



PF940SC, PF940C and PF940v2 Pistol Frames, 80% Milling Instructions

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Subcompact Pistol Frame, PF940SC



Compact Pistol Frame, PF940C



Standard Pistol Frame, PF940v2

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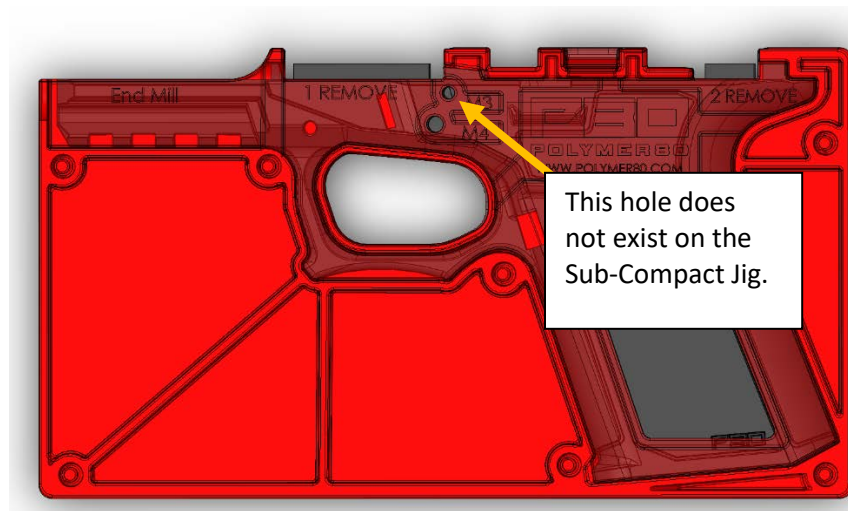
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Introduction

Thanks for choosing our products, we're very appreciative of your business. Polymer80 products are designed with quality in mind, but also with the idea that this should be a fun experience. The P80 pistol that you build will be the pride and joy of your gun safe because you brought it to life with your own hands. Each time you pick up this firearm, you'll feel a sense of pride and accomplishment. You'll feel quality in the field, a smooth operating pistol that feels good in the hand, that has the latest in ergonomic features that make you a better shooter with a more accurate gun. It's the best of both worlds, and each and every person at Polymer80 absolutely believe this to our core.

The following instructions designed to work with both the Sub-Compact, Compact and the Standard Pistol Frames, there are no differences between the builds, with one exception:

On the Sub-Compact pistol frame, the Jig does not have a locking block pin hole. It is not needed on this frame build. Therefore, you should notice that the jig is missing that hole during jig examination.



At the end of this document, there's a few tips on installation of the Locking Block Rail System, which has a very tight fit, particularly on the V2 frame. We have a few pointers to help you install this component.

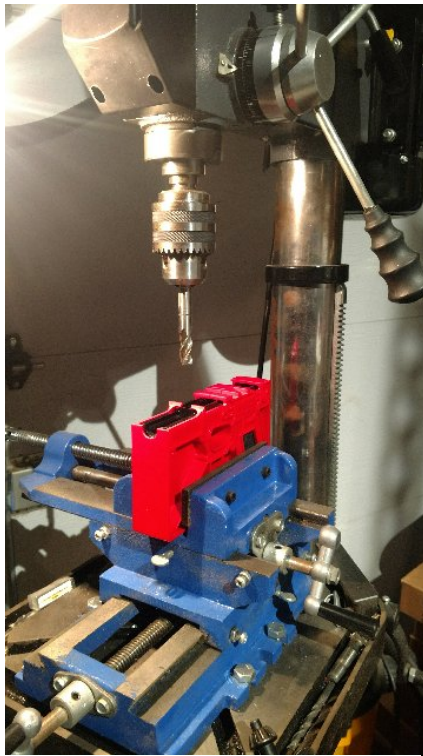
The instructions are critical to understanding the details of how to build the pistol frame properly. **These instructions override any Polymer80 produced video or any other online videos/reviews**, because videos are difficult to update and control in terms of current versioning. Therefore, this is the control document which guarantees you the latest information required to finish your pistol project properly.

There are key details concerning how to mill and drill in this document that may surprise even the most experienced gunsmith or machinist. Please read the instructions to ensure your project is completed with quality and satisfaction.

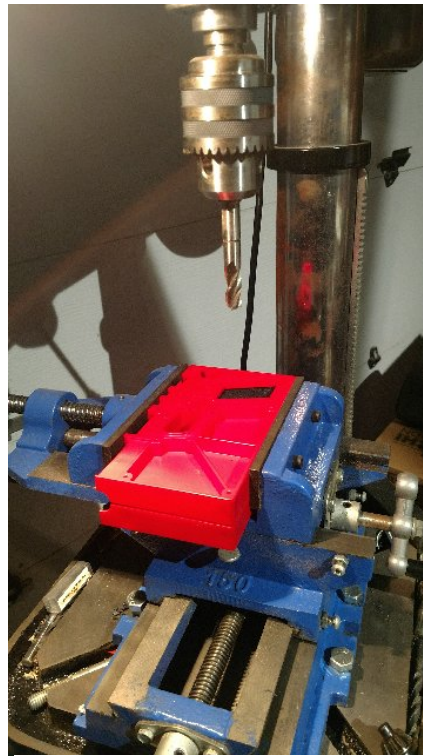
Warnings & Issues That Impact Warranty Coverage

Polymer80, Inc. stands by our product and offers excellent no-hassle warranty coverage. However, there are limits to coverage, particularly when the customer damages the product through poor craftsmanship or improper control during the milling process, and when they drill holes using the wrong tools. Additionally, after the milling is completed, the build process seems to be where most people get into trouble, particularly during assembly and cleaning. Here are key areas that you need to watch for:

1. **Do not drill the pin holes using a drill press on the cross vise. Drill the pin holes using the bench vise and hand drill!**
2. Only use Loctite that is approved for contact with polymer based products. Super Glue versions are not to be used on the polymer.
3. Chemicals: Generally, you do not use penetrating lubricants on polymer products, they can damage the material.
 - a. **Do not put acetone on the receiver.** Acetone will generally instantly destroy, tarnish, or weaken any polymer-based product.
 - b. Many oils are combined with rust penetrants or some other type of penetrant which can damage polymer based products. Regular gun oil, high quality grease or simple household oils can be used.
 - c. Do not utilize brake cleaner (it has acetone in it) or rust penetrants, they penetrate through polymer.
4. Do not overtighten the jig in any vise, you can adversely adjust placement of holes to the pistol frame. Pin hole drill placements are critical on the pistol frame function.
5. *The jig isn't designed to be gripped from the top and bottom edges.* Rather, the jig is designed to be used in a regular bench vise for the pin holes standing upright, and on a cross vise **also standing upright**.



