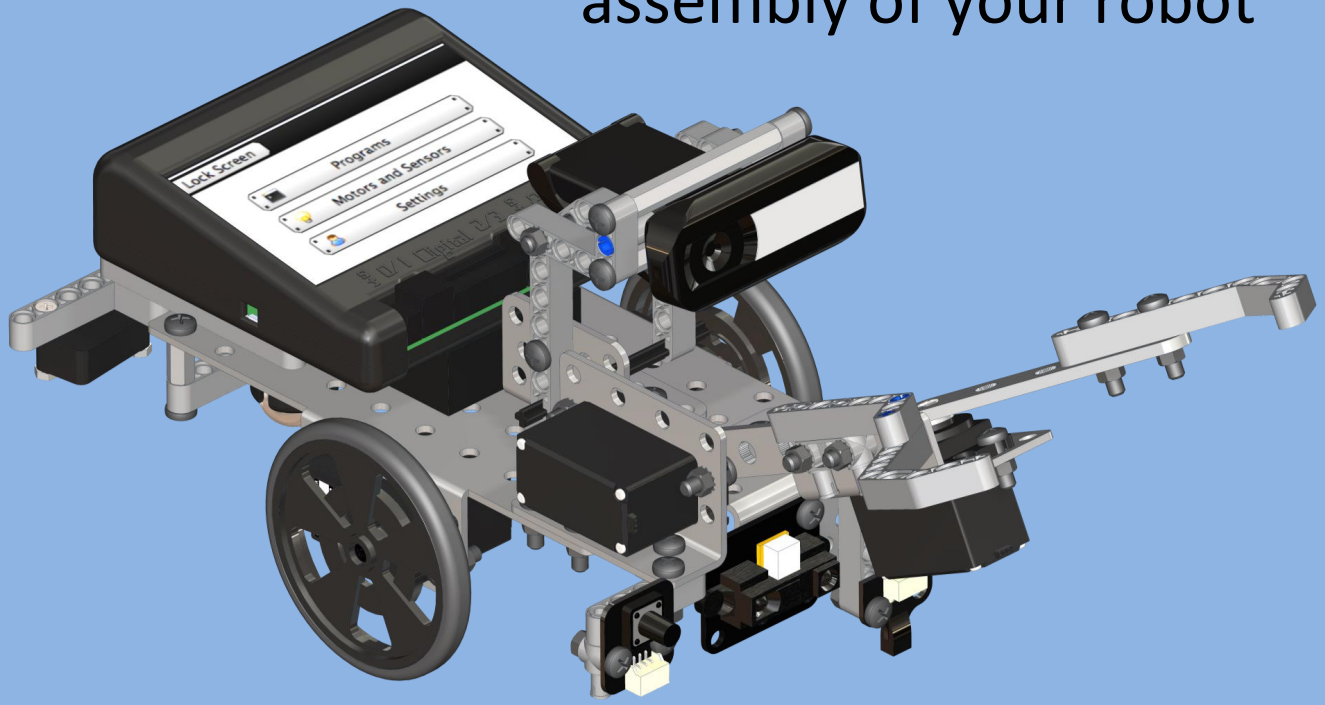
# KIPR Robot
# Wallaby Controller Robot

Please go ahead and follow the slides to complete the assembly of your robot

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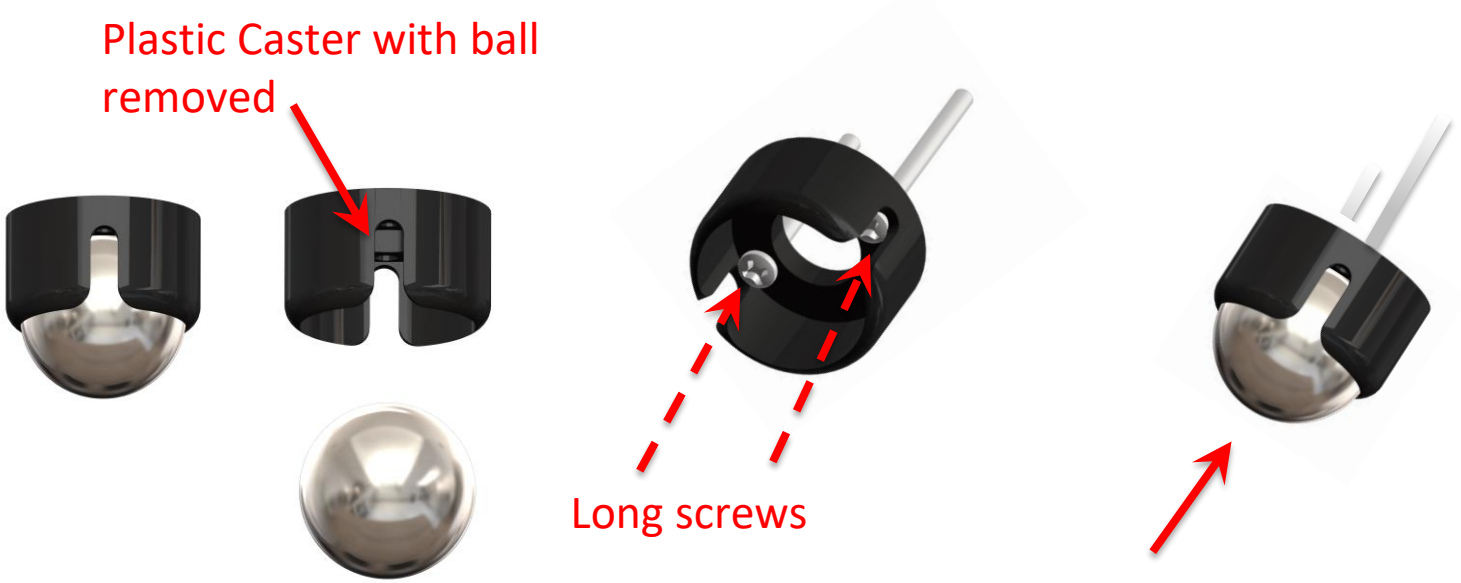


Remove the caster, two plastic discs (one is thicker than the other), the two long bolts and the nuts from the caster bag.
Be careful the nuts are tiny and easy to lose

Remove the metal ball from the caster (be careful it rolls). You can use the screwdriver to carefully pry it out of the plastic case (be careful that you don't pop it out onto the screen of your computer)

Insert the two long bolts through the plastic caster from the side that the ball fits into and then reinsert the ball (this keeps the bolts from falling out)

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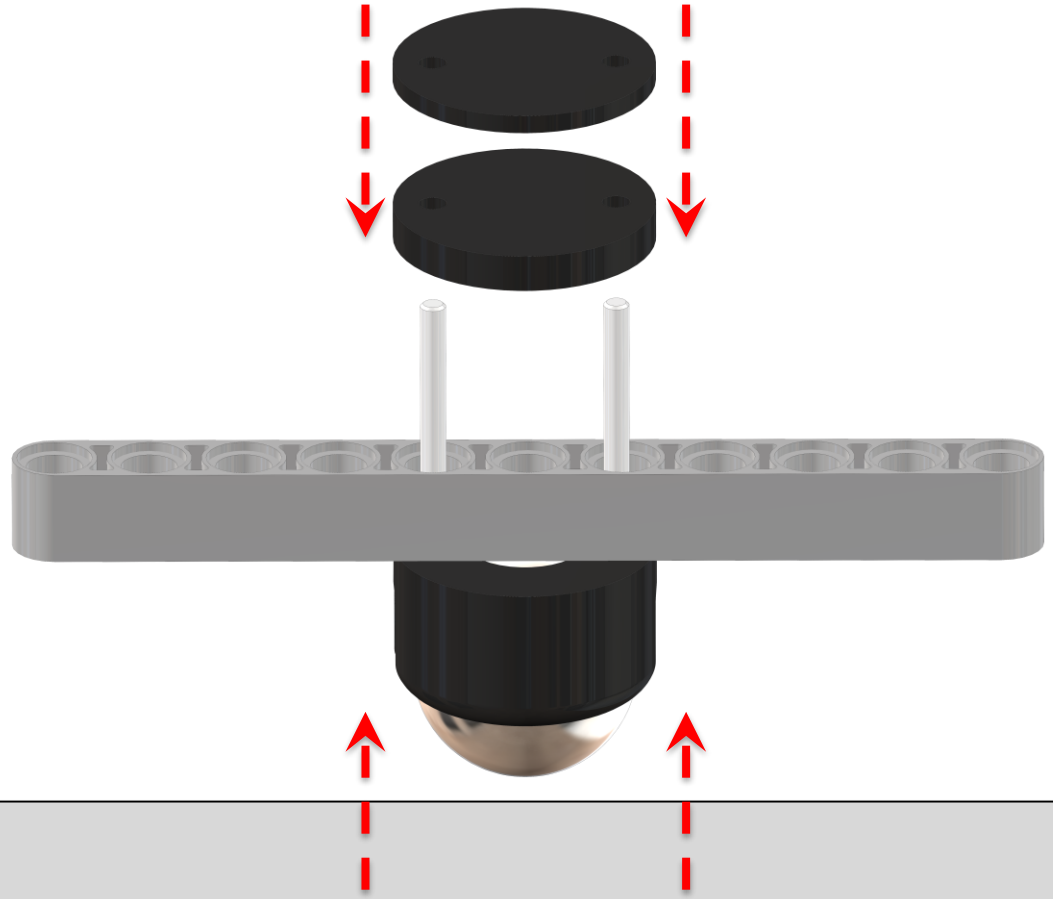

Place the two bolts coming out of the caster through the center two holes on the straight 11 hole LEGO piece

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

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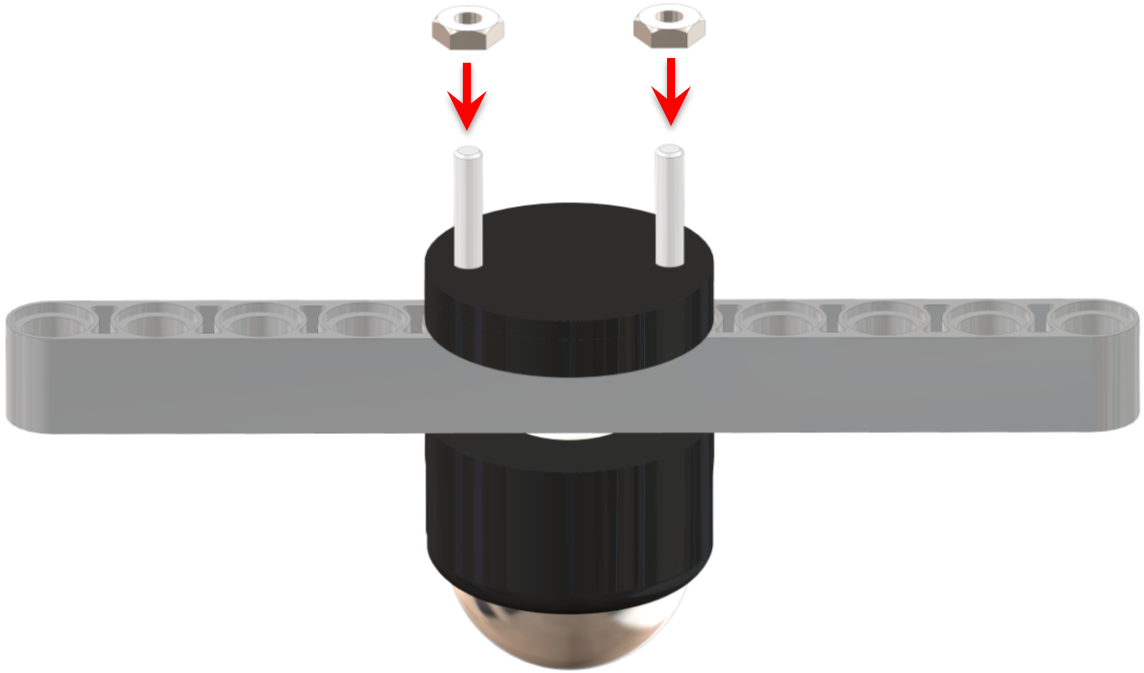

Start the nuts onto the bolts. This is a tedious process, be careful not to lose the nuts.

