# MEPR-X

(MPX Equivalent Printed Receiver)

# Assembly Guide

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# SECTION I: INTRODUCTION

I started work on the MEPR-X in late 2020. It was one of my first projects where I would recreate the receiver, and arguably be one of the longest development projects I'd spend time on. I have spent countless hours endlessly refining and optimizing the lower receiver for best fitment, ease-of-assembly, and durability.

The Sig Sauer MPX is a unique beast. While it has familiar controls, it is a gas-operated rotating-bolt 9mm, which is unique in a world of blowback-operated AR-9 platforms.

This was not a common parts kit to find. It was generously loaned to me for the express purpose of designing a baseline printable lower receiver model. It is arguably one of the rarest parts kits among the range of printable firearms.

In the three years I have spent working on printable firearms, I have gathered knowledge and experience that has been invaluable to designing effective models. The MEPR-X is one of many projects (among the DS1913, SW1522, and others) that are getting a refresh with my updated experience and design feedback.

For those that will ask, yes a EVO3/AK9 and Colt magazine remix is possible, however, I have no standing plans to incorporate them at this time.

If you are one of the fortunate folks who have an MPX parts kit, I hope you enjoy this model I've put together.

Vinh Nguyen

# SECTION II: TOOLS AND SHOPPING LIST

To assemble this firearm, you will **need** the following tools:

- Gunsmithing Punch Set
- Assorted Power Bit Set
    - With metric and imperial hex bits
- Metric Drill Bit Set
    - 2.5mm Drill Bit
    - 3.5mm Drill Bit
    - 4.0mm Drill Bit
    - 6.5mm Drill Bit

The following tools may help, but are **not required**:

- Flathead screwdriver

You can check out a recommended shopping list of tools Vinh keeps at his desk at www.vinhstoolbox.com.

# SECTION III: PARTS KIT CHECKLIST

In order to successfully build your MEPR-X…

## UPPER PARTS

A complete upper assembly should compose of the following:

- Upper receiver
- Bolt assembly
- Handguard

## LOWER PARTS

A complete lower parts kit should compose of the following:

- AR-15 Lower Parts Kit, including:
  - Trigger Bow
  - Trigger Bow Spring
  - Trigger Bow Guard (*MPX Specific)
  - Hammer
  - Hammer Spring
  - Fire Selector
  - Fire Selector Detent
  - Fire Selector Detent Spring
  - Fire Selector Ambidextrous Lever
  - Fire Selector Spring pin
  - Front Takedown Pin (*MPX/MCX specific)
  - Rear Takedown Pin
  - 2x Takedown Detent
  - 2x Takedown Detent Spring
  - Bolt-Catch
  - 2x Bolt-Catch Detent
  - Bolt-Catch Detent Spring
  - Bolt-Catch Pin
  - Magazine Release
  - Magazine Release Ambidextrous Side
  - Magazine Release Button (*MPX/MCX specific)
  - Magazine Release Spring
  - AR-15-compatible grip of your choosing
  - Bolt Buffer (*MPX/MCX specific)
  - Bolt Buffer Screw (*MPX/MCX specific)
- Standard Hardware, including:
  - 2x M4 Steel Hex Nut (MCC 90592A090)
  - 2x M4x30 Socket Head Screw (MCC 91290A176)

## MAGAZINES AND ACCESSORIES

Don't forget you will also need:

