The purpose of this guide is to provide instructions to swap the IHS Contact Switch components. This guide is split into two parts.

Part 1 will cover disassembling the Z-axis assembly to remove the old IHS Contact Switch components.

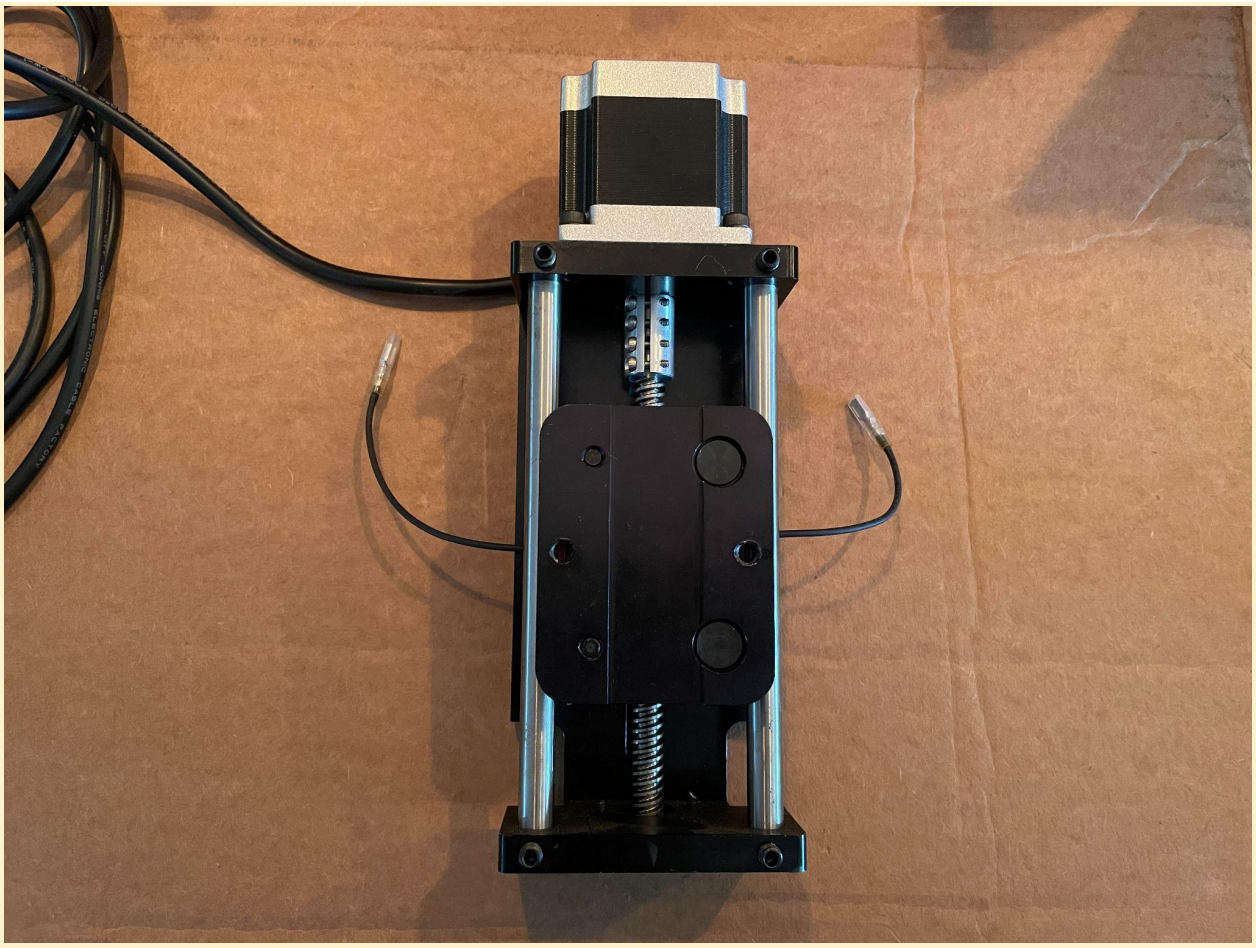
Part 2 will cover reassembling the Z-axis assembly using the new IHS Contact Switch components.

**The Z-axis assembly is an intricate part of Langmuir Systems CNC machines. If you have any questions or need any clarification while performing this components swap, do not hesitate to contact us at support@langmuirsystems.com and we will gladly help you. Let us know which numbered step you are stuck on.**

# PART 1: Disassembling the Z-axis assembly to remove the old IHS Contact Switch components

## Step A1: Dismount Z-axis Assembly

Use FireControl to manually jog the Z-axis until the **Z Slide** is at approximately the midpoint of travel. Uninstall the Z-axis assembly from the machine and set it on the work surface with the **Z Slide** facing upward.

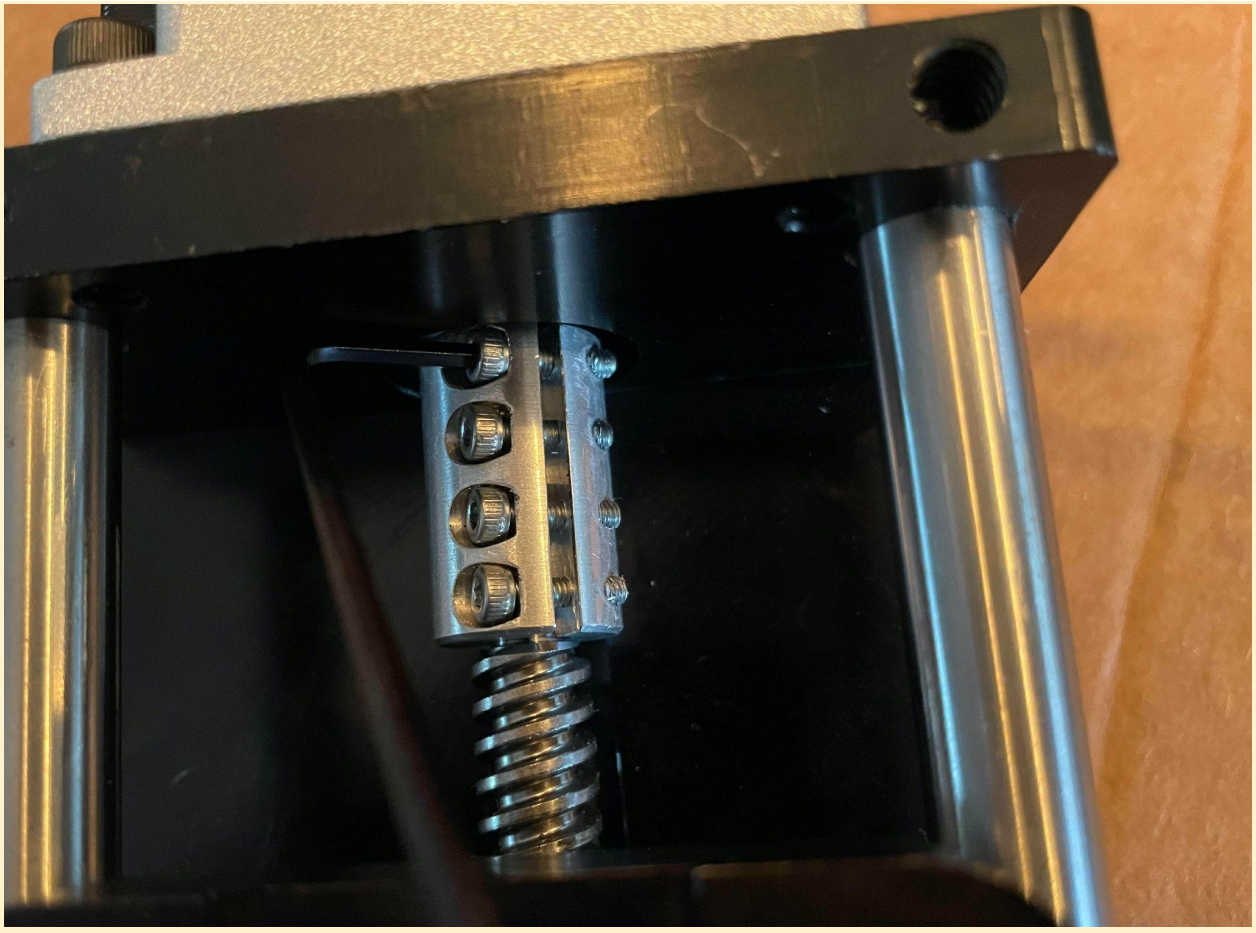


## Step A2: Loosen RH Linear Rail Set Screws

Use a **1/8" Hex Key** to remove the two set screws that hold the ***right-hand* Z-axis Linear Rail** in place. We are only going to remove the set screws on the ***right*** because the **Z-axis Linear Bearings** on the ***right*** are adjustable. This will be important in a later step.

