

Lynx C-Gripper Assembly Instructions Rev. 5.

Updated 04/18/2007.

Safety first! Wear eye protection and never touch a powered robot!

Note: Do not use Loctite or thread locks on the assembly. They are not necessary and may cause damage to the Lexan.

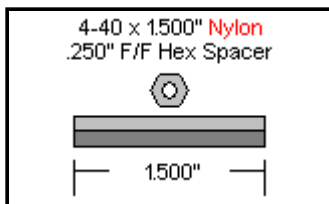


Image of the gripper attached to the arm.

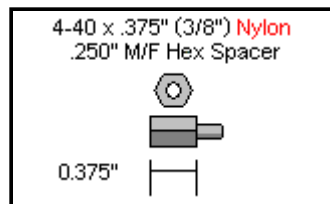
Step 1.

Make two 1.875" cross members using the 1.500" and the .375" nylon hex spacers. Then connect them to the wrist servo panel as illustrated in figure 1. Tighten these down snugly.

2 x



2 x



2 x

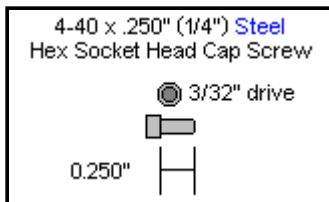


Figure 1.

Step 2.

Install the wrist rotate servo plate and the servo hinge panel as shown. Use two .250" 4-40 screws for this step. Tighten these down snugly.

2 x

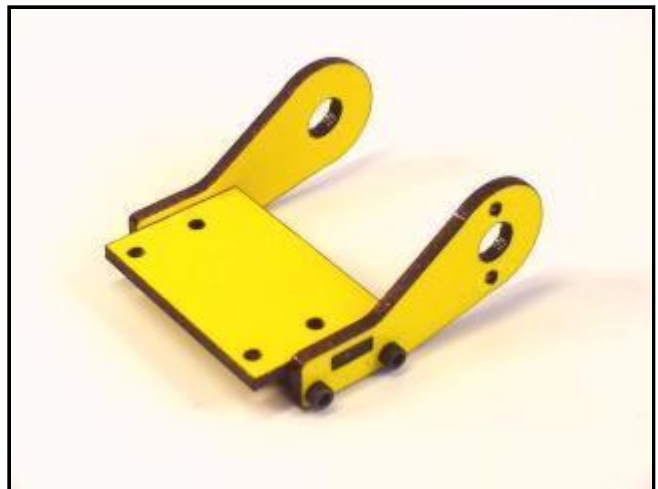
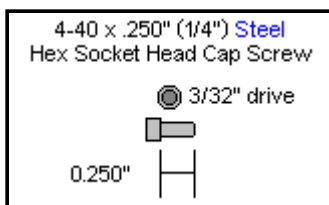


Figure 2.

Step 3.

Attach the two horizontal mounting adaptors to the HS-85BB servo as shown. These parts are located in a small bag packaged with the servo. The other components in the bag are not needed.

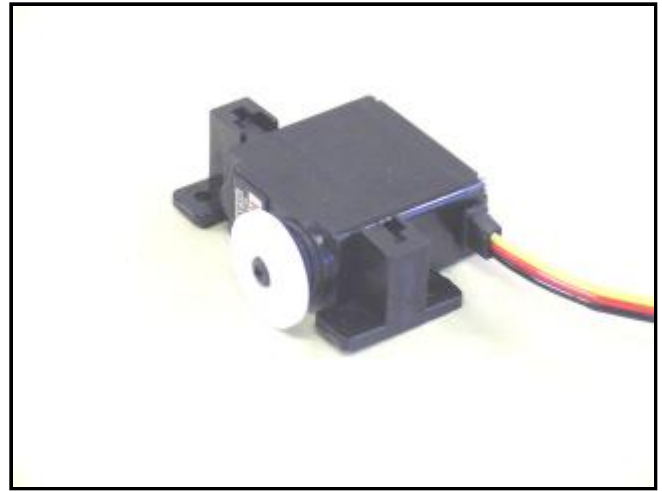


Figure 3.

