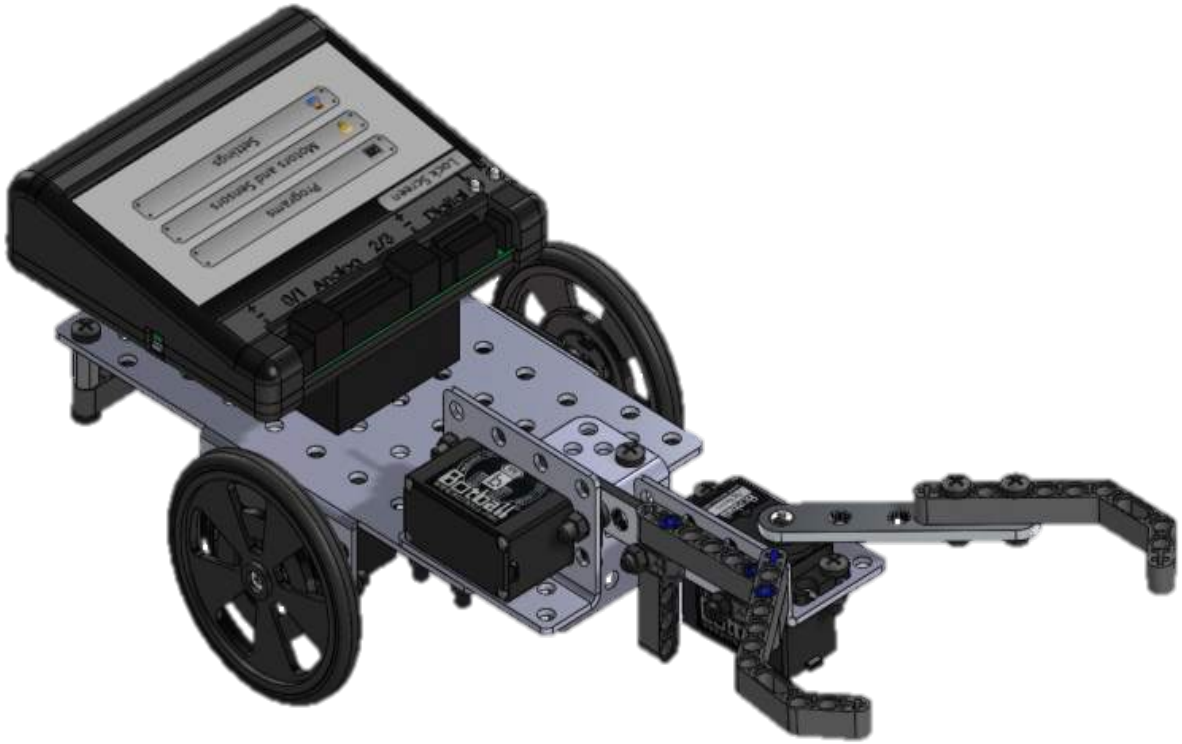
KIPR Wallaby Robot Build Guide

Demobot



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Pull out the Battery and Controller

1x Battery

1x KIPR Robot Controller Wallaby

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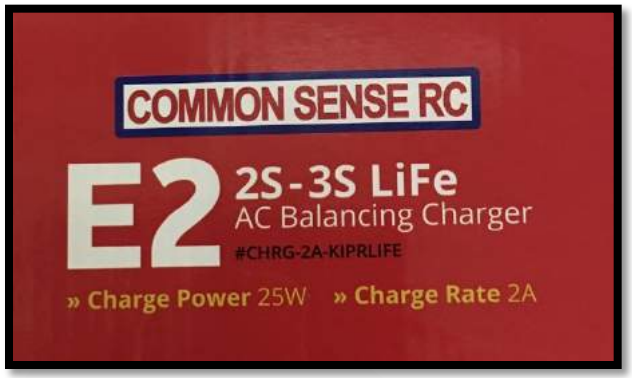
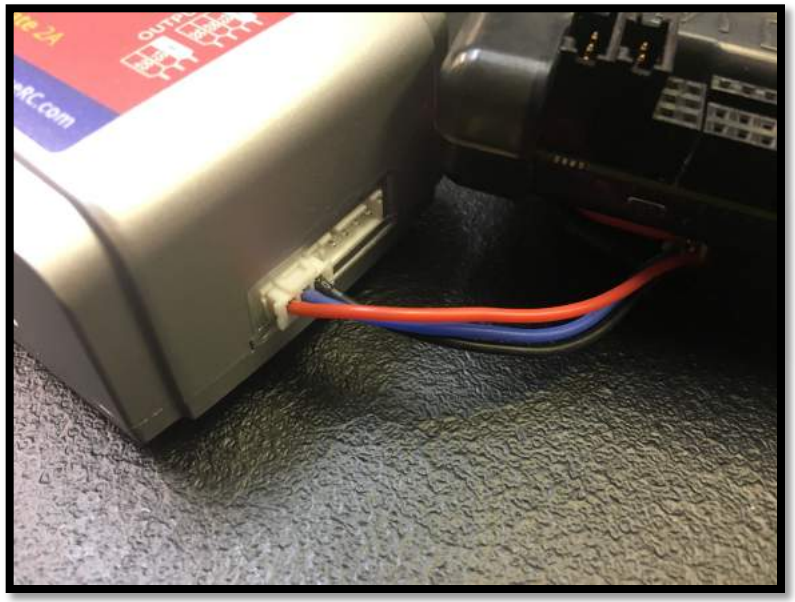
Charging the Battery

Please go ahead and start charging your battery using the charger located in the COMMON SENSE RC box.

Charge your battery by plugging in the battery charging cable into the corresponding port (shown below).





Please apply the team stickers to your boxes and bags!

- The next few slides will cover what materials you need to pull out for building the robot.

OR

- You can go to slide 13 and pull the needed parts out as you go along.

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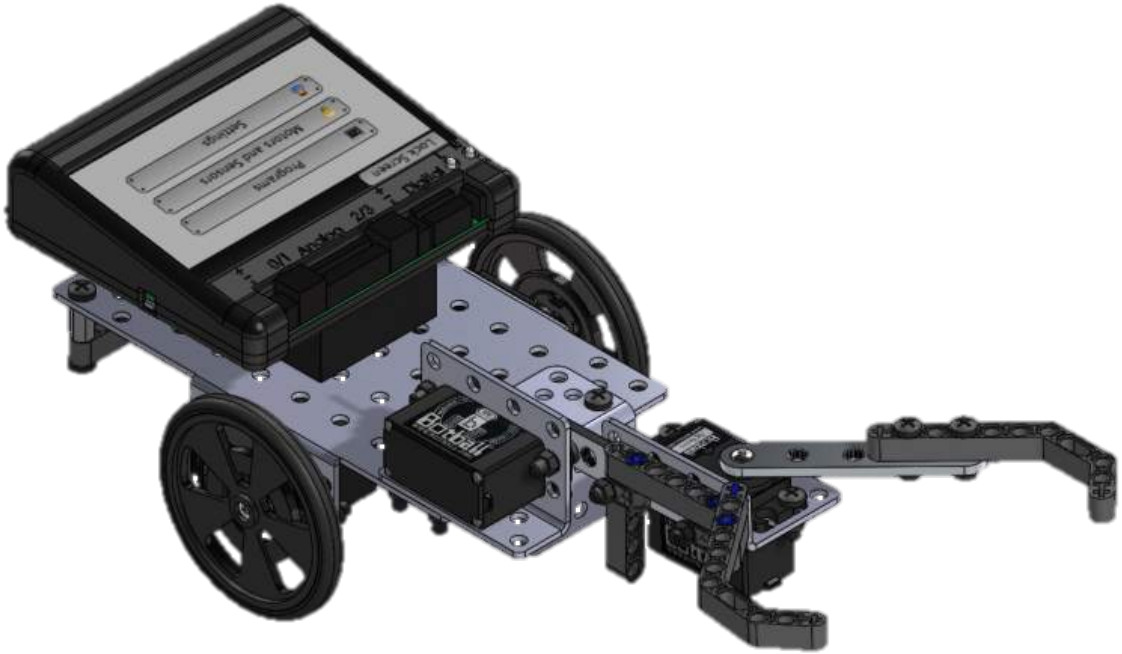
Parts Review for Demobot



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USB Cable, Screwdriver, and Special Parts

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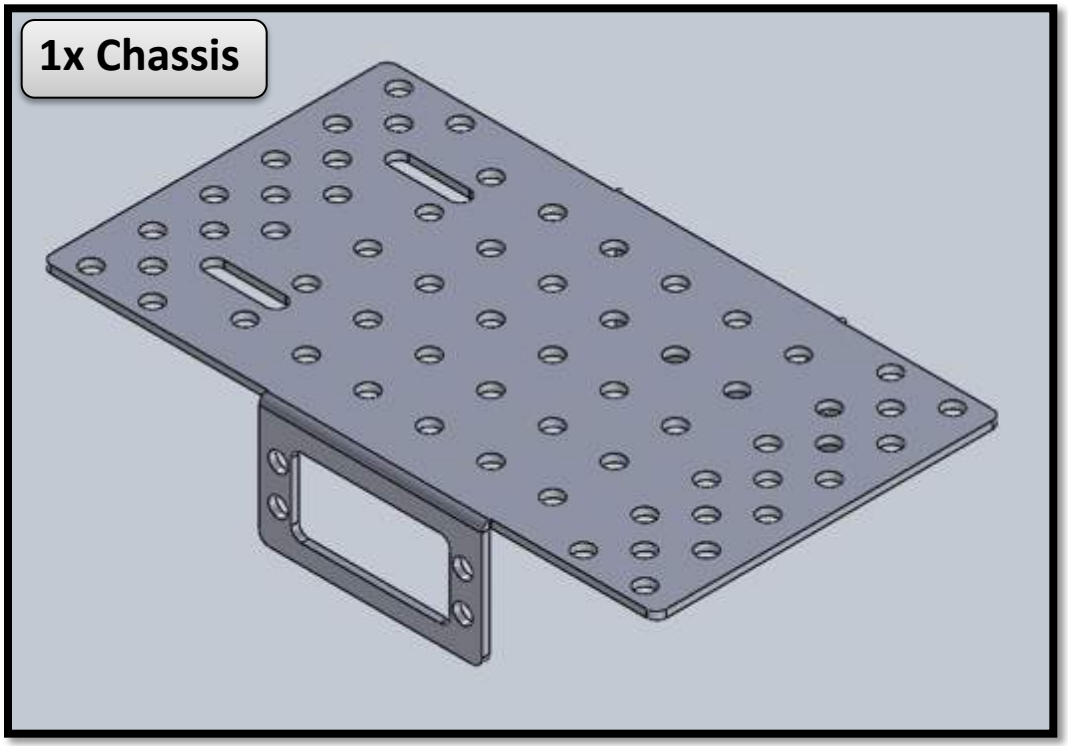
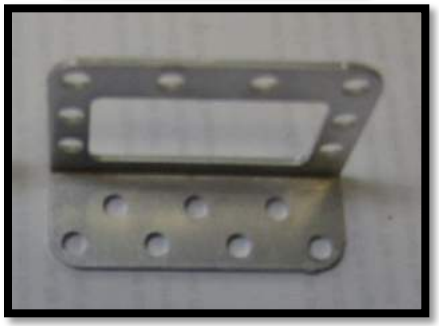
KIPR Metal Construction Pieces

Go ahead and remove the white plastic film.

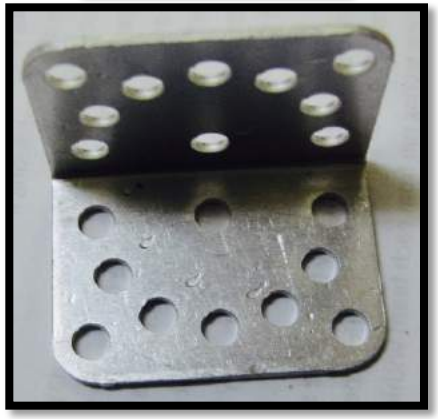
1x Chassis



2x Motor Brackets



1x Angle Bracket



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Motors and Servos

Note the difference between the two!!

The two small black screws in the servo horn bag are what you will use to mount the wheels later in the build.

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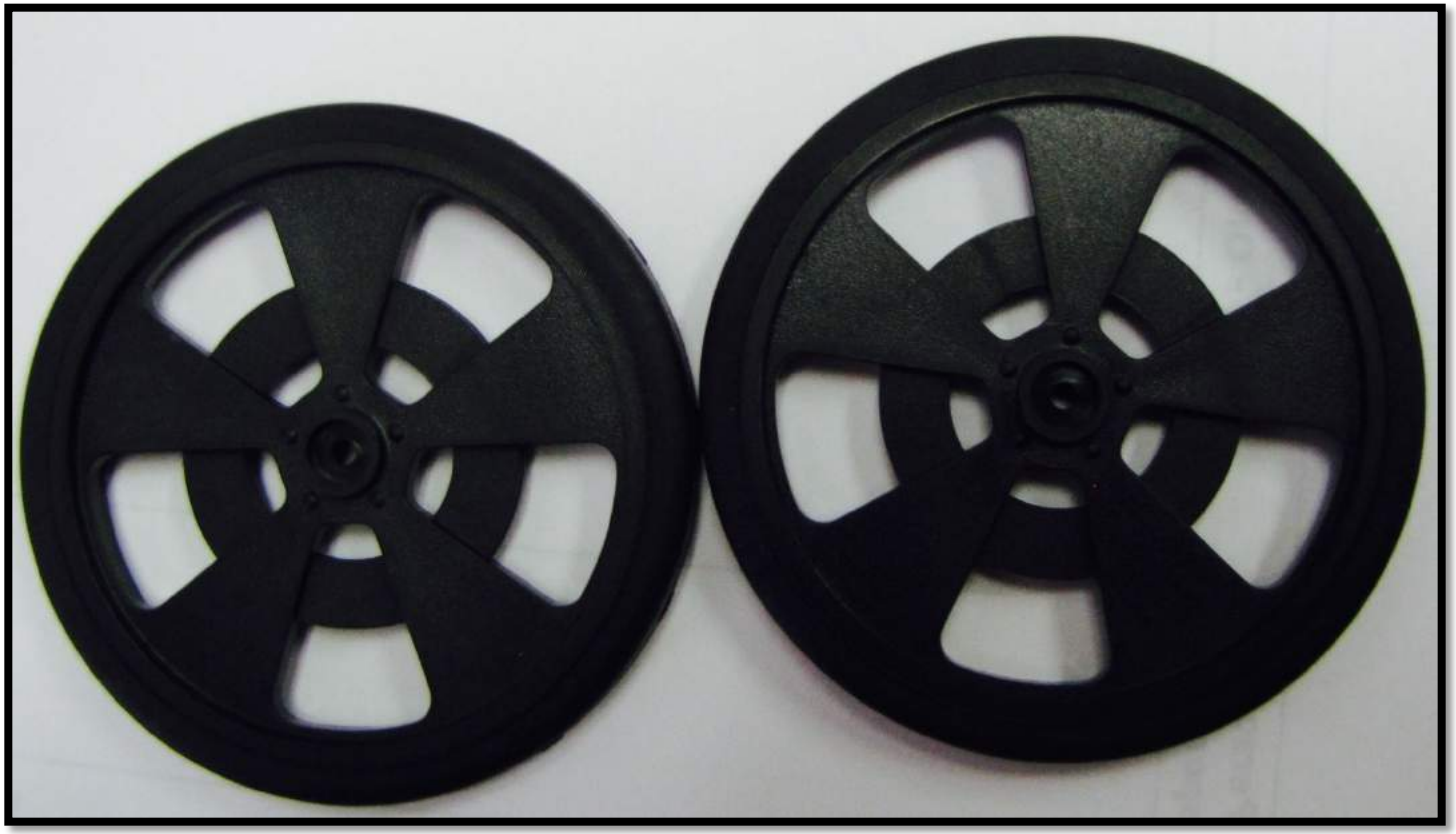
Wheels for the Robot