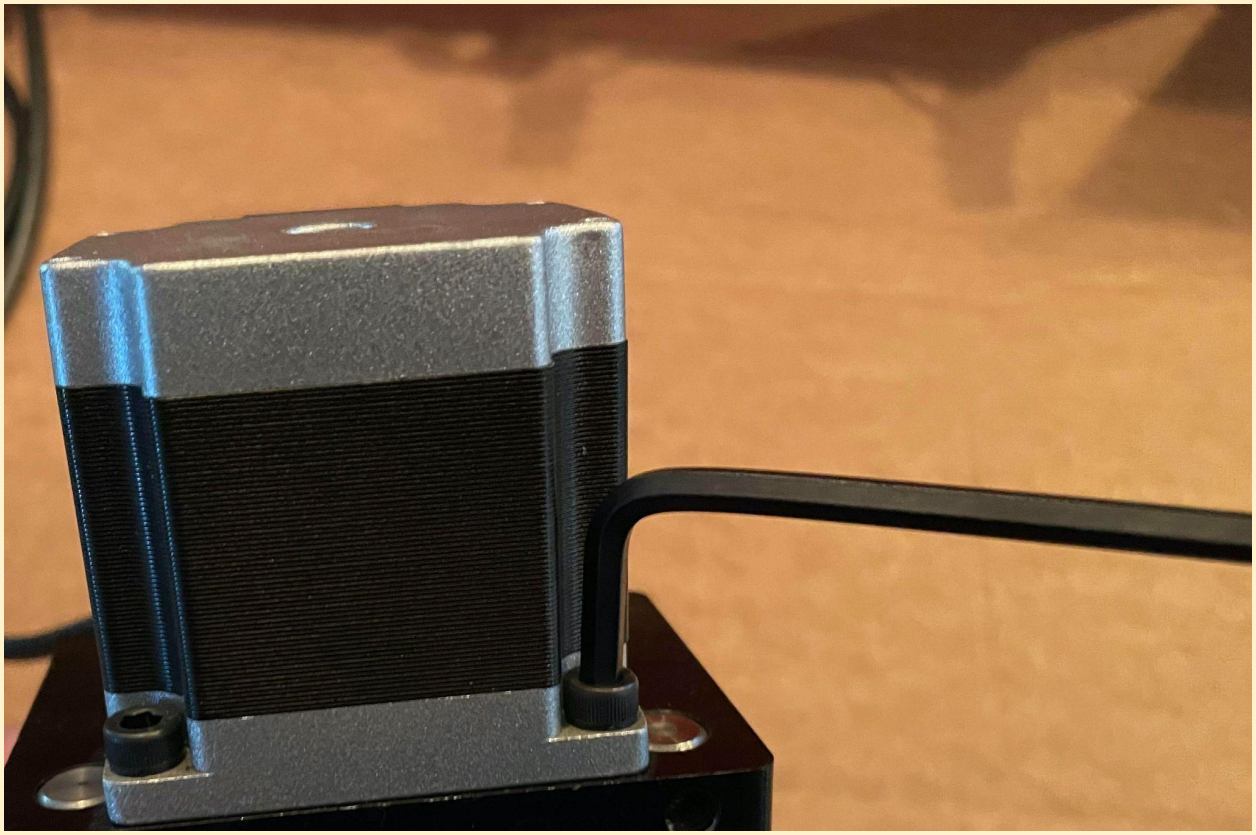
## Step A3: Loosen Z-axis Motor Coupler

Use a **5/64” Hex Key** to loosen the four set screws in the **Z-axis Motor Coupler**.



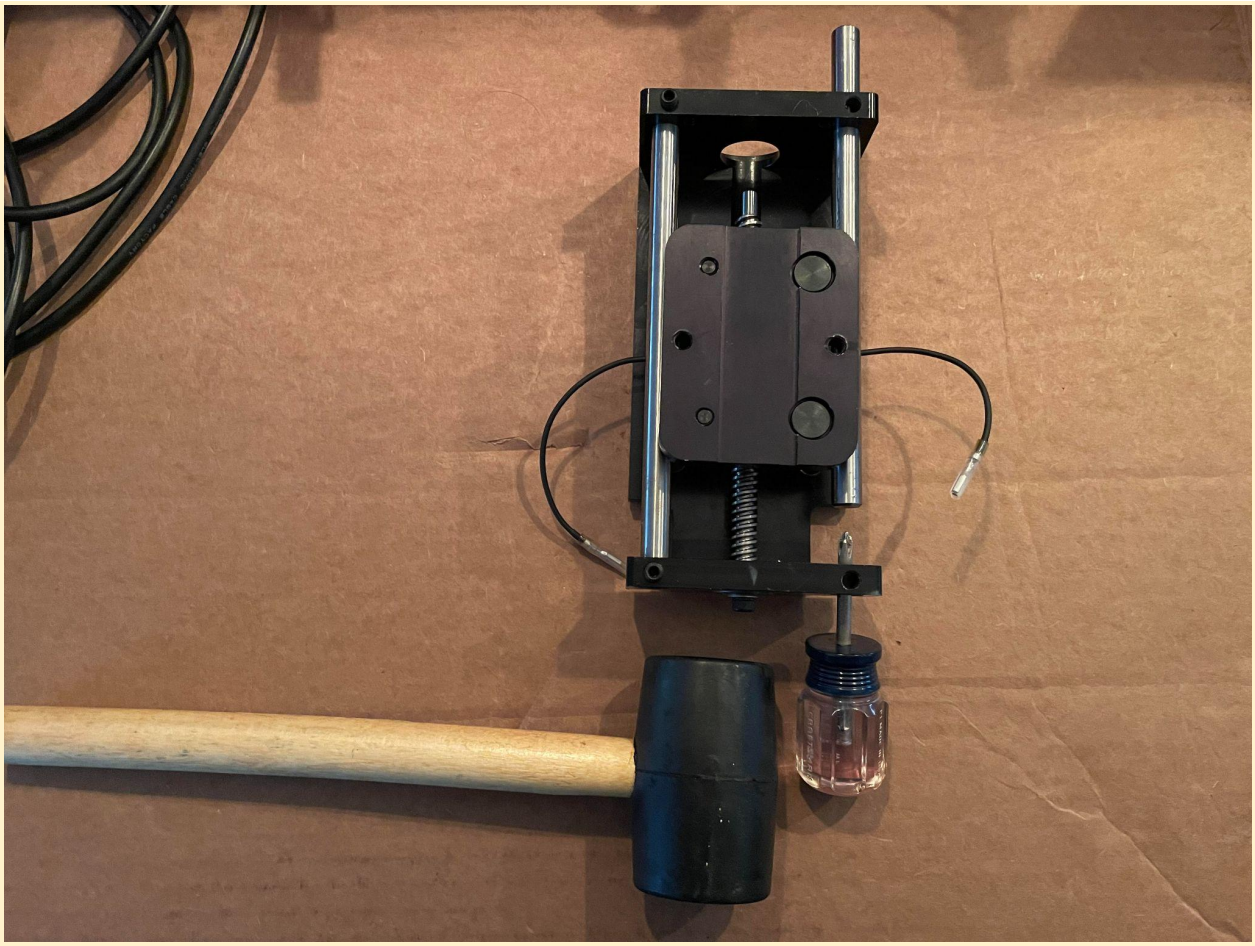
## Step A4: Uninstall Z-axis Motor & Z-axis Motor Coupler

Use a **5/32” Hex Key** to remove the four bolts that attach the **Z-axis Motor** to the Z-axis assembly. Set the **Z-axis Motor** and **Z-axis Motor Coupler** aside.