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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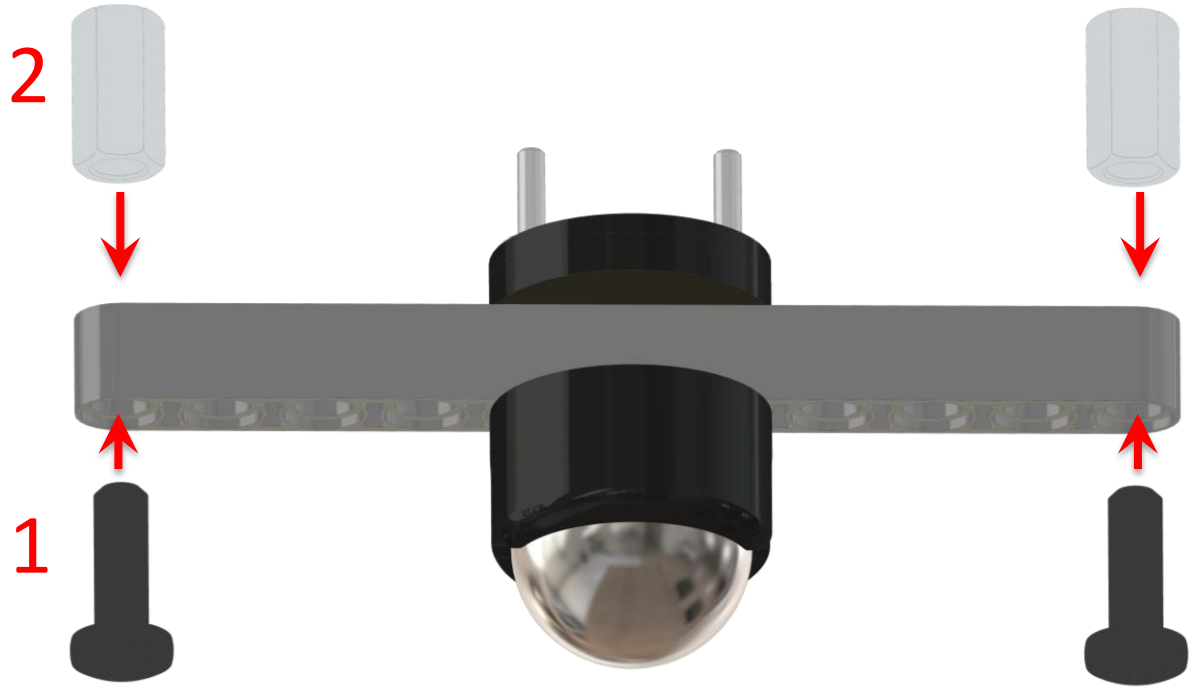


1. Insert 2 medium length bolts through the end holes of the 10 hole LEGO piece that has the caster attached
2. Screw two short Aluminum Offsets

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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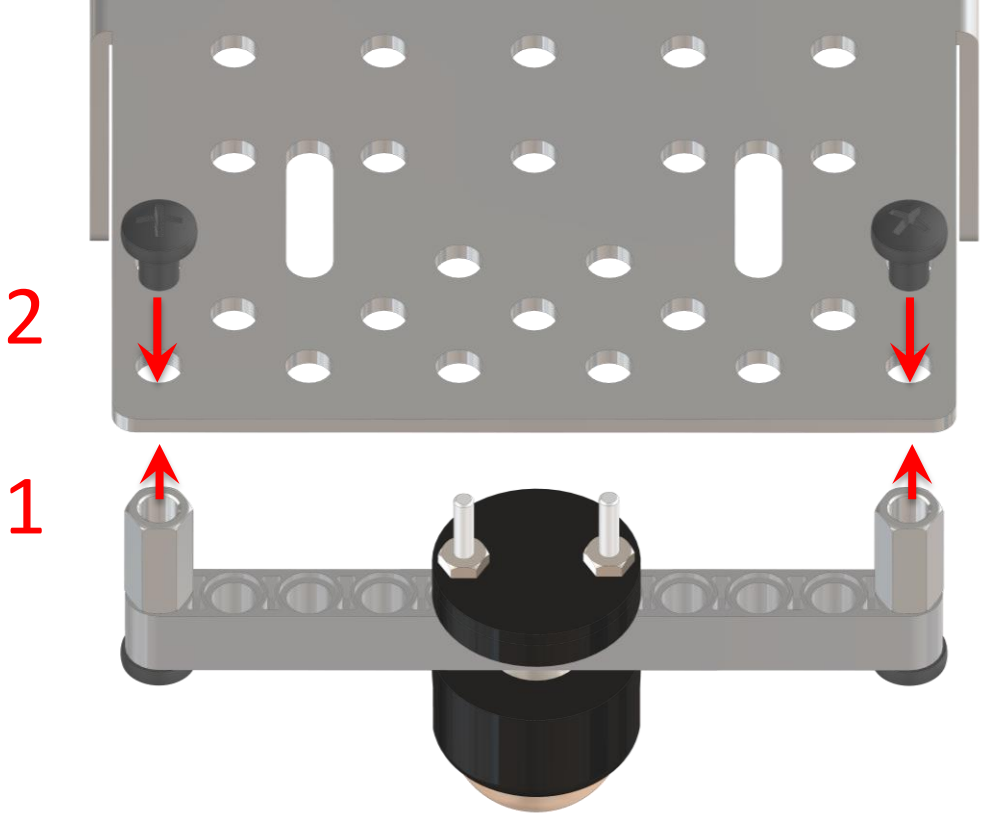


1. Using the caster assembly you built in slide 20 and set aside, line it up with the back row of holes in the chassis (on the end closest to the slots)
2. Using 2 short Bolts and the screwdriver, attach the caster assembly to the chassis

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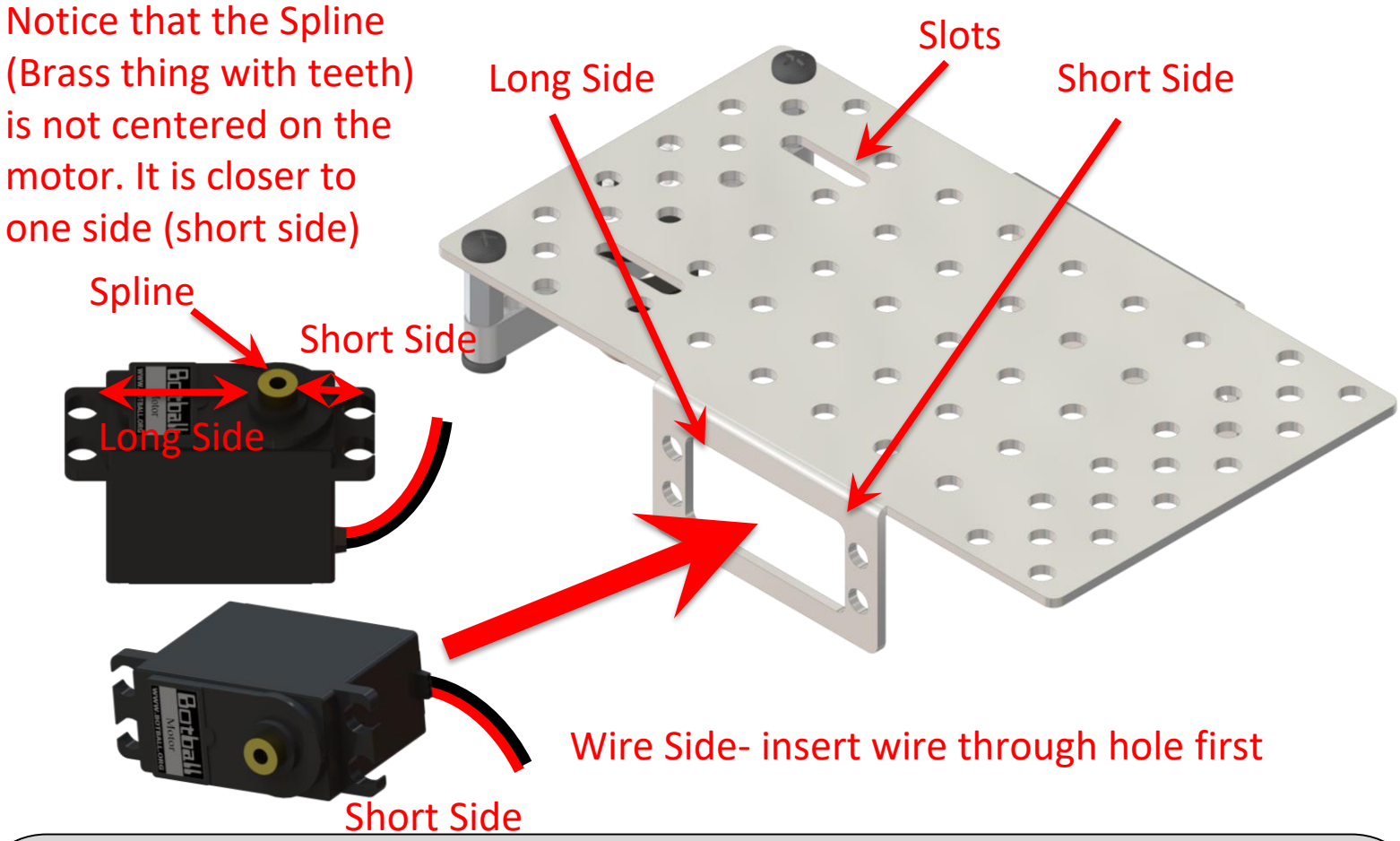


Insert the motors (Motors will be labeled Motor) into the chassis (put the wire through the hole first).
**The wire should be next to the short side of the chassis.**

Make sure and mount the motor with the Spline **closest** to the **shorter side** of the chassis (away from the slot side of the chassis)

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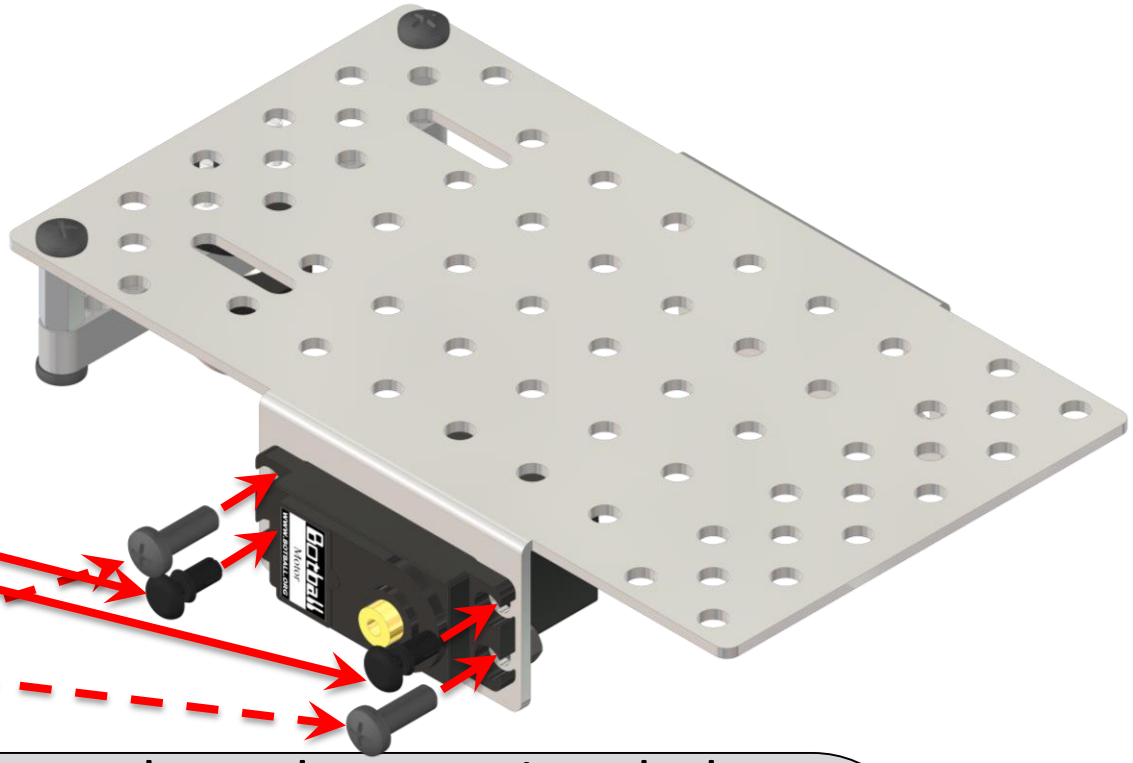
Plastic Pop Rivets pushed through from BACK of motor (one on each side of the motor)

Medium Bolts, nut on back (one on each side of the motor)



Use 2 plastic pop rivets (insert through motor into hole on chassis and push until they snap)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 lock nuts (one on each side). You do not need the wrench, simply hold nut with your finger.

