

SG Series Gripper Kit

Kit Assembly Guide

VERSION 1.0



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Chapter #1: Preparing to Assemble the SG Series Gripper kit

REQUIRED TOOLS

The following tools will be required to build your SG5/6 robotic arm:

- Phillips screwdriver
- Drill
- 1/8" drill bit
- Small adjustable crescent wrench or socket set
- Scissors

Aluminum Parts:

- (1) Palm Bracket
- (2) Left Hand Grippers
- (2) Right Hand Grippers
- (4) Flat Braces
- (1) Gear Brace
- (1) Servo Gear Brace
- (1) Sensor Bracket

Nuts, Bolts, Washers Screws & Spacers

- 4 – #2 nuts
- 4 – #2 lock washers
- 16 – #4 washers
- 2 - #4 1/2" screws
- 2 – #4 3/8" screws
- 2 – #4 nuts
- 3 – #4 1" screws
- 5 – 1/4" #4 nylon spacers
- 2 – #4 5/16" screw
- 3 – #4 lock washers
- 9 – #4 lock nuts
- 6 – #4 1/4" screws
- 2 – #6 3/8" screws
- 2 – #6 nuts
- 2 – #6 lock nuts
- 2 – #6 lock washers

Miscellaneous

- Gripper padding
- 2 – 60 tooth gears

PREPARING THE SERVOS

Remove the riser tabs from all of the servos (figure 1). The removal of this plastic riser will allow the servo to sit flush against the palm bracket later in the assembly process.



Figure 1

Chapter #7 – Constructing the Gripper Assembly

1. Using (2) 1/4" #4 screws, assemble the (2) gripper assembly's as shown in figure 2.

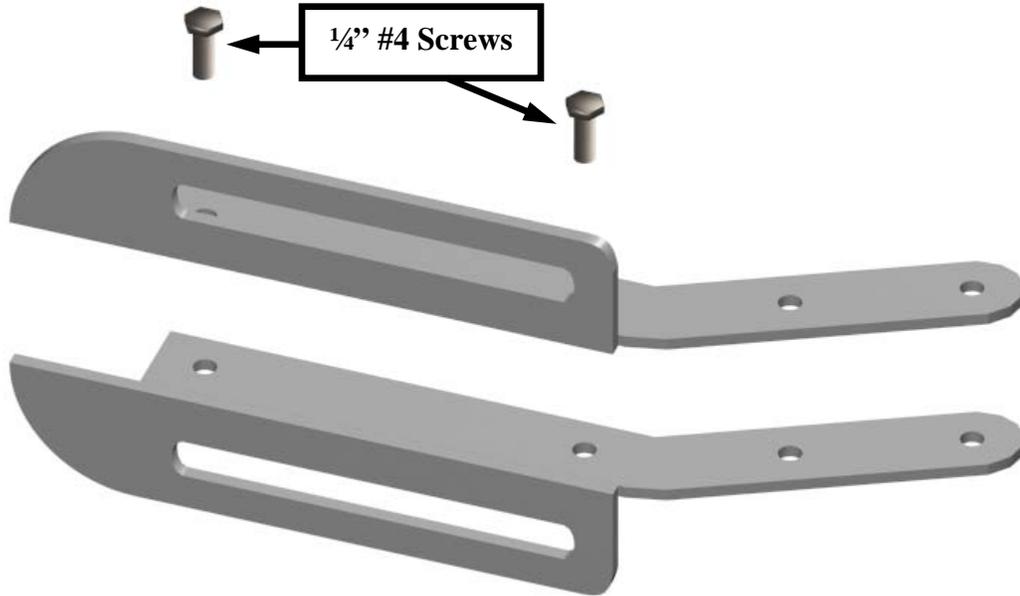


Figure 2

2. Install the 1/16" rubber padding to the insides of the gripper assemblies. Be sure to cut out the slots on the insides of the grippers. Also, ensure that you cut as close to the edge of the grippers as possible to obtain a clean finish. Place the gripper assemblies to the side of your work area.

Tip: To ensure a clean cut of the rubber padding, a small hobby cutter is the best tool.

- Using (2) 3/8" #6 screws and lock nuts, install the HiTec HS475HB servo to the palm as shown in figure 3. Do not tighten the #6 screws completely as this will be completed later in the construction process.