GOOD



BAD

P80-PF940 Series Frames - Parts List

Part Description	ITEM SKU	Qty per Kit
PF940 Pistol Frame Lower	PF940Cv1 (compact) PF940v2 (standard)	1
Red Jig for the PF940	PJ940C (compact) or PJ940 (standard)	1
Locking Block Rail System and Trigger Mechanism Housing Pins, 3mm diameter x 25mm long pins	P80-PFP-M325Pin1	2
Locking Block Rail System Hardened stainless steel and coated	P80-LBRS940Cv1(compact) P80-LBRS940v2 (standard)	1
Rear Rail Module Hardened stainless steel and coated	P80-PFP-940RRM1	1
Large End Mill Bit, Stainless Steel	Universal End Mill 9mm Diameter End Mill	1
M3 Drill Bit – For drilling the Locking Block and Trigger Mechanism Housing pin holes	3mm Diameter Drill Bit	1
M4 Drill Bit - For drilling the trigger pin hole	4mm Diameter Drill Bit	1

Methods of Finishing the Lower Receiver:

The goal of finishing the lower receiver is to mill out the following with the assistance of the jig:

- a. The holes for the pins, on each side of the receiver.
- b. Mill the barrel guard and ribbing on the top of the receiver to allow the barrel and slide fit later in the build process.
- c. Mill off the rear ribbing to allow for the installation of the Rear Rail Module (RRM)
- d. Install the Polymer80 Locking Block Rail System (LBRS) provided with the kit.
- e. Install the Rear Rail Module provided with the kit.

These instructions will guide you through the process of milling and installing the locking block rail system and rear rail module. There are different techniques utilized. In general, we will cover utilizing a drill press which has a cross vise installed on the drill press table. We won't go into much detail for those who have milling machines; the assumption is that a user at this level would already have strong milling and technical skills, allowing them to adapt to the following instructions.

Different techniques will result in different qualities of finish. We prefer to utilize a drill press with a cross vise because it is faster, requires less time to set up, and you have absolute control if the cross vise is utilized properly.

In all cases, use the included jig and drill bits and always level the jig in your vise:

For finish work, we prefer to use hand tools and sheets of sand paper rather than a Dremel tool for clean up because of the precision control and feel that is required. Dremels can do a WLDQ (Whole-Lotta-Damage-Quick).

Example Tools

Example Tools	Additional Information
Cross Vise for Drill Press	http://www.northerntool.com/shop/tools/product_200199324_200199324
Drill Press	http://www.harborfreight.com/catalogsearch/result?q=drill+press
Level	Utilized to ensure the drill press table is flat
Sand Paper	220 grit to fine tune milled areas and to clean up any rough edges of the nylon blended polymer utilized in the frame
Bench Vise	Utilized to drill the side holes for the (3) different pins used on the frame, and to install the Polymer80 Locking Block Rail System
Hand Drill	Used to drill the pin holes
Small Hammer and Punch	To install the pins

Additional tools to help refine the fit and finish of the frame to the slide: Small hand files, 220 grit sand paper to clean up any areas that were left rough cut, or a Dremel tool with sanding wheels.

