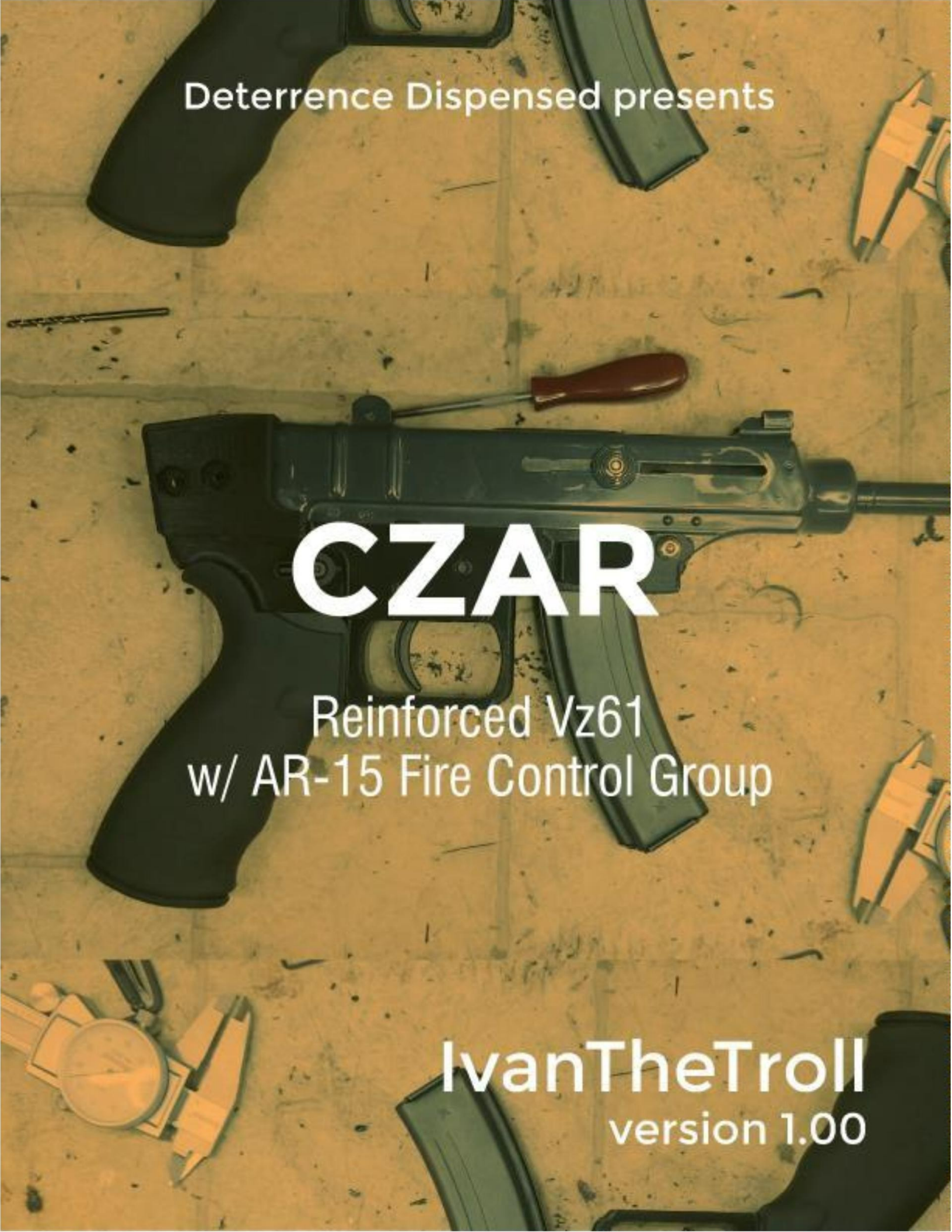

Deterrence Dispensed presents
CZAR
Reinforced Vz61
w/ AR-15 Fire Control Group
IvanTheTroll
version 1.00

Preface

The CZAR Reinforced Vz61 AR15 FCG Receiver is an update to FMDA's original Vz61 AR15 FCG Receiver. After having put about 2k rounds through the original models, I had identified two key places that tend to wear out/crack. This project/update was aimed at reinforcing those points so that printed Vz61 receivers can easily surpass 1000 rounds on a single receiver.

