MK4 TO MK5 UPDATE MANUAL

Annin Robotics

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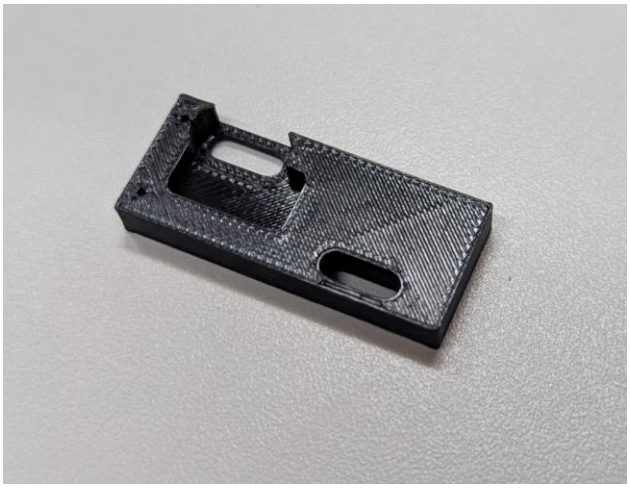
BOM



MK4 TO MK5 J1 SENSOR MOUNT

PETG FILAMENT 15% INFILL 2X WALLS

MK4 TO MK5 J2 SENSOR MOUNT

PETG FILAMENT 15% INFILL 2X WALLS

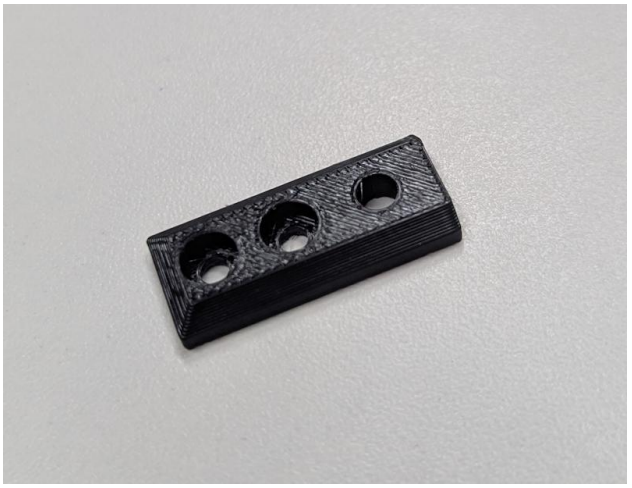
MK4 TO MK5 J3 SENSOR MOUNT

PETG FILAMENT 15% INFILL 2X WALLS

MK4 TO MK5 J2 TENSION RING

ABS-GF FILAMENT 100% INFILL 4X WALLS

MK4 TO MK5 J1 MAGNET MOUNT

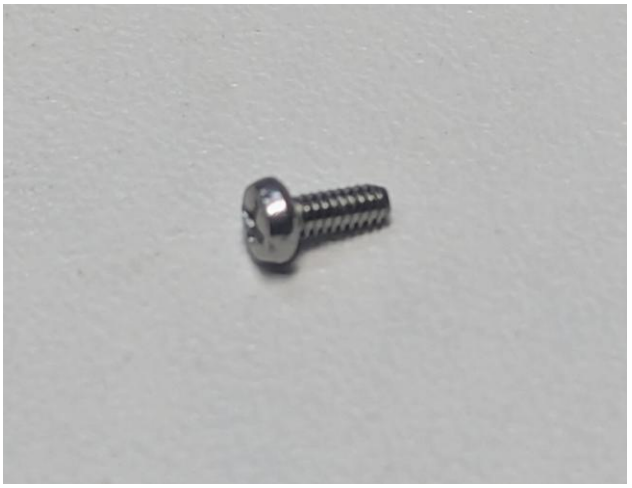


MK4 TO MK5 J3 MAGNET MOUNT

J2 Cable Holder

PETG FILAMENT 15% INFILL 2X WALLS

(6x) M3 x 10 pan head screw

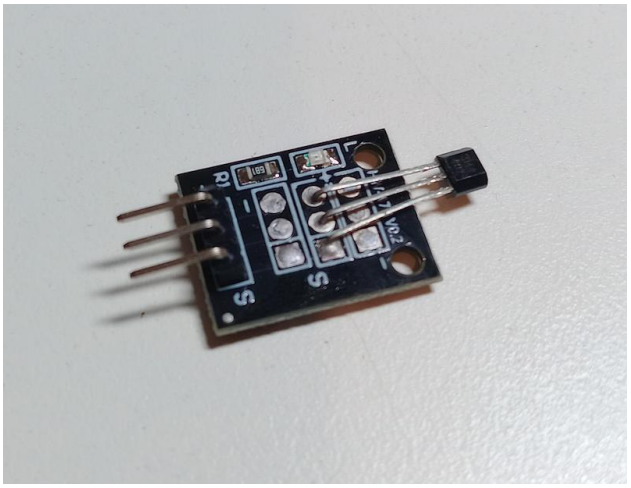


(6x) M1.6 x 4 pan head screw

(4x) M4 x 8 pan head screw

(4) M4 plastic thread heated inserts

M8 to M4 reducer insert



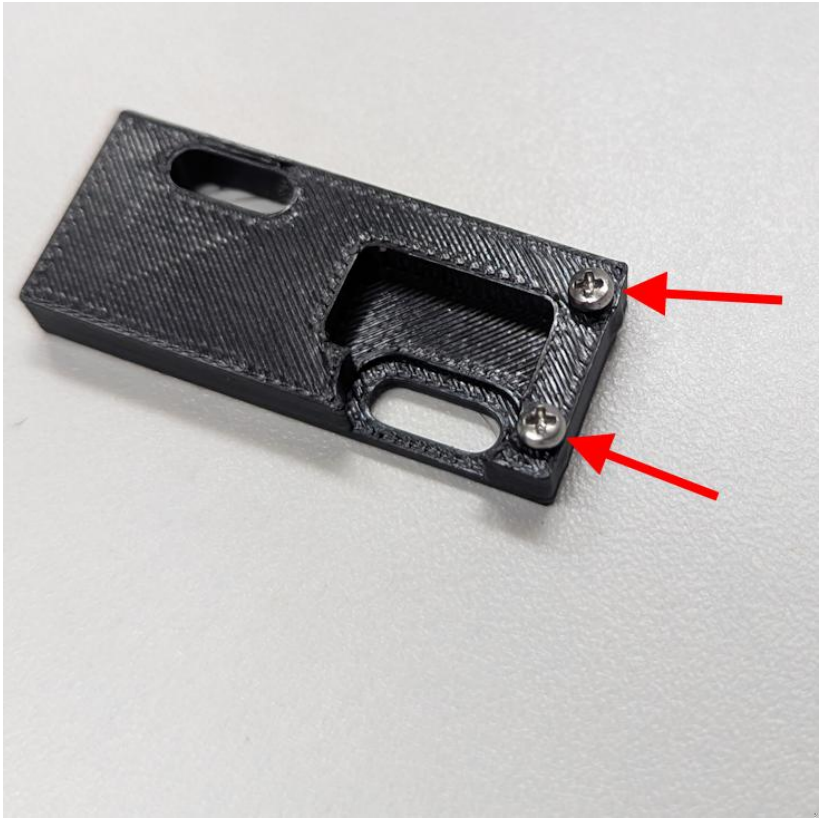
(3x) 3144 Hall Effect Sensor 3.3v.

(3x) 4mm x 4mm round magnet

(3x) Dupont 2.54 mm female 3 pin connector lead.

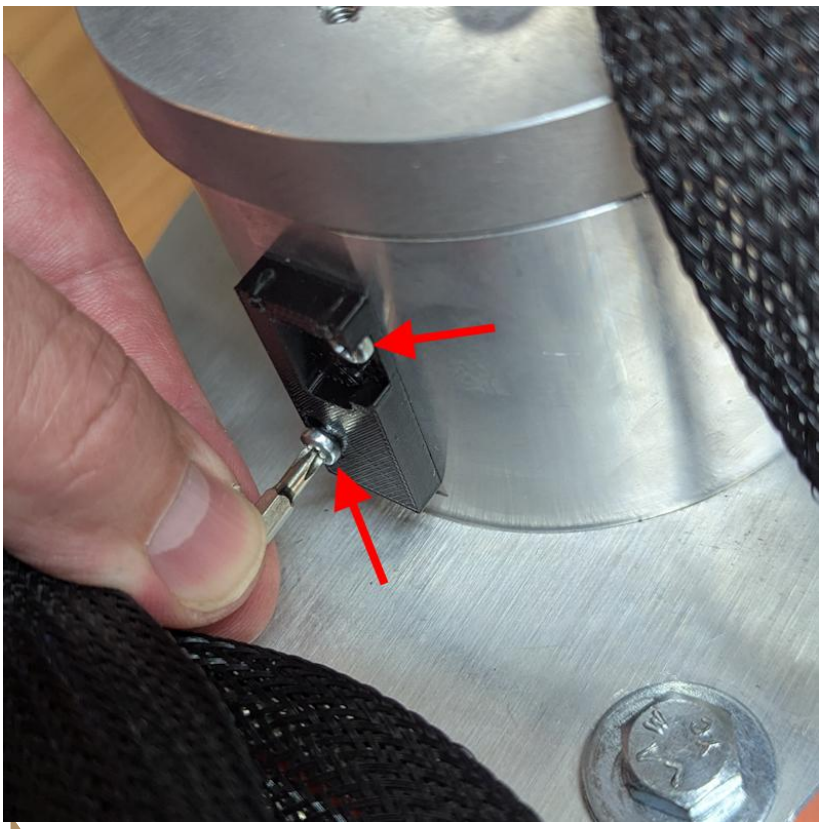
EMI shielding tape 2.5cm wide by 30cm long

UPDATE INSTRUCTIONS



Pre thread (2x) M1.6x4 screws into the J1 sensor mount as shown and then remove them.

