

BUILD A CUSTOM 10/22® STEP BY STEP



Amilcar Hernandez

THE BOLT

The factory bolt works well. It may not be as nice as custom aftermarket bolts but many scary-accurate rifles have been built using them. My experience with bolts may vary from others. Let me tell you my story.

I have always used factory bolts. One day I decided to buy an aftermarket bolt just because I had the extra money and wanted to see what all the hype is all about. I heard how great aftermarket bolts were. Curiosity finally won over and I ordered one. At first glance, I was indeed impressed. My new aftermarket bolt came with all the mods I normally do on factory bolts. I installed it on my most accurate rifle. I was not sure what to expect since the rifle was already laser-accurate. After a year, and a thousand rounds later, I saw no difference in accuracy or function. At least in my experience, I am willing to say the factory bolt worked just as good as an aftermarket bolt.

To be fair about comparing the bolts, my old factory bolt was not stock; I had it tuned up/modified.

Stock Bolt

As I just mentioned, the Ruger® bolt assemblies are not bad. If you already have a factory bolt, consider the following three options.

- Plain Factory Bolt
- Bolt Rework
- Do it Yourself Tune-up

Plain Factory Bolt

Leave the bolt alone and continue building your rifle. You can always go back and work on it, replace it, or send it out to a gunsmith. You might be surprised how accurate your dream rifle can shoot with the factory bolt.

Factory 10/22 Bolt



Bolt Rework

If you want to fine-tune the factory bolt and not mess with it, take it to your favorite gunsmith. Many members at Rimfire Central highly recommend Connecticut Precision Chambering (CPC):

www.ct-precision.com. CPC does great work on the bolts, barrels, and trigger groups.



Do it Yourself Tune-up

This option is for the true handyman, the hands-on guy, or the gunsmith wannabe. If you are the “I did it myself” kind of person, look at these next steps. The following modifications are what you get with

most of the aftermarket bolts. When you send the factory bolt to **Connecticut Precision Chambering**, they do all of these modifications plus bolt scalloping if you wish.

1. Field strip the bolt
2. Upgrading the extractor claw
3. Polishing the bolt - Optional
4. Charging handle channel mod - Optional
5. Polishing the firing pin
6. Reshaping the firing pin - Optional
7. Check the headspace
8. Pinning the firing pin - Optional
9. Radius the bolt - Optional

Field Strip

Field Strip the bolt and get to know the parts and how it works. In the future, you might do this again to give it the best cleaning possible. This is not something you do every time you clean the rifle.

