

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.

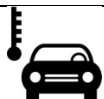
The Following parts however ARE REQUIRED to be printed at 100% infill: Bolt1, P1, P2, P3b, Ram2, Sear, and Spreader

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>

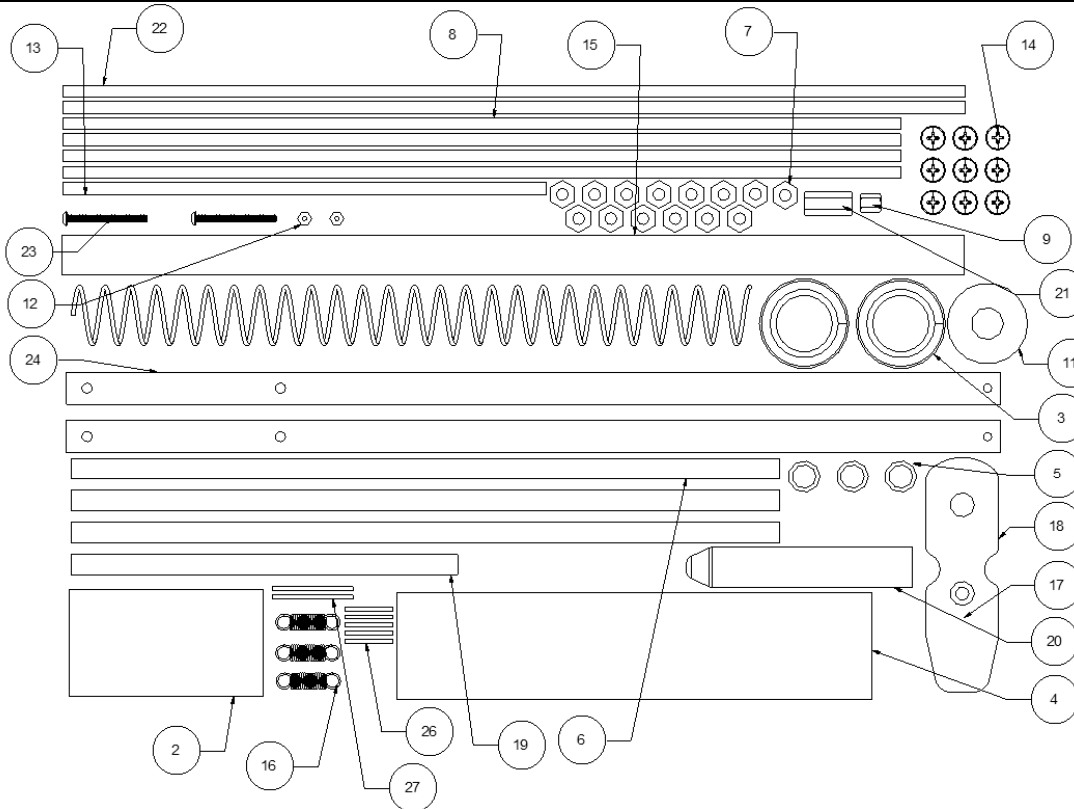
<http://nerfhaven.com/forums/topic/27193-caliburn-mag-fed-pump-action-springer/>



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.



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. Optional part designs intended to curb peak performance are included in the file set.



Item #	Quantity	Part Name
1	1	K25 Spring
2	1	StockSpacerAlt2
3	2	Skirt Seal
4	1	Plunger Tube
5	4	012 O-Ring
6	3	11.25" Spacer
7	14	Locking Hex Nuts
8	4	13" Threaded Rod
9	1	Grip Standoff
11	1	ShockPad
12	2	4-40 Hex Nut
13	1	7.5" 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
23	2	4-40 Screw
24	2	BoltArm
26	5	Pin Short
27	2	Pin Long

CALIBURN HARDWARE KIT

Printed/Cast Parts NOT included.

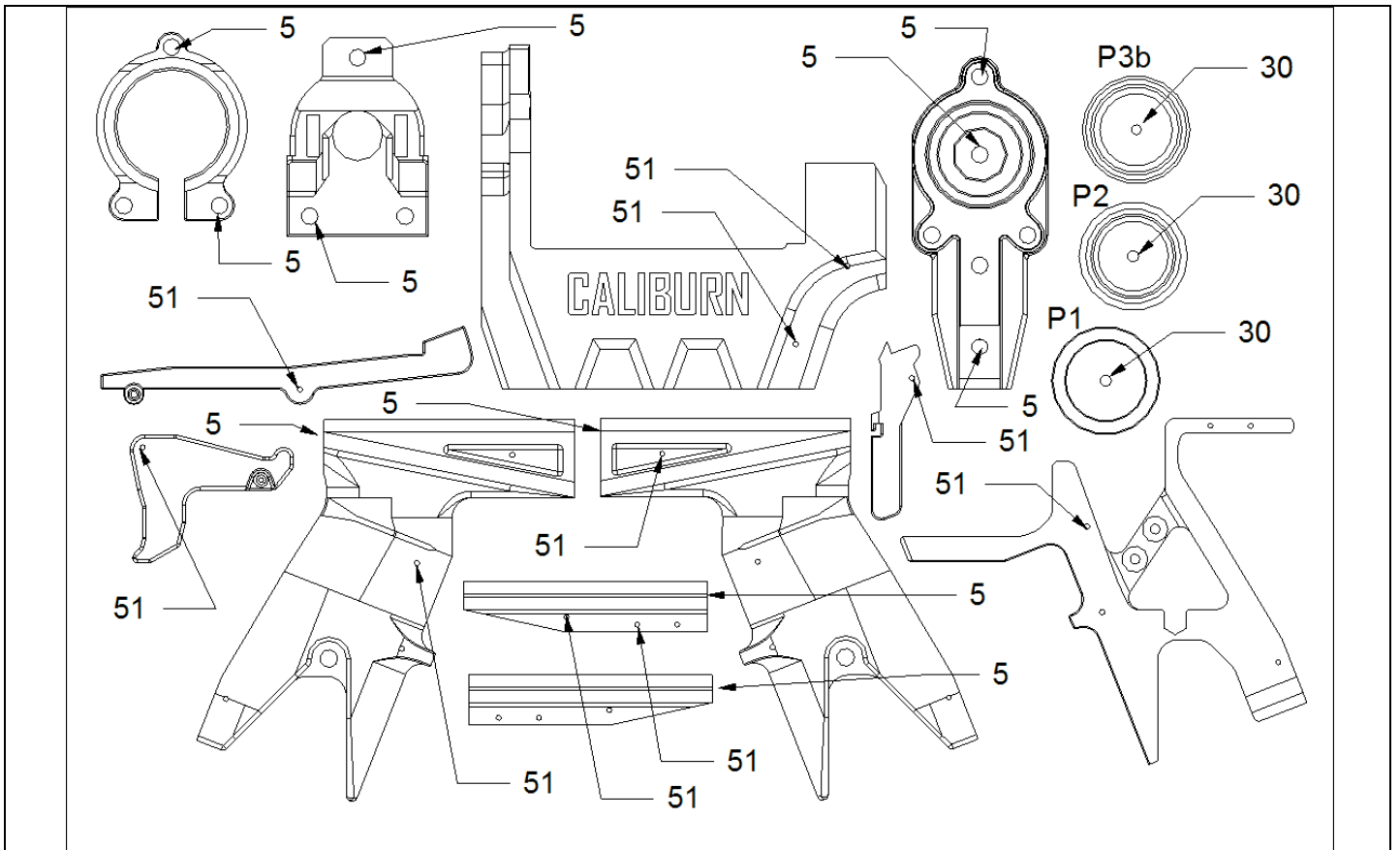
Tools needed: Philips Screwdriver, 3/8 Combination Wrench, 1/16" Allen Key, Needle-Nose Pliers

Here are the typical contents of the Hardware Kit as of 07/16/17.

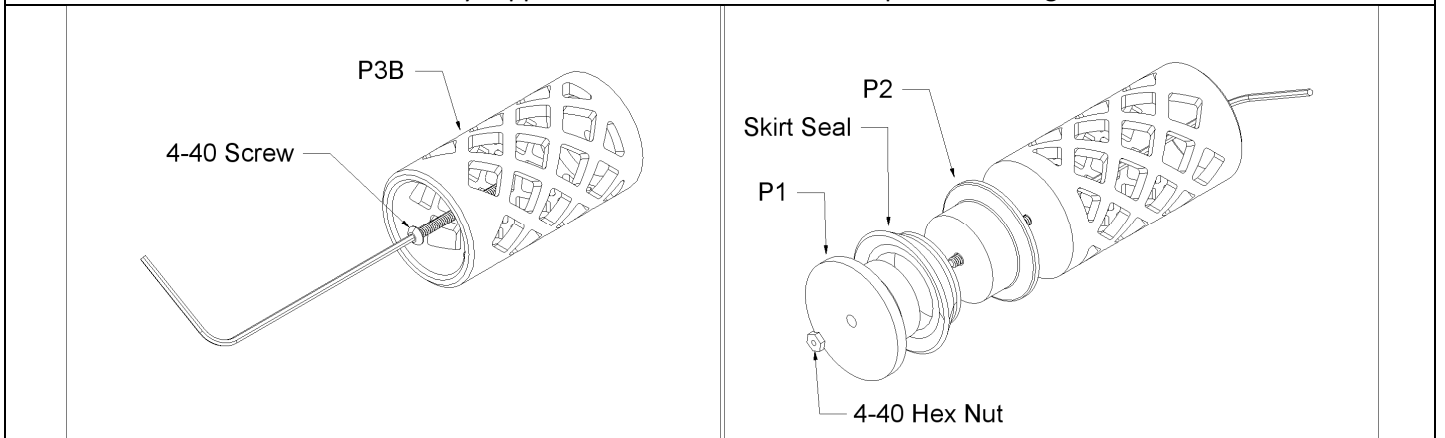
To Assemble this blaster you will need a Philips Screwdriver, 3/8 Combination Wrench, 1/16" Allen Key, Needle-Nose Pliers (or hemostats), and a bottle of Super Glue.

Recommended tools are a Power Drill or Drill Press, a # size Drill Bit Index, and a structural Epoxy such as Devcon Plastic Weld or Plexus MA310.

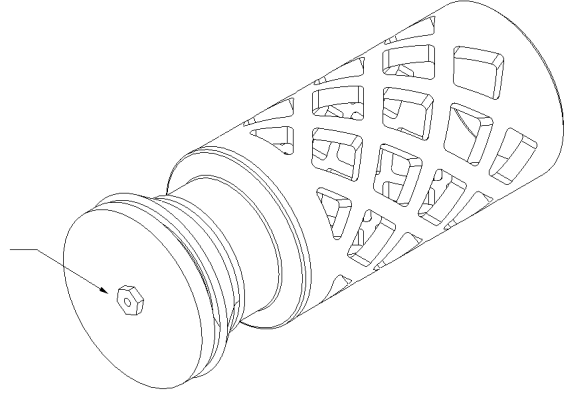
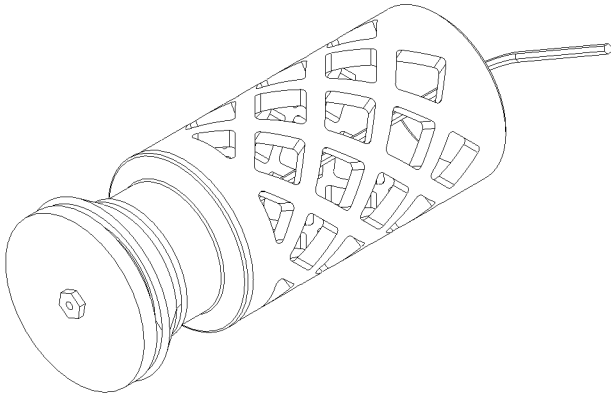
The Plunger Tube in the Hardware Kit does come pre-lubricated. But it's also a good idea to have extra lubricant on-hand for the Plunger Tube and I would recommend only using clear Silicone Grease such as Oatey's brand #30219.



