

ROBOT FINGER ASSEMBLY INSTRUCTIONS

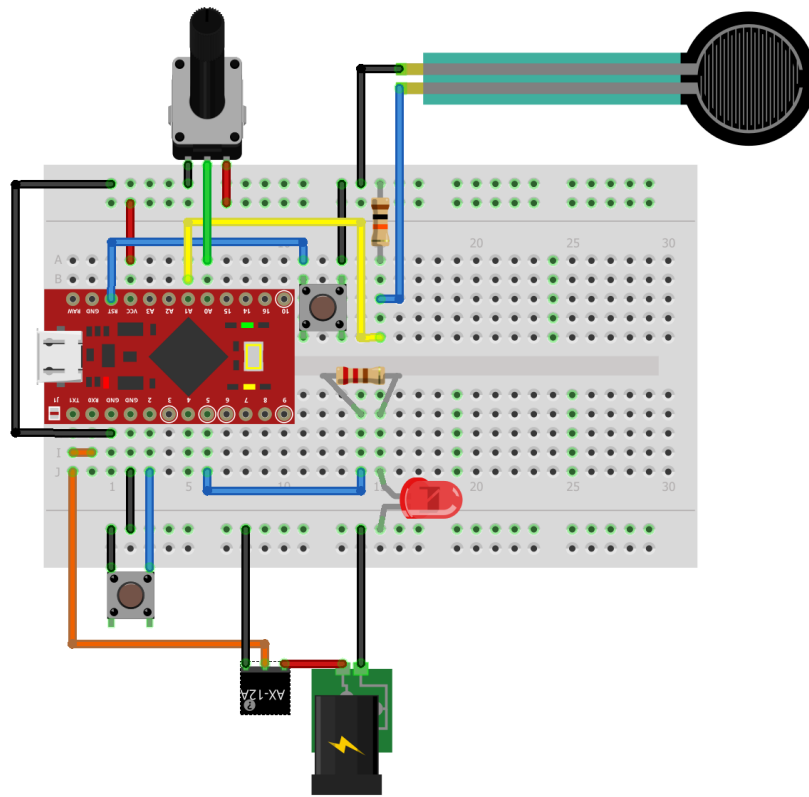
OVERVIEW

This document provides brief assembly instructions for the robot finger. Note that depending on the 3D print quality the printed parts may need some additional work, like sanding.

PART LIST

NAME	SPECIFICATIONS	COUNT
SERVOMOTORS	Dynamixel AX-12A	2
CONTROLLER	Arduino Pro Micro (Sparkfun)	1
ROTARY POTENTIOMETER		1
FORCE SENSING RESISTOR	FSR402	1
RESISTORS	10 k Ω , 220 Ω	2
LED		1
2 SIDED TAPE / GLUE		
SPRINGS	length 45 mm, diameter 5 mm, Spring constant 2.3 kN/m	2
FISHING LANE		
PLATFORM		1
BOLT M5	30 mm	1
BOLT M5	25 mm	2
NUT M5		3
BOLTS M4	16 mm (depends on platform thickness)	8
BOLT M4	30 mm	1
BOLTS M4	45 mm	2
NUTS M4		9
BOLTS M2	16 mm	16
NUTS M2		8
BEARINGS	608ZZ	3
BUTTONS		2
POWER SUPPLY	12 V, 1.5A	1

WIRING

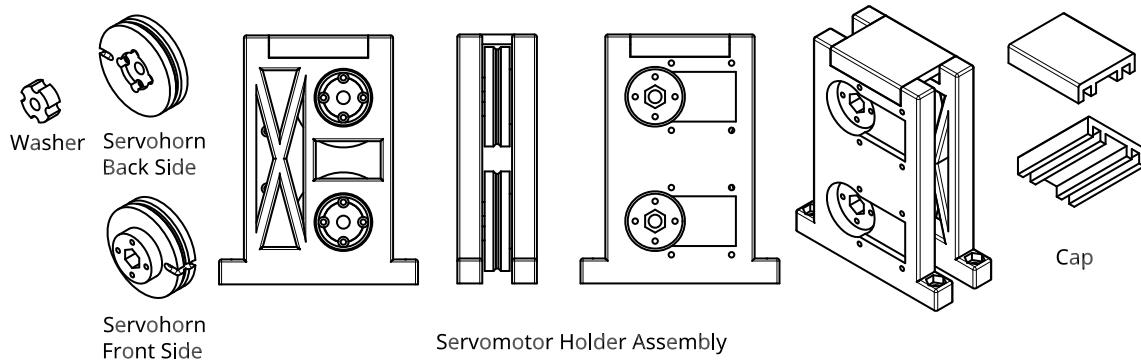


fritzing

Diagram above illustrates the wiring that is compatible with the provided arduino source code. Restart button and the indicator led are optional. Note that signal to servomotors should be passed through both of the servomotors.