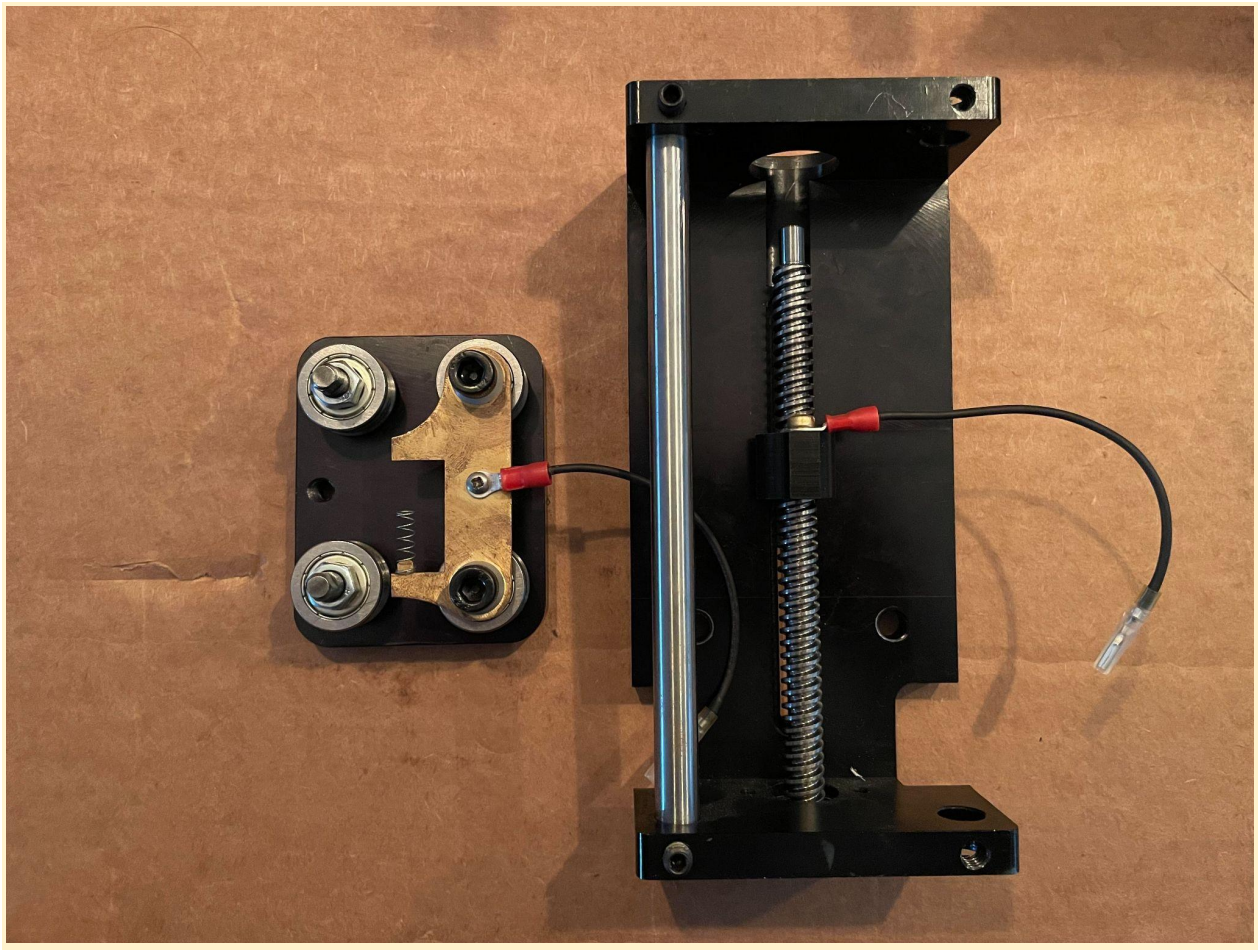
## Step A5: Uninstall RH Linear Rail

Remove the **Z-axis Linear Rail** that is on the ***right-hand*** side of the Z-axis assembly while it is oriented with the **Z Slide** facing upward. The **Linear Rail** is press-fit pretty tightly into its mounting holes, but gently tapping it out using a small **mallet** and a short, narrow tool (like the **screwdriver** pictured below) should be sufficient. Once the ***right-hand*** **Linear Rail** is free from the bottom hole, it is easy to slide it through the top hole. Set the ***right-hand*** **Linear Rail** aside.



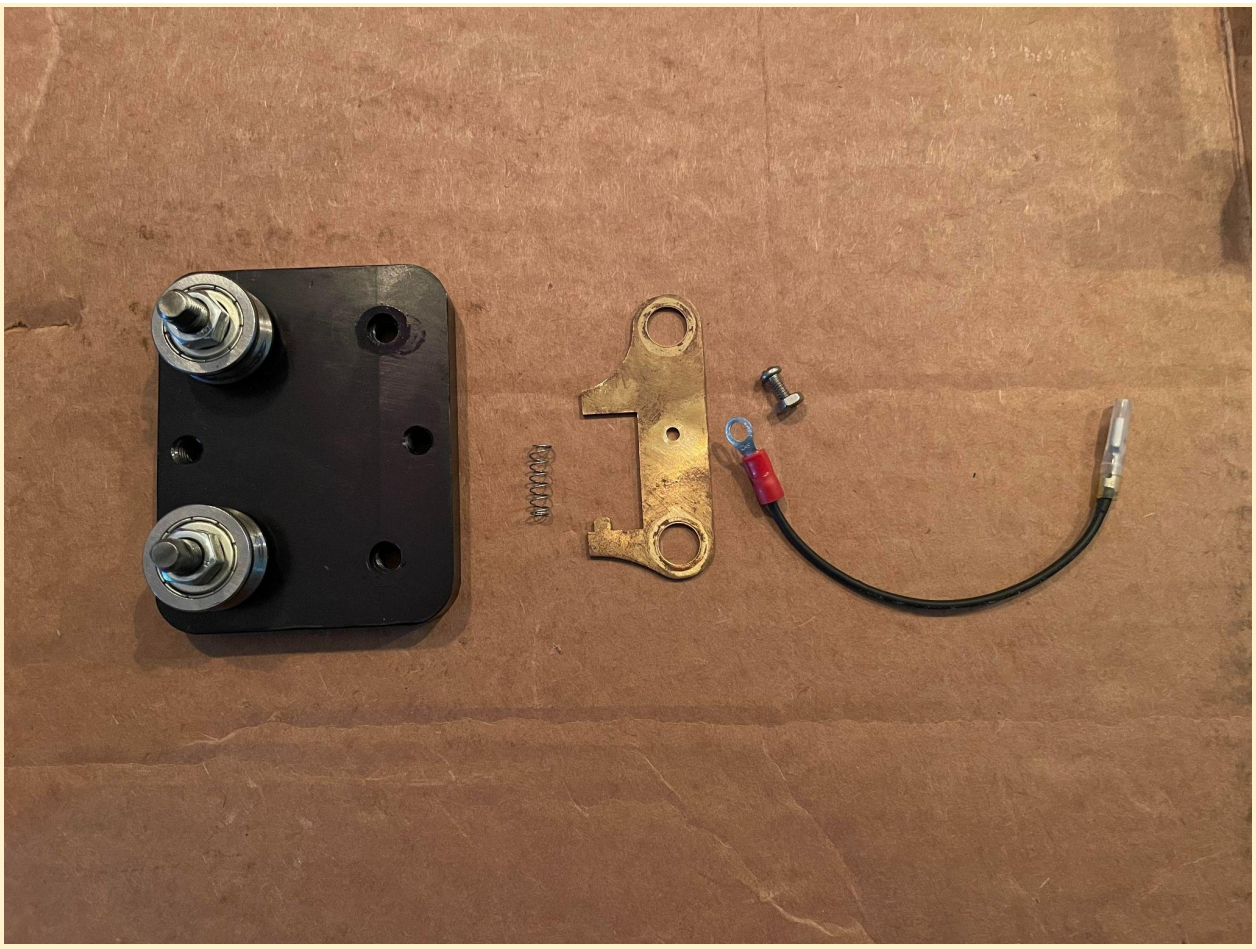
## Step A6: Uninstall Z Slide

There is a small **Spring** that pushes the **Brass Screw Contact** up against the **Brass Lifter Switch Contact** while the Z-axis is in its neutral position. The small **Spring** is attached to the lower portion of the **Brass Lifter Plate**, which itself is attached to the **Z Slide**. When uninstalling the **Z Slide** from the Z-axis assembly, it is very important to preserve the small **Spring** so that it does not deform or break. Move the **Z Slide** in a downward motion, like you are mimicking Z-axis negative travel. This will free the small **Spring** from a hole that it seats into at the bottom of the **Z-axis Lead Nut**. Once the small **Spring** is free, it is safe to uninstall the **Z Slide** from the Z-axis assembly