You can watch this assembly process on video here:
https://lbry.tv/@Ivan's_CAD_Streams:c/Vz61TutorialV1.0:c

I recommend you use this document as to supplement the video, having text-based steps helps keep things organized, being able to see things in real time helps clear up confusing instructions.

Do not be intimidated by the length of the build video/tutorial – this process is not much more complex than assembling an AR15 from parts. With a little patience, the extensive tutorial value provided by this document and the build video should be able to help coach you through the build.

If you have found this tutorial useful, consider sending me Bitcoin to further development of this sort of thing – there is much more to explore in 3D printed guns, DIY guns, DIY ammo, etc.

Bittube:Tubed6E8i2J7pPp1MuASSjZpUkmunPcZgEogo1
6dggDWS7KFSt4dq9TAM9aTyVAGBrhM1gwvsafoX9rjM
Mc1RstVgHko8Sy9iy3

For Michael – You Are Missed.

Remember that it is our shared responsibility to be safe and smart with firearms and show the world there is a peaceful way to own guns – take the time to get training, to learn basic (and advanced) safety rules, and to share the hobby with everyone interested – those most scared of guns in the hands of the people are often the ones who have no experience with guns in the first place.

Table of Contents

Shopping List

This list will cover what supplies you will need for a CZAR build. You will need some basic tools, such as a ¼-28 tap, metric and imperial drill bit indices, and a drill. The build video details the tools I use at the beginning – I recommend you take a peek just to make sure you're on the right path in that regard.

Vz61 32ACP Parts Kit

The big-ticket item for this build will be a Vz61 parts kit. Most of these kits are from old military guns. While you will not need the stock, original fire control parts, nor the grip parts or trigger guard, most kits include these – you can just stick them in a box and forget about them. The parts to ensure you have is an upper receiver (with trunnion installed, it's EXTREMELY uncommon to find them **without** a trunnion, they usually have one), a barrel (ideally already installed and pinned into the upper receiver), a bolt assembly (including recoil spring and guide rod setup), a magazine catch, a bolt catch, and an ejector/ejector plunger. If you aren't sure if a kit has all the right parts, refer to the video where you can see me assemble each part, and cross reference with Numrich's diagram for the Vz61 (https://www.gunpartscorp.com/gun-manufacturer/cz/machine-guns-cz/vz-61-skorpion).

The best source for these kits seems to be Gunbroker – search for 'Vz61 Parts Kit'. These kits are becoming a little uncommon, though at least one importer occasionally brings commercial manufacture kits in.

If Gunbroker runs out of kits, I bought a kit from this company before it changed ownership – I would imagine they are still good to go: https://www.sargesmilitaryvault.com/product/skorpion-vz-61-with-barrel/

Example of a Vz61 Parts Kit

AR15 Parts

I know this receiver works with Milspec, LaRue MBT, and BFSIII AR15 fire control groups. I would imagine it is compatible with a great deal more drop-in triggers but cannot confirm that. Nothing special is required here, so the decision is up to you.

NOTE: If you don't want to print an AR15 (or the special Vz61-inspired AR15 grip that salo_ developed), you will need to buy and AR15 grip. You **WILL** need an AR15 grip screw regardless (though a generic ¼-28 bolt will work for this)

NOTE: You will need a safety, safety detent, and safety detent spring in addition to your fire control groups. More fire control groups do not include a safety, so you may have to get an AR15 lower parts kit that has a safety (these run about 20 bucks).

MilSpec AR15 Fire Control Group. Note that the safety, safety detent, and safety detent spring are not pictured!

AR15 Grip and Grip Screw

5mm or 3/16” Bolt, 1.5” Long

This bolt will act as your front takedown pin. You could use a 5mm pin if you wanted, but using a bolt ensures it won’t come loose as easily. If you worry about your bolt coming loose, get a bolt that is 1.6” long or so and use a nut on it.