This step is meant to force thread the screw into the plastic and pre-thread the holes in the plastic so that it is easier to install the screws in a future step.

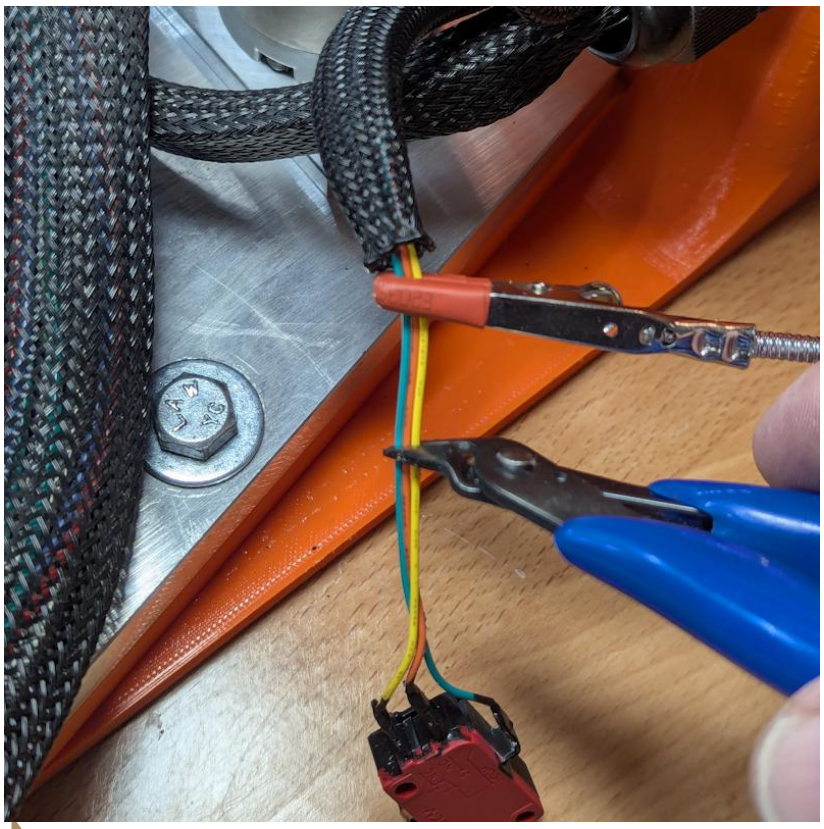


Remove the original J1 limit switch and lay it to the side.

Install the new J1 sensor mount as shown using (2x) M3x10 screws as shown.

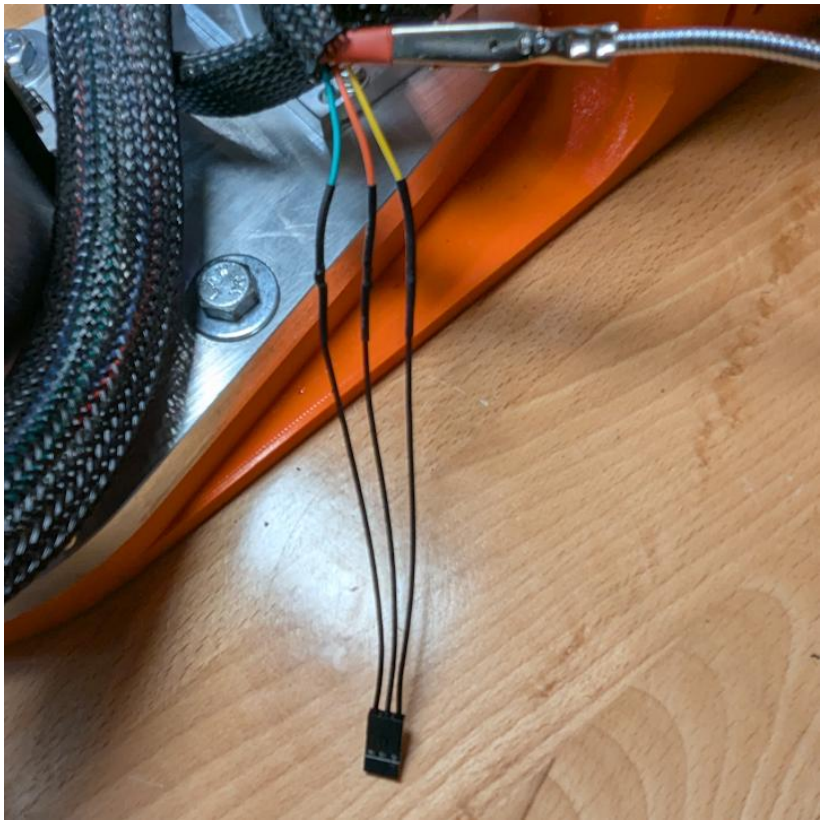
Note: you will need to use a small Philips head bit to install the screws in this tight area.

Install hall effect sensor as shown using (2x) M1.6x4 pan head screws.



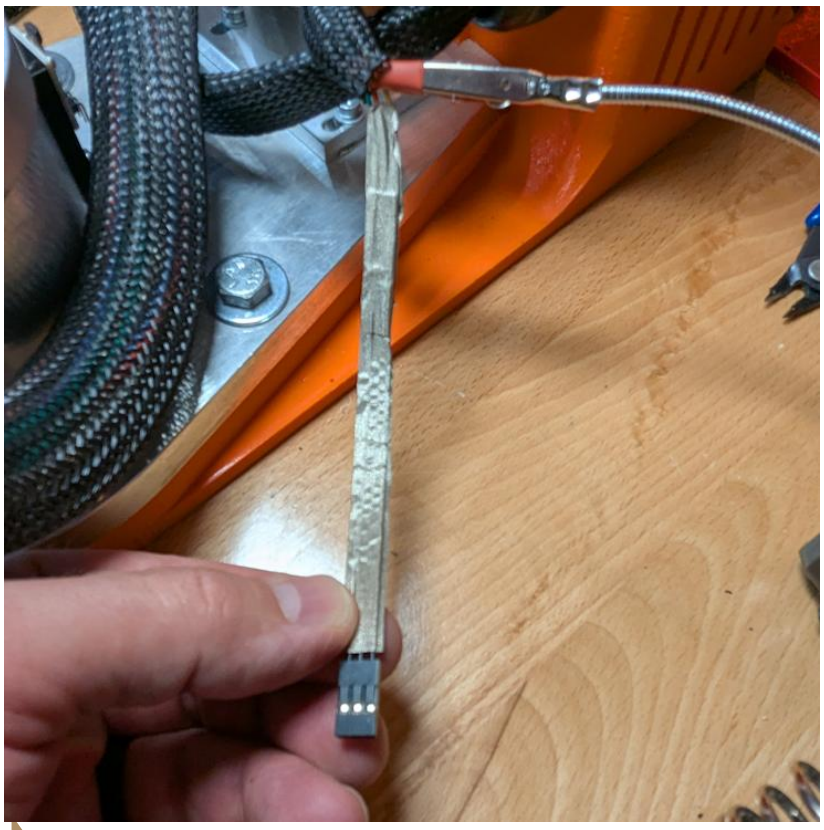
Make sure your USB cable to your robot is disconnected.

Cut the J1 limit switch wires as shown.



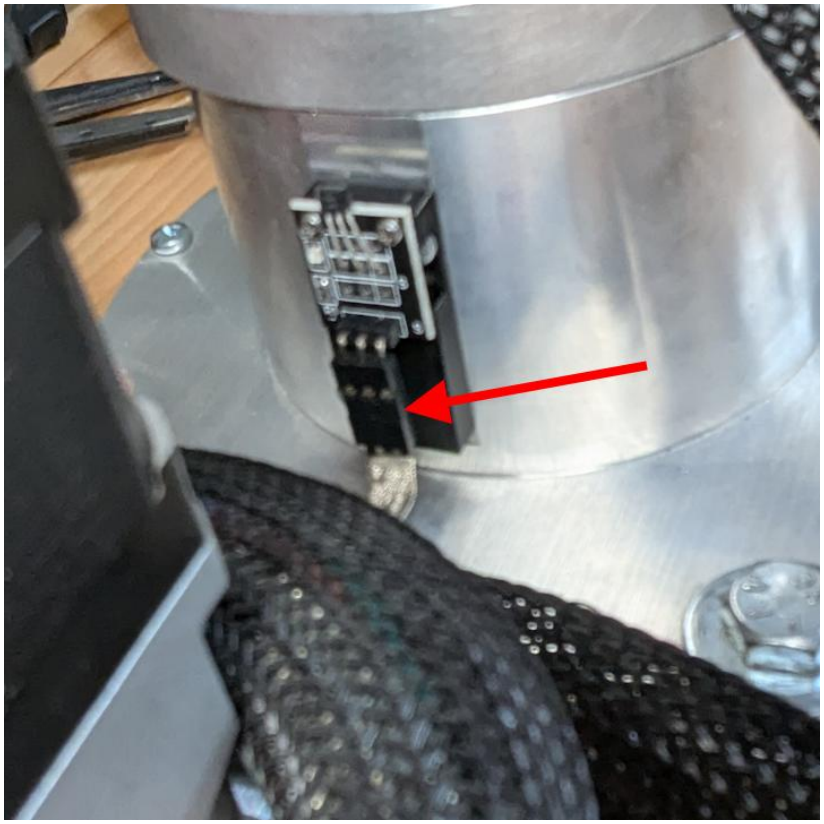
Solder and heat shrink wire connections from the 3 J1 limit switch wires to Dupont 2.54mm 3 pin connector lead as shown.