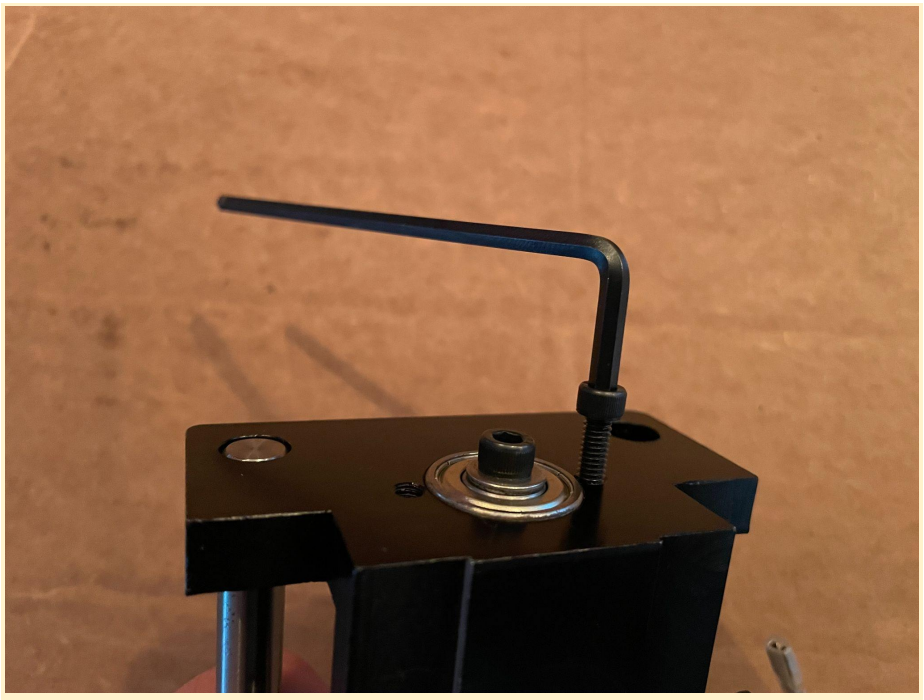
## Step A7: Disassemble Z Slide

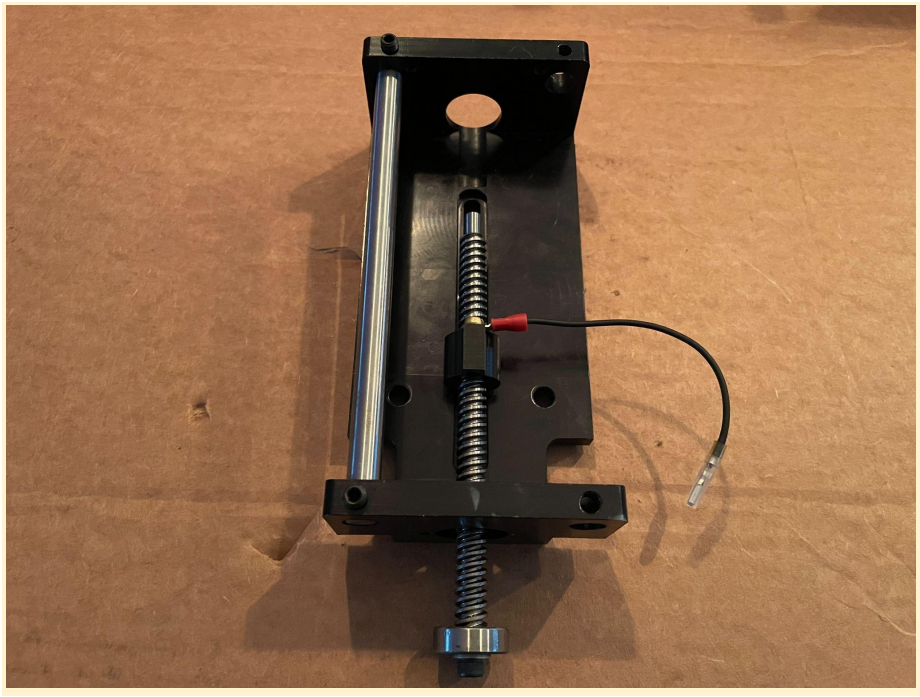
Use a **7/32” Hex Key** to remove the two socket head cap screws that mount the ***old*** **Brass Lifter Plate** to the **Z Slide**. Carefully remove the small **Spring** from the ***old*** **Brass Lifter Plate**, and set it aside. Use a **phillips screwdriver** to remove the **IHS Blade Connector Cable** from the ***old*** **Brass Lifter Plate** and set the **Cable** along with its **mounting screw** and **nut** aside. Discard the ***old*** **Brass Lifter Plate** as well as the **white plastic washers**.



## Step A8: Loosen Z-axis Lead Screw Connection

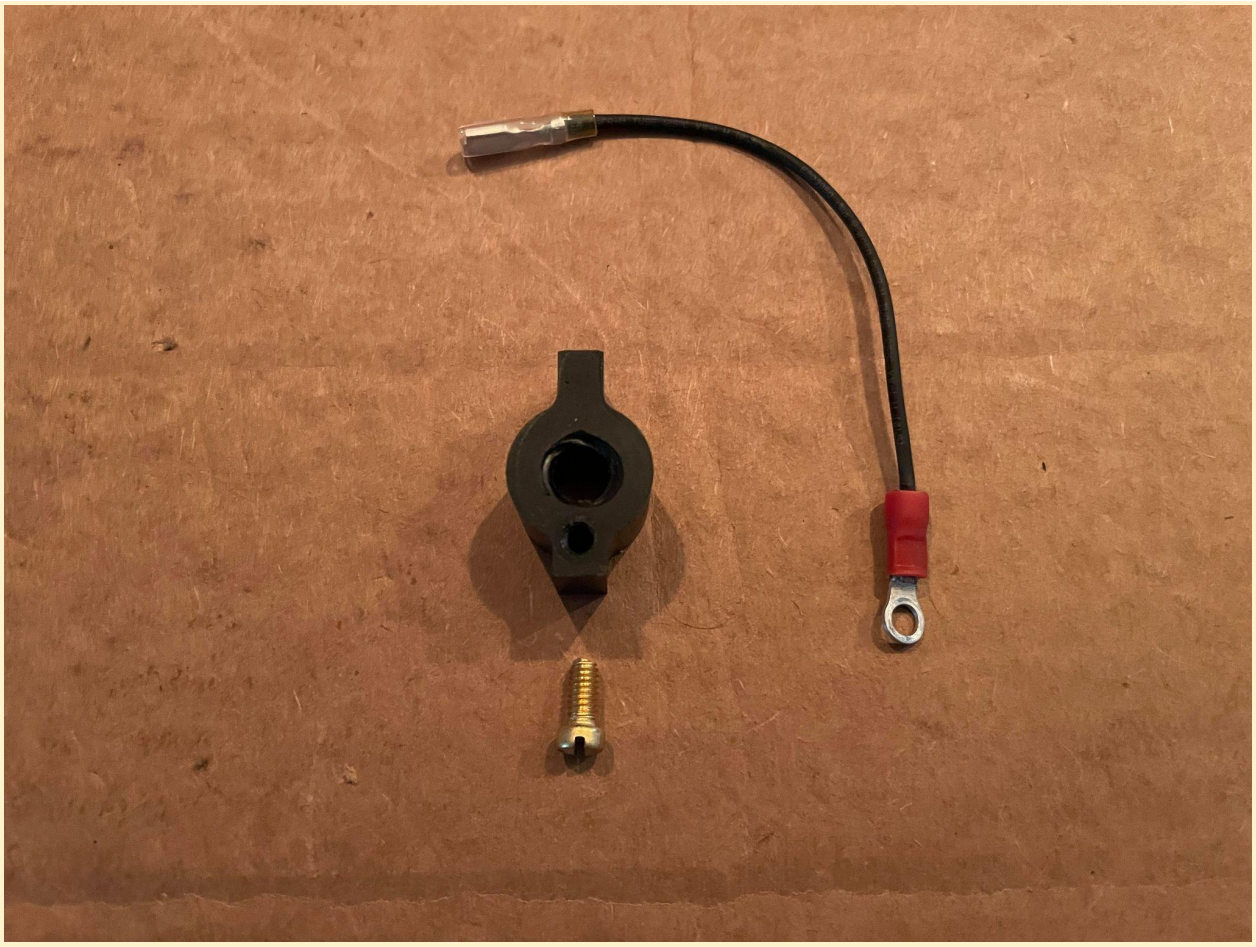
Use a **9/64” Hex Key** to remove the two socket head cap screws from either side of the **Z-axis Lead Screw Bearing**. Once the socket head cap screws are removed, push downward on the **Z-axis Lead Screw** to free the **Z-axis Lead Screw Bearing** from its press-fit hole.