PRINTED PARTS

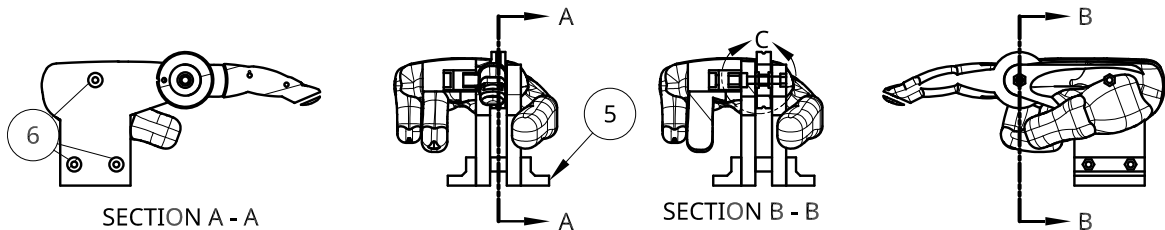
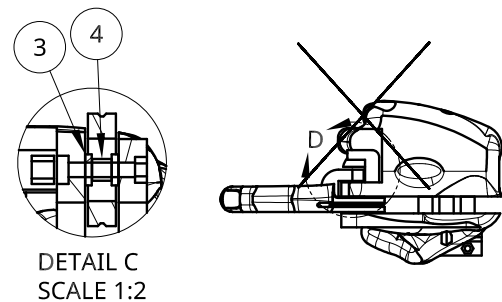
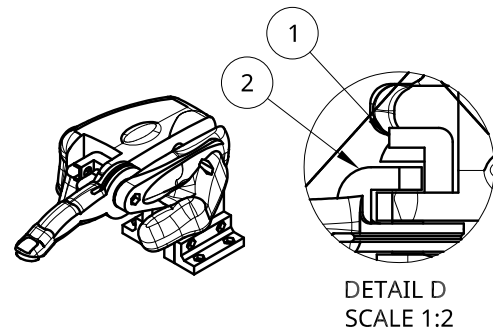
SERVOMOTOR HOLDER



1. Attach servomotors to the side of holder via four M2 bolts and nuts for each servomotor.
2. Push the M5 nuts to the hexagonal pocket at the front side of the servohorns.
3. Attach servohorns to servomotors with M2 bolts.
4. Place washer to back side of the servohorn.
5. Tie piece of fishing line to the servohorns. Tie the other ends of the fishing line to the two springs.
6. Place bearings to the other side of the holder.
7. Attach two sides of the holder together with two 25 mm M5 bolts that go all the way from outside of the bearings to the nut behind the servohorns.
8. Attach servoholder to platform with 16 mm M4 bolts and nuts
9. Place cap at the top of the servomotor holder for additional support.

HAND

1	Potentiometer Base Holder
2	Potentiometer Shaft Holder
3	Washer
4	Padding Piece
5	Base
6	Support Beams



1. Remove support from the 3D printed parts and make sure potentiometer holders fit to the finger and the support frame.
2. Place bearing at the center of the wheel at the back of the finger. Place padding piece inside the bearing (see detail C in the figure above.).
3. Tie two fishing lines to the finger. Tie the other ends of the fishing lanes to the springs of the servomotor holder assembly.
4. Place two washers at each side of the bearing to hold it stable. Attach the finger to the frame with 30 mm M5 bolt and nut.
5. Attach two sides of the hand together with M4 bolts. Remember the support beams and the base pieces (annotated with 5 and 6 in figure above).
6. Attach base to the platform with 16 mm M4 bolts and nuts.
7. Place potentiometer loosely inside the potentiometer base holder and attach the base holder to groove inside the frame (see detail D in the figure above).
8. Attach the potentiometer shaft holder to the finger and make sure the potentiometer is firmly in place between base holder and shaft holder.
9. Attach the force sensing resistor to fingertip with two sided tape or glue.