Make sure the green wire is connected to the right terminal, The orange wire to the center terminal and the yellow wire to the left terminal.



Pull braided sleeve back as far as possible and secure with clip.

Cut 12cm length of EMI shielding tape and apply to J1 sensor wire leads as shown.



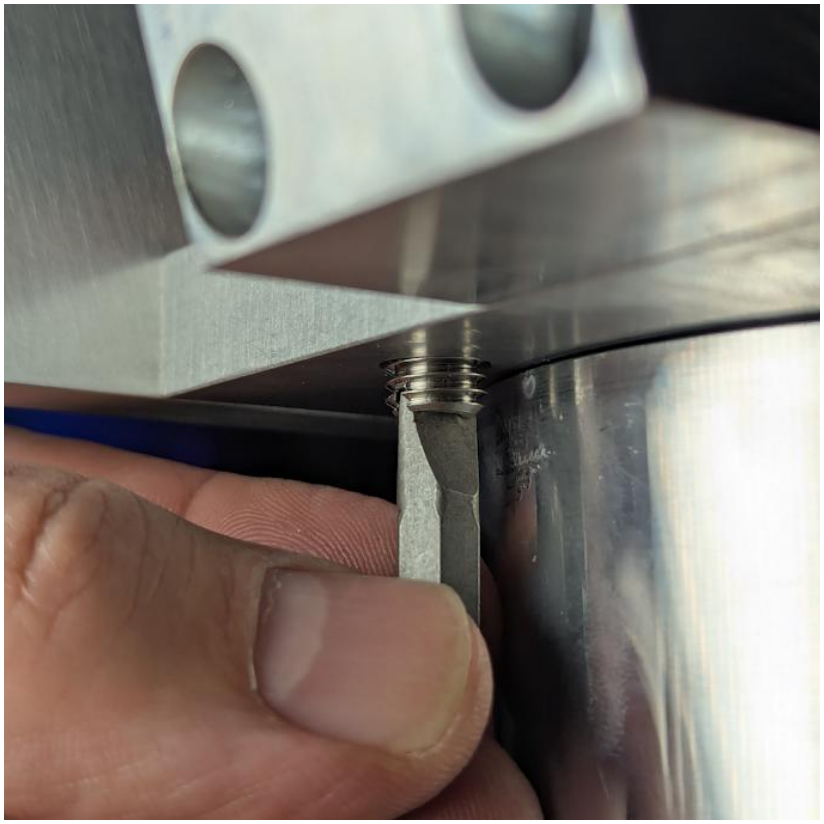
Plug Dupont connector onto J1 hall effect sensor as shown.

Make sure the connector is plugged in with the green wire terminal on the right side.

Place 4mm x 4mm round magnet on end of flat blade screwdriver – then use magnet polarity tester to make sure the North end of the magnet is facing out as shown.

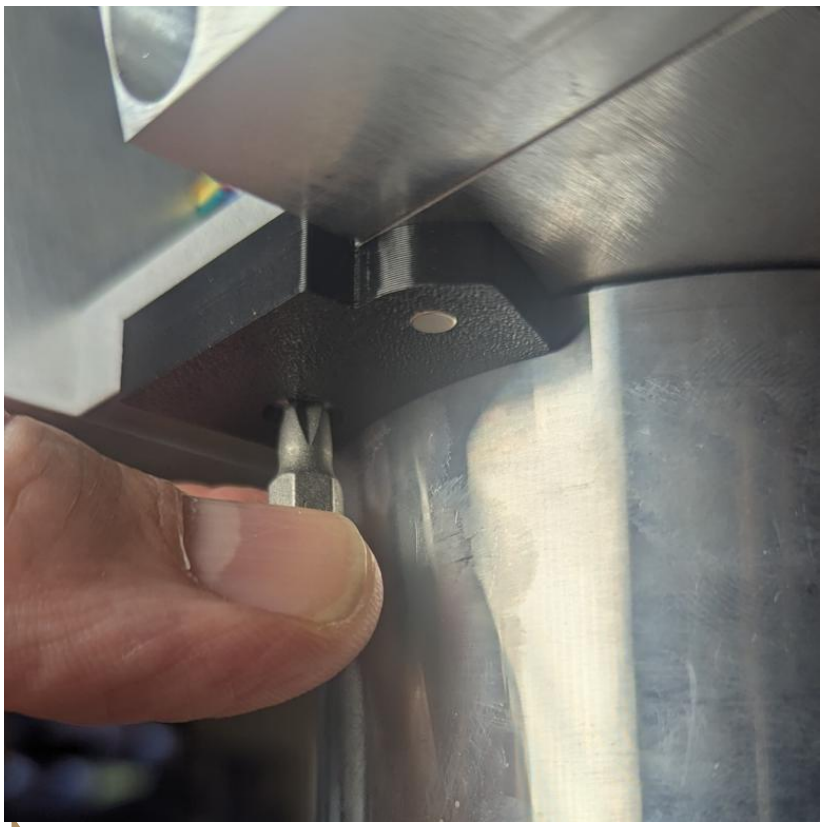
Press magnet into J1 magnet mount as shown using flat blade screwdriver.

Use magnet polarity tester to verify the Sount end of the magnet is now facing out on sensor mount.



Remove and discard the M8 cap screw previously used to trip the J1 limit switch.

Use small flat blade screwdriver bit to install M8 to M4 thread adapter as shown.

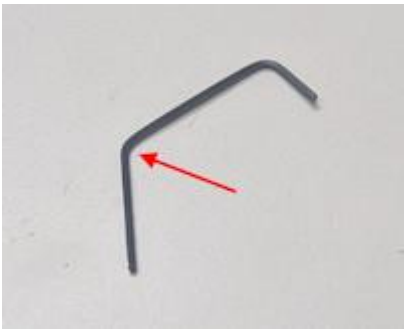


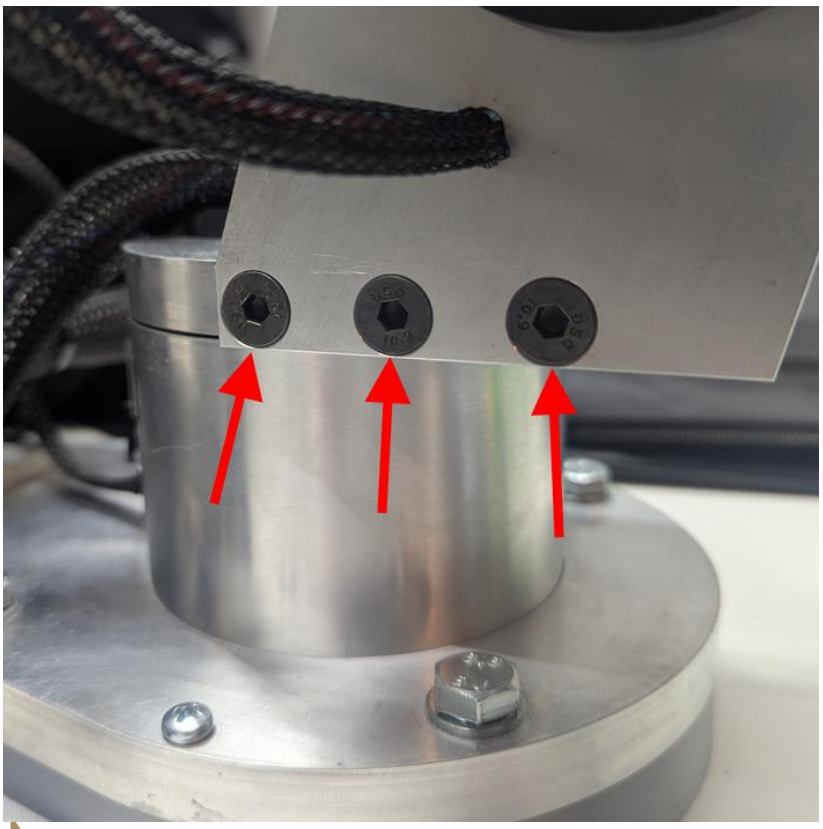
Use Phillips head screw driver bit to secure J1 magnet mount to bottom side of J1 turret platform as shown.

Make sure south side of magnet is facing down.

We need to remove the J2 motor. First, we will need to loosen the M3 set screw on the J2 motor shaft.

