

Aloha Gripper Assembly

Version	Date	Author(s)	Description
1.0	07/28/23	Thinh Nguyen	

1.0 Overview

- This document outlines the steps involved in building the Aloha Gripper.

2.0 Parts

WidowX Gripper				
Line	Part Description	Supplier	Part #	Qty
1	W-bridge_rails_support_v1	STEP FILE		1
2	W-finger_adaptor_v1	STEP FILE		2
3	W-finger_holder_M_v1	STEP FILE		1
4	W-gripper_backplate_v1 (acrylic 3mm thickness)	STEP FILE		1
5	W-hand_holder_v1	STEP FILE		1
6	W-rotor_arm_v1	STEP FILE		2
7	W-rotor_v1	STEP FILE		1
8	W-shim_rotor_v1	STEP FILE		1
9	6725K27_5 mm Wide x 120 mm Long Rail Ball Bearing Carriage	McMaster	6725K23	1
10	8438K1_Corrosion-Resistant Ball Bearing Carriage	McMaster	8438K1	4
11	Deep Groove Ball Bearing (3mmx6mmx2.5mm)	Amazon	Amazon	6
12	M2 Brass Male-Female / Female-Female	Amazon	Amazon	1
13	Flat Head Screw M3 x 0.5 mm Thread, 10 mm Long	McMaster	92125A130	4
14	Flat Head Screw M3 x 0.5 mm Thread, 20 mm Long	McMaster	92125A136	2
15	Flat Head Screw M2 x 0.4 mm Thread, 10 mm Long	McMaster	92010A005	22

16	Flat Head Screw M2 x 0.4 mm Thread, 16 mm Long	McMaster	92010A008	4
17	Flat Head Screw M2 x 0.4 mm Thread, 20 mm Long	McMaster	92095A106	6
18	Socket Head Screw M2 x 0.4 mm Thread, 6 mm Long	McMaster	91292A831	2
19	Hex Nut M2 x 0.4 mm Thread	McMaster	91828A111	16
20	Flat Head Screw M2.5 x 0.45 mm Thread, 16 mm Long	McMaster	93395A185	4
21	Steel Washer for M2 Screw Size, 2.200 mm ID, 4.500 mm OD	McMaster	98688A110	8
22	Short profile button head m2 x6mm (come with rails)			8
23	M3 Steel Nylon-Insert Locknut	McMaster	90576A102	2
24	Socket Head Screw M2.5 x 0.45 mm Thread, 8 mm Long	McMaster	91292A012	8

Viper Gripper				
Line	Part Description	Supplier	Part #	Qty
1	Bridge_rails_support_v1	STEP FILE		1
2	Finger_adaptor_v1	STEP FILE		2
3	Finger_v1	STEP FILE		1
4	Gripper_backplate_v1(acrylic 3mm thickness)	STEP FILE		1
5	Rotor_arm_v1	STEP FILE		2
6	Rotor_v1	STEP FILE		1
7	Shim_rotor_v1	STEP FILE		1
8	6725K27_5 mm Wide x 150 mm Long Rail Ball Bearing Carriage	McMaster	6725K23	1
9	8438K1_Corrosion-Resistant Ball Bearing Carriage	McMaster	8438K1	4
10	Deep Groove Ball Bearing (3mmx6mmx2.5mm)	Amazon	Amazon	6
11	M2 Brass Male-Female / Female-Female	Amazon	Amazon	1
12	Flat Head Screw M3 x 0.5 mm Thread, 10 mm Long	McMaster	92125A130	4
13	Flat Head Screw M3 x 0.5 mm Thread, 20 mm Long	McMaster	92125A136	2
14	Flat Head Screw M2 x 0.4 mm Thread, 10 mm Long	McMaster	92010A005	22
15	Flat Head Screw M2 x 0.4 mm Thread, 16 mm Long	McMaster	92010A008	4
16	Flat Head Screw M2 x 0.4 mm Thread, 20 mm Long	McMaster	92095A106	6
17	Socket Head Screw M2 x 0.4 mm Thread, 6 mm Long	McMaster	91292A831	2
18	Hex Nut M2 x 0.4 mm Thread	McMaster	91828A111	16
19	Flat Head Screw M2.5 x 0.45 mm Thread, 16 mm Long	McMaster	93395A185	4
20	Steel Washer for M2 Screw Size, 2.200 mm ID, 4.500 mm OD	McMaster	98688A110	8
21	Short profile button head m2 x6mm (come with rails)			8
22	M3 Steel Nylon-Insert Locknut	McMaster	90576A102	2

3.0 Assembly

3.1 Mechanical

WidowX Gripper:

Step 1: Insert the 4x M2 brass standoffs to the bridge rails support.



Step 2: After laser cutting 3mm acrylic, countersink the holes as shown in the picture.