## Step A9: Uninstall & Disassemble old Z-axis Lead Nut Assembly

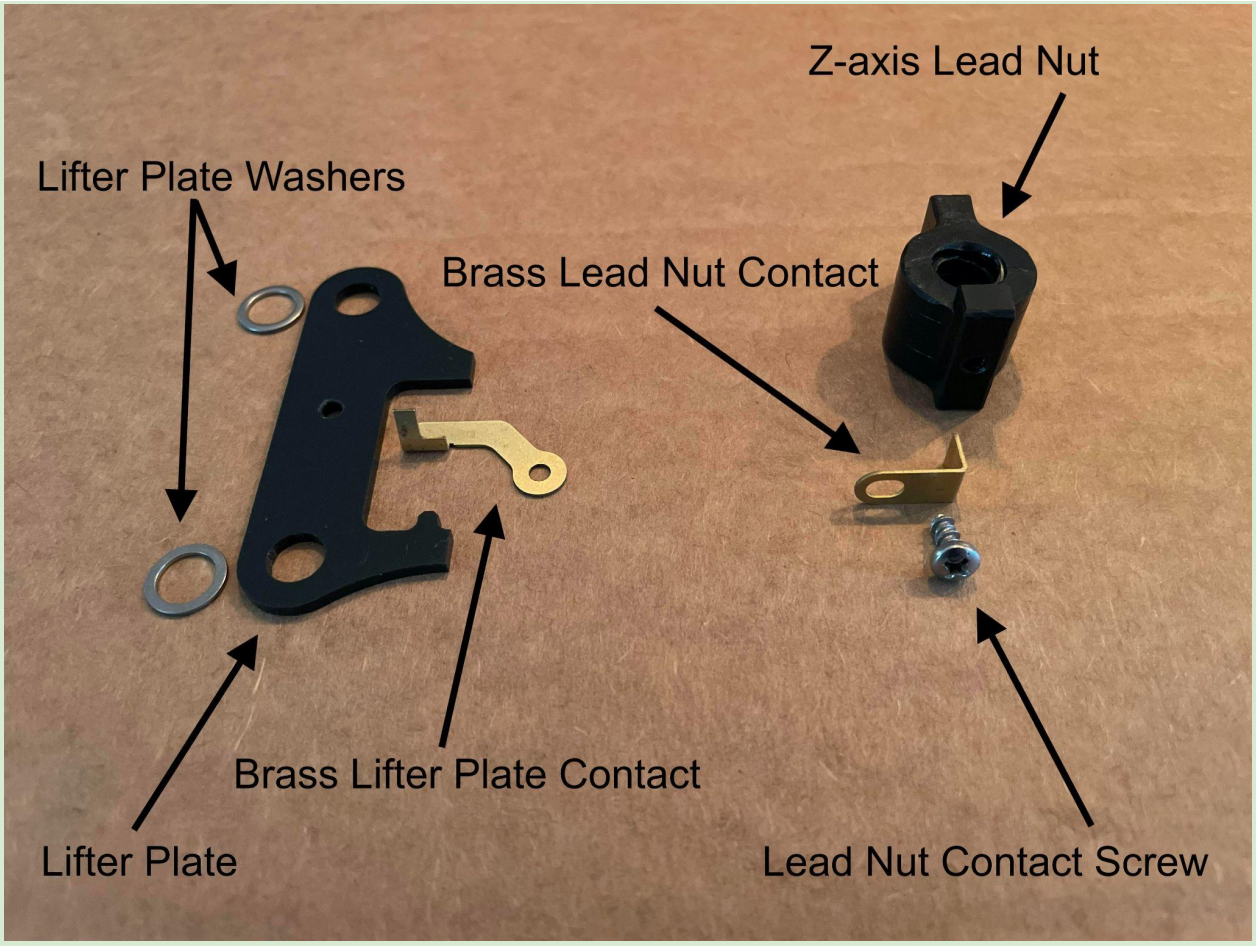
Once the **Z-axis Lead Screw Bearing** is free from the hole, manually rotate the **Z-axis lead screw** to uninstall the ***old*** **Z-axis Lead Nut assembly** from the **Z-axis Lead Screw**. Once the ***old*** **Z-axis Lead Nut assembly** is uninstalled, use a **flathead screwdriver** to remove the ***old*** **Brass Screw Contact** from the ***old*** **Z-axis Lead Nut**. Set the **IHS Blade Connector Cable** aside. Discard the ***old*** **Z-axis Lead Nut** as well as the ***old*** **Brass Screw Contact**.



# Part 2: Reassembling the Z-axis assembly using the new IHS Contact Switch components

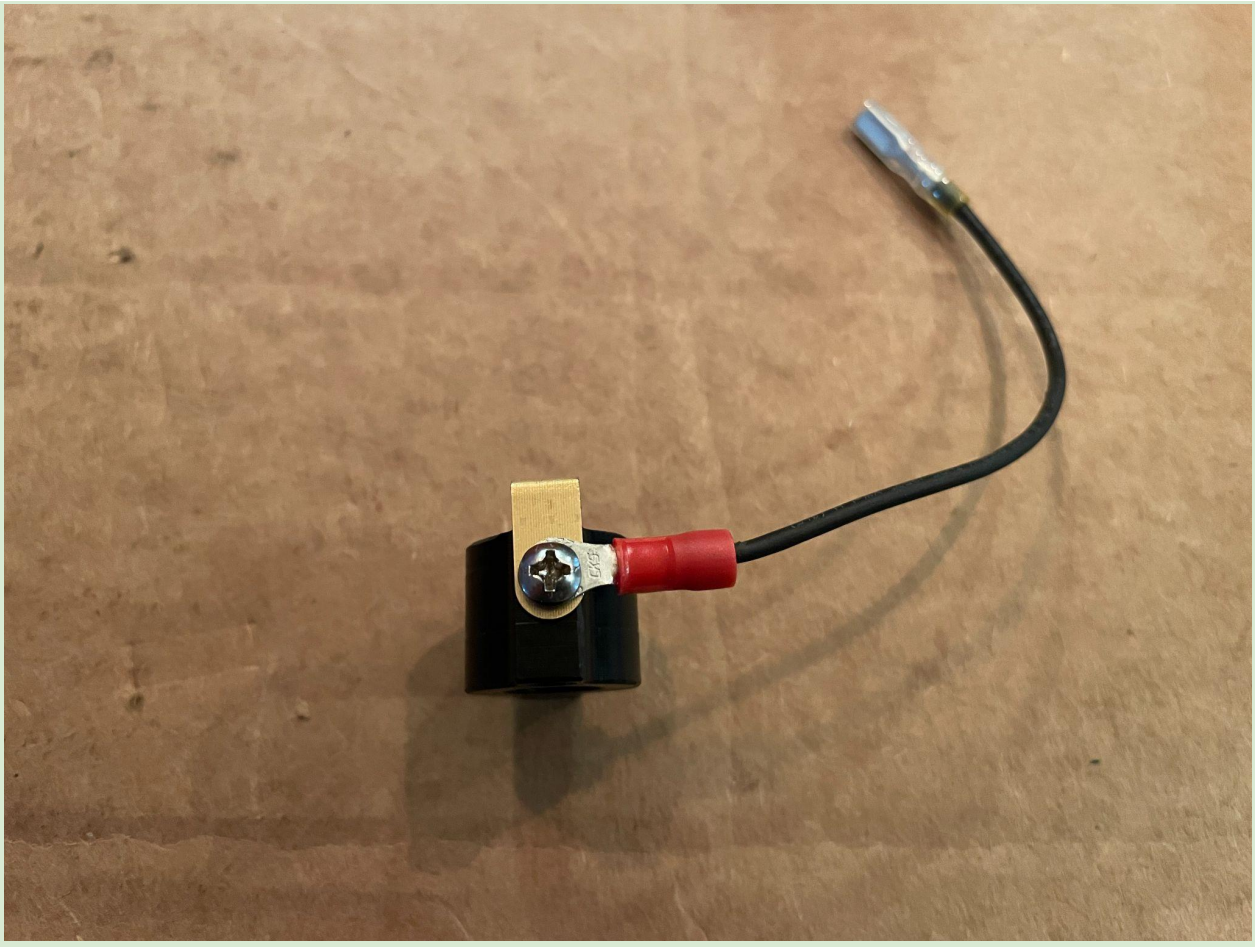
## Step B1: Examine New IHS Contact Switch Components

Become familiar with the ***new* Z-Axis Contact Switch components**. The **Lifter Plate** and the **Brass Lifter Plate Contact** replace the old Brass Lifter Plate that was discarded in step A7 of Part 1. The **Lifter Plate Washers** replace the old white plastic washers that were discarded in Step A7 of Part 1. The **Z-axis Lead Nut**, **Brass Lead Nut Contact**, and **Lead Nut Contact Screw** replace the old Z-axis Lead Nut and the Brass Screw Contact that were discarded in Step A9 of Part 1.