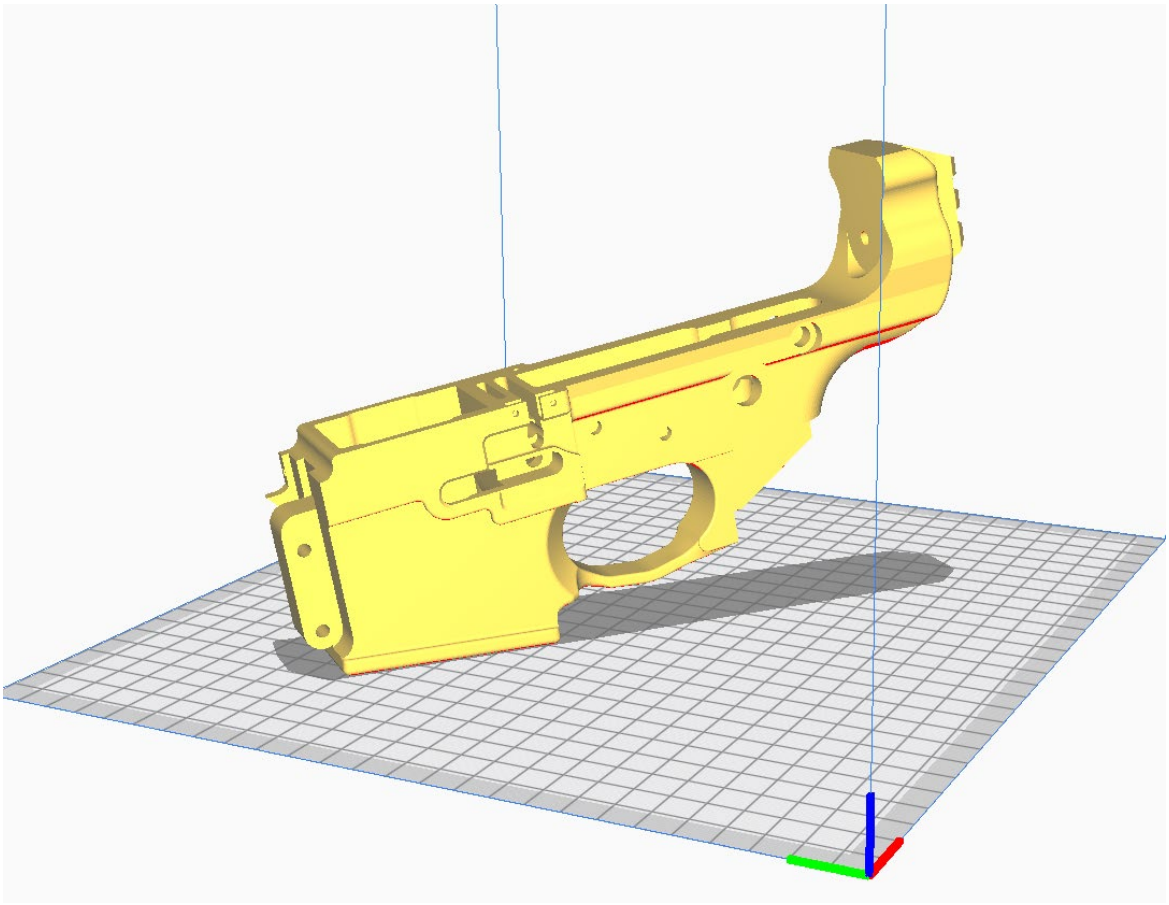
- Magazine
  - *Sig Sauer MPX Magazine*

You may also want to consider:

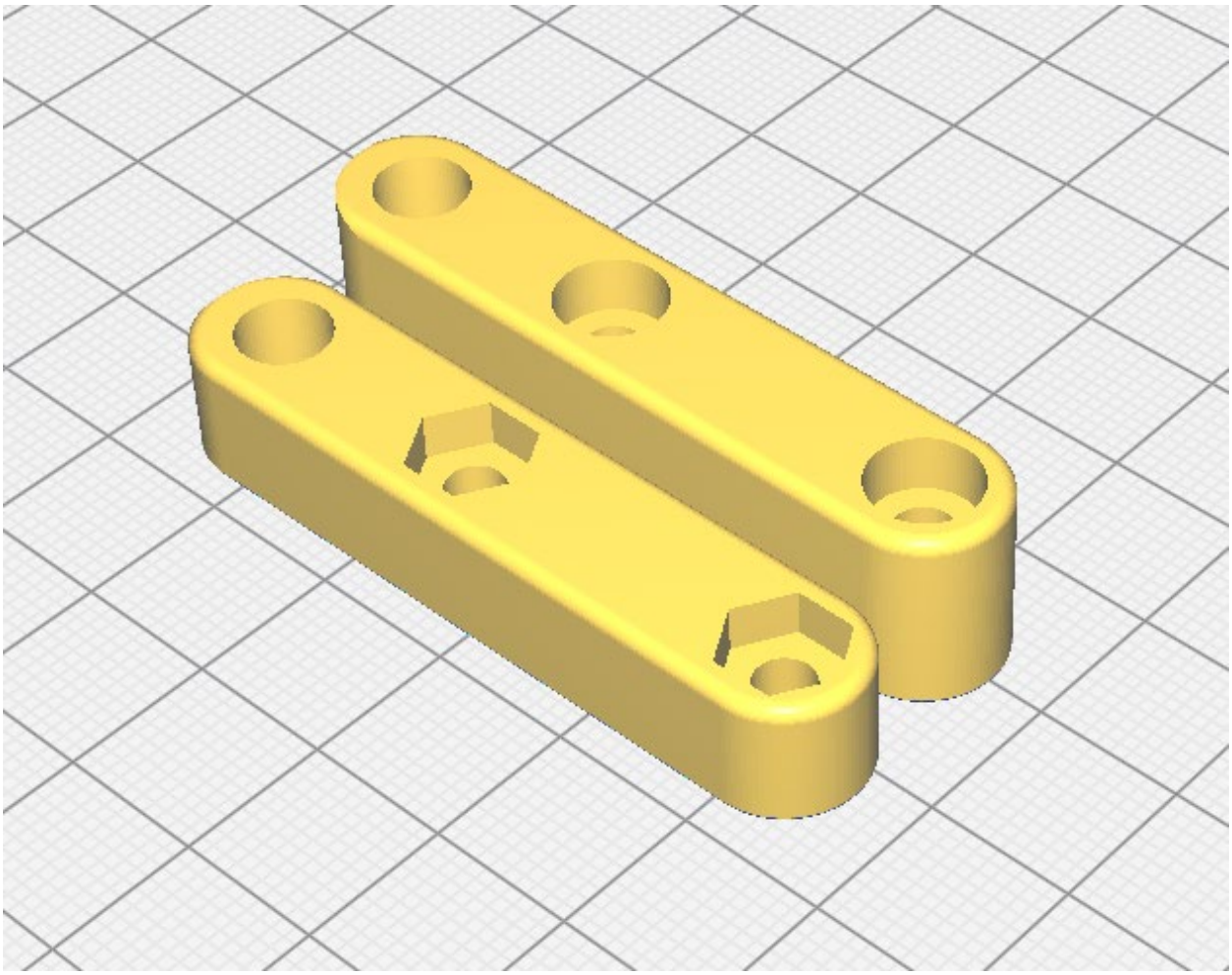
- Braces
  - SB Tactical Collapsing Brace for MPX
  - Strike Industries collapsing brace
- Stocks
  - Sig Sauer MPX/MCX folding stock
    - Many varieties offered
  - Manticore Arms collapsing stock

(While this may be common knowledge, it is a gentle reminder that you are responsible for ensuring your build does not run afoul of local laws you may be held to.)

## PRINT SETTINGS AND ORIENTATION



Print using the above orientation. Use Cura's "Align Face to Build Plate" tool under "Rotate" to orient the lower receiver with the magwell facing downwards onto the build plate.



Similarly, print the takedown standoffs with the outer-facing sides pointed upwards.

These were the printing settings used:

- Nozzle Size: 0.4mm
- Layer Height
  - Height: 0.16mm
  - Initial Height: 0.16mm
- Walls: 8
- Infill Density: 100%
- Supports: Tree Supports
- Bed Adhesion: Brim

eSUN PLA+ or PolyMaker PolyMax PLA+ is recommended for the lower receiver.

If you can, it is recommended to print the takedown standoffs using a nylon blend of your choice.

# SECTION IV: ASSEMBLY

In this section, we will cover the settings you should print your frame and assembling it.

## SAFETY FIRST

Putting a gun together is no joke. Firearms are dangerous tools that must be treated with care and respect. **You are responsible for your safety, and those surrounding you** when you work with or operate firearms. Fellow developers or engineers cannot be responsible or liable for what you do or don't do.