You can either remove the J3 motor to gain access or you can bend and M1.5 hex key as I have done here:

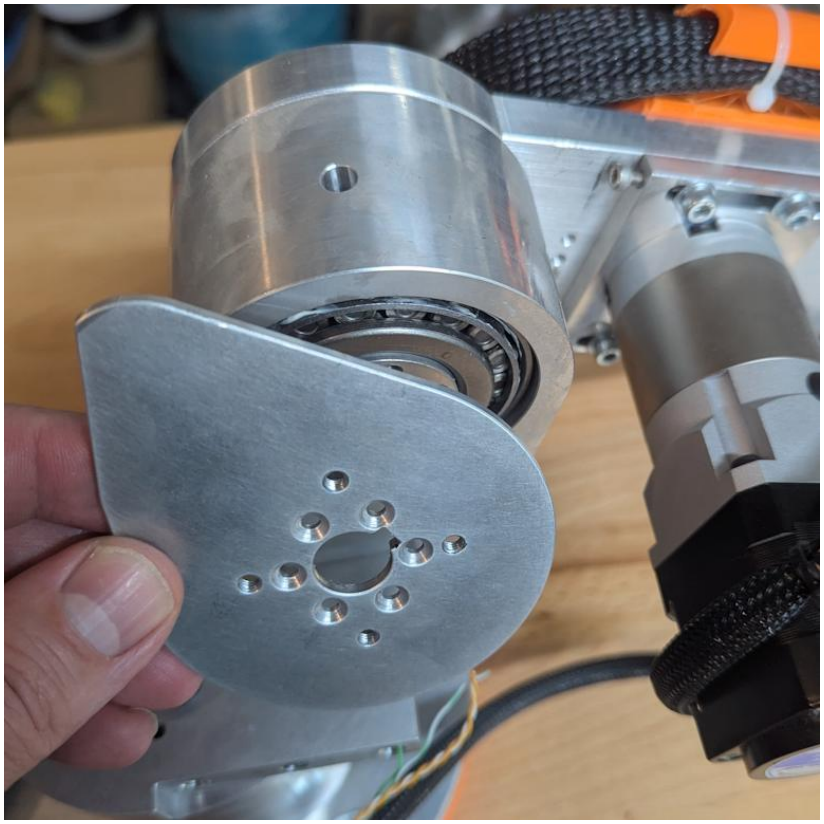




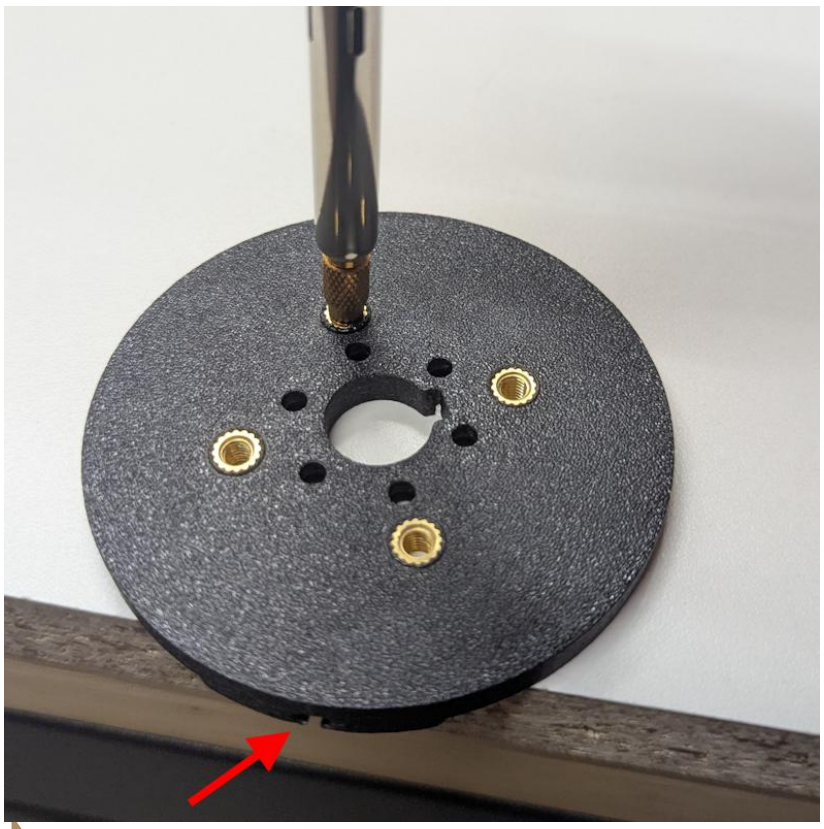
Remove the (3) M6 flat head screws securing the J2 motor mount to the J1 platform.

Next we need to remove the motor – using a broad head punch and mallet carefully tap on the motor shaft to start removing the J2 motor.

Remove the J2 motor and lay it to the side.

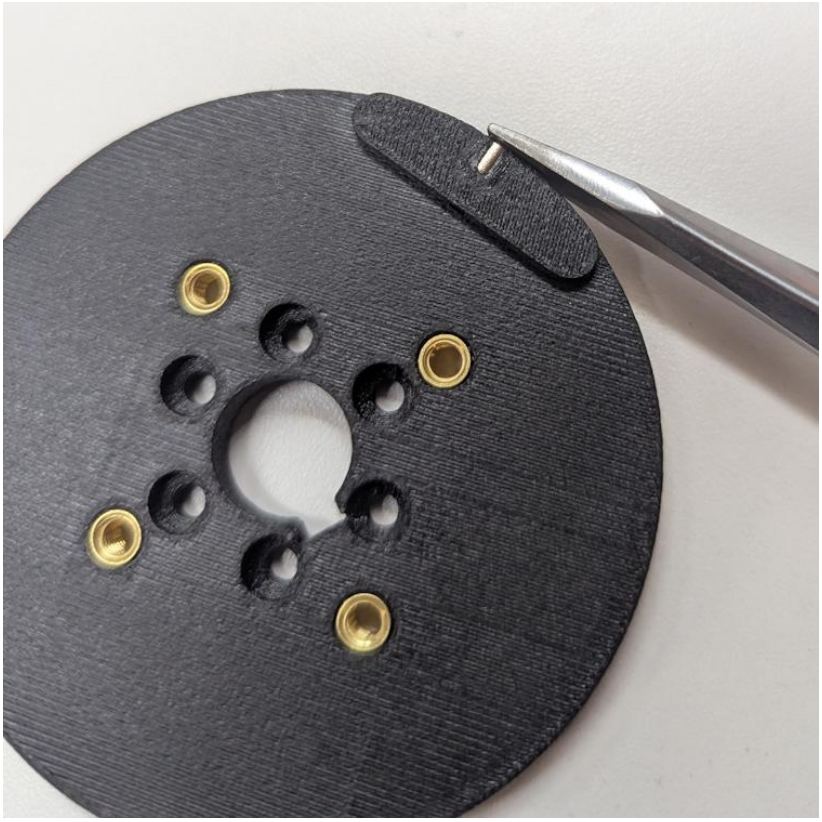


Remove the original J2 tension ring. Save the M3 fasteners and M4 set screws.

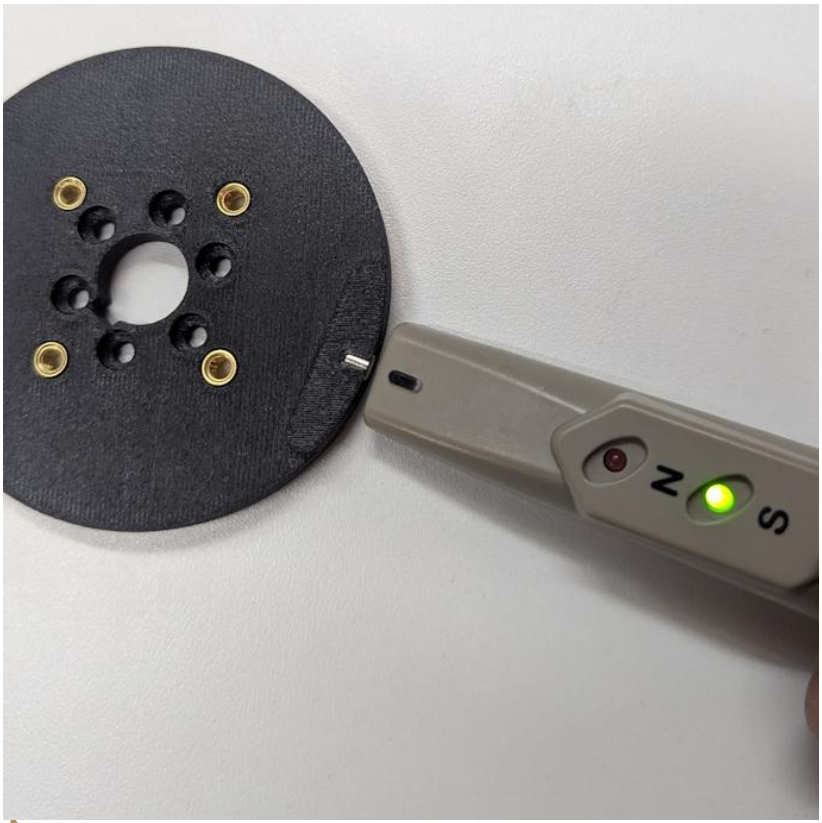


Use heat insert tool to install (4) M4 threaded heat inserts into the replacement 3D printed J2 tension ring as shown.