Repeat the process on the other side with the other motor. MAKE SURE SPLINE ON MOTOR (short side) MATCHES SHORT SIDE OF CHASSIS (refer to slide 21 if needed)

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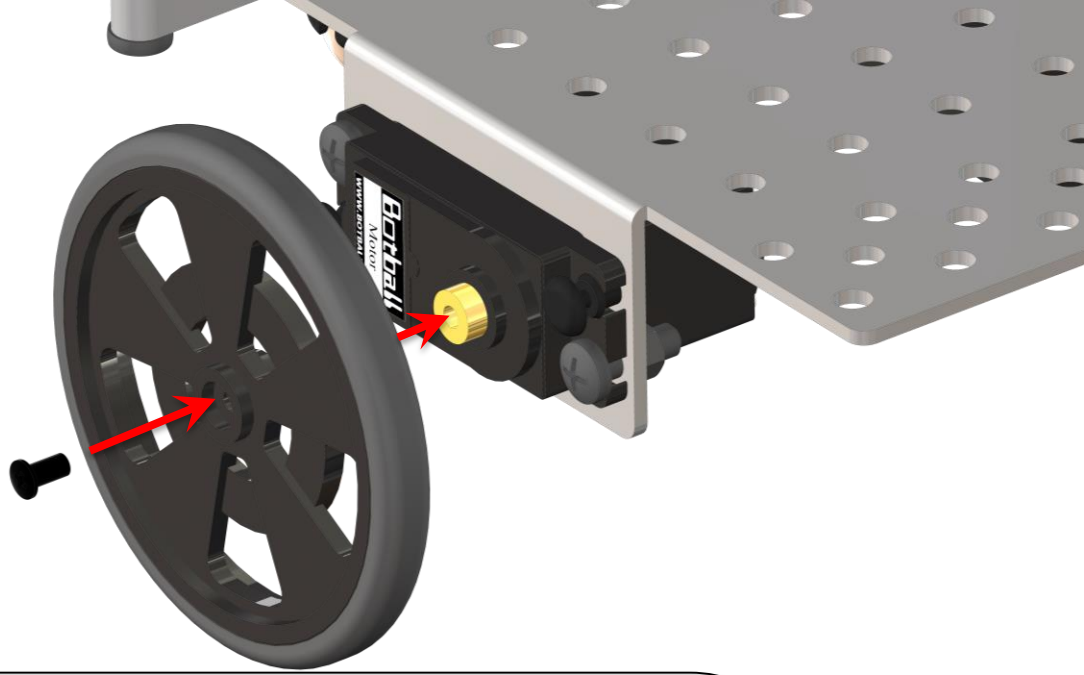

1. Using your screwdriver make the hole in the wheel slightly larger. Place one of the large wheels onto the spline of the motor you attached to the chassis. THE WHEEL HAS TWO SIDES, one side has teeth that match the teeth on the motor spline.
2. Use one of the black screws that is in the servo horn 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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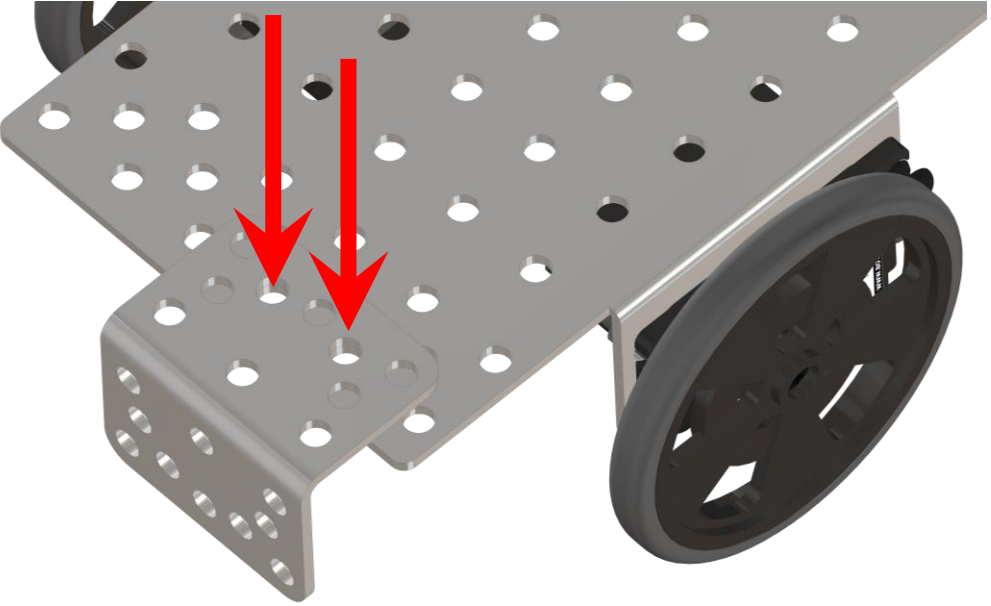

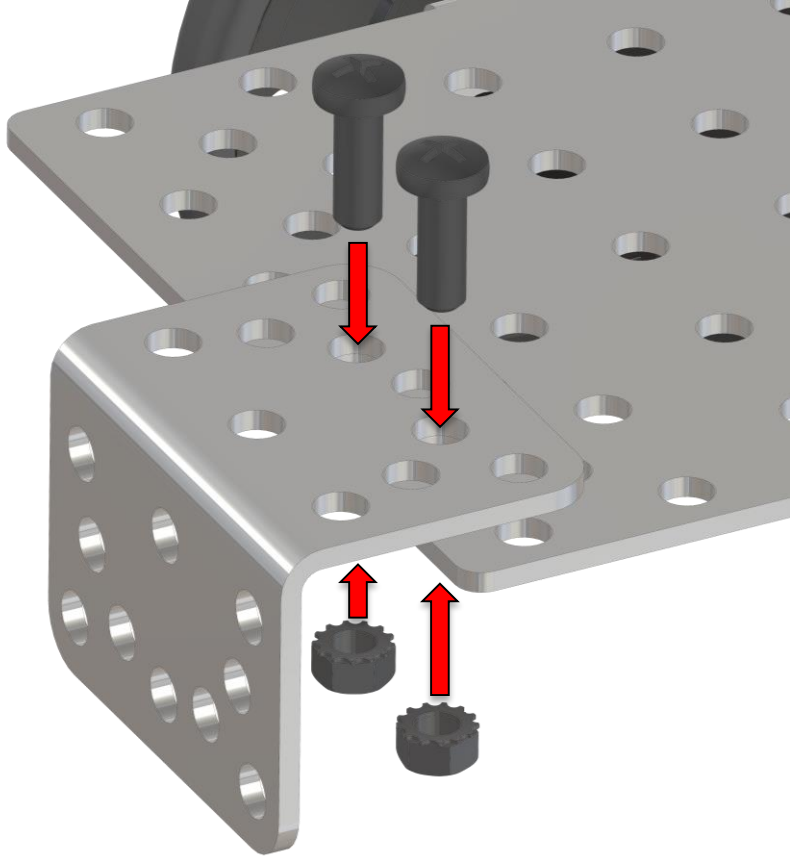

Take the KMP (KIPR Metal Part) Angle Bracket.

You can identify it by the hole spacing that look like a smiley face. Line up the holes as shown in blue.

Using 2 medium bolts, 2 lock nuts and the screwdriver fasten it in place

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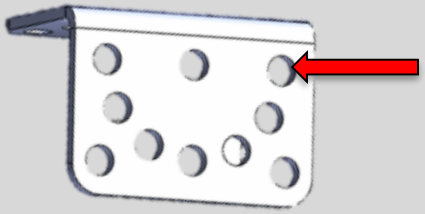
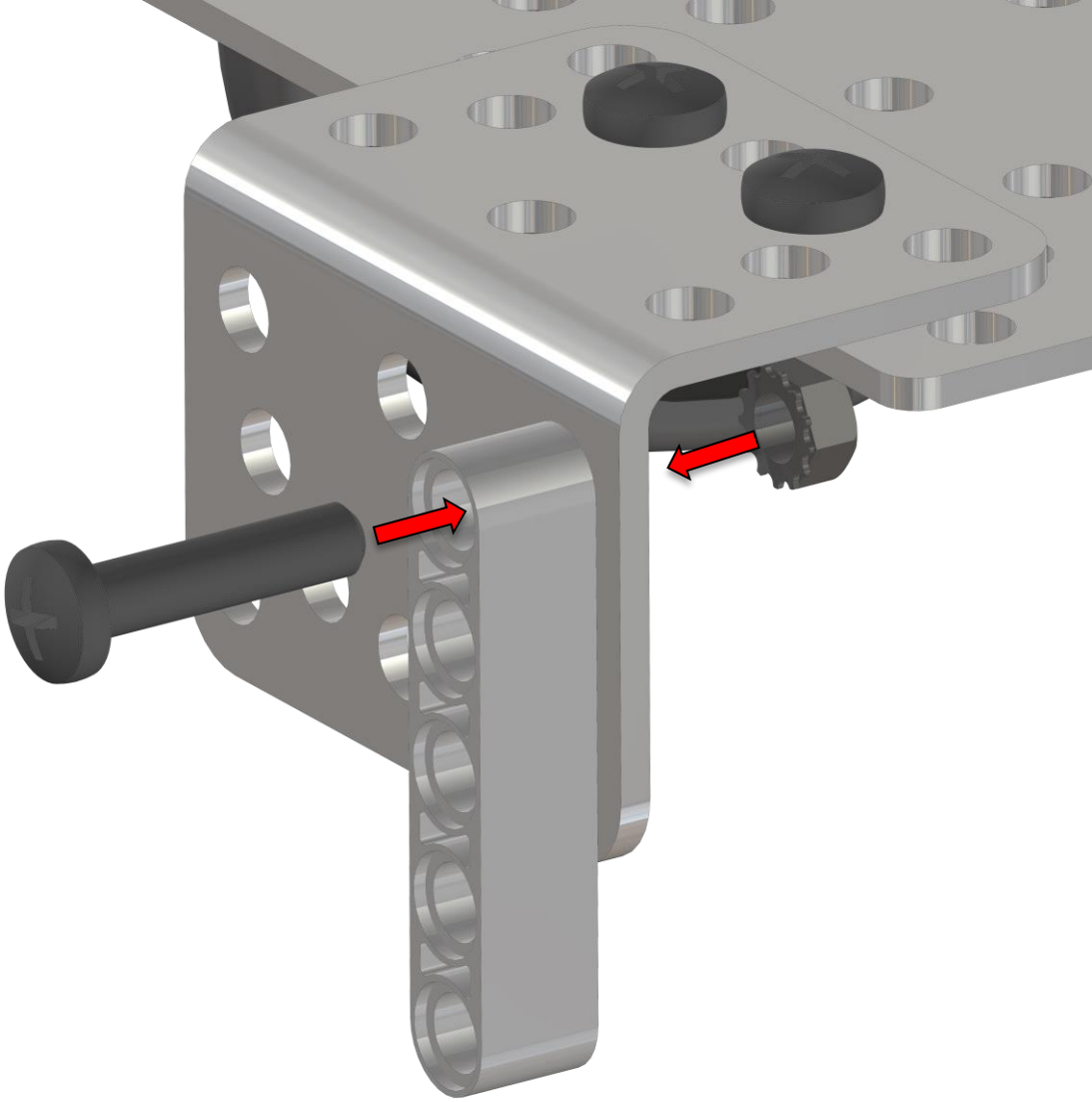
Take the 5 hole straight LEGO piece and using one long bolt and lock nut attach it to the angle brackets as pictured. 