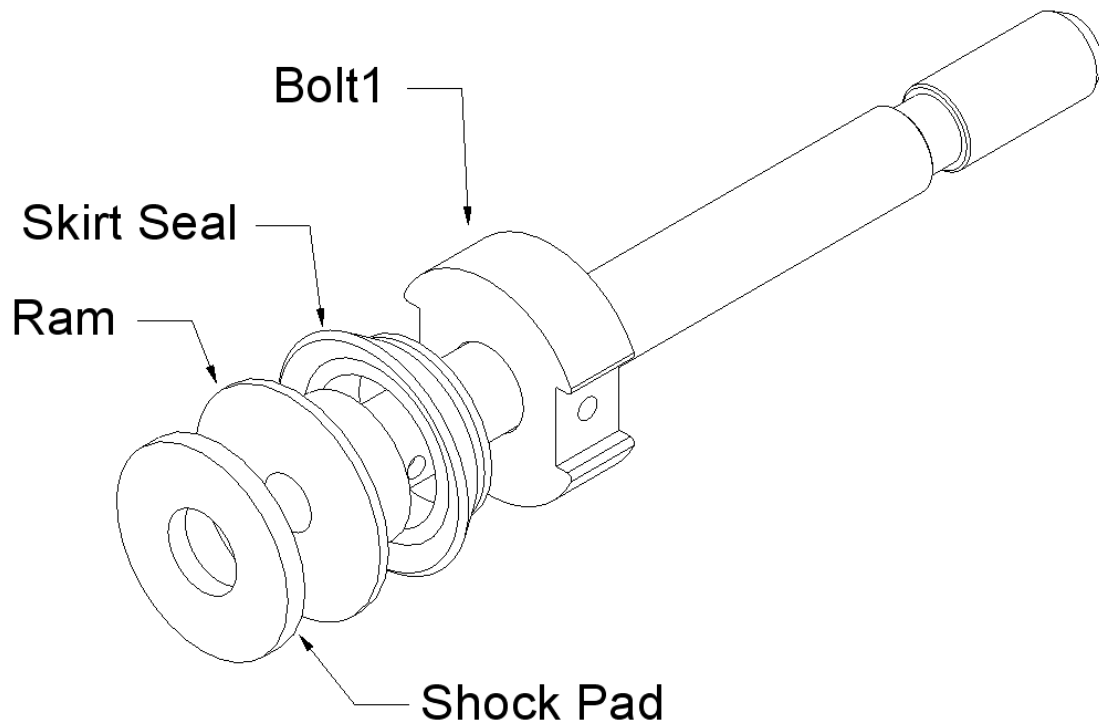
Check all of the through holes of your printed parts for tolerance by trying to insert the threaded rod into the #5 holes, the short or long pins into the #51 holes, and the 4-40 screw into the #30 holes. Any holes that will not accept the matching hardware will need to be drilled to tolerance using the # size drill bits indicated by the above chart. Make sure to remove any support material from these holes prior to drilling them.



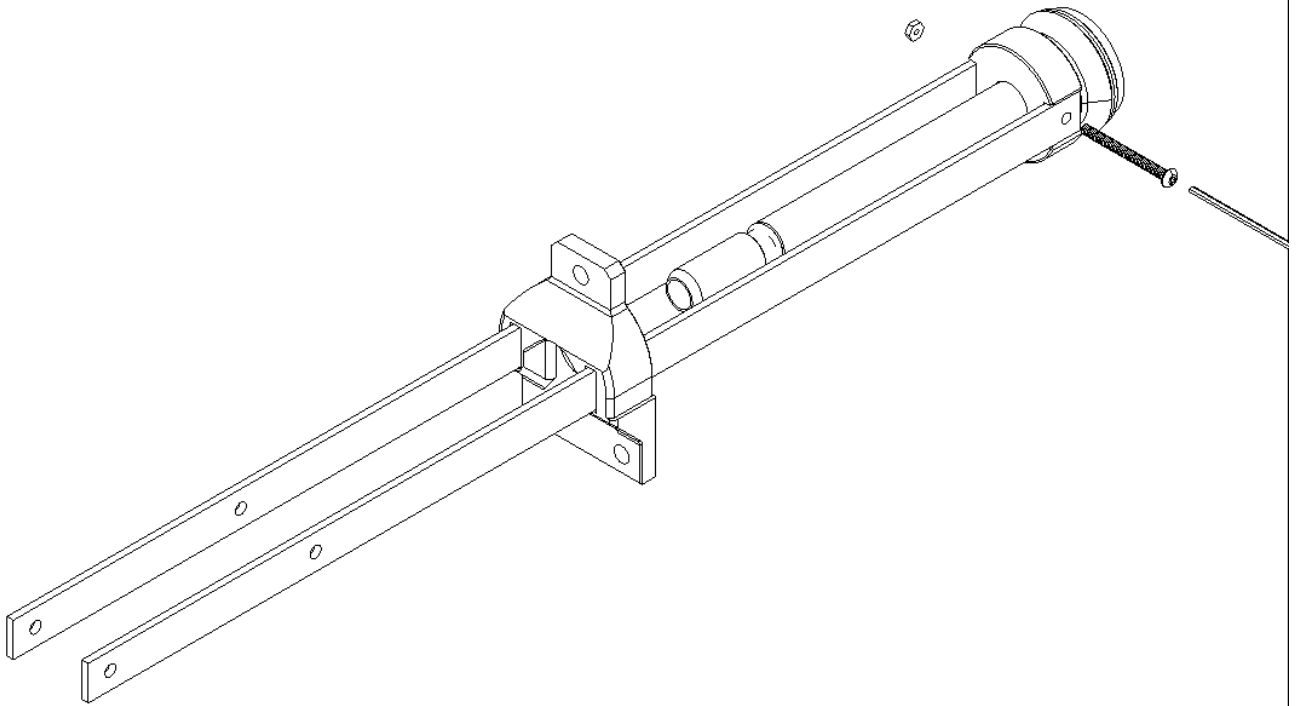
Use a 1/16 allen key to insert a 4-40 screw in through the back of P3B. Sandwich P2, Skirt Seal, and P1 onto the screw, then add a 4-40 hex nut.



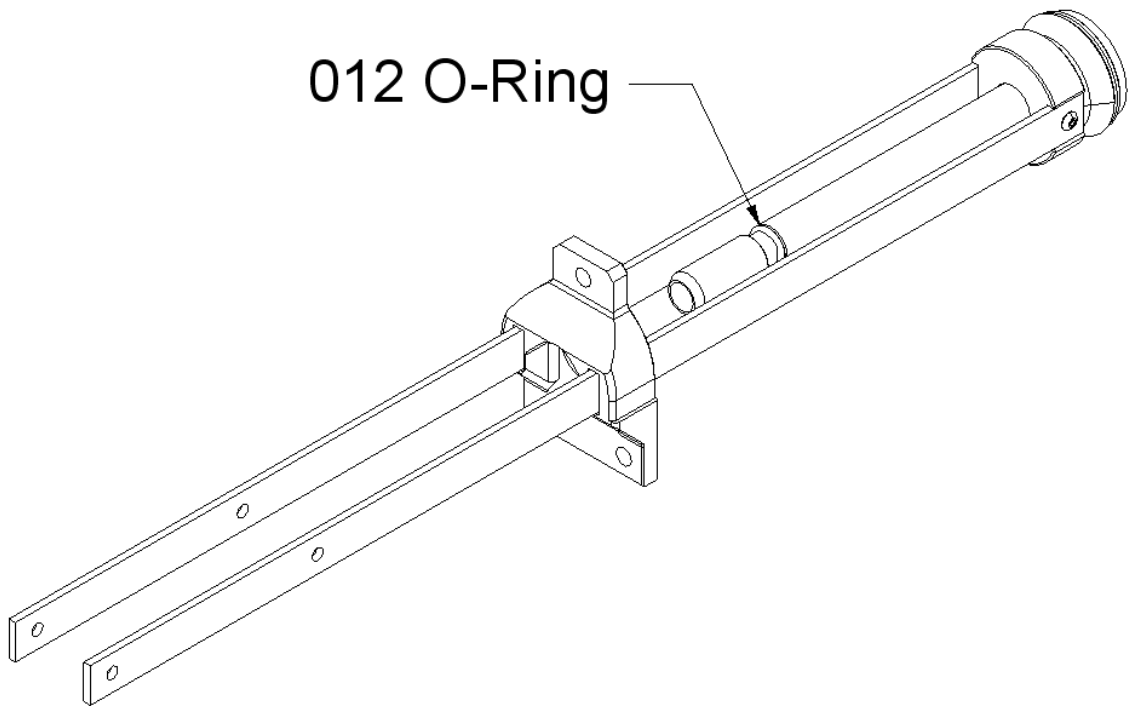
Tighten the hex nut, then apply a spot of super glue onto the end of it to help prevent it from backing off of the threads. Set aside to let the glue dry fully.



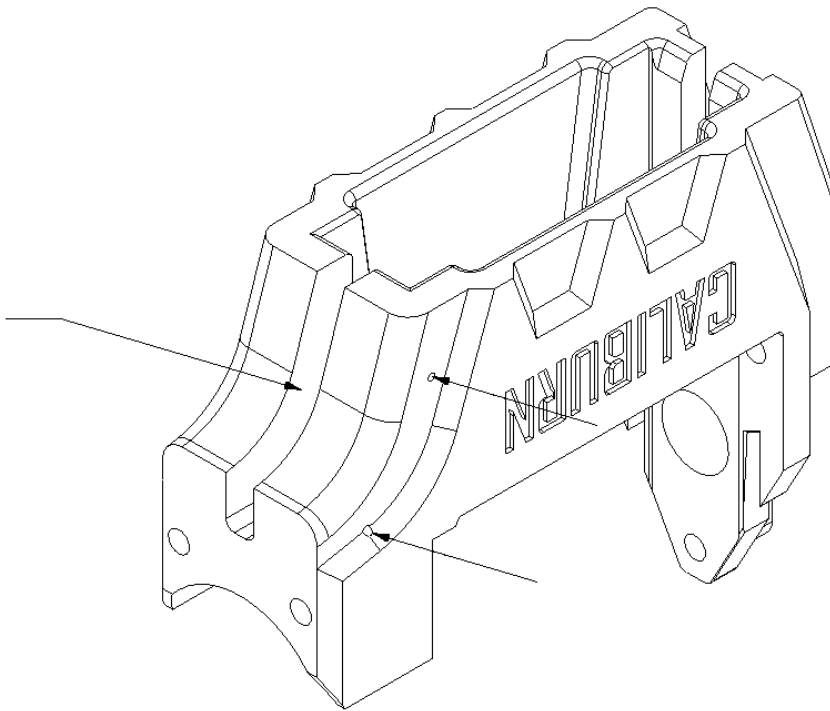
Adhered the Shock Pad centered onto the back of the Ram. Slide a Skirt seal onto the Ram from the front so that it is facing backwards, then slide Bolt 1 on from the front as well. Make sure that the through holes in Bolt1 and Ram line up.



Slide the pair of Bolt Arms through the Spreader.
Add the Ram Assembly and secure it with a 4-40 screw and hex nut. Apply super glue to the hex nut and let it dry.

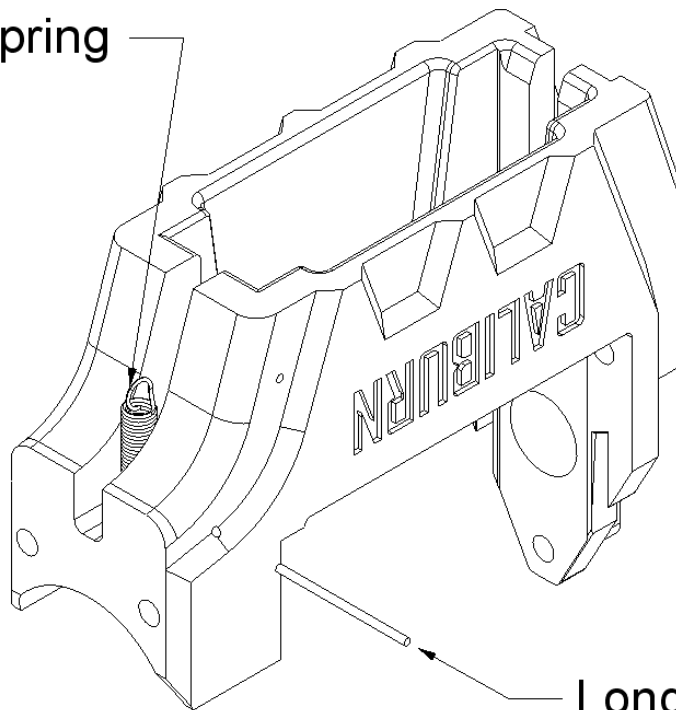


Add an 012 O-ring to the undercut in the Ram. Set this assembly aside temporarily while the glue dries.



Use a Rectangular File or Knife to remove any scragglies or hair from the inside of the Magwell where indicated. Also check that you can insert Long Pins into the through holes from both sides.