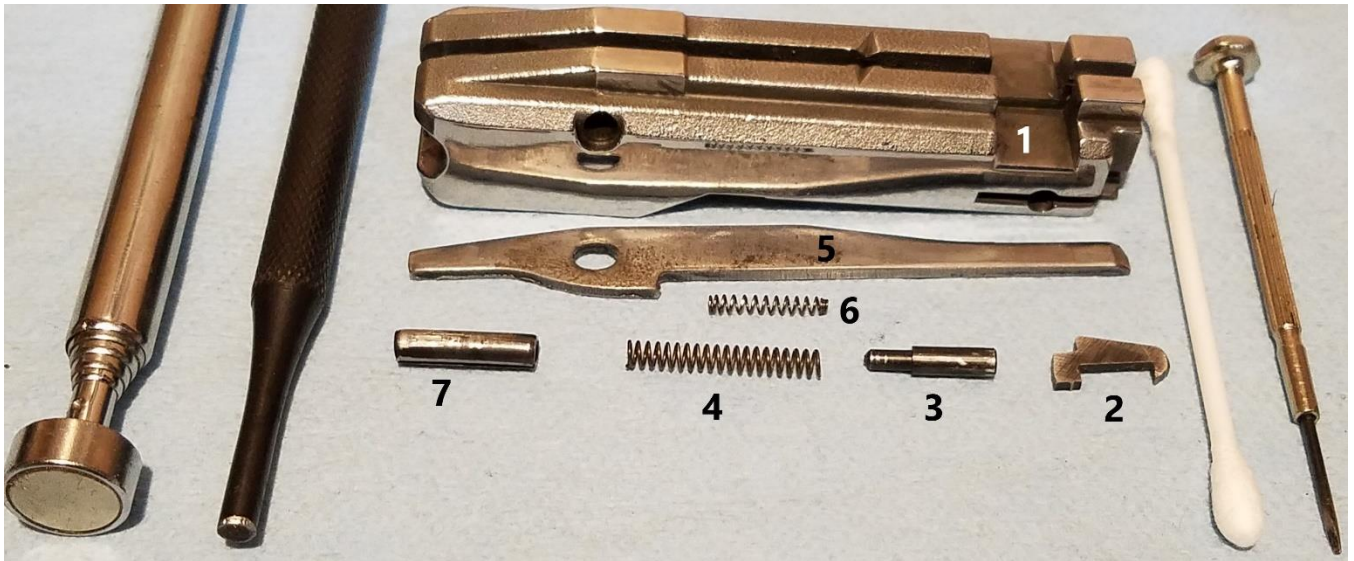


The hardest part is removing the extractor. Well, it is not that hard, it is just a little tedious. The Gunsmither 10/22 Bolt Bar and Extractor Tool is a nifty dual purpose bolt bar and extractor tool that works great.

It sells for around \$15.

My old fingers and hands still work pretty well so I will continue to use a magnet and a jeweler's screwdriver to field strip the bolts. To clean all the tight areas, I use Q-Tips. I remove a small amount of cotton and so it fits inside the extractor spring hole.

A 5/32-inch punch and a small hammer are all you need to remove the firing pin.



- 1) Bolt
- 2) Extractor
- 3) Extractor Plunger
- 4) Extractor Spring
- 5) Firing Pin
- 6) Firing Pin Rebound Spring
- 7) Firing Pin Stop Pin

NOTE: I use the jeweler's screwdriver to push back on the extractor plunger. Then, I use the magnet to remove the extractor.

Upgrading the Extractor Claw



Since you have field stripped your bolt, consider replacing the extractor. Aftermarket extractors have a better claw design than the factory extractor does. The cost is around \$12 and it is well worth it.

These are a few aftermarket extractors



Clark

Volquartsen



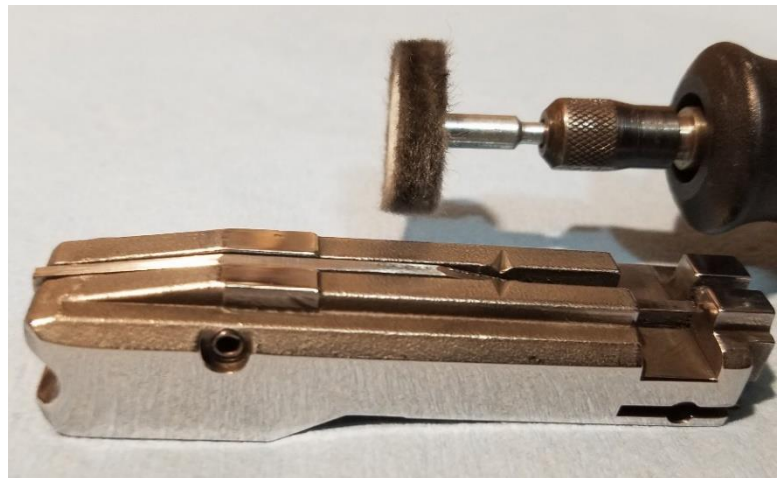


References:

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MidwayUSA	www.midwayusa.com
Kidd	www.coolguyguns.com
Power Custom	www.powercustom.com
Volquartsen	www.volquartsen.com
Tandemkross	www.tandemkross.com

Polishing the Bolt:

Polishing the bolt does not help with accuracy. However, if the factory bolt is a little rough, polishing the bolt will help the action run smoother. You can use knife-sharpening stones to smooth and clean up the flat sides of the bolt. After you are satisfied, you can finish it using a buffing wheel to give it a mirror chrome look. A Dremel tool will also work but it will take a little longer. A clean, smooth surface does not attract grit, and it cleans easier.