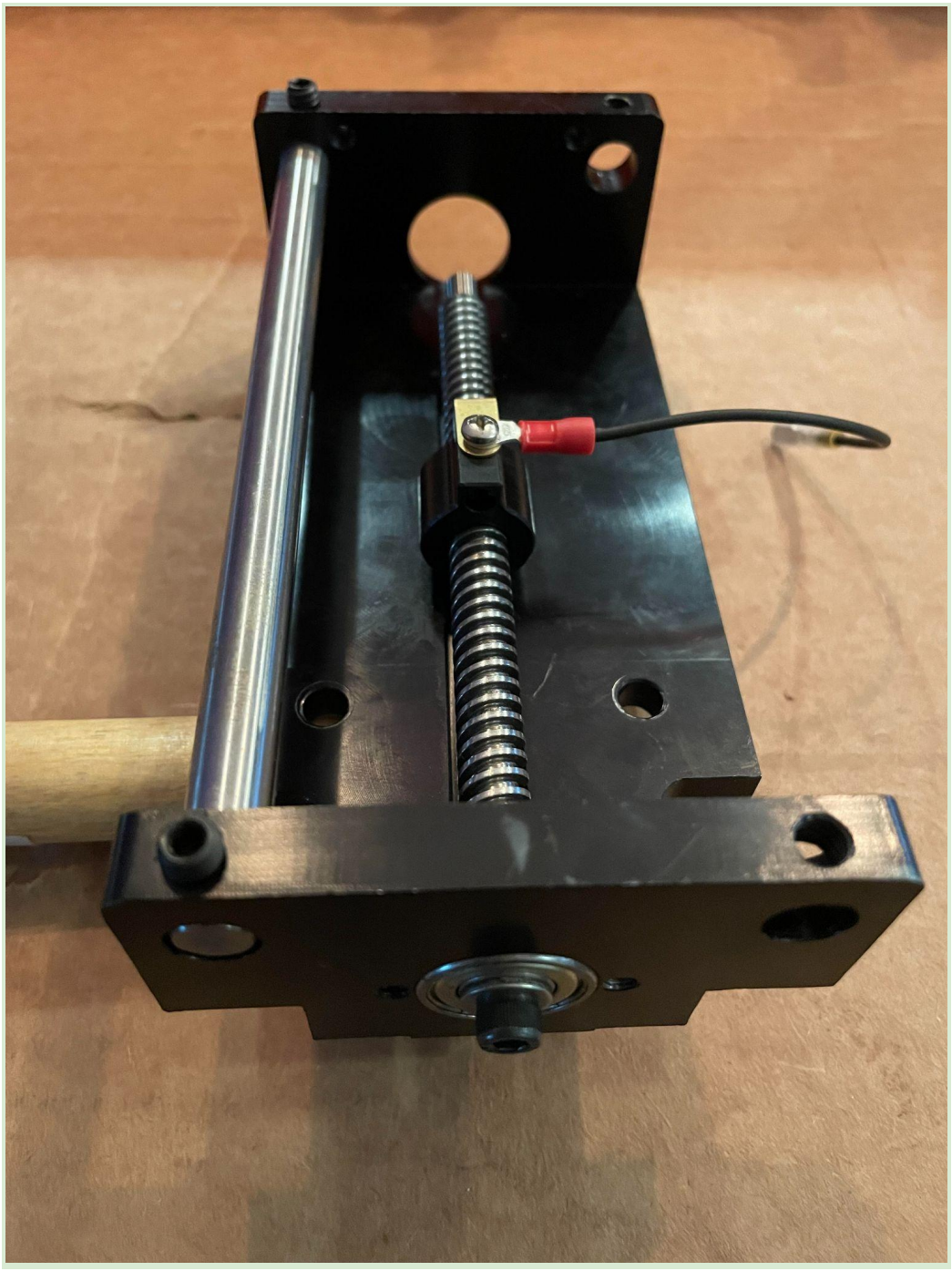
## Step B2: Assemble & Install Z-axis Lead Nut Assembly

Use a **phillips screwdriver** and the **Lead Nut Contact Screw** to attach an **IHS Blade Connector Cable** as well as the **Brass Lead Nut Contact** to the ***new*** **Z-axis Lead Nut**. Be sure to orient the **IHS Blade Connector** in the correct direction.



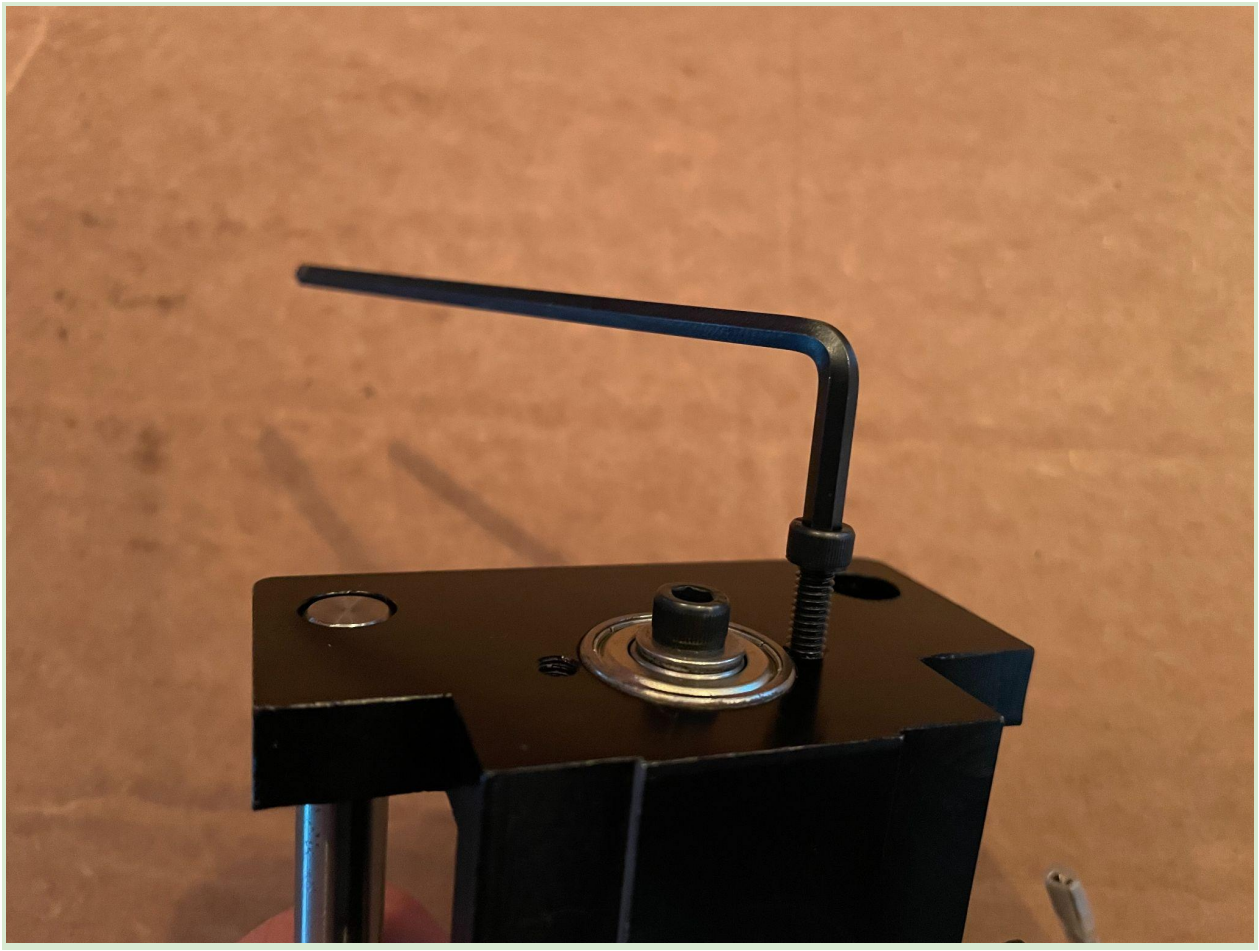
## Step B3: Install Z-axis Lead Nut Assembly onto Z-axis Lead Screw

Place the back portion of the **Z-axis Lead Nut assembly** into the slot in the Z-axis assembly chassis. Thread the **Z-axis Lead Nut** onto the **Z-axis Lead Screw** by manually rotating the **Z-axis Lead Screw**. Continue manually rotating the **Z-axis Lead Screw** until the **Z-axis Lead nut** is at approximately the midpoint of travel.



