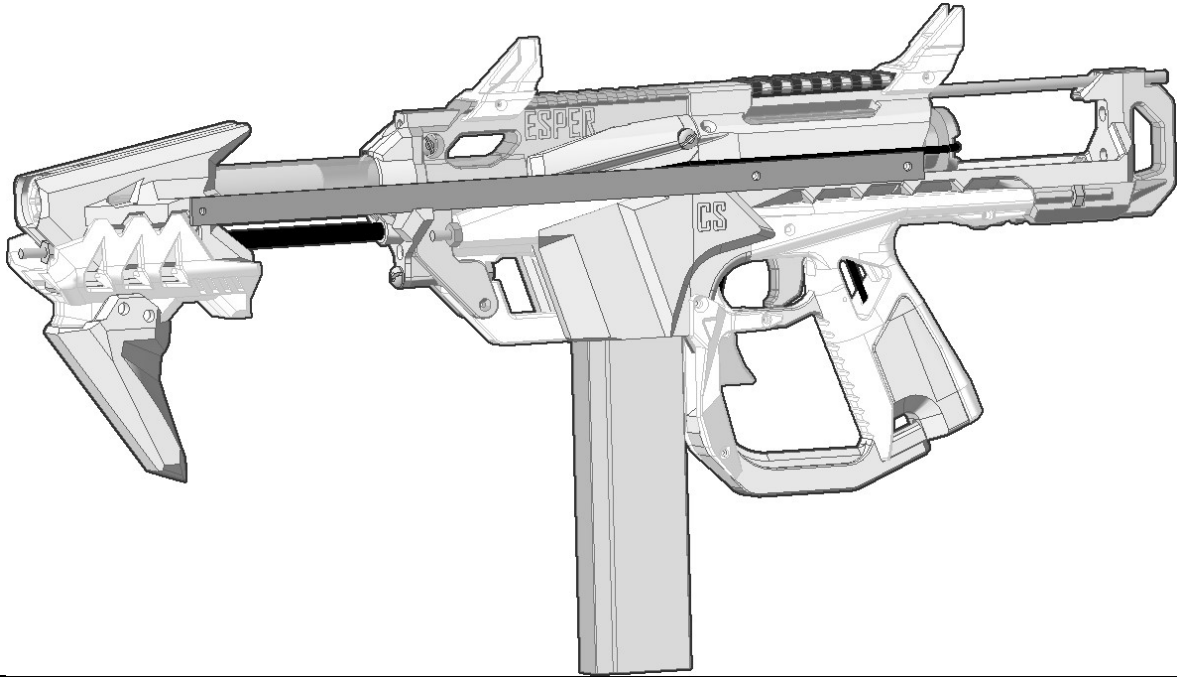


ESPER ASSEMBLY INSTRUCTIONS

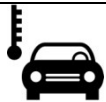


The Esper is a Mag-Fed Homemade Nerf Blaster design released as a Creative Commons Non-Commercial license file set by Captain Slug (<http://www.captainslug.com>).

It uses elastic cords as a replacement for traditional compression (and extension) springs. They drive a plunger with a catch surface at its tail end. The mag release and sear/trigger assemblies also use elastic cord for return.

Hardware kits and Full Blasters are available for sale as made-to-order items.

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



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.



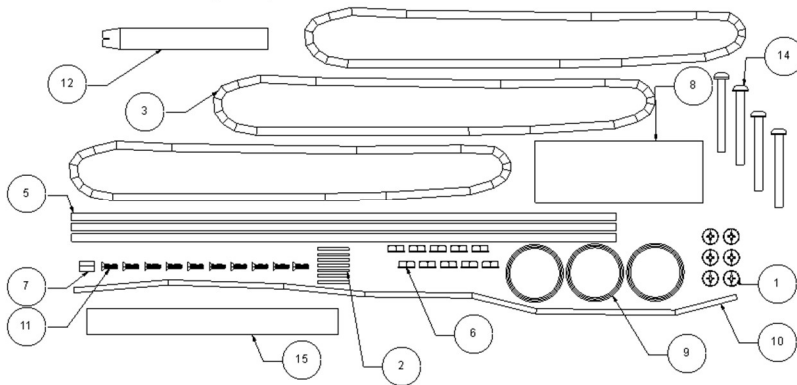
DO NOT use this blaster for wars involving minors. ALWAYS WEAR EYE PROTECTION. The muzzle velocities this design can reach are between 100fps and 150fps depending upon the darts used and the elastic load of the cords.



DO NOT Insert or Remove a Magazine while the breech is closed.

ESPER Hardware Kit

12/04/18



Item #	Quantity	Part Name
1	6	.31" 10-32 Screws
2	7	Short Pins
3	3	1/8" Cord
5	3	13.25" Threaded Rod
6	10	10-32 Hex Nut
7	1	Sear Standoff
8	1	Plunger Tube
9	3	Dash 123 O-Ring
10	1	3/32" Cord
11	10	4-40 Screws
12	1	Ramrod Core
14	4	1.75" L 10-32 Screw
15	1	Barrel

Printed Parts NOT included.

Tools needed: Philips Screwdriver, Slotted Screwdriver, 3/8 Combination Wrench, Round Needle File, Scissors.

CAPTAINSLUG.COM

For most of the above hardware list the quantities are the MINIMUM required for assembly. Easily-lost items will have several spares and I typically include extras of the majority of the items. The Plunger Tube in the Hardware Kit does come pre-lubricated.

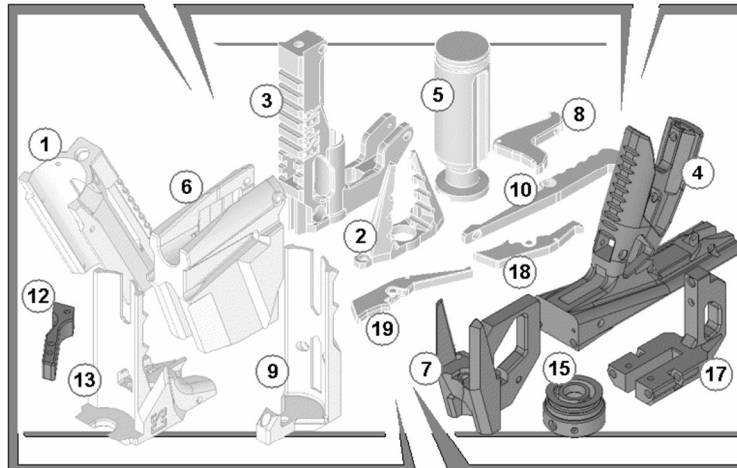
To assemble this blaster you will need a Slotted Screwdriver, Small Philips Screwdriver, 3/8 Combination Wrench, a Round Needle File, and a pair of Scissors.

ALSO AVOID DRY-FIRING THIS BLASTER EXCESSIVELY. Firing without a dart in the barrel will add unneeded wear on this blaster. Also do not pull the trigger with the breech open.

ESPER PRINTED PART SET

08/08/19

ACCESSORY



PRIMARY

SECONDARY

Note: Print layers should not be any larger than 300 microns. Parts were designed for PLA filament, but can be printed using ABS or PETG without issue. No support material is needed, but some parts may print more reliably with a brim added.

- Captain Slug

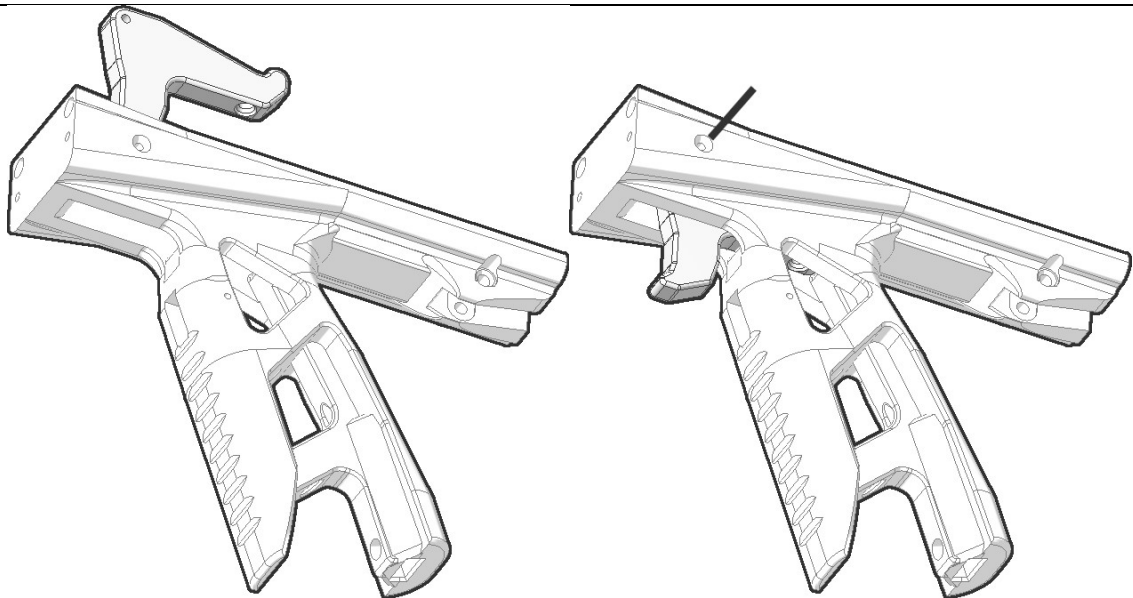
Assembly Instructions:

<http://www.captainslug.com/nerf/EsperAssembly1.pdf>

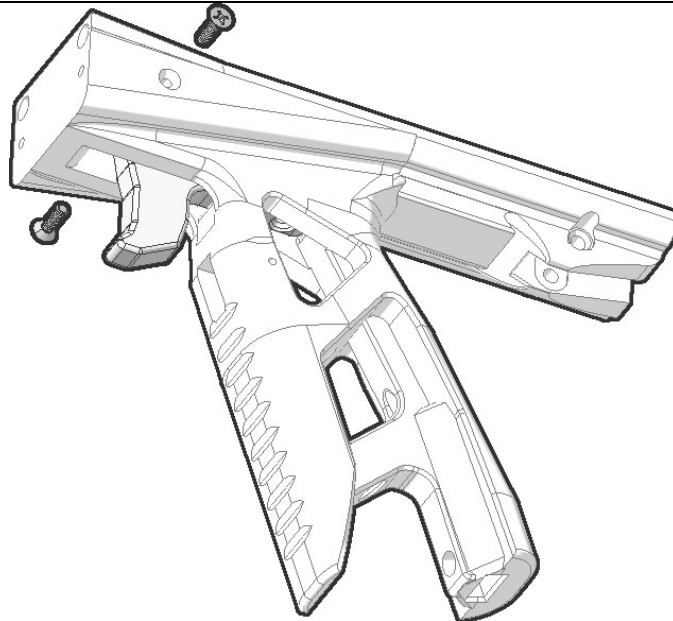
Item	Part Name
1	E-Pull
2	E-Brake
3	EDartJam
4	EGrip
5	EPlunger
6	EUpper
7	EMuzzle
8	ETrigger
9	Endcap
10	ESear
12	Tguard7
13	ECoupler
15	ERamBase
17	EndLoop
18	Release
19	Krelease

eVF1	
FG Kit	Gripstrike
	Grip Insert
Ayy LMAO	Ayy FG
	Pyangle
	AFG
	KnuckieDuster
	Iron Sights
	Upgraded Ram

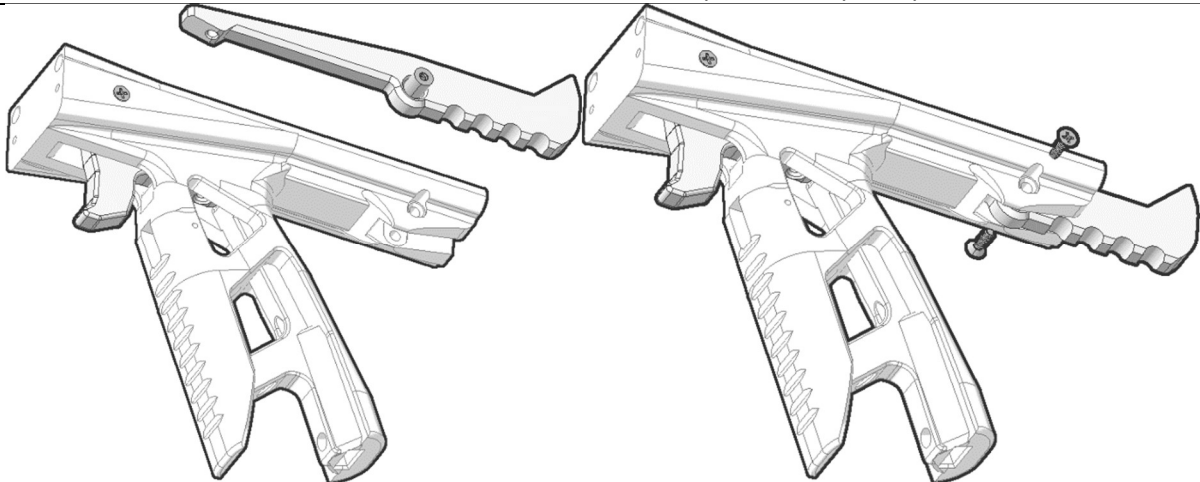
Above is a list of every printed part needed to assemble this blaster. The majority of the through holes should print to the required tolerance, but you will likely have one or two that may require minimal filing. Also make sure to trim off any burrs or oversized edges.



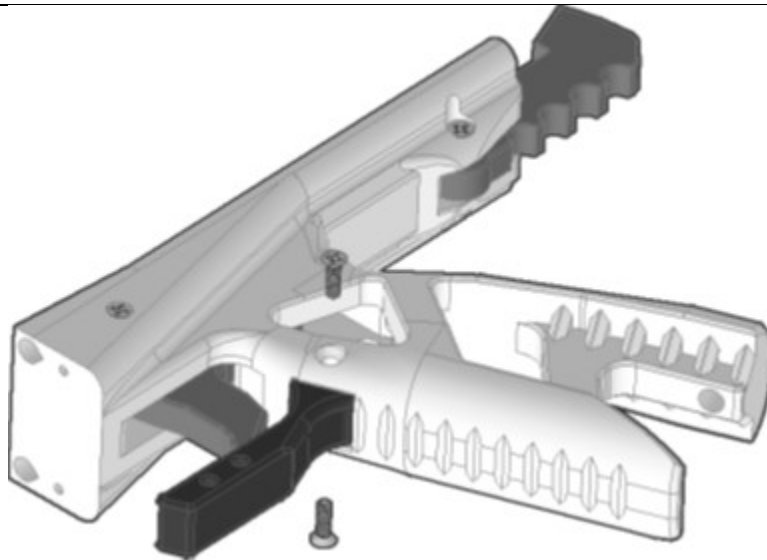
Line the hole in the ETrigger part with the holes in the sides of the EGrip print towards the front. Insert a Short Pin through both until it is roughly centered.



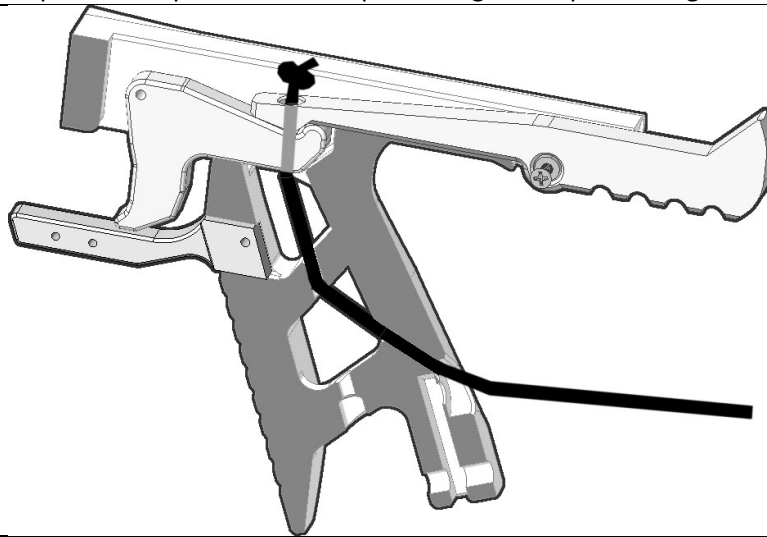
Drive a 4-40 screw into each hole to keep the short pin captive.



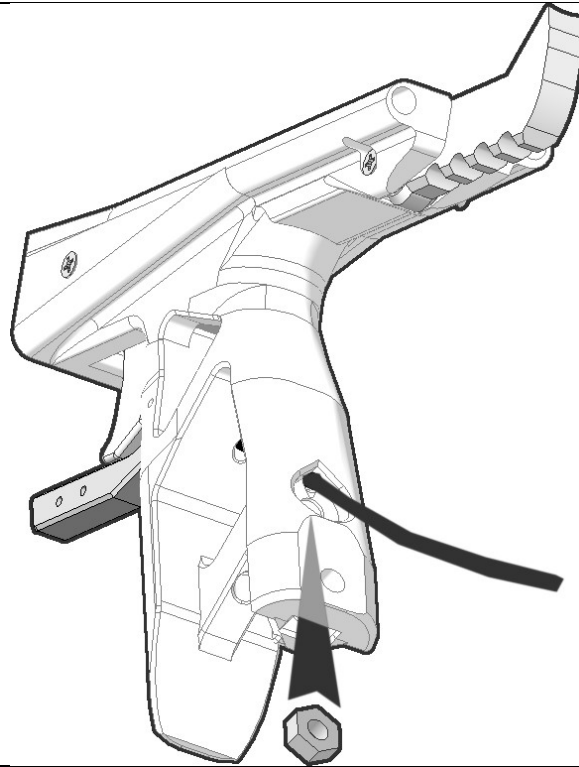
Slide the Sear Standoff into the center hole of the ESear. Slide the ESear into the top of the grip until the center of the Sear Standoff lines up with the holes in EGrip. Drive a 4-40 screw into the Sear Standoff from each side.



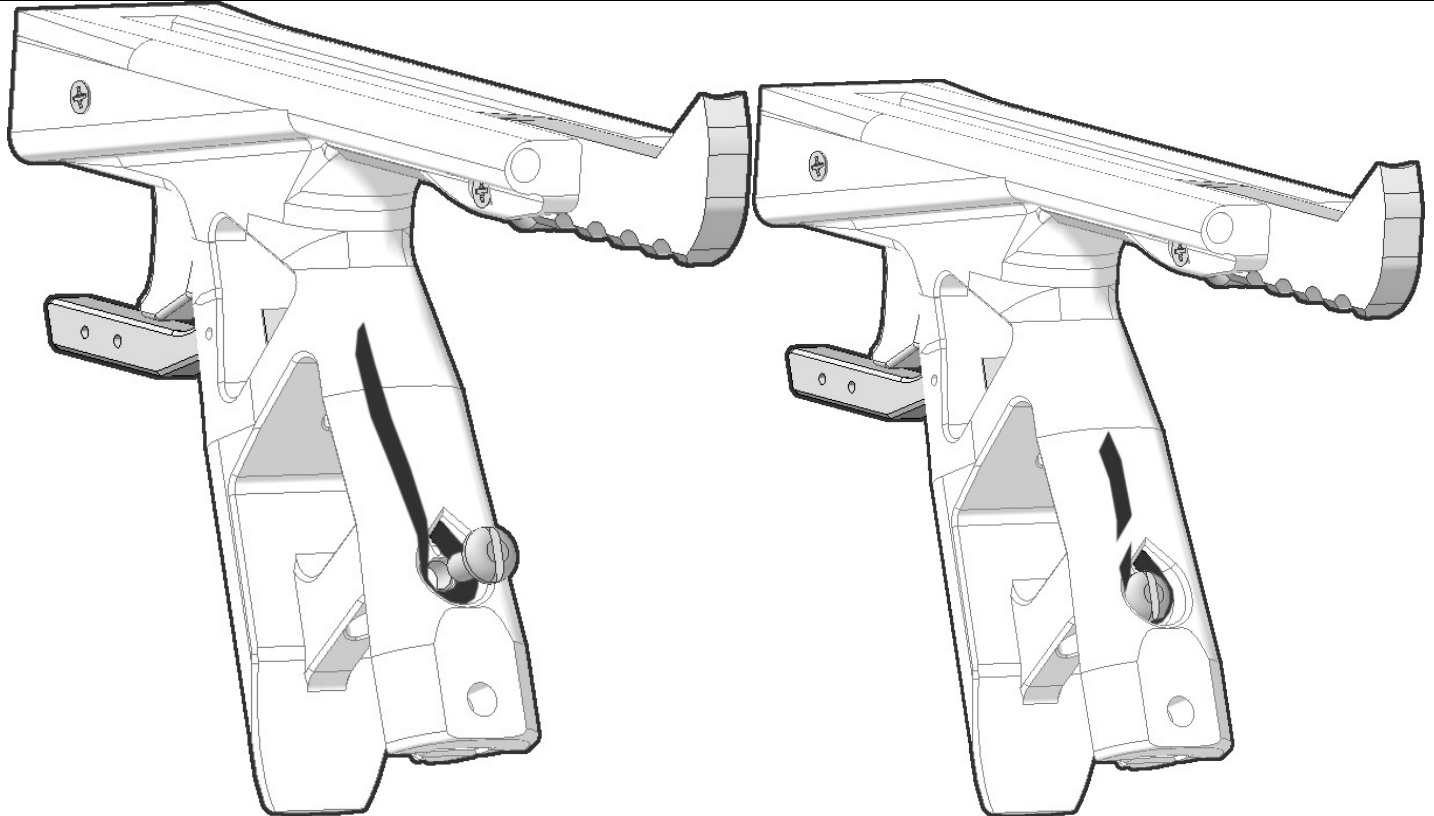
After trimming the flash from the rear of the print, slide the EGuard into the slot in the front of the EGrip print until the holes in both parts line up. Drive a short pin through both parts using a small hammer.