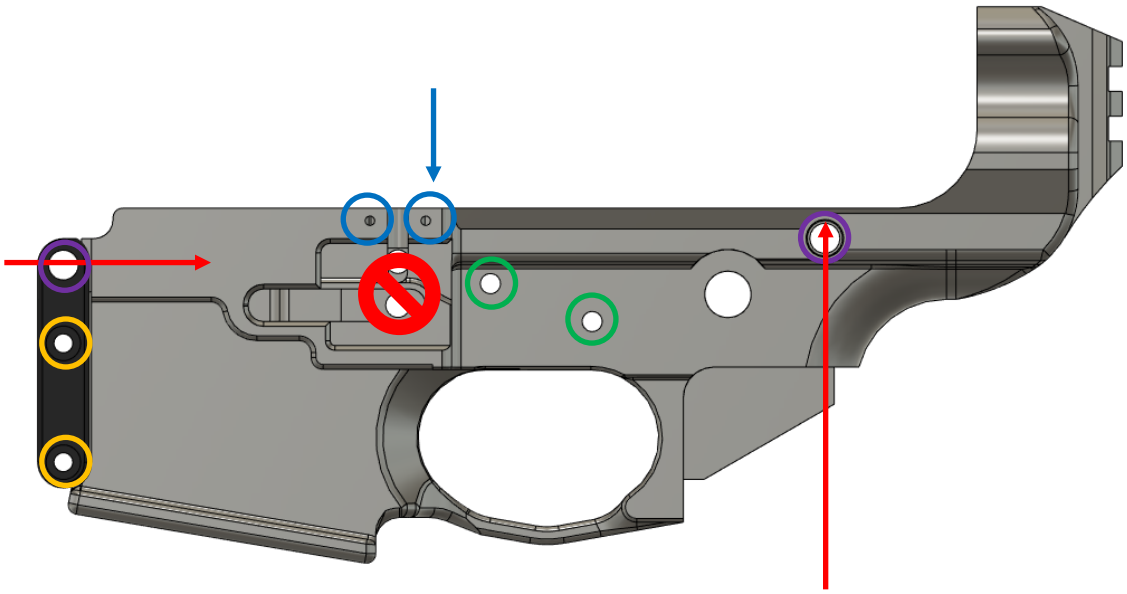
As a general reminder, here are some rules to keep in mind:

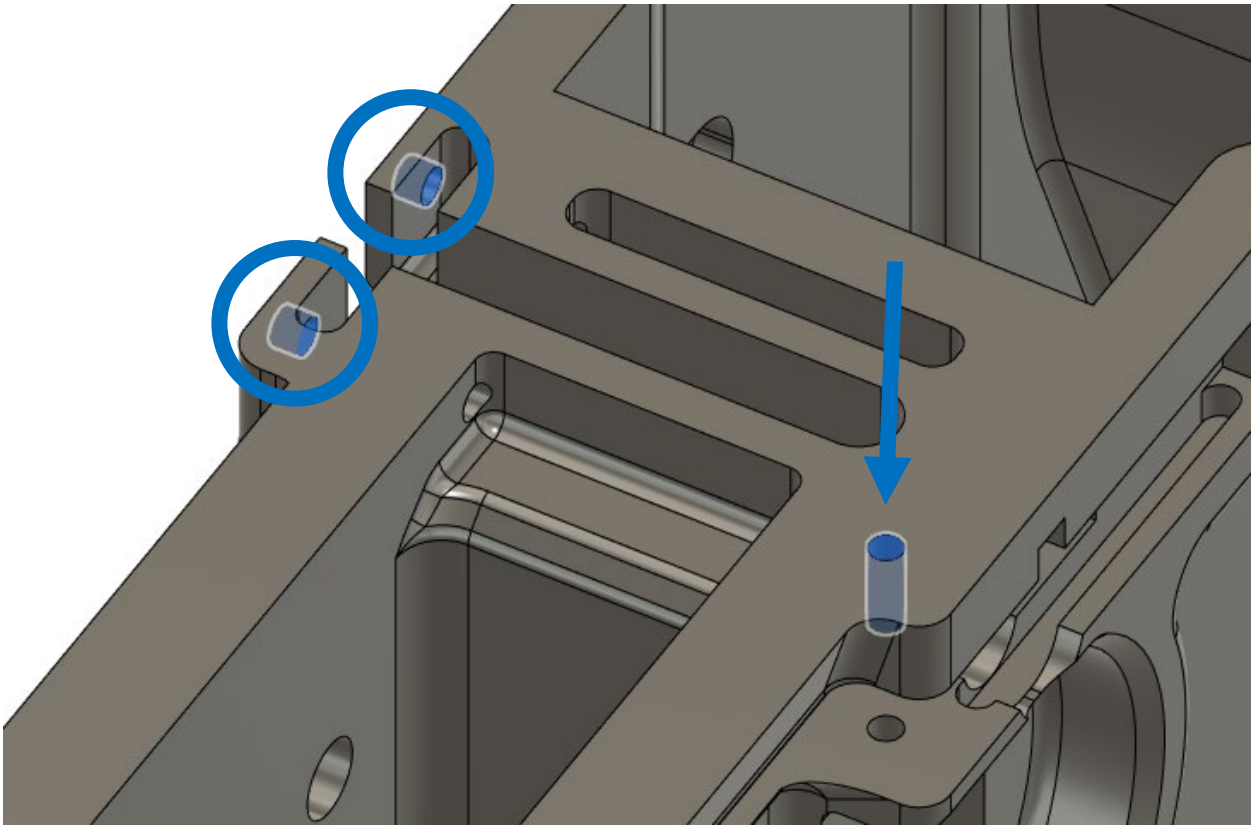
1. **Always treat a gun as if it is loaded**. Remove the magazine and check the chamber yourself to verify the gun is unloaded.
2. **Keep your firearm always pointed in a safe direction.** Never point your gun at anything you don't intend to destroy.
3. **Be aware of what is in front and behind of your target.**