Note: You can cut down a 2” bolt or whatever size bolt you find to make it the proper length.

Important Note: As I describe in the video, you can use 5mm or 3/16” bolts. If you use a 3/16”, you won’t need to drill out the front holes with a drill bit, and any warp your receiver has can be negated by the slightly smaller diameter of the 3/16” bolt. The 3/16” bolt still holds the upper on tight enough that there is no real wiggle/loose fit. The choice is yours, but I prefer using the 3/16” bolt.

5mm (or 3/16”) Bolt

Tooling:

You will need a 3mm, 4mm, 9mm, 5/32”, and a 3/8” drill bit. You will need a way to drive these drill bits (cheap battery drill). You will need a ¼-28” tap and a way to spin it (a wrench or tap handle). It will help to have 1/8” and 1/16” punches. You may need a hammer and drift/dowel rod. You will need whatever setup is required to install your pistol grip and the front takedown pin that you choose.

Build Tutorial

I recommend you read this section in its entirety, then watch the build video while you go about building your CZAR. You are, of course, free to build as you would like, but having the manual in your mind while watching the video should make each step clear.

REFER TO THE README FOR BASIC PRINT INFORMATION

Step 1: Lay Out Your Parts

This step is simple – gather up all your parts and lay them out. Make sure you have all the parts you need. If you are going to be cutting down any bolts or pins, go ahead and do so now. If you cut down a bolt, remember that you will need to apply a chamfer around the end you cut down and will need to ensure that nuts can still thread easily on to the bolt.

Spread of parts and tools used in assembling a CZAR

Step 2: Install Vz61 Parts

Take your 9mm, 4mm, and 3mm drill bits. You will drill out the hole for the magazine catch with the 9mm bit (I recommend you set the drill in reverse so that you don't drill through the receiver!). Insert the magazine catch drum and ensure it moves freely. If it doesn't, make sure the keyway (slot at the top of the mag catch hole) is free of any remaining support material/crud. If it is clear, drill just a little more. Remove the mag catch. Next, take your 4mm bit and drill out the hole for the bolt catch. Refer to the video if your bolt catch doesn't move freely after drill out its hole. Remove the bolt catch. Next, take your 3mm drill bit and carefully drill out the hole for the ejector retention plunger. Be sure not to drill the hole any deeper than it already is (drill slowly and don't let the drill bite). Ensure the plunger moves freely. Remove the plunger. Next, take your ejector and try installing it. **ENSURE THE SLOT IS FREE OF ALL SUPPORT MATERIAL AND CRUD BEFORE INSTALLING!** I recommend using a drift/dowel rod to push the ejector back into its slot. It shouldn't take much force to get it to fit, light taps from a hammer at most. If you get it to move into place, remove it. If it doesn't get all the way into place, remove it and ensure the support material is removed.

Finally, take your 9mm, 4mm, and 3mm drill bits and use them by hand to ensure each of their respective holes are still clean and clear of debris. Ensure each component can move free in its hole still. You are now ready to install these parts. I recommend you refer to the video for this process. You will place the magazine catch into its hole, insert the bolt catch, press the magazine catch in and hold it, place the ejector retention plunger in place, press it down, slide the ejector back over the depressed plunger, release the magazine catch, then seat the ejector. Ensure the bolt catch and magazine catch move freely, then test magazine insertion and release. If either part binds or magazines don't fit, you may have to disassemble and find whatever is causing your problem (likely a print error or remaining support material).