Cut a 6-inch length of the 1/8" diameter elastic cord (the smaller size) and tie a knot at one end. Fish the opposite end through the holes in ESeal, ETrigger, and then through the middle of EGrip. Then feed the free end through the hole that passes from the inside of the EGrip print through to the counterbore in the back of the EGrip print as shown.

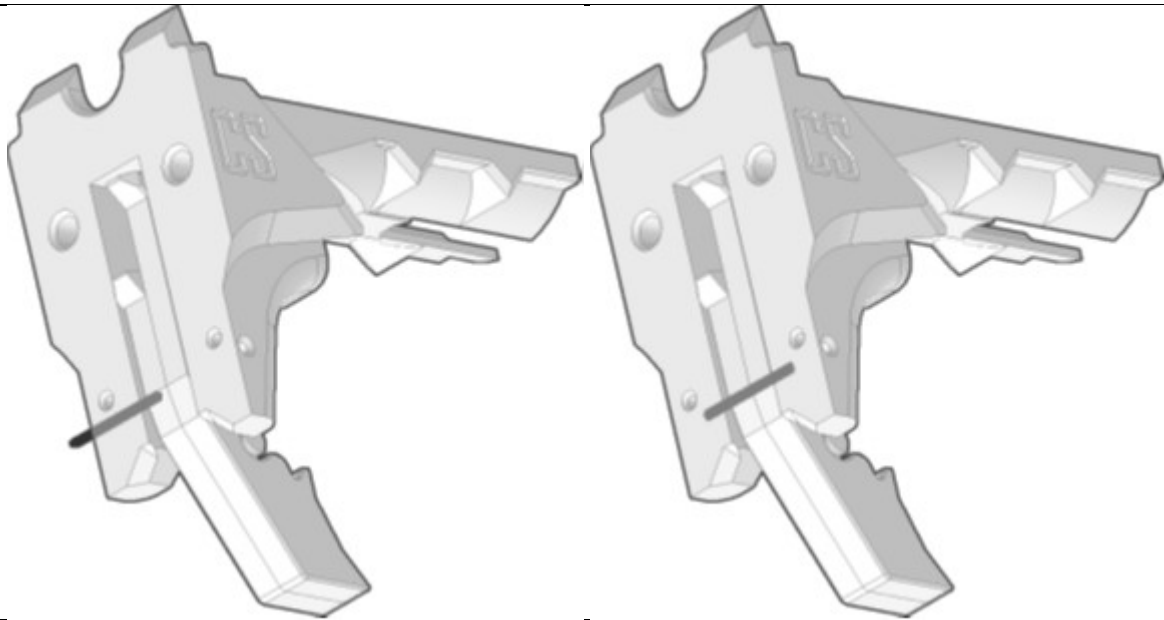


Slide a Hex Nut in through the slot in the bottom of the EGrip print until it lines up with the hole in the back.



Loop the free end around the hole clockwise as shown, then use a slotted screwdriver to install a short 10-32 screw into the captive hex nut. Before tightening fully, adjust the tension on the elastic cord by pulling the free end taught. Test the feel of the trigger and then adjust the free end of the cord as needed. Loosen the screw if required to make the needed adjustment. Once you are satisfied with the tension, tighten the screw until bottomed out, then trim off the excess cord with scissors.

Set this assembly aside.

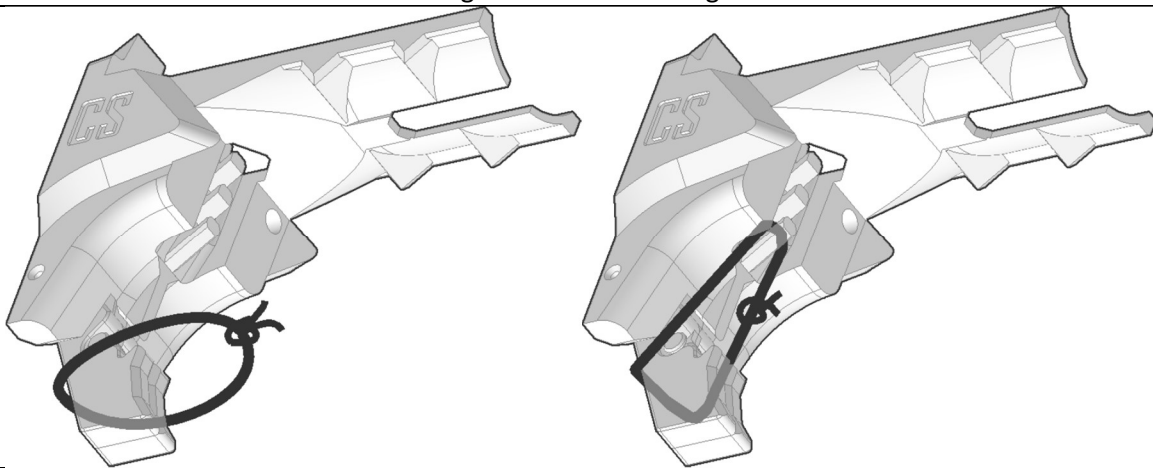


Slide a short pin in from the right side hole of the eCoupler print, then into the hole in the Trelease part. Continue the process carefully through the Trelease, then again with the Krelease. You may need to use a 1/16" drill bit or another short pin to push this pin until it is roughly centered with all the parts retained.

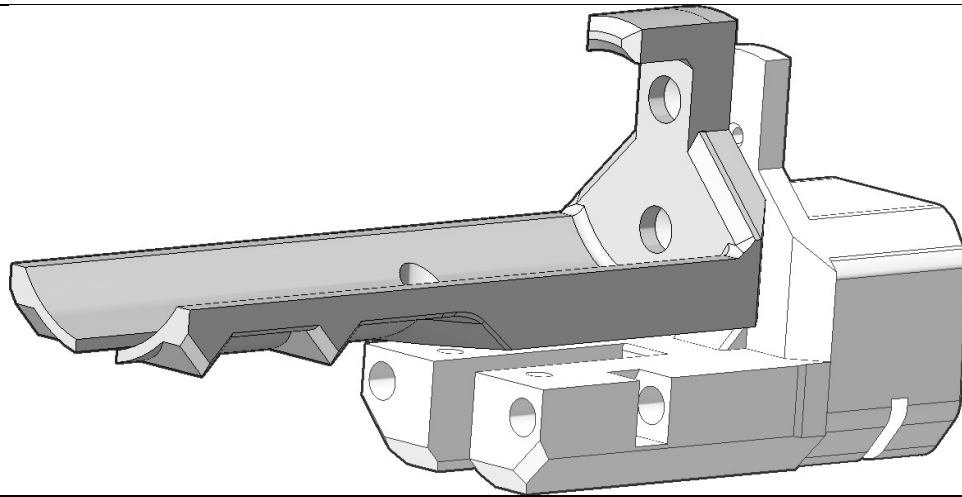
To retain the pin you can apply super glue gel to the holes, or drive a 4-40 screw into each side.