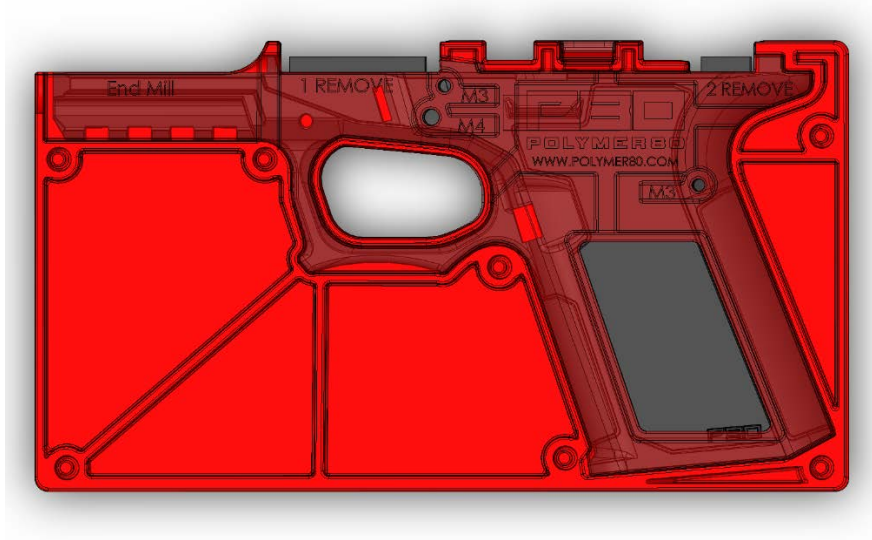


Cross Slide Vise

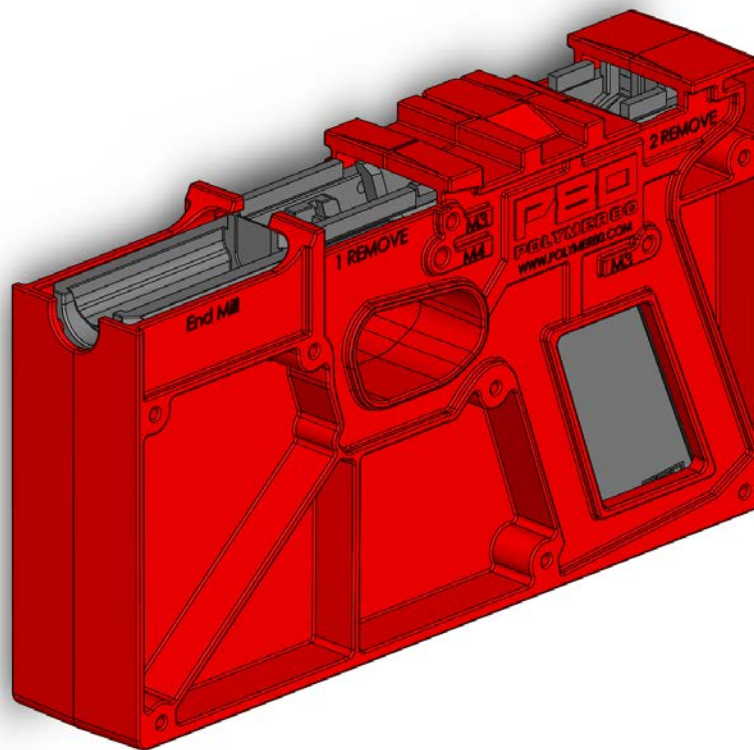
The Features and Description of the Jig

The Jig features a numerical system with indicators and drill bit sizes imbedded in the jig. There are three other holes on each side of the jig to use with the appropriate sized drill bits that are included to drill the pin holes.

The top jig features are designed to guide you to drill only those exposed frame slide guards that must be milled off using the provided end mill exclusively. You should not cut into the red ABS polymer of the jig along the top of the jig. If you are, then you are milling outside of the intended areas and may be permanently damaging the frame.



The pistol frame is inserted into the jig to prepare it for the milling and drilling procedures.



The large end mill bit is used to clear the temporary rails along the top and barrel block which is located where the recoil spring assembly will eventually be installed, inside the pistol frame.

Critical Do's and Don'ts

1. **DO NOT DRILL THE PIN HOLES WHILE USING THE DRILL PRESS.** The biggest problems from our builds came when testers attempted to drill the six pin holes (for the trigger and locking blocks) using the jig laid down on its side with a Drill Press. The jig should be placed in a bench vise, and squeezed from the sides when drilling the pin holes.
2. When drilling the pin holes, you don't need to squeeze the jig to the point of deformation or crushing. **Snug, not crushed.**

Preparation

(Assumes you are using a Drill Press, a Cross Vise and a Bench Vise)

1. Prep the drill press. When using a drill press, the spinning chuck head of the drill press needs to be firmly attached by slamming it with a mallet up into the press, or the vibration of the below procedure can sometimes make the entire head fall out (destroying things in the process).
2. The table of the drill press must be level.
3. The end mill cross slide vise installed on the drill press (a link is provided above to an appropriate cross vise) is the absolute fastest and most secure way to finish this part. Using a tool like this, as opposed to just using a Dremel tool, will allow for more accuracy.

Side Note: We utilize the cross slide vise in various ways and for different projects, as it's a great tool that can be mounted on the drill press table semi-permanently by bolting it down (drill holes and mount with nut/bolt combo's or thread the holes and bolt it down. It can be utilized for many other projects. If you needed an excuse to get one, I just gave it to you. ☺

Final Mental Prep: Building a firearm takes craftsmanship and pride, **so don't be in a hurry!** Slow down and work precisely and methodically, **Measuring Twice and Cutting Once!!** After you drill something out, you can't put it back. Therefore, approach things conservatively. In my personal experience, if I'm feeling like I may be lacking patience, I just stop. I'll put the tools down, walk away from the bench and go take care of whatever made me be in a hurry in the first place. This sounds sort of simple, but I've destroyed too many things in the past from my lack of patience.

High Level Steps

1. **PERFORM THIS STEP FIRST!** Drill the side holes in a regular table vise; you can and should use a hand drill to finish the side holes.
2. Use the large end mill bit to mill off the top rails.
3. Use the large end mill bit to mill off the interior barrel block in the designated indented area only to carefully remove a slot that will allow the spring and guide rod on your Glock Slide to move freely.
4. Install the Locking Block Rail System which includes the slide rails; and then use one of the provided pins to pin down the front legs of the locking block.
5. On the Rear Rail Module (the stainless steel rear rails), slide that around the Glock frame parts kit's Trigger Mechanism Housing (not included as part of this kit) and install using the second pin that is included with the kit.
6. Assemble your firearm (instructions for assembling a Glock 17 not included in this document) by finishing the installation of the trigger, the trigger pin, slide lock, slide stop, etc. to finish the entire build of the lower frame. Again, we aren't providing full instructions on how to assemble the entire Glock Frame, but much of that information is found online.

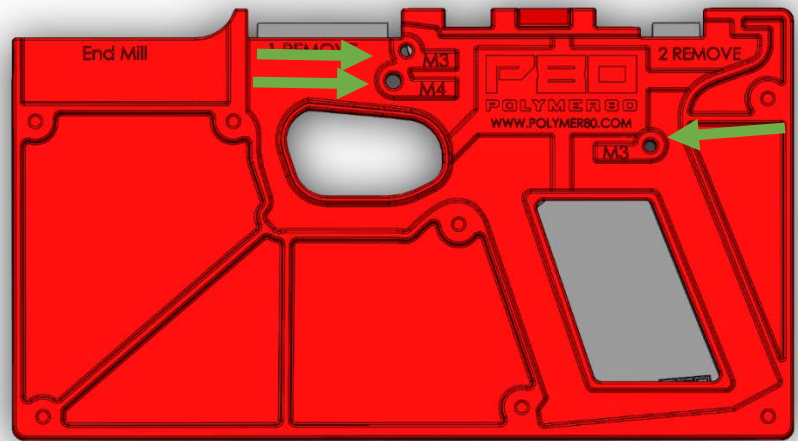
Pin Hole Drilling Procedure (PERFORM THIS STEP FIRST!)

Insert the Pistol Frame in the Red Jig. Drill the side holes as indicated below using a regular bench vise and drill. The drill bits are provided in the kit.