Step 4.

Install the wrist rotate servo to the gripper assembly as shown. Insert the .375" 4-40 nylon screws in from the top, and secure them on the bottom with nylon nuts. Use four of these for this step. Tighten these down snugly.

4 x
4-40 x .375" (3/8") Nylon
Hex Socket Head Cap Screw
3/32" drive
0.375"

4 x
4-40 x .250" Nylon
Standard Nut



Figure 4.

Step 5.

Drill the servo horn with the 1/16" drill in the indicated positions. These holes are by the 2 and the 4 molded on the horn. Then install the vertical mounting plate to the servo using two of the .250" #2 tapping screws. Use care not to over tighten these.

2 x
#2 x .250" (1/4") Steel
Phillips Head Tapping Screw
0.250"

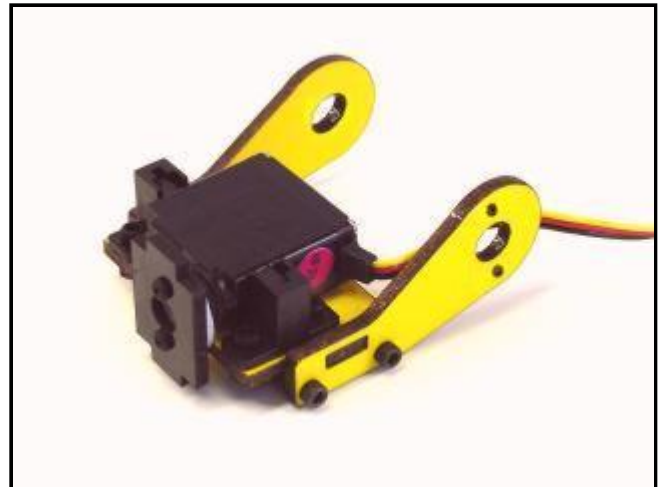
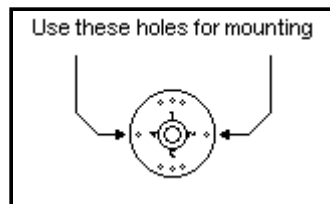
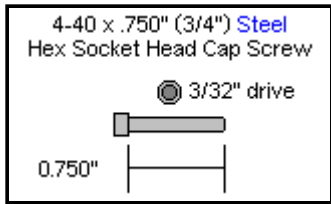


Figure 5.

Step 6.

Push two 4-40 x .750" steel screws through the end holes on the wrist rotate servo top mounting plate, and thread one 4-40 x .375" nylon hex spacer onto the end of each screw.

2 x



2 x

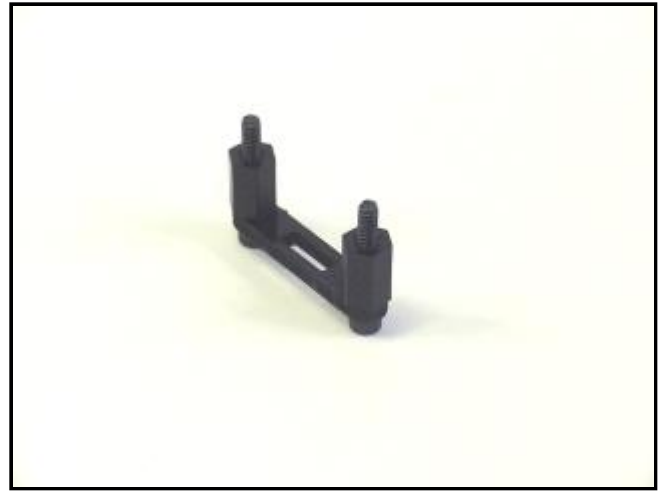
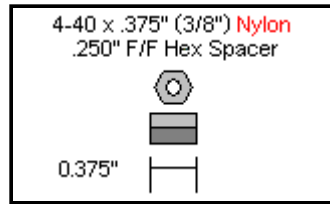


Figure 6.