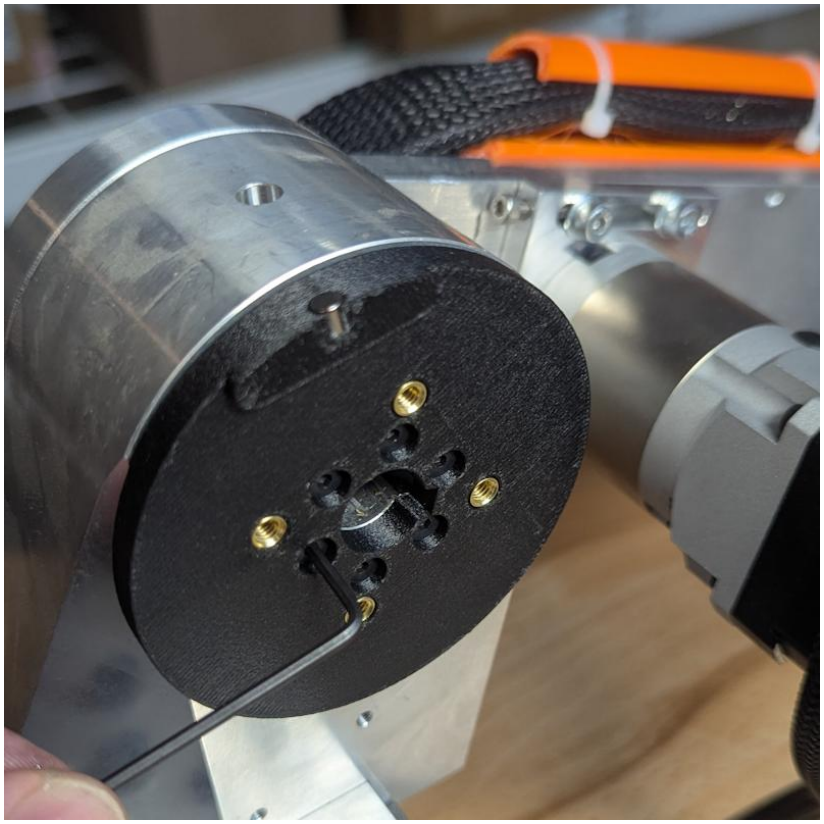
Make sure the magnet mount lug is facing down and overhanging the edge of your table or workbench.



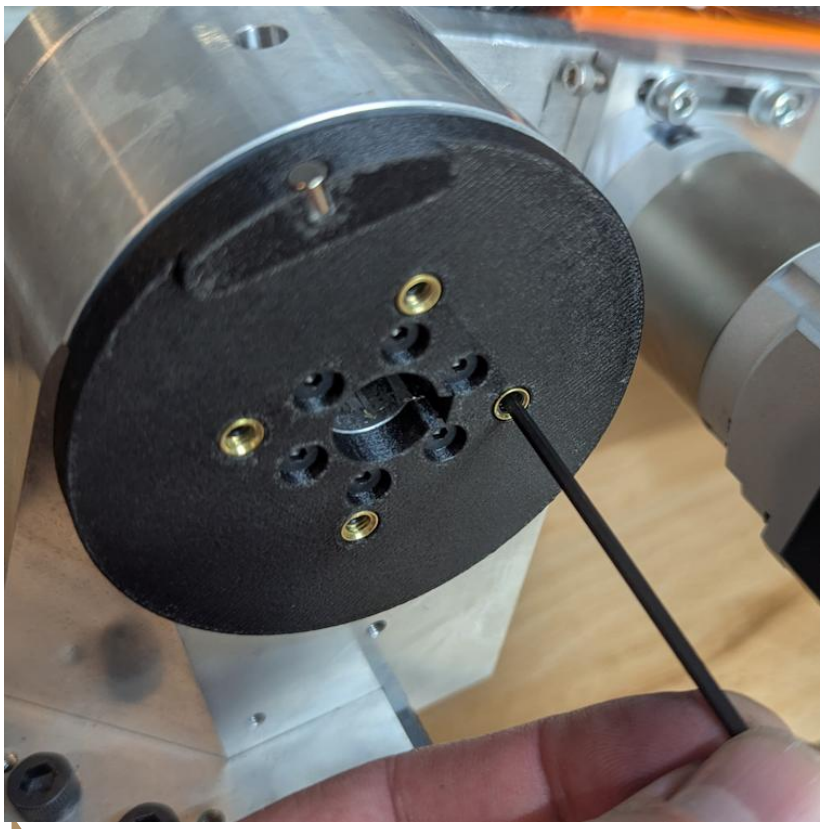
As shown previously use flat blade screwdriver to press 4mm x 4mm magnet into J2 tension ring.



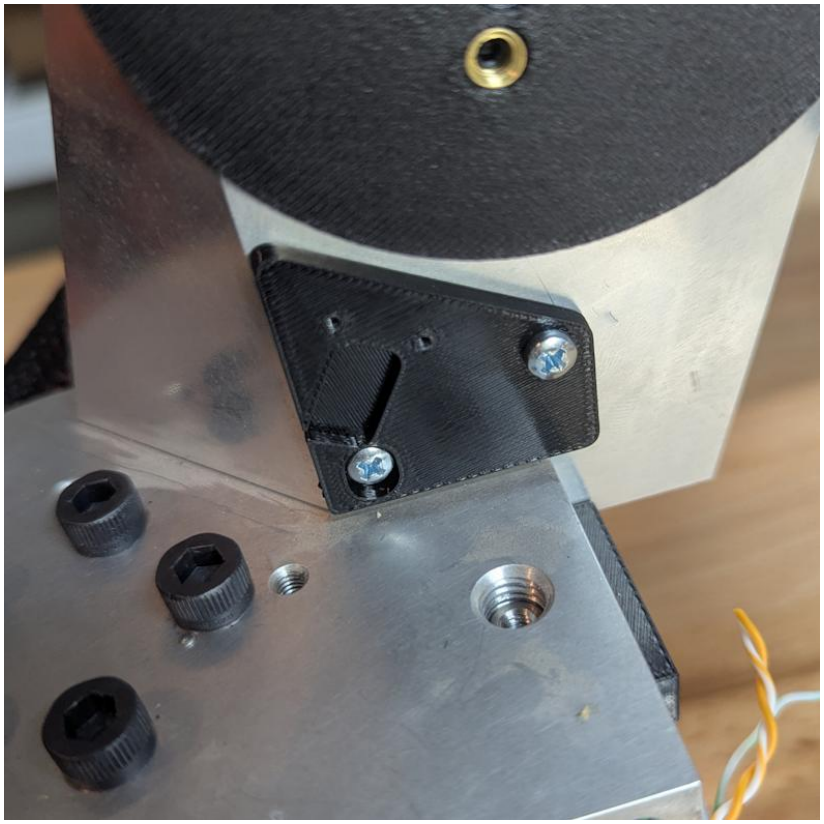
As done previously use magnet polarity tester to verify the south side of the magnet is facing out.



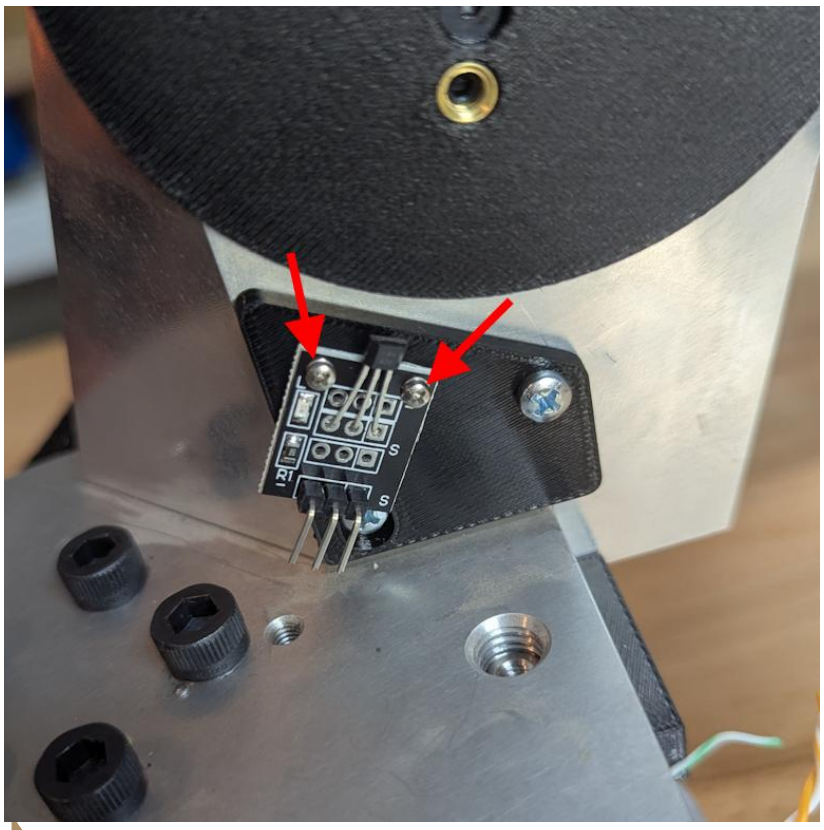
Install replacement J2 tension ring and shown using the (6) M3 flat head fasters that were removed previously.