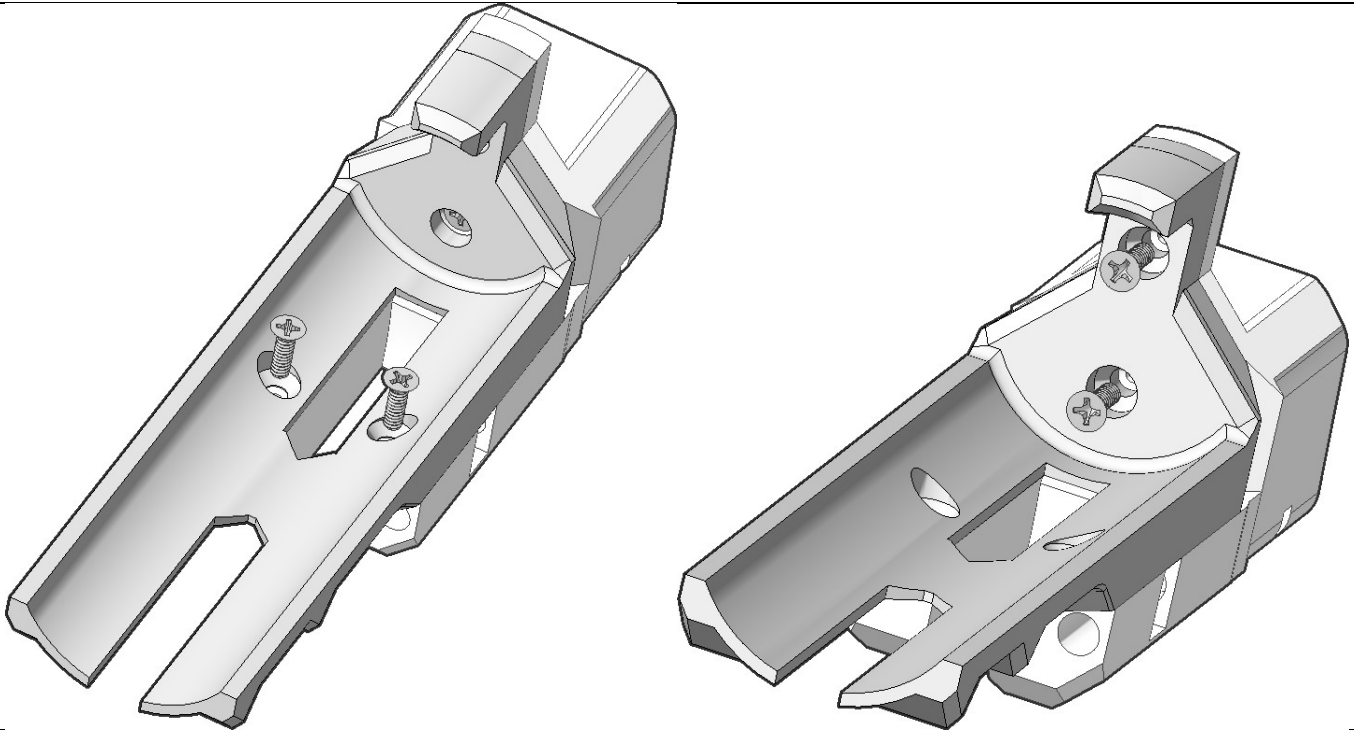
Cut a 5-inch length of the smaller size elastic and tie a square knot to turn it into a loop. This loop should be small enough to fit around 3 fingers.



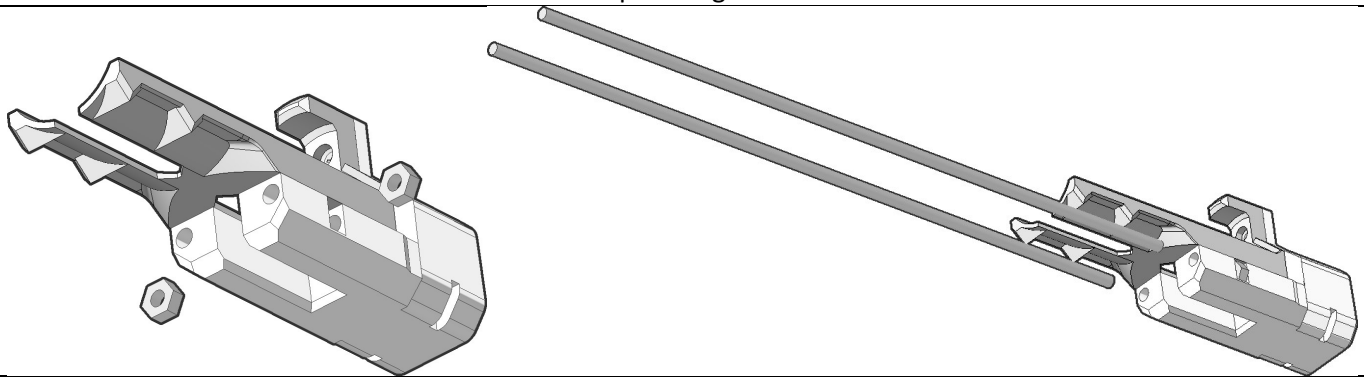
Feed the loop over both releases, then stretch it onto the lower hook (or one of the upper hooks if the lower one doesn't provide enough tension). Make sure the knot is located to one side. Manipulate each mag release individually to confirm that they both move freely and that the elastic cord causes them both to return to their resting position. Make adjustments as needed until they do, then set this sub-assembly aside.



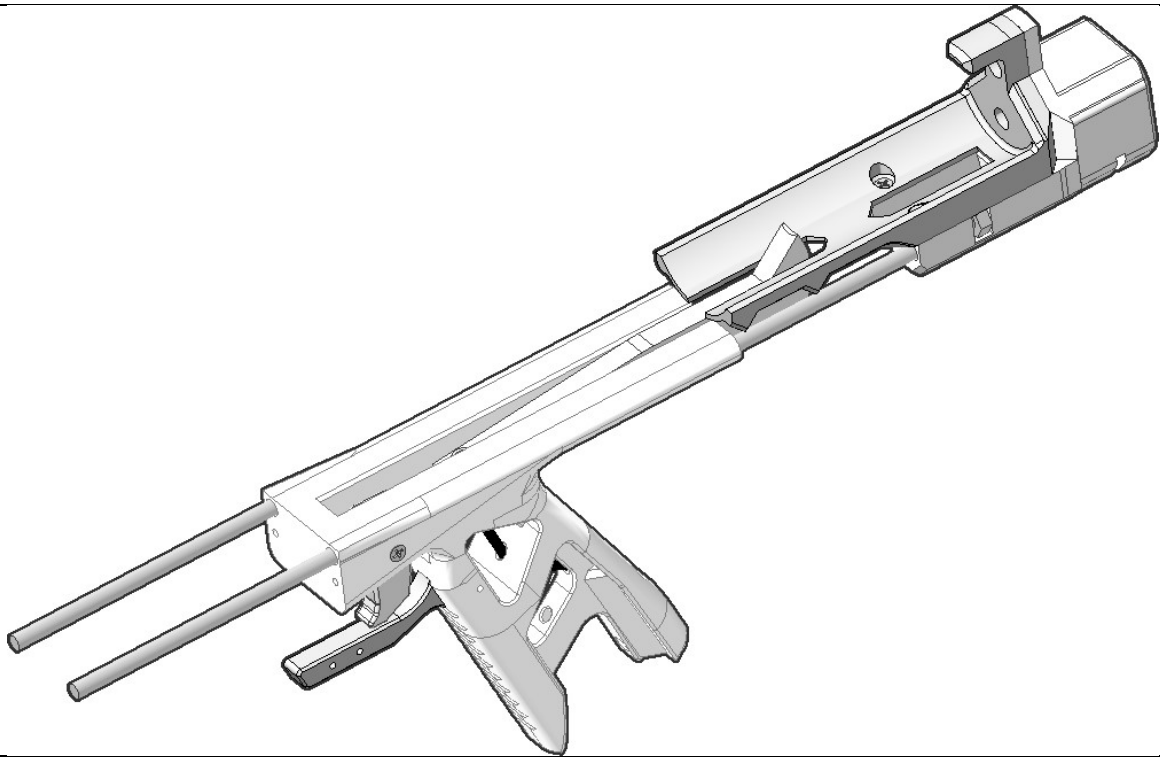
Take the EndLoop (or EndStrike) print and line it up with the EndCap print.



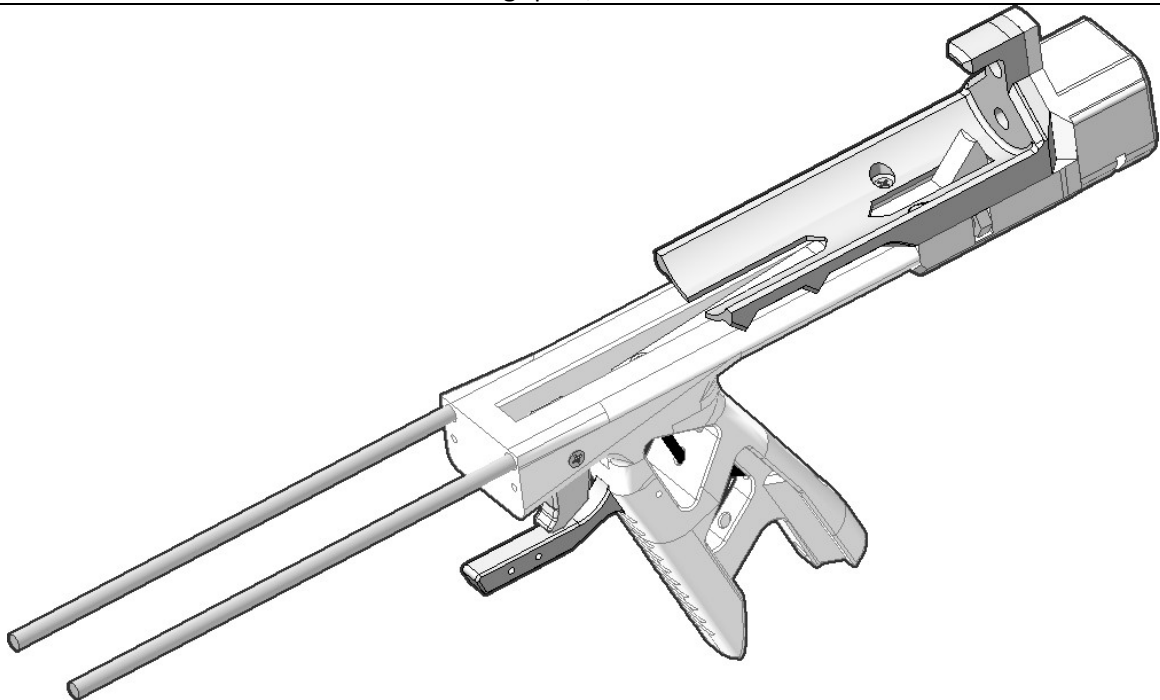
Drive some 4-40 Screw into the EndLoop (or EndStrike) print from the through-holes in EndCap as shown to secure the two parts together.