Step 7.

Push the screws through the other lexan panel and thread two more 4-40 x .375" nylon hex spacers onto the ends of the screws.

2 x

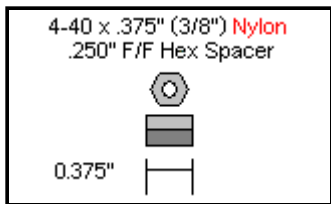


Figure 7.

Step 8.

Install the above assembly onto the wrist rotate servo using the wrist rotate servo bottom mounting plate and two .250" 4-40 screws. Tighten these down snugly.

2 x

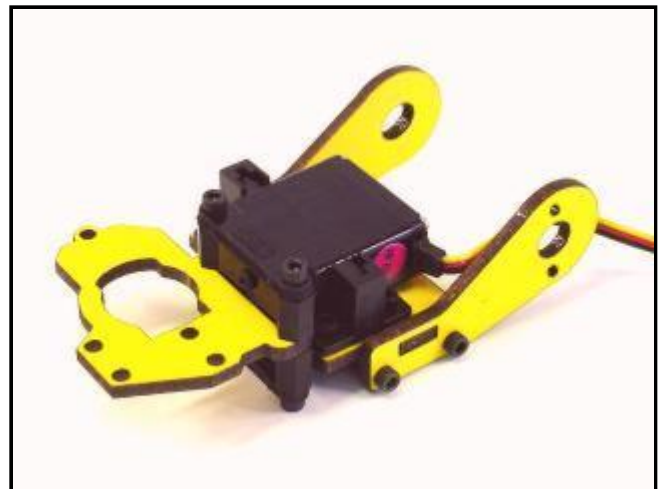
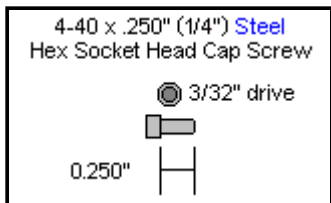
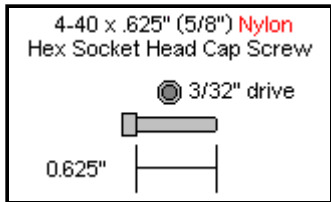


Figure 8.

Step 9.

Turn the assembly over and insert two .625" 4-40 nylon screws up from the bottom. Hold them in place with two 4-40 nylon nuts on each screw. Tighten these down snugly.

2 x



4 x

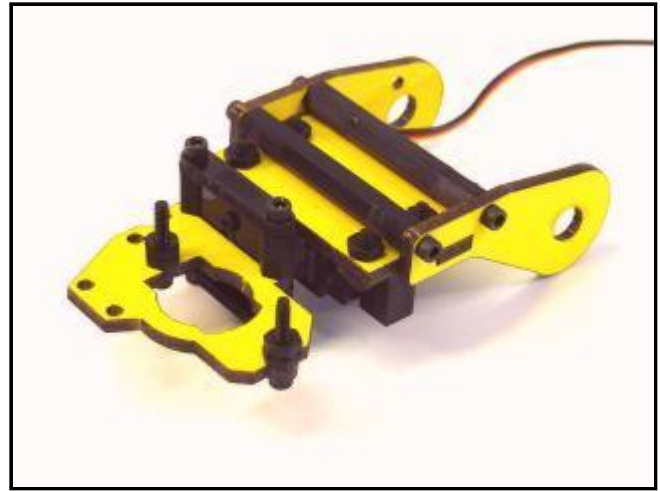
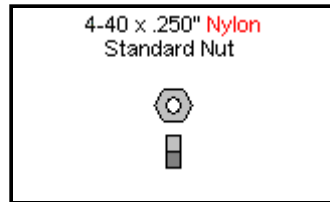


Figure 9.

Step 10.