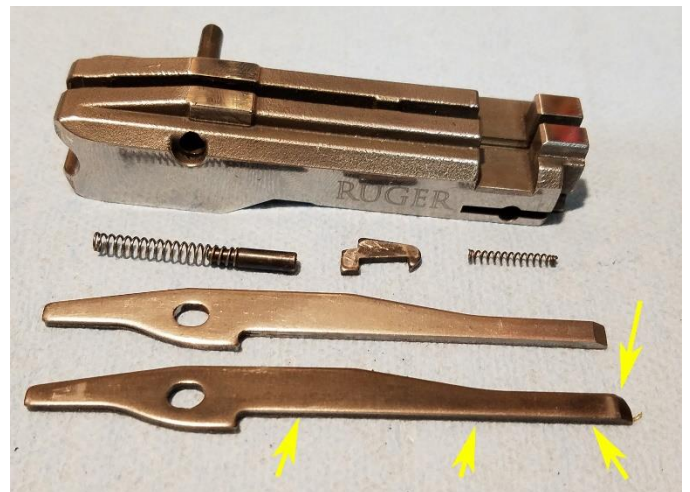
Charging Handle Channel Mod:

If your factory bolt has sharp edges at the charging handle channel, you might consider this mod. The older factory bolts have a sharp edge. This will help when installing the bolt in the receiver. The beveled edge helps the charging handle slide into the channel easier.



Polishing the Firing Pin:

The factory firing pin works just fine but it can be rough. You do not have to remove the firing stop pin out completely. Using a 5/32 inch punch, tap the firing stop pin out just far enough to remove the firing pin. The sides and the bottom of the firing pin can have machine marks. Use a knife-sharpening stone to smooth out the sides and the bottom. A smooth surface cleans better and does not get as dirty.



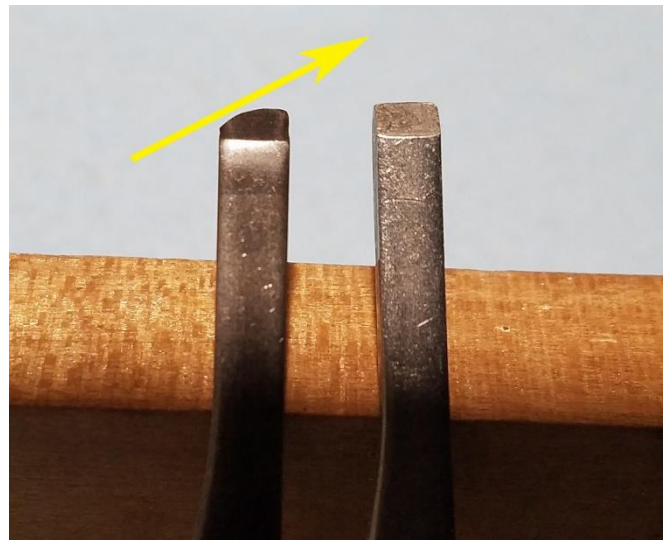
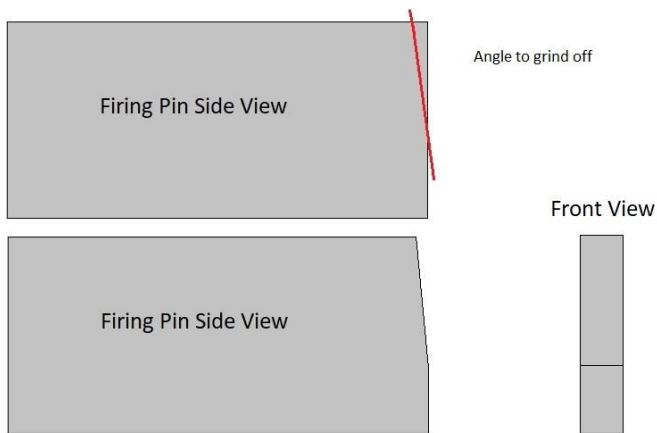
To reinstall the firing pin:

- Start by tapping in the firing stop pin partially (not all the way)
- Install firing pin rebound spring. (The spring's tapered end is pointed to the front.)
- Install the firing pin
- Push the pin slightly forward, then finish tapping in the firing stop pin the rest of the way

Reshaping the Firing Pin:

This is also optional. Since you have the firing pin removed, do the modification. Many people like to reshape the firing pin where it strikes the shell rim. They claim this helps reduce fliers and ensures a better strike on the rim. I have no way of proving that, but just in case, I have done this mod on all my bolts.