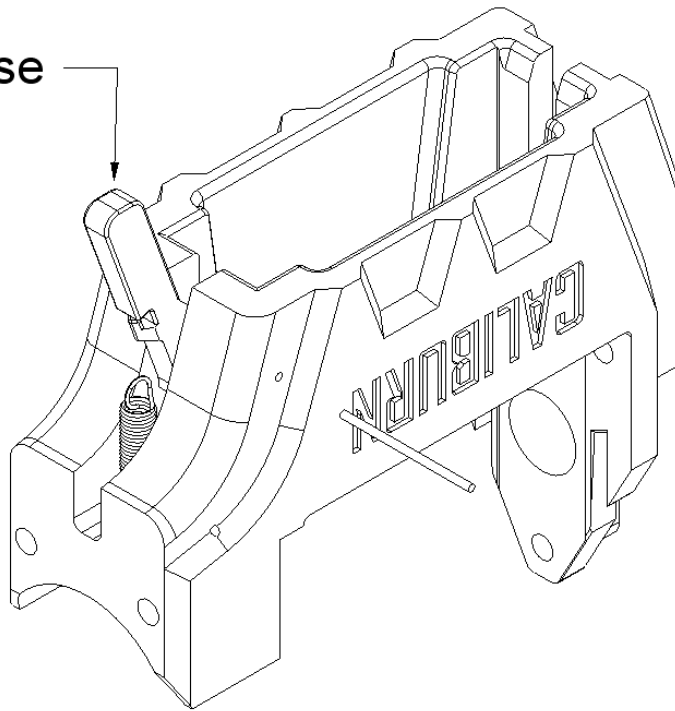
Extension Spring



Long Pin

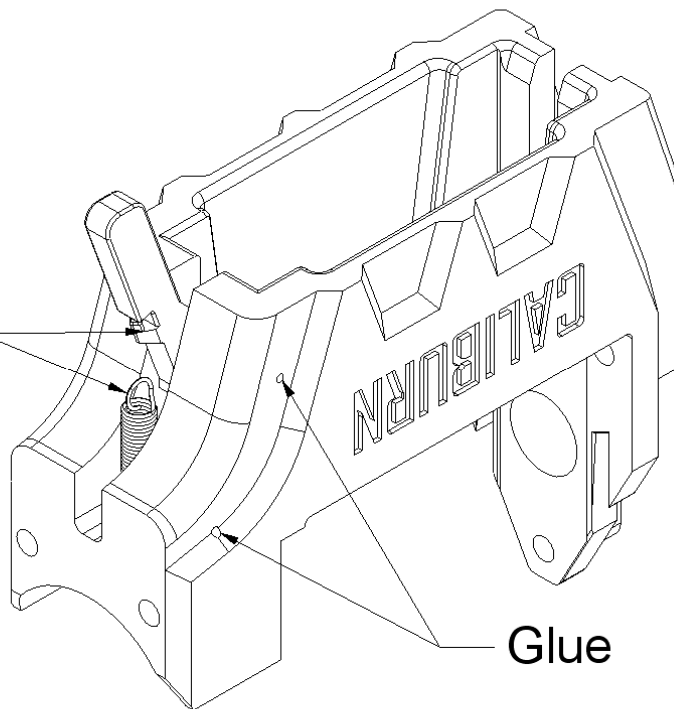
Insert a Long Pin through the MagWell and through the loop of an Extension Spring.

Mag Release



Do the same through the MagWell and the Mag Release.

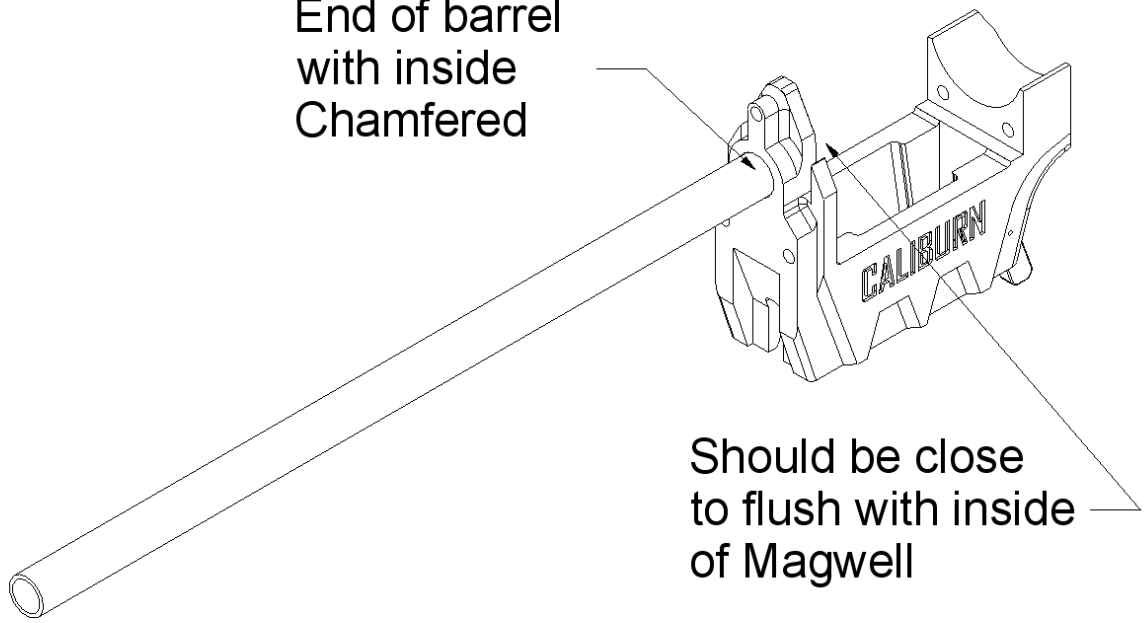
Pull Loop
onto Hook



Glue

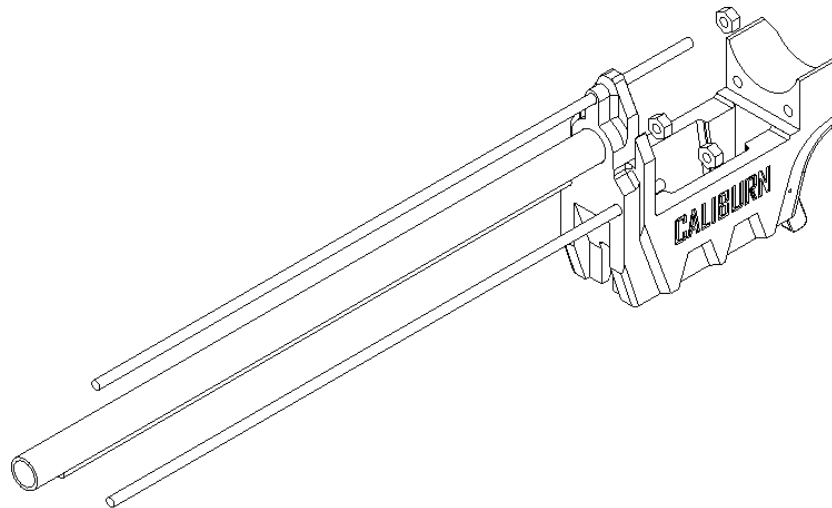
Pull the remaining loop of the Extension Spring onto the hook on the Mag Release. Apply Super Glue to the open holes in both side of the Mag Well to prevent the Long Pins from falling out. Let the glue dry.

End of barrel
with inside
Chamfered

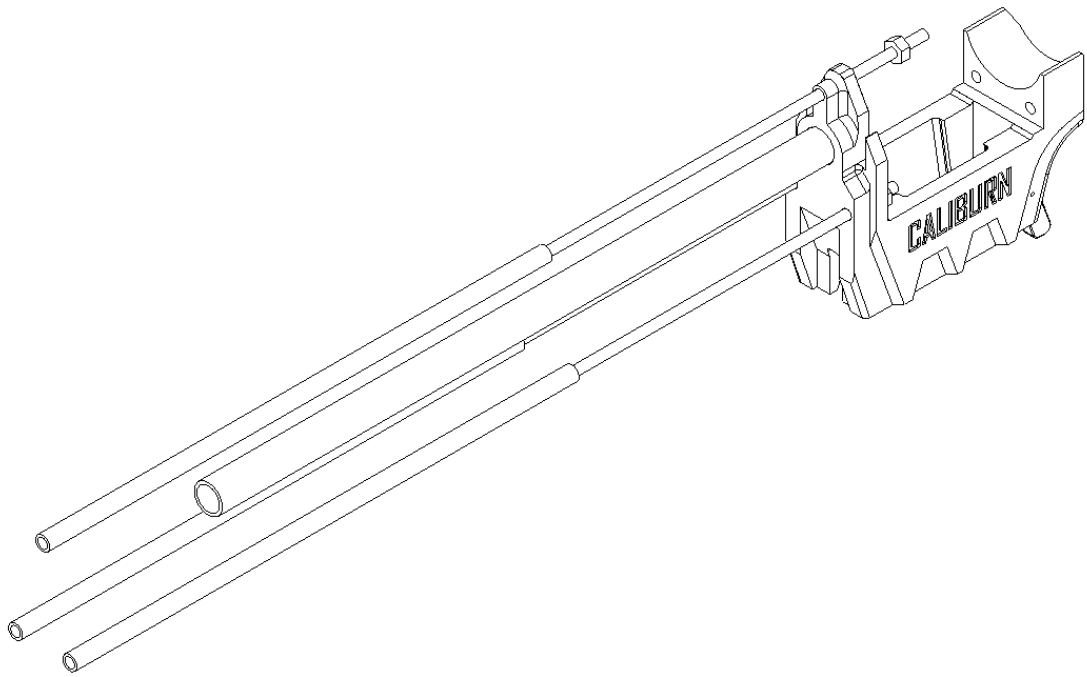


Should be close
to flush with inside
of Magwell

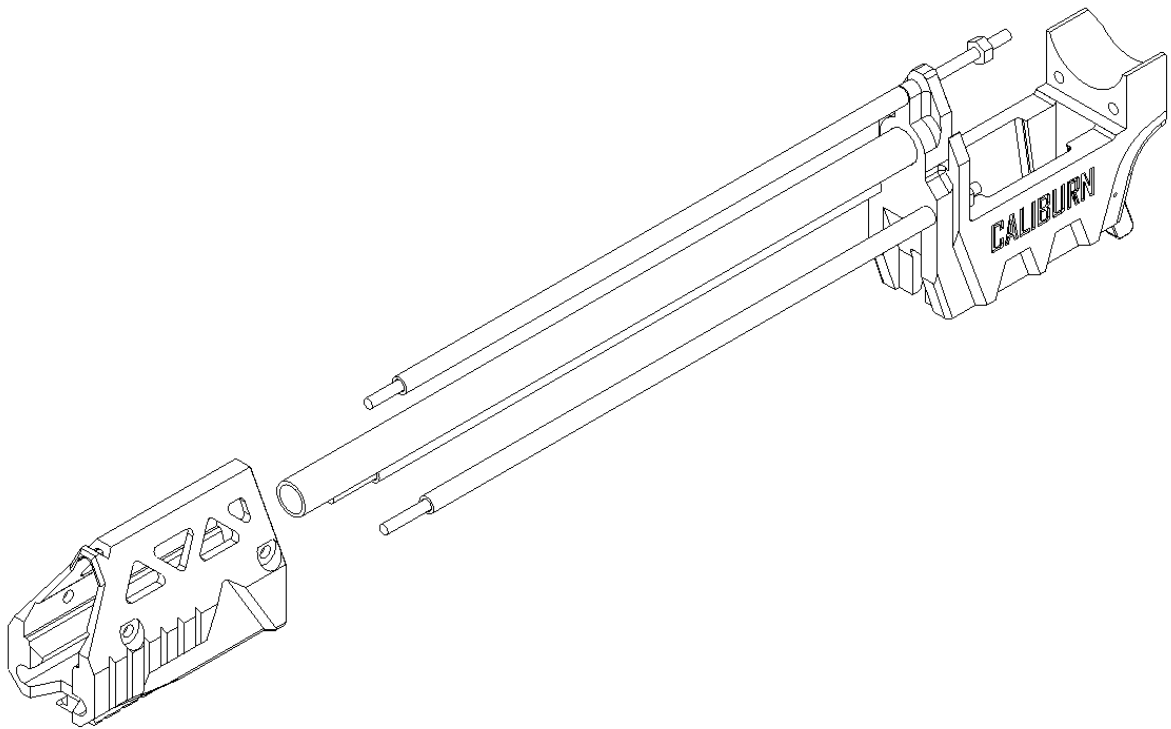
Install the Chamfered side of the Barrel into the Mag Well. You may need to file this hole out with a Round Needle File prior installing the barrel. The inside of the Mag Well can be rested on the edge of a desk or table in order to push the Barrel in.



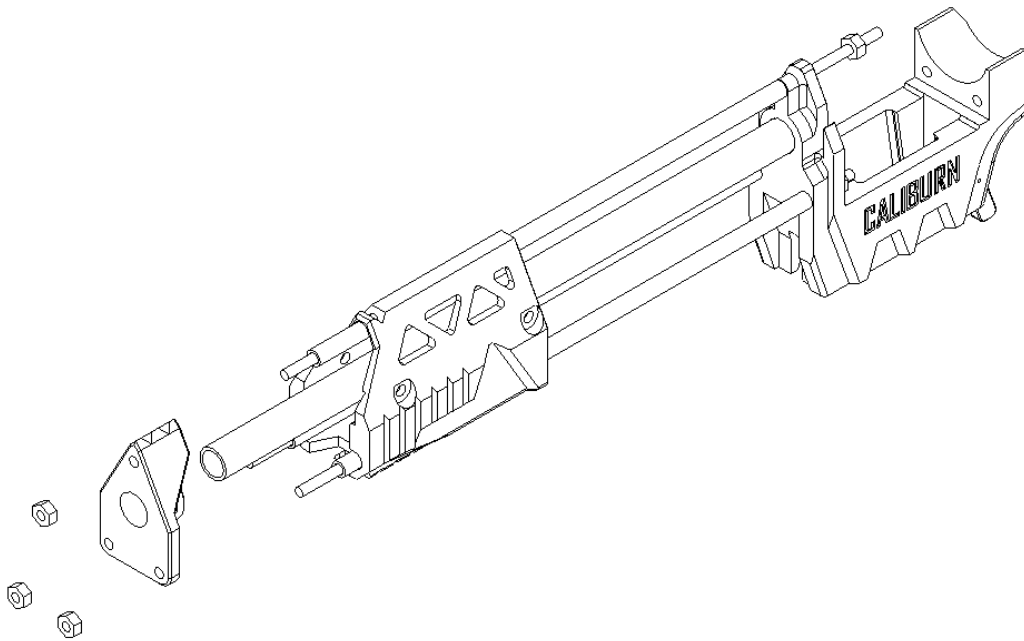
Slide two 13-inch length threaded rods into the lower holes at the front of the Mag Well. Slide one 14-inch length threaded rod into the upper hole at the front of the Mag Well. Add a hex nut to the inside end of each.