Install two of the rubber bushings onto the mounting tabs of the HS-81 servo. These parts are located in the servo parts bag. These are the only components needed. These parts are polarized, meaning they can only be installed one way. If you have difficulty, try turning the part around.

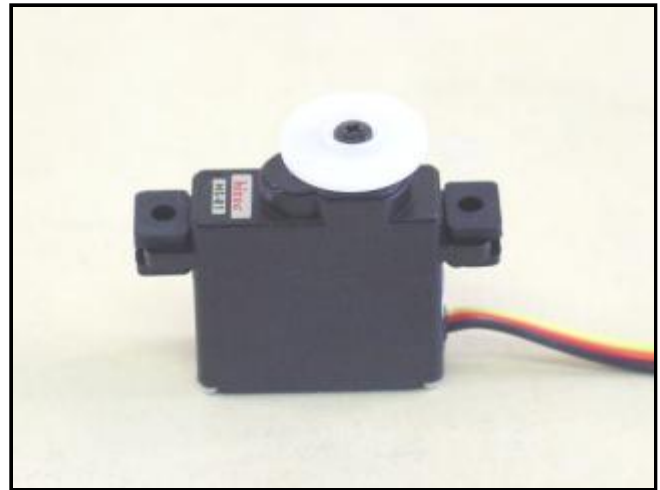


Figure 10.

Step 11.

Install the gripper servo into the assembly as shown. Use two of the 4-40 nylon acorn nuts for this step.

2 x

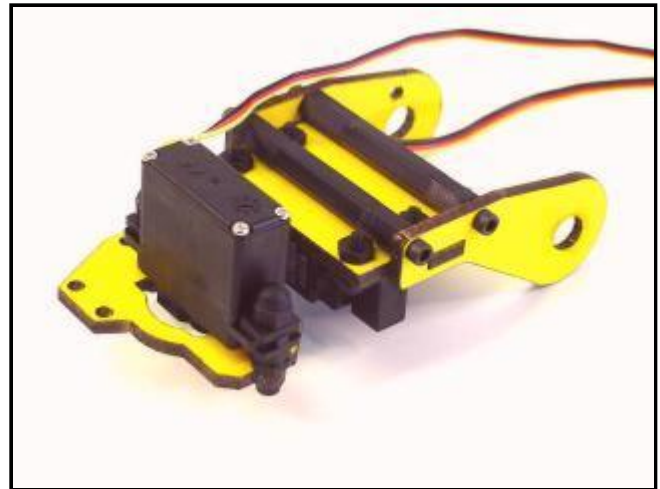


Figure 11.

Step 12.

Drill the servo horn with the 1/16" drill in the indicated positions. These holes are by the 2 and the 4 molded on the horn. Then install the driven gripper cross member to the servo using two of the .250" #2 tapping screws. Use care not to over tighten these.

2 x

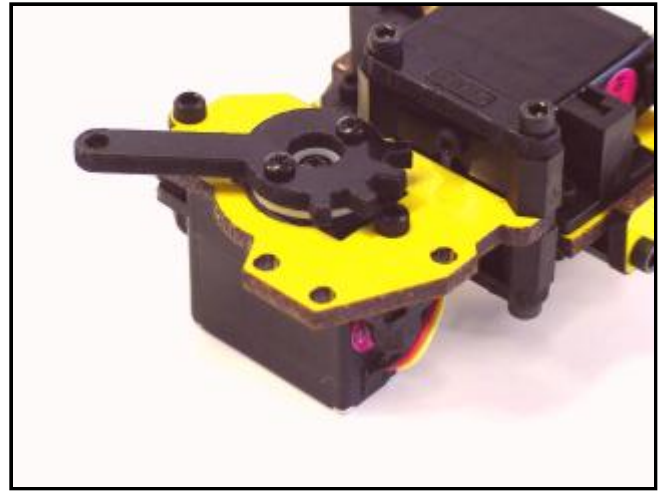
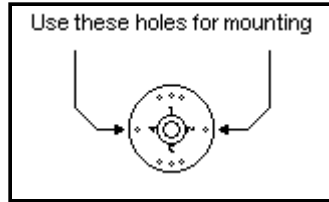
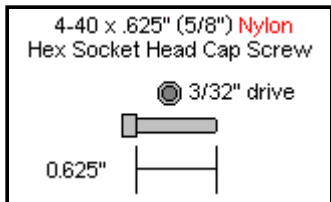


Figure 12.