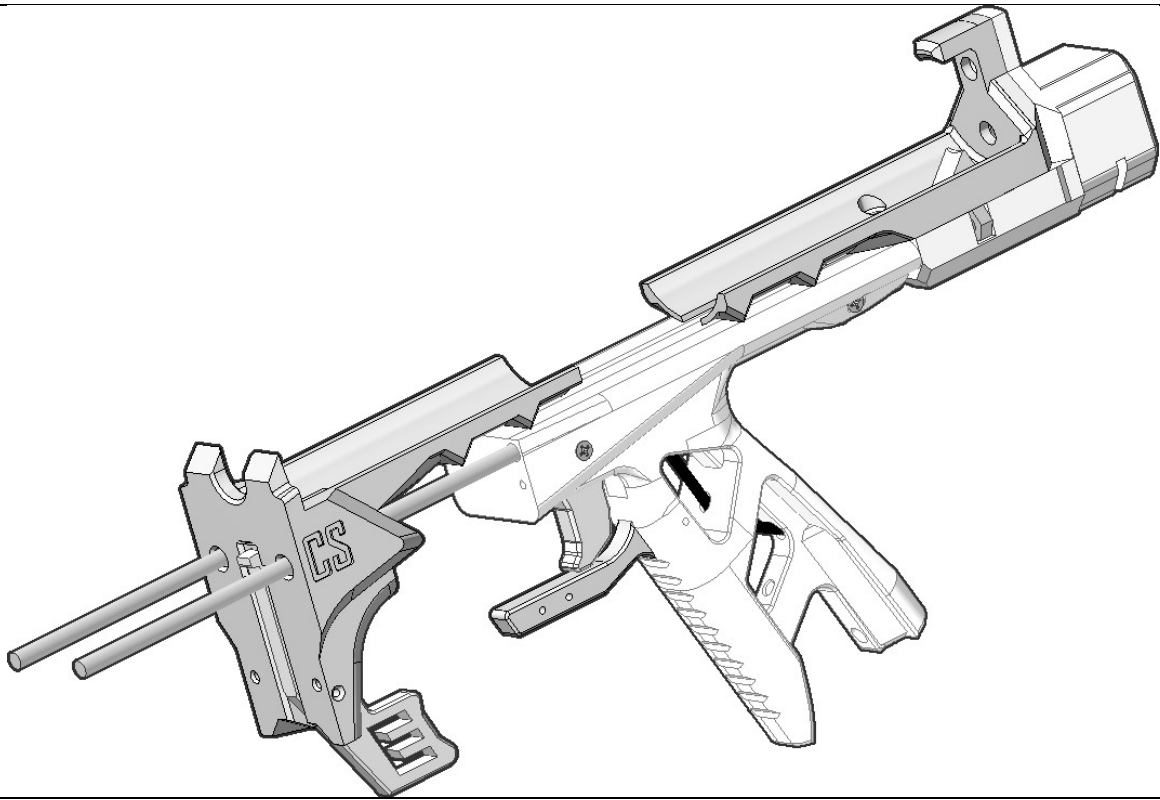
Slide hex nuts into the slots in each side of the assembly. Then screw a threaded rod into each one from the front.



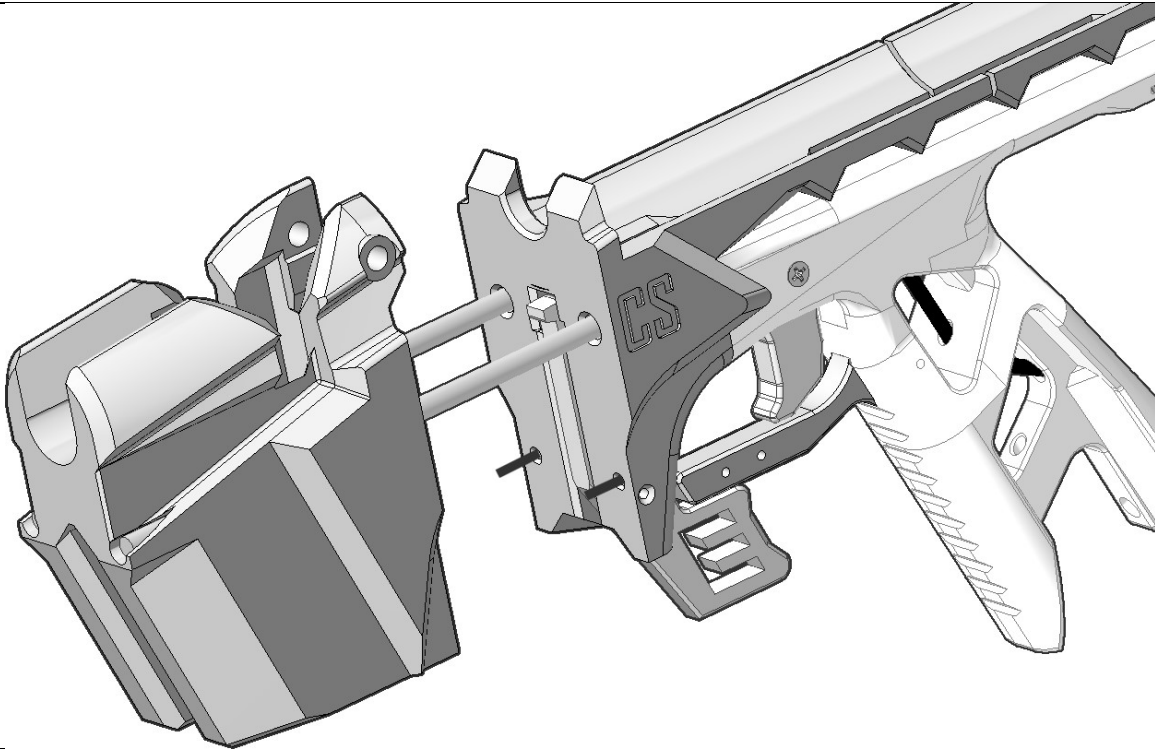
Slide the Grip Assembly onto the threaded rods until it is about to run into the prior assembly. This may not be possible with the "Ayy LMAO" themed grip and may require you to remove the EndCap piece from the EndLoop/EndStrike piece, slide the grip on, then reattach.



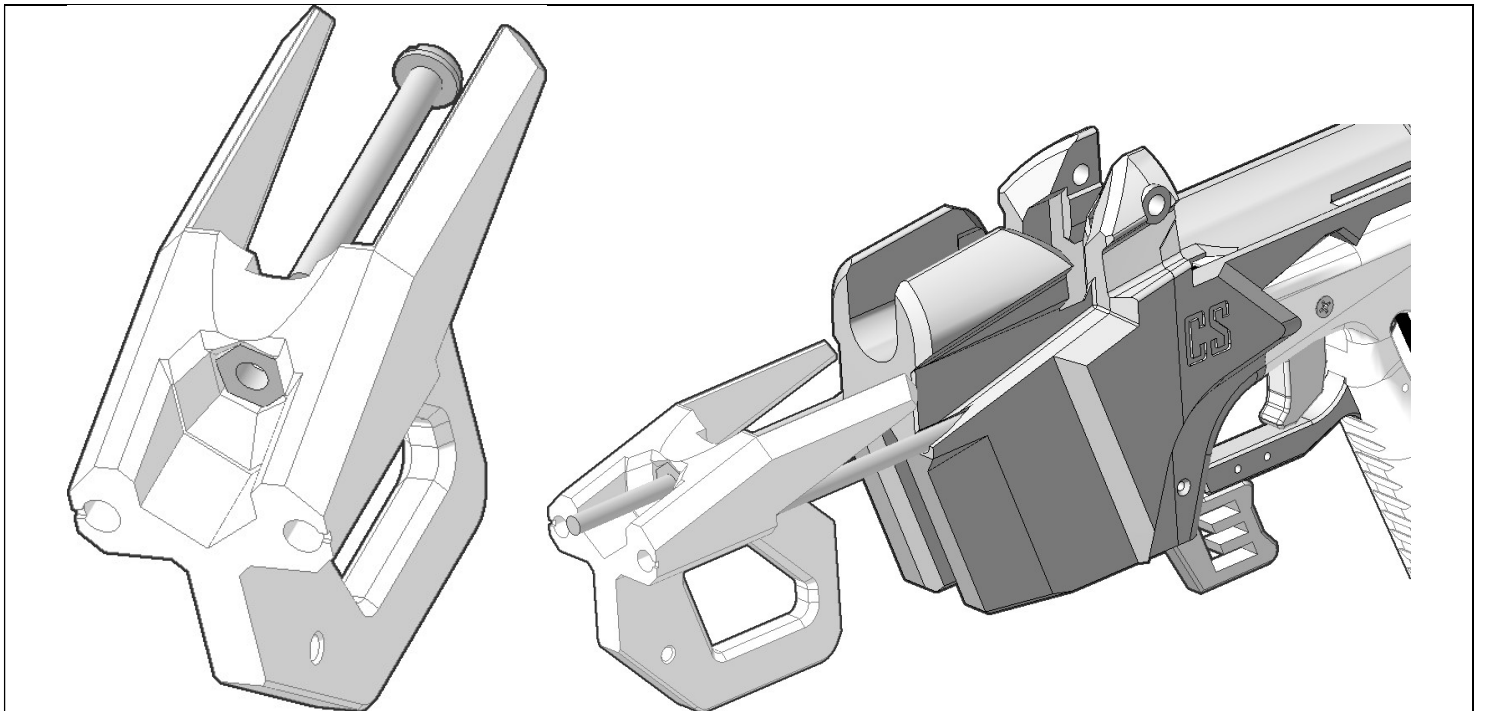
Pull the trigger to drop the sear and then slide the Grip Assembly on the rest of the way.