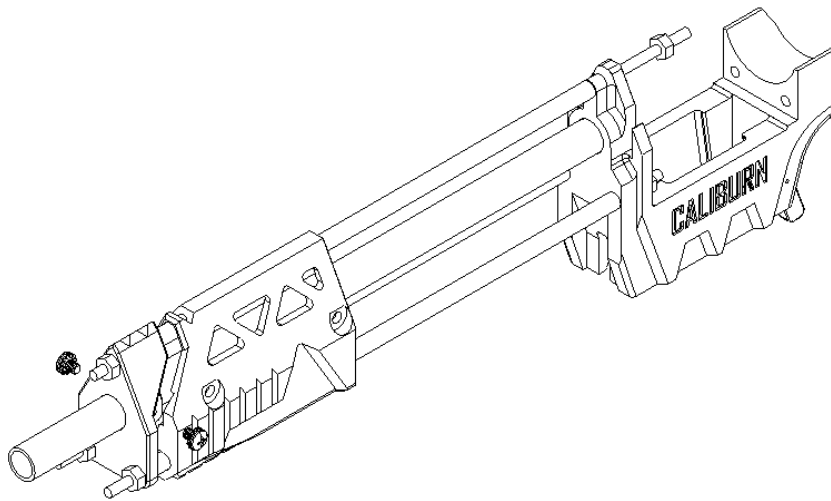
Slide three 11.25 inch length spacers onto the threaded rods.



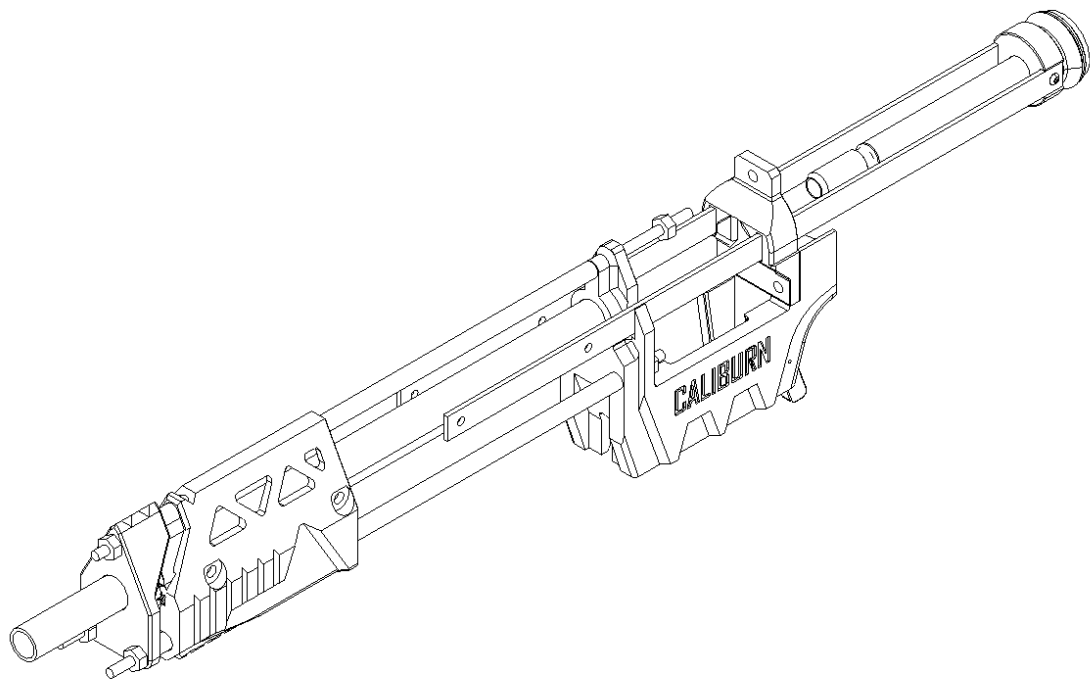
Slide the Foregrip over the now covered threaded rods and the barrel.



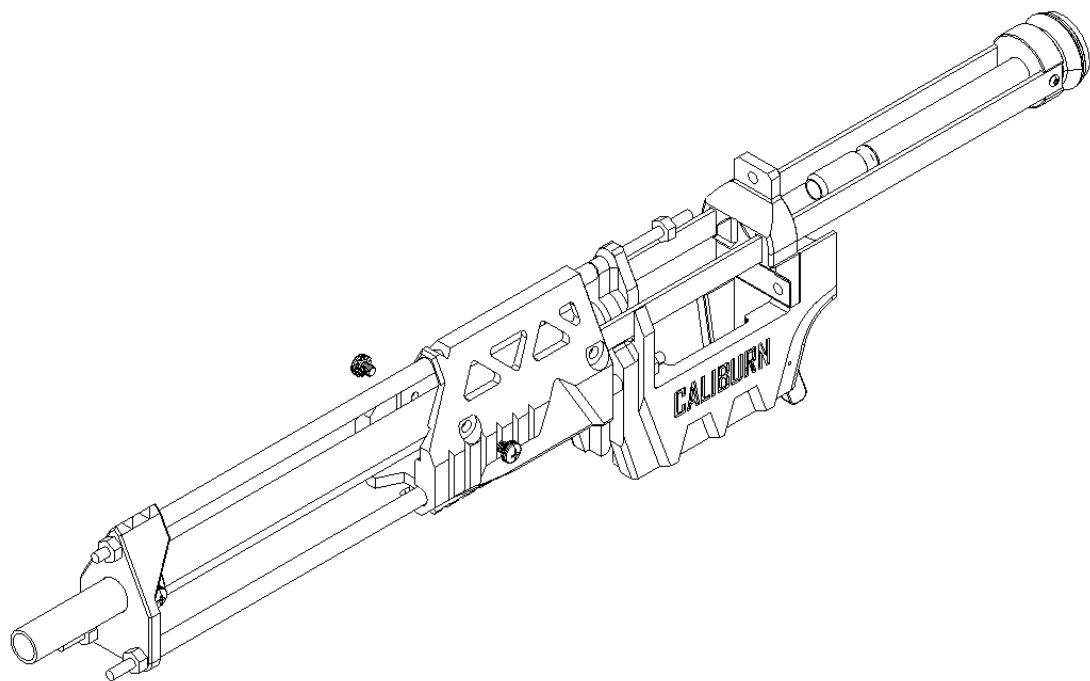
Slide the Muzzle onto the end of the Barrel, then fit the ends of the Threaded Rods through it. Add three Hex Nuts and tighten the lower two.



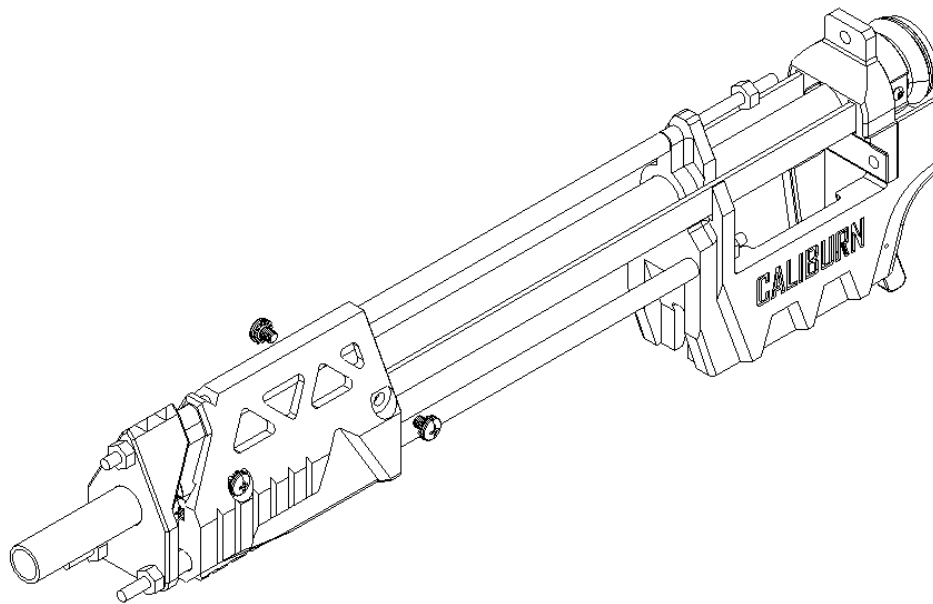
Confirm that the Barrel is still flush with the inside of the Mag Well. The Barrel can be secured using two 1/4" length screws if it has been tapped for them. Otherwise the barrel needs to be glued to the Muzzle using Super Glue or a strong epoxy such as Devon Plastic Weld or Plexus MA310.



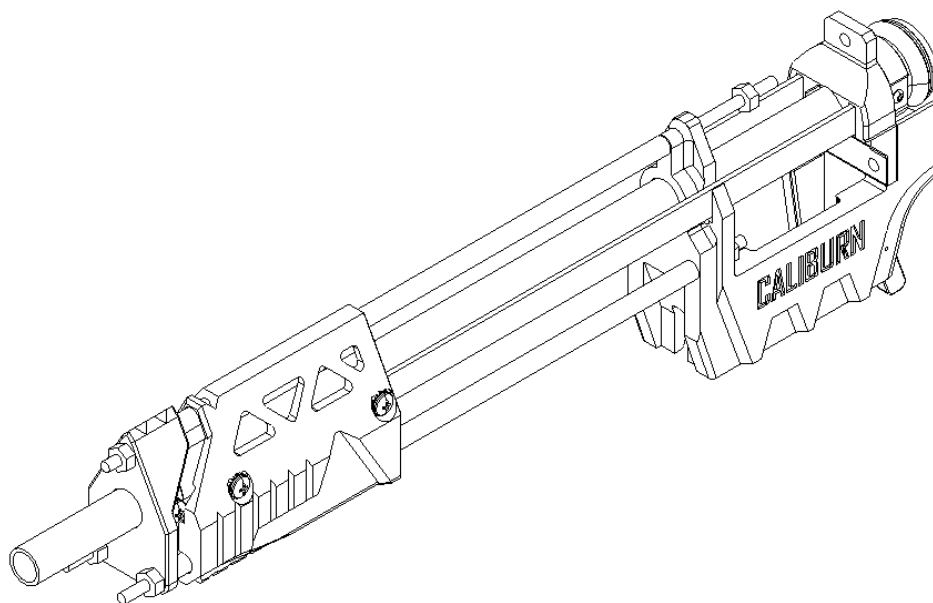
Install the Bolt Assembly by sliding it into the Mag Well from Above. Make sure that the Spreader part is ahead of the lip at the back of the Mag Well.