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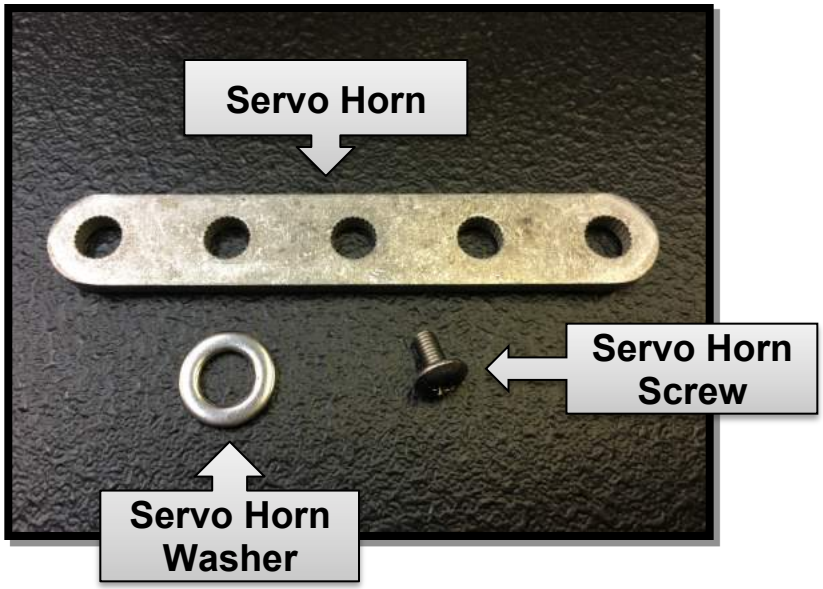
Construction Components



You will need
- Long Bolts
- Medium Bolts
- Short Bolts
- Lock Nuts
- Short Standoffs

Bolts

Lock Nuts

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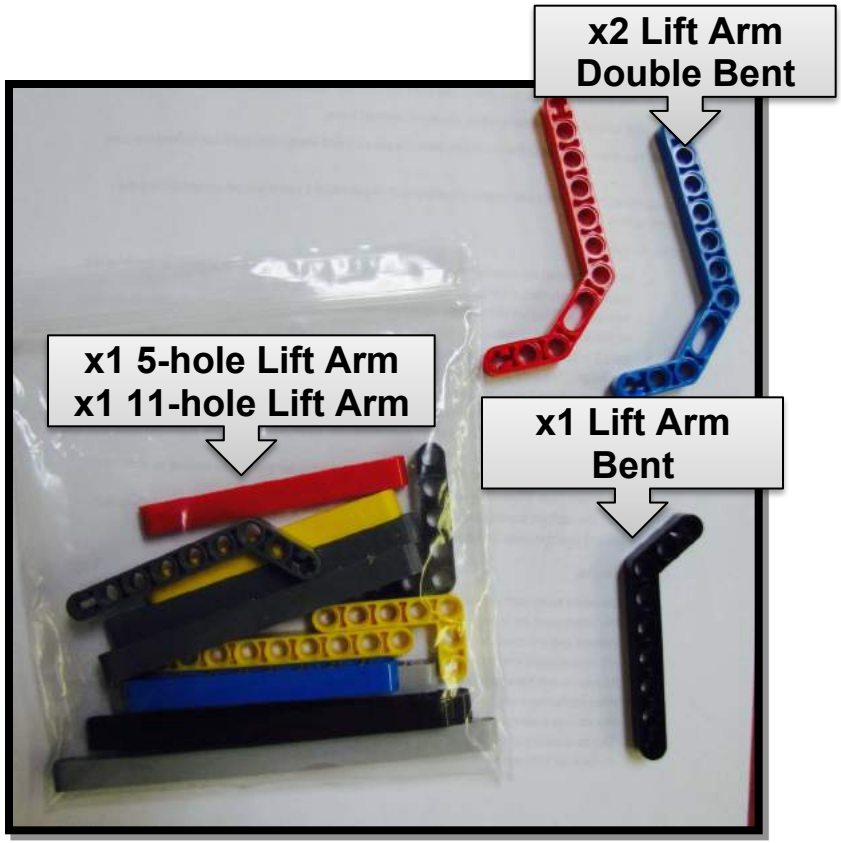
Lego Pieces

Colors may vary



x2 Axle Joiner
Perpendicular

x2 Axle Pin
with Friction

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Now that you have the parts set aside…

- Put everything else back into your boxes and bags.
- Follow the rest of the slides to build your robot.

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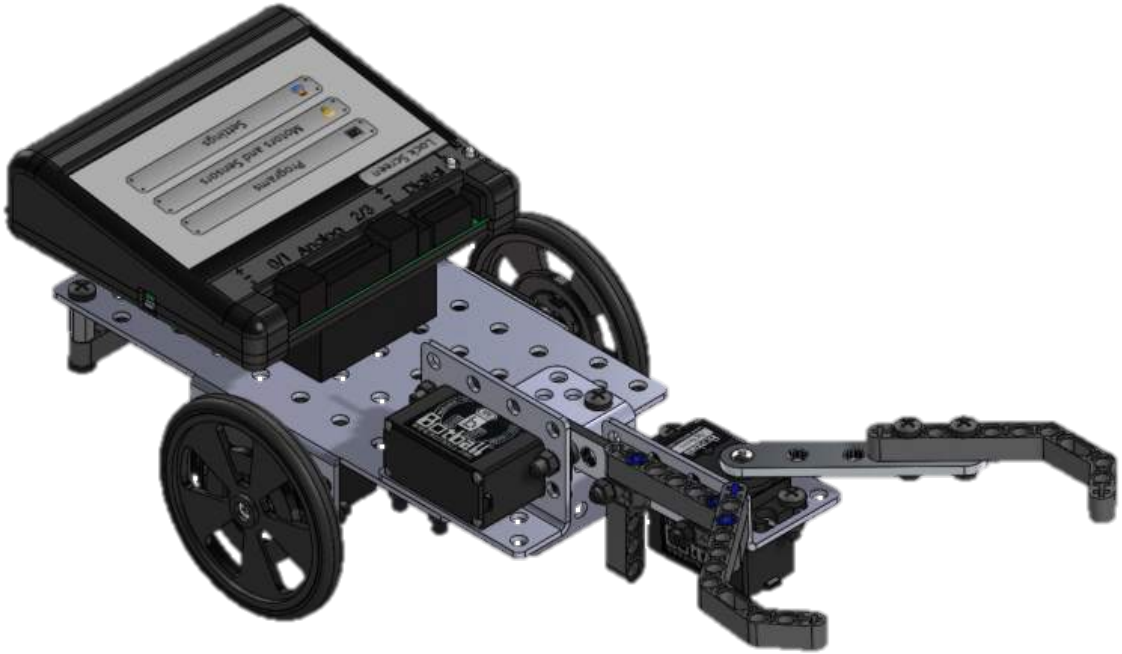
Building the Demobot



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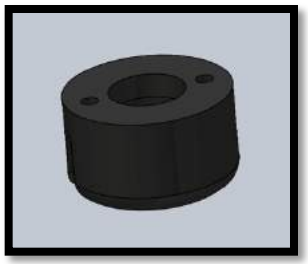
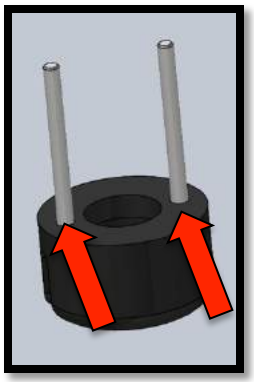
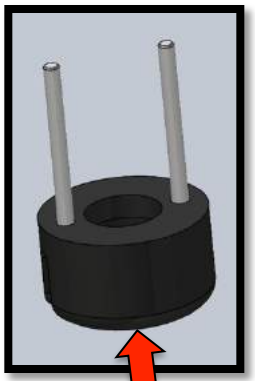
Caster



Ball





1

2

Long Screws

Ball

Remove the caster, two plastic discs, the two long bolts and the nuts from the caster bag. Be careful to not lose the small nuts!

Carefully remove the metal ball from the caster. You can use the screwdriver to pry it out of the plastic case.

Insert the two long bolts through the plastic caster from the side that the ball fits into (1) and then reinsert the ball (2).

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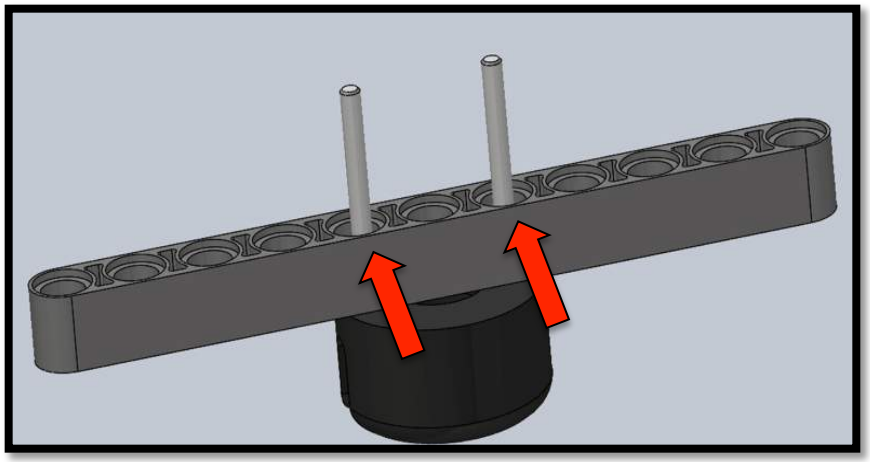
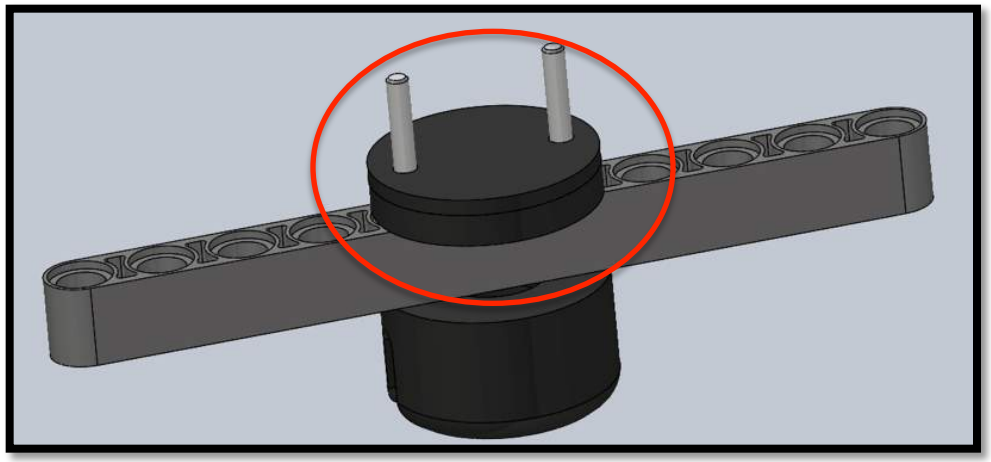
Mounting the Caster





Place the two bolts coming out of the caster through the center two holes on the straight 11 hole LEGO piece.

Place the two plastic discs over the protruding bolts. The order of the thickness of the discs does not matter.

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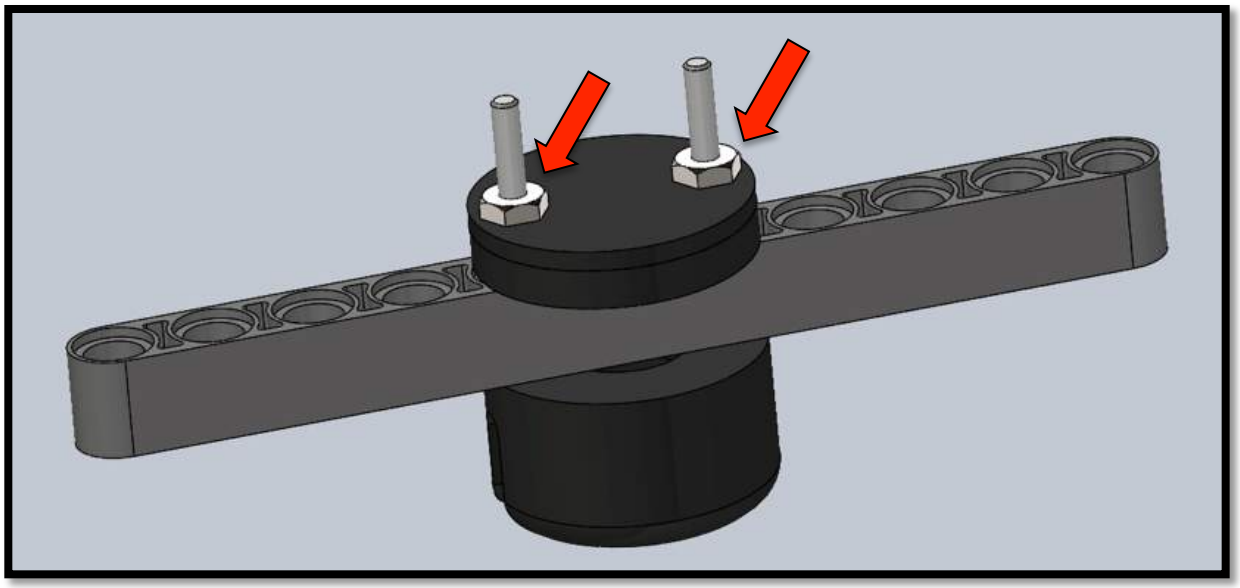
Mounting the Caster (cont.)



Start the nuts onto the bolts. This is a tedious process, be careful not to lose the nuts.

Once you have the nuts started, you can once again remove the ball (pry it out with a screwdriver) and use the screwdriver to tighten the bolts into the nuts.

Once tight, place the ball back into the caster

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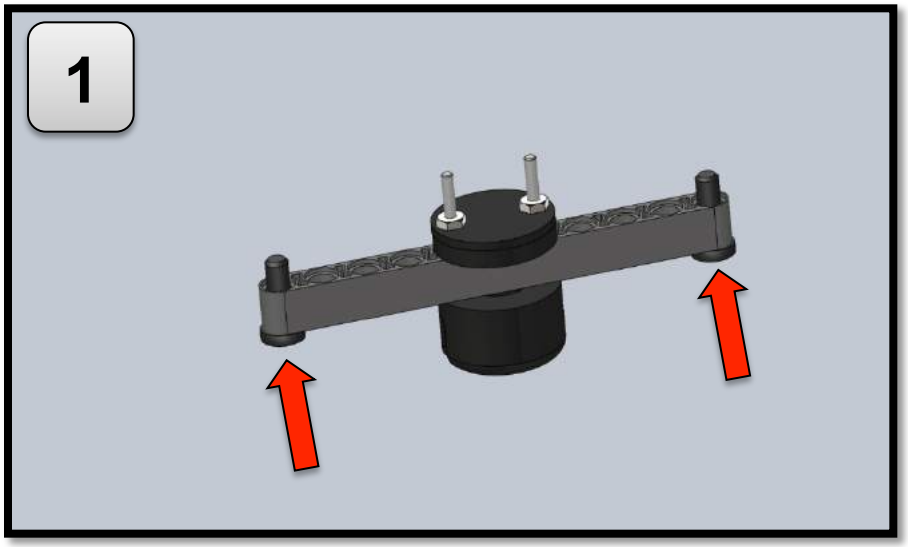
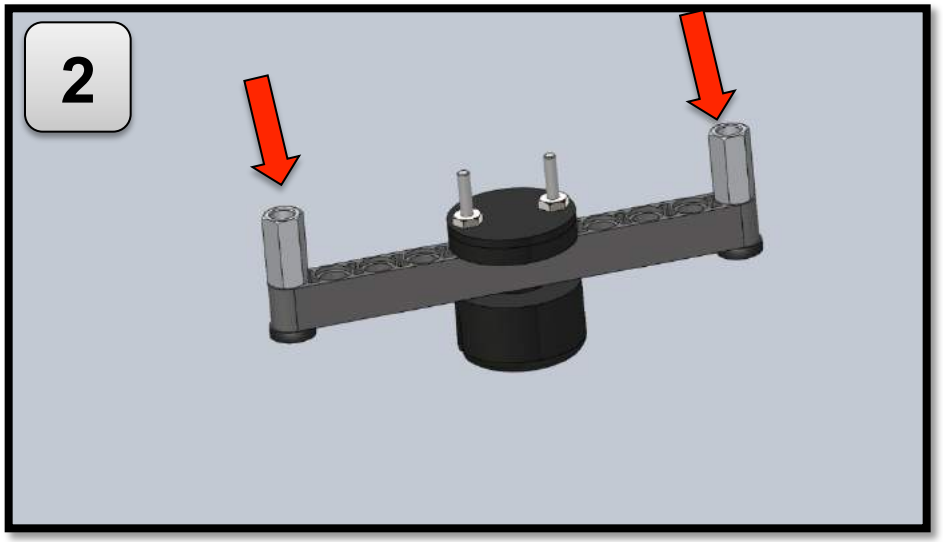
Mounting the Caster (cont.)