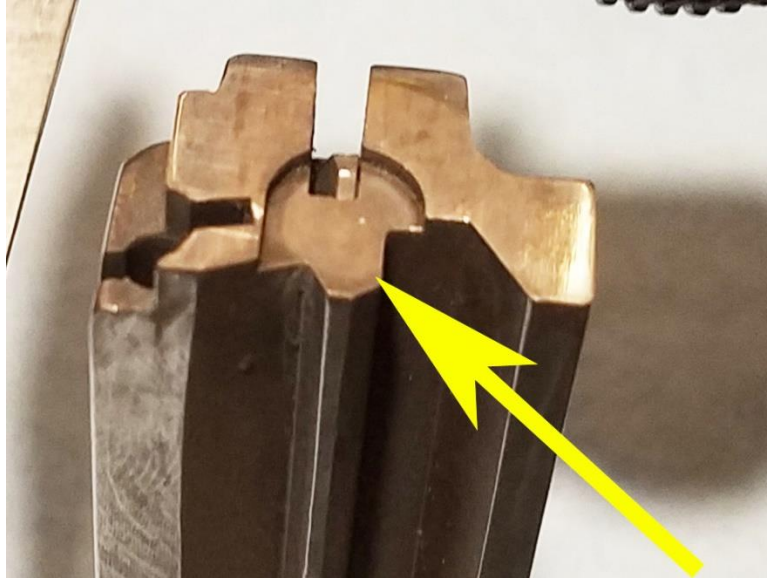
A file or a Dremel tool with a fine-grinding wheel works fine or you can use anything you have handy to reshape the firing pin. You are not taking off a lot of material. Estimate the angle and grind just a little.



To give you an idea, I'll show you the Ruger® Mark II pistol factory firing pin as an example of the size of the small strike point. When I reshape the 10/22® 's firing pin, I try to make the strike point the same size as the Mark II and III's firing pin strike point.

Check the Headspace:

Check the headspace on the face of the bolt. This mod helps the firing pin to have a consistent strike and helps the extractor get a positive grip on the spent shell. The recommended headspace is 0.043-.044



If the headspace exceeds .044, you can use a flat sharpening stone to polish the bolt face. Make sure you keep the bolt face square as you polish. It may not take much to get it within 0.34 - 0.44.

Pinning the Firing Pin:

Before reinstalling the firing pin, you might consider pinning the bolt, to secure the firing pin. This step is optional. Many say this prevents fliers when shooting.

You will need the following:

1. A drill press
 2. A vice or a way to secure the bolt
 3. A 1/16 inch Hi-Roc Spade drill bit
 4. A piece of 1/16 by 1/2 inch long piano wire or similar material
- I use a Sharpie to mark where to drill, then remove the firing pin



- Set the drill press speed to the slowest speed setting
- Align and secure the bolt
- Mark the bolt where you will drill. You want to drill as close as possible to the firing pin.
- Add a drop of oil and begin to drill slowly



- When you finished drilling, tap in a ½ long piece of 1/16 piano wire or rod.



- Install the firing pin.
- If the pin is too tight or will not fit, stone/polish the top



Radius the Bolt:

This mod is controversial. Many people say it makes the rifle cycle smoother. That is true, but is it necessary?

Let me tell you my story. I first heard about the radius bolt modification about forty-years-ago. I heard good things, and it made sense, so I decided to radius one of my bolts. It was simple, and it did not take long. After assembling the action, I immediately noticed when cocking and releasing the charging handle the action-felt smoother. I felt less resistance as the bolt moved back cocking the hammer. I was pleased.