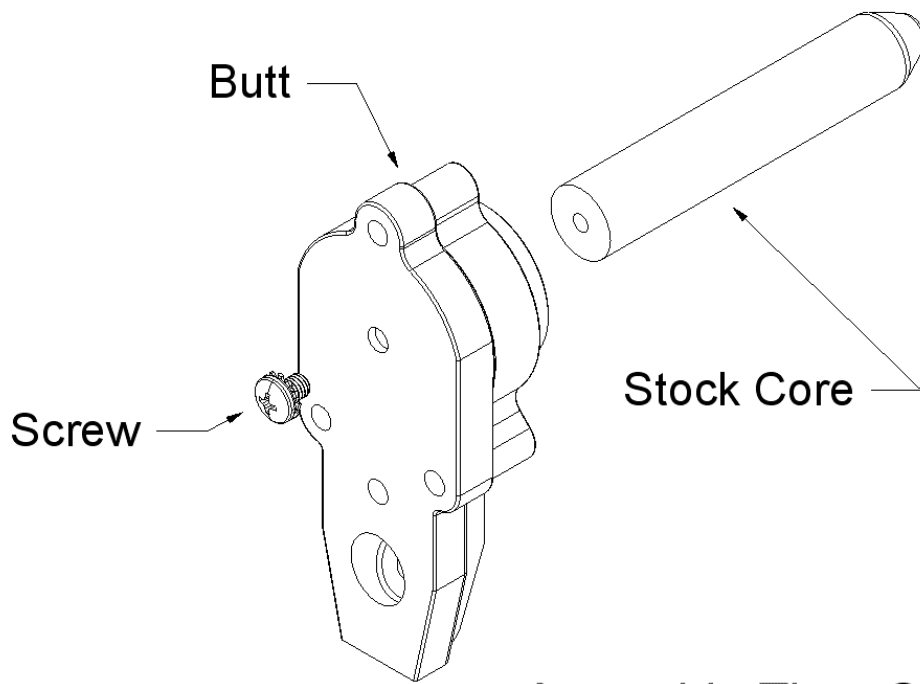
Slide the Foregrip back over the aluminum straps (Bolt Arms) until the threaded holes line up with the holes in the Foregrip. Secure them together at the front pair of holes using two 1/4" length screws. You may need to use a second screddriver or other hand tool to push the aluminum against the inside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

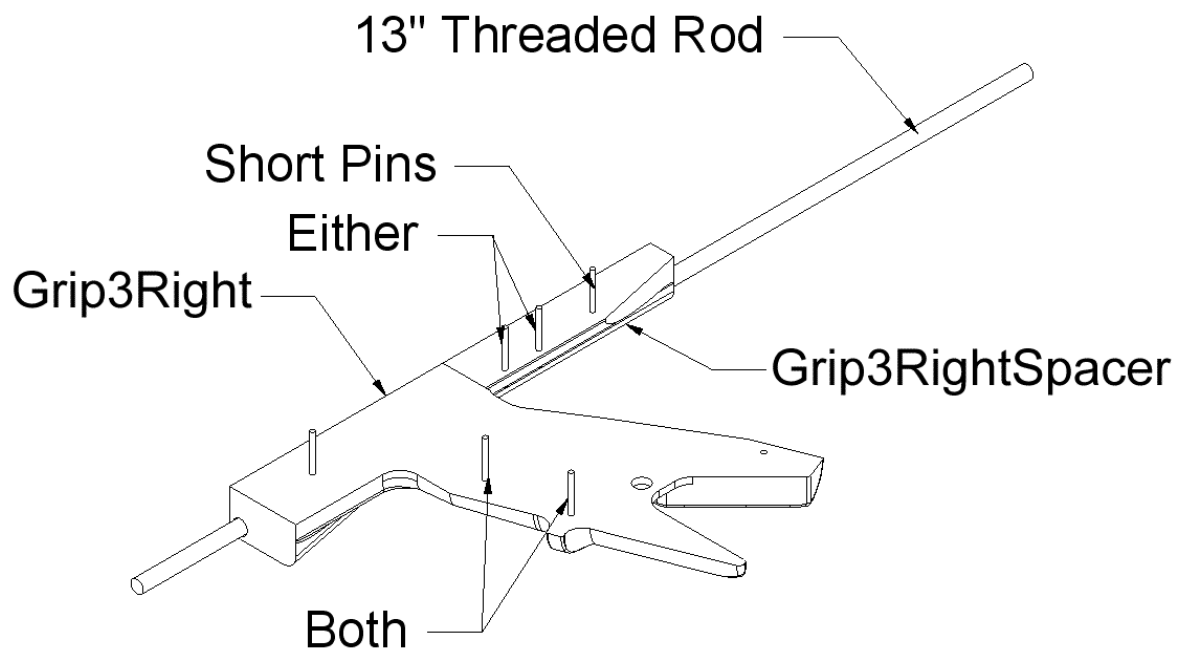


The assembly of the front half of the blaster is complete.

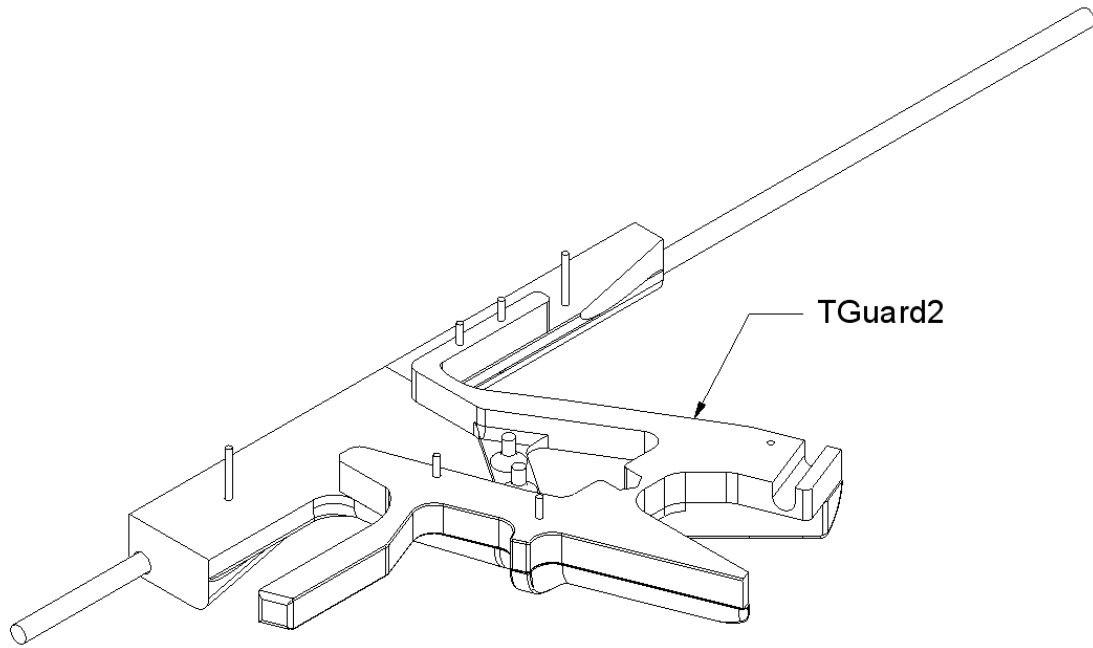


Assemble Then Set Aside

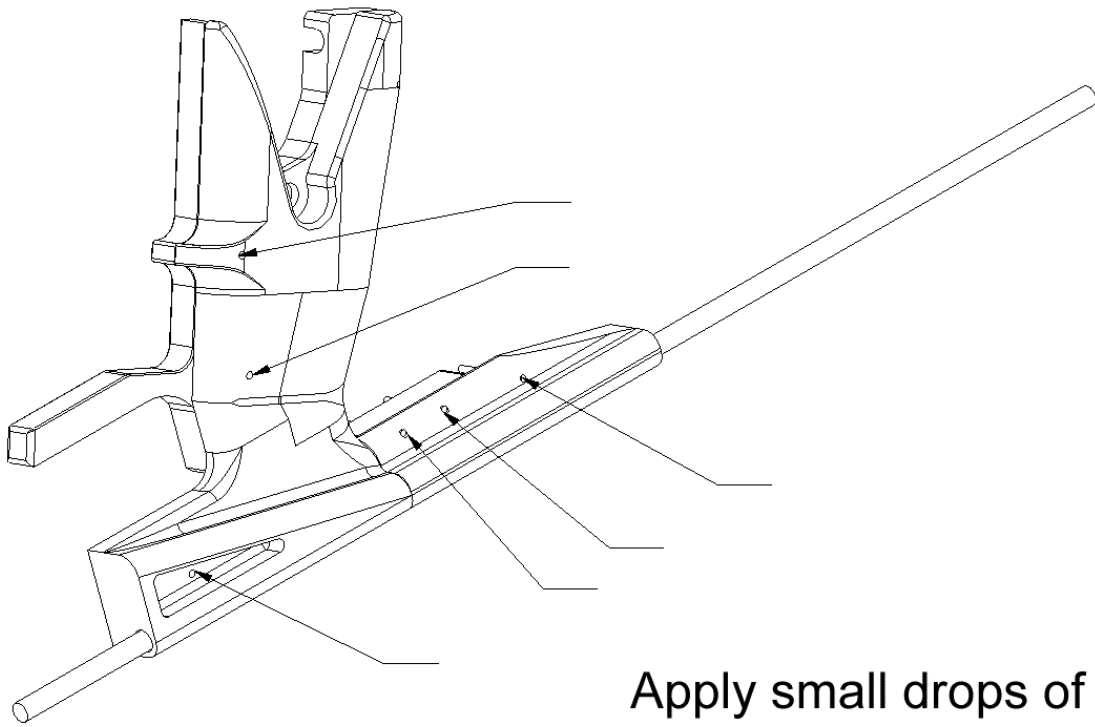
Attach the Stock Core to the Butt piece using a Screw.



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

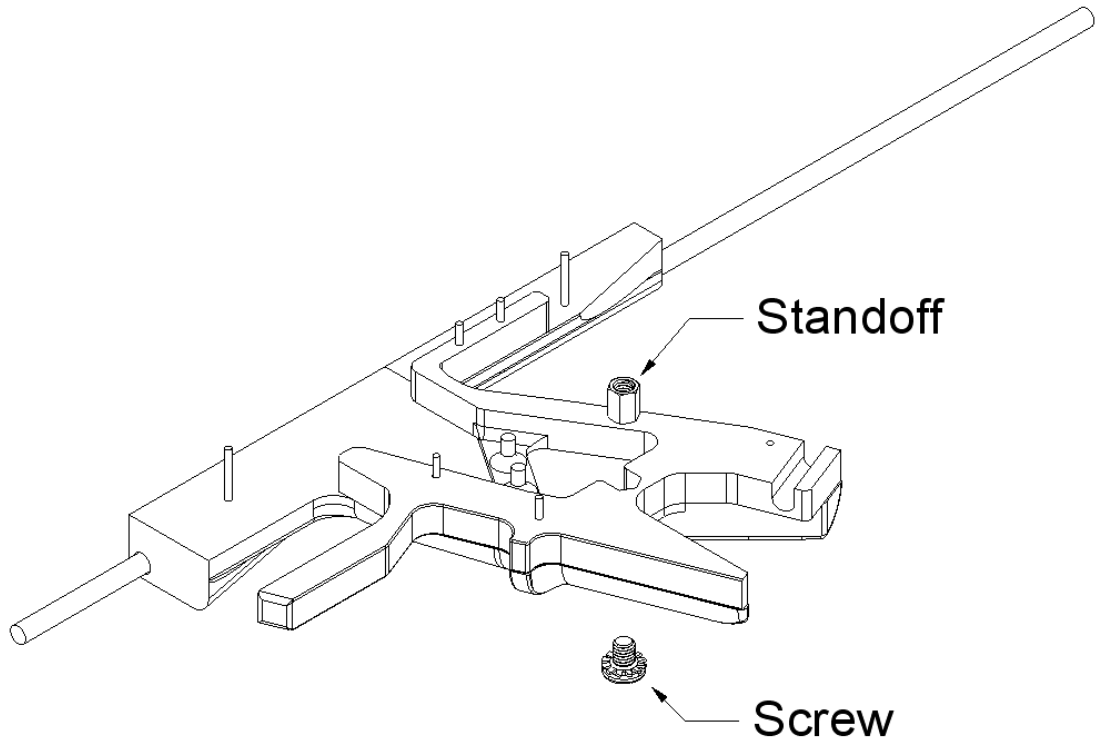


Slide TGuard2 onto the pins.