But specifically, for working on your firearm, you should remember the following too:

1. **Keep live ammo away.** Use snap caps or dummy rounds to verify function of your firearm. Never keep live ammo around your workspace, and certainly never mix them with your dummy ammo.
2. **A clean gun is a safe gun.** Never leave your firearms uncared for to foul or dirty up. Debris can cause malfunctions, which can be dangerous.
3. **Always read and follow directions.** Don't ignore a warning or follow instructions out of order.
4. **Use prudent judgement.** If something doesn't add up- use common sense. Stop, inspect, and re-evaluate your previous actions and procedures.

# DRILL BIT CHASING GUIDE





**Use a drill bit to deburr and chase out the highligted holes above.**

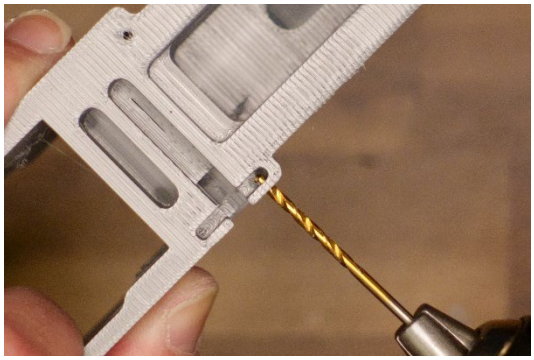
- RED - 2.5mm Drill Bit
  - 2x Takedown Pin Channels
- GREEN - 3.5mm Drill Bit
  - **CHASE THIS BY HAND if your print is suboptimal.**
  - 4x Fire Control Pin Holes
- ORANGE - 4.0mm Drill Bit
  - 2x Takedown Standoff Holes
  - 2x Takedown Standoff Holes on the standoffs
- PURPLE - 6.5mm Drill Bit
  - 4x Takedown Pin Holes
- BLUE – 1.5mm Drill Bit
  - 2x Bolt catch cross-pin hole
  - 1x Ambidextrous retention pin hole

**TIPS:**

- Use a power drill at low speed.
- Be gentle and work slowly to ensure the holes are clean and rounded.
- Insert the bit straight in- don't cant the bit or enter at an angle.

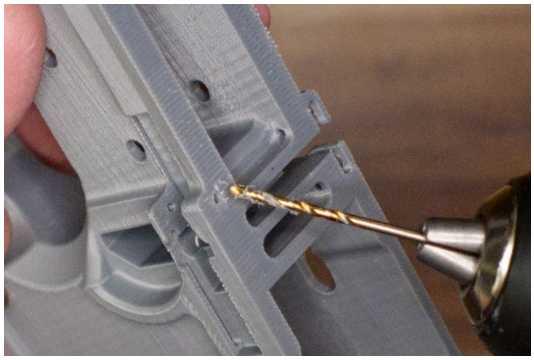
## PREPERATION

**Using a 1.5mm drill bit, chase out the outer-most face of the bolt-catch cross-pin geometry.**



**IMPORTANT! Do not drill through the other side.**

*Refer to the drilling diagram of highlighted faces where one must chase.*



**Using a 1.5mm drill bit, chase out the top-most face of the ambidextrous bolt release pin geometry.**

**IMPORTANT! Do not drill through the other side.**

**Using a 2.5mm drill bit, chase out the front takedown spring channel.**

Using a 2.5mm drill bit, chase out the rear takedown spring channel.

Using a 4.0mm drill bit, chase out the takedown offset screw geometry on the receiver.