- You can **and should** use hand a drill to finish the three side holes on each side (total 6 holes)
- Drill one side, DO NOT attempt to drill through both sides of the frame from one side of the jig. In other words, flip the jig to the other side in the vise once the first side is done, and drill the other side independently.
- Do this for all six holes, pay attention to the M3 vs M4 hole indicators on the Jig.

Drilling Tips:

- While you are drilling, make sure the jig is not over tightened.
- Over tightening will displace the drill holes if you are crushing the jig. Snug, not crushed.
- Make sure the drill chuck is not hitting the vise itself while drilling..**

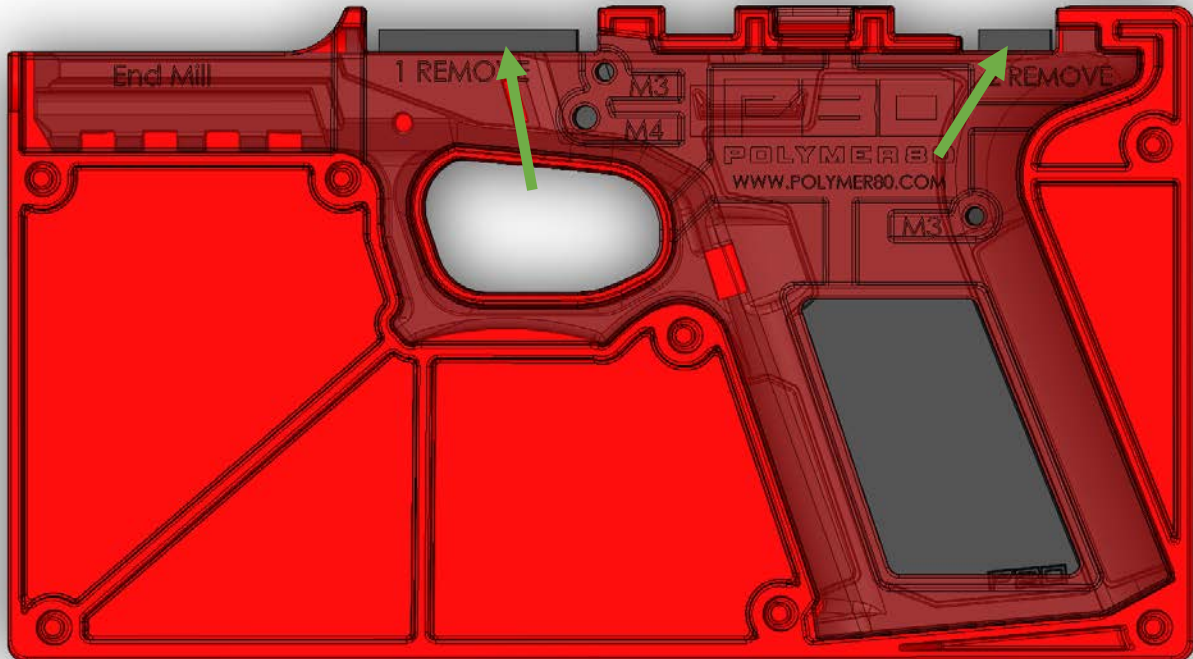


Top Rail Block Milling Procedure

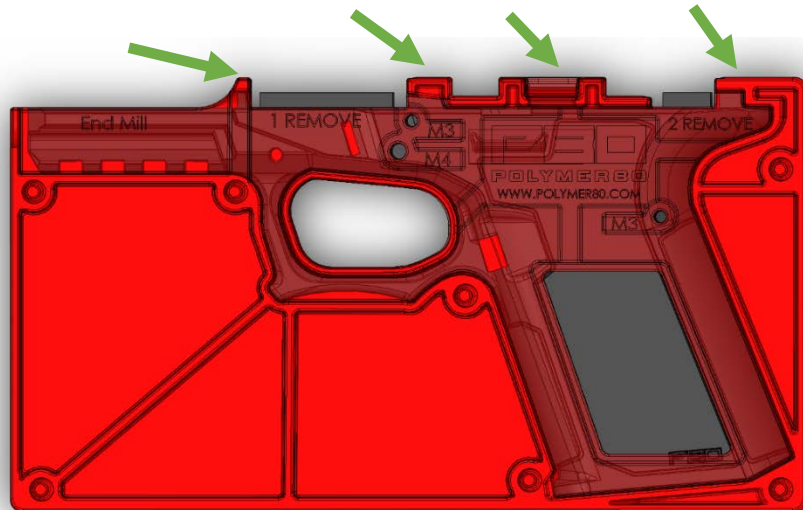
Use the large end mill “bit”, otherwise called “end mill” moving forward. This is the large tool steel fluted end mill.

1. Place the lower in the jig. Install the end mill in the Drill Press, adjusting the table so you don't necessarily need to move the chuck head up or down. Get fairly even with the top of the frame but leave a little bit of room and slowly mill away the polymer where the green arrows are indicated below.
2. There is no need to get overly aggressive at this stage. You can always leave a little extra material to sand down by hand or use a Dremel to refine the top part of the frame to attain a smooth and clean finish. Remember, use of a Dremel is WLDQ.

During this procedure, you are only removing the material that protrudes above this area:



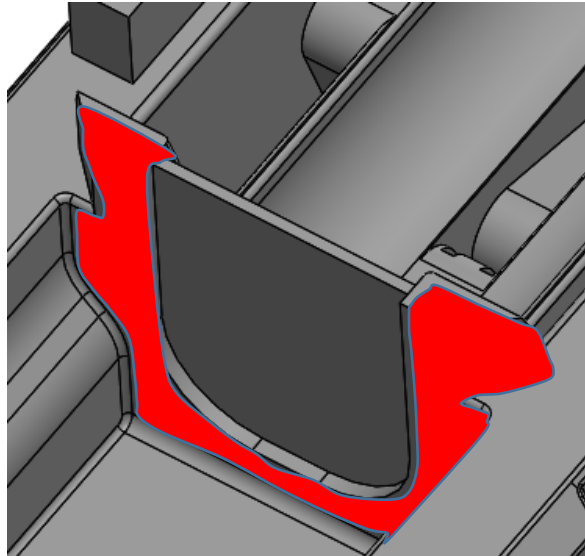
DO NOT REMOVE THESE RED TOWERS. Don't mill the red jig on the top.