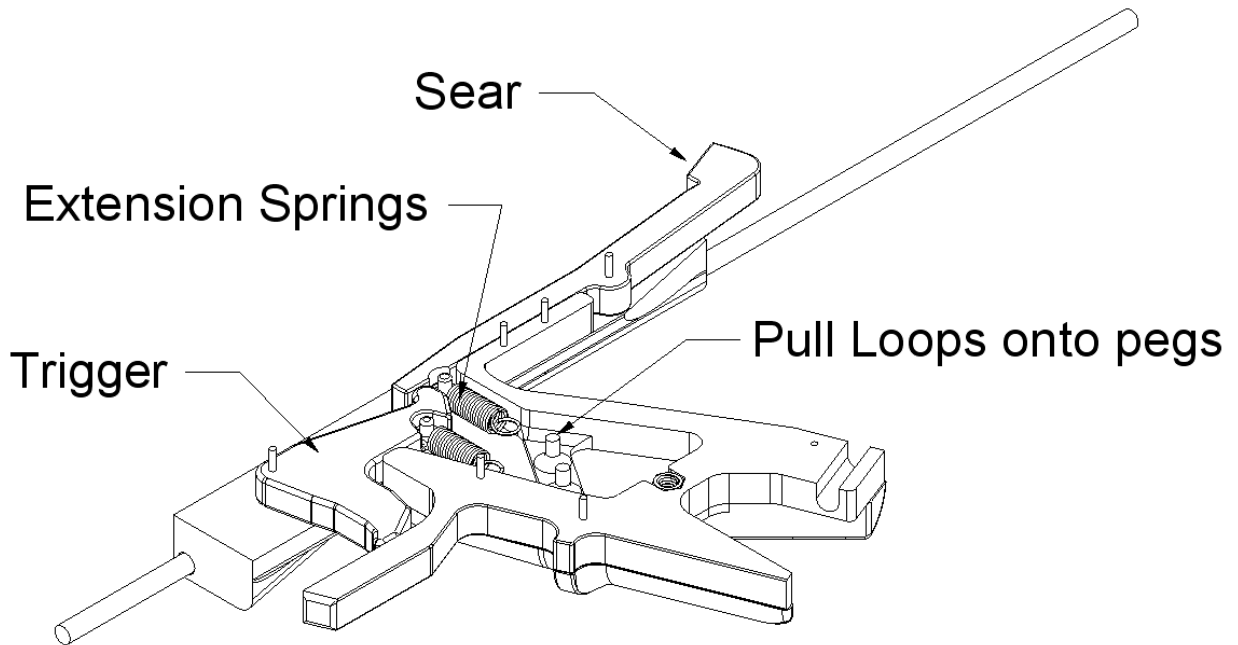


Apply small drops of super glue and let it dry

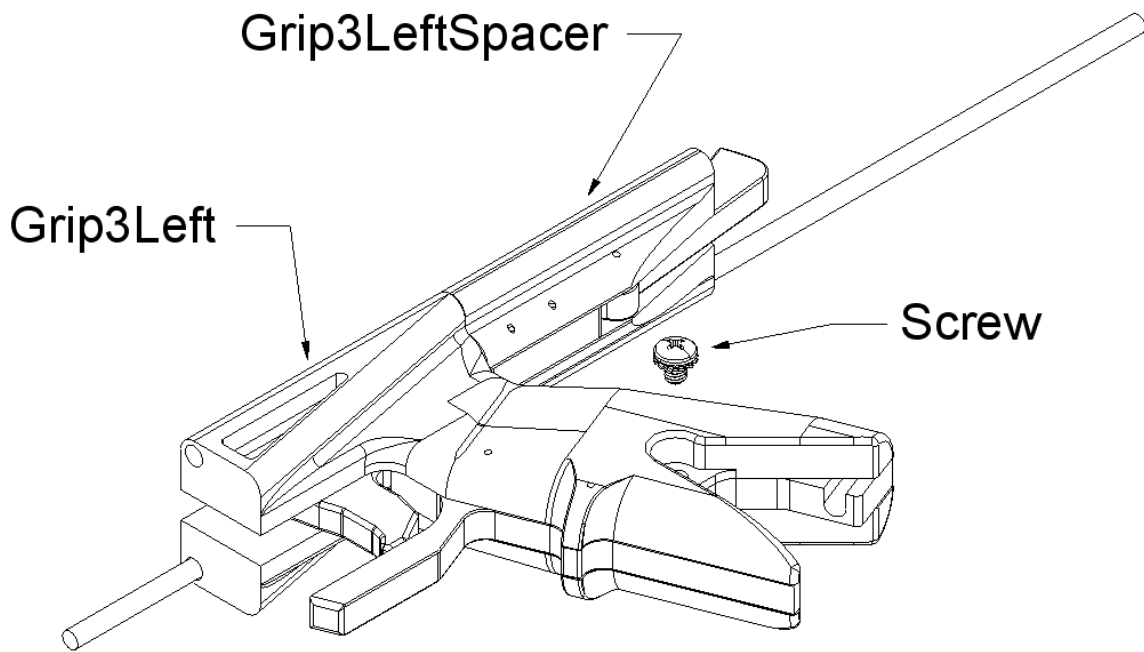
Flip the assembly over and make the ends of the pins flush with the exterior surfaces. Apply a drop of Super Glue to each of the pins and let it dry. This will keep the pins secured to the Right half of the grip assembly.



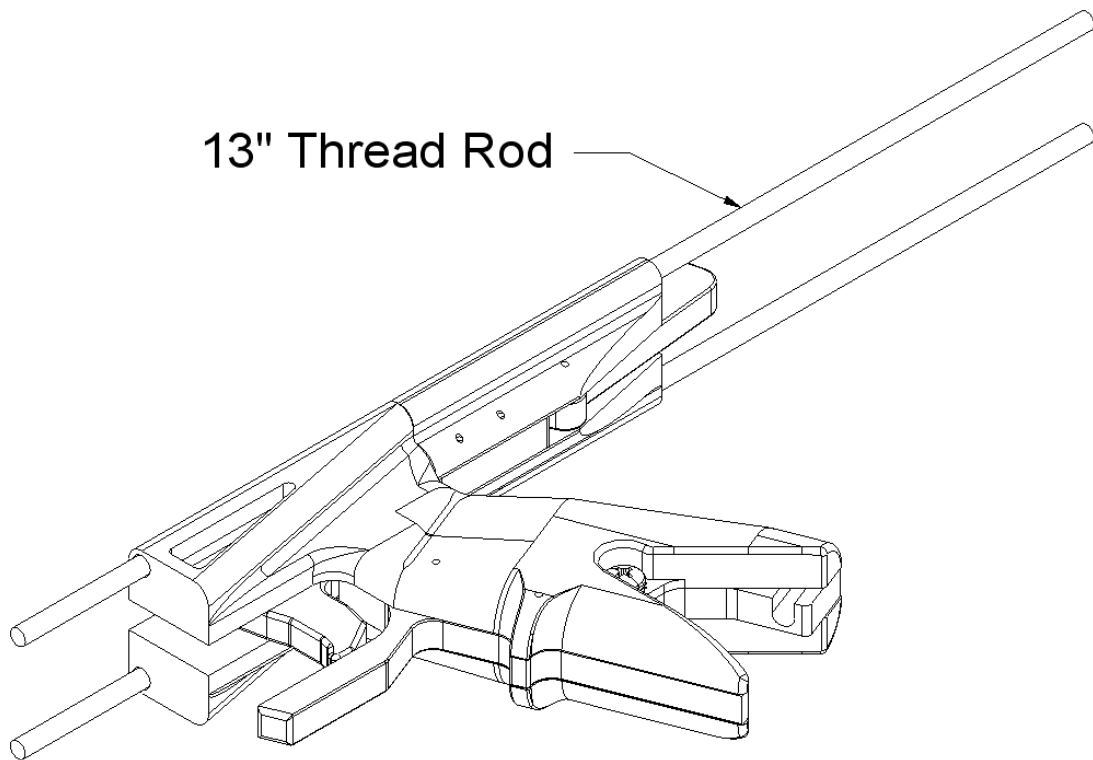
Add the Standoff and Screw into the cutout in TGuard2.



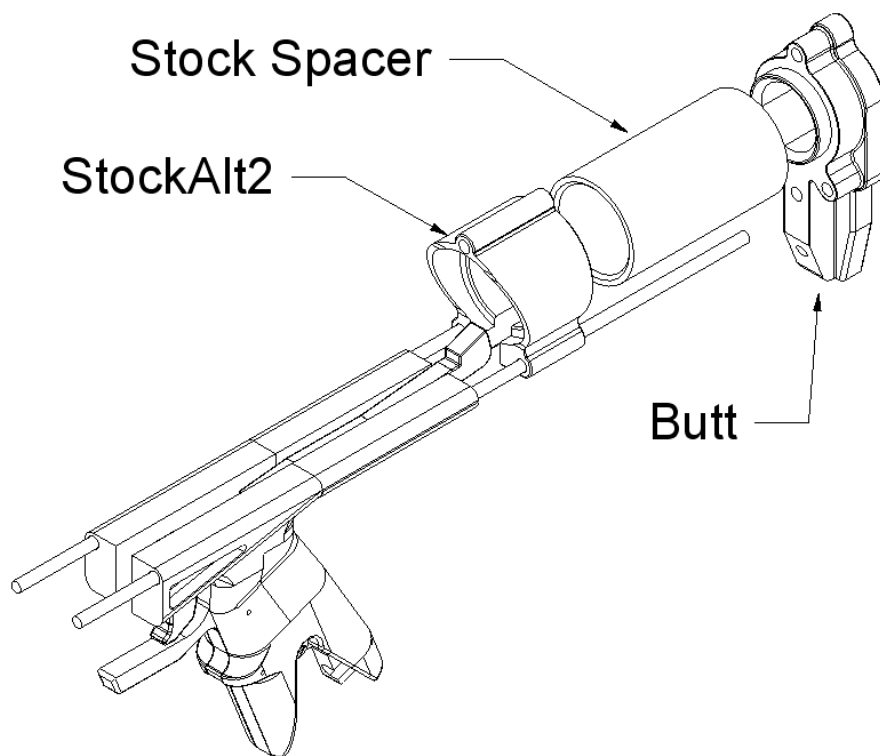
Slide the Sear and Trigger onto their pins. Put the loop of an Extension Springs onto the peg of each. Pull the opposite loop onto the pegs of TGuard2.



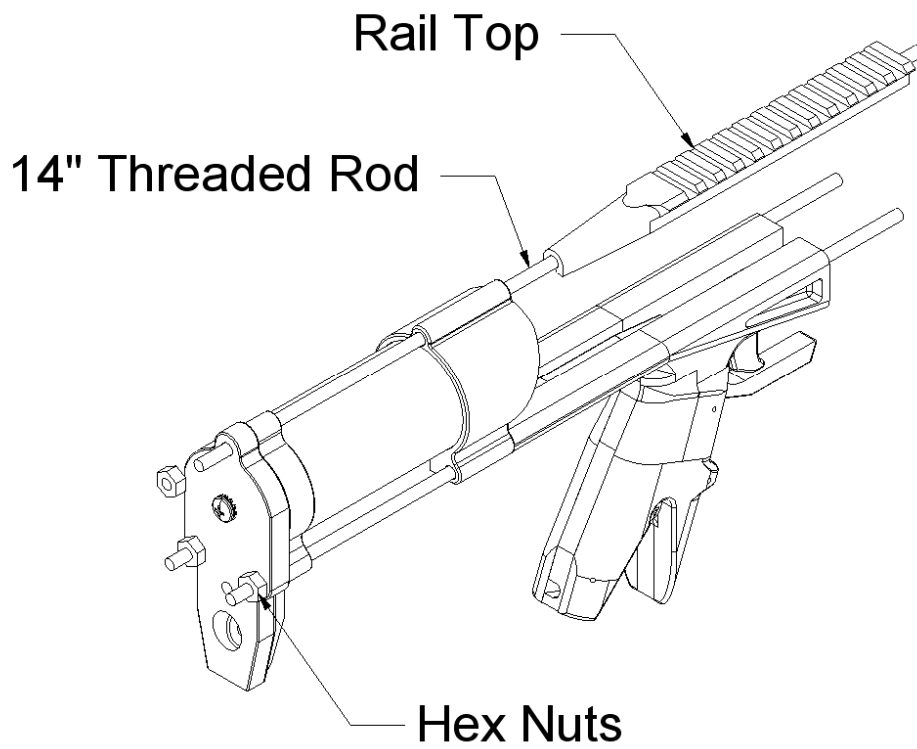
Slide Grip3Left and GripSpacerLeft onto the peg and secure it with a Screw.



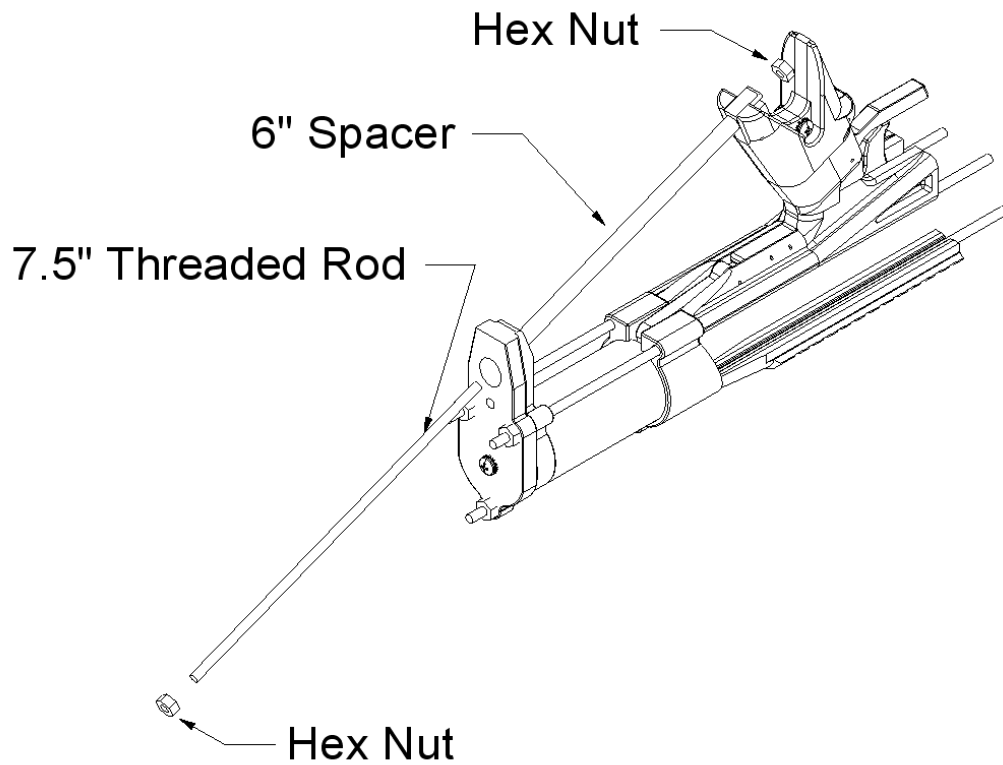
Slide a 13 inch Threaded Rod through Grip3Left and GripSpacerLeft



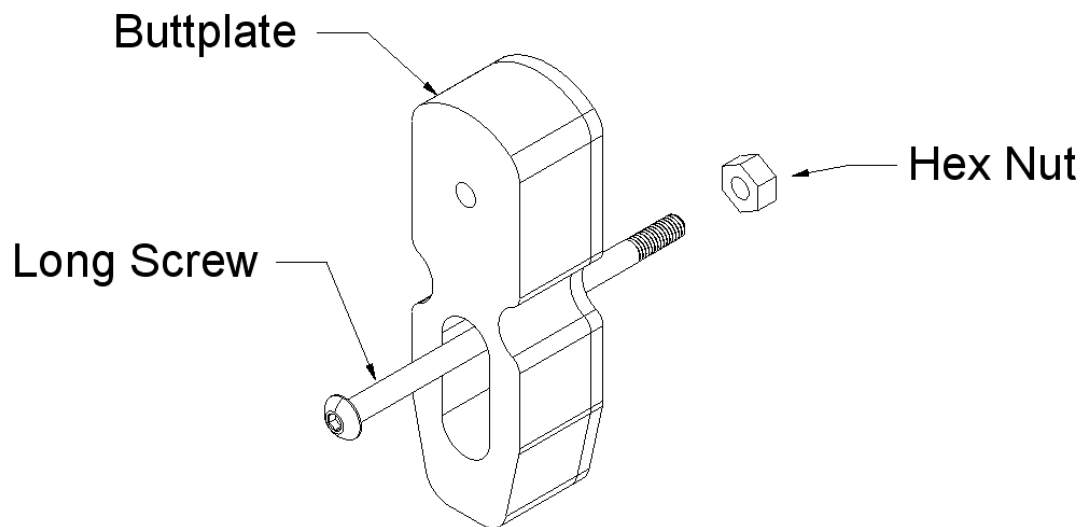
Slide the parts shown onto the 13" Threaded Rods.



