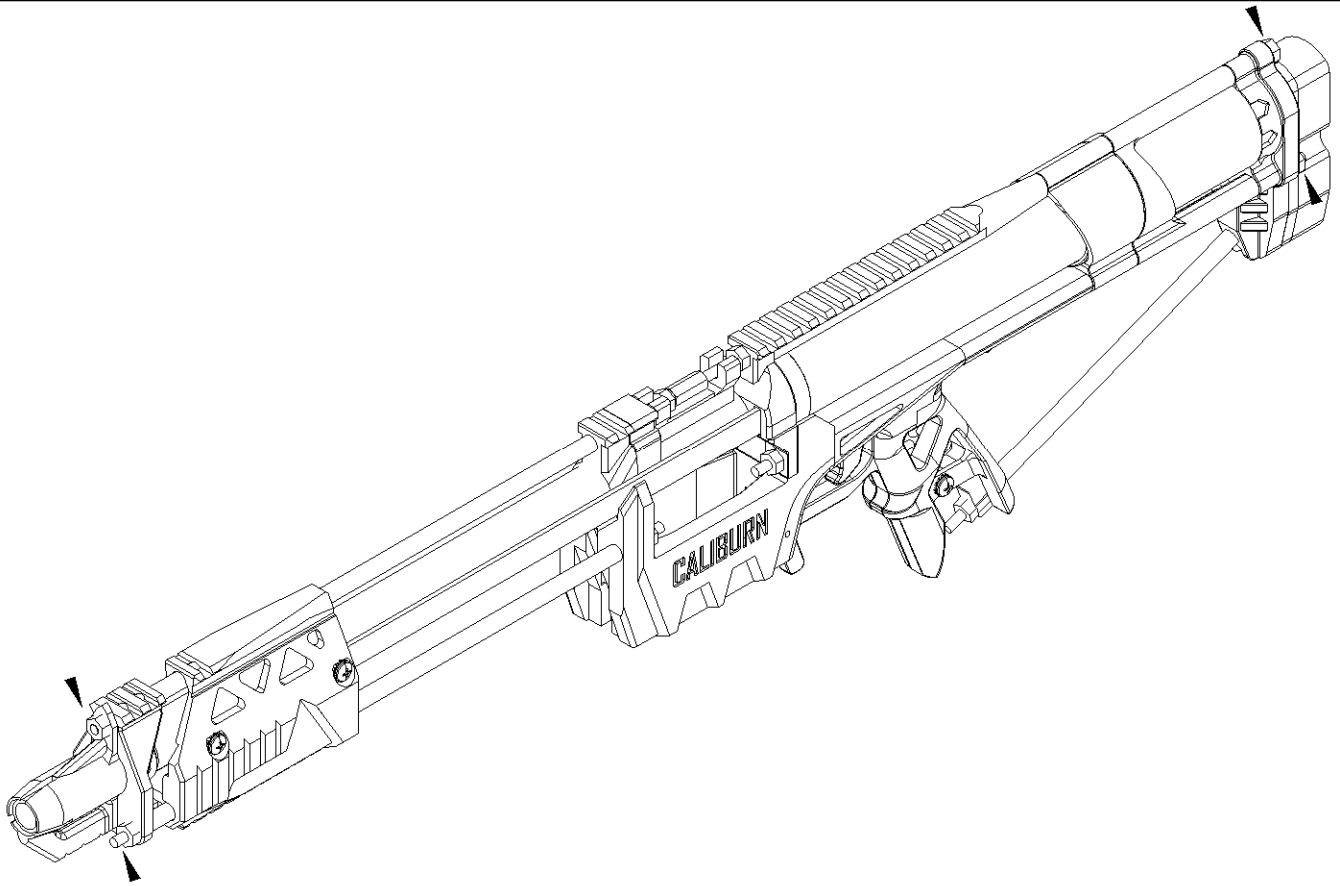
Use six Acorn Nuts to cover the exposed Threaded Rod ends at the front and back of the Blaster.