1. Insert 2 medium length bolts through the end holes of the 11 hole LEGO piece that has the caster attached 
2. Screw two short Aluminum Offsets onto the end of the bolts sticking out past the 11 hole LEGO piece

Set this aside, we will mount it to the chassis after we attach the motors and wheels in the next few slides.

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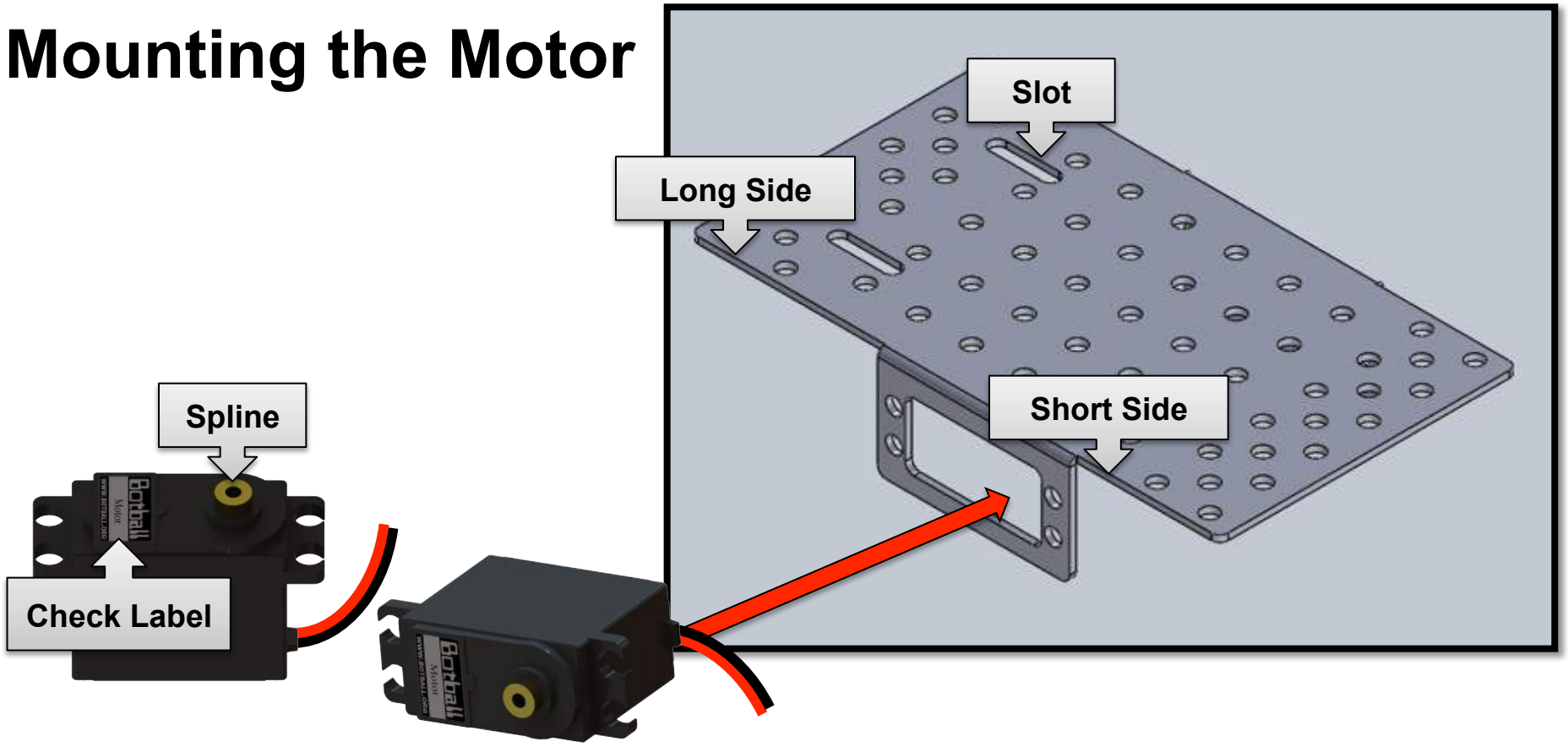
Mounting the Motor



Insert the **motor**s (check the printed label) into the chassis with the wire through the hole first. **The wire should be next to the short side of the chassis.**

Make sure to mount the motor with the Spline **closest** to the **shorter side** of the chassis, opposite of the slot.

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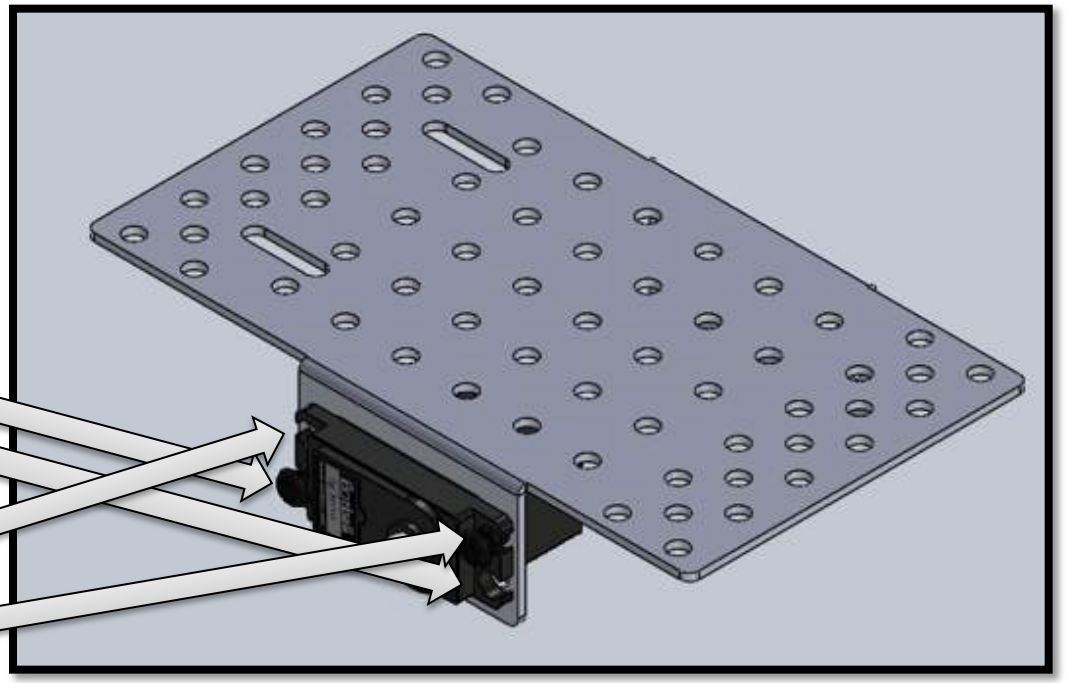
Securing the Motor



Plastic Pop Rivets pushed through the back of the motor.

Medium Bolts and Nuts

Rivet

To secure the motor to the chassis, use 2 plastic pop rivets by inserting them through motor into hole on chassis and push until they snap. Use one pop rivet on each side to secure the motor in place while you use medium bolts with lock nuts. You do not need the wrench, simply hold nut with your finger.

Repeat the process on the other side with the other motor.

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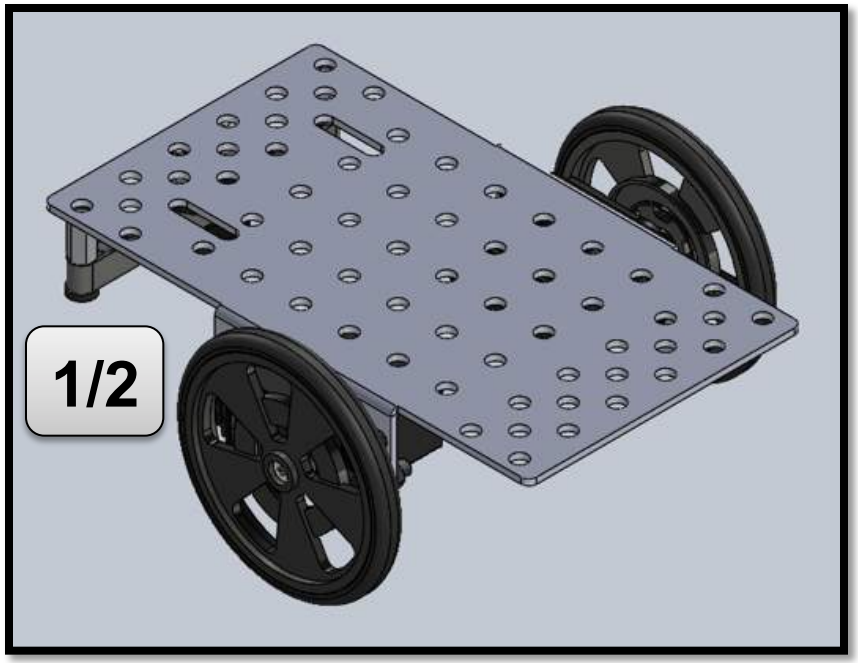
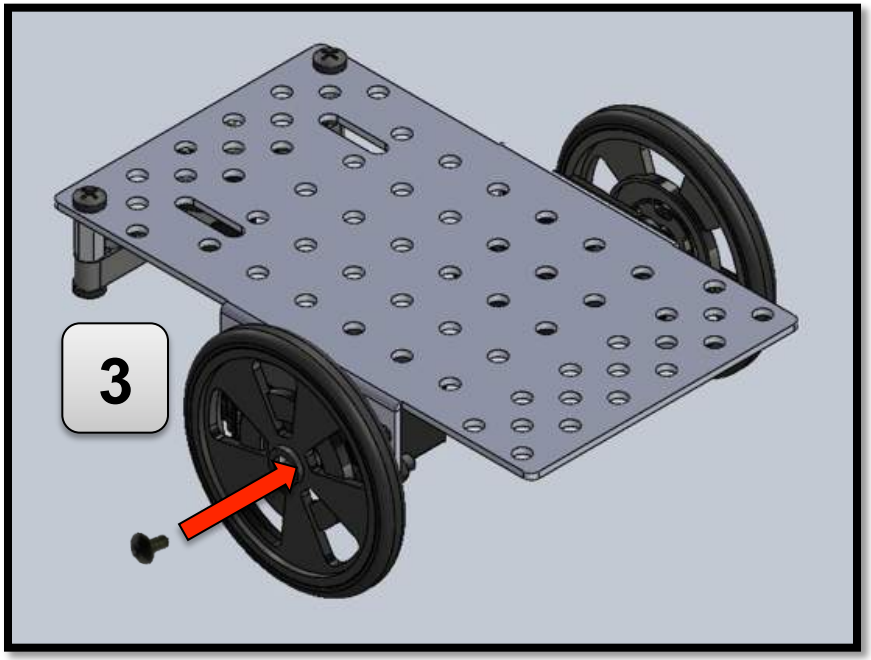
Mounting the Wheel





1. Using your screwdriver make the hole in the wheel **slightly** larger. Place one of the large wheels onto the spline of the motor you attached to the chassis. The wheel **has two sides**, we want the one side has teeth that match the teeth on the motor spline.
2. Use one of the black screws  that is in the servo horn bag that came with the motor using the screwdriver, screw the wheel into place.
3. Repeat the process for the other side.

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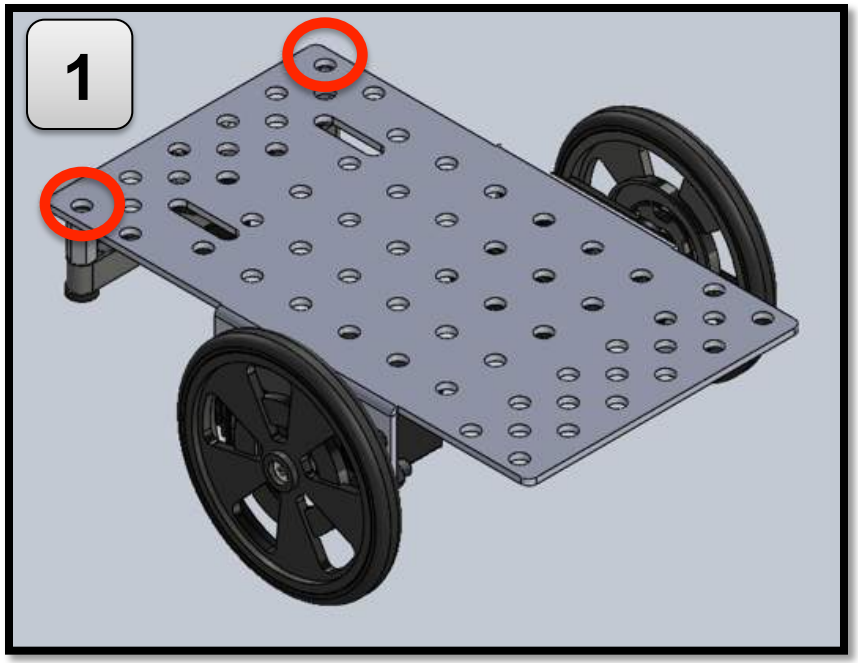
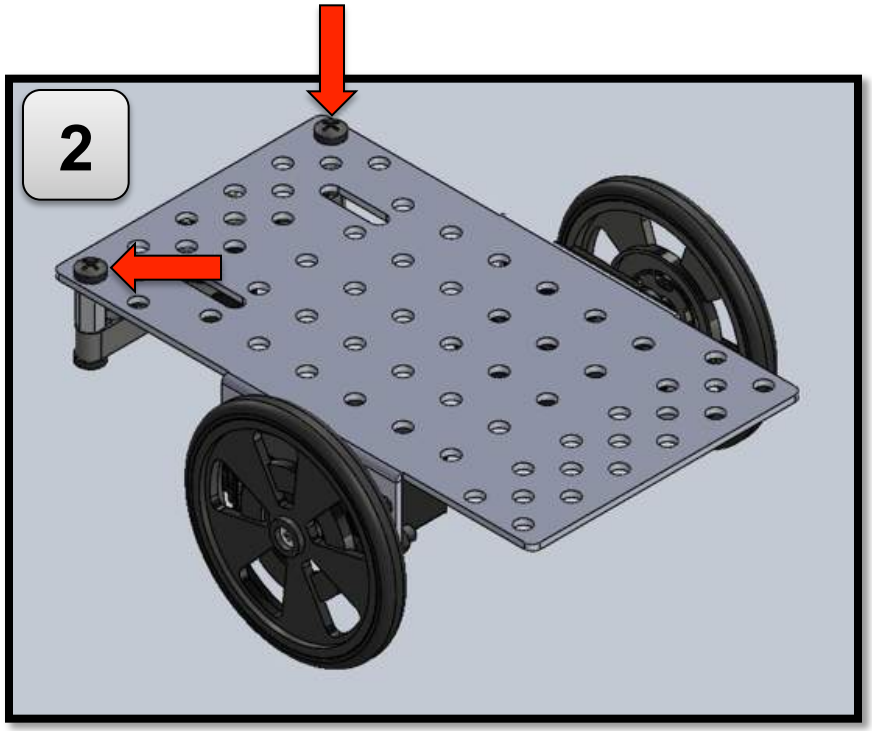
Mounting the Caster Assembly





1. Using the caster assembly you built earlier, line it up with the back row of holes in the chassis on the end closest to the slots.
2. Using 2 short bolts and the screwdriver, attach the caster assembly to the chassis.