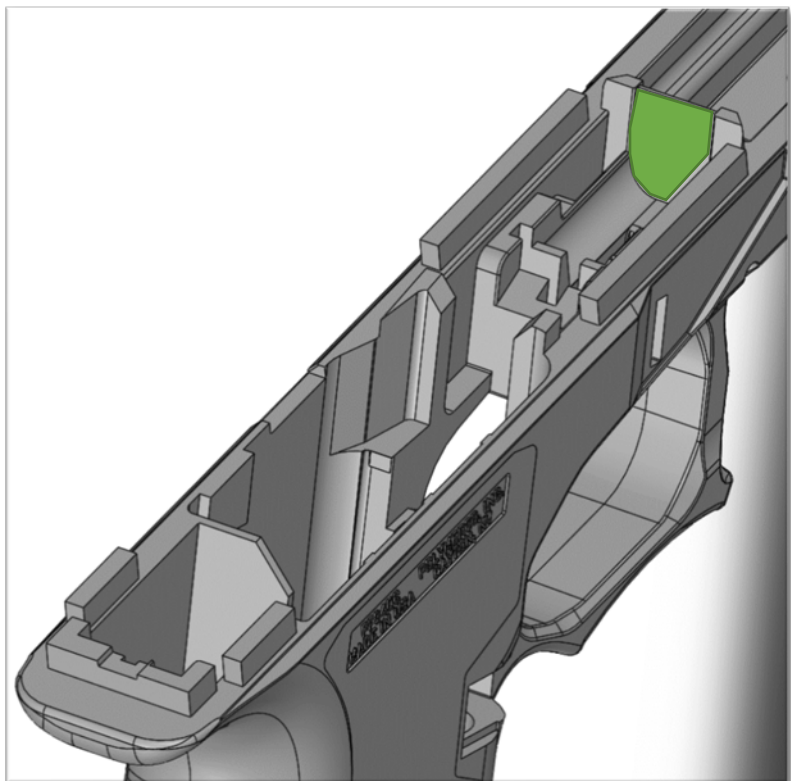
Barrel Block Milling Procedure

Milling out the Barrel Block is probably the most complex procedure, so please pay careful attention to the areas that need to be removed vs the areas that should not be removed: Use the large end mill to mill off the interior barrel block. **DO NOT REMOVE THE SLIDE BUFFER AS INDICATED IN RED. Only remove the green colored areas.**

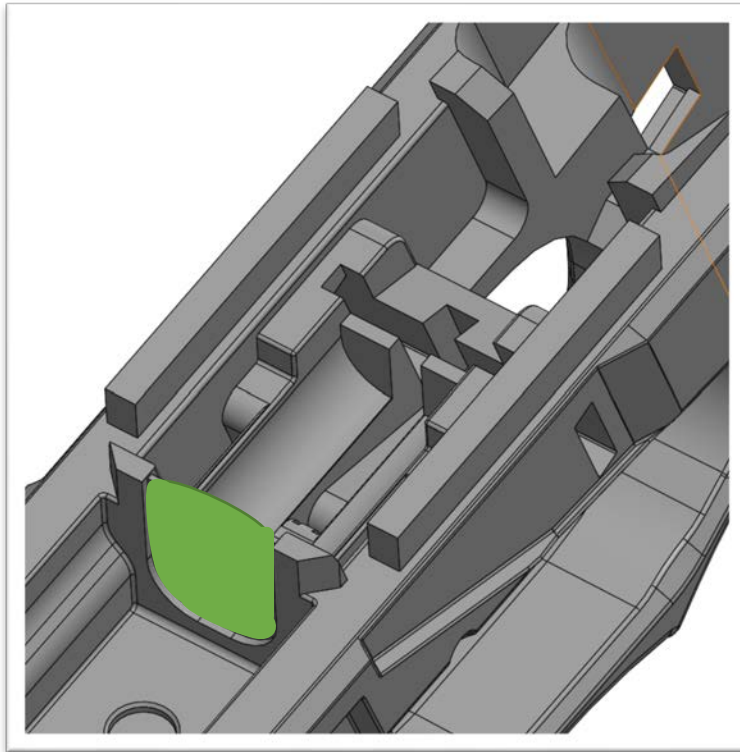
- 1) **DO NOT REMOVE THE POLYMER INDICATED IN RED BELOW. THIS IS THE SLIDE BUFFER STOP**



- 2) Adjust the drill press so you can put the Jig and Frame upright (pictured below), so the end mill is pointing down through the nose of the jig and frame and facing you. Make sure the end mill and the chuck do not interfere with the jig as you plunge carefully down and slowly mill out the green area. You can leave a little bit of material and finish with a 1/4inch round file later. Remove **ONLY THE GREEN AREA**.



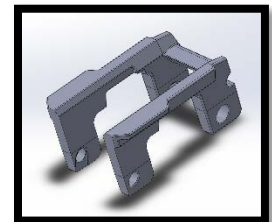
Remove only the green area on the barrel block. There's a relief in the material that's visible on both sides. This indicates the edge of the milling area.



Remove only the green area on the barrel block. There's a relief in the material that's visible on both sides. This indicates the edge of the milling area.

