C-Bot User Guide

PITSCO EDUCATION

Cautionary and Warning Statements

- This kit is designed and intended for educational purposes only.
- Use only under the direct supervision of an adult who has read and understood the instructions provided in this user guide.
- Read warnings on packaging and in the manual carefully.

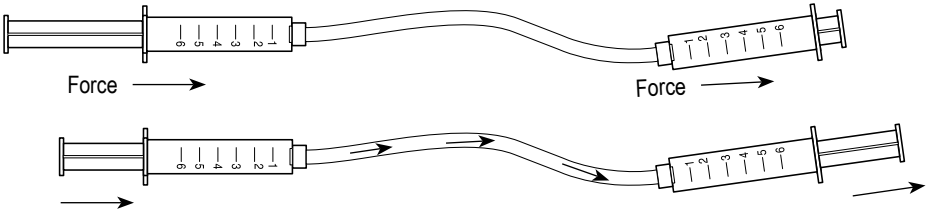
60019 V0413

How It Works

The C-Bot operates on the principles of basic hydraulics and mechanics. The hydraulic system is made of two syringes with a tube between them. These are attached to the C-Bot and move it forward with every push and pull of the syringe plunger.

Understanding Hydraulics

A hydraulic system uses fluid as a force. The principle behind a hydraulic system is simple: Force applied at one point is transmitted to another point using a fluid.



Pushing on one end of a syringe filled with water creates an equal and opposite reaction on the other syringe. Tubing filled with water connects to the mechanical parts of the kit. Force causes the part to move.

Materials Included

- Sheet of laser-cut parts
- 2 syringes
- Clear tube
- 4 self-adhesive foam rubber tabs
- 6-32 x 3/4" screw
- 3 – 6-32 x 3/8" screws
- 4 – 4-40 x 3/8" screws
- 4 – 4-40 x 3/16" screws
- 6-32 nut

Items Required (not included)

- White glue (such as HD Bond II)
- Cool-melt glue and glue gun
- Small Phillips screwdriver
- Matte acrylic paint (gloss can make parts stick) and brushes (optional)
- Cup of water

Before You Start

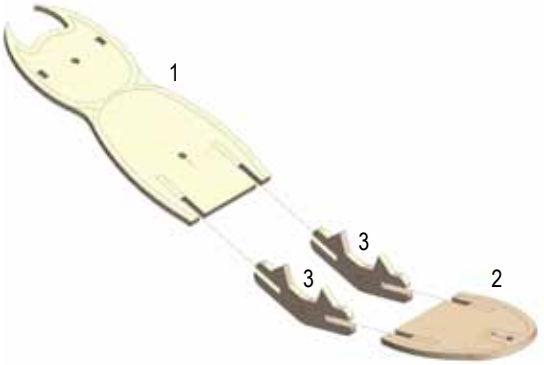
- Let parts dry completely after each step.
- Don't use too much glue.
- Be sure not to overtighten the screws; the C-Bot will not work if the screws are too tight.

Building the Subassemblies

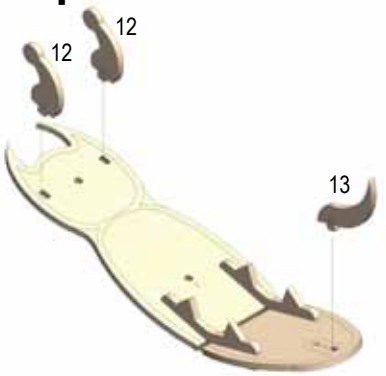
Tip: Plug in the cool-melt glue gun to warm up in time for the next section.

1. Find the parts labeled 1, 2, 3, 12, and 13. Glue and insert the two Part 3s into the straight end of Part 1 as shown.
2. Glue and insert Part 2 on the other end of the Part 3 pieces.
3. Glue the two Part 12s into the pincher end of Part 1; they will look like a bug's antennae.
4. Glue Part 13 into the end of Part 2; this will look like a bug's stinger. This is the C-Bot body.
5. Gather Parts 7 and 8 – there should be four of each. Glue each Part 7 into a Part 8 as shown. These make the legs.
6. Locate Parts 4, 5, and 6 (2). Glue one Part 6 centered on Part 4 and the second centered on Part 5. These are the parts that act as shoulders and hips that connect the legs to the body.