Install (4) previously removed M4 set screws into the thread inserts and tighten screws to set moderate tension on J2 bearings.

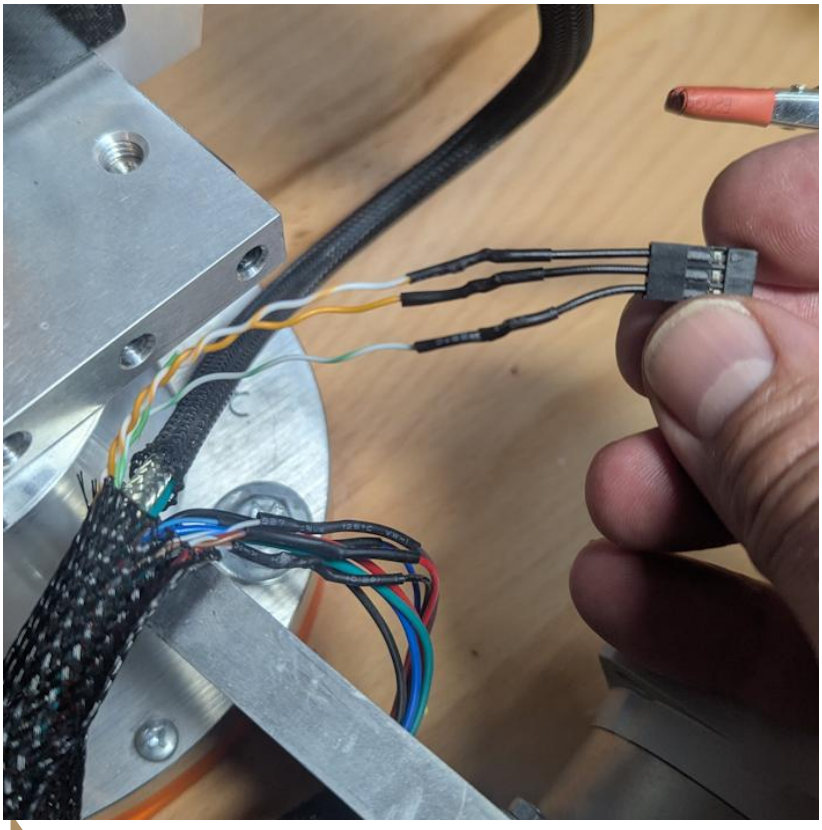


Secure J2 sensor mount to J2 turret housing as shown using (2) M3x10 pan head screws.



Install hall effect sensor as shown using (2x) M1.6x4 pan head screws.

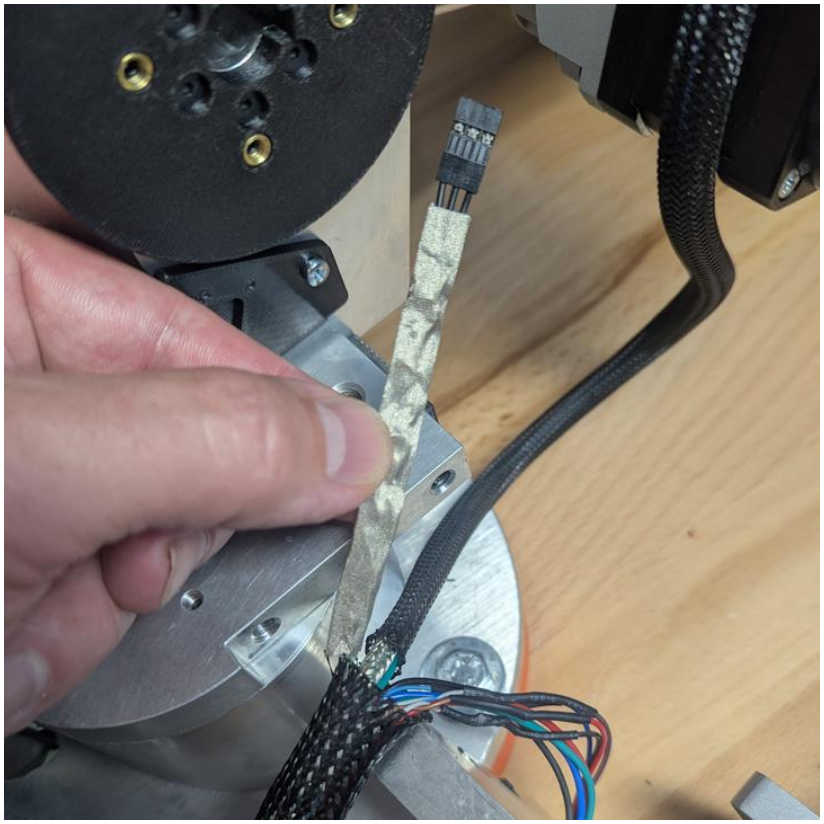
Trim wires on Dupont 2.54mm connector as shown.



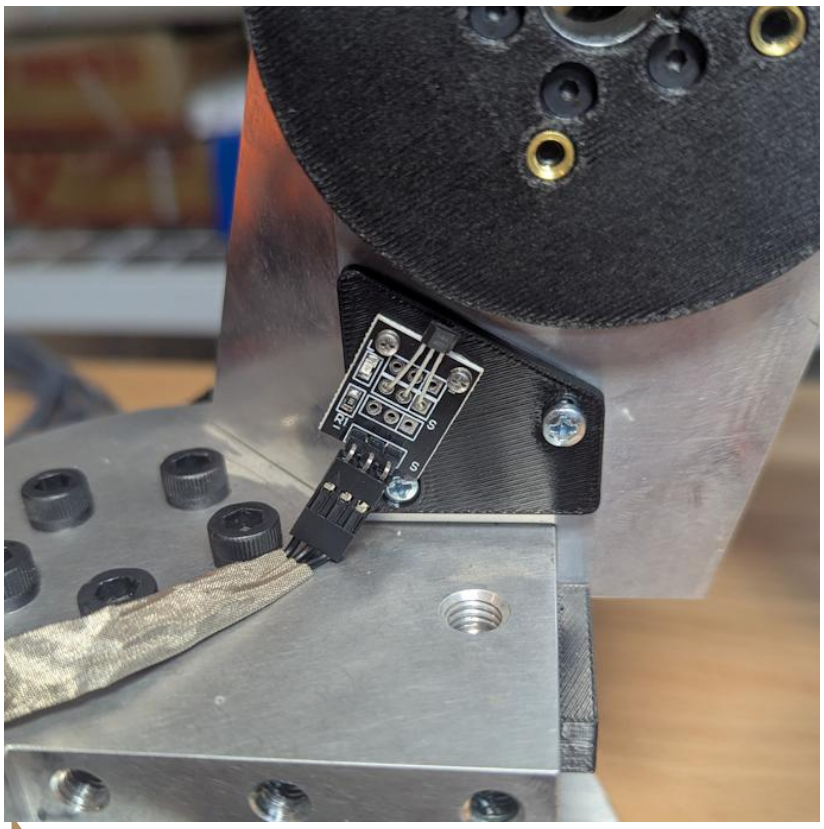
Cut wires going to previous J2 limit switch and discard limit switch.

Solder and heat shrink wire connections from the 3 J2 limit switch wires to Dupont 2.54mm 3 pin connector lead as shown.

Make sure the green stripe wire is connected to the right terminal, The orange wire to the center terminal and the orange stripe wire to the left terminal.

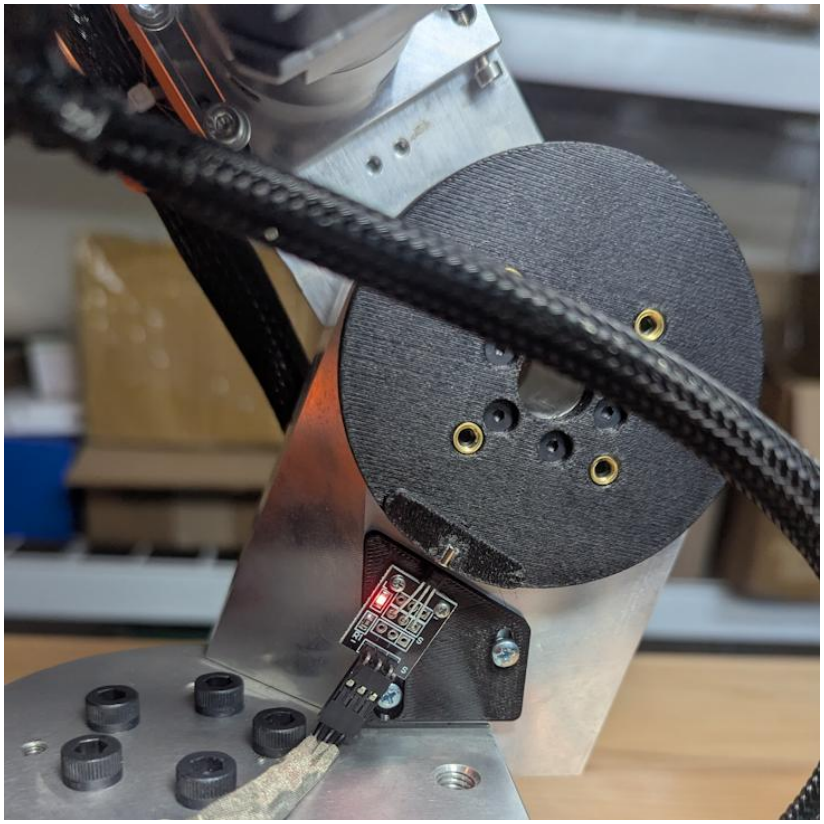


Cut 8cm length of EMI shielding tape and apply to J2 sensor wire leads as shown.