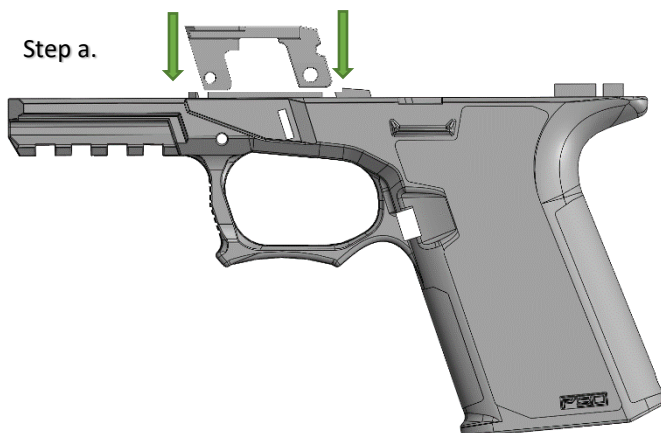
Installing the Locking Block Rail System (LBRS)

Once you are finished with the milling, it's time to install the Locking Block Rail System. The patent pending system is a hardened stainless steel component with a black nitride surface treatment. The LBRS features a multi-functional design efficiently incorporating the locking block and slide rails, and it provides the strength behind the slide stopping block buffer.

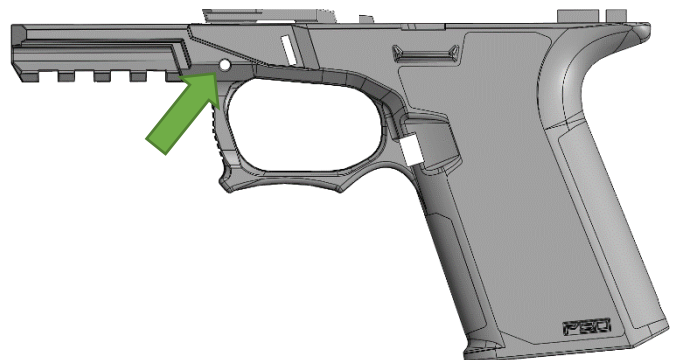


LBRS

- a. Install the locking block by lightly tapping it into place. Align it as indicated below.
- b. Utilize one of the provided 3mm x 25mm black pins. Tap the pin with a hammer all the way through the side hole and front legs of the LBRS. The pin should be equally distributed across the pistol frame.



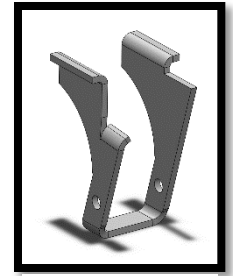
Step b. Tap the black P80 pin through the hole



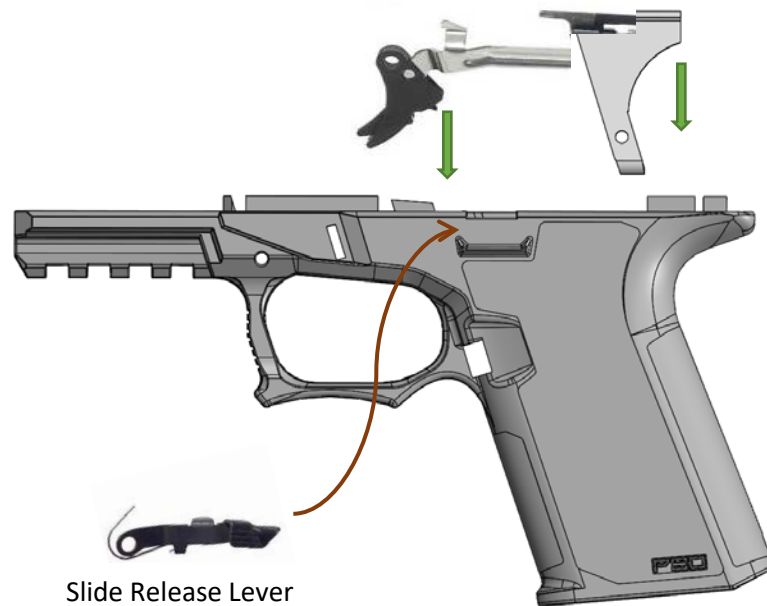
Installing the Frame Parts Kit (not included with this kit) and the Rear Rail Module (RRM)

(To complete this process, you'll need a Frame Parts Kit with the trigger kit and trigger mechanism housing and other parts sold separately).

- 1) After the LBRS has been installed, as described in the previous instructions, install the Magazine Catch Spring, gently tapping the pin into the hole inside the magwell with a hammer and punch. The pin sticks up into the Magazine Catch area approximately 2mm when completed. Install the Magazine Catch using long needle nose pliers to nudge the pin in place on the inserted Mag Catch until it snaps into the safety switch hole.
- 2) Install the Slide Locking Lever Spring and Stop
- 3) Install Trigger Mechanism Housing and Trigger:
 - a) Slide the RRM around the trigger mechanism housing. Install the entire unit (including the trigger, trigger bar, etc.) into the rear housing hole and the trigger hole (assuming the trigger bar and trigger are already attached to the trigger mechanism housing).



RRM



Slide Release Lever

- b) Now tap the Trigger Housing Pin (the second 3mm by 25mm black pin provided with the kit) through the Trigger Mechanism Housing pin hole.
- 3) Install the smaller diameter Locking Block pin that comes with your separately purchased trigger kit (Frame Parts Kit).
- 4) Install the Slide Release Lever, sliding it alongside the Trigger and aligning the hole on the Lever with the hole on the Trigger and Trigger Pin hole on the side of the frame.
- 5) Tap in the large Trigger Pin to hold the Slide Release and Trigger together – don't smash the small spring! This is the toughest installation step because a small hammer and punch, and periodic foul language due to smashed thumbs are required to finish this step.

The system should be ready to test with your slide and barrel now. Make sure no loaded mags are used!! – BE SAFE, TEST WITH UNLOADED GUN!

Final Pistol Build, Tuning and Fitment

As mentioned above, to complete the PF940 series pistol frame builds, you'll need a frame parts kit, a slide and barrel (and possibly the slide parts kit if the slide doesn't already come complete).

Eventually, all of these parts will be available on our site. We have many partner dealers with links to their websites – go to the product page itself and look for the dealer links, or to the dealer link page acquire anything that's not available through Polymer80. <http://www.polymer80.com/dealers/>

Installation of slide lock spring (included in kit)

(exclusive to PF940SC Subcompact)

- 1) Drop the included slide lock coil spring into hole at center of slide lock area.
- 2) Use punch through one side of the slide lock slot to completely cover and depress spring to bottom of slot.
- 3) Insert slide lock lever into opposite side of slot at an upward angle and push over the top of the punch.
- 4) Pull out punch while simultaneously pushing slide lock further into slot.
- 5) Fully insert slide lock and check for functionality when complete.