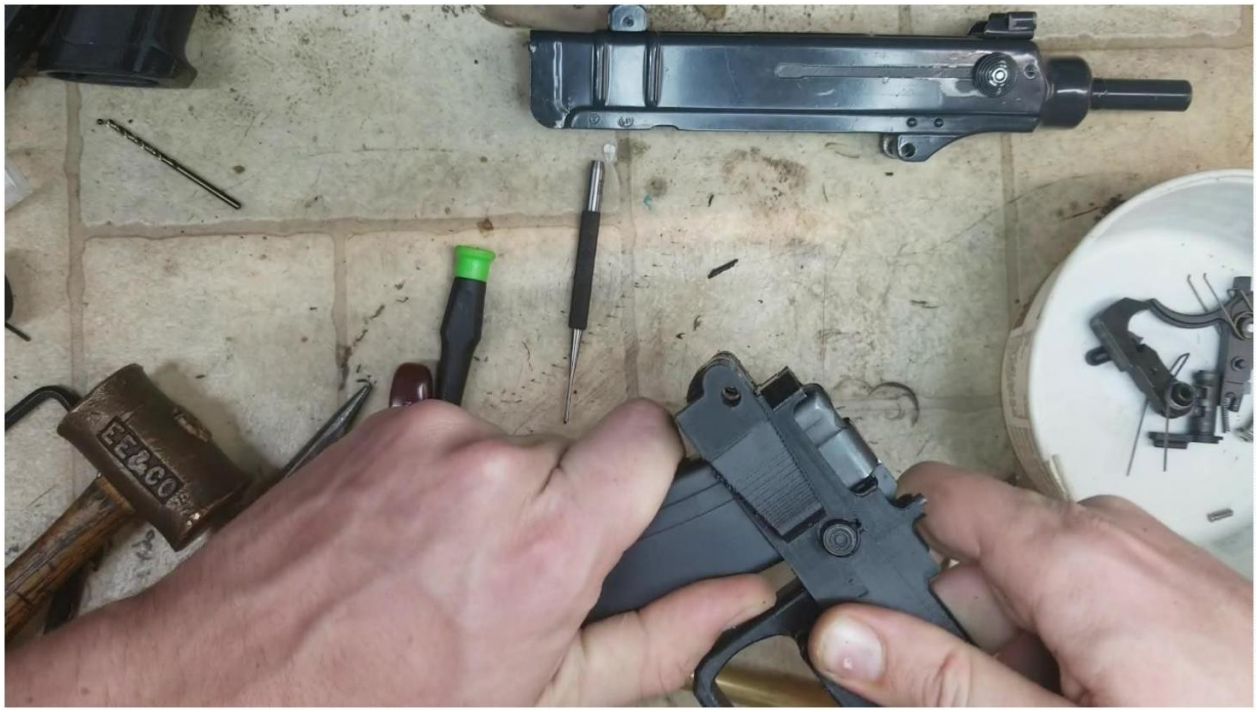
Magazine Catch Drilling

Bolt Catch Drilling

Plunger Drilling

Ejector Test Fit

Parts Installed In Receiver



Magazine Fitment Test

Step 3: Install AR15 Parts

Take your 5/32” and 3/8” drill bits and your receiver from Step 2. Use the 5/32” drill bit to drill out the hammer and trigger pin holes (and the safety selector detent hole), then use the 3/8” bit to drill out the selector hole. Allow the drill bit to spin while moving the drill in and out of the fire selector hole to ensure it won’t fit too tight on the selector itself. Next, take your ¼-28” tap and tap the pistol grip screw hole. Refer to the video if you don’t know how to use a tap: be sure and cut your chips often and use plenty of oil.

After tapping, you are ready to begin installing parts (this process will be identical to how these parts install on an AR15). Install the trigger/disconnector first. Install the hammer next. Install the safety selector when the hammer is cocked. Leave the selector on safe and install the pistol grip along with the selector detent and selector detent spring. With the grip installed, do a basic function test – ensure the hammer will drop when it should and doesn’t when on safe. Do not let the hammer slam against the receiver, catch it with your hand.

Drilling Fire Control Group Holes

Drilling Selector Detent Hole

Drilling Selector Hole

Tapping Grip Screw Hole

Installing Hammer and Trigger

Installing Selector (Ensure it can Move Freely/Isn't Tight)

Installing Pistol Grip/Detent/Detent Spring

Parts Installed. Be Sure to Function Check!