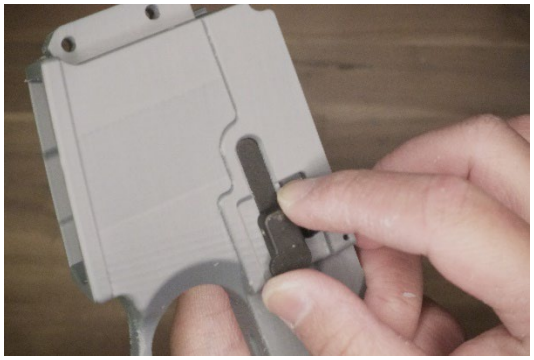
Using a 4.0mm drill bit, chase out the takedown offset screw geometry on the takedown offsets themselves.

Using a 6.5mm drill bit, chase out the takedown pin geometry on the receiver.

**Using a 6.5mm drill bit, chase out the takedown pin geometry on the takedown offsets.**

# LOWER RECEIVER INSTALLATION
# BASIC AR-15 ASSEMBLY

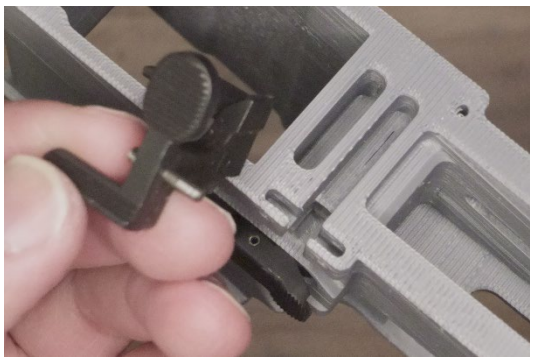
These steps will walk you through the basic AR-15 lower receiver part installation, but with detail given only to the MPX specific parts and instructions, as AR-15 lower assembly is considered common knowledge.



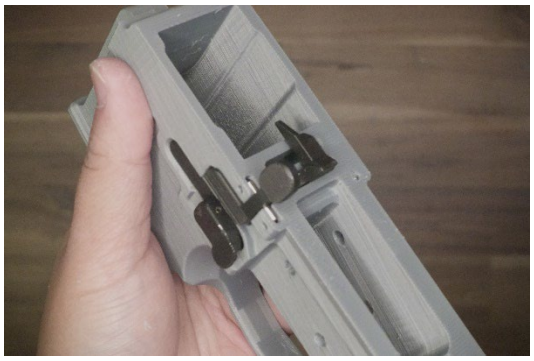
**Remove the magazine catch geometry of all debris. Fit and insert the magazine catch.**

**Place the magazine catch spring and magazine catch button into the lower receiver.**

**Spin the magazine release to secure it in place with the magazine release button.**



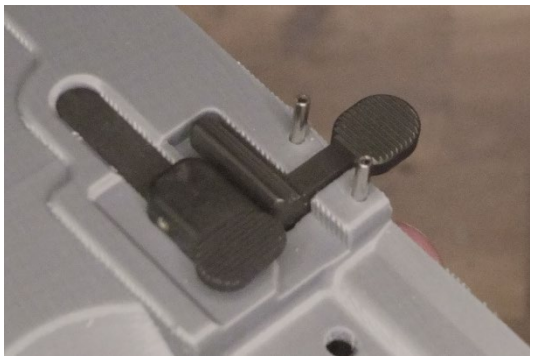
**Place the bolt catch into the bolt catch channel.**



Ensure that it is bottomed out into the receiver.

*(The picture to the left demonstrates an improperly seated bolt catch.)*

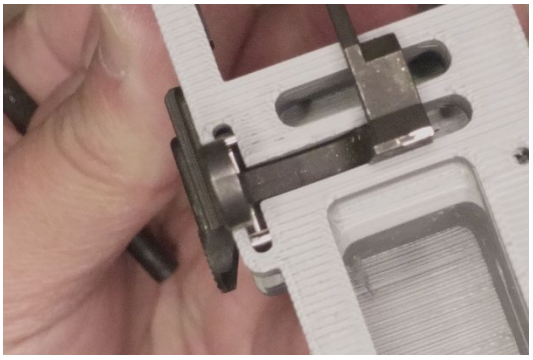
*(The picture to the left demonstrates a properly seated bolt catch.)*



**Insert the bolt catch cross pins into the receiver.**

These should easily seat, given the holes were properly chased with a 1.5mm drill bit earlier.

A starter punch may be helpful to seat the pins if your fingers are too wide.