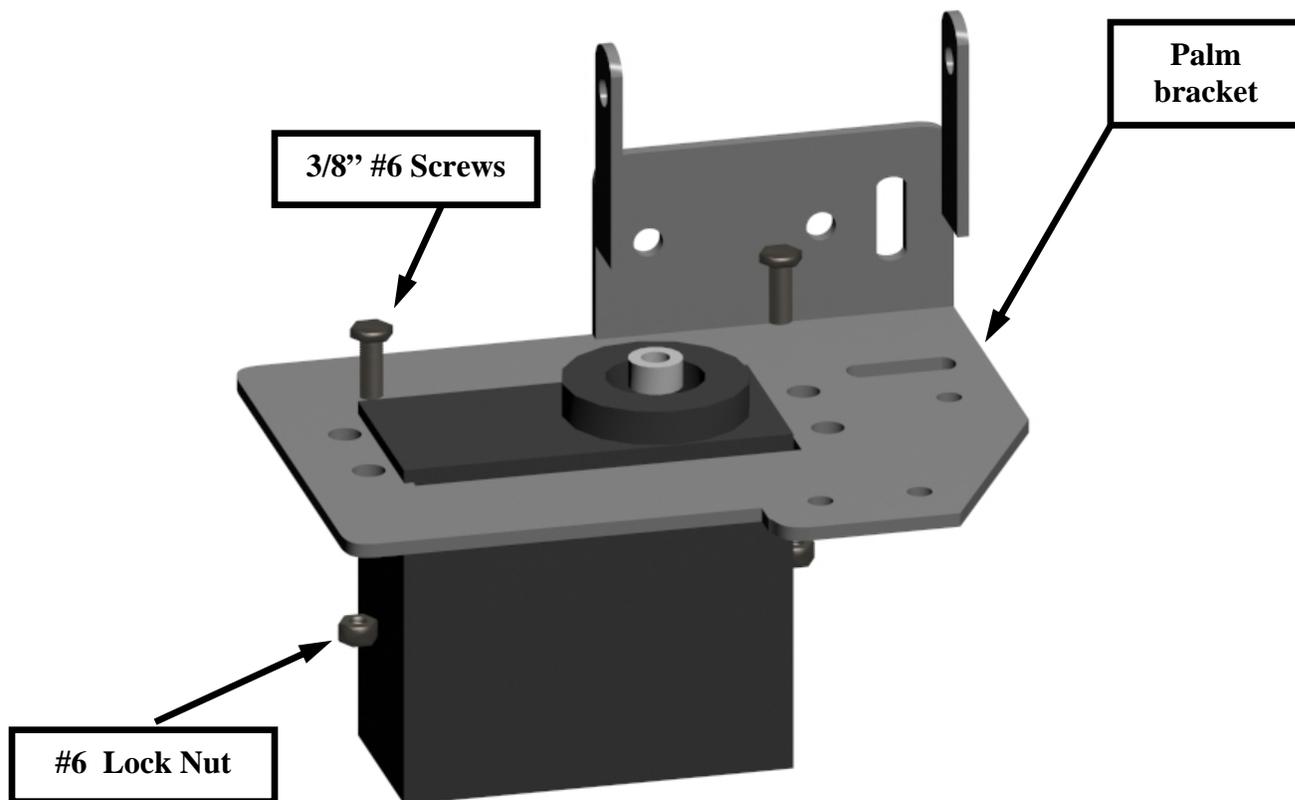


Figure 3

4. Using a 1/8" drill bit, drill out the holes shown in figure 4 of the HiTec servo.

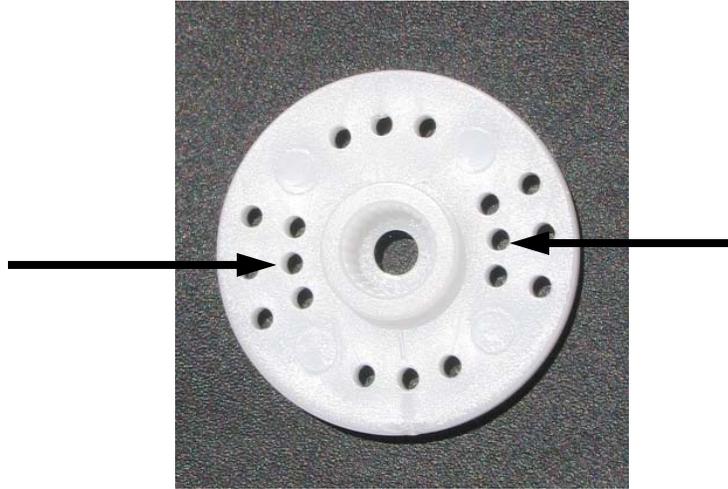


Figure 4

5. Using (2) #4, 5/16" screws, lock washers and nuts, install the servo horn to the palm bracket as shown in figures 5 and 6 if you are installing the wrist rotate servo option.



Figure 5

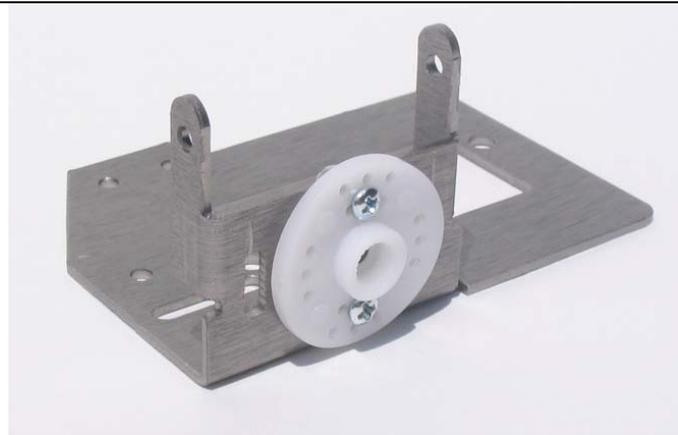


Figure 6

6. Using (1) #4 washer and lock washer, install the servo arm screw as shown in figure 7. The washer should be installed first followed by the lock washer and then the screw.(The palm servo is not being shown for clarity)

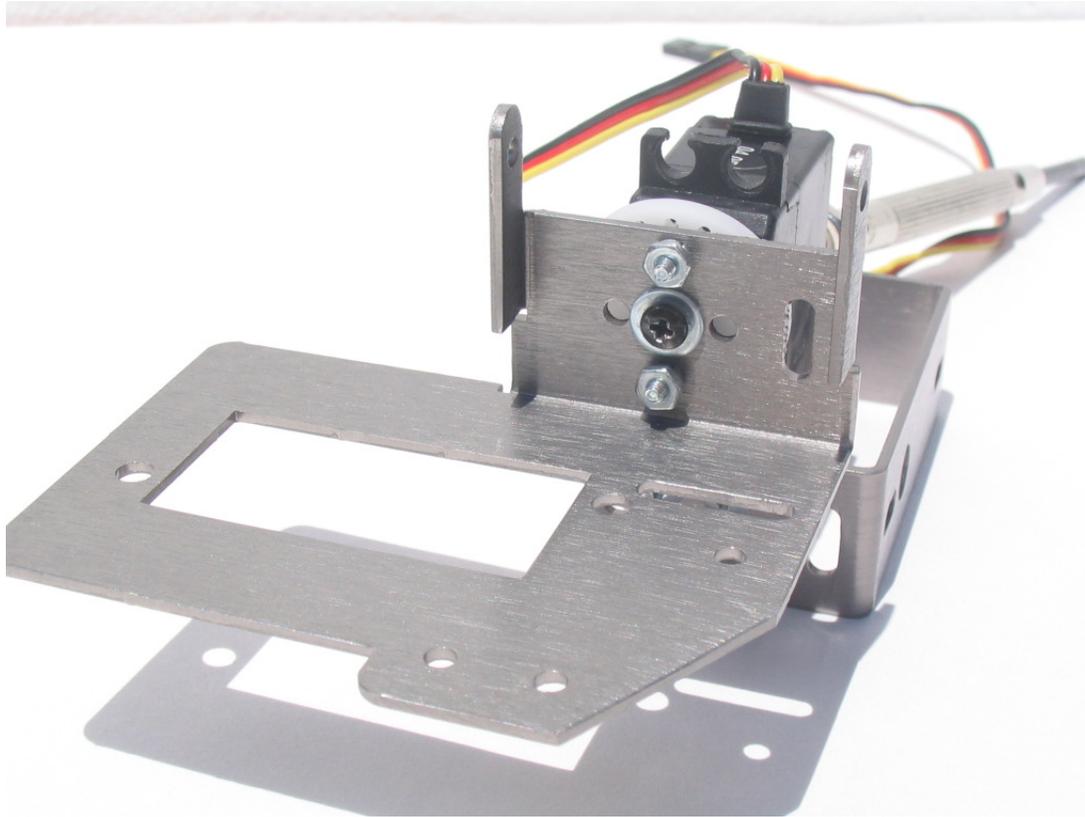


Figure 7

- Using (2) #2 lock washers and nuts, install the servo arm to the pre-assembled 60-tooth gear and the servo gear brace as shown in figure 8. (Use the servo brace that has the slightly larger, offset, center hole in the middle of the 3 hole pattern). Repeat the exact assembly sequence for the opposite gear brace.