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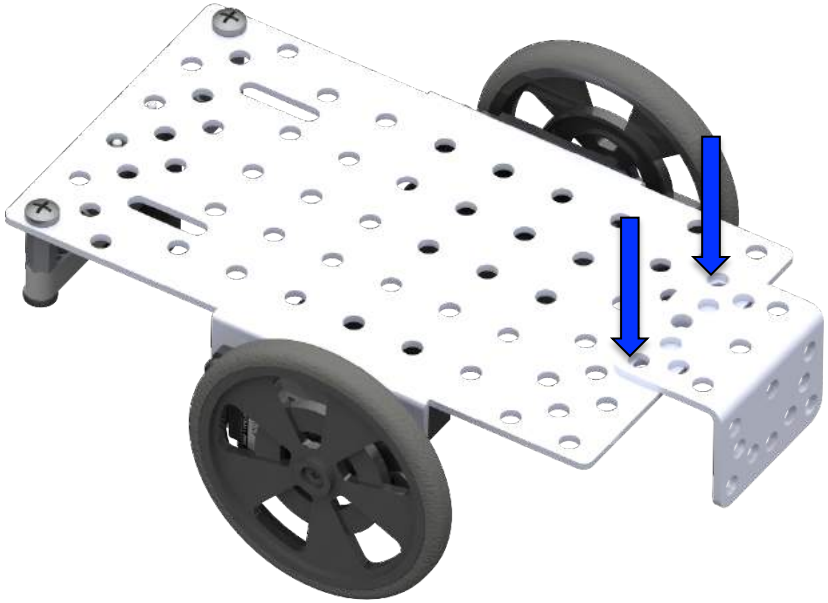
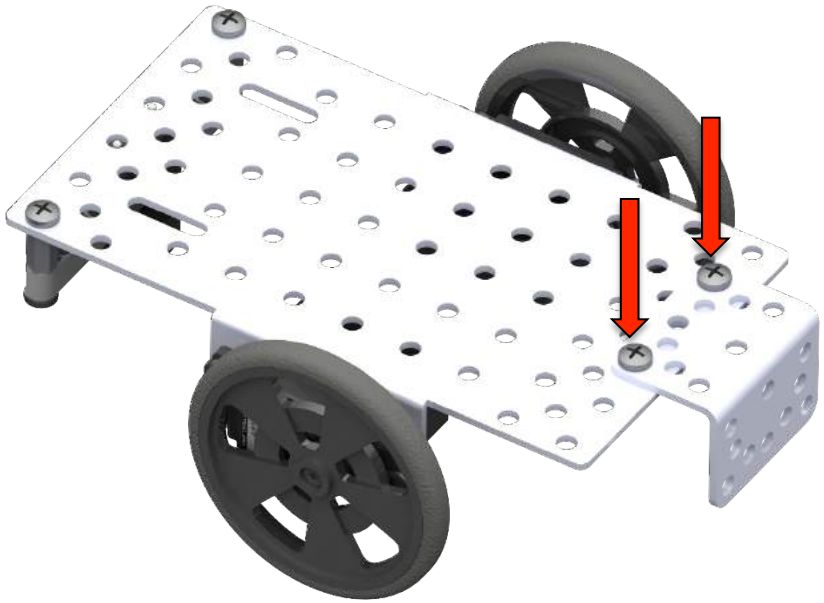
Mounting the Angle Bracket





Take the KMP (KIPR Metal Part) Angle Bracket. You can identify it by the hole spacing that look like a smiley face. Line up the holes as shown by the blue arrows.

Use 2 medium bolts, 2 lock nuts, and the screwdriver to fasten the bracket into place.

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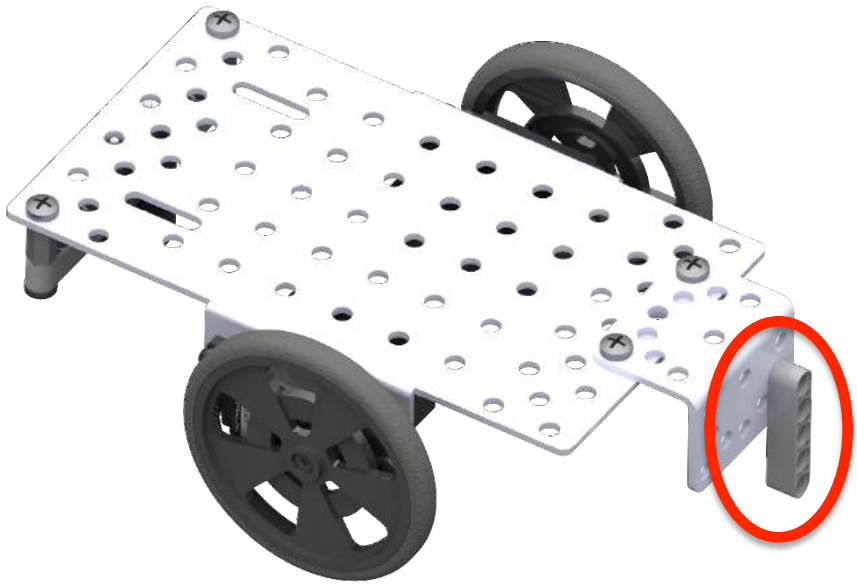
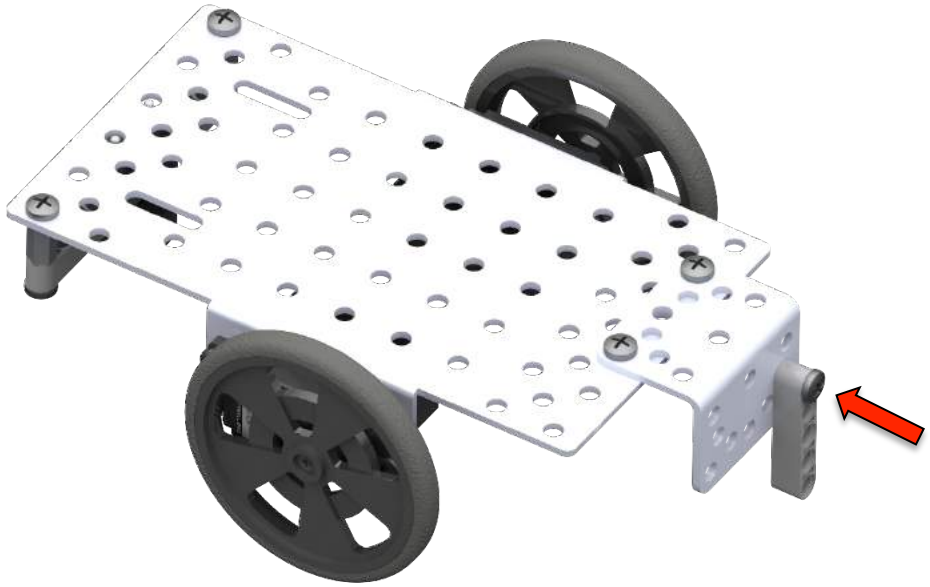
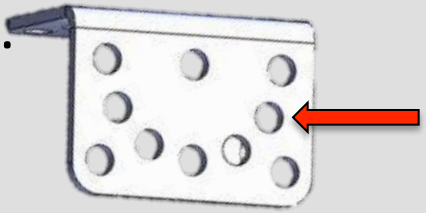
Mounting the Angle Bracket (cont.)





Take the 5 hole straight LEGO piece  and using one long bolt and lock nut attach it to the angle brackets as pictured. 

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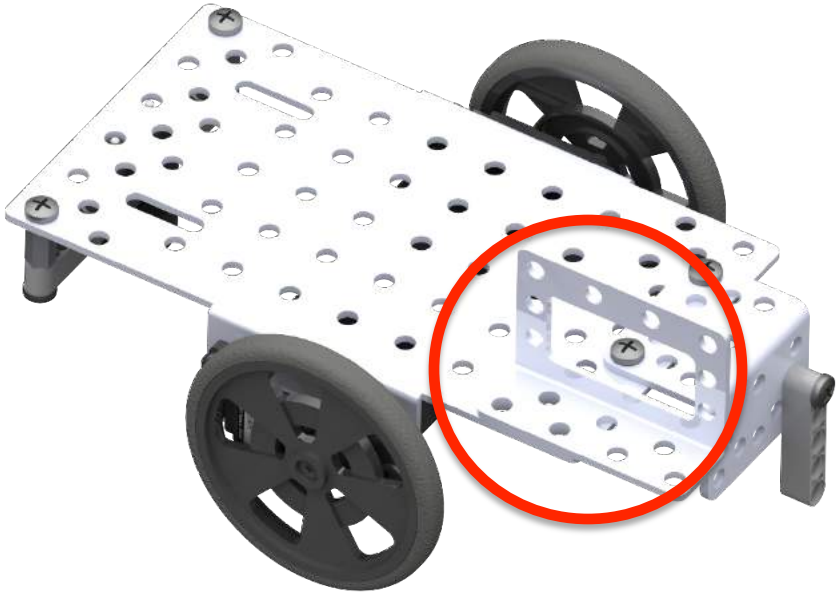
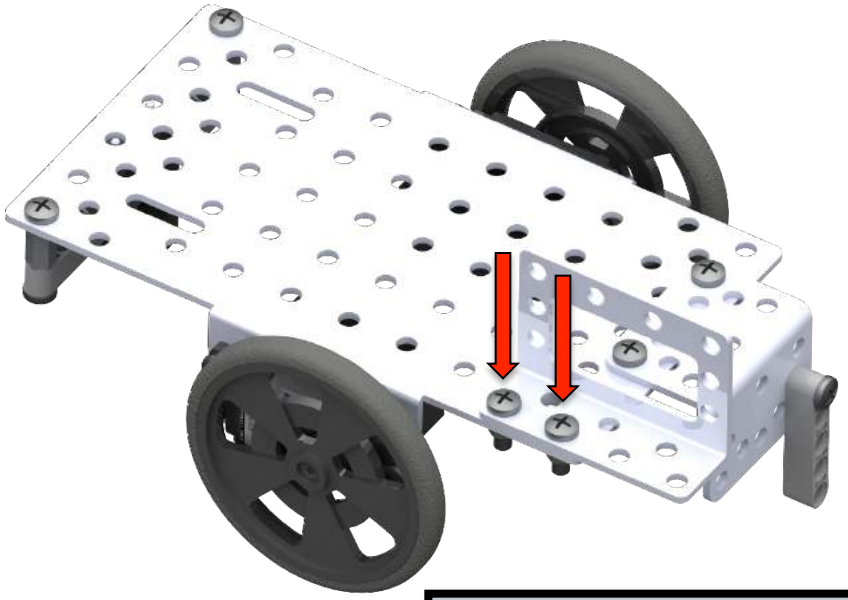
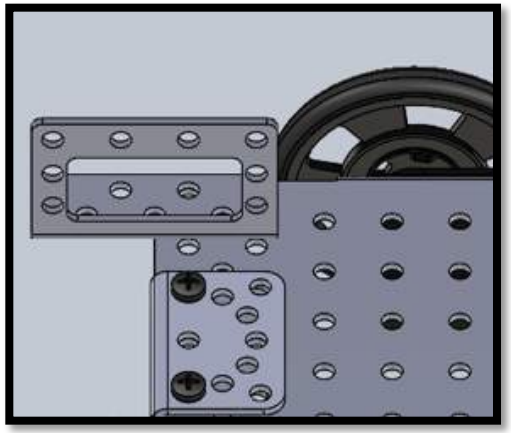
Mounting the Motor/Servo Bracket







Take a motor mount, 2 medium bolts, and 2 lock nuts attach it to the chassis as pictured.

Notice that the motor mount extends past the front end of the chassis

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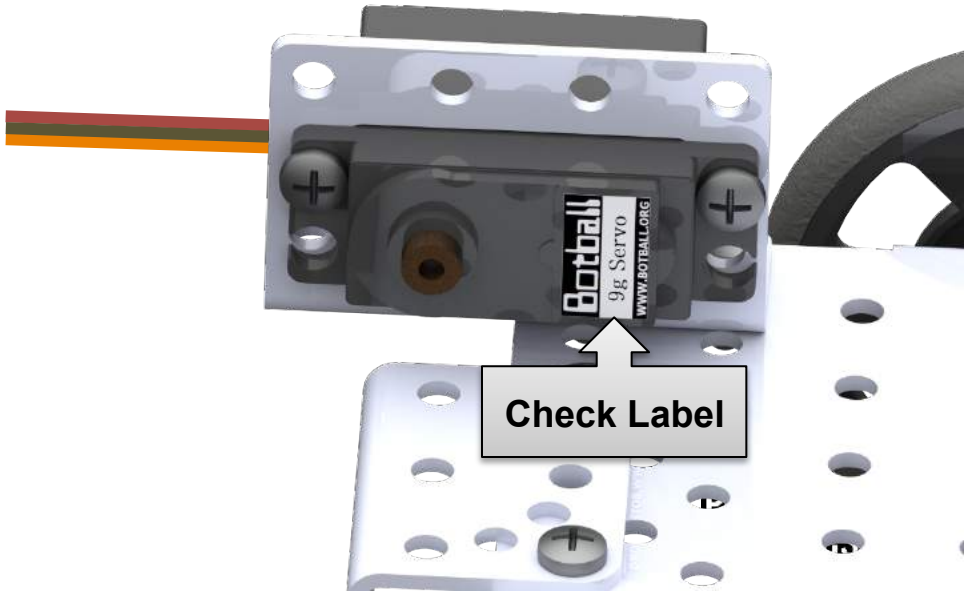
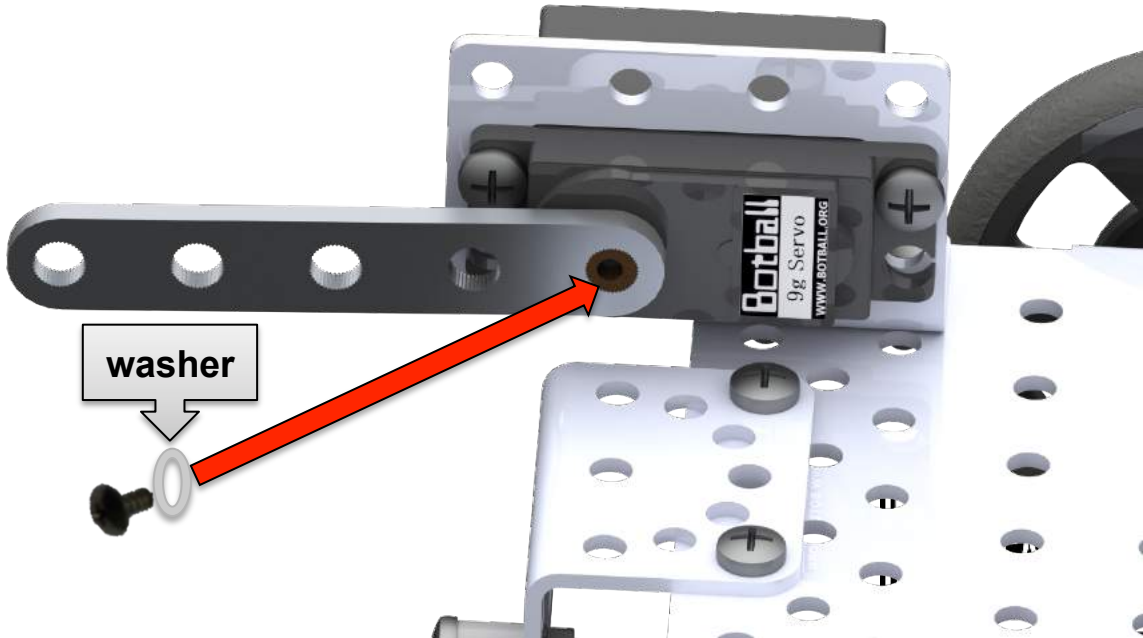
Mounting the Servo

Insert the servo (labeled Servo) into the motor bracket, making sure to put the wire through the hole first. The wire should be next to the side **away from the chassis**, shown below. This mounts just like the wheel motors. Use 2 plastic pop rivets to secure the motor to the chassis. Simply place one pop rivet on each side to hold it in place while you use medium bolts with nuts. You do not need the wrench, simply hold nut with your finger and tighten with the screwdriver.