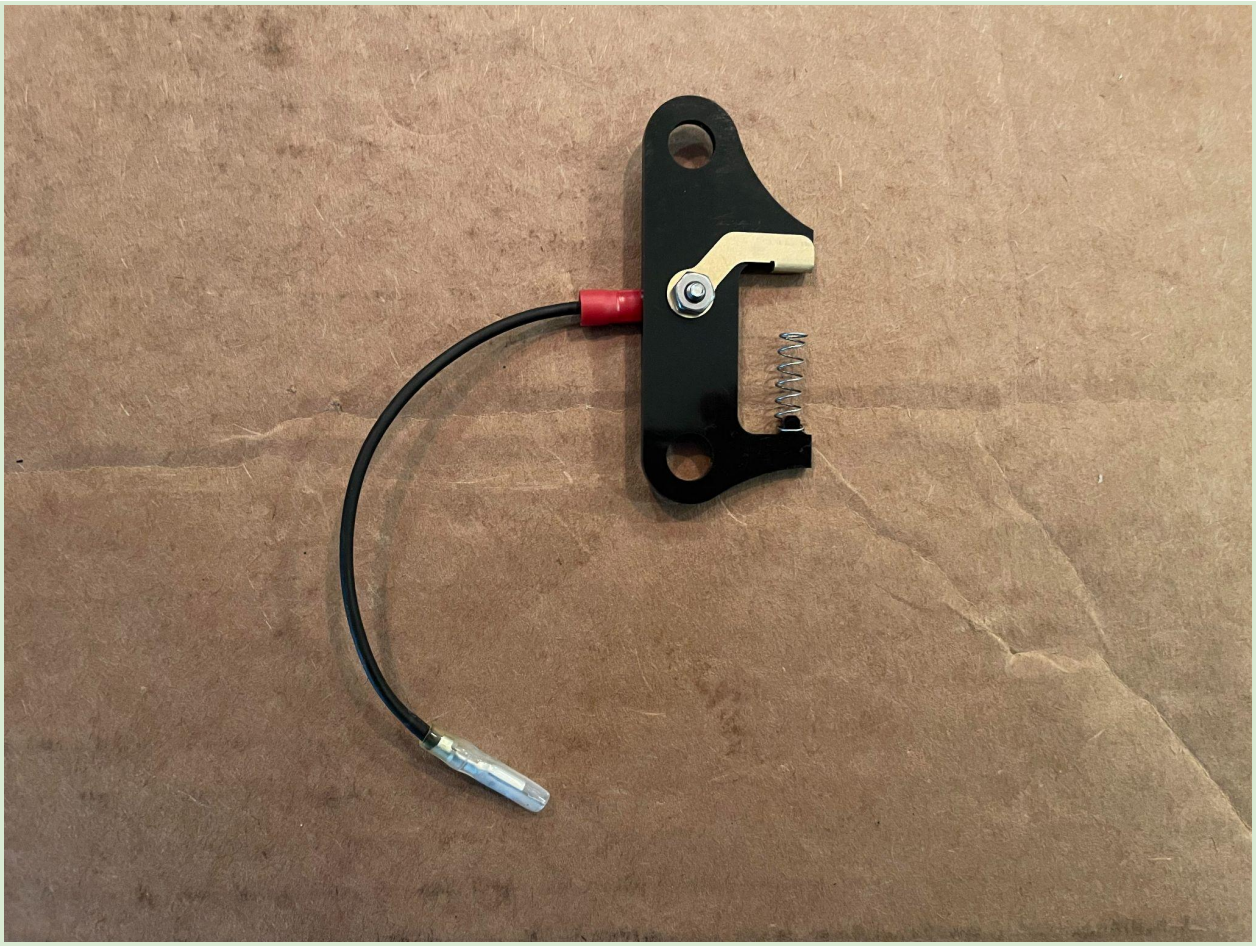
## Step B4: Tighten Z-axis Lead Screw Connection

Seat the **Z-axis Lead Screw Bearing** into its hole, then use a **9/64” Hex Key** to install the two socket head cap screws on either side of the **Z-axis Lead Screw Bearing.**



## Step B5: Assemble Lifter Plate Assembly

Use a **phillips screwdriver** to attach an **IHS Blade Connector Cable** as well as the **Brass Lifter Plate Contact** to the **Lifter Plate**. Be sure to orient the **IHS Blade Connector** in the correct direction. You will need to bend a portion of the **Brass Lifter Plate Contact** to wrap it around the upper portion of the **Lifter Plate**. Install the small **Spring** onto the lower portion of the **Lifter Plate**.



## Step B6: Assemble Z Slide

Stack the **black plastic washers**, the **Z-axis Linear Bearings**, and the **Lifter Plate Washers** on top of each other as shown in *figure B6/1* shown below. Place the **Lifter Plate assembly** on top of the stacks, and attach everything in place using the bolts as shown in figure *B6/2* shown below.

*figure B6/1*

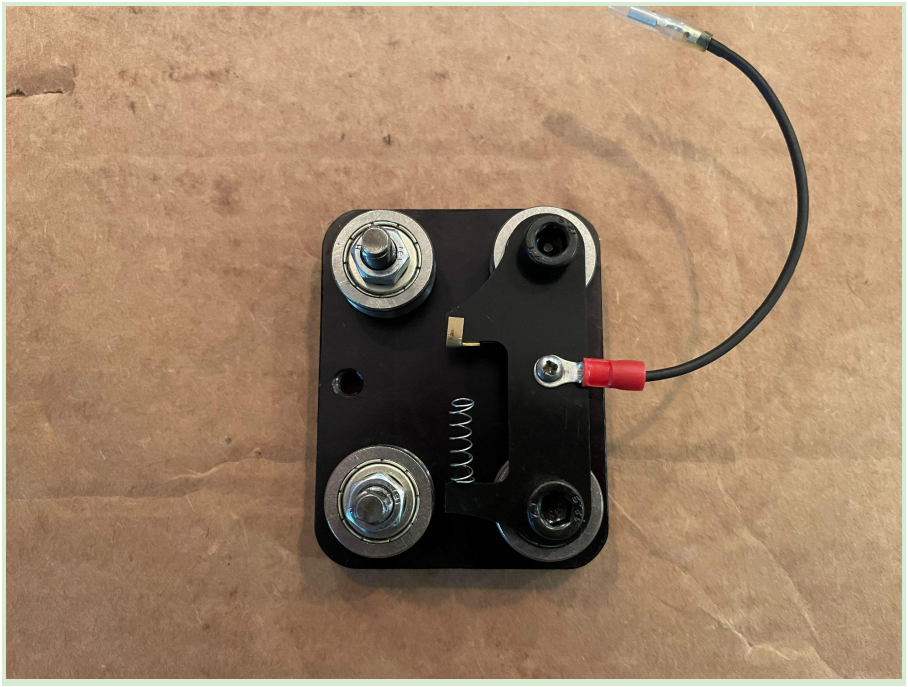
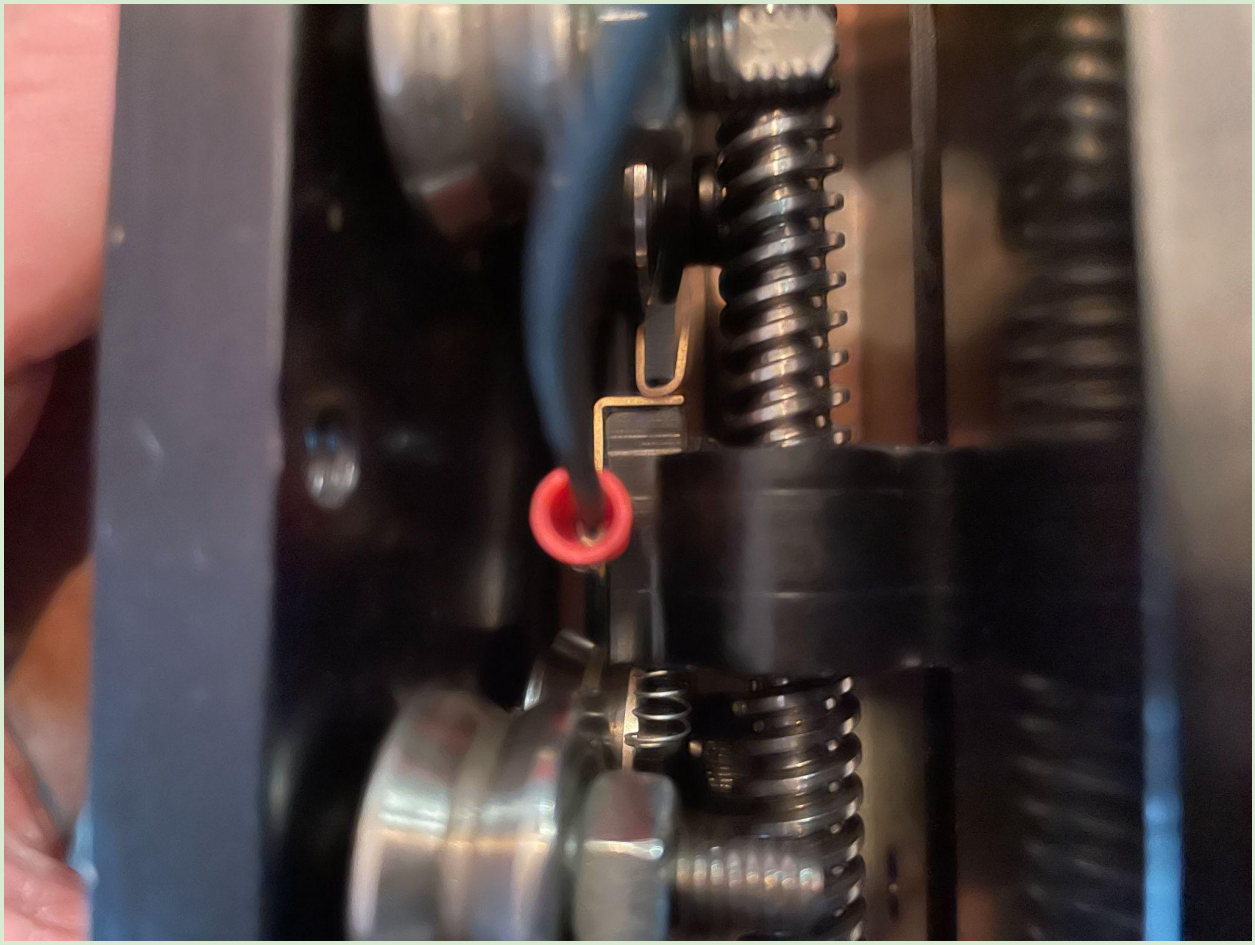