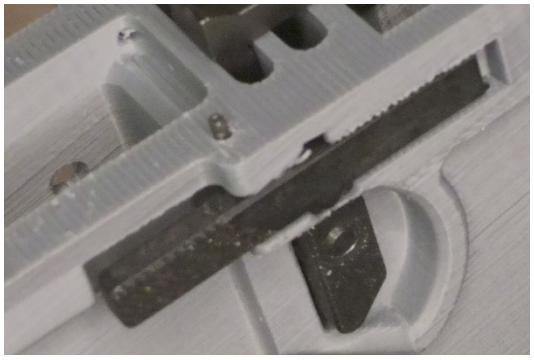
**Use the flat end of the starter punch to seat the pins flush into the receiver.**

**Prepare the bolt catch detents and spring.**

It should be arranged as: detent, spring, detent. Insert the spring and detent into the channel.

**Slide in the bolt catch ambidextrous control.**

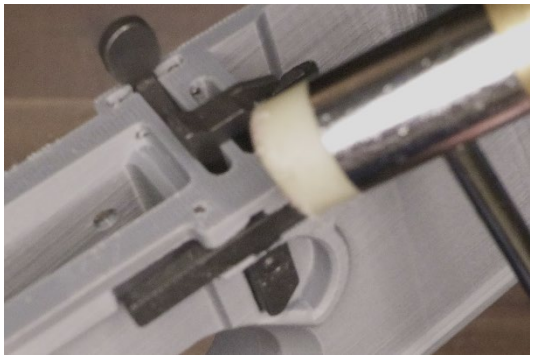
**Ensure the ambidextrous control is seated completely to the front of the receiver.**



**Insert the ambidextrous cross pin into the receiver.**

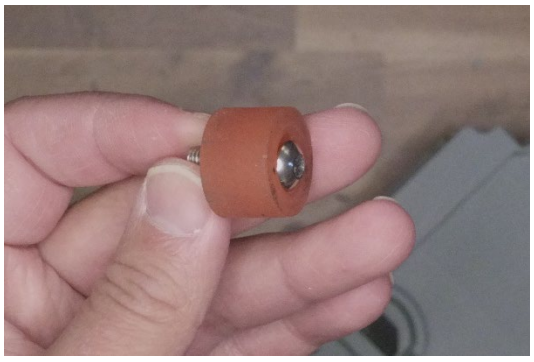
These should easily seat, given the holes were properly chased with a 1.5mm drill bit earlier.

A starter punch may be helpful to seat the pins if your fingers are too wide.



**Seat the pin flush into the receiver.**

Use the flat end of the starter punch to help seat the pins flush into the receiver, if needed.

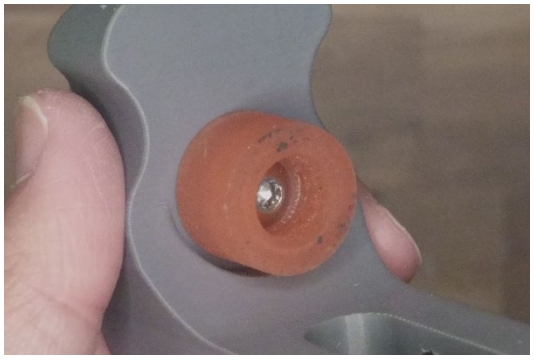


**Prepare the buffer and buffer screw.**

**Screw in the buffer to the rear of the receiver.**

Be sure you do NOT overtighten the screw, or it will strip the lower receiver.

The screw should self-tap into the lower.



There should be no play or wobble in a properly tightened buffer.

**Prepare the trigger assembly.**

The trigger assembly should be partially assembled with the trigger spring, disconnector, disconnector spring, and hammer guard.

IMPORTANT: DO NOT OMIT INSTALLING THE HAMMER GUARD. It is there to protect the trigger from the impulse of the bolt.

**Insert the trigger assembly and pin it in place.**

**Prepare the hammer assembly.**

Insert the hammer assembly and pin it in place.

Insert the fire-selector.

Insert the rear takedown pin.

Insert the takedown detent and fire selector detent.

Place the takedown spring into the channel on the receiver.

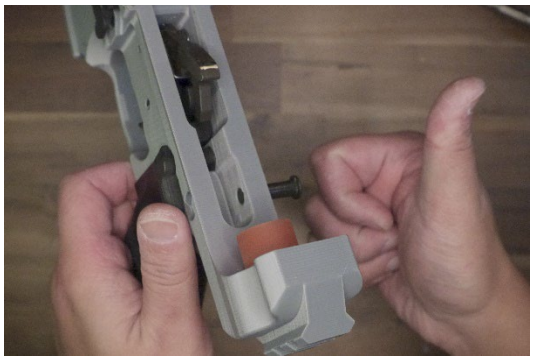
Place the fire-selector detent spring into the grip.