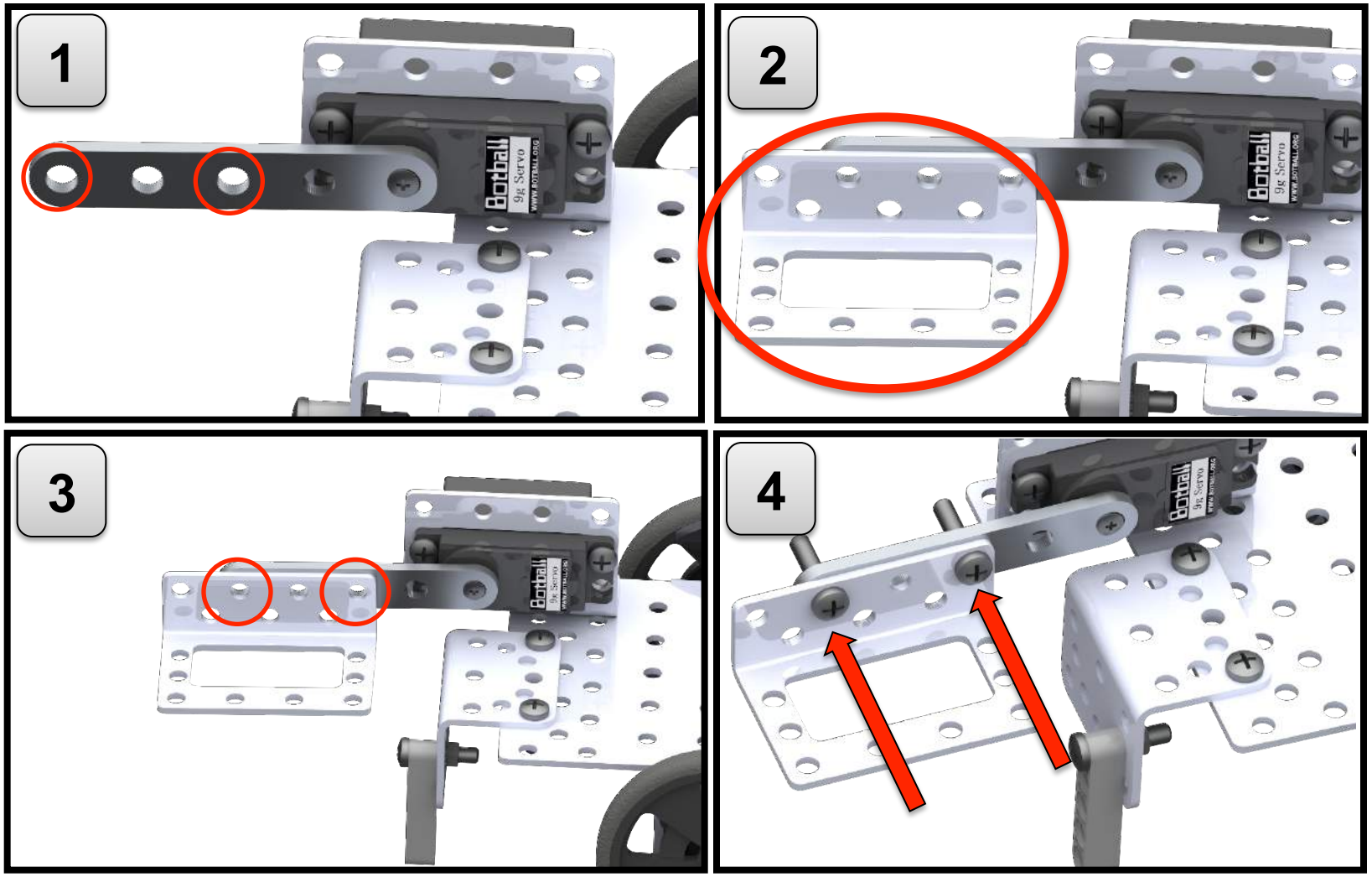


Mounting the Servo Lever Arm Horn

Get one 5 hole aluminum servo horn. Carefully look at the hole on one end. One side will have Splines (teeth) near the edge and the other side has smooth metal. Place the servo horn over the brass spindle on the servo with the side that has the Splines. Placer a **washer** in between the screw and the servo horn, and tighten down the screw using a screw driver.



Mounting the Motor/Servo Bracket



Take a motor mount and using two long bolts insert them through the motor mount and the five hole aluminum servo horn in the location as shown.

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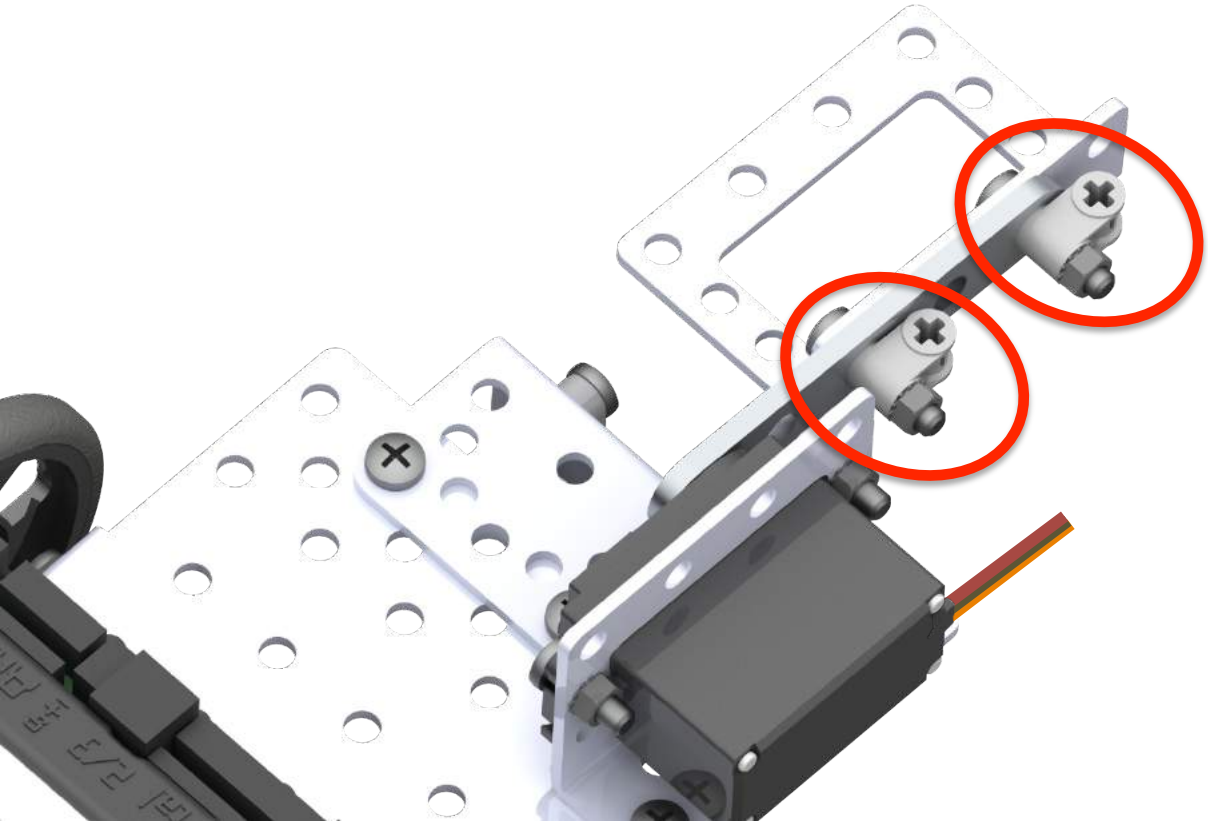
Claw Mounting Preparation

Slide the two Lego pieces (highlighted) over the bolts and secure with a lock nut. Hold the nut with your finger and tighten with the screwdriver. Notice the orientation of the axle friction (+).



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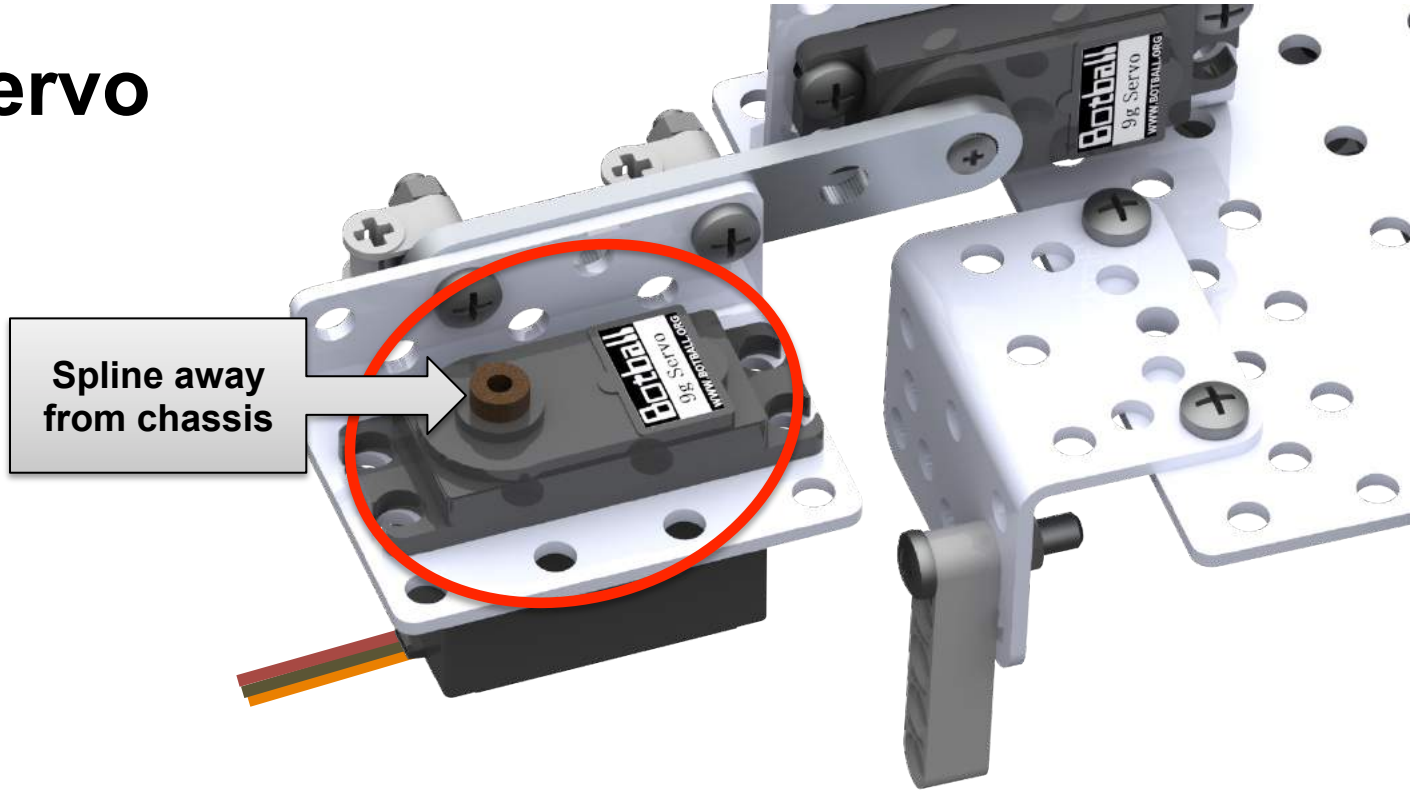
Mounting Servo



Place a servo motor (labeled Servo) into the servo/motor bracket with spindle away away from robot and secure in place with two pop rivets and two medium bolts with lock nuts (just like all motors you have mounted before).

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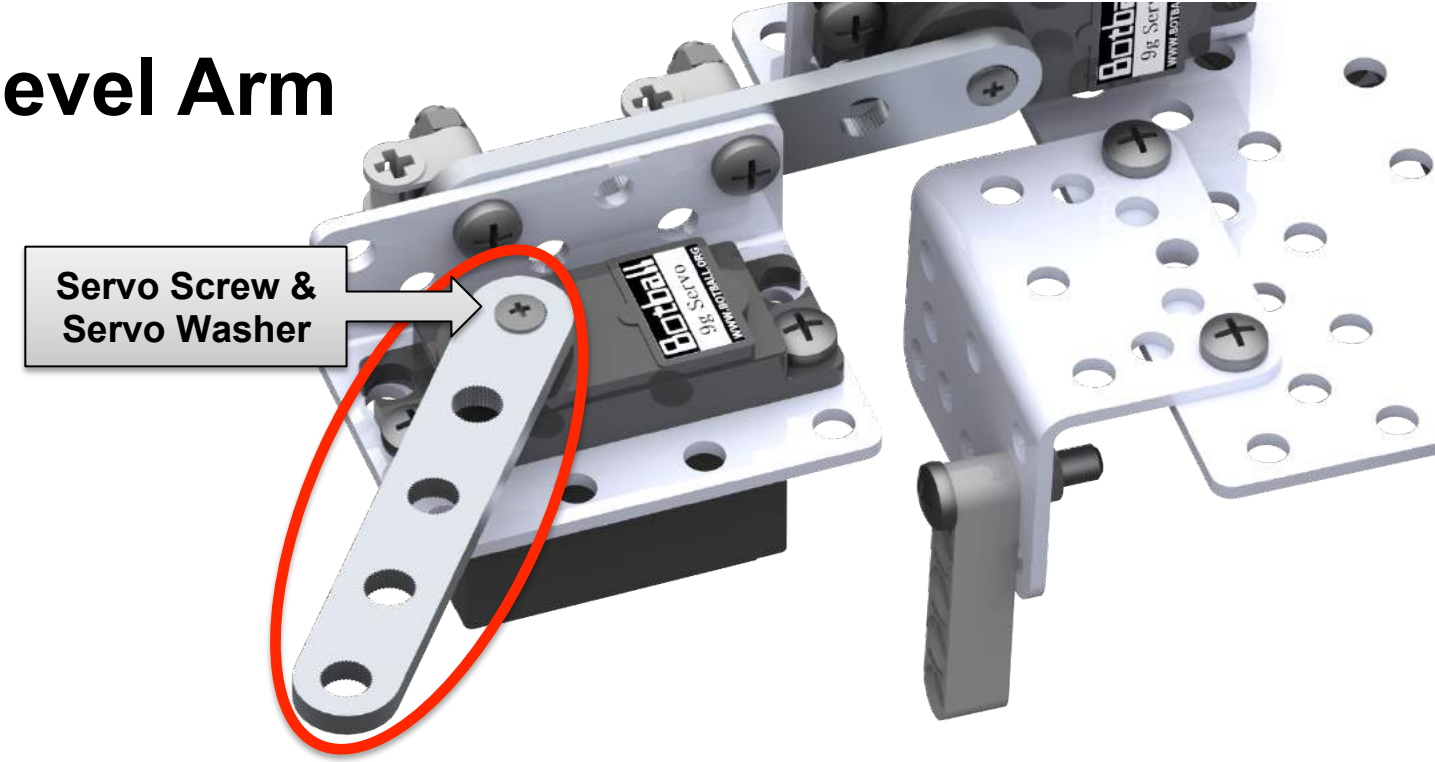
Mounting Level Arm



Get one aluminum servo horn. Carefully look at the hole on one end. Place the servo horn over the brass spindle on the servo with the side that has the Splines (teeth).