Tight fitting Locking Block Rail System Installation Tips

The Locking Block Rail System tends to have a very tight fit, particularly on the PF940v2 Standard sized frame. If this is the case with your system, find anything round (to prevent marring the frame) that is roughly 7/16" in diameter. You may use a 4-in-1 screwdriver shaft (with bits removed), the handle to an Exacto knife (with blade removed), wood or plastic dowel, etc. You will use this tool to spread the frame open to allow easy installation of the LBRS.

Exacto Knife with blade assembly removed, 4-in-1 screwdriver shaft with bits removed



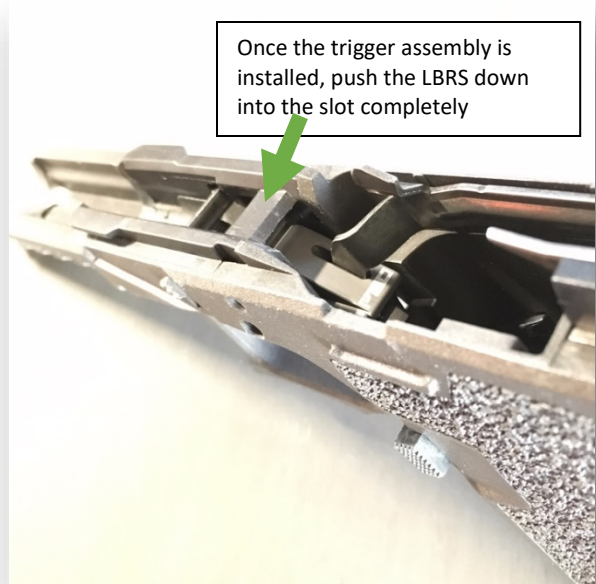
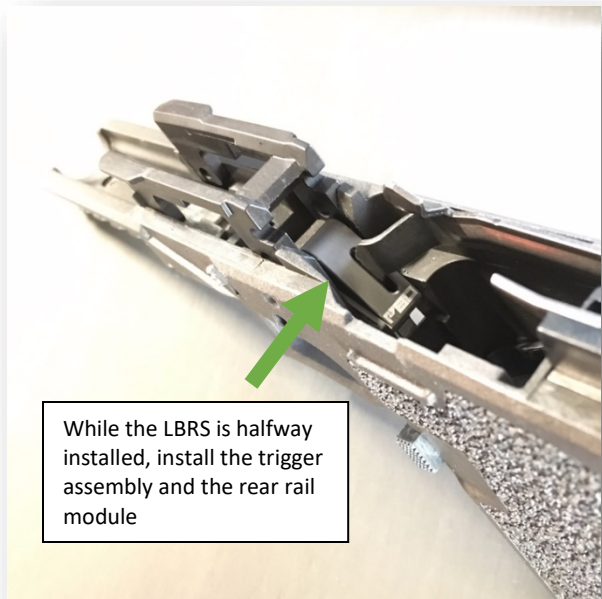
7/16 Diameter Round Object (examples are an Exacto Knife Handle or a 4 in 1 Screwdriver Shaft).

Installation:

- 1) Push the 7/16" diameter tool (we're using a 4-in-1 screwdriver shaft) down into the trigger opening. You will then start the front and rear legs of the LBRS into their respective openings.



- 2) Please be sure to only start the LBRS into the frame as this will allow room to install the trigger assembly, ie: Don't insert the LBRS all the way because the trigger assembly won't fit.
- 3) Next, remove the 7/16" diameter tool by pulling it to the rear of the frame. You will then insert the Rear Rail Module and trigger assembly. Once the trigger assembly is properly inserted into the frame, the LBRS can then be pushed down completely and fully seated into the frame.



Tight Fitting Rear Rail Module with the Trigger Mechanism Housing:

When putting the RRM (rear rail module) and Trigger Mechanism Housing together in the frame, it can be very tight. Here's the basic procedure you should follow to complete the frame.

- 1) Ensure all parts are fully seated and held secure during installation of pins
- 2) Attempt to install pin normally from one side with all parts (frame/RRM/trigger housing)
- 3) Attempt to install pin normally from **other** side with all parts (frame/RRM/trigger housing)
- 4) Attempt to install pin while using second pin for alignment from opposite side with all parts (frame/RRM/trigger housing)
- 5) Attempt to install pin without trigger housing (this will allow the pin to "set" the RRM in the frame without the constraint of aligning the trigger housing)
- 6) Re-attempt installation of pin normally or while using alignment pin from opposite side with all parts (frame/RRM/trigger housing)

Finally: If the rail module and the pins with the frame cannot be installed (with **no** trigger mechanism housing installed), do the following:

- 7) take the small M3 drill bit (installed on the drill), push all the way through and pull out without turning the drill bit on. This cleans out the holes.
- 8) Attempt re-installation of all parts put together.

Fitment to Slide and Testing

MAKE SURE THE GUN IS NOT LOADED!

Once you put the slide, barrel and recoil spring/plunger together as well as the slide stop spring and slide stop and entire trigger kit installed, you are ready to test the slide/frame combo together.

The system could be slightly stiff at first, therefore use gun lubricant along the slide rails and other touch points to get things working smoothly. If you're familiar with how a Glock frame and slide feel, then you'll have a baseline for the feel that you're attempting to achieve of your new Polymer80 build.

Don't put the magazine in while testing this, and definitely don't use a loaded magazine. BE CAREFUL, ensure that the pistol is unloaded.

Again, you'll want to test without the magazine at first. Rack the system back and forth, get the kinks worked out and finally test to make sure the pistol is going into battery. Battery position is when the slide moves all the way forward, bringing the barrel up and into its proper position flush with the top surface of the slide.

It should go into battery, even when you pull the slide back one inch, and cleanly let go.