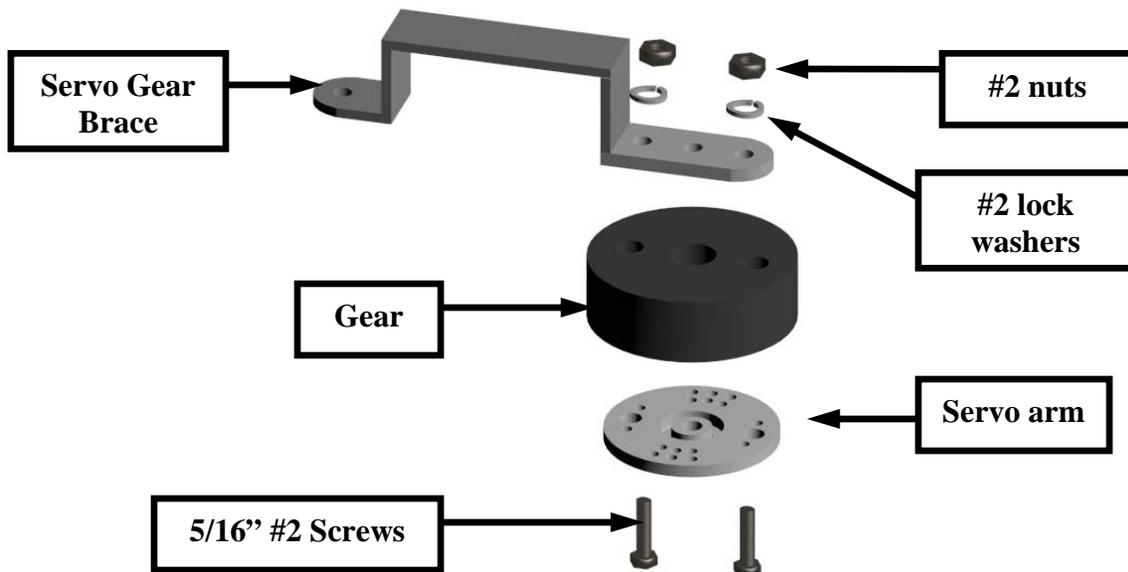


Figure 8

7. Install the servo gear brace assembly (The one with the larger, slightly offset center hole of the 3-hole pattern) to the palm servo as shown in figure 9. Ensure that the servo gear brace assembly can swing freely from the far, upper left corner of the palm to the point of the palm before securing it with the stock servo screw as illustrated in figure 9 and 10.