Screw on the servo horn with a servo **washer** in between the screw and the servo horn.

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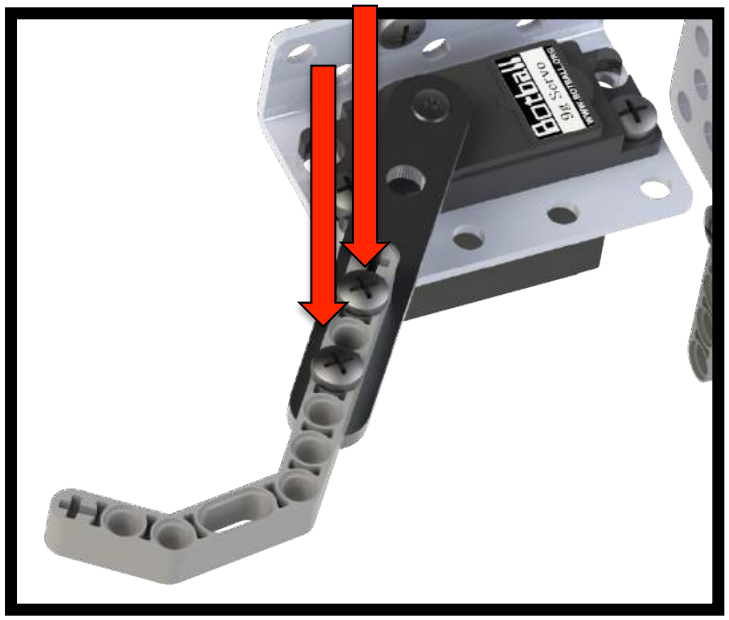
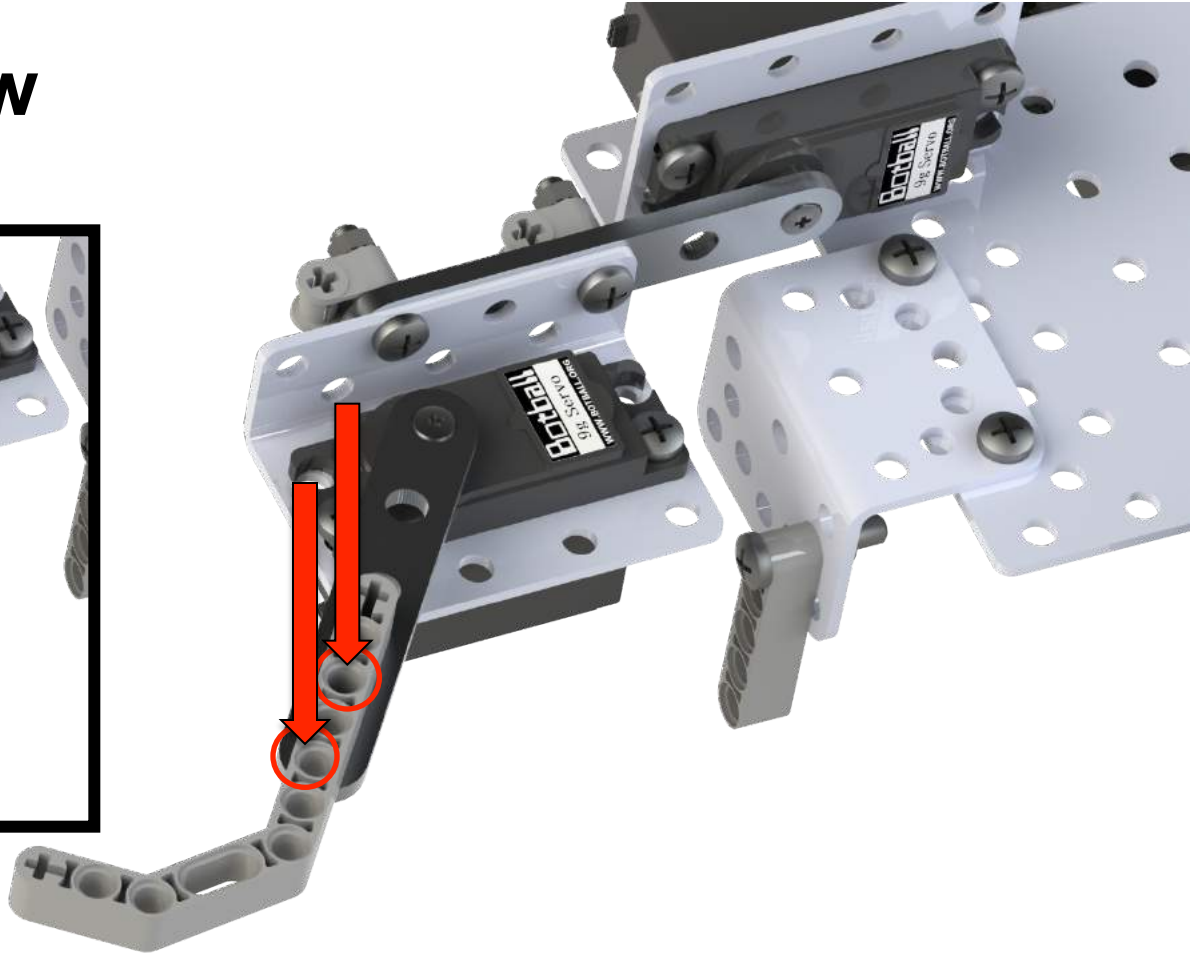
Mounting the Claw





Attach a curved Lego piece to the metal servo horn using two long bolts and lock nuts. Secure with screwdriver while holding the lock nut with your finger.

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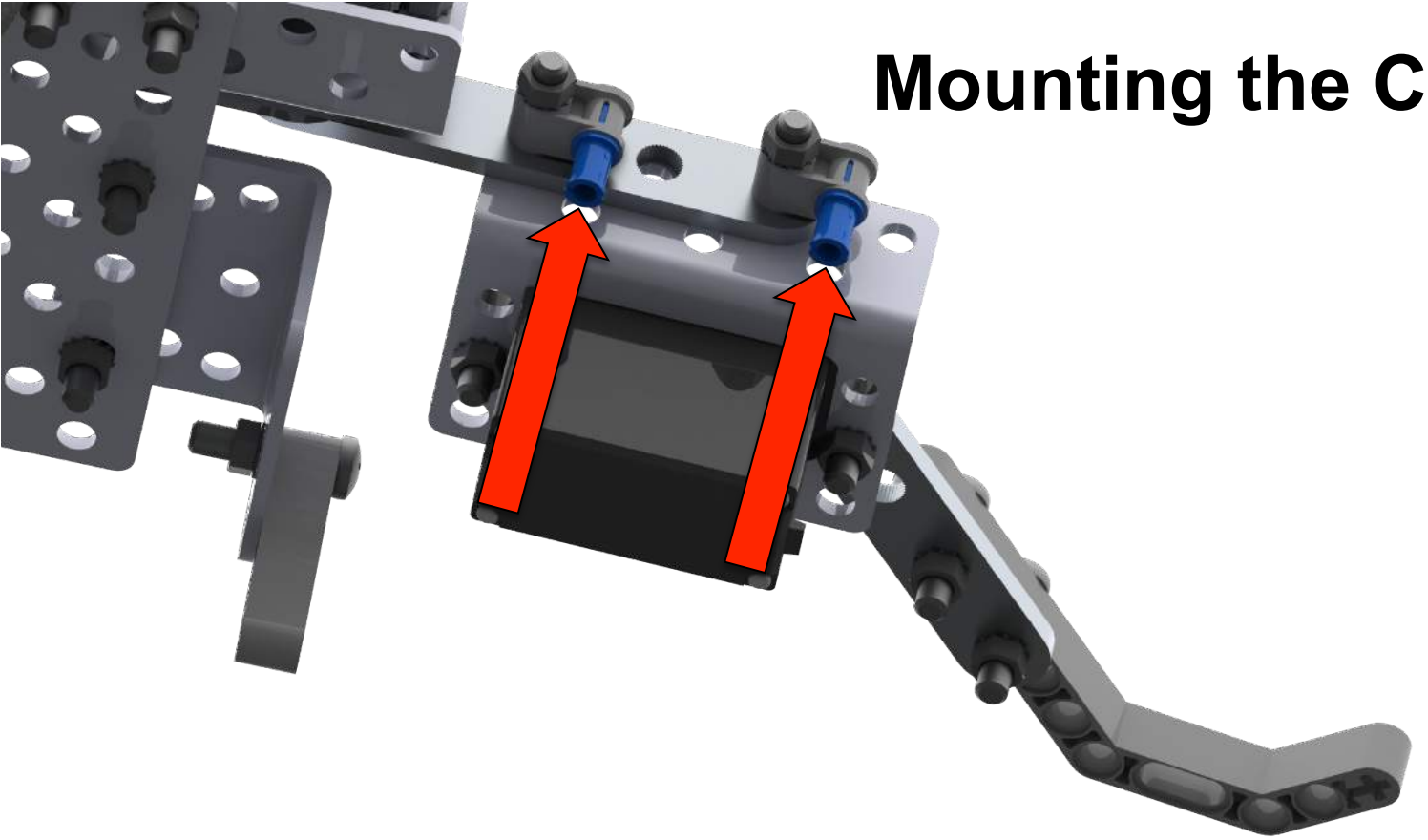
Mounting the Claw (cont.)



Place (push) two pins into the Lego pieces such that the friction through hole (+) is exposed

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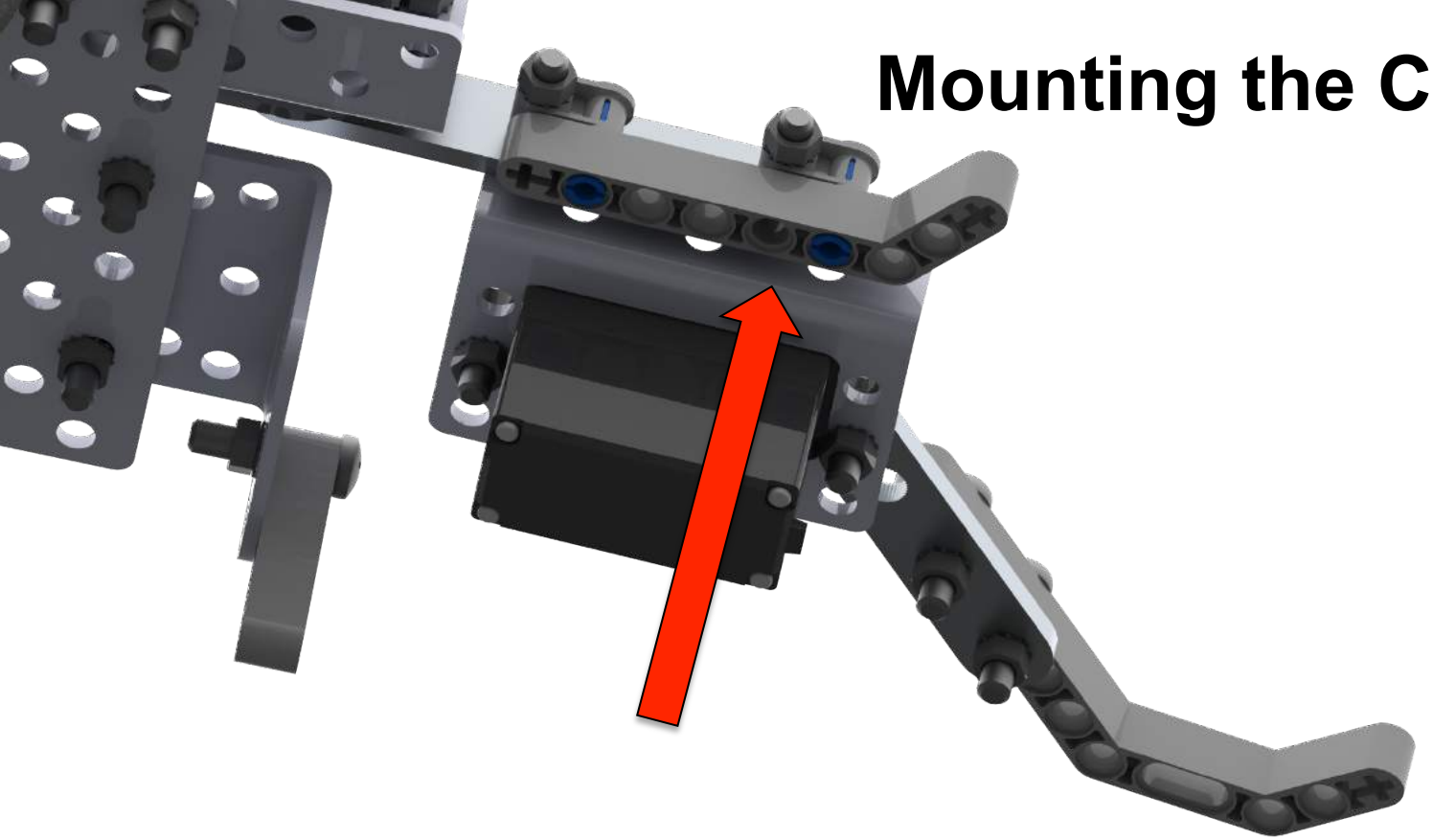
Mounting the Claw (cont.)



Place the bent lift arm Lego piece onto the two pins that were just added.

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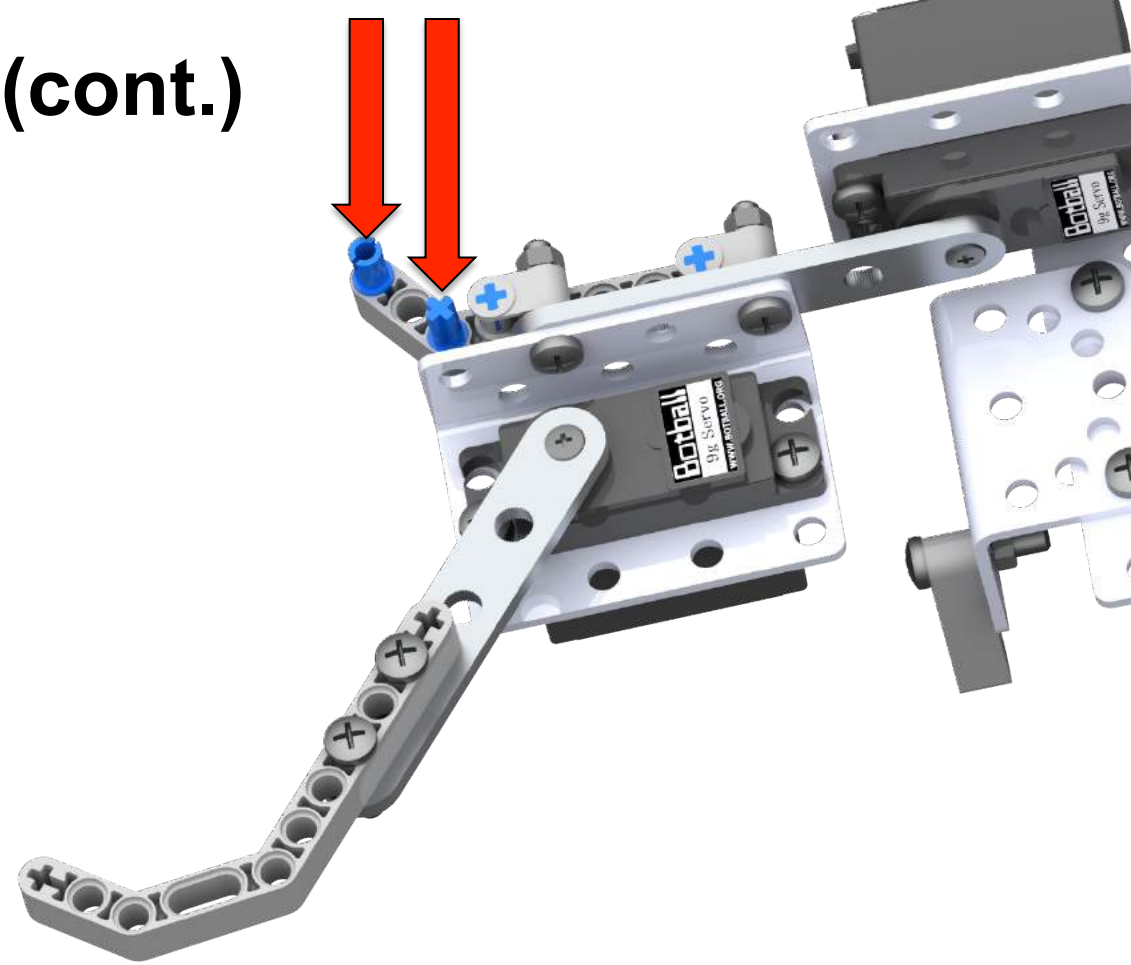
Mounting the Claw (cont.)