Now point the gun upwards making gravity the enemy, and continue pulling back one inch and letting go. It should go into battery each time. At the very beginning, it's possible that it doesn't go into battery each time, but keep racking it back and forth with lubricant to get the roughness worked out.

Now it's time to go into the field and test with live rounds. Have fun, be careful and put several hundred rounds down range to allow the system to work smoothly together, especially if you are using a new slide/barrel combo.

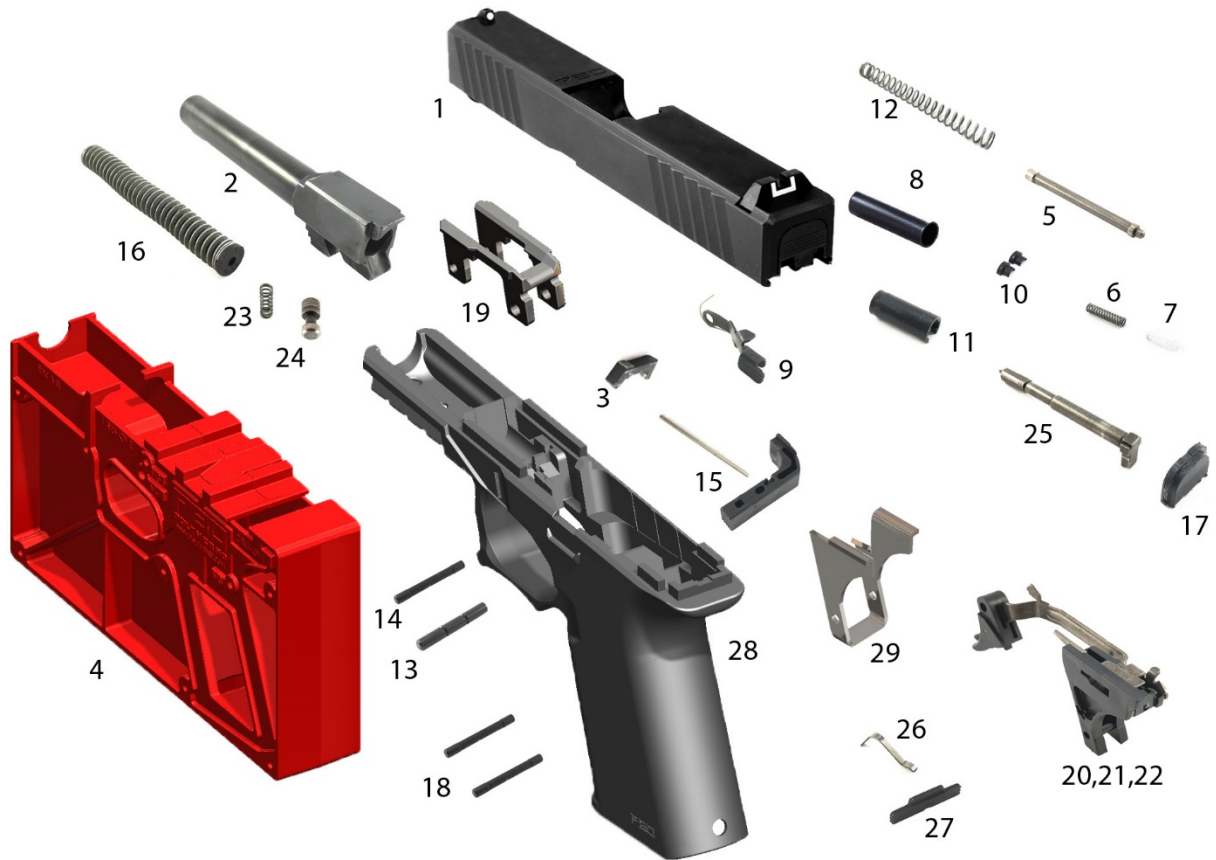
Note: Most of the issues we see in testing are related to a **new barrel**, whether that be in combo with a new slide or even a Glock slide. If that's the case, and if you happen to have a compatible Glock slide and Glock barrel combo, use that combo to isolate whether or not a new barrel/slide combo is the source of any battery failure modes.

Congratulations! You are now the proud owner of a PF940 series pistol frame, a pistol that you built and tuned yourself. Welcome to our growing 2nd Amendment family. You are purposefully exercising your rights to own, build and operate firearms.

Parts List

(not all parts are included within the Polymer80 standard 80% kit)

Provided below is a convenient complete list of parts that are needed to finish your own PF940 series pistol frame. We have included a list of retailers that offer the necessary parts on our website. Make sure you purchase the correct kit for the size of pistol frame you are building.



Complete Pistol Parts List with P80 Frame, Jig and Custom Components	
1) Polymer80 PS940 Slide (sights sold sep)	15) Magazine Release and Spring
2) Barrel	16) Recoil Spring/Guide Rod Assembly
3) Extractor	17) Slide Cover Plate
4) Jig	18) Polymer80 LBRS front pin and Trigger Mechanism Housing Pin
5) Extractor Depressor	19) Locking Block Rail System (LBRS) (provided by Polymer80)
6) Extractor Depressor Spring	20) Trigger Mechanism Housing 21) w/Trigger, 22) Trigger Bar (Shown Assembled)
7) Spring Loaded Bearing	23) Firing Pin Safety
8) Firing Pin Channel Liner	24) Firing Pin Safety Spring
9) Slide Stop Lever	25) Firing Pin
10) Spring Cups	26) Slide Locking Lever Spring (the compact frame spring is smaller than the standard size pistol frame spring)
11) Firing Pin Spacer Sleeve	27) Slide Locking Lever
12) Firing Pin Spring	28) Frame (Polymer80 PF940 series frame kit)
13) Trigger Pin	29) Rear Rail Module (RRM)
14) Polymer80 LBRS Pin	

CHECK BACK ON OUR INSTRUCTIONS SECTION OF THE WEBSITE PERIODICALLY. WE CONTINUE TO ADD INFORMATION THAT WILL EXPAND AND REFINE THE INSTRUCTIONS OVER TIME.

If your questions can't be answered here, call support at 1-800-517-1243 or send a Customer Support ticket through <http://www.polymer80.com/contact>