The problem came up at the range. This particular rifle shot CCI Standard Velocity lead bullets only. I noticed more recoil when I shot the rifle. I thought I was shooting CCI Stingers (High-Velocity bullets). What happened was the bolt slammed harder against the factory steel bolt stop. The bolt was smoother and had less resistance, which caused it to hit the bolt stop harder. Back then, Clark Customs used to sell aftermarket bolt buffers made of polyurethane. I installed one, and it helped dampen the bolt impact. Great, but I asked myself if I really fixed it or covered up the problem.

I concluded the new softer bolt buffer was just covering up the problem. The bolt was still hitting the polyurethane bolt buffer hard. If I had not radiused the bolt, I would not have needed an aftermarket bolt buffer/stop.

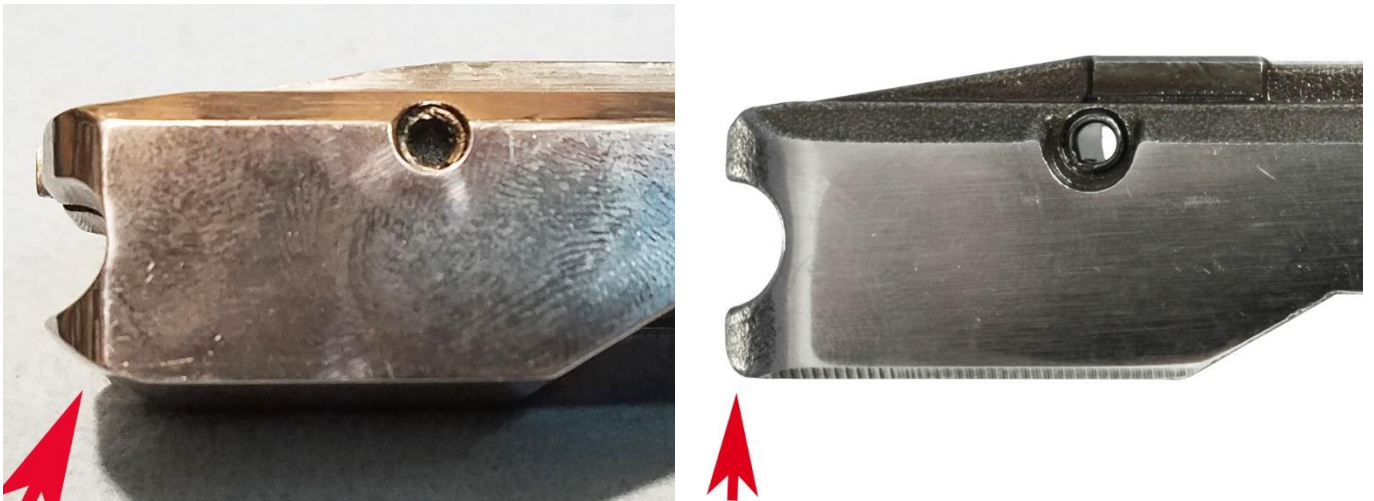
So what did I learn about the bolt radius modification? A perfectly tuned 10/22® bolt should barely touch the bolt stop or not at all. The bolt should move back just enough to eject the spent shell, strip a new round, and chamber it.

My rifle shot just fine, but it bugged me and I had to try something else. In the search for perfection, I reinstalled the factory steel bolt stop again and replaced the bolt spring with a stiffer one -- back then, Wolf Springs sold heavier tension 10/22® recoil springs. These days Wolf Springs still sells them as well as a few other vendors.

I went back to the range and tried my rifle again. It shot smoother; in fact, it cycled a little smoother than before. The stiffer bolt spring kept the bolt from slamming hard against the bolt stop. The rifle cycled CCI Standard Velocity like a dream.

NOTE: I did eventually have to cut two coils off the stiffer spring because once in a while I got ejection issues. From that point on the rifle fired great.