Step 13.

Attach the passive gripper cross members as instructed. Insert a .625" 4-40 nylon screw into the geared passive cross member, install two 4-40 nylon washers, insert it into the gripper main plate, add a passive gripper cross member, and finish it off with a 4-40 nylon acorn nut. This should not be tightened down fully. It should be as friction free as possible.

1 x



2 x

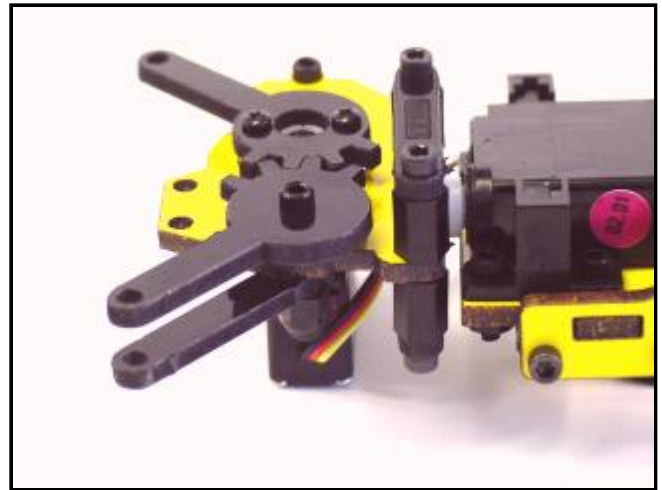


Figure 13.

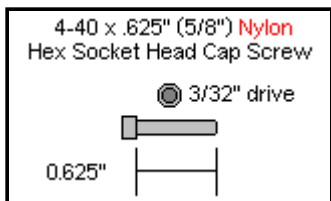
1 x



Step 14.

Install the four passive gripper cross members as shown. Use two .625" 4-40 nylon screws, four nylon washers, and two nylon acorn nuts for this step. Start with the .625" screw. Insert it into one of the passive cross members, add two nylon washers. Insert this into the gripper main plate, then add another cross member and the acorn nut. These should not be tightened down fully.

2 x



4 x

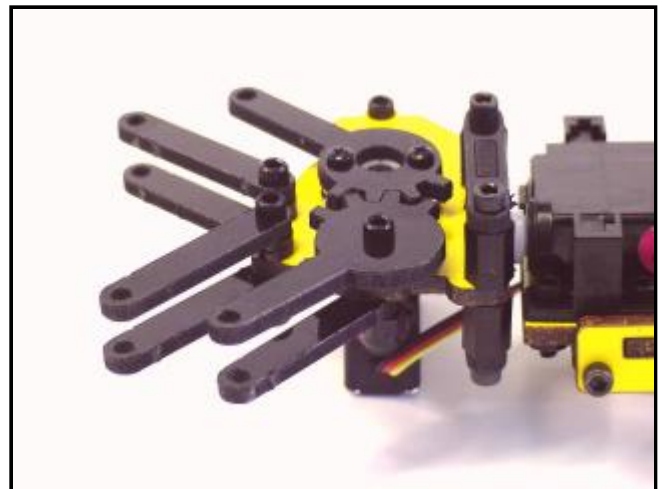


Figure 14.

2 x



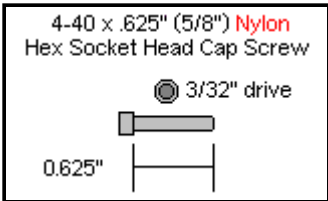
Step 15.