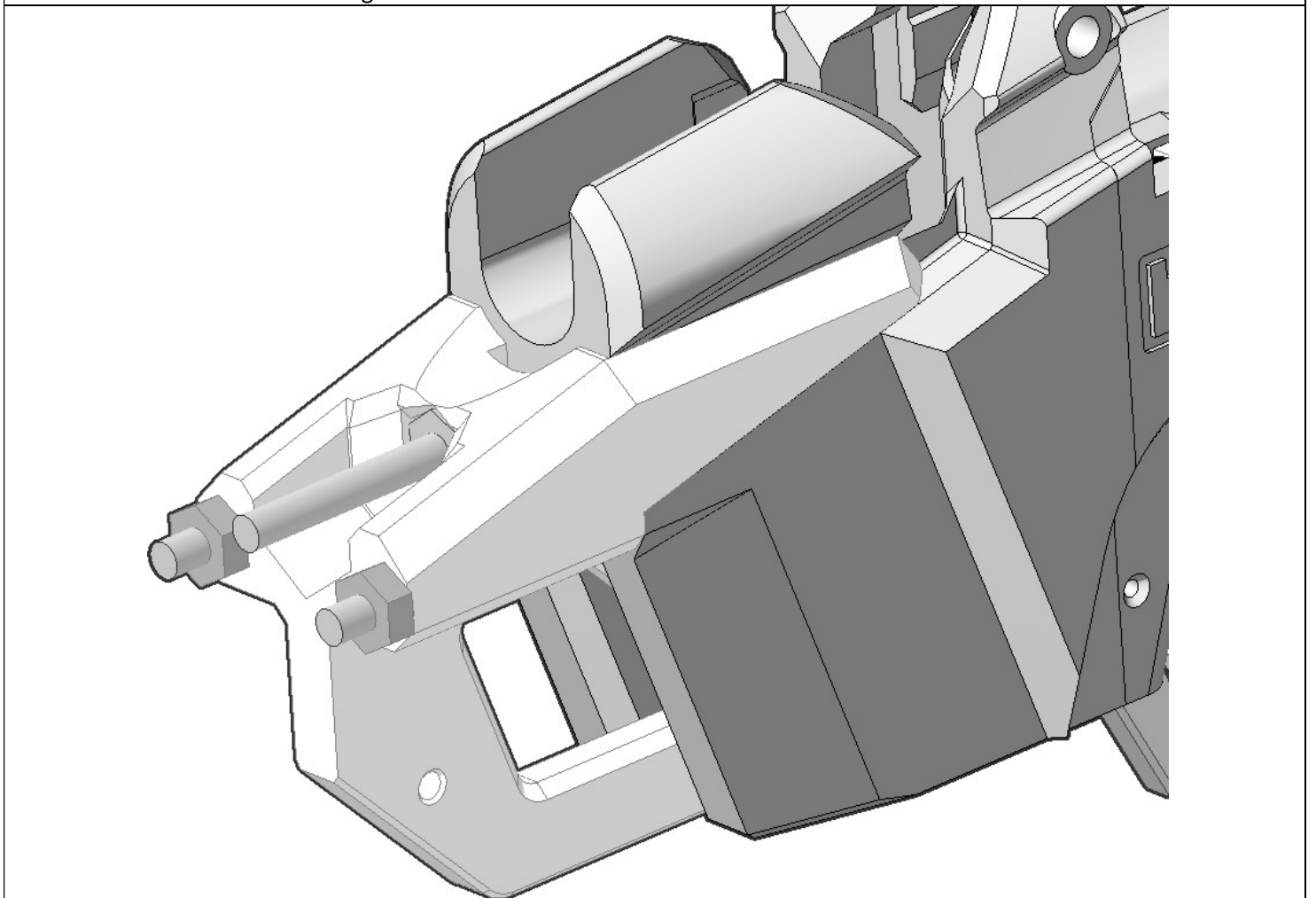
Slide the Coupler Assembly onto the front of the threaded rods until it butts up against the Grip assembly.



Insert a short pin into each of the holes in the front of the ECoupler print. Then slide the EUpper print onto the threaded rods and onto the short pins.

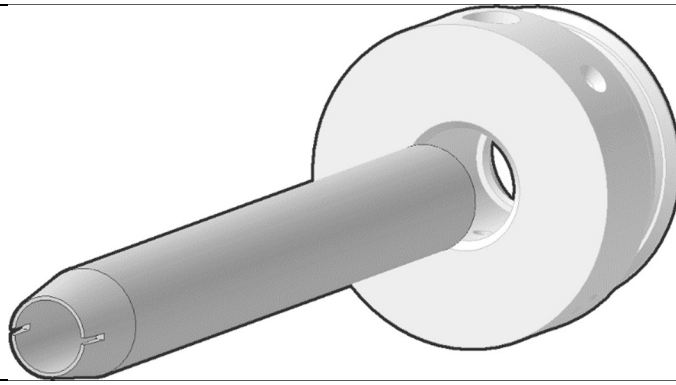


Insert a hex nut into the socket in the front of the EMuzzle print, then drive a 1-3/4" screw through it from behind until tightened. Then slide the EMuzzle onto the threaded rods.

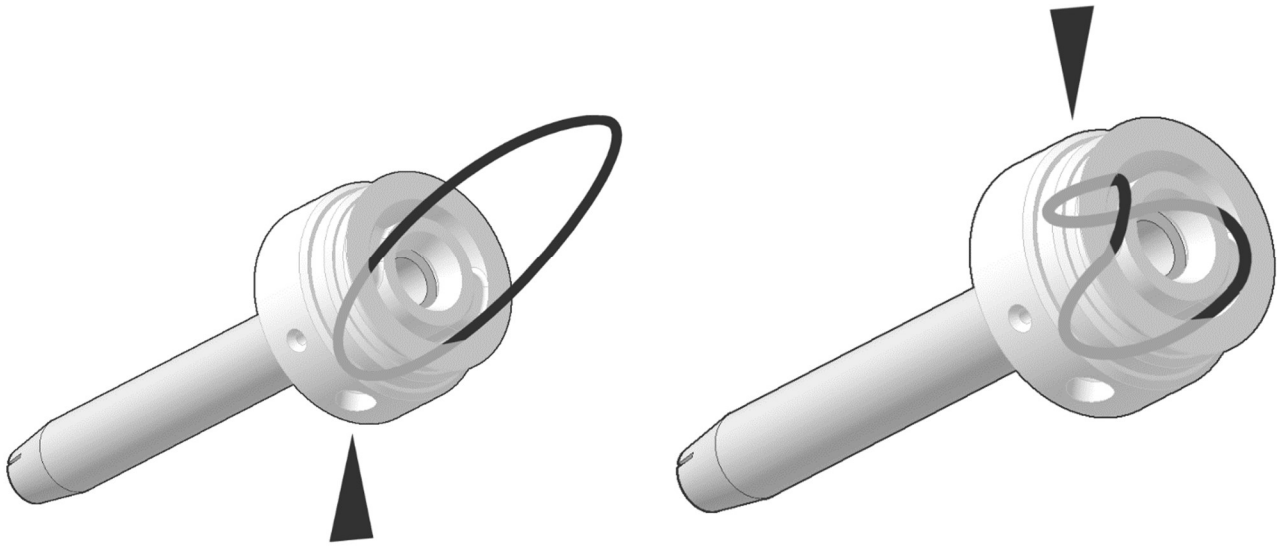


Secure the Assembly with a hex nut on each threaded rod, making sure that they are parallel with each other as shown.

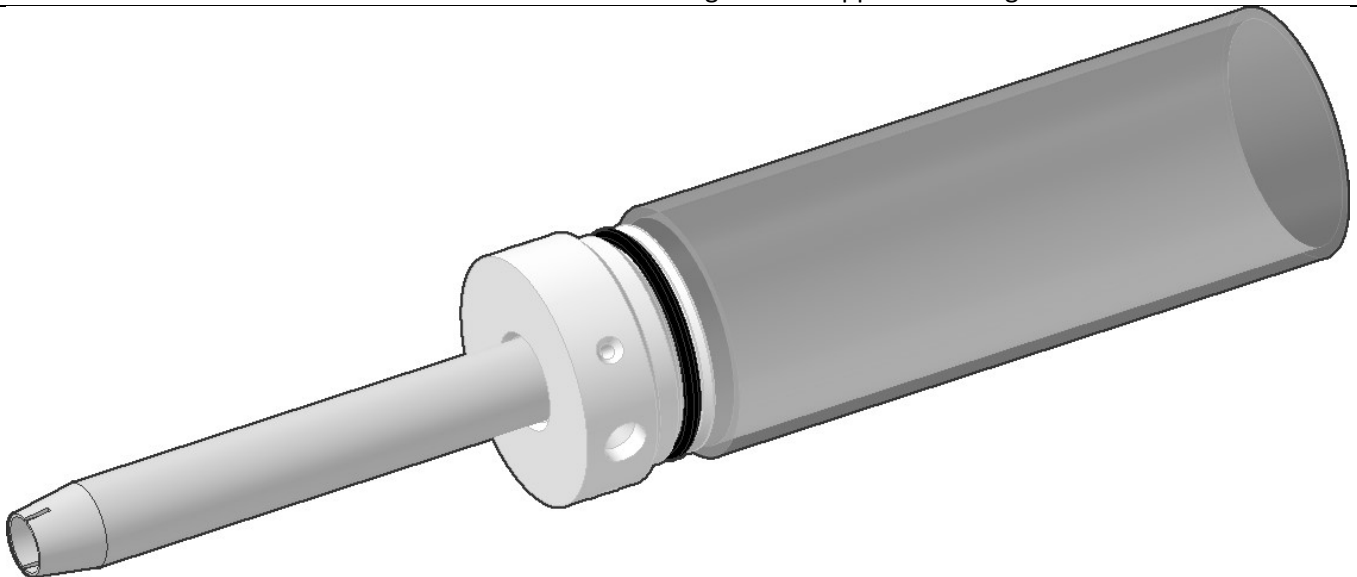
Set the assembly aside.



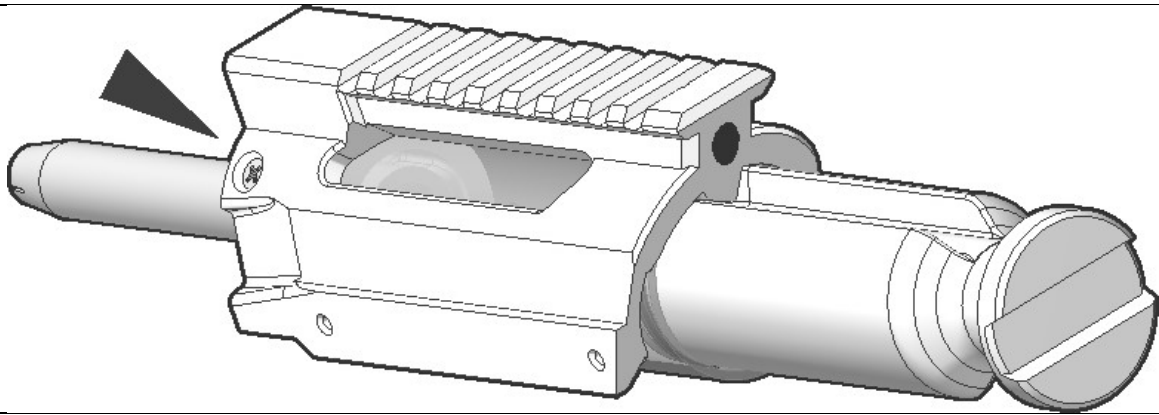
Insert the Ram Core into the ERamBase print until it bottoms out against the lip on the inside of the hole.