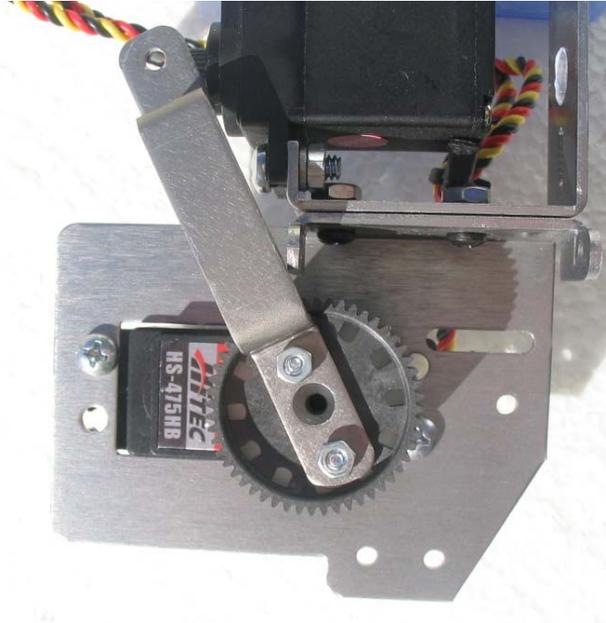


Figure 9

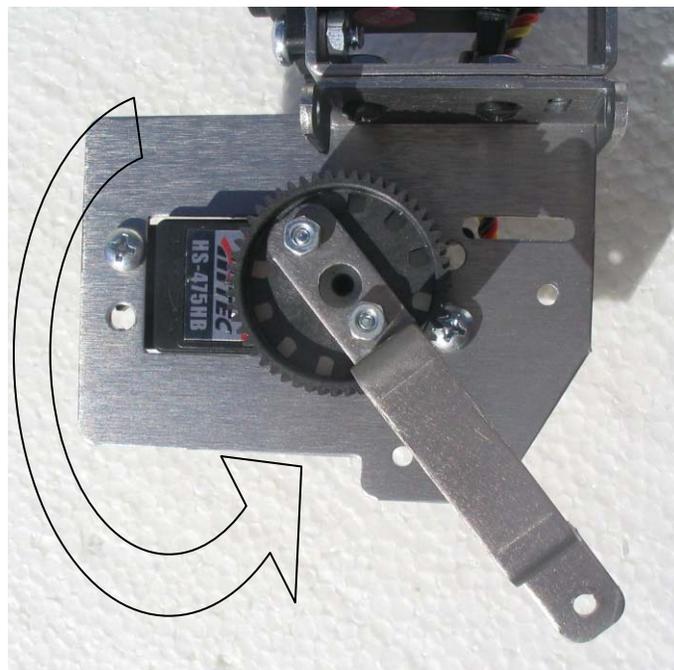
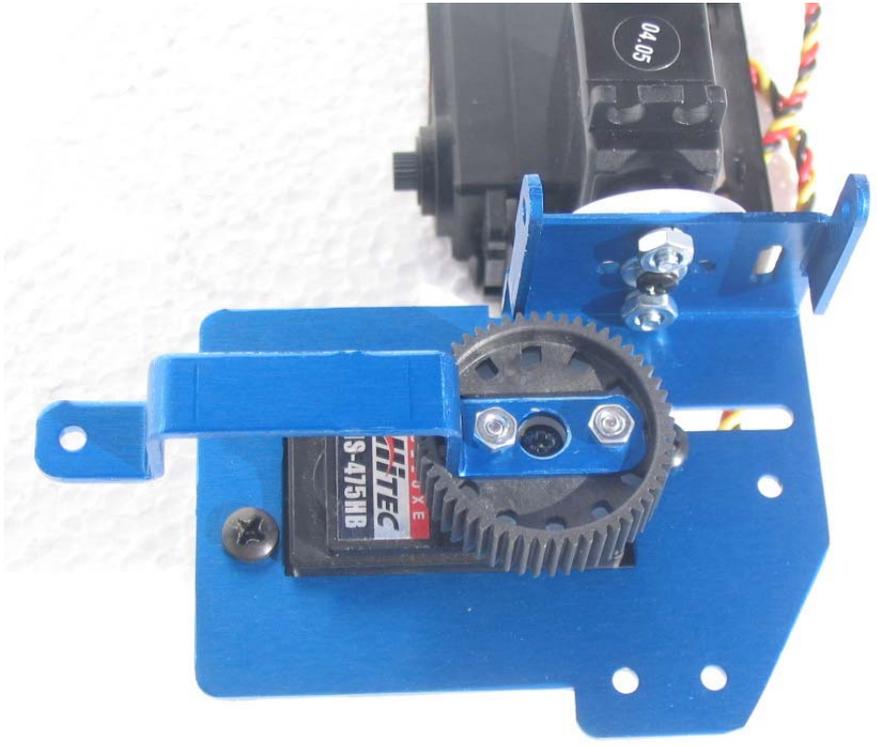


Figure 10



9. Using (1) 1" #4 screw, (2) washers, (1) lock nut and (1) 1/4" nylon spacer, install the gear brace assembly to the palm assembly as shown in figure 11. Ensure that the gear brace assembly is aligned ("in line") with the opposite servo gear brace assembly before tightening the locknut of the assembly (see figure 12). Tighten the 1" #4 screw enough so that there is no "play" in the assembly yet loose enough to the assembly can be turned by hand.

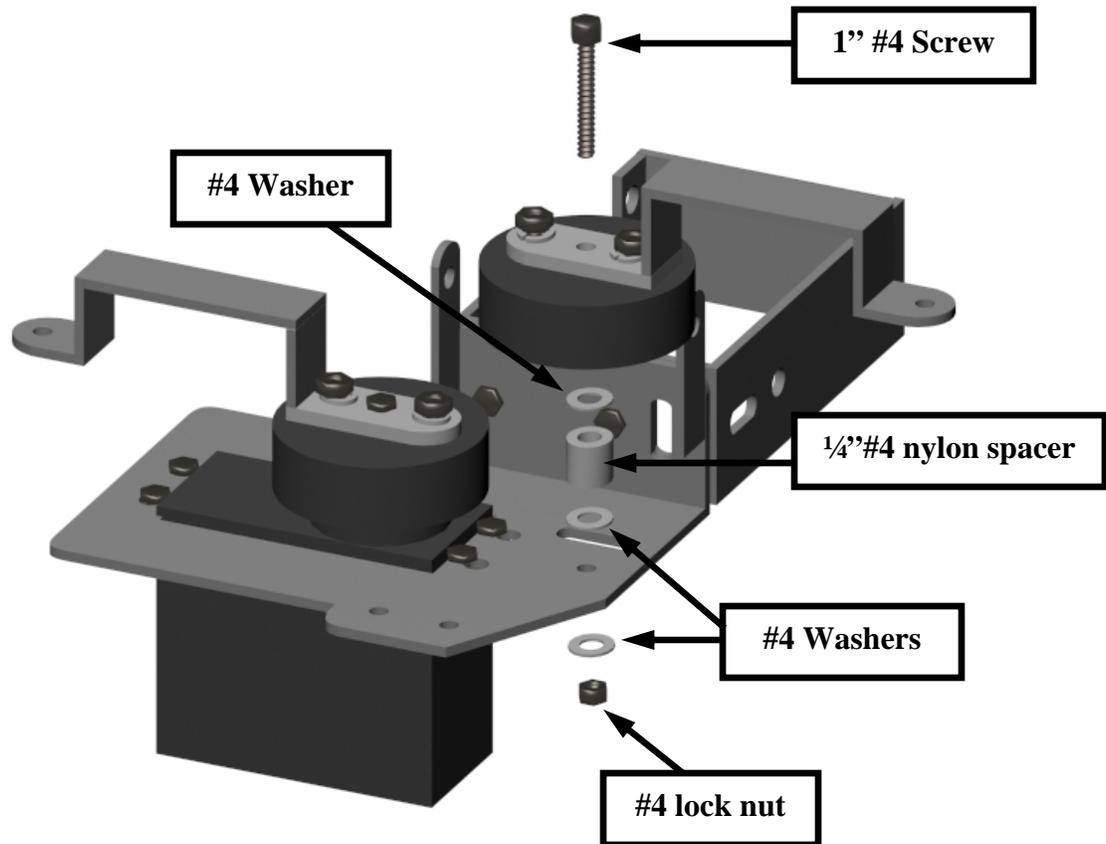


Figure 11

Tip: Applying a small amount of grease between the washers and the aluminum parts of the gripper assembly will help to ensure smooth, friction free operation.



Figure 12

Note: Move the palm servo to the right to ensure that the gear trains engage fully and then tighten the palm servos (2) #6 screws .

10. Using (1) 3/8" #4 screw, (2) washers and (1) lock nut, install the gripper assemblies to the gear brace assemblies as shown in figure 13 and 14. Tighten the lock nut just enough so there is no play in the assembly but loose enough so the assembly can be moved by hand.