Plug Dupont connector onto J2 hall effect sensor as shown.

Make sure the connector is plugged in with the green wire terminal on the right side.



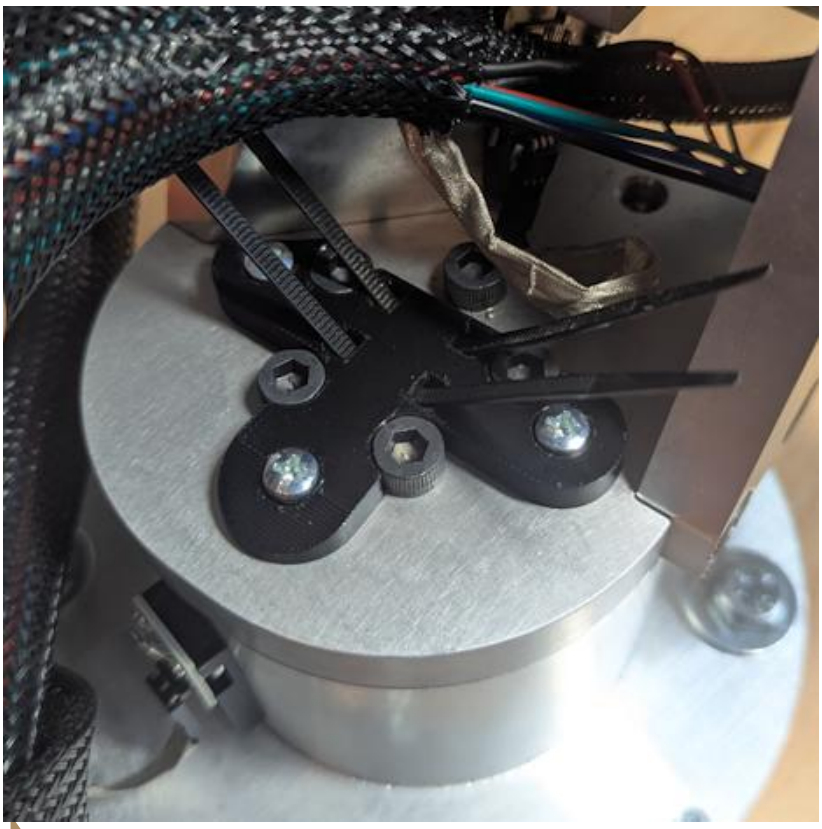
Plug USB cable back into robot base, then manually rotate the arm back and verify that the sensor illuminates when the magnet is in position as shown.

Adjust sensor mount screws as necessary.

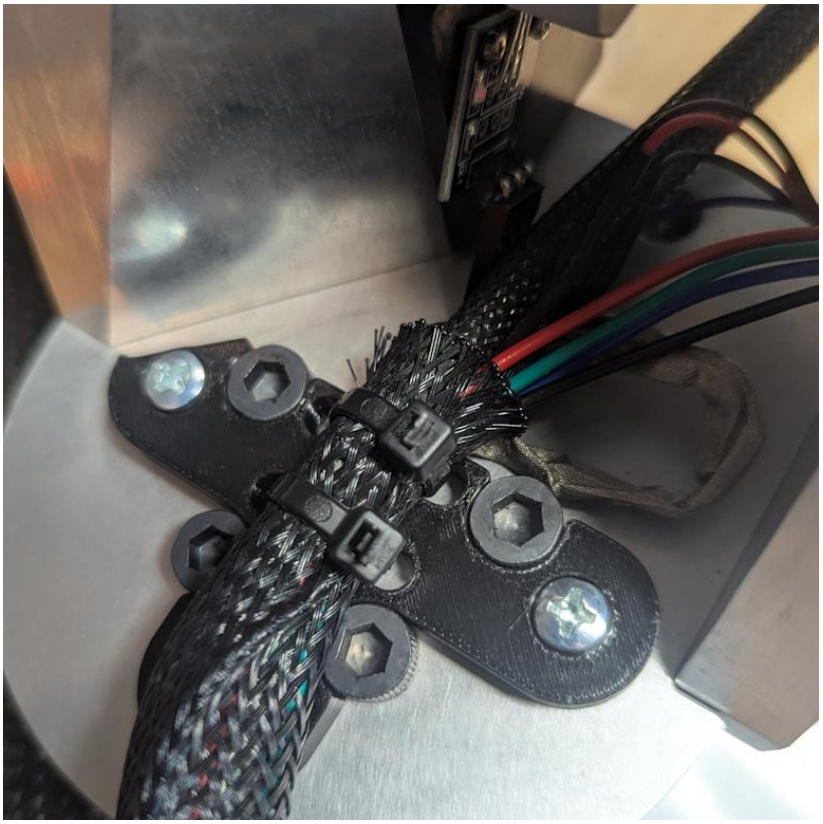
Unplug USB cable after test.

Reinstall J2 motor and secure J2 motor mount to J1 platform as shown.

Insert (2) large cable ties through the 3D printed J2 Cable Holder as shown in photo.



Secure J2 Cable holder to the J1 Platform as shown with (2) M4x8 pan head screws.

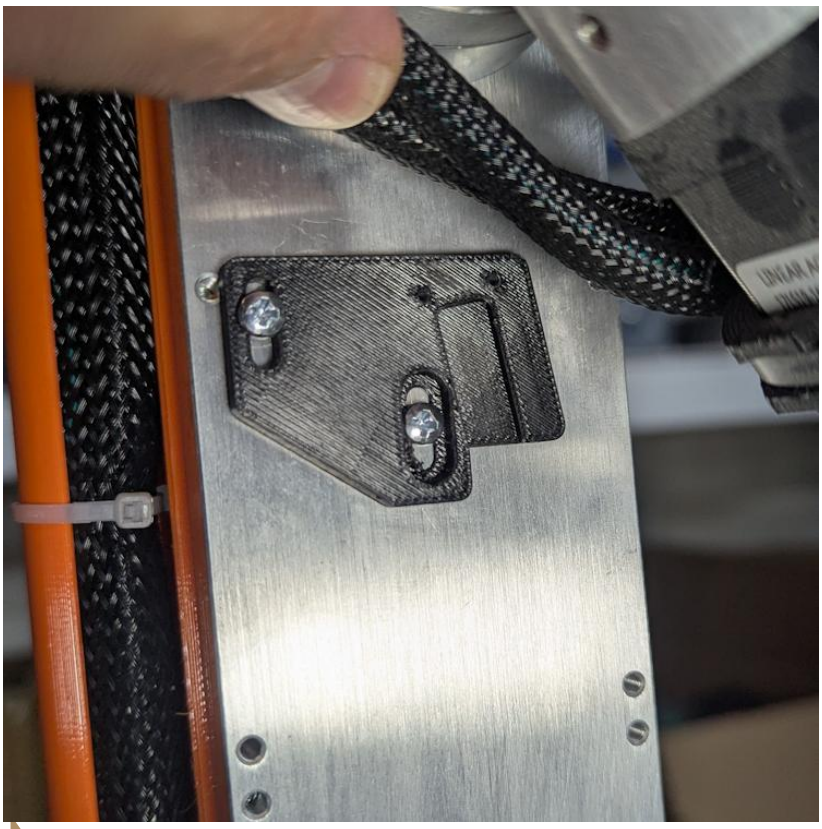


Lay the J2 and J3 cables down center of J2 Cable Holder. Secure the cable bundle with the (2) cable ties as shown and then trim the cable die ends.

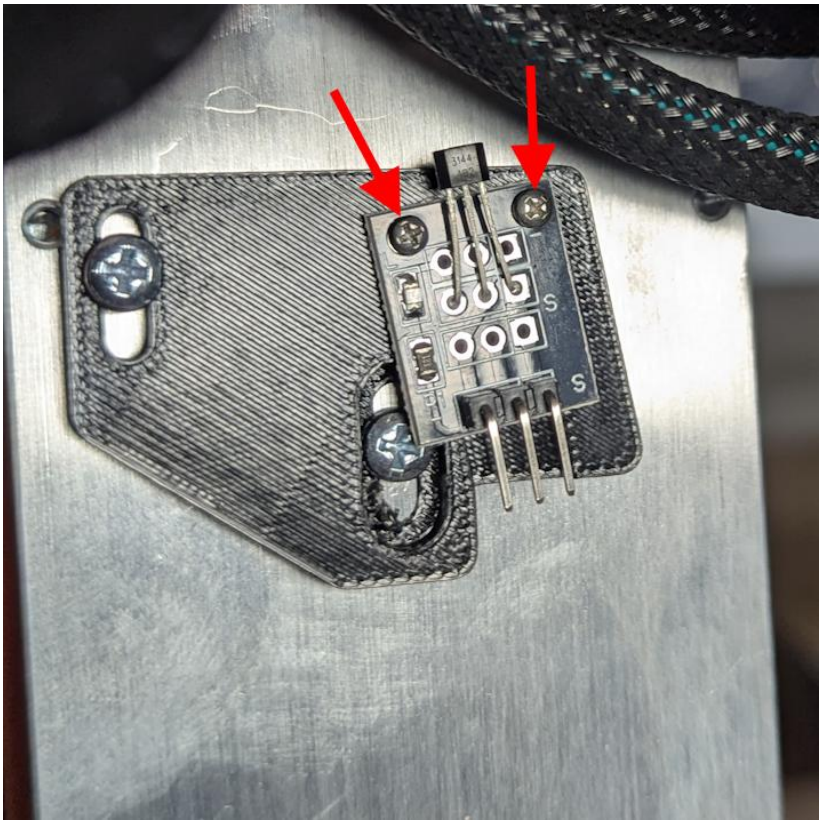
Remove previous J3 limit switch, cut wires and discard switch and printed mount.