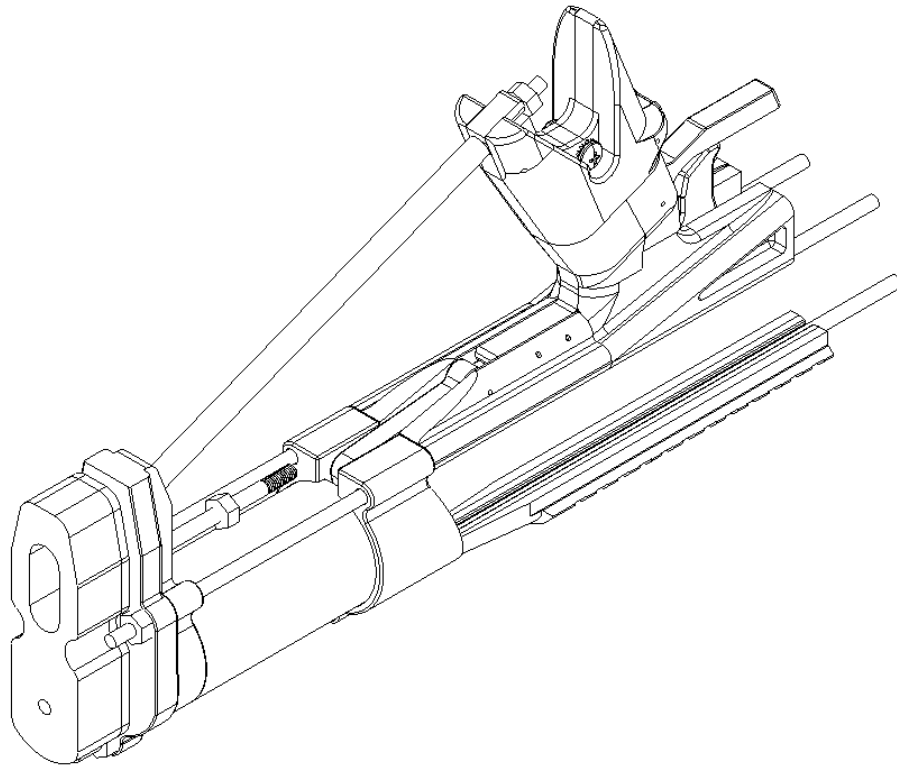
Add a 14" Threaded Rod, Rail Top, and three Hex Nuts.



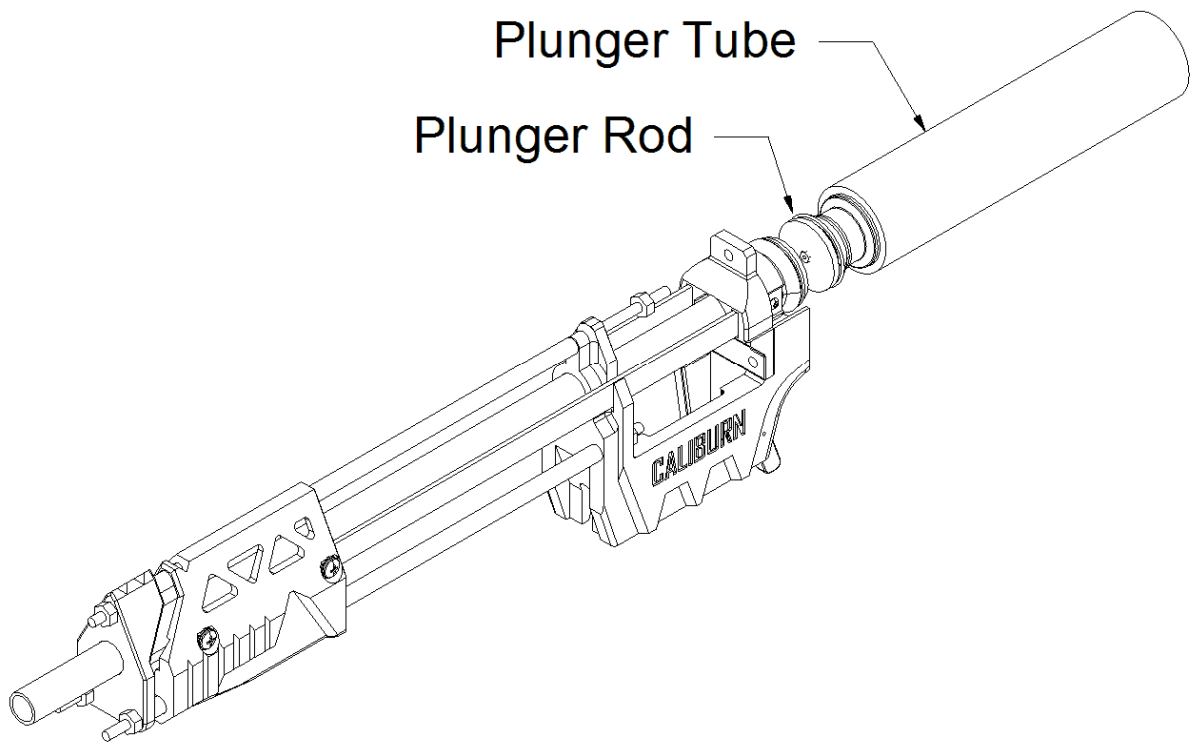
Wedge the 6" spacers inbetween the heel of the Grip and the front angled surface of the Butt. Add a Hex Nut to the very end of the 7.5" Threaded Rod and then slide it in through the counterbored hole in the Butt. Add a Hex Nut to the opposite end of the 7.5" Threaded Rod and tighten.



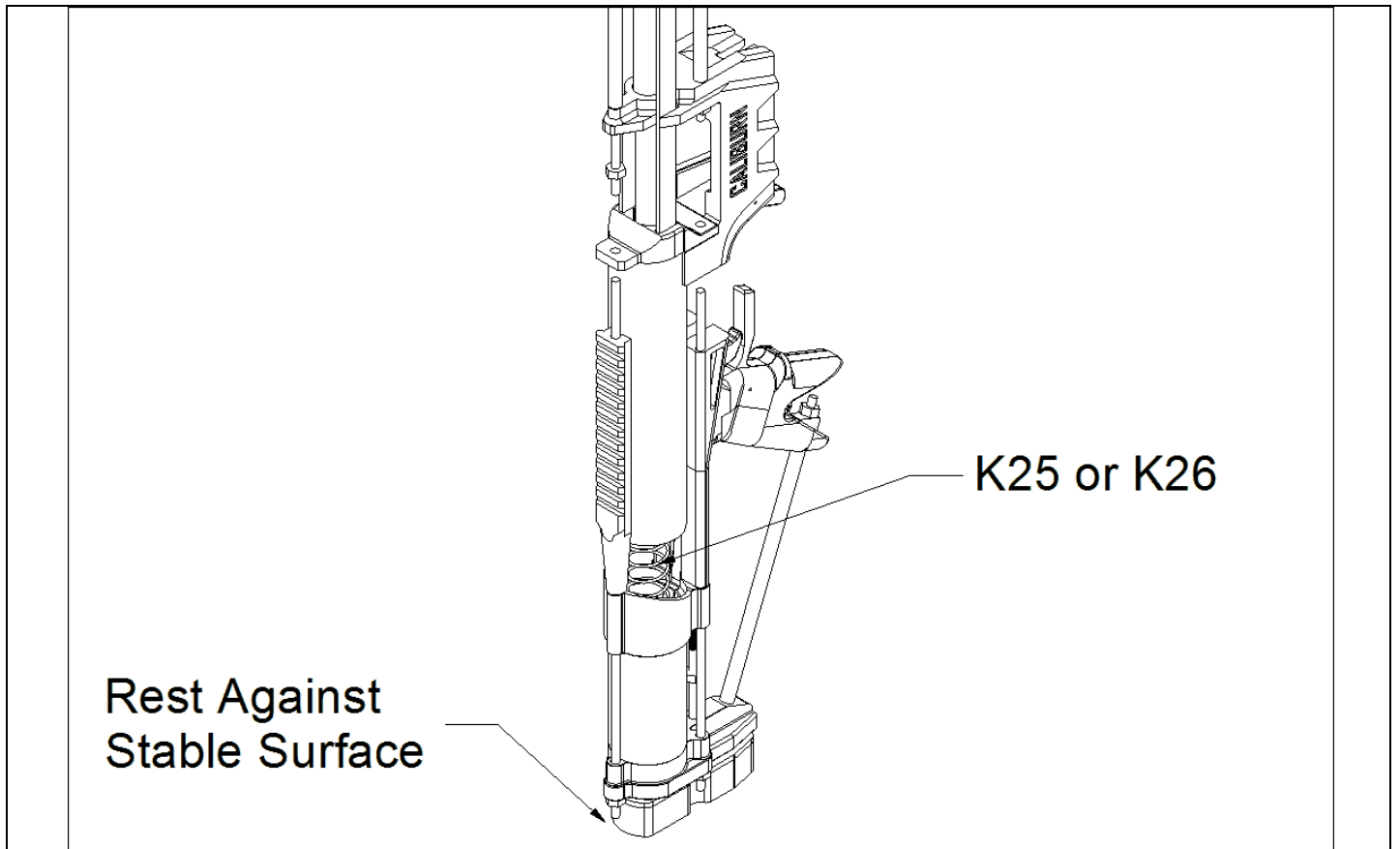
Add the LONG Screw and a Hex Nut to the Padded Buttplate (or a Printed Alternative). Then Tighten.



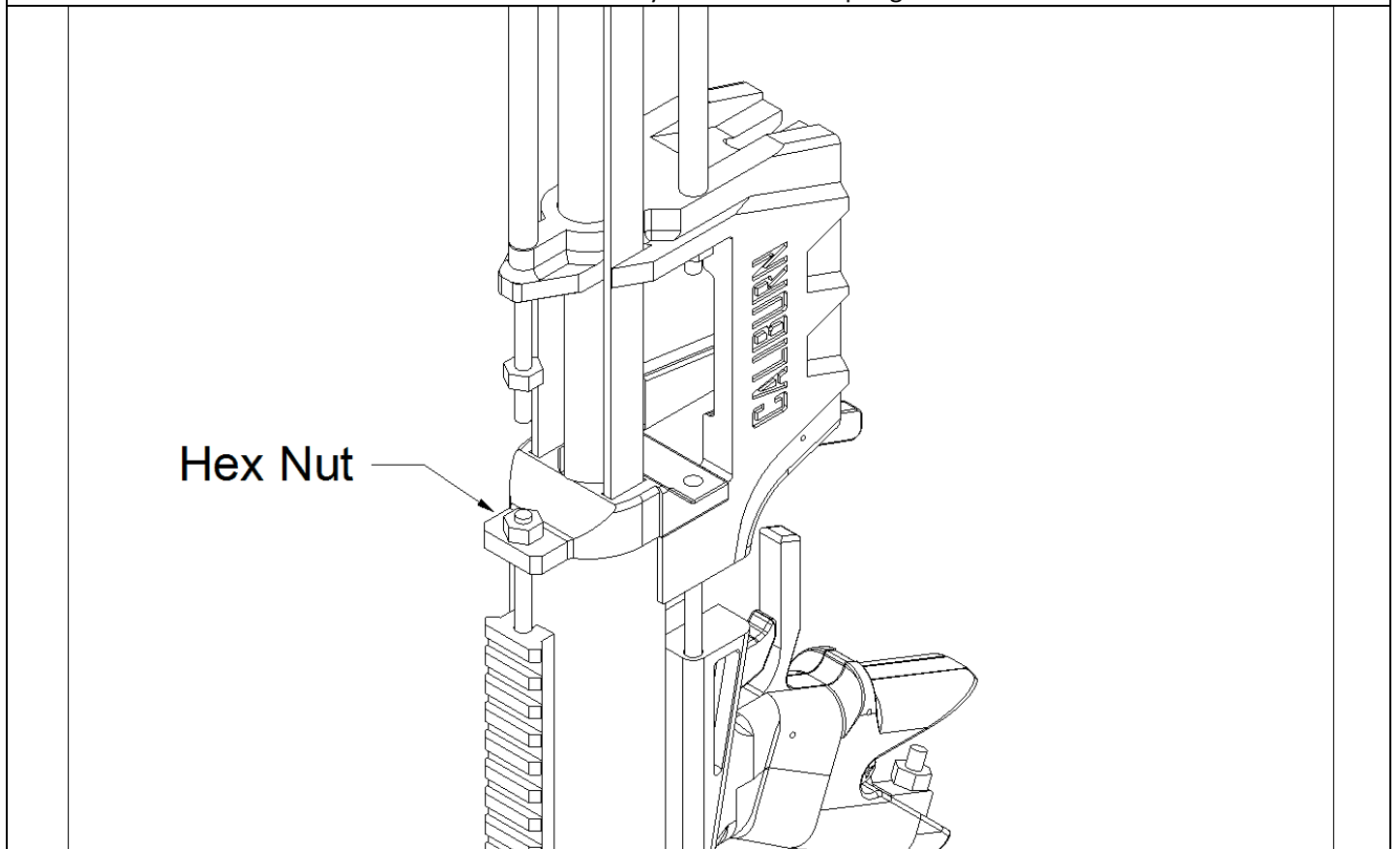
Add Buttplate to Butt. Secure with one or more Hex Nuts. Adjust to your desired spacing.