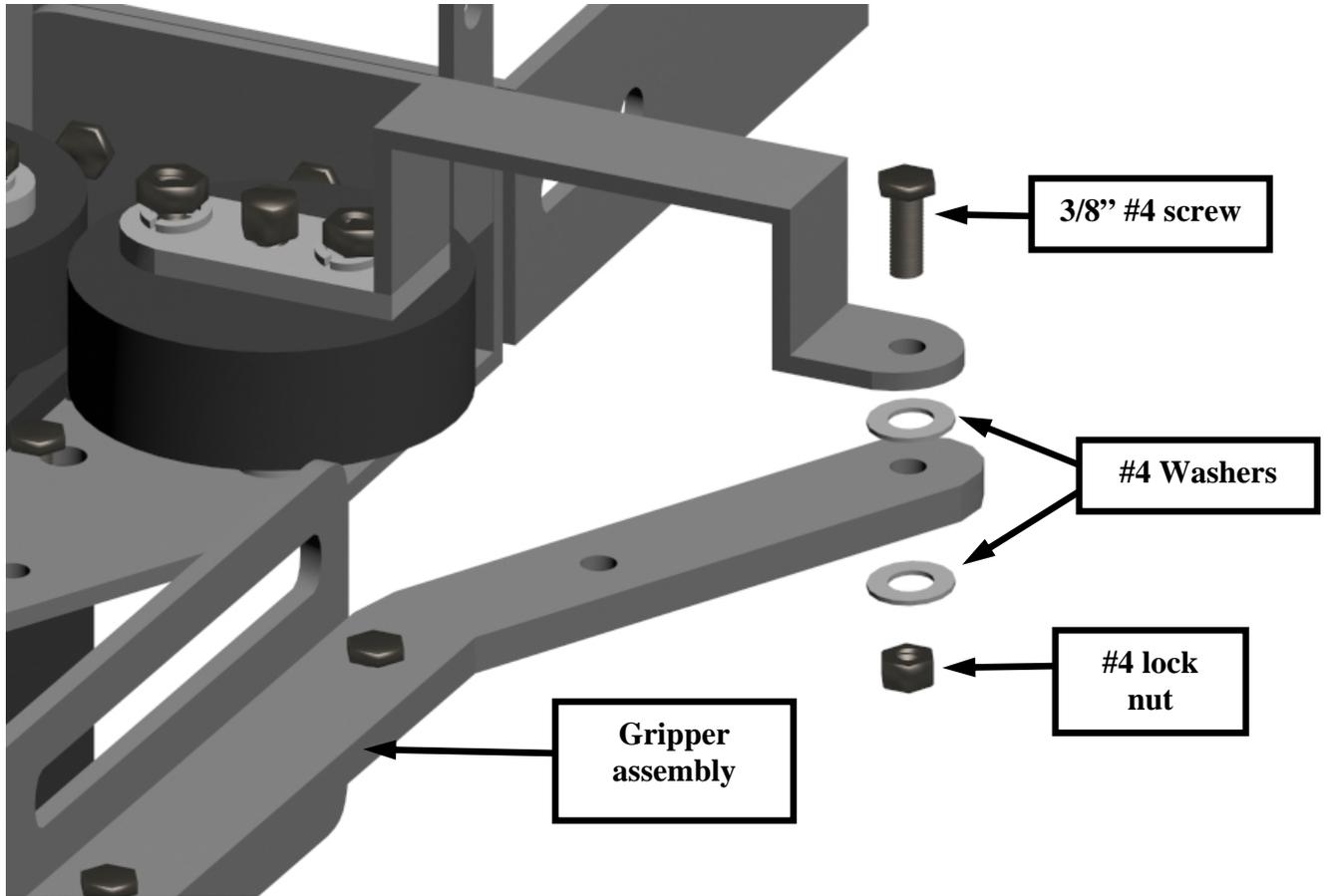


Figure 13



Figure 14

11. Using (1) 1/2" #4 screw, (4) washers and (1) lock nut , install the flat braces as shown in figure 15, 16 and 17. Once again, tighten the lock nut just enough so there is no play in the assembly but loose enough so the assembly can be moved easily by hand.