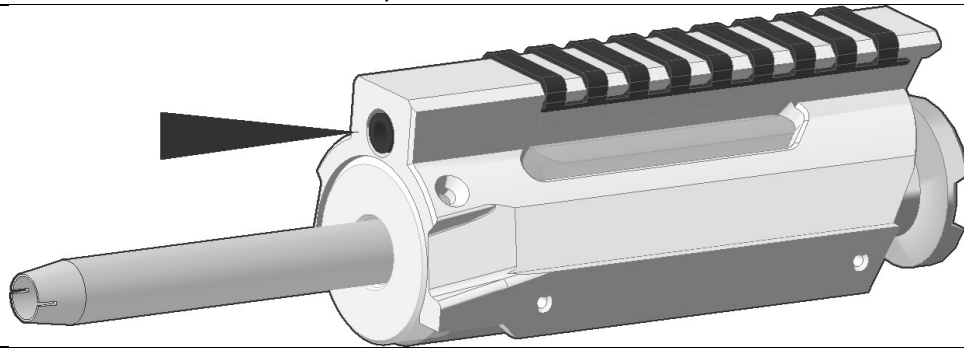
Insert a 123 O-Ring into the oblong slot in the back of the ERamBase print until you can see it move past the hole indicated by the arrow. Drive a 4-40 screw into this hole until it bottoms out against the Ram Core. Drive a 4-40 screw into the opposite hole until it bottoms out against the Ram Core. Fold the other side of the 123 O-Ring into the opposite oblong slot.



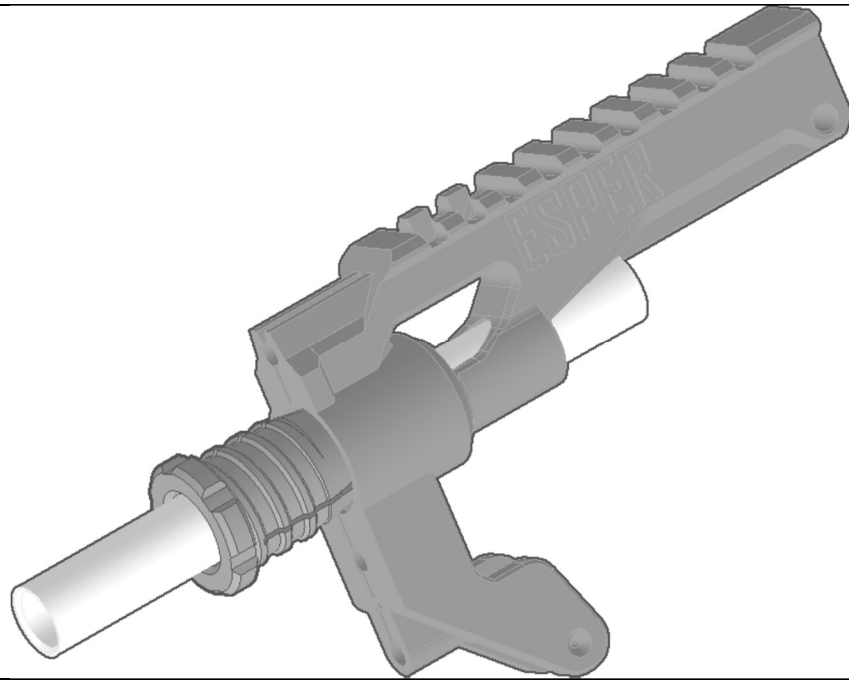
Add a 123 O-Ring onto the back lip of the ERamBase print, then slide the plunger tube onto the o-ring.



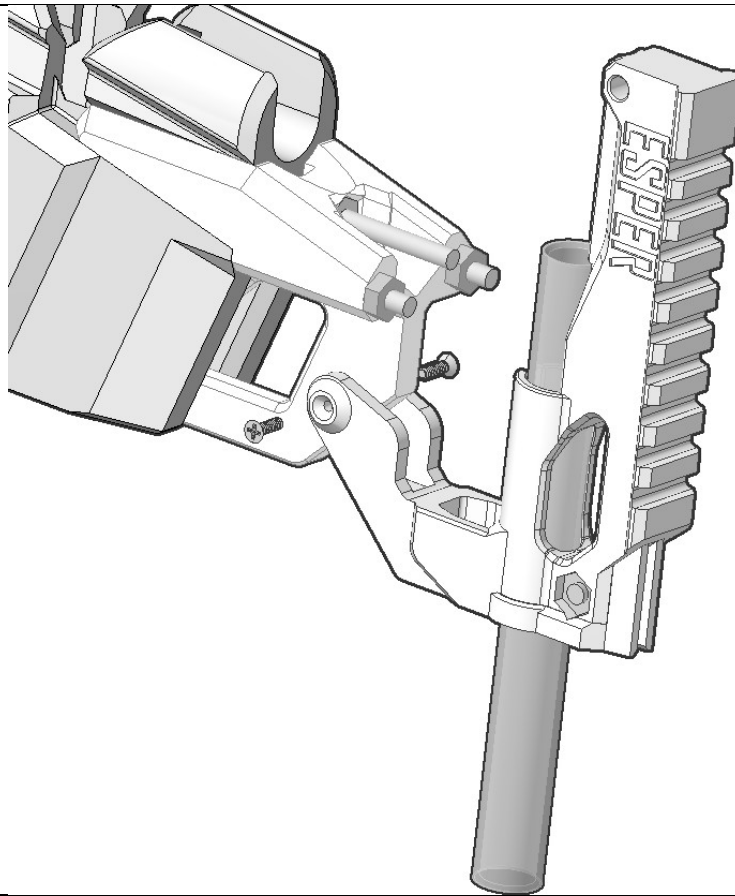
Add a 123 O-Ring to the front of the EPlunger print, then slide it into the back of the plunger tube. Snap the E-Pull onto the plunger tube until the holes in the E-Pull line up with the holes in the ERamBase print and the key in E-Pull lines up with the slot in the EPlunger print. Drive a 4-40 screw through each hole and into the ERamBase print until secure.



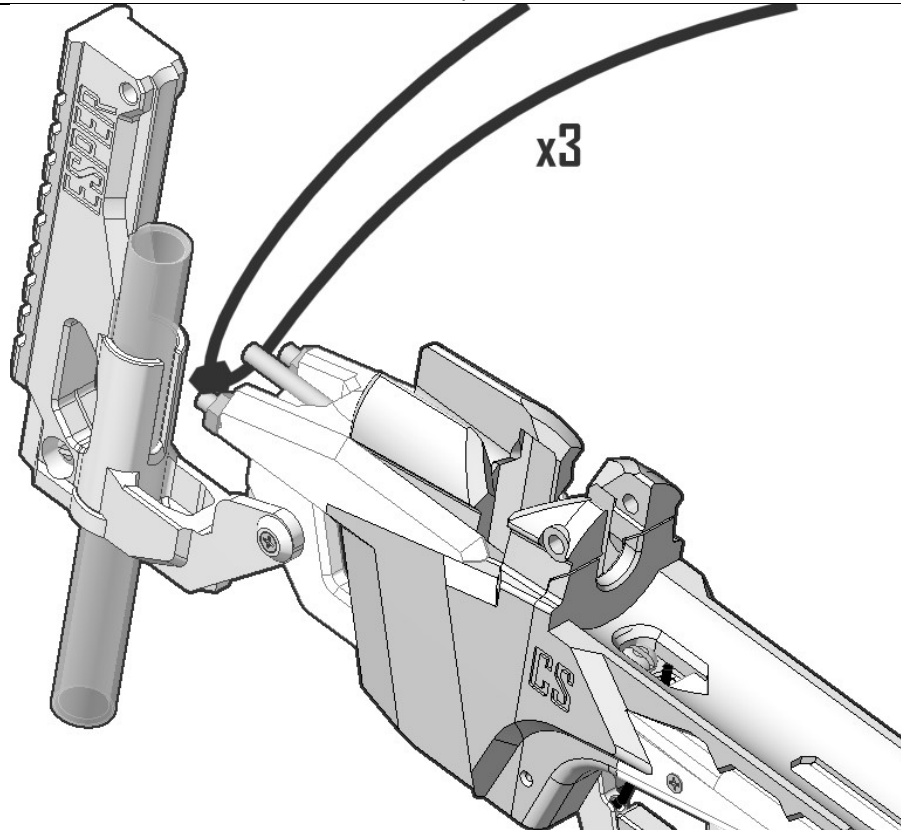
Slide a 4-inch length of spacer tubing into the hole in the front of E-Pull. The "Bolt" Assembly is complete.



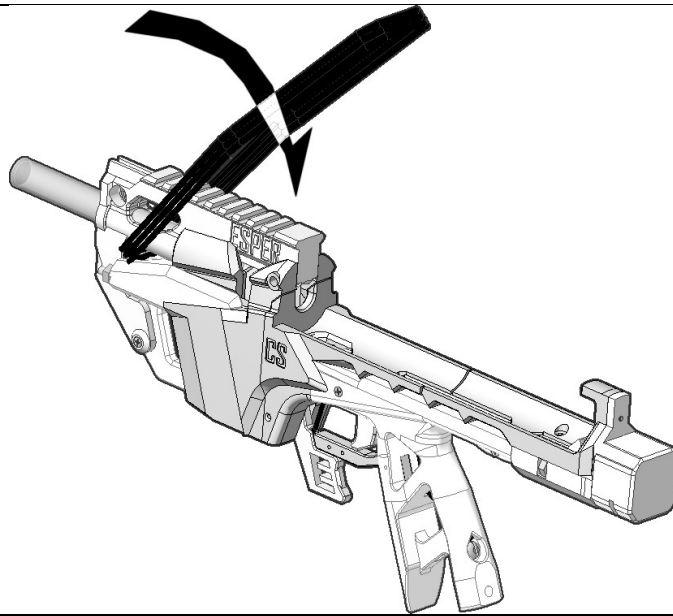
Slide the barrel into the front hole of the EDartJam print until just before it meets the lip below the lettering. Slide the CMThread print over the barrel and screw it into the front of the eDartjam print until the barrel is held firmly.