Push two pins through the bent lift arm Lego piece as pictured.

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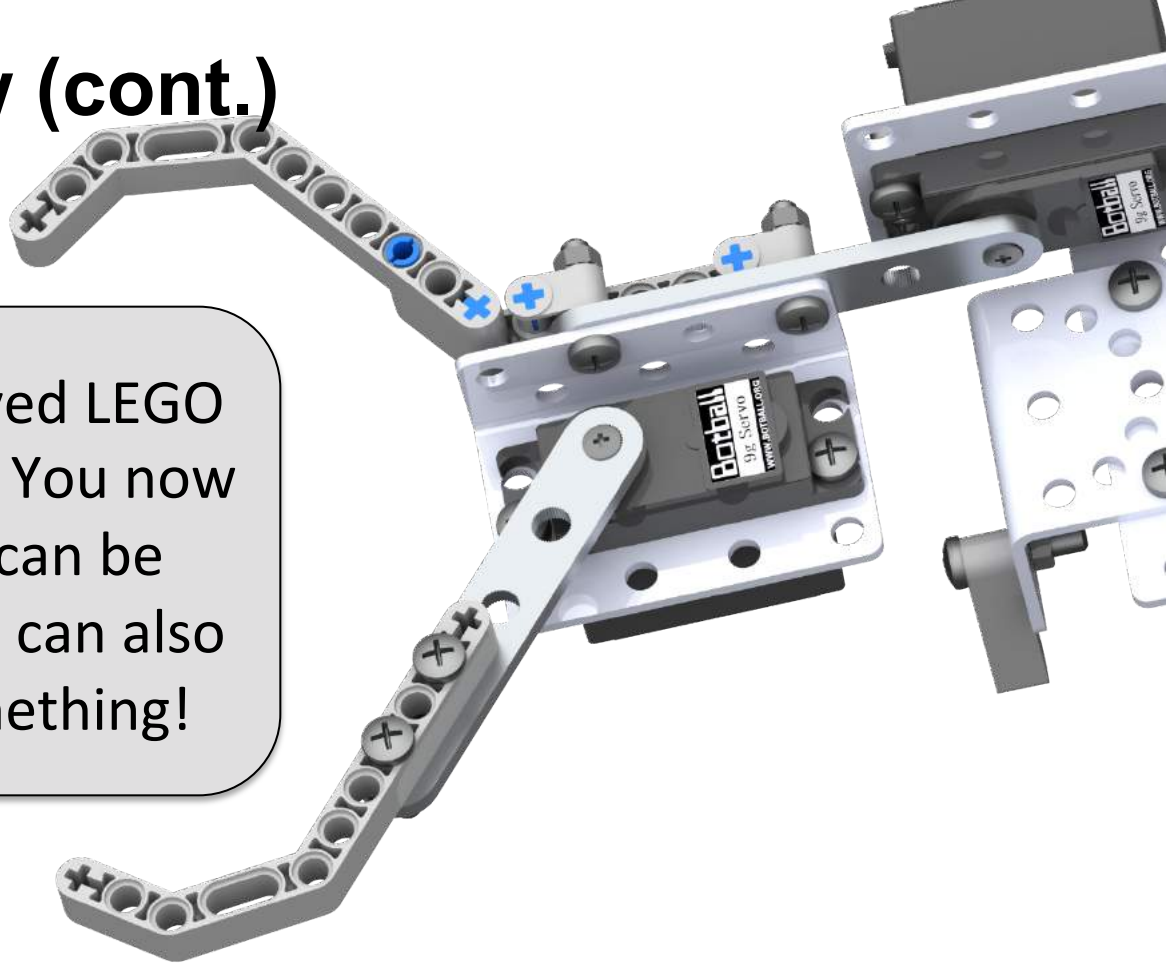
Mounting the Claw (cont.)

Push the other curved LEGO piece onto the pins. You now have a claw that can be raised/lowered and can also grasp/release something!



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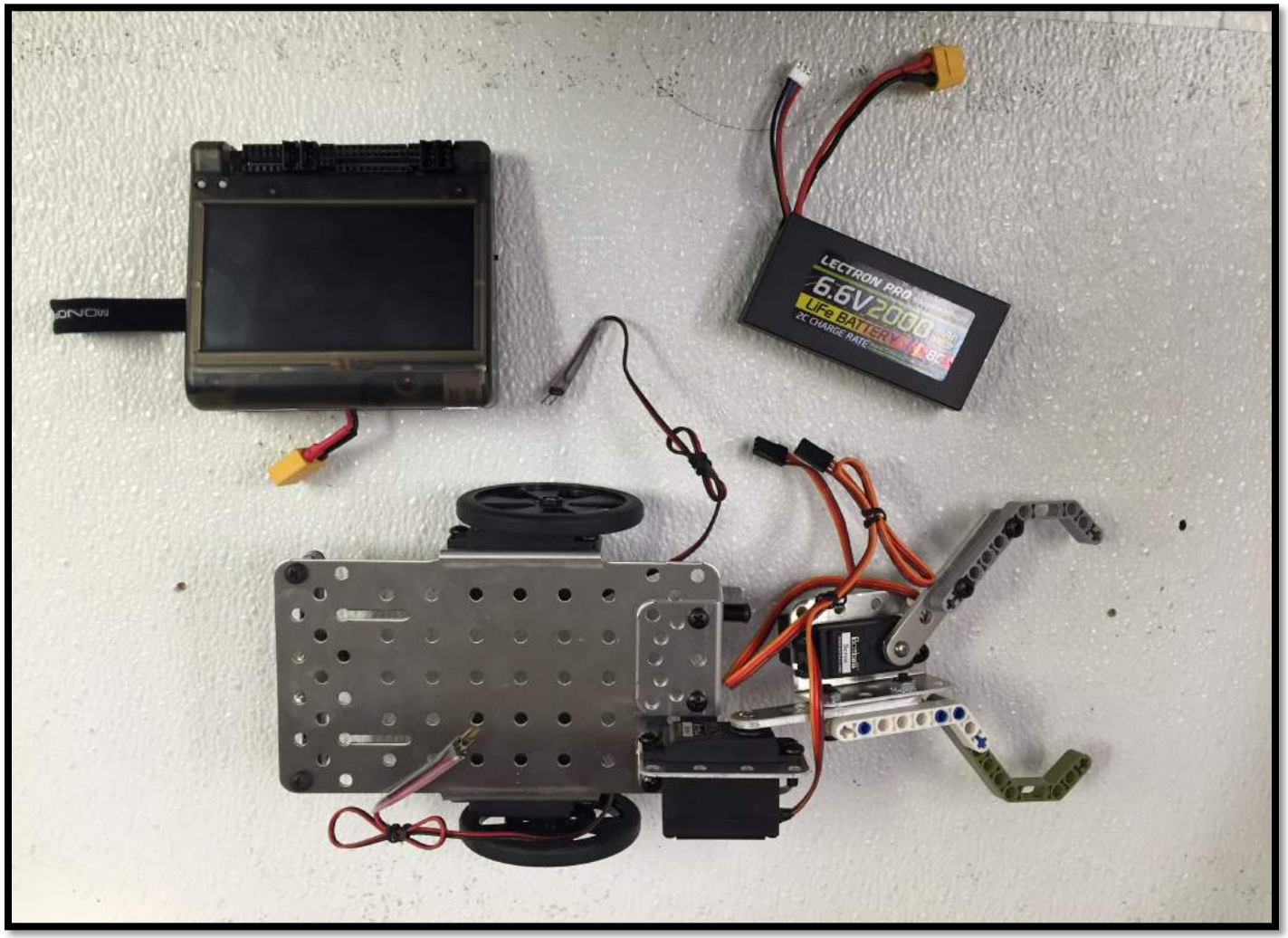

Now place the above pieces on the table so that we can combine them into a working robot!

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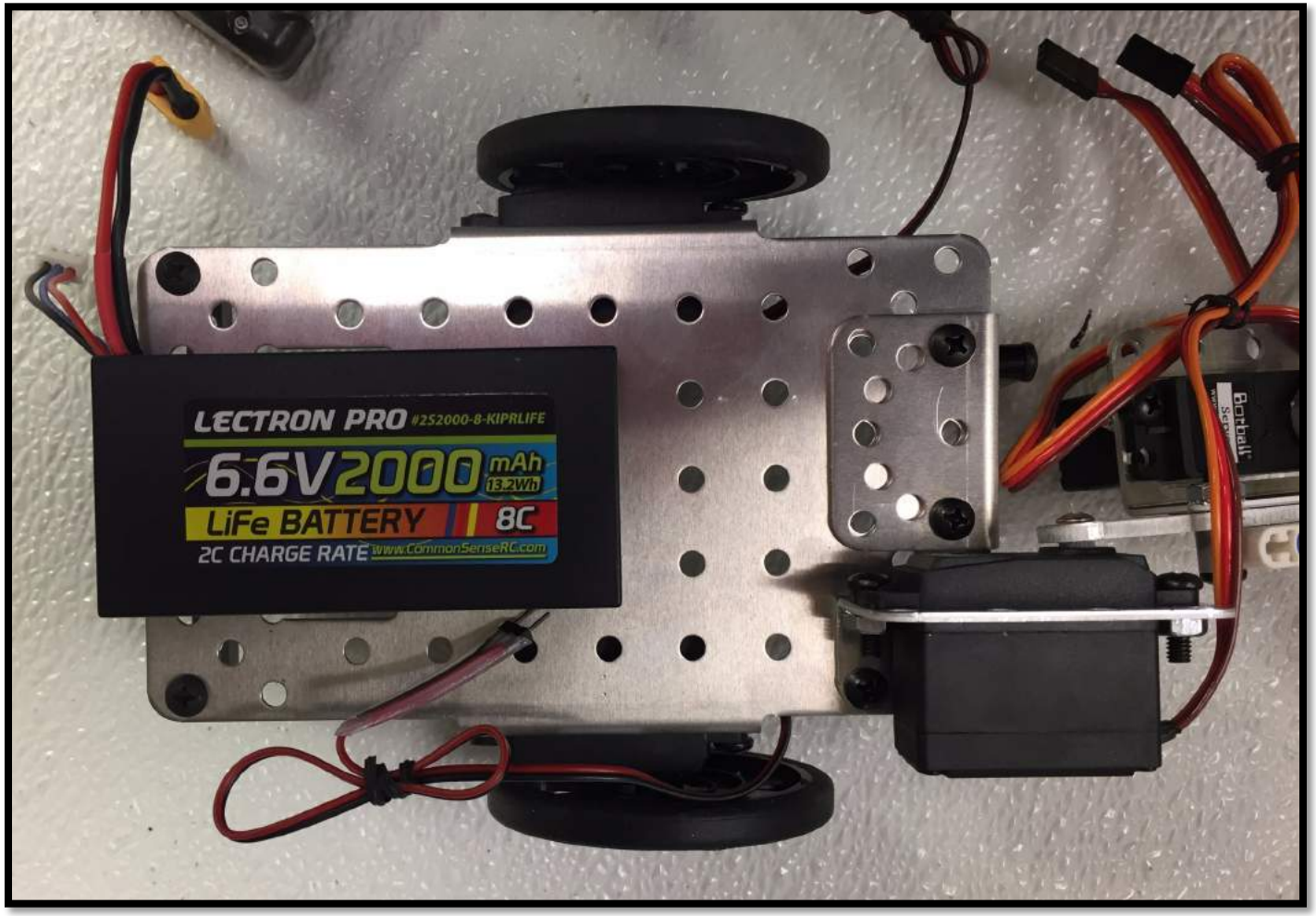

Place the battery face up so that the cord exits the back end of the chassis of the arm/claw.

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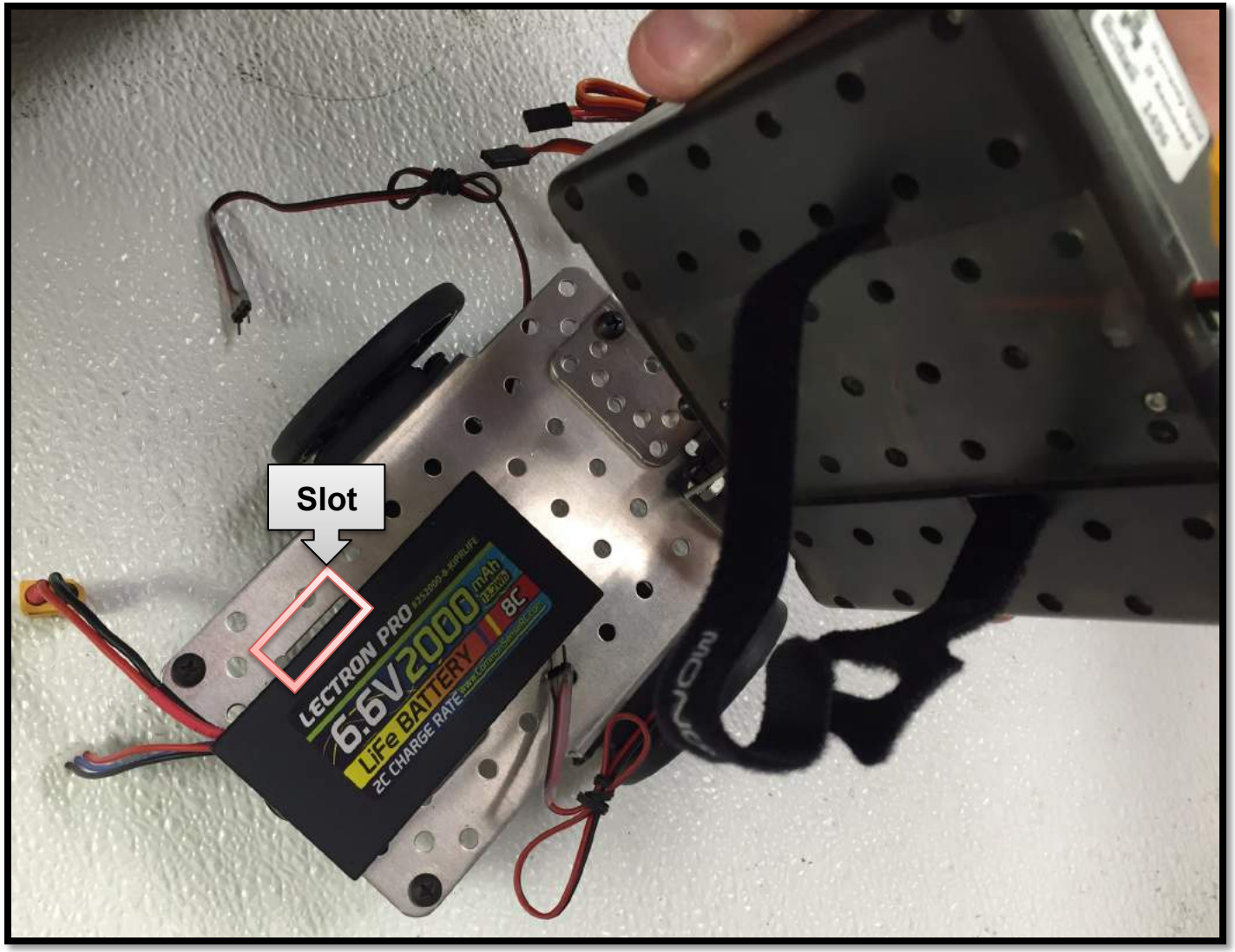

Place the Wallaby on top of the battery so that power cord exits in the same direction. Feed the Velcro straps through the slots in the chassis.