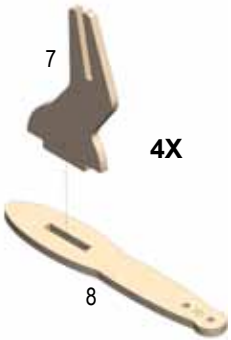
Steps 1-2



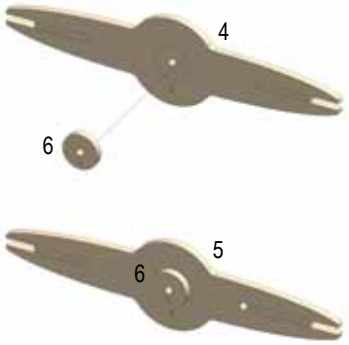
Steps 3-4



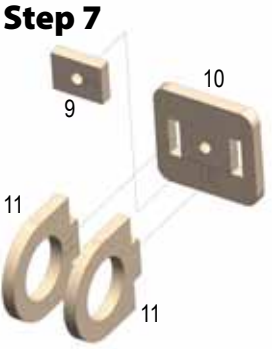
Step 5

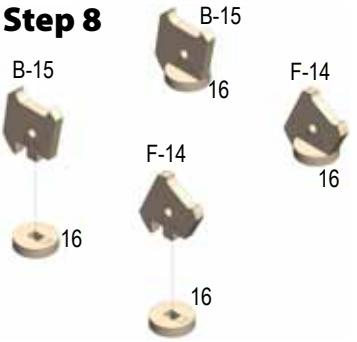


Step 6



7. Find Parts 9, 10, and 11 (2). Glue Part 9 flat onto Part 10 where there is a rectangle etched in the center and align the holes. Glue the Part 11 pieces vertically in the slots on Part 10. This is the syringe holder.
8. Gather F-14 (2), B-15 (2), and Parts 16 (4). Glue an F-14 or B-15 into each Part 16. A small piece of the wood will hang over the edge of Part 16 like a toe. These are the feet.
9. Take the shoulders (5 and 6) and glue a leg into each end. Now glue a leg into each end of the hips (4 and 6) as shown.

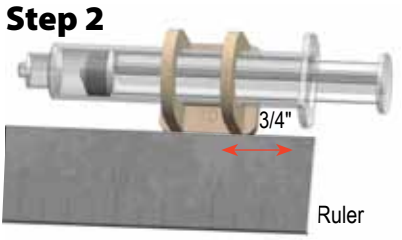




At this time, you can paint the subassemblies with paint, if desired.

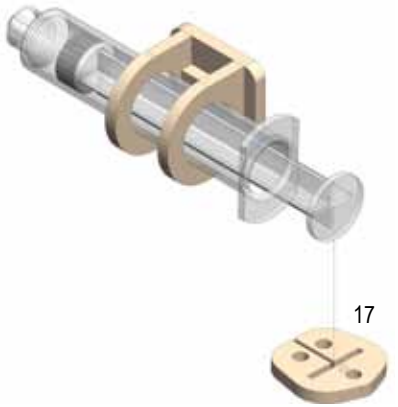
Gluing the Syringe Holder

1. Remove the syringes from their cases. Find the syringe holder and Part 17.
2. Put one syringe into the syringe holder so the top of the syringe is 3/4" away from the holder. Cool-melt glue this in place, making sure to get glue where both Part 11s touch the syringe.



3. Slide Part 17 over the plunger end of the same syringe. Cool-melt glue this in place. At this time, you are done with the cool-melt glue gun and can unplug it.

Step 3



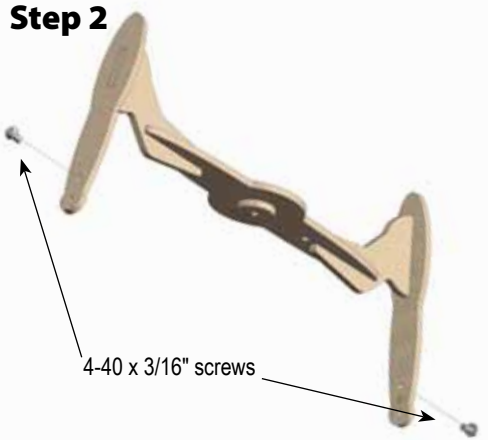
Putting Together the Subassemblies

1. Find the foam rubber tabs, all screws, and the nut. Peel off the foam rubber tabs and place one on the bottom of each foot.

Step 1

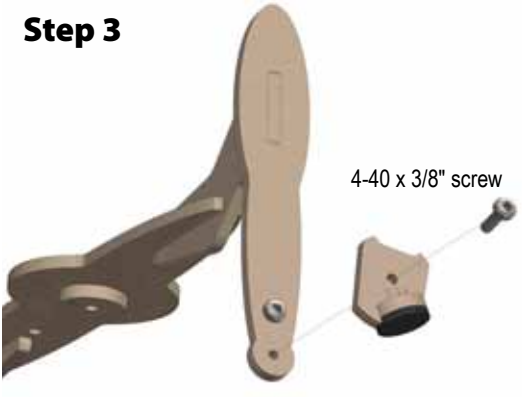
2. In the top hole of each leg, slightly screw in a 4-40 x 3/16" screw.