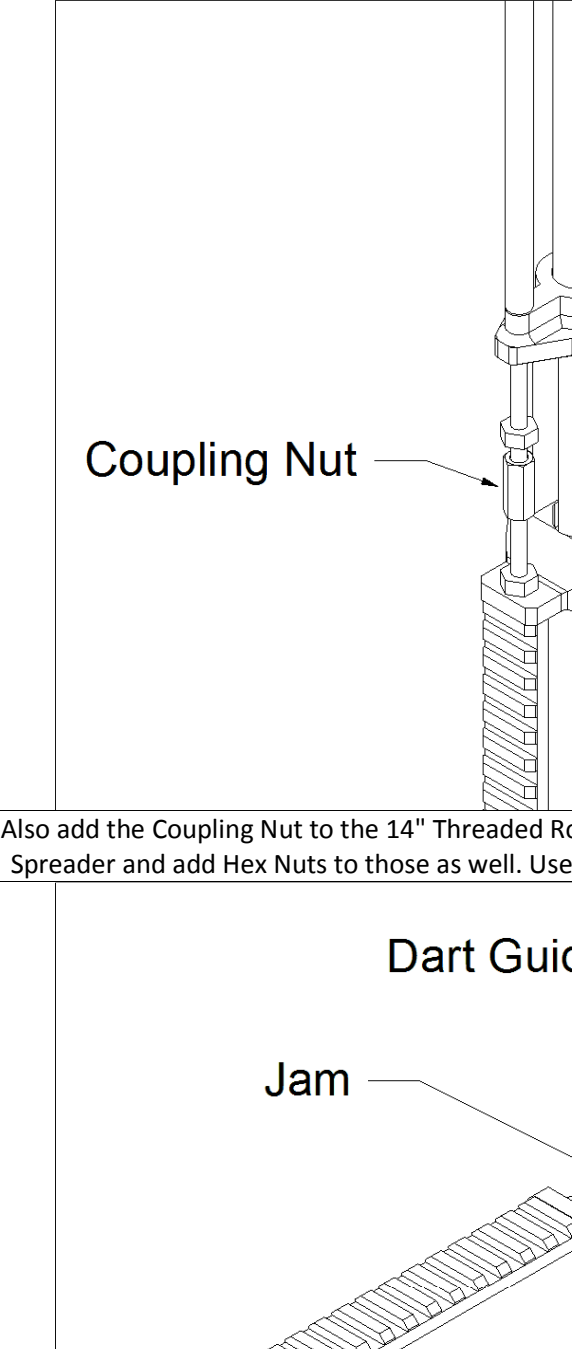
Slide the Plunger tube backwards into the Lubricated end of the Plunger Tube. This end typically comes with a wider white spacing band. Wiggle the Plunger Tube onto the Skirt Seal at the back end of the Ram Assembly.



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.



Coupling Nut

Hex Nuts

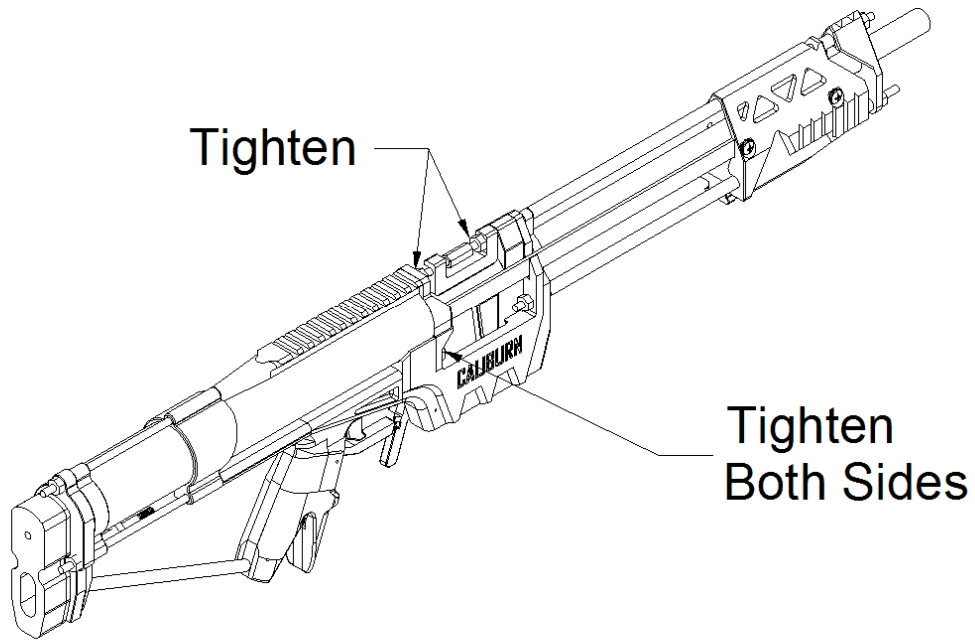
Also add the Coupling Nut to the 14" Threaded Rod, then guide the 13" Threaded Rods through the lower holes in Spreader and add Hex Nuts to those as well. Use the Coupling Nut to connect both 14" Threaded Rods together.



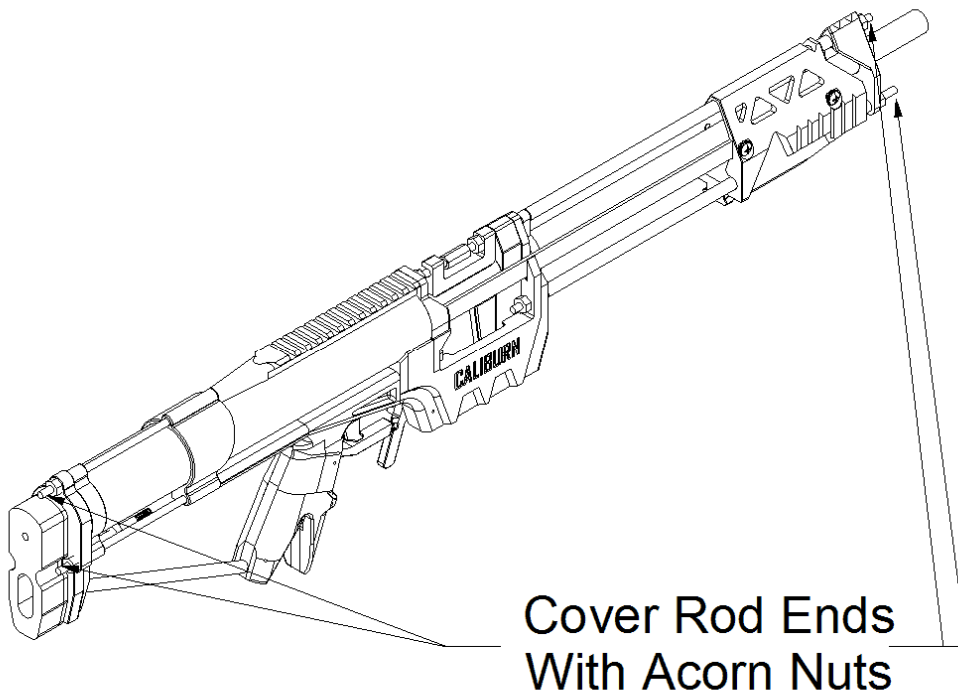
Dart Guide

Jam

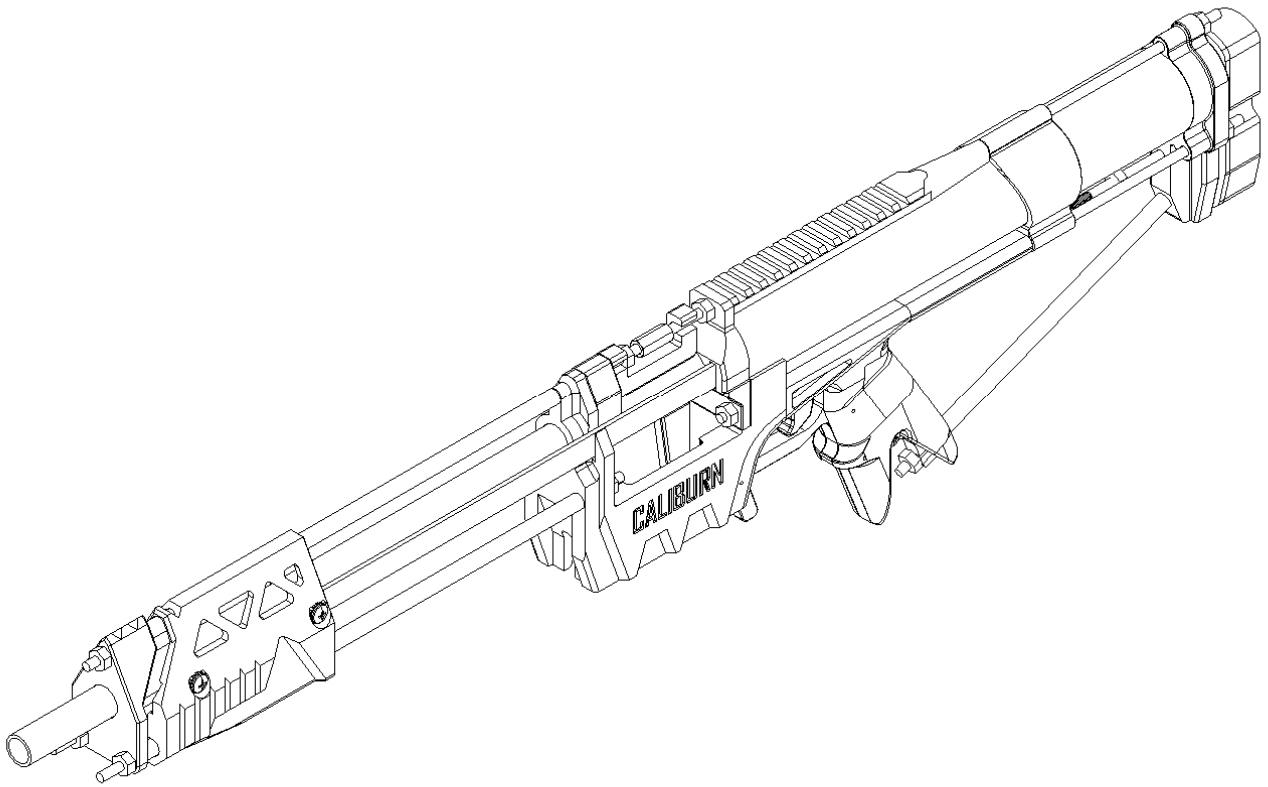
You will need to adjust the positioning of the upper 14" Threaded Rods for this next step, which is why they have not yet been tightened. Slide the Dart Guide onto the front 14" Threaded Rod from the top. Slide the Jam onto both from one side so that the front Hex Nut is behind the tab towards the front of the Blaster.



Tighten both Hex Nuts up top. One against the front tab of Jam, the other against Spreader. Tighten both of the lower Hex Nuts 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 loosen and remove the four Hex Nuts at the very back in order to slide the Buttplate and Butt off the ends of the Threaded Rods. This will allow you to pull those core components out the back of the Blaster, then reassemble.

The Blaster and Hardware Kits are shipped with K26 and K25 springs. The K25 is rated slightly lower than the K26 and 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.