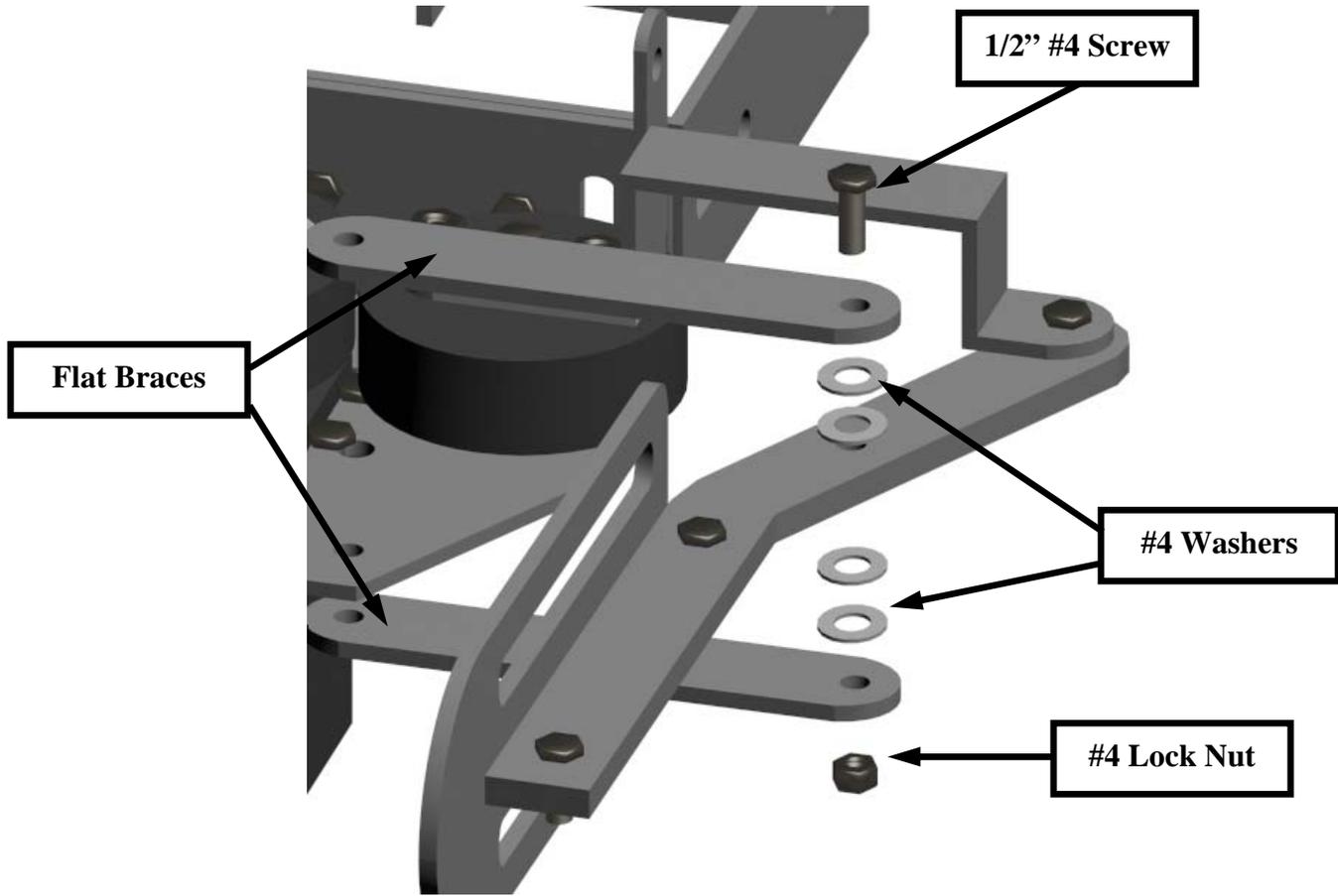


Figure 15

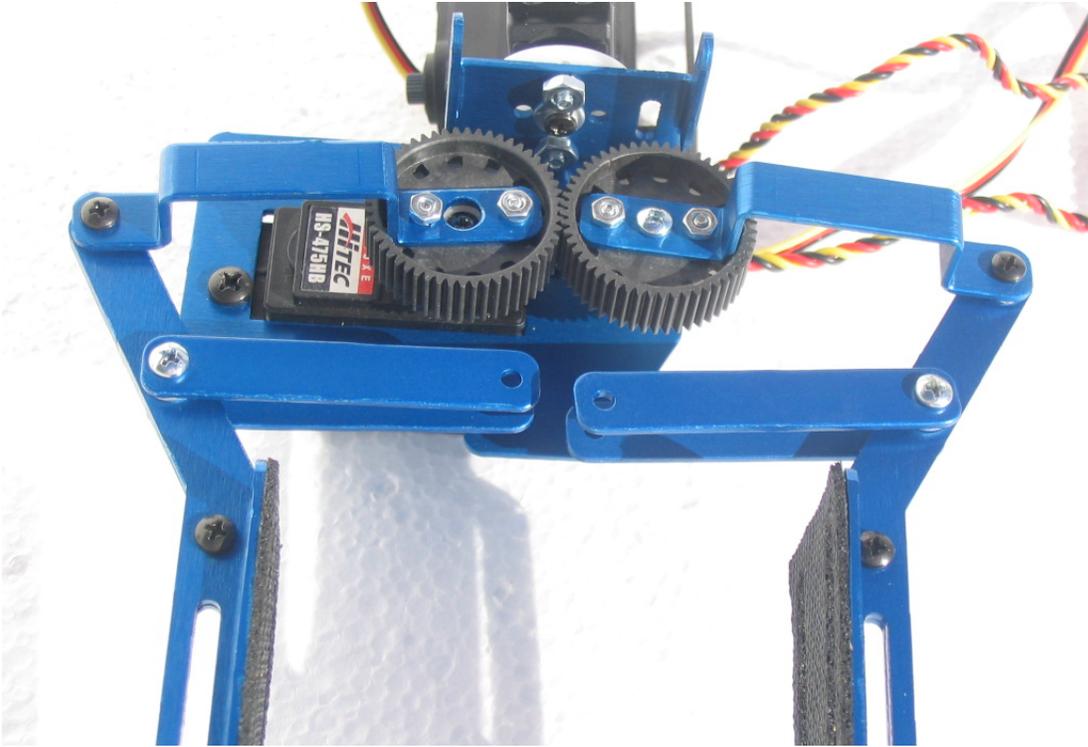


Figure 16



Figure 17

12. Using (1) 1" #4 screw, (2) washers, (2) 1/4" nylon spacers and (1) lock nut, install the flat braces to the inside of the palm as shown in figure 18.

Note: The image below has been stripped of the prior assembly sequences for greater clarity.

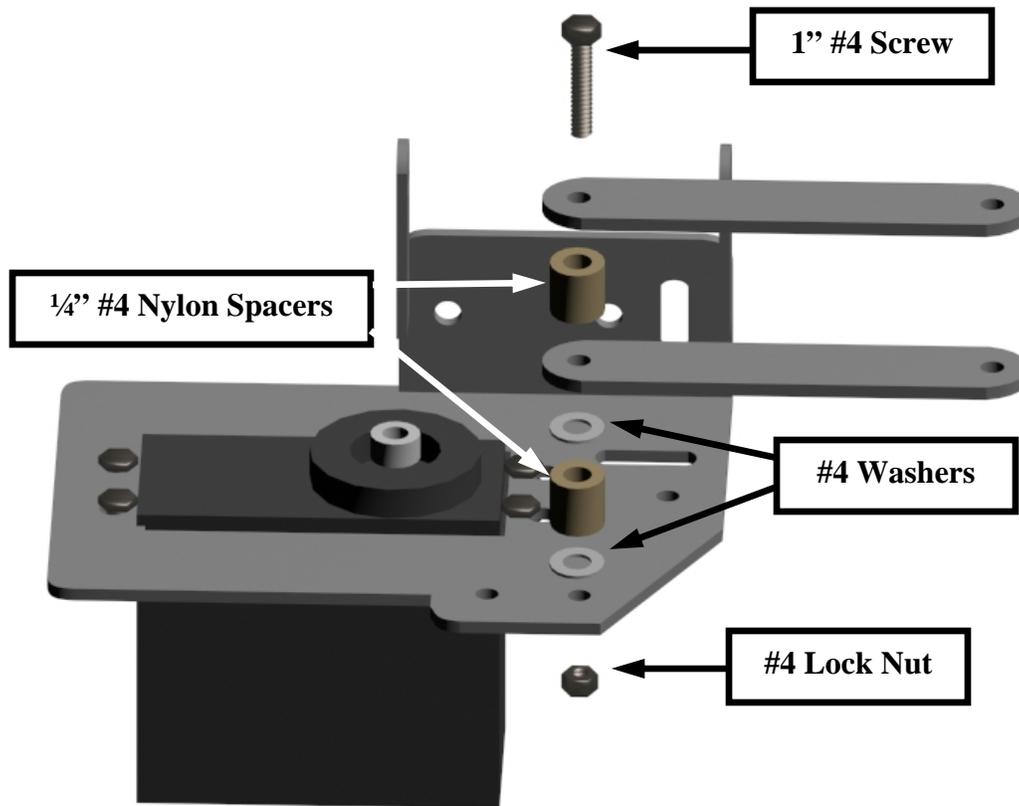


Figure 18

13. Perform the same assembly routine as outlined in the previous step for the opposite side of the gripper assembly as shown in figure 19 and 20.