Step 3: Install the 3 bearings on the rotor arm (2 on the right side and 1 on the left side).



Step 4: Use a tap to create M3 threads in the middle holes, to a depth of about 5mm.



Step 5: Attach the rotor and rotor arm together with an M3x10mm countersunk screw and lock nut, as shown in the figure.



Step 6: Attach the rails with carriages to the bridge, and secure them with M2x16mm countersunk screws at both ends. Use M2 x 10mm countersunk screws and nuts to secure the middle holes.



Step 7: Attach the finger adapter to the carriages using the 8 button head screws (6mm) that came with the rails and small OD flat washers.



Step 8: Use M3x 20mm countersunk screws to attach the rotor-link to the finger adaptor.



Step 9: Attach the backplate to the bridge using M2 x 10mm screws, making sure the countersunk holes are facing forward. To ensure the backplate is correctly oriented, check that the center of the large holes are aligned with the center of the two rails.



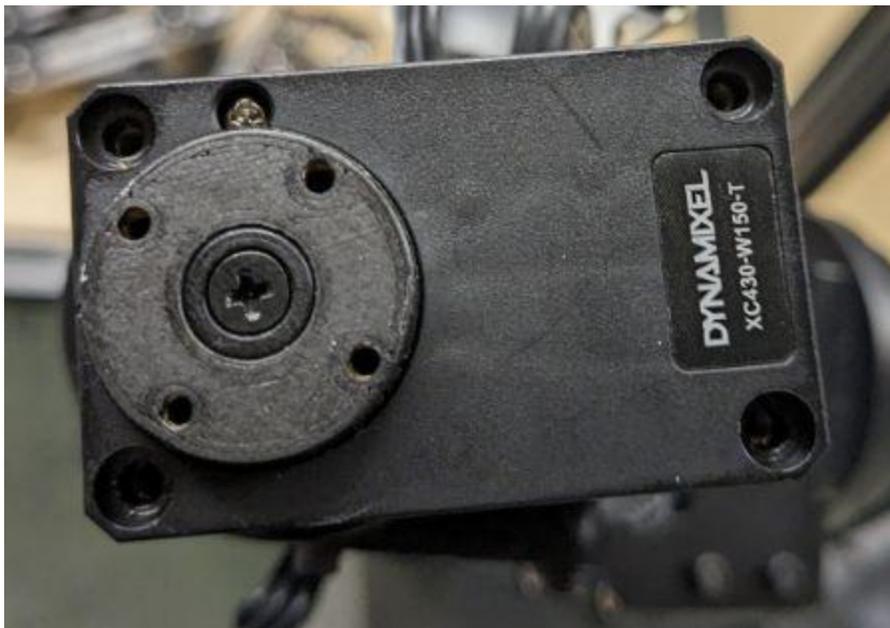
Instruction: Step 10: Attach the finger holder with Velcro.



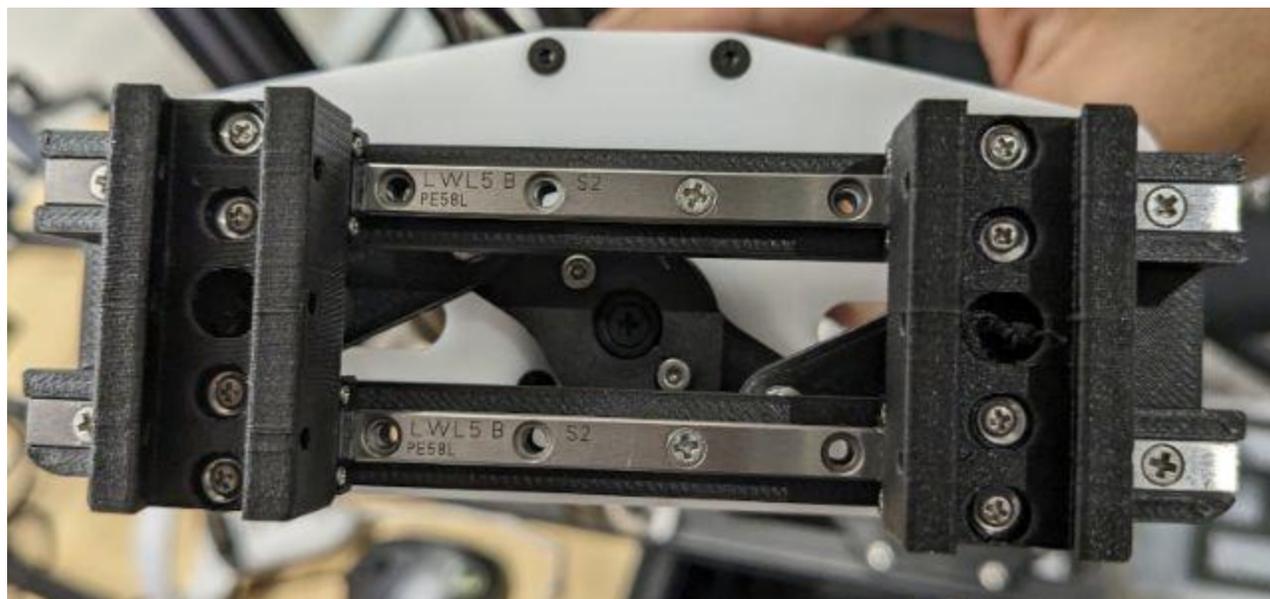
Step 11: Move the finger adaptor open or closed to ensure that the rotor rotates correctly (close = clockwise, open = counterclockwise).