**Guide the grip to seat. Ensure the springs do not kink.**

**Screw in the grip screw to the receiver.**

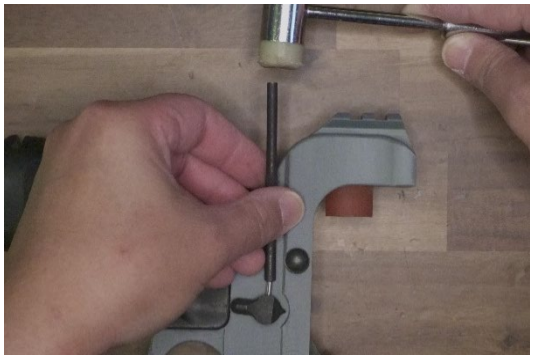
Be sure you do NOT overtighten the screw, or it will strip the lower receiver.

The screw should self-tap into the lower.



**Briefly check the rear takedown pin and fire-selector.** Both should move smoothly, and with a tactile feeling of the detent engaging.

**Place the ambidextrous fire-control onto the fire-control selector.**

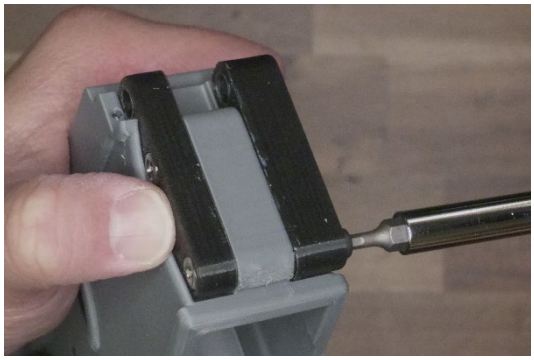


**Pin it in place.**

*(continued.)*

# TAKEDOWN-OFFSET INSTALLATION

**Place the nuts into the takedown offset.**



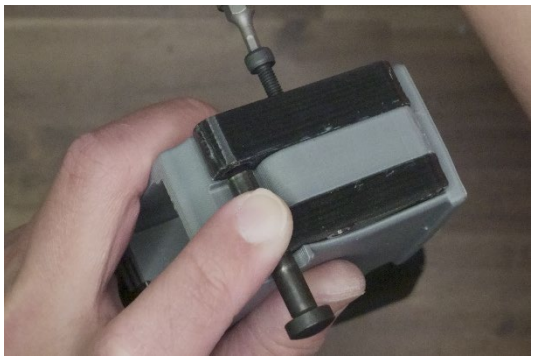
**Place the takedowns on the receiver. Thread in the bottom takedown offset screw.**

(Do not tighten. The offsets must be able to pivot.)

**Prepare the takedown detent and takedown spring. Place the spring into the channel.**

**Using the takedown pin, pivot the takedown offset on top of the detent into the spring in the channel.**

*(continued)*



**Pivot down the other takedown offset. Secure and tighten the takedown offset screw.**

**Tighten all the offset screws.**

# SECTION V: FUNCTION CHECK

Verify your firearm works by evaluating each of the following functions.

**BE SURE YOUR GUN IS STILL UNLOADED.**

**Check that your chamber is empty, and that there are no rounds in the magazine.**

- Magazine Release Function
  - Insert and remove the magazine.
  - Test the magazine release for fluid movement.
- Fire Control Function
  - **DO NOT LET THE HAMMER FALL FREELY ONTO THE LOWER.**
  - The hammer should fall when the trigger is pulled.
  - The hammer should be held back when it its reset while the trigger is held down.

    - Release the trigger while the hammer is in the disconnected position should gently put the hammer back into the cocked state.
    - Safety should freely rotate between SAFE and FIRE.
    - When the safety is in SAFE, the hammer should not drop when the trigger is pulled.
- Takedown Function
    - The takedown should be able to move freely, with or without stiffness.

When you have completed the function check, the assembly process is complete.

Be sure to remove your magazine and store your firearm in a secure and safe place.

# SECTION VI: TROUBLESHOOTING

You may encounter certain problems with your firearm either during usage or assembly.

- Grip screw geometry stripped
    - Do not over tighten the grip screw. You can still salvage this if you melt some loose filament against the wall of the grip screw channel.