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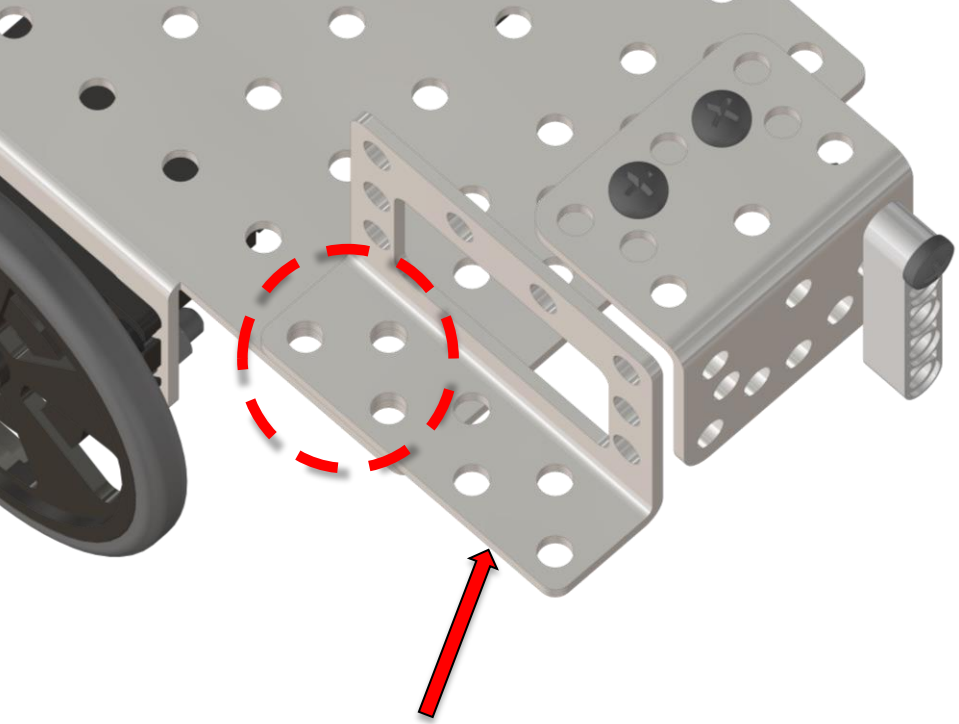
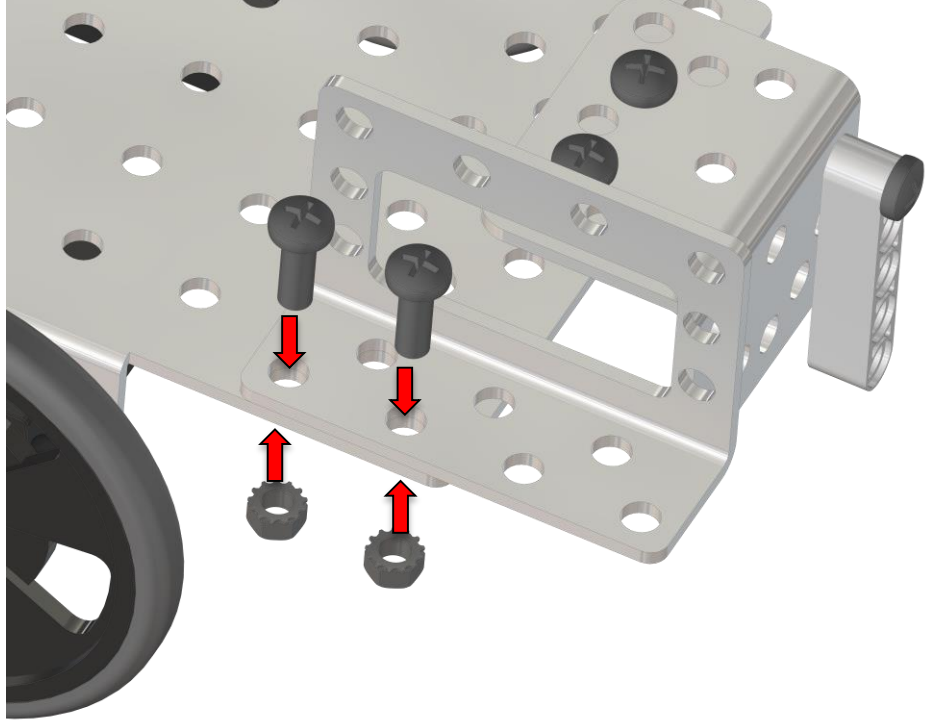
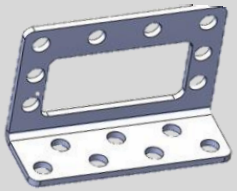




Notice that the motor mount extends in front of the end of the chassis

Take a motor mount 

and using two medium bolts and lock nuts attach it to the chassis as pictured.

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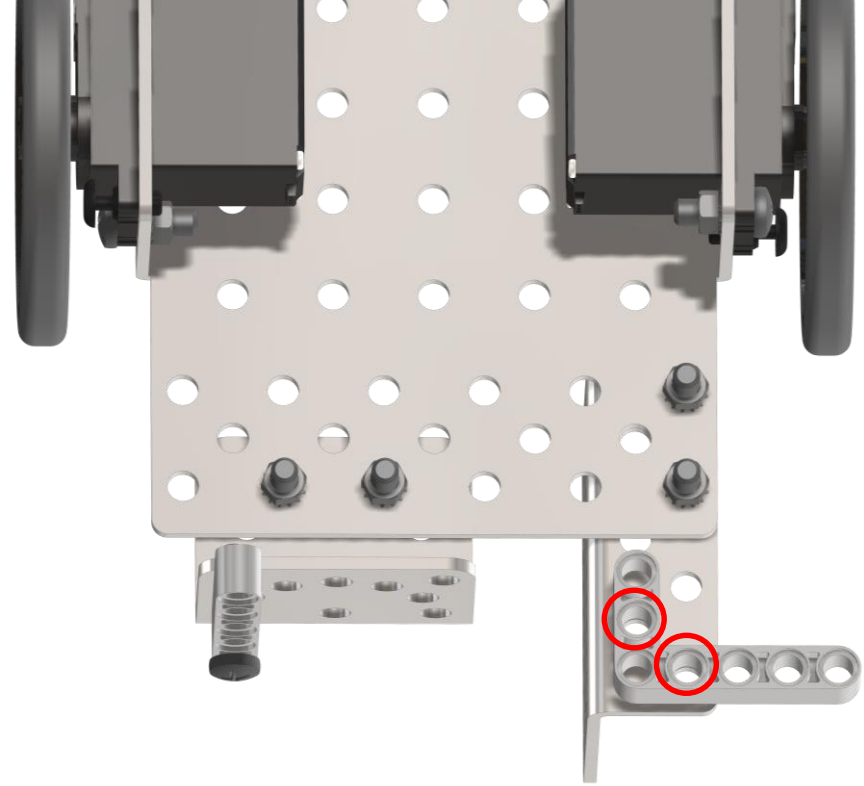

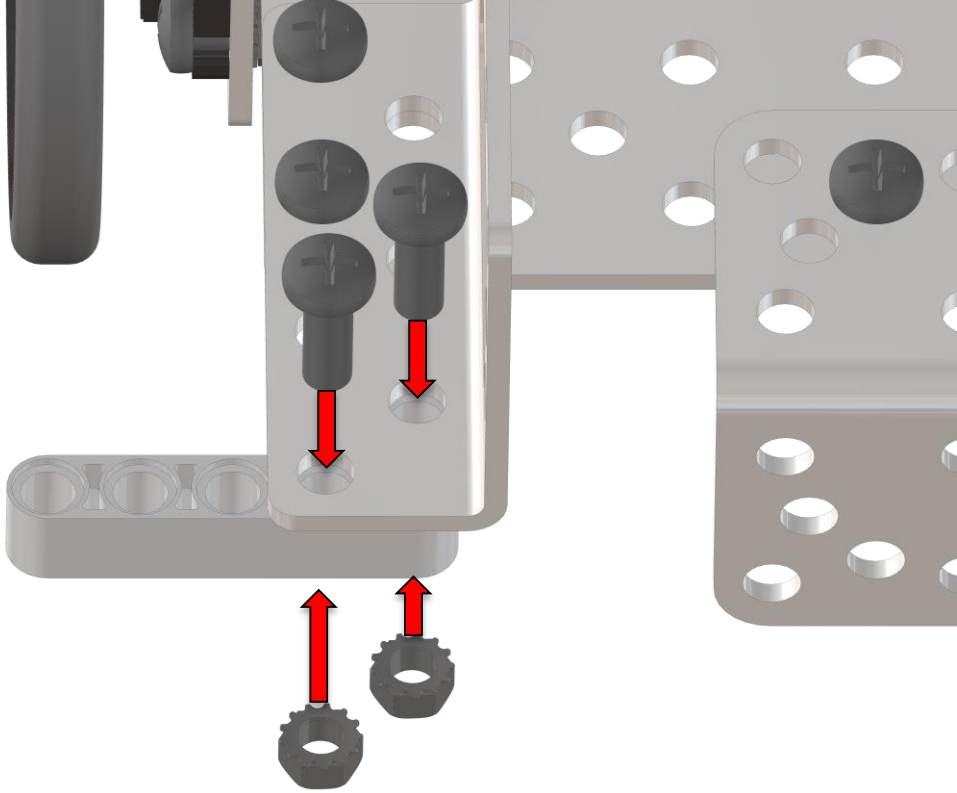

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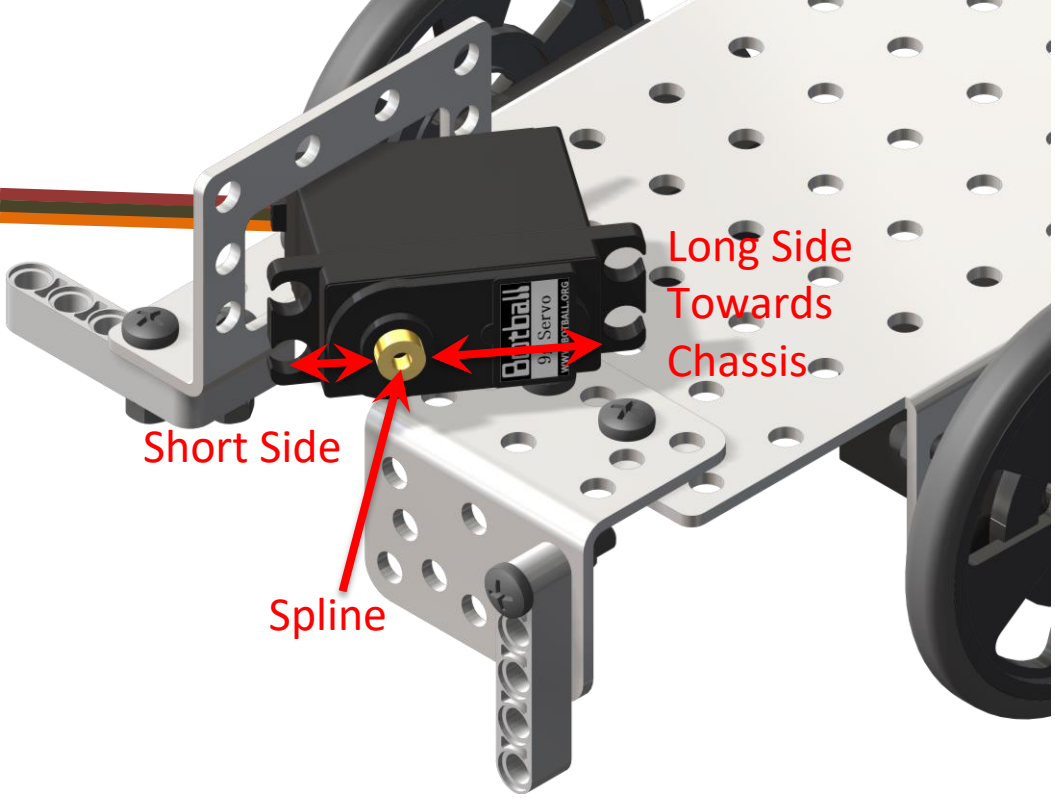


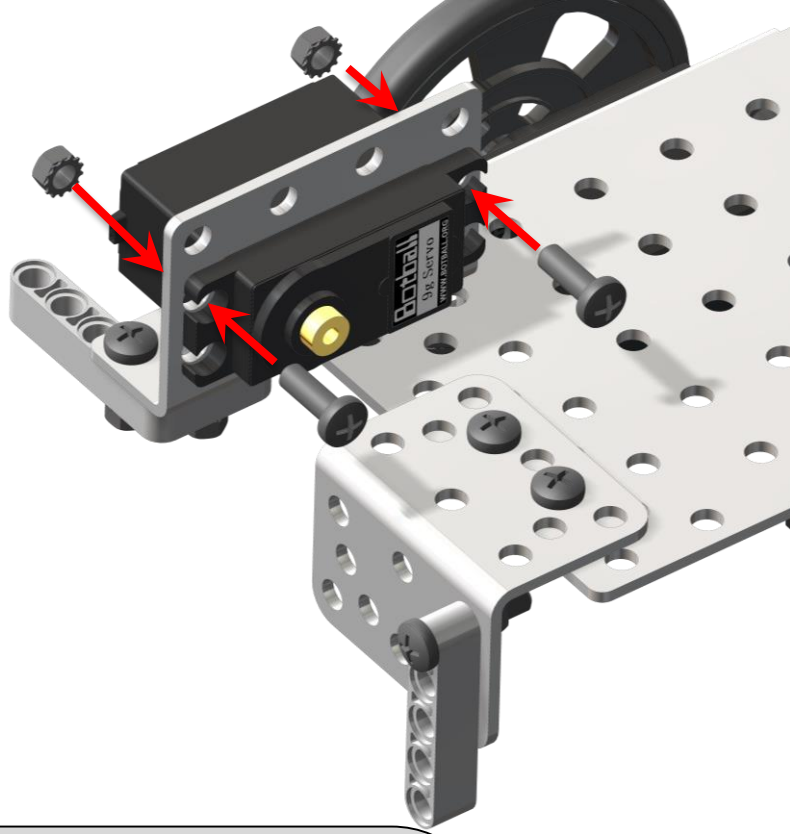

Insert the servo (will be labeled Servo) into the motor bracket (put the wire through the hole first).