Install one of the gripper fingers as shown. Use a .625" 4-40 nylon screw inserted into the driven geared cross member, add a nylon washer, add the gripper finger, add two more washers, then finish it off with a nylon acorn nut. This should not be tightened down fully.



Figure 15.

1 x



3 x



1 x



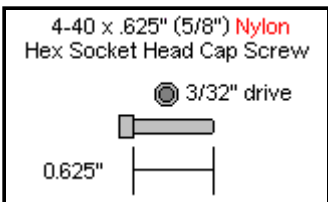
Step 16.

Attach the finger to the cross members at the front using a .625" 4-40 nylon screw, two nylon washers, and a nylon acorn nut. Start with a .625" nylon screw inserted into the top cross member, add a nylon washer, go through the gripper finger, add another nylon washer, go through the lower cross member, then finish it off with a nylon acorn nut. As before, not too tight.



Figure 16.

1 x



2 x



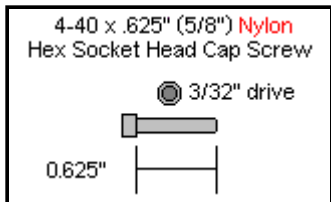
1 x



Step 17.

Attach the other finger to the cross members as follows. Use two .625" 4-40 nylon screws, four nylon washers, and two nylon acorn nuts. For each position start with a .625" nylon screw inserted into the top cross member, add a nylon washer, go through the gripper finger, add another nylon washer, go through the lower cross member, then finish it off with a nylon acorn nut. As before, not too tight.

2 x



4 x



2 x

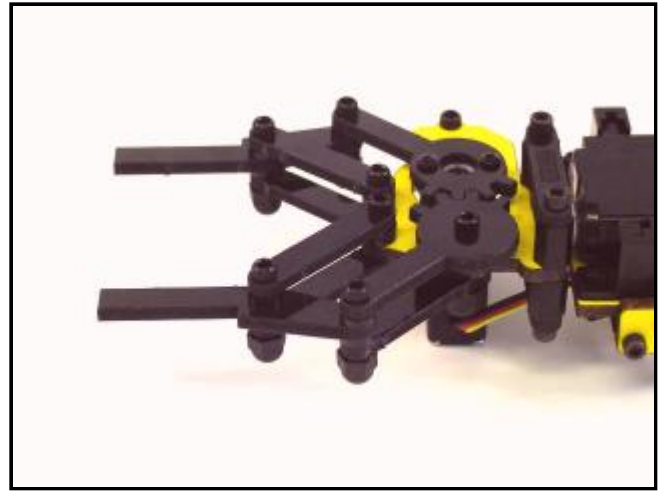


Figure 17.

Step 18.

Now for something easy. Press the rubber fingers onto the gripper fingers as shown.



Figure 18.

Step 19.

This completes the mechanical assembly of the gripper. Move on to the arm assembly guide.

The original gripper design used a pushrod to actuate the opening and closing of the gripper from a servo mounted to the base of the arm. The pushrod assembly was difficult to adjust for reliable operation so users requested we mount the servo right on the gripper. To do this requires the use of micro servos to keep the weight to a minimum. These servos are light weight, but they can be damaged if not used with great care. Most problems result in breaking a gear inside the servo. Replacement gears are less than \$5.00. To keep your micro servos working well we recommend the following.

- Adjust the min and max positions to prevent the program from causing the servo to try to move to a position beyond it's mechanical capability. Adjust the position slowly, and when the servo stops moving the end point has been found. Do this for both directions.
- Do not move the final gear on the servo by hand. The servos are geared very aggressively and the gears can be broken if back driven.
- To prevent grabbing onto too large an object set the min and max positions so the gripper can't be closed too tightly onto the object the arm is going to be used to pick up.

- Use only 6vdc for micro servo power. 7.2vdc can generally be used for most standard size servos, but micro servos will twitch when used at this voltage.