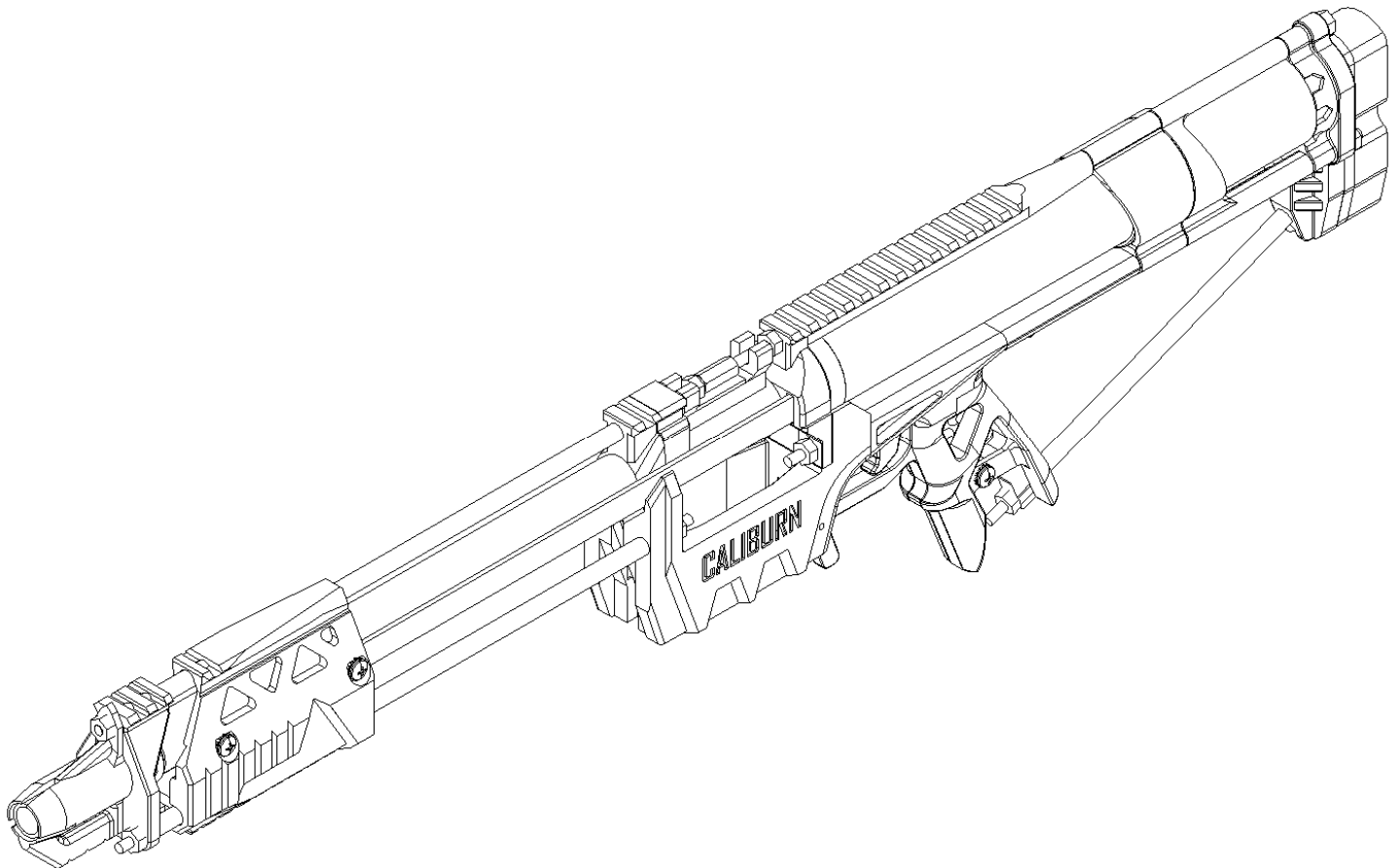
Install a Magazine loaded with darts and cycle the Foregrip back until the catch engages. Slide the foregrip all of the way forwards to chamber the dart in the top of the Magazine. You can load up to four darts into the barrel at a time if desired by cycling the Foregrip back and forth multiple times prior to pulling the Trigger.

Removing the Plunger Rod, Main Spring, And Plunger Tube for lubrication or replacement does not require full disassembly of the Blaster. You just need to reverse the last 7 steps in these instructions in order to split the blaster in half.

The Blaster and Hardware Kits are shipped with K26 and K25 springs. The K25 is rated slightly lower than the K26. The third spring option is the K31 (which has to be purchased separately or opted for as a replacement) is 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.