Step 2



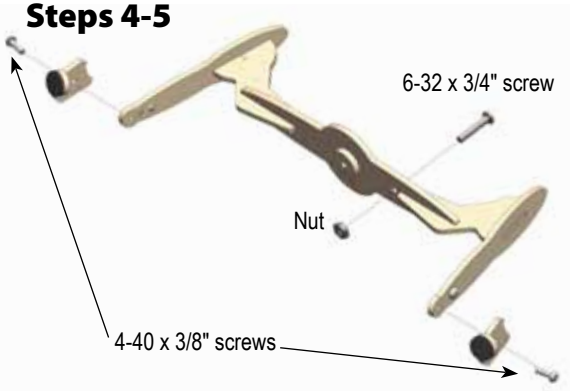
3. To the bottom hole of the legs on the shoulders (Parts 5 and 6), loosely attach the F-14 feet with the 4-40 x 3/8" screws – making them too tight will keep the feet from flexing. The toes should face forward so the extra hole on the shoulder will be on the right side of the C-Bot.

Step 3



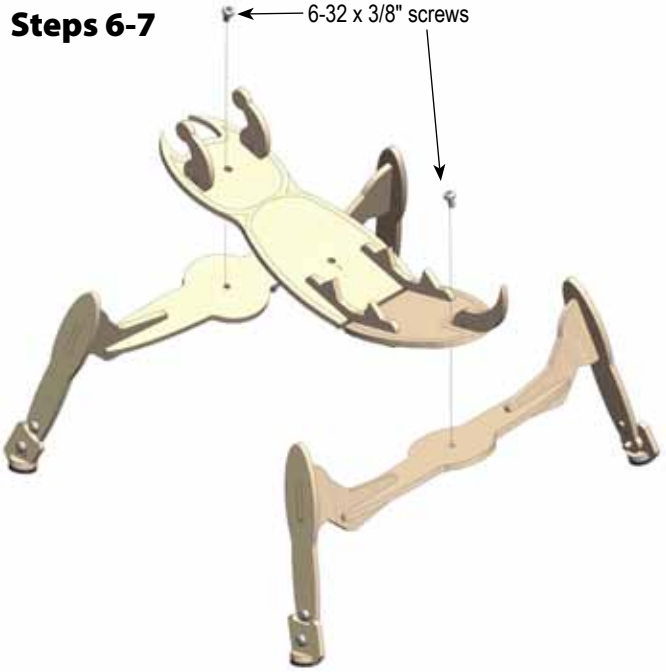
4. Now, loosely attach the B-15 feet with 4-40 x 3/8" screws to the Parts 4 and 6 subassembly (hips) so the toes point in the same direction.
5. Insert the 6-32 x 3/4" screw into the hole on the right side of the subassembly from Step 3 and secure it with the nut.

Steps 4-5



6. Use a 6-32 x 3/8" screw to attach the shoulders and front legs to the end of Part 1 so the off-center hole with the screw is on the right side. Make sure the screw is slightly loose or the legs will not move.
7. Use a 6-32 x 3/8" screw to loosely attach each of the back legs, which are on the hips, to the end of Part 2.

Steps 6-7



8. Hold up the syringe with the holder – turn Part 17 on the plunger so it is on the same side as Part 10 on the holder.

Step 8

9. Turn over the C-Bot and place Part 17 over the end of the screw. Align the hole in the syringe holder with the hole toward the center of the body. Adjust the plunger if needed.
10. Flip the C-Bot over and secure the syringe with another 6-32 x 3/8" screw.

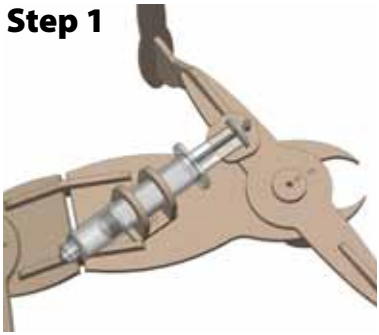
Step 9

Step 10

Adding Water

1. Get a cup of water. Completely depress the syringe on the C-Bot.
2. Depress the second syringe completely, put the nozzle into the water, and pull the plunger back out to fill it with water.
3. Attach the tube to the syringe nozzle and slowly depress the plunger until all the water is in the tube.

Step 1



Step 2

Step 3

4. With someone holding the tube with the ends up, detach the syringe and refill it. Carefully lifting one tube end until the water comes as close to the other end without spilling, reattach the tube to this end and slowly depress until the tube is completely full of water.
5. Fill the syringe completely with water and reattach it to the tube. Connect the other end of the tube to the syringe on the C-Bot.

Step 5

Tip: If you have a 12 CC syringe available, you can fill the tube in one step instead of two. This will also help prevent air from getting in the tube.

Operating Your Kit

To operate the C-Bot, just pull out and push in the syringe repeatedly. With every push or pull, the C-Bot will take a step forward.
Caution: The laser-cut pieces in this kit won't take much impact, so be careful not to drop or step on your C-Bot.

PITSCO EDUCATION
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