**The wire should be next to the side away from the chassis.**

Mount just like the wheel motors: Use 2 plastic pop rivets (insert through motor into hole on chassis and push until they snap)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 (one on each side). You do not need the wrench, simply hold nut with your finger and tighten with the screwdriver.

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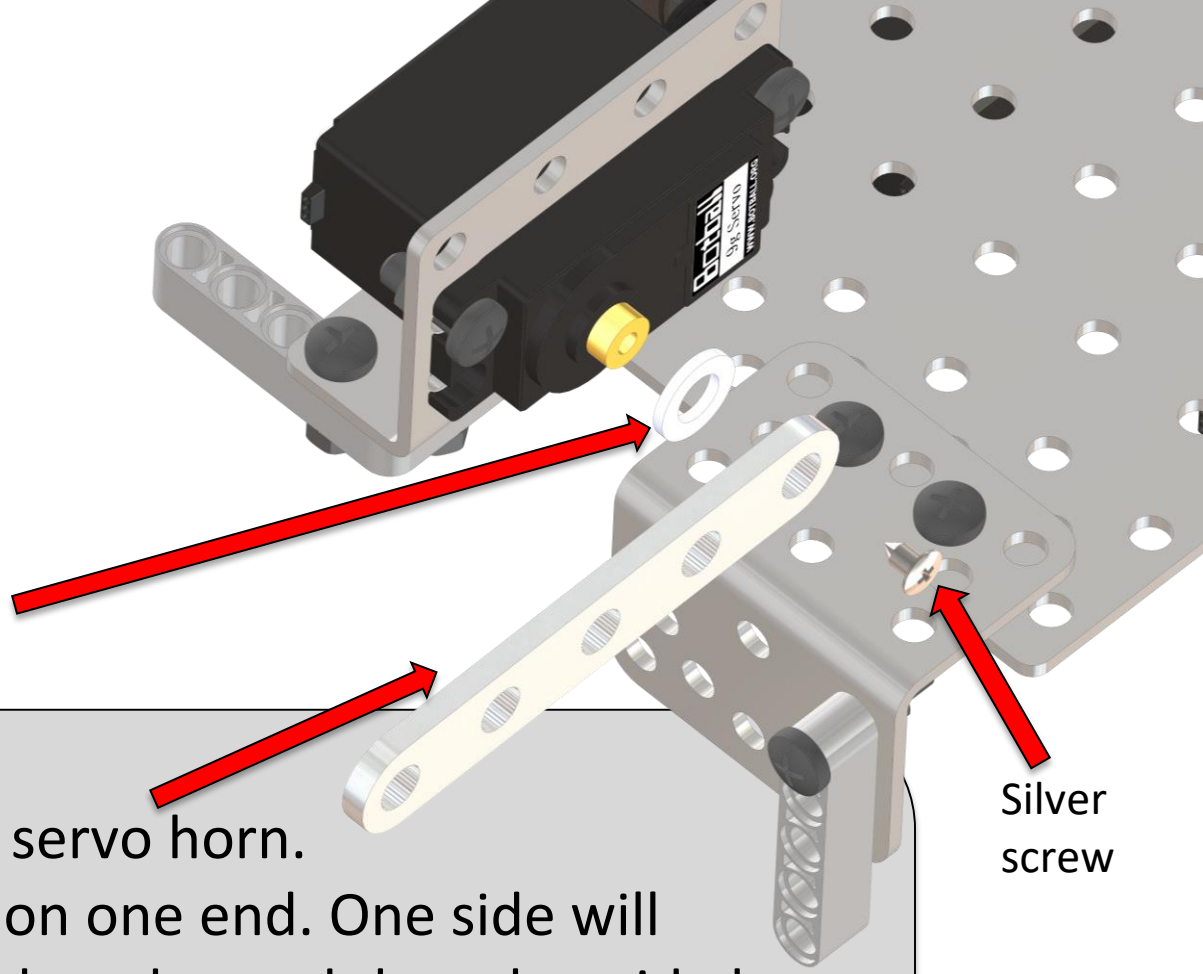
5-hole metal servo horn




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 (teeth). Using the silver screw in the servo horn bag and the screwdriver, screw the servo horn into the spindle.

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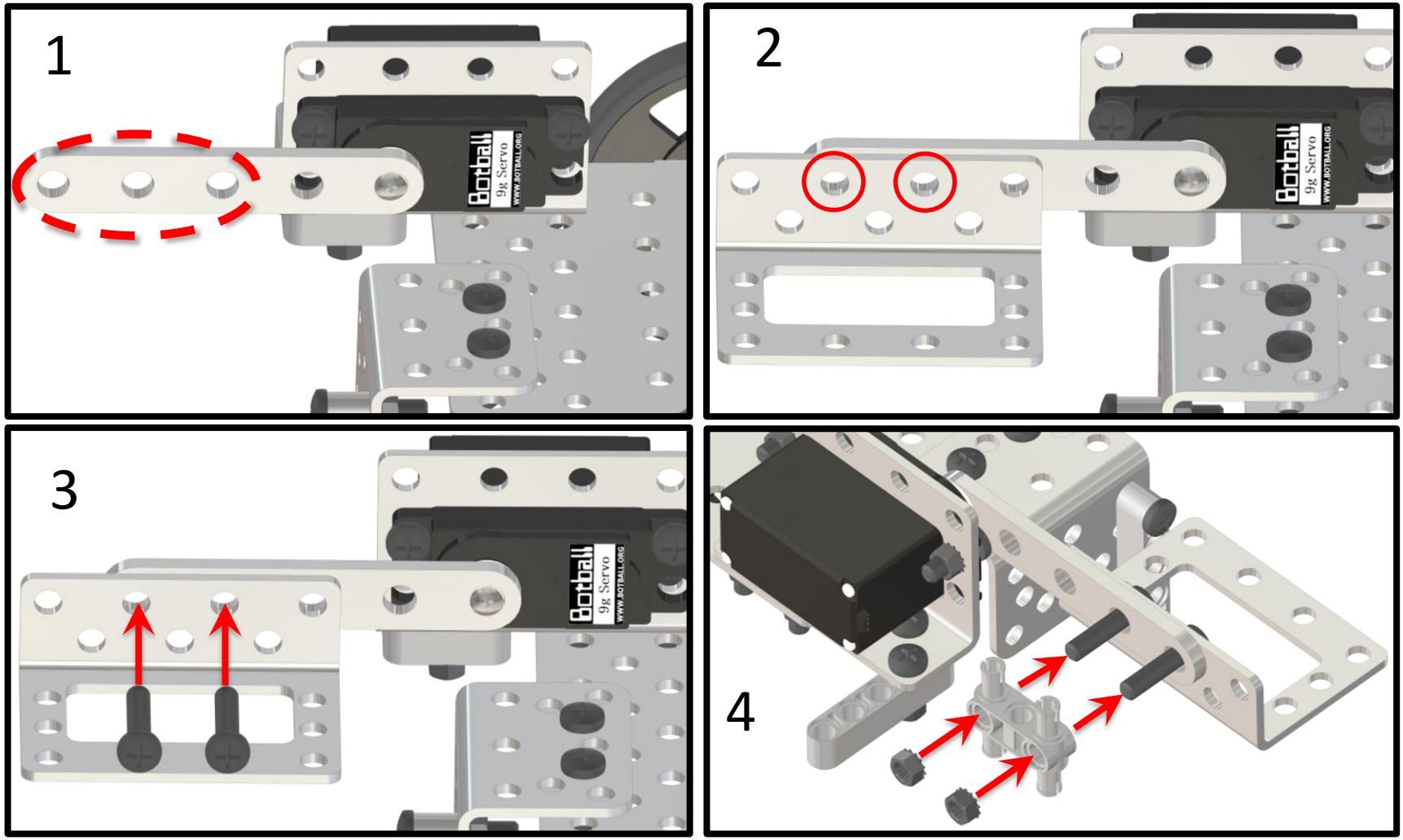


Take a motor mount and using two long bolts insert them through the motor mount and the five hole aluminum servo horn in the location as shown. Then secure the Axel Joiner 3 long with 4 pins on the other side of the bolt with two nuts.

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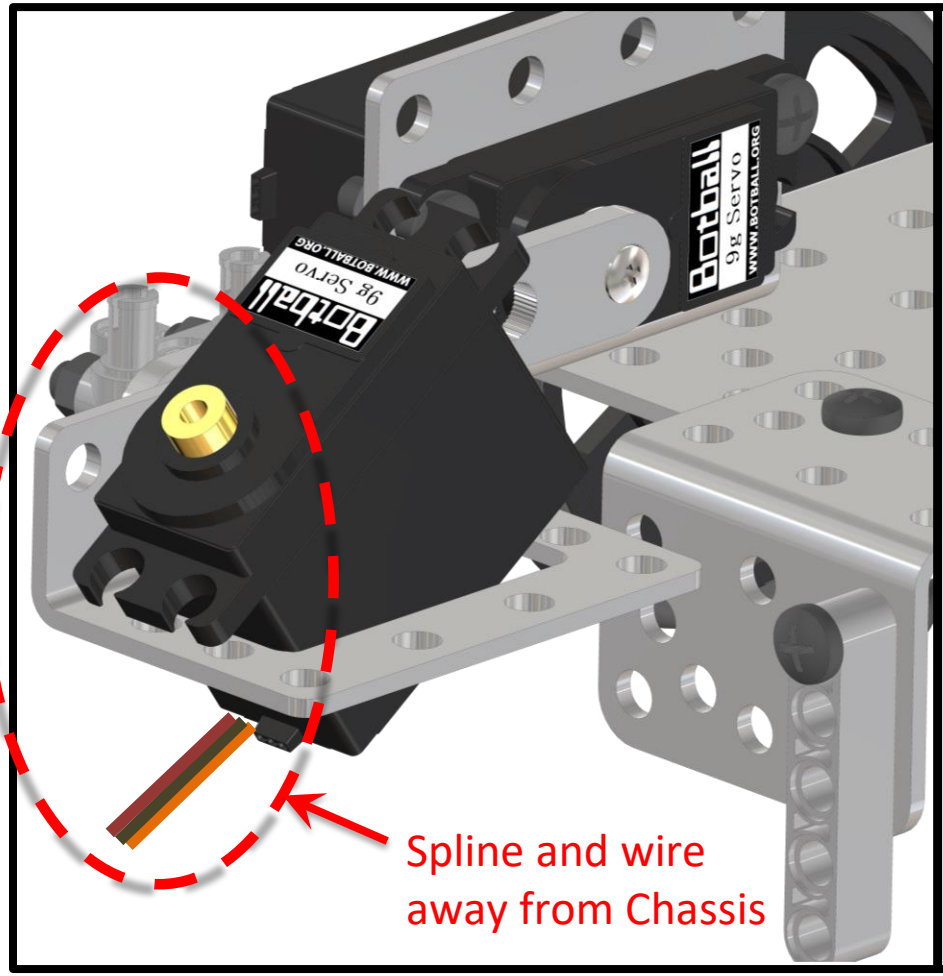