Pre thread (2x) M1.6x4 screws into the J3 sensor mount as shown and then remove them.

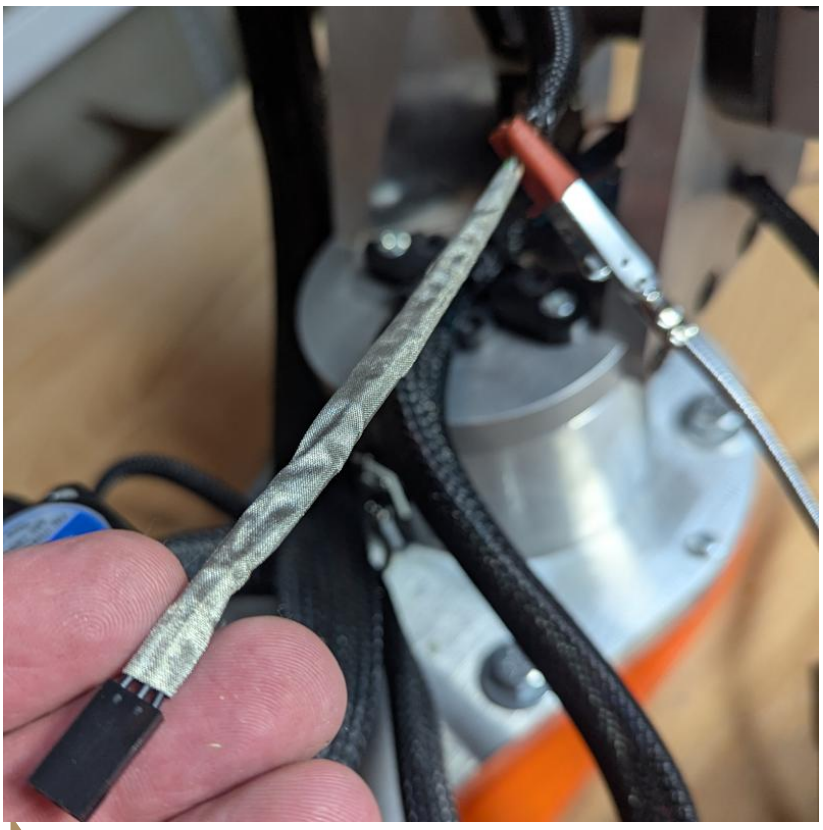
This step is meant to force thread the screw into the plastic and pre-thread the holes in the plastic so that it is easier to install the screws in a future step.



Install the new J1 sensor mount using (2x) M3x10 screws as shown.



Install hall effect sensor as shown using (2x) M1.6x4 pan head screws.



As shown in previous steps; trim wires on Dupont 2.54mm connector, Solder and heat shrink wire connections from the 3 J3 limit switch wires to Dupont 2.54mm 3 pin connector lead.

Make sure the green stripe wire is connected to the right terminal, The orange wire to the center terminal and the orange stripe wire to the left terminal.

Pull braided sleeve back and secure with clip.

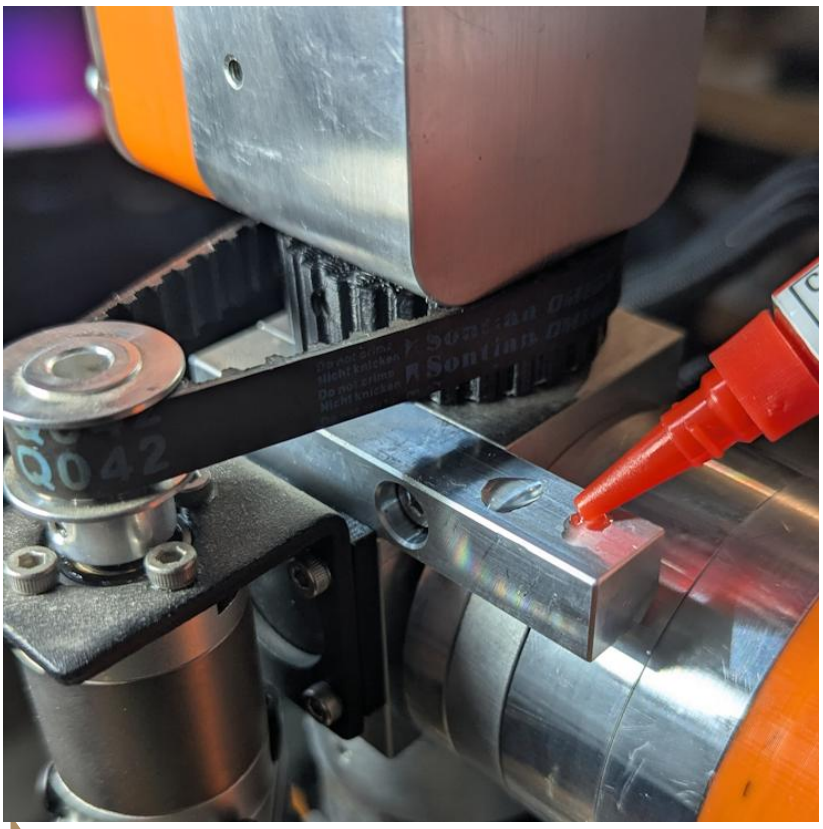
Cut 10cm length of EMI shielding tape and apply to J3 sensor wire leads as shown.

Plug Dupont connector onto J3 hall effect sensor as shown.

Make sure the connector is plugged in with the green wire terminal on the right side.

As shown previously use flat blade screwdriver to press 4mm x 4mm magnet into J3 magnet mount.

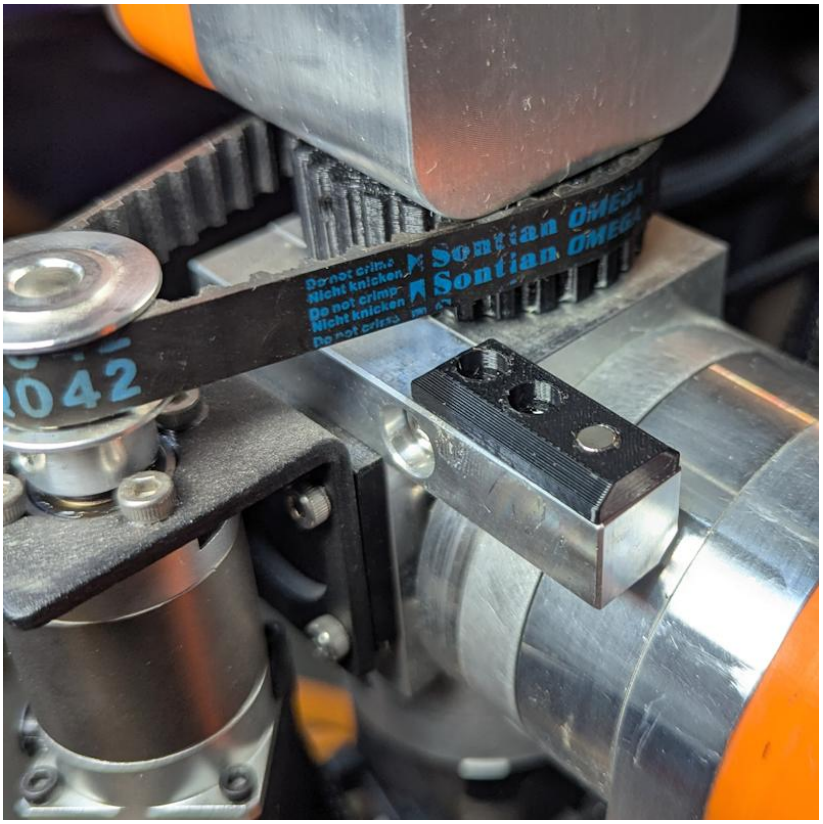
Use magnetic polarity tester to verify south side of magnet is facing out.



The J3 magnet mount needs to be affixed to the J4 motor mount.

This can be done in 2 different ways; you can use the magnet mount as a template then mark, drill and tap M3 holes in J4 motor mount, then secure to motor mount using M3 fasteners.

Or the alternative is to use adhesive which is shown in this photo.



Secure the J3 magnet mount as shown using either the adhesive or the M3 fasters.

THIS CONCLUDES THE ROBOT UPDATE PROCEDURE

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PLEASE REVIEW THE BUILD MANUAL CHAPTER ON ROBOT STARTUP AS WELL AS THE TUTORIAL VIDEOS ON THE ANNIN ROBOTICS WEBSITE TUTORIALS PAGE.