*figure B6/2*

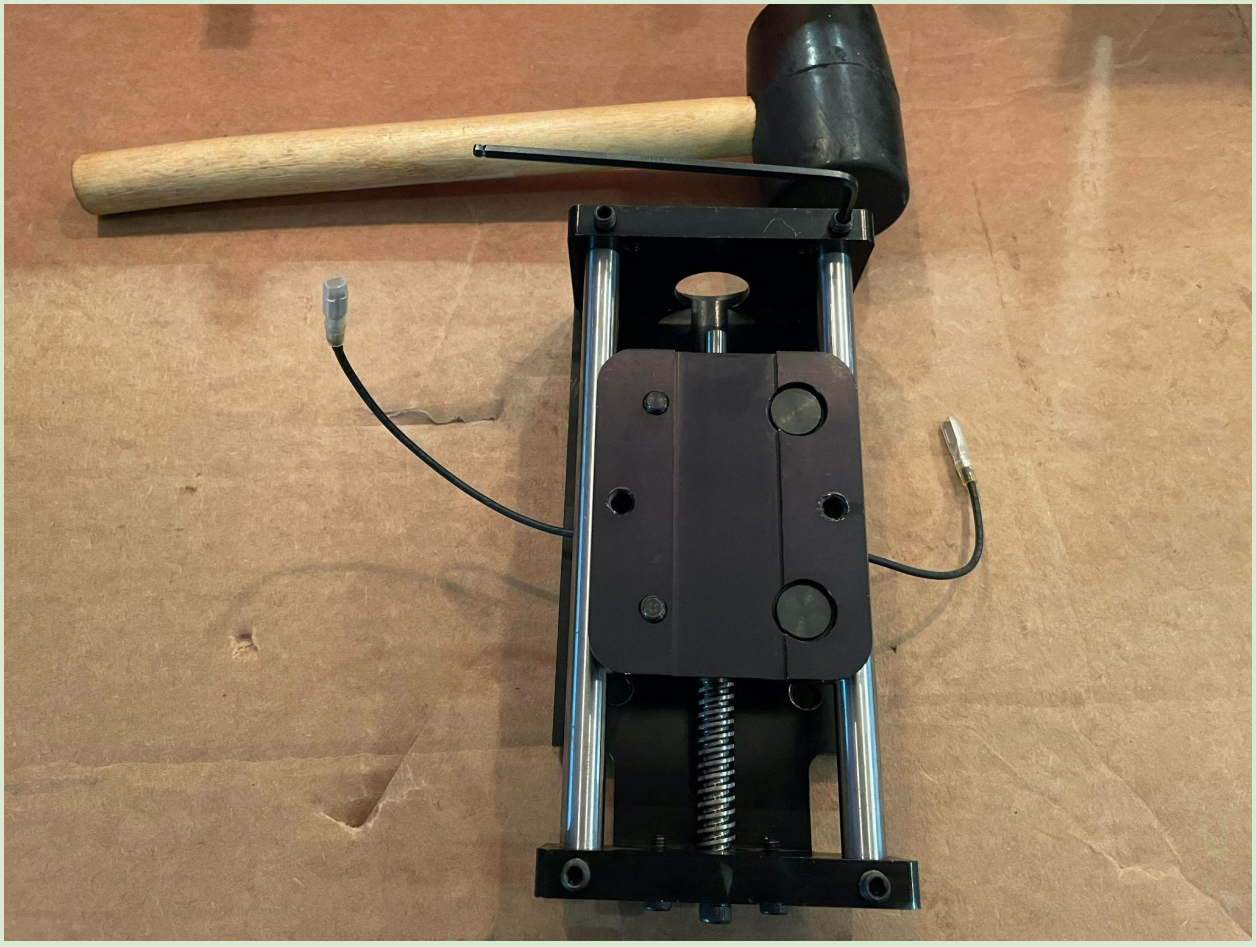
## Step B7: Install Z Slide

Install the **Z Slide**, making sure that the small **Spring** is inserted into the hole at the bottom of the **Z-axis Lead Nut**.



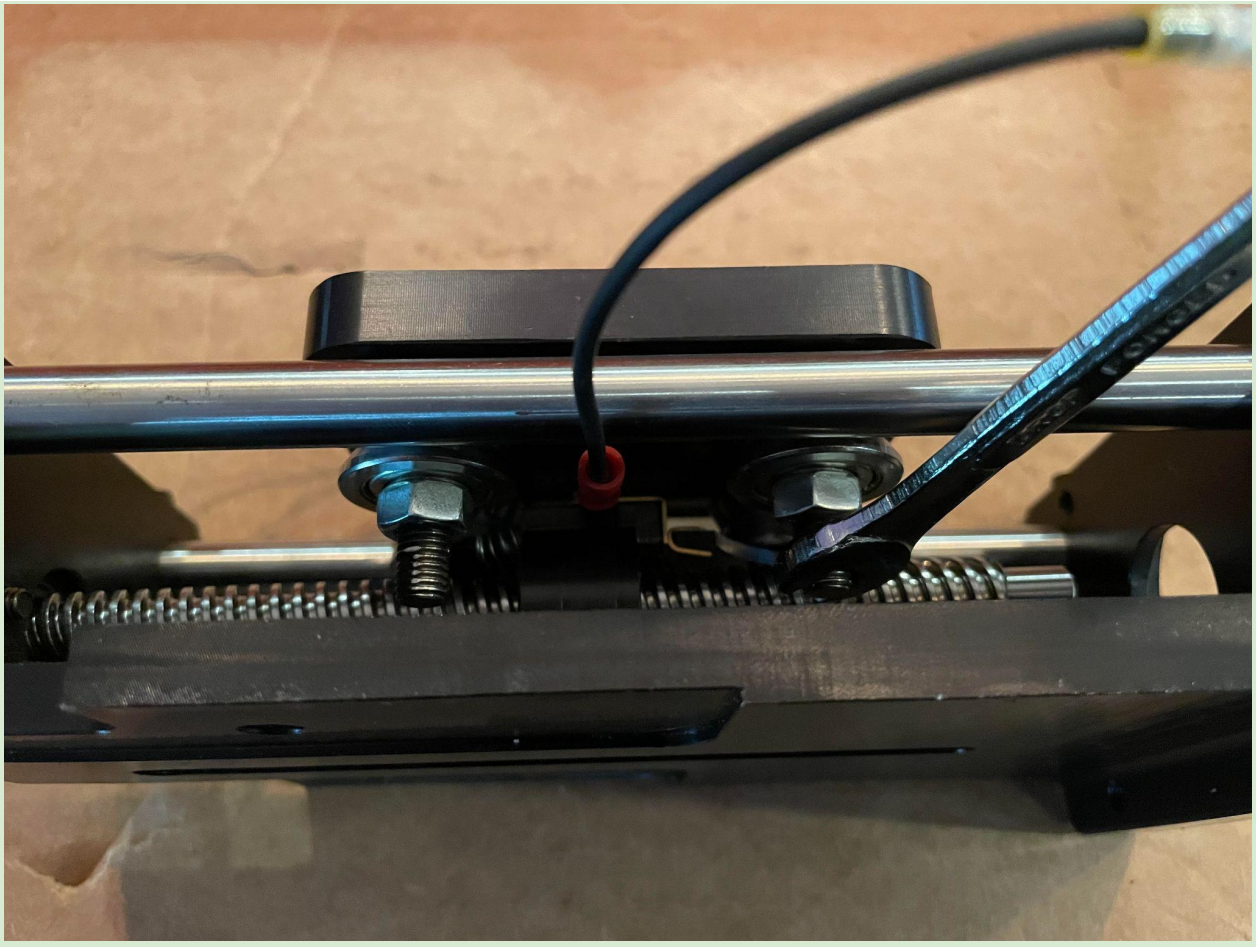
## Step B8: Install RH Linear Rail

Use a small **mallet** to tap the ***right-hand* Linear Rail** into place. Use a **1/8” Hex Key** to install the set screws that hold the ***right-hand* Linear Rail secure**.



## Step B9: Adjust Z-axis Linear Bearing Preload

The **Z-axis Linear Bearing** axles on the ***right-hand*** side are adjustable, the bolts that hold the bearing are eccentric. Turn them with a **5mm wrench** to adjust the bearing preload and drive the **Z-axis Linear Bearings** into the **Linear Rail** until they make contact.



## Step B10: Install Z-axis Motor & Motor Coupler

Use a **5/32” Hex Key** to install the four bolts that attach the **Z-axis motor** to the Z-axis assembly chassis. Make sure that your **Z-axis Coupler** is in place between the **Z-axis Motor** and the **Z-axis Lead Screw**.

## Step B11: Tighten Motor Coupler Set Screws

Use a **5/64” Hex Key** to tighten the four set screws in the **Z-axis motor coupler**.