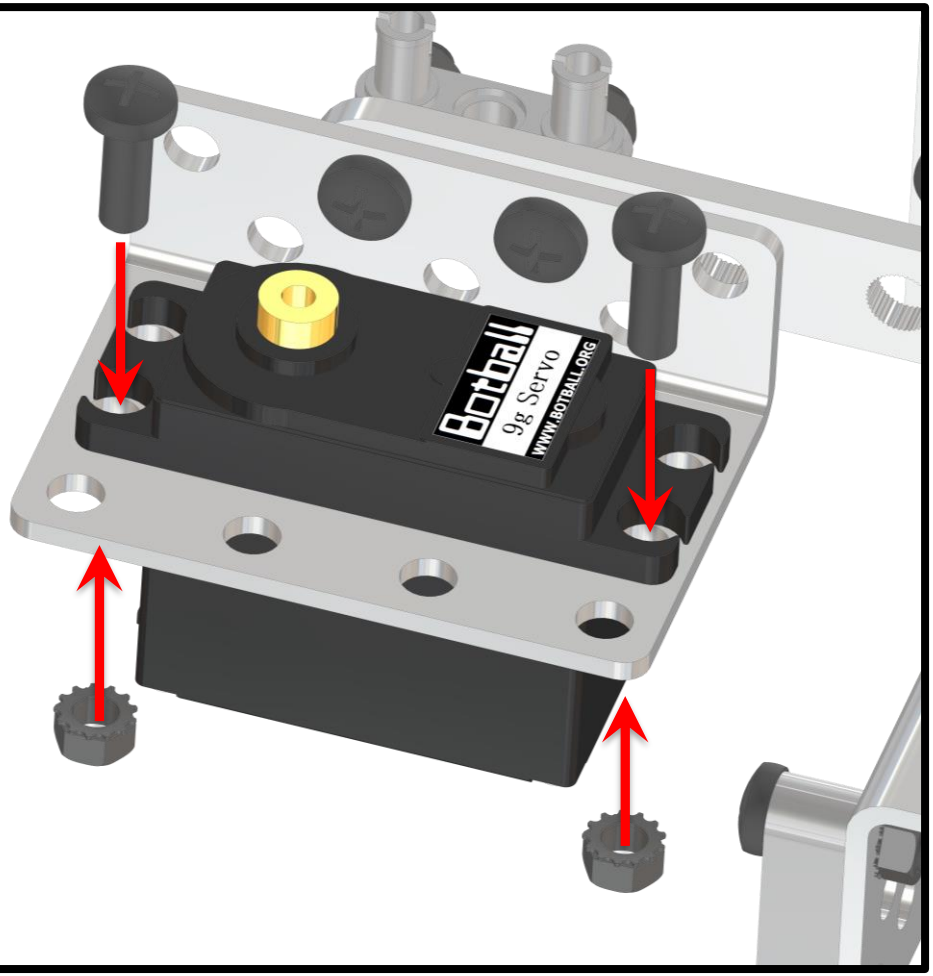


Place a servo motor (three colored wires labeled Servo) into the servo/motor bracket (brass spindle away from robot-wire away from robot) and **secure in place with two pop rivets and two medium bolts with lock nuts** (Just like all motors you have mounted before).

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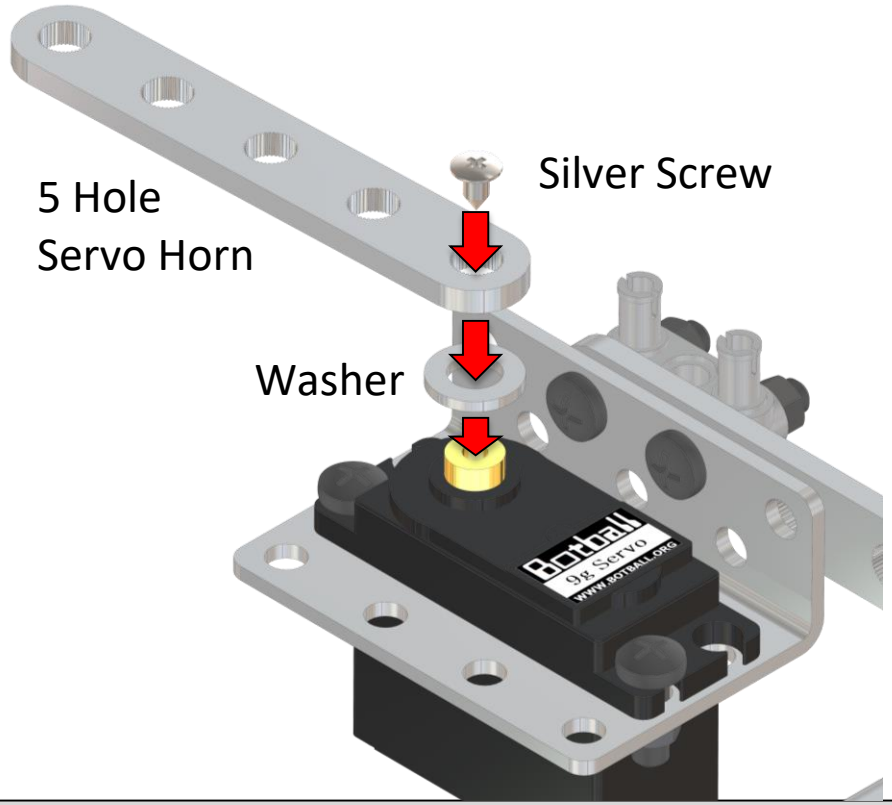


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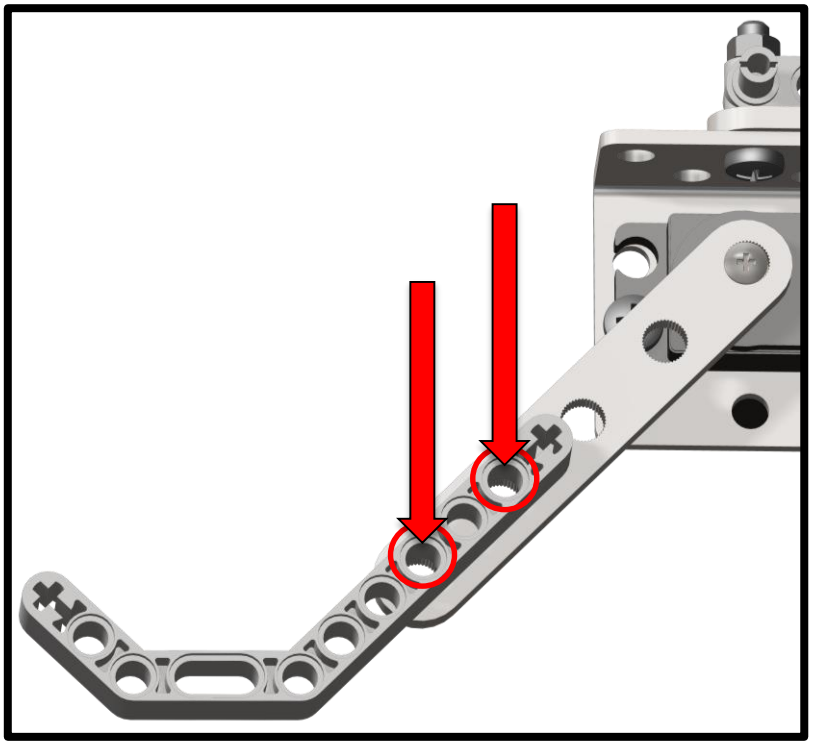

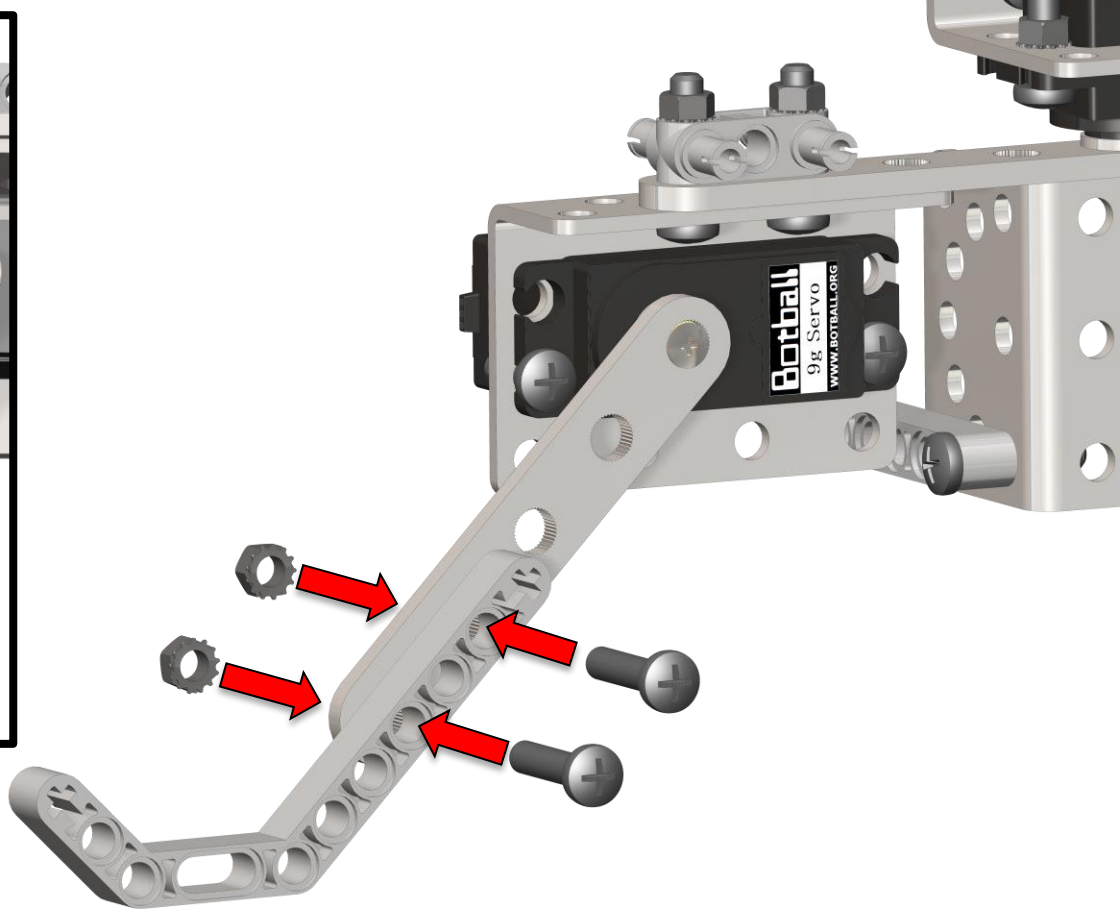


Attach a curved LEGO piece to the 5-hole metal servo horn using two long bolts and lock nuts. Secure with screwdriver while holding the lock nut with your finger

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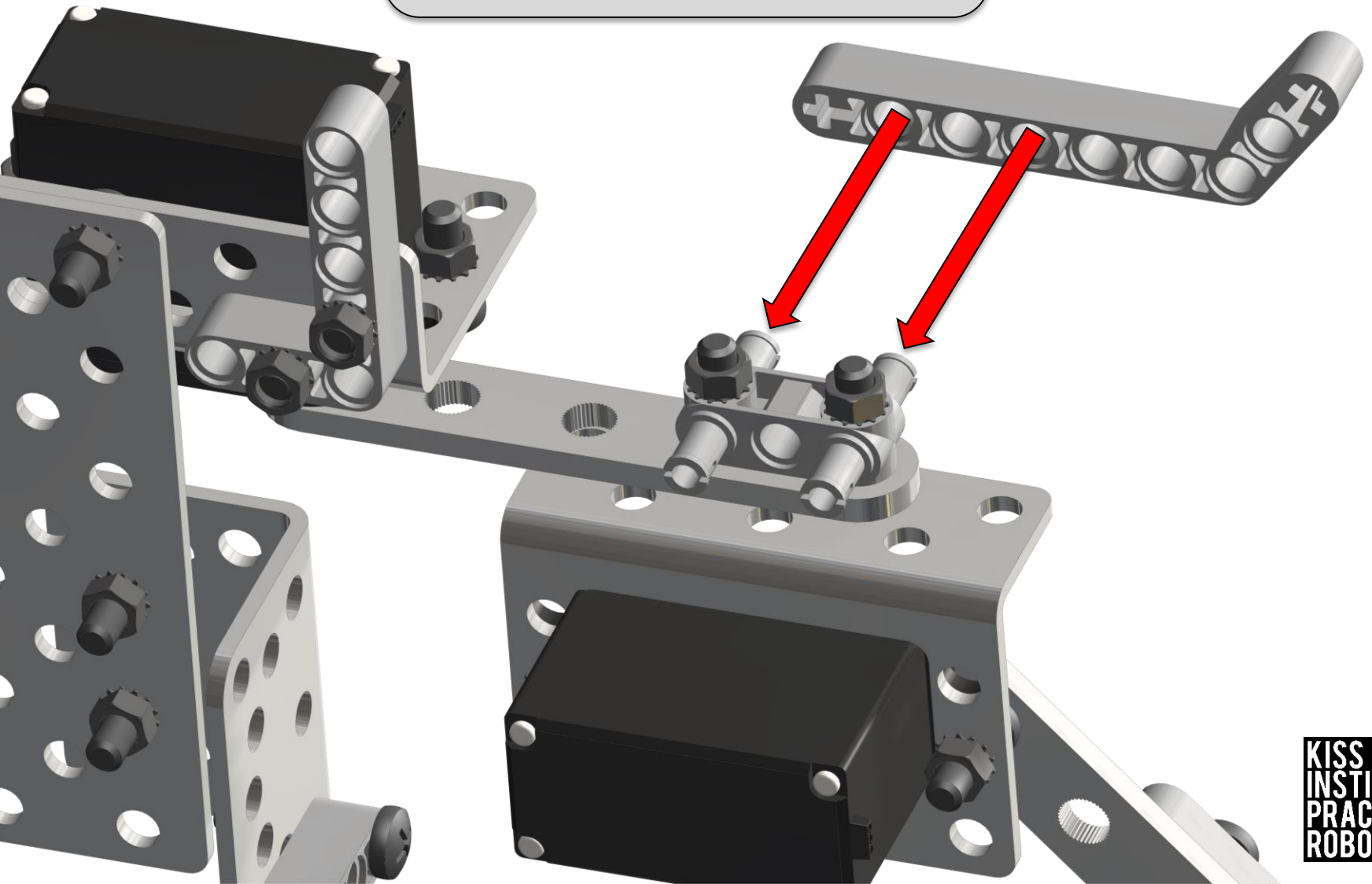
Place the pictured LEGO piece onto the two pins as shown