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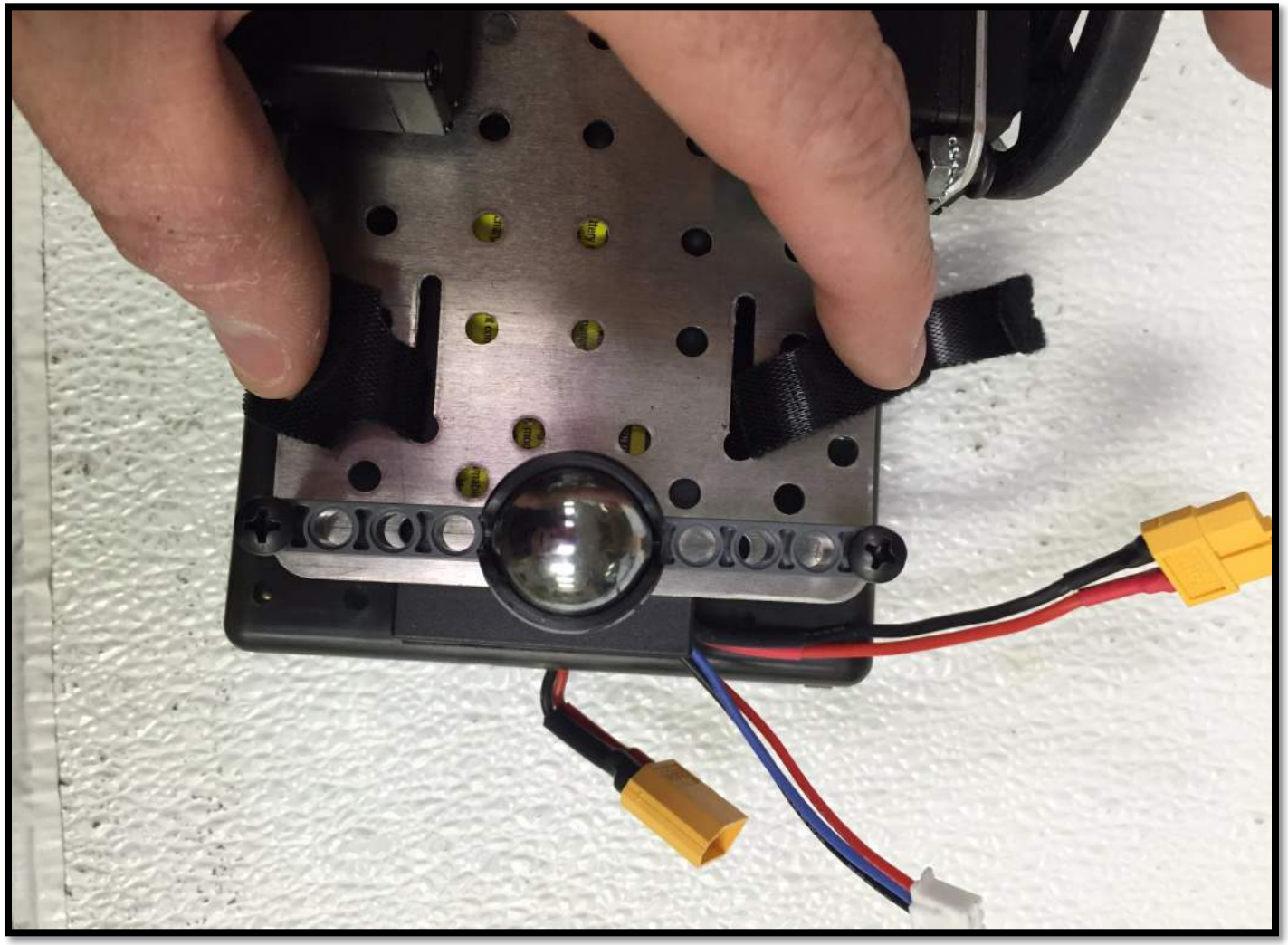

Securely grasp the Velcro straps from the bottom side, pull them snugly against the chassis, and then flip over the robot. Reposition the battery and Wallaby as needed.

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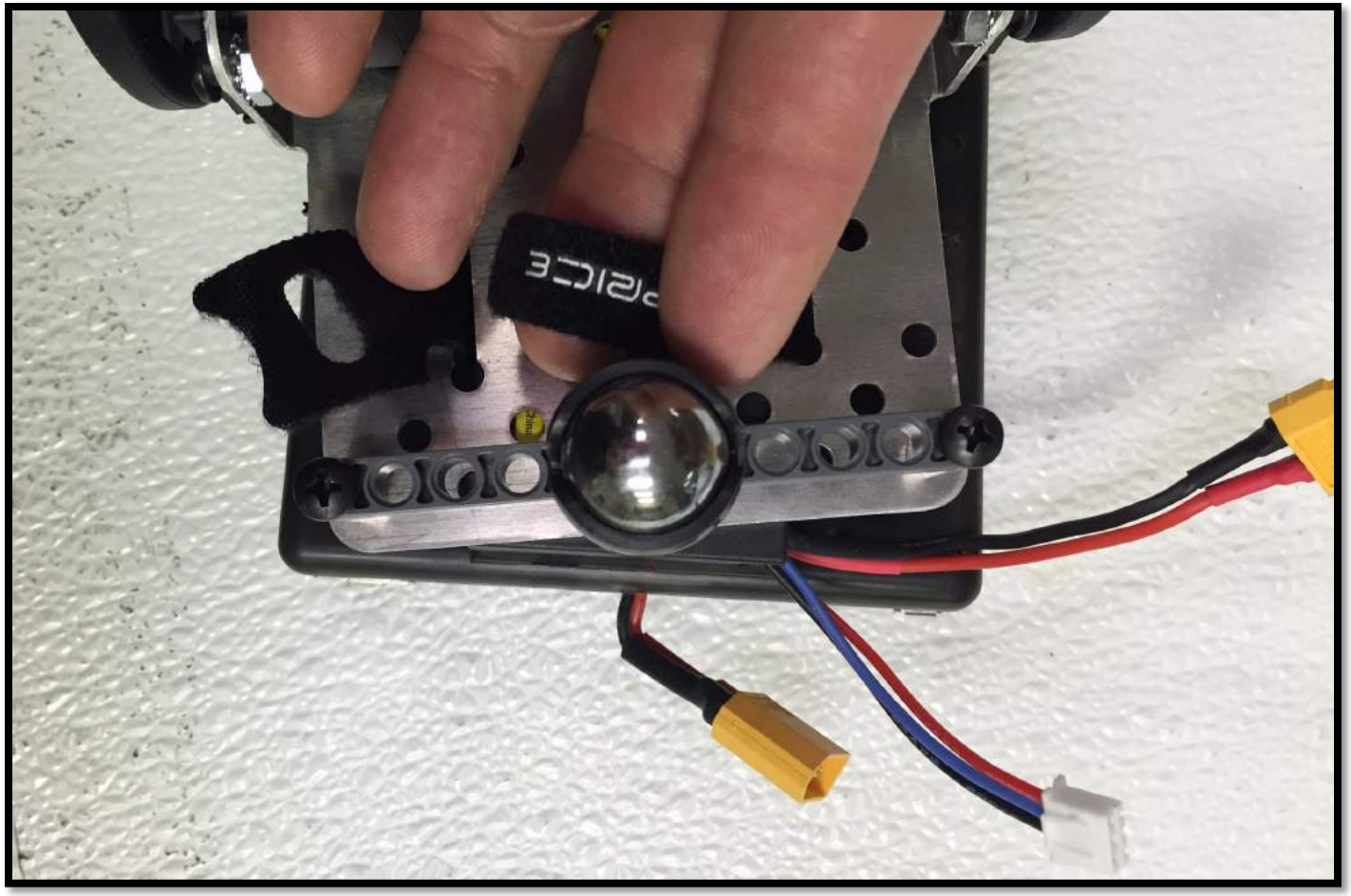

Take the lead and insert it through the slot in the other end of the Velcro tie down. Pull firmly to secure the Wallaby and the battery to the chassis.

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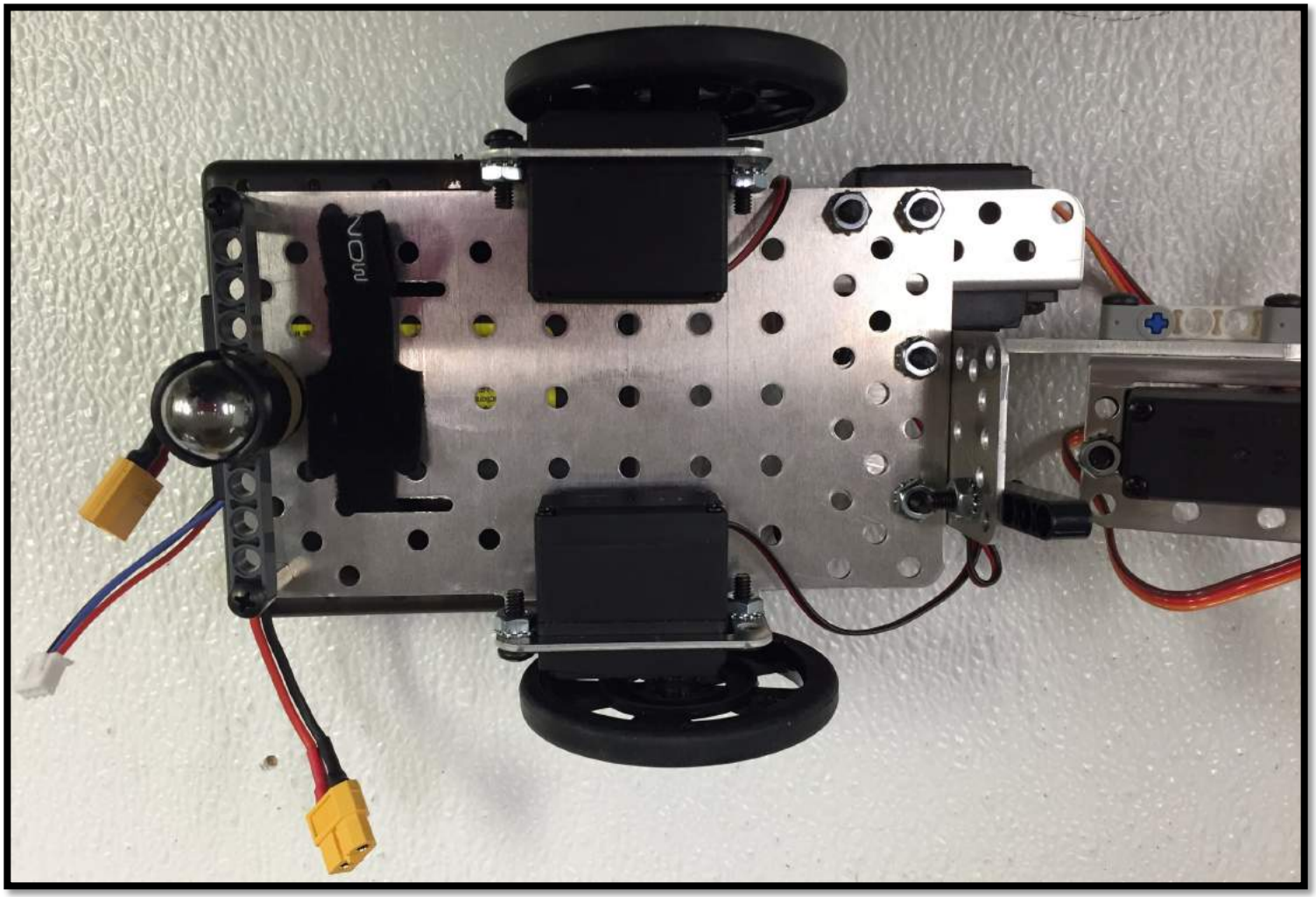

Once tight, lock in place with the Velcro. It still can be a little loose, but this is okay and should not effect the robot's performance.

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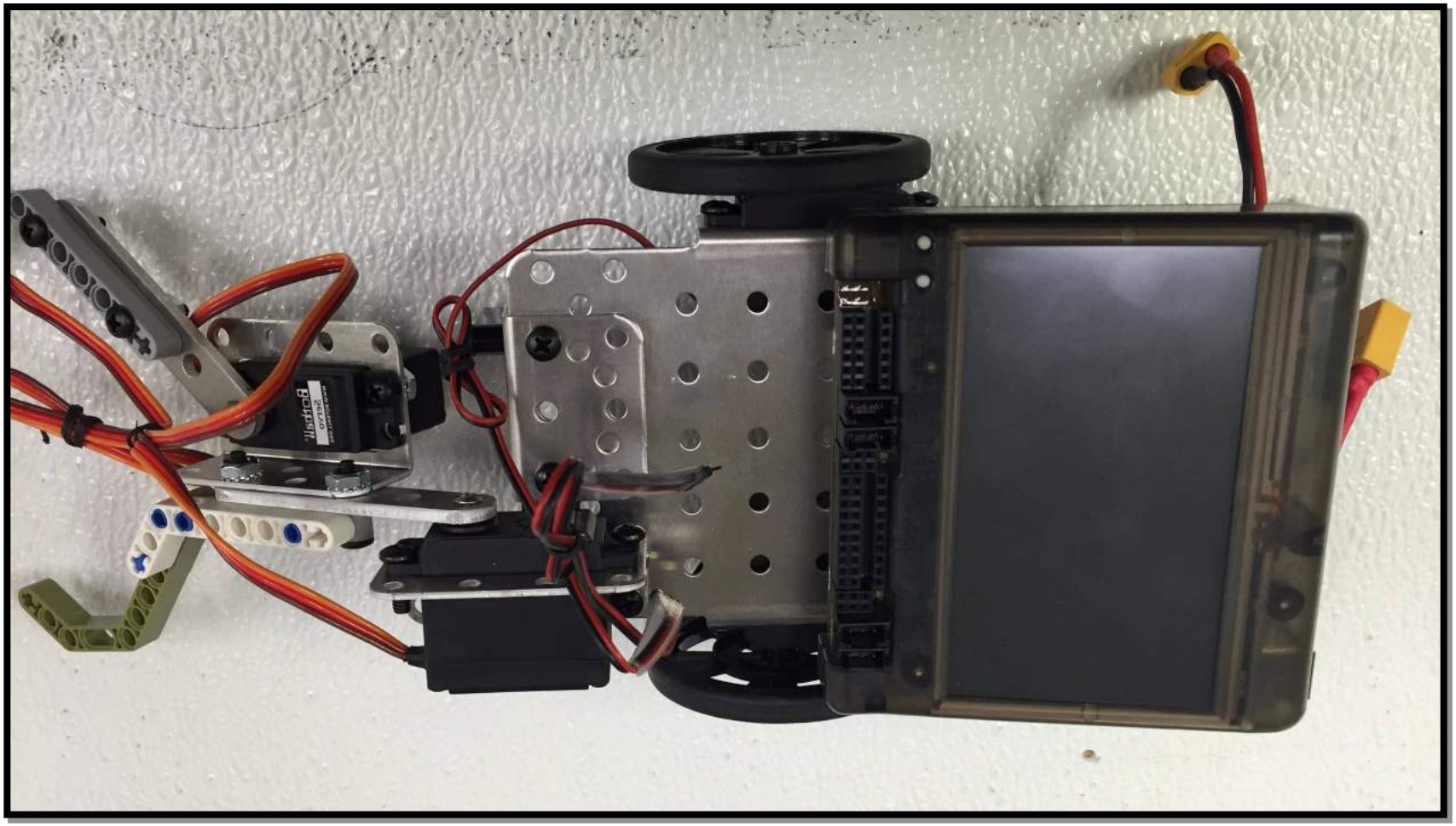

After you flip the robot back over, it should look like this!
You're done building your robot!

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