Okay, I learned a lesson. Radiusing the bolt is a great modification if you want your rifle to cycle subsonic or quiet ammo reliably. If your rifle currently cycles standard velocity ammo reliably, there is no need to radius the bolt.



Aftermarket Bolt

There is an advantage to buying an aftermarket bolt. Most of the seven bolt-tuning steps, if not all, mentioned above, are included with aftermarket bolts. Keep in mind you are building a custom rifle and there could be fitting during your build. Depending on the bolt manufacture and the receiver, there could be some tweaking to the bolt or the receiver. The aftermarket bolts have a tighter tolerance and might fit tighter in the receiver. The bolts will and could vary from manufacturer to manufacturer. I will talk more about fitting the bolt later in the book.

There are a couple of things to look for when selecting an aftermarket bolt.

- The finish such as color, engraved, or etched

- Standard bolt or a custom bolt that requires a dedicated charging handle and springs



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Custom Shooting Technologies (CST)



JWH Custom



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References:

JWH Custom

www.jwhcustom.com

Kidd

www.coolguyguns.com

Tactical Innovations

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Power Custom
MidwayUSA

www.powercustom.com
www.midwayusa.com

Charging Handles



If you have a factory charging handle, you can use it on your custom build. I personally prefer aftermarket handles for a couple of reasons. First, I like the handle to extend out further. Second, aftermarket charging handles have a little snugger fit in the bolt/receiver and come with a better and smoother spring rod.





Power Custom



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Bolt Buffers

Many builders say to replace the steel bolt stop with a bolt buffer. If you are asking yourself if you need one of these bolt buffers the answer is no. So why do many people recommend them? The reason is you do not hear a clanging sound when the bolt hits the steel bolt stop. People using suppressors can really tell the difference. The rifle shoots quieter with an aftermarket bolt buffer. I like them. I have made my own and have used several aftermarket buffers. This has nothing to do with accuracy but it does eliminate noise in the receiver. Replacing the steel bolt stop pin with an aftermarket bolt buffer will soften the bolt impact. But remember, a perfectly tuned 10/22® bolt should barely touch the bolt stop or not at all. The bolt should move back just enough to eject the spent shell, strip a new round, and chamber it.



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Kidd www.coolguyguns.com
Power Custom www.powercustom.com
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Volquartsen www.volquartsen.com

ABOUT THE AUTHOR



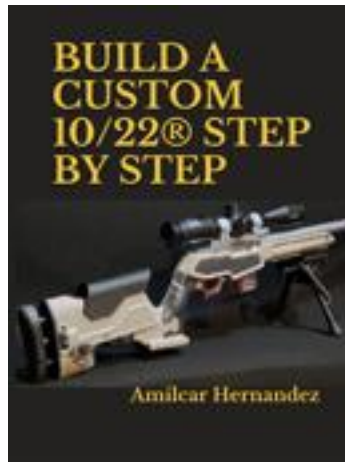
See Amilcar's biography at:

<https://www.aumih.info/bio.html>

Amilcar Hernandez took his first breath of air in 1954 in the industrial city of Monterrey Mexico. After his father abandoned them, he and his mother immigrated to the United States in search of the American Dream. At times, it was the American Nightmare. With dedication and persistence, he learned a new culture, a new language, and a new way of life with some hard knocks along the way. Amilcar is a retired computer system engineer. To keep active and his mind busy, he started a new chapter in his life as a writer.

His interests are riding a motorcycle, fishing, and target shooting.