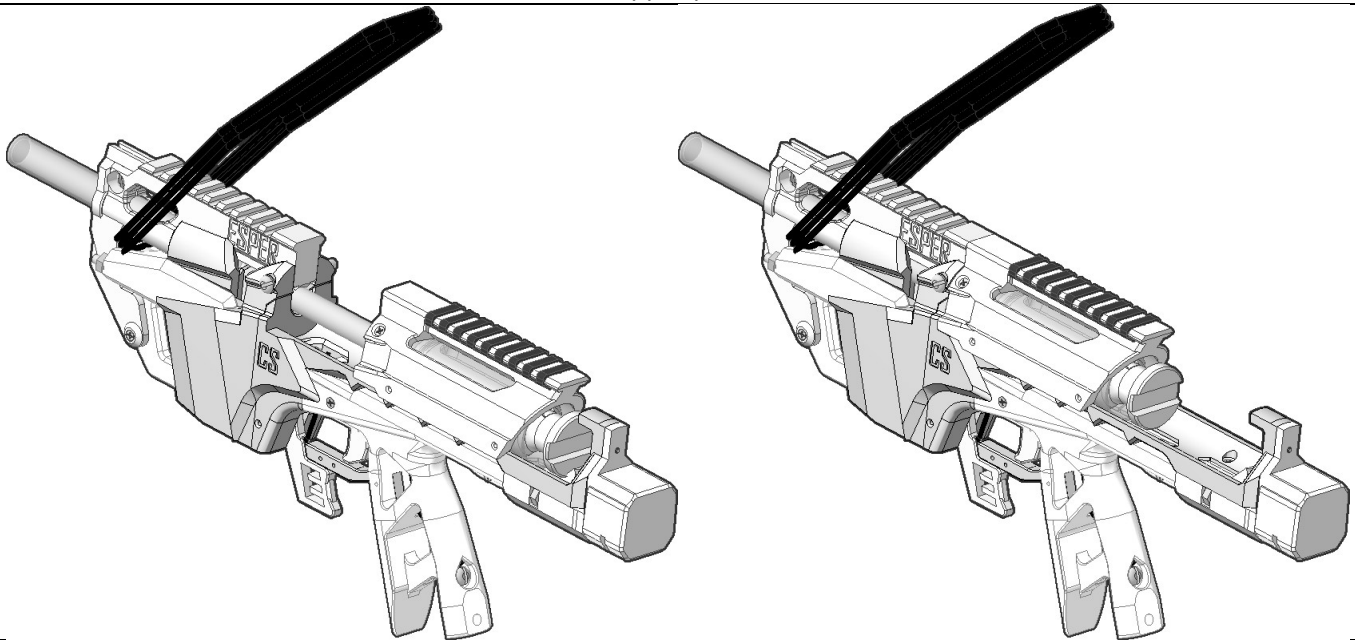
Slide the EDartJam print onto the front of the EMuzzle print until the holes in both line up. Drive a 4-40 screw into each side so that they act as an axle.



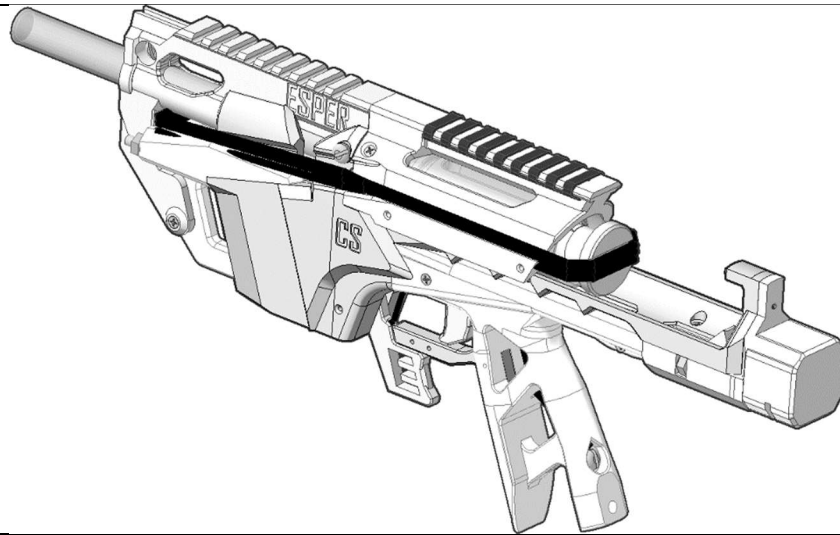
Measure out your desired length/load for the three larger diameter elastic bands then cut them. Tied the free ends with a tight square knot. Alternatively them from left-to-right, place the knotted ends of the cord loops onto the exposed 10-32 screw sticking out of the front of the EMuzzle print.



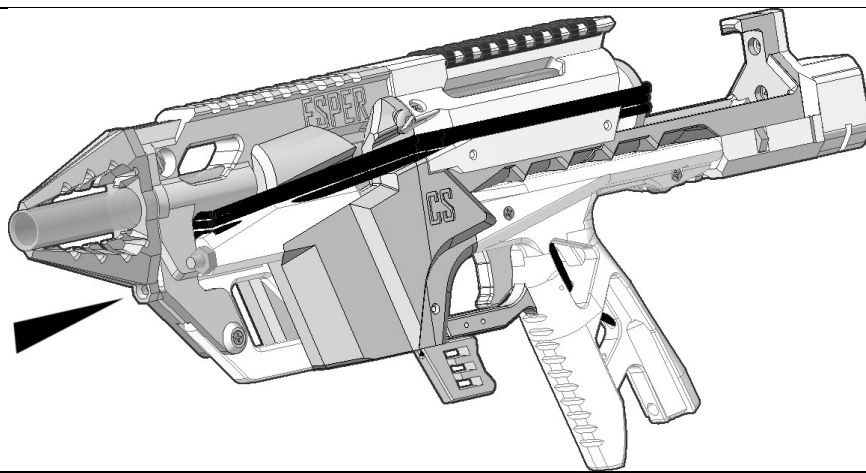
Holding all three cords upright, hinge the EDartJam closed until the hole in the back of it lines up with the hole in the EUpper print.



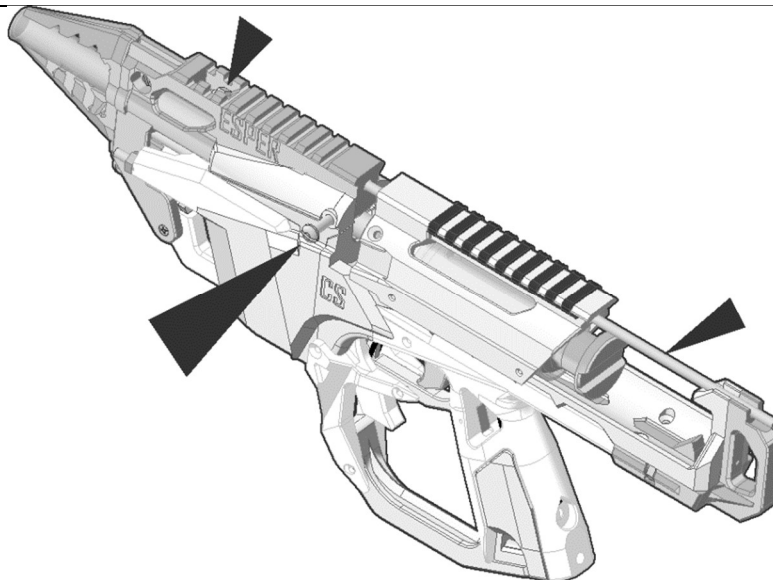
Sneak the end of the Ram Core into the hole at the back of ECoupler and EUpper, then pivot the rest of the "Bolt" assembly into the tray at the back of the blaster.
Slide the "Bolt" Assembly forward until it bottoms out.



From back-to-front in order, pull each main elastic cord into the slot at the back of the plunger until they're all seated in it.

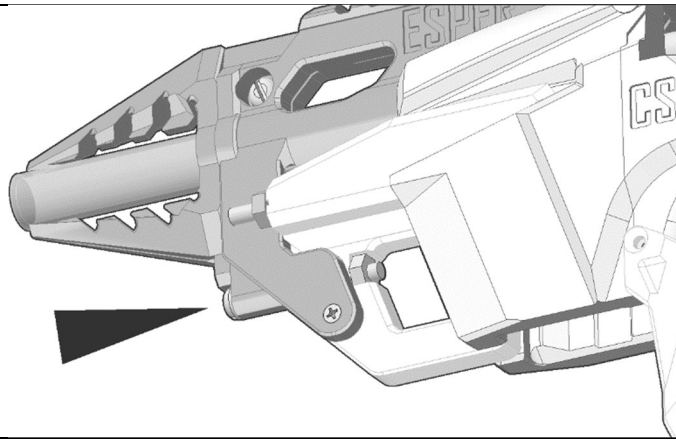


If opting for the "Pistol Mode" slide the Ebrake print onto the barrel and secure it with a 4-40 screw.



Insert a hex nut into the top of eDartjam, then slide the top threaded rod into the back of the blaster going through e-Pull and the eDartjam until it can be screwed into the hex nut. You can optionally add a hex nut to the opposite end of the threaded rod at the back of the blaster for a more secure hold.

Line up the hole in the eDartjam print with the holes in the eUpper print and push/drive a 1-3/4" screw through both. You can optionally add a hex nut to the opposite side for a more secure hold.



Slide a hex nut into the slot in the sling cutout in the EMuzzle print, then drive a 1-3/4" screw in through the front of eDartJam until it tightens the hex nut. This will prevent the impact of firing the plunger from stressing the hinge point.