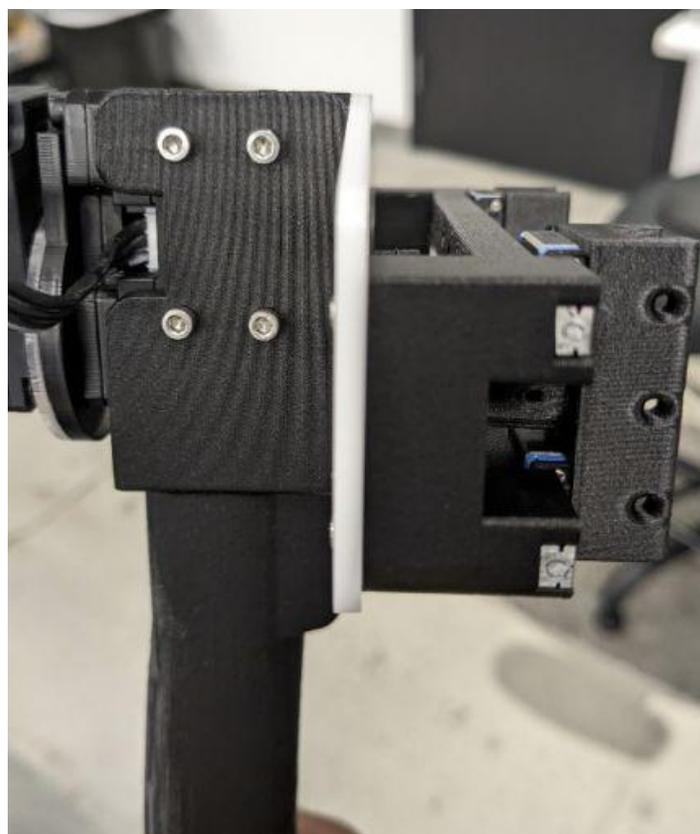
Step 12: Fit the shim rotor into the motor.



Step 13: Use an M2x6mm screw and washer to secure the rotor to the motor horn. Use M2.5x16 countersunk screws to secure the gripper to the motor. Make sure the orientation is correct according to your configuration.



Step 14: Fit the handle to the motor and fasten it with M2.5x8mm screws on both sides.



Step 15: Move the finger holder open and close to ensure smooth movement. The gripper assembly is now complete.



ViperX Gripper:

Step 1: Insert the 4x M2 brass standoffs to the bridge rails support.



Step 2: After laser cutting 3mm acrylic, countersink the holes as shown in the picture.



Step 3: Install the 3 bearings on the rotor arm (2 on the left side and 1 on the right side).



Step 4: Use a tap to create M3 threads in the middle holes, to a depth of about 5mm.



Step 5: Attach the rotor and rotor arm together with an M3x10mm countersunk screw and lock nut, as shown in the figure.



Step 6: Attach the rails with carriages to the bridge, and secure them with M2x16mm countersunk screws at both ends. Use M2 x 10mm countersunk screws and nuts to secure the middle holes.



Step 7: Attach the finger adapter to the carriages using the 8 button head screws (6mm) that came with the rails and small OD flat washers.



Step 8: Use M3x 20mm countersunk screws to attach the rotor-link to the finger adaptor.



Step 9: Attach the backplate to the bridge using M2 x 10mm screws, making sure the countersunk holes are facing forward. To ensure the backplate is correctly oriented, check that the center of the large holes are aligned with the center of the two rails.



Step 10: Move the finger adaptor open or closed to ensure that the rotor rotates correctly (close = clockwise, open = counterclockwise).



Step 11: Attach the fabric tab to the finger.



Step 12: Slide the finger-to-finger adapter into place and secure it with M2x 20mm screws.



Step 13: Fit the shim rotor into the motor.



Step 14: Use an M2x6mm screw and washer to secure the rotor to the motor horn. Use M2.5x16 countersunk screws to secure the gripper to the motor. Make sure the orientation is correct according to your configuration.



Step 15: Move the finger open and close to ensure smooth movement. The gripper assembly is now complete.