Build a Custom 10/ 22 ® Step By Step

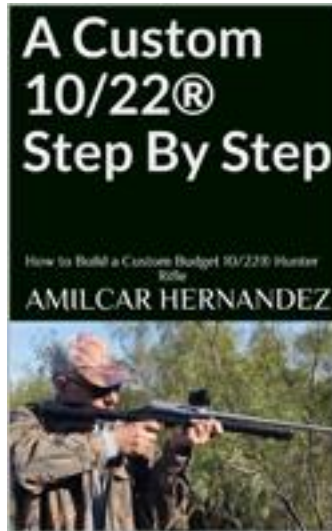


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Do you like 22 caliber rifles? Have you always wanted a cool-looking, colorful, tack-driving .22 rifle? Ever thought of building one yourself? It's easy. This book, BUILD A CUSTOM 10/22® STEP BY STEP, takes even the beginner through step-by-step instructions on how to modify, upgrade, and customize your own 10/22. With large color photos, Amilcar shows you exactly what you need to do, and how you need to do it. It won't take thousands of dollars in tools either — in fact, you probably already have all the tools you need. Decades of knowledge and experience went into the making of this book so that you can enjoy a sport that is truly fun and rewarding. Filled with references that will get you to the right places to find just what you need for your own modification, BUILD A CUSTOM 10/22® STEP BY STEP takes the guesswork out of this fun DIY project!

A Custom 10/22® Step By Step

How to Build a Budget 10/22® Hunter Rifle



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This book is a continuation of Build A CUSTOM 10/ 22® STEP BY STEP. In the previous book, every aspect of building a custom 10/22® rifle is discussed. This book takes that information further by illustrating how to build a custom 10/22® type rifle specifically for hunting.

If you ever thought about building a custom rabbit slayer rifle on a modest budget, this is the book for you. This book discusses all the components needed for Building a Custom Budget Hunter rifle together and why the parts were selected. The step-by-step approach will help you build one just like the one in the book or something similar to your liking. The book has detailed images of the step-by-step build project. The author explains why he used the parts he selected and other options available for a builder not on a budget.

THE HAMMER AND THE NAIL



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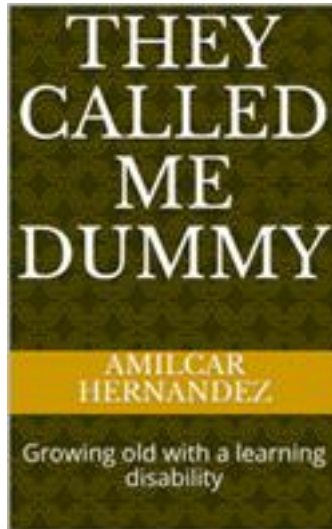
It's 21 AD., life is harsh under Roman occupation and even harder for a lonely peasant with no family or friends. Despite his miserable life, Oren seeks to better himself. But the harder he tries, the more difficult his life becomes.

At a low point in his life, fate shines on him. A Roman Tribune offers him work.

In Jerusalem, he finds the security and stability he dreams of—but discovers it comes with a price. He must decide. If he refuses, it could cost him his life. If he accepts, he will lose his soul.

They Called Me Dummy

Growing old with a learning disability

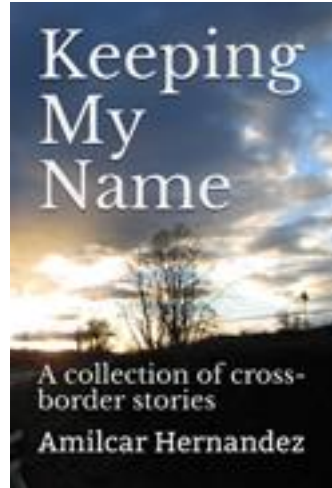


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As a child, the author suspected there was something wrong with him. In his mid-thirties, he sought help and that is when he discovered and confirmed he had a learning disability (LD). This book is about his experiences growing old with several forms of LD. The author writes of events that span from his childhood up to his golden years. He shares his struggles, his victories, his pains, and his joys. His story will give you an insight into the frustrations, anxieties, challenges, and depression associated with LD. The author explains how he learned to understand and accept his limitations, which helped him to live a positive, satisfying, and rewarding life.

Keeping My Name

A collection of cross-border stories



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- A boy's painful experience with a gangster stepfather
- A boy's experience of the 1962 Cuban Missile Crisis
- The wisdom of an old man to his great-grandson
- A boy wants to show the adults he is not a child
- A child teaches the true meaning of sharing
- Feeling lonely on New Year
- A young recruit does not change his name
- A narrow escape with death
- Backing out of a wedding
- Mother's Day will never be the same