Finishing Up:

Your final step will involve your choice of using an M5 or 3/16” (1.5” long) bolt/pin for your front takedown hardware. If you are using an M5, drill out the front takedown hole with a 5mm drill. If you are using a 3/16”, you don’t need to drill (unless you want a push-fit and don’t want it to thread in, in which case you can drill with a 3/16” drill). If you have a pin, drill the hole the size of the pin.

Next, take your upper receiver. The first time you install it, it will fit fairly tight. Refer to the video for tips on getting the upper to line up correctly. Place the front end of the upper and lower together and hinge them together. Ensure that you don’t accidently push the bolt out of the back of the upper at all. Hinge downward until the upper is parallel to the lower. At this point, you should be able to push the upper backwards, into the lower. I recommend pushing down on the assembly, barrel down, using a t-shirt or rag to protect the barrel from whatever surface you are pushing against. You should be able to feel the upper fully seat itself in the lower after you push. At this point, the front pin hole should line up, and you can stick your bolt or pin through. If it doesn’t line up, ensure the upper is fully seated and that your print didn’t warp – if it warped, you may be able to use a drill to force the pin holes to line up (drill the holes in the lower receiver in the direction they need to go to line up with the upper).

With the upper installed, perform a final function check. Your bolt may feel a little tight as it passes over your hammer – this is normal, but if it bothers you, you can get a lightweight hammer spring. If you think it might be an issue, put a little grease on the front face of the hammer. You may have the cycle the gun with a little vigor, depending on how stiff your hammer/disconnector spring is – when firing, this won’t be an issue, as that is plenty vigorous. Perform a dry-fire/safety test with the selector.

At this point, you can test hand-feeding rounds if you would like. Otherwise, you are set for test firing.

FAQ/Troubleshooting

Q: What sort of round counts should I expect? What ends up breaking?

A: Expect at least 1000 rounds. If I had to guess, the rear tower may develop a small crack over time. With the reinforced front takedown lug, there is no real danger of a bolt flying backward (the upper can't hinge open if the tower breaks), so worst case scenario is that the front takedown lug breaks and your upper falls off forward.

Q: What sort of reliability should I expect?

A: My builds have been extremely reliable. The Vz61 is a sturdy, well designed firearm. The biggest issue with it comes from it's magazines – 32ACP is semi-rimmed, which means it doesn't play very nice in mags. When loading your magazines, ensure that you never push rounds down on top of each other, and instead push them in from the front of the mag towards the back – as if it were a single stack magazine. This helps to avoid getting the rim of an upper cartridge stuck behind the rim of a lower cartridge (which causes a failure to feed). I tried to get the magwell just tight enough that mags can drop free (at least on prints that match how my printer turned my receivers out), but still has so little slop that gripping the gun by the magazine won't induce feeding issues.

Q: Why is it hard to cock/rack the bolt?

A: This is likely because your fire control group is stiff. Putting a little grease on the front of the hammer may help some. Cycling vigorously (snapping the bolt back like you would on a 1911 with a stiff recoil spring) should overcome the drag from the hammer.

Q: What parts kits work?

A: Original/milsurp 32ACP kits will definitely work. I believe that commercial 32ACP kits will also work. I don't think 9x17 or 9x18mm kits will work without changing the magwell/mag catch geometry. 22lr kits should use the receiver found here: https://lbry.tv/@Deterrence-Dispensed:2/Vs22-1.00:0, as the 22lr kits seem to have differing specs than the 32ACP kits.

Q: What mags work?

A: OEM Vz61 mags work great. I haven't tested any aftermarket options, and OEM mags are quite cheap, so try and stick with those.

Q: Why won’t my upper receiver align with my lower receiver?

A: Your receiver may have warped a little during printing. Visually inspect the lower to ensure this isn’t the case. You may also still have some support material remaining in the cutouts on the lower that the upper sits inside – ensure that there is no support material left in the tower at the rear of the receiver, or at the front takedown lug area.

Q: Where can I find the files for a brace setup?

A: This download package includes files for a very simple tube that will work with the Shockwave Blade pistol brace. Other braces, like those that work with the MacDaddy, will work on this receiver.