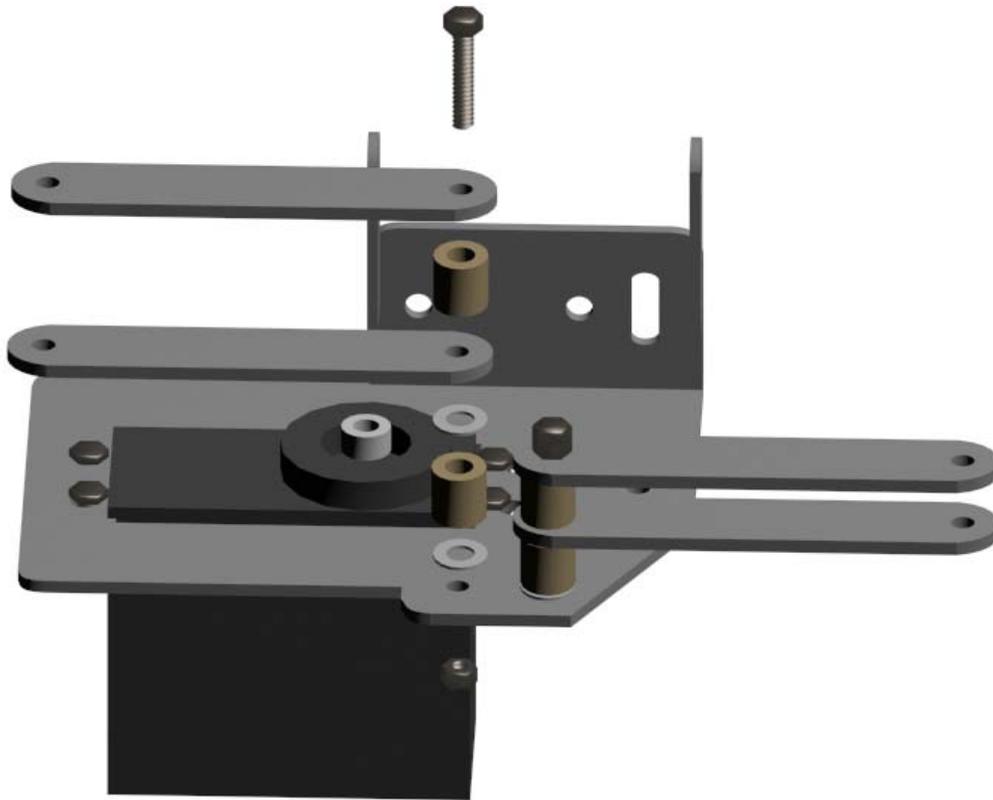


Figure 19

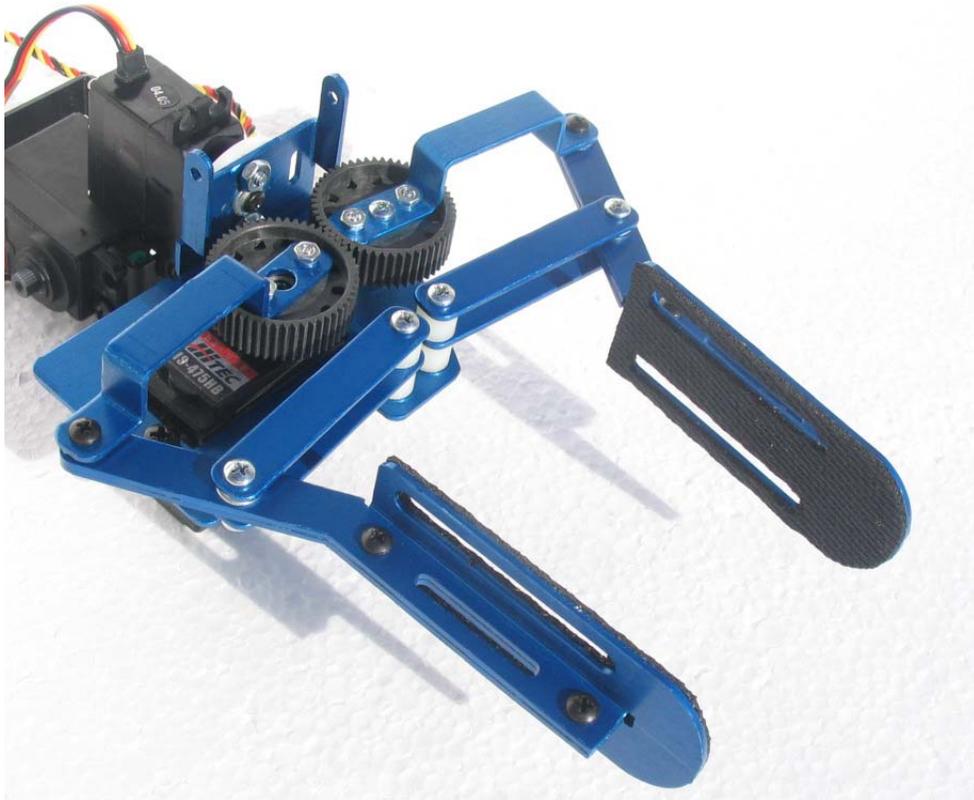


Figure 20

14. Using (2) 1/4" #4 screws and lock nuts, install the sensor bracket to the gripper assembly as shown in figure 21.

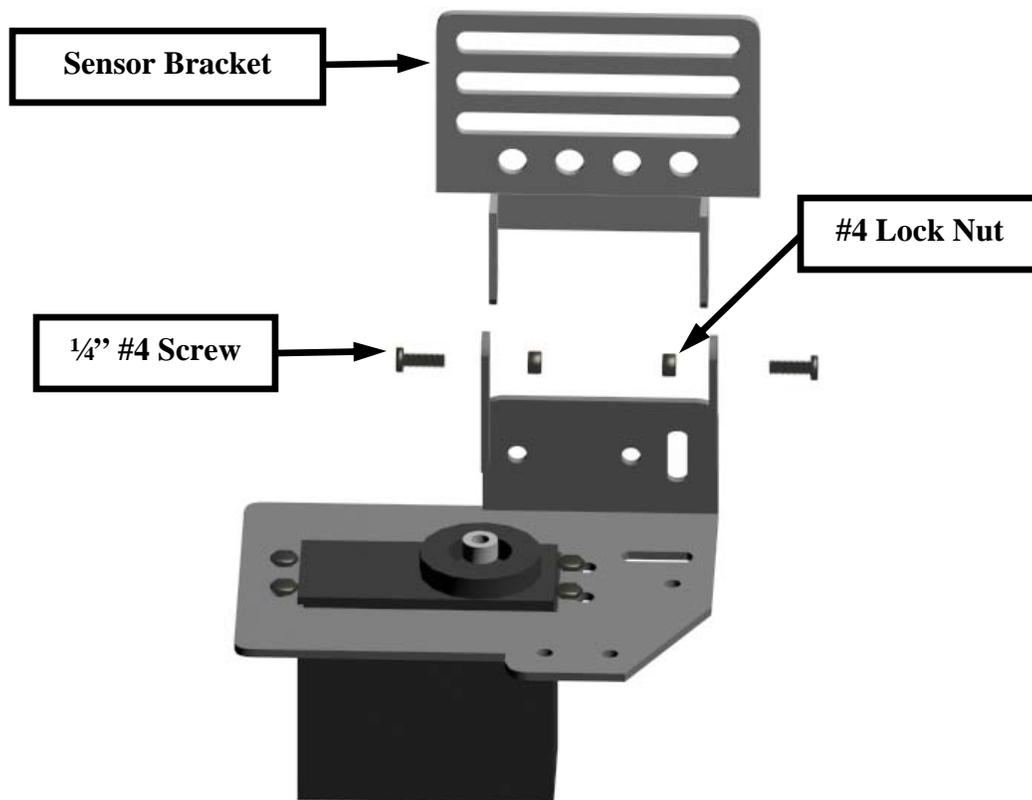
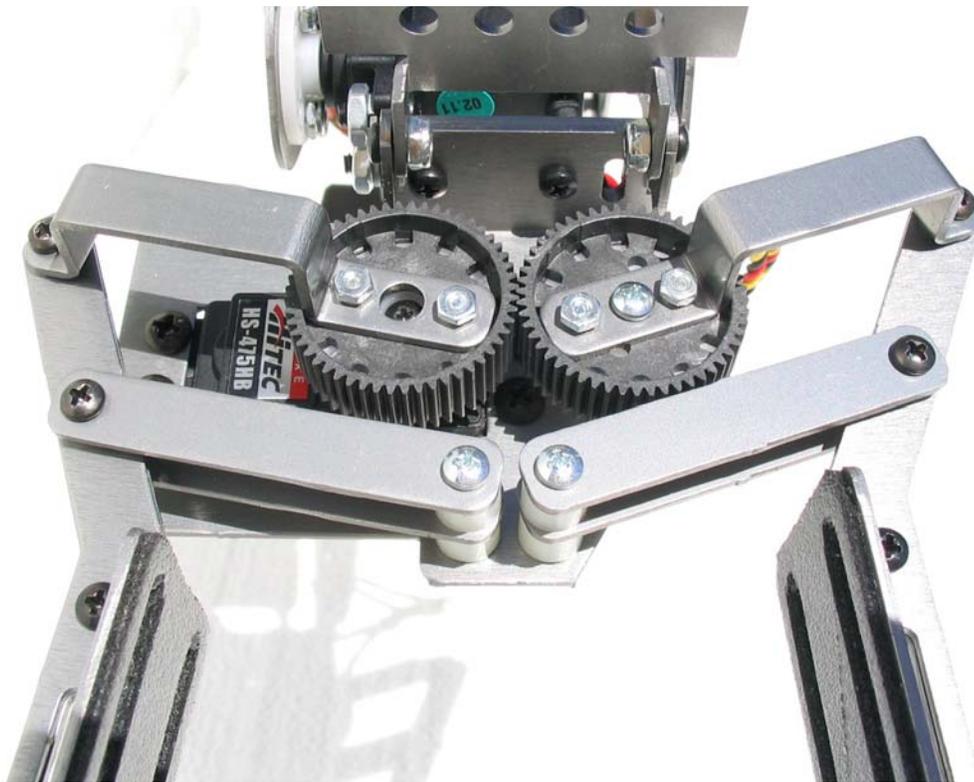
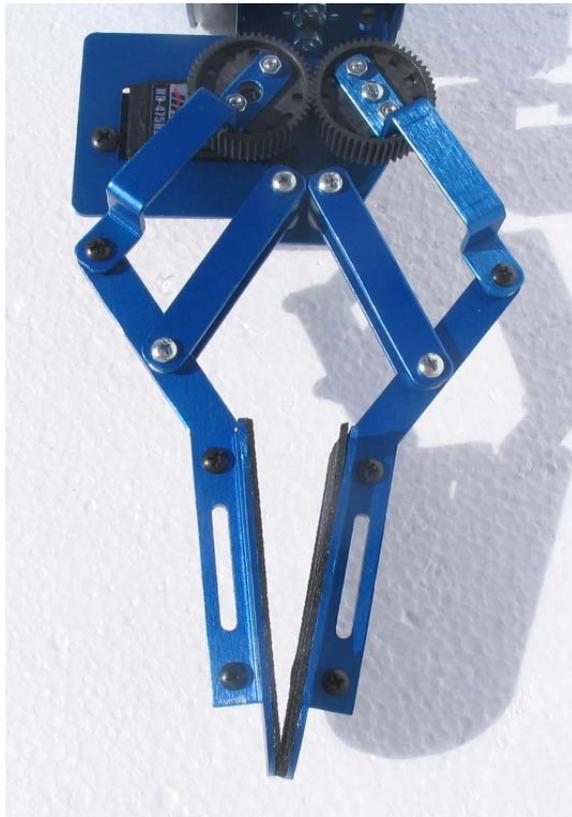


Figure 21

Refer to the next 6 images as a reference for the gripper assembly





Note: If the gripper ends do not align when placed together, simply loosen the palm servo, slide the servo to the left to disengage the gear assembly and rotate one or both of the gear sets to align the gripper properly. Retighten the #6 screws when the grippers have been aligned.