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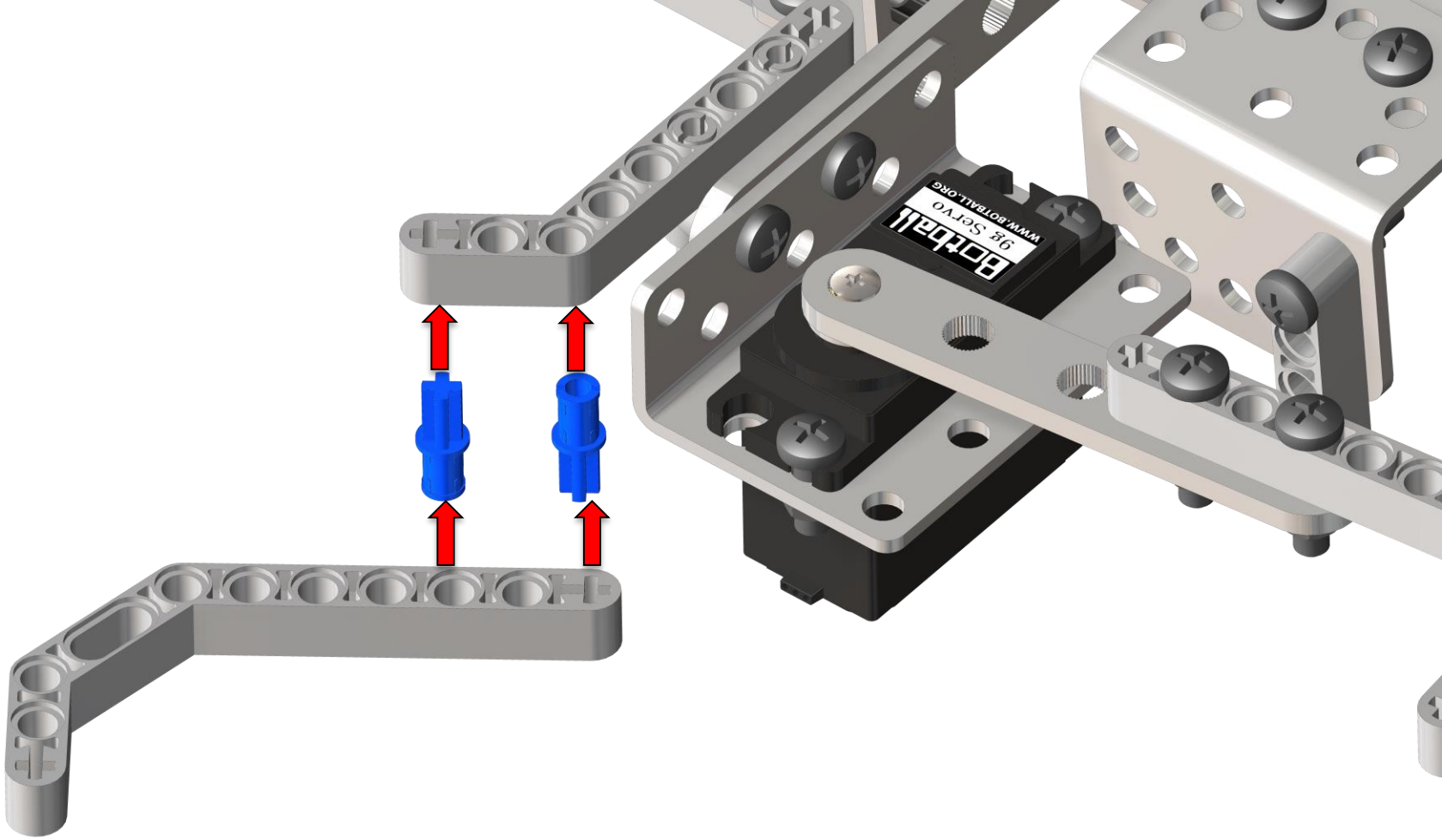


Push two pins through the two LEGO pieces as pictured (notice one end is a + the other is round). You now have a claw that can be raised and lowered and can also grasp/release something.

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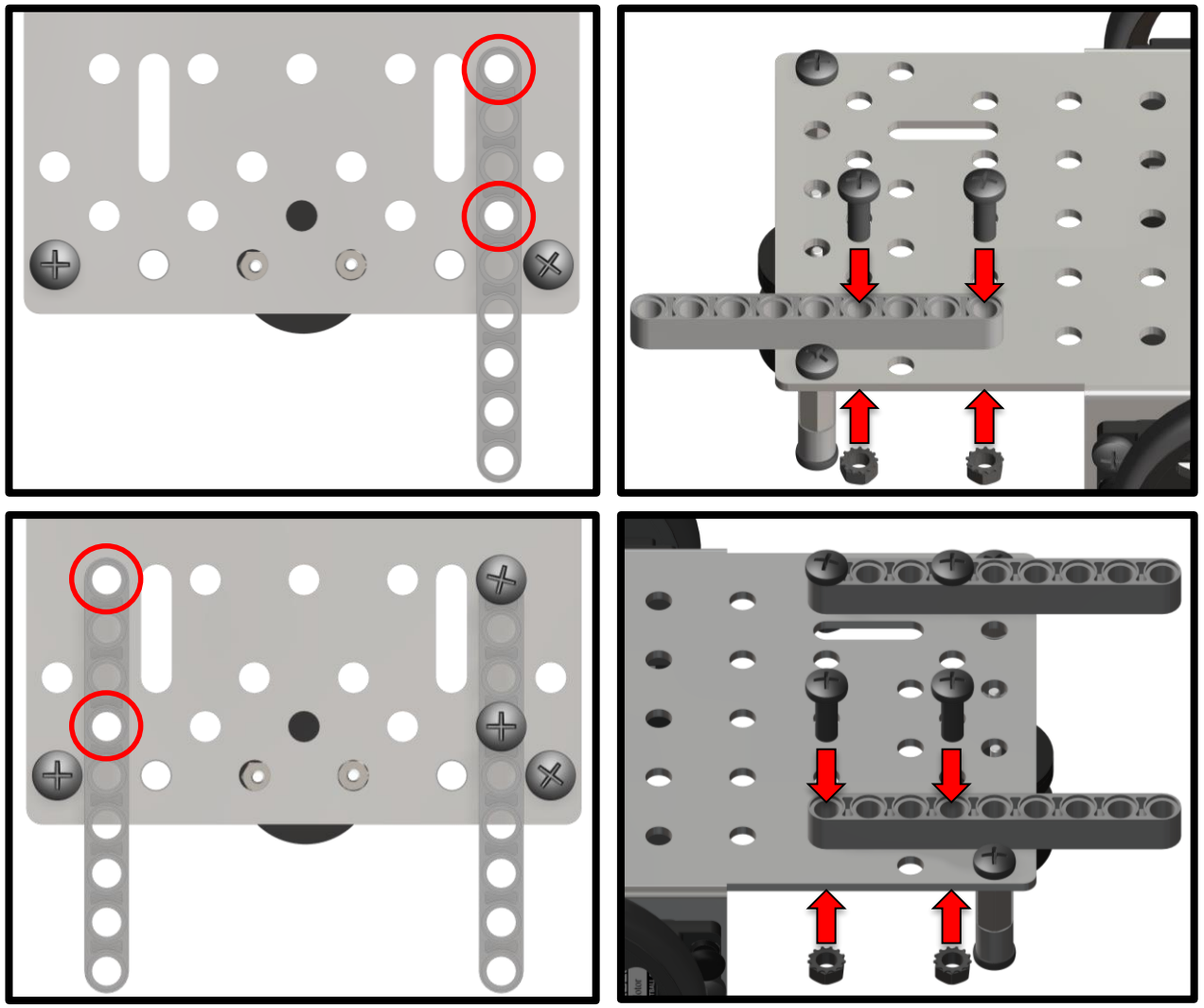

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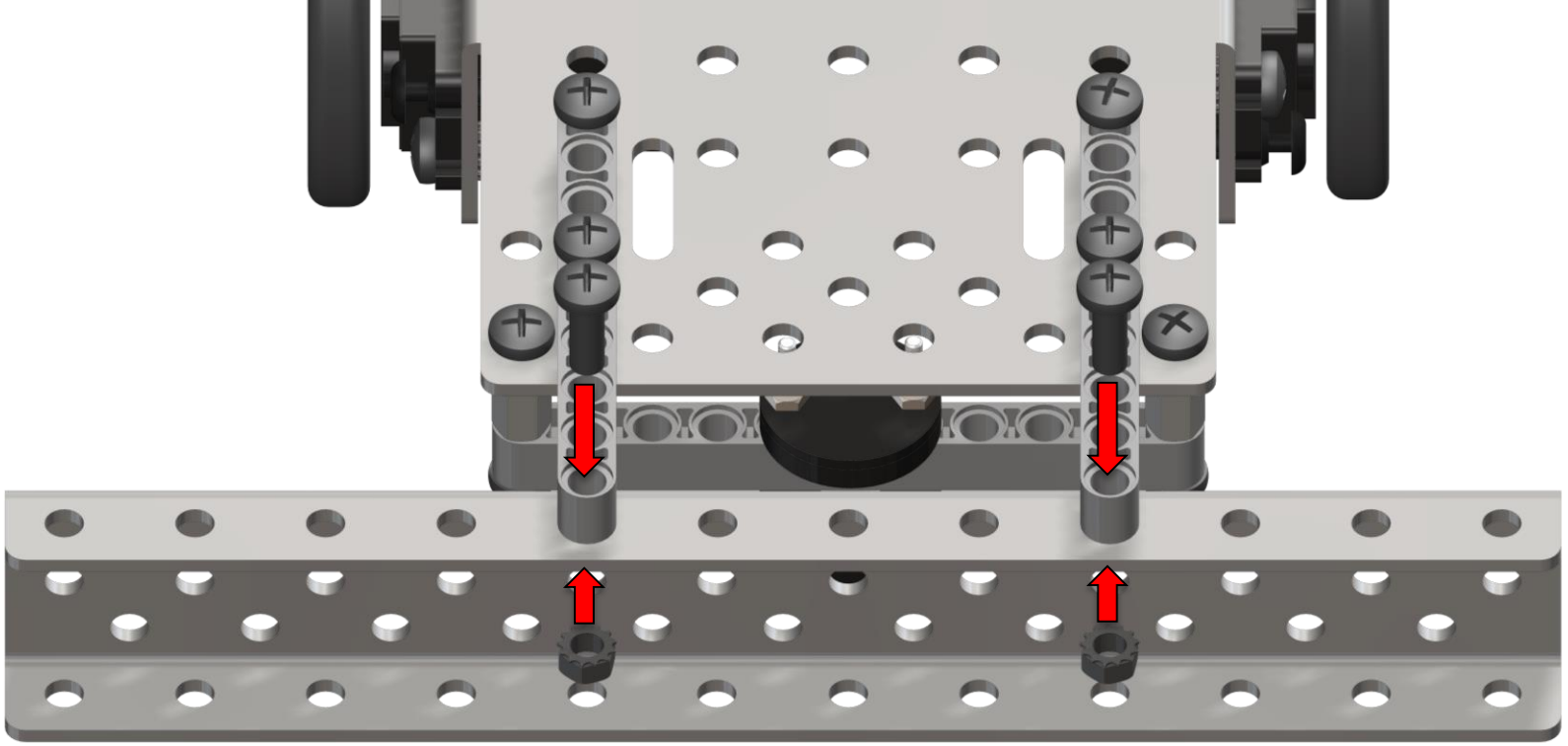

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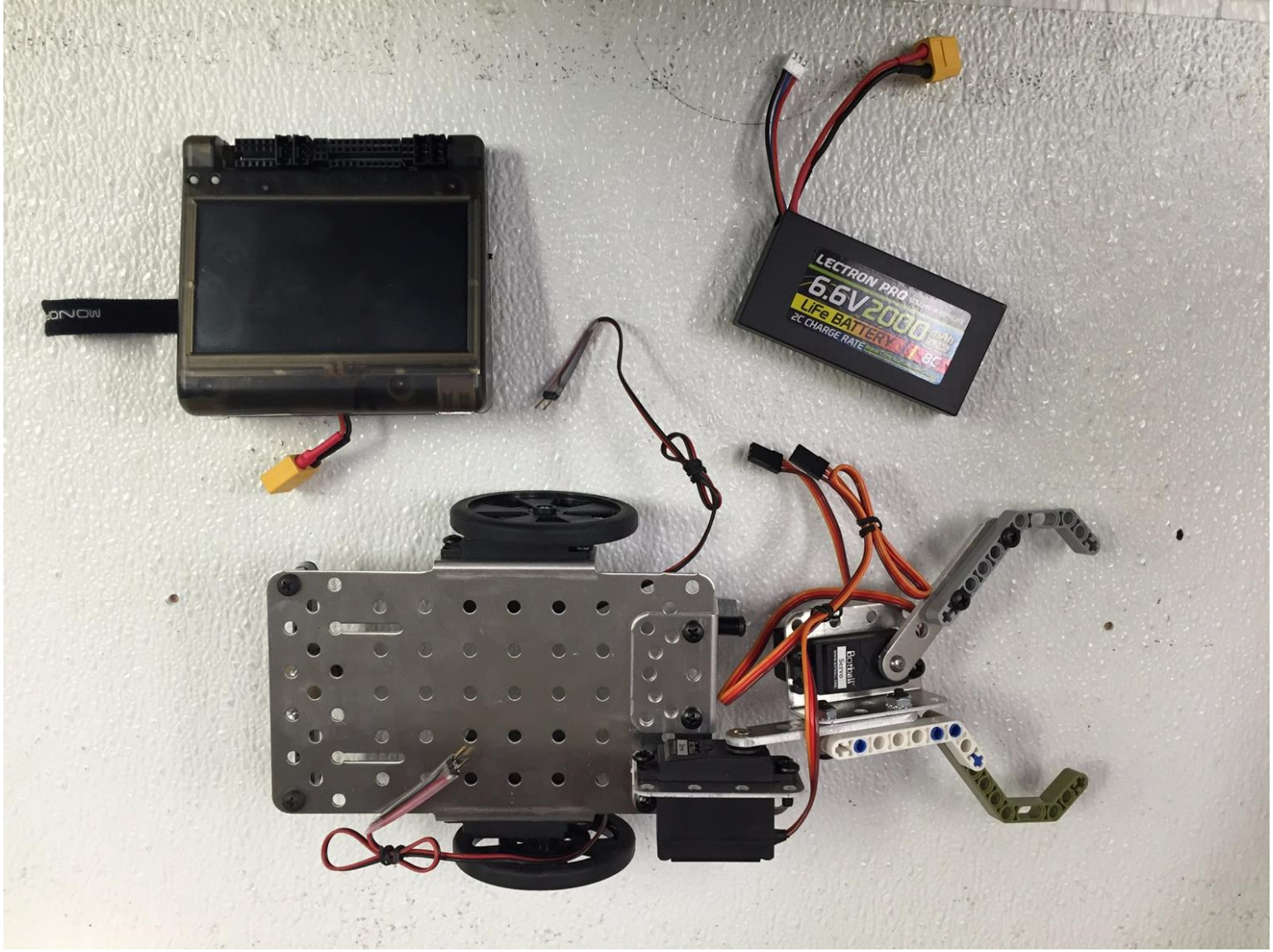


Now place the following pieces on the table so that we may combine them in a working model with some stability.

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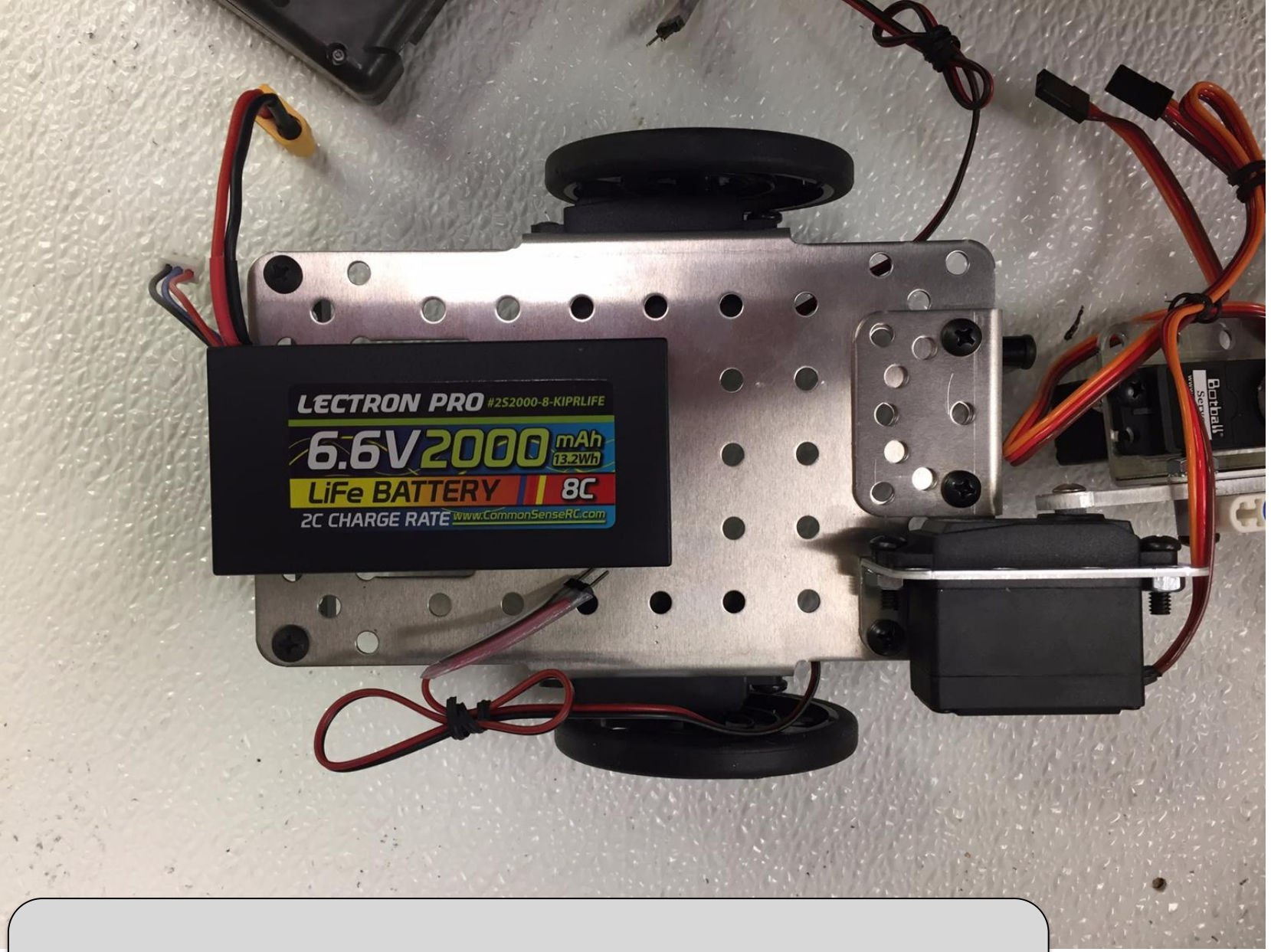


Place the battery face up so that the cord exits the opposite end of the chassis of the arm/claw

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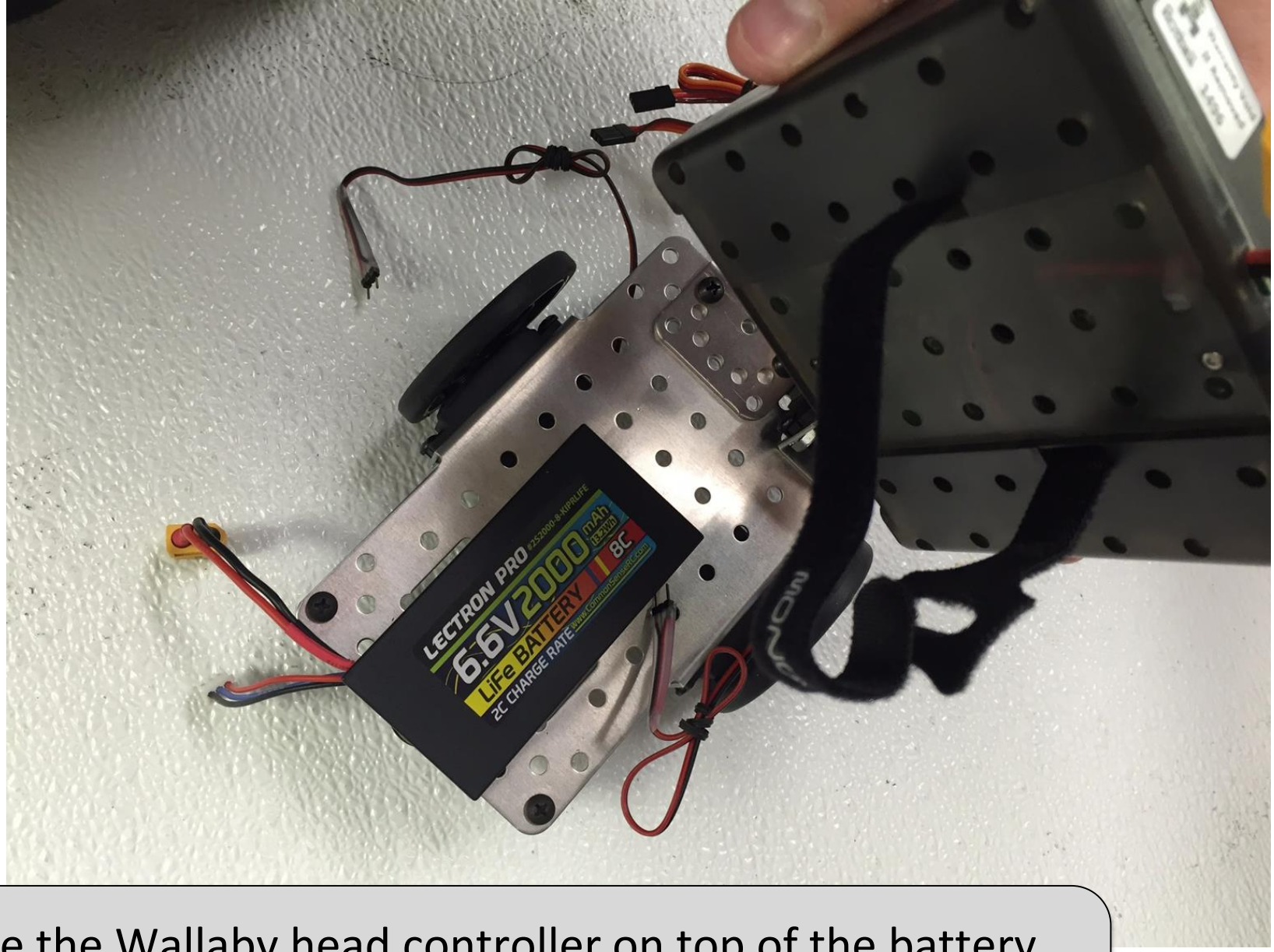


Place the Wallaby head controller on top of the battery so that power cord exits in the same direction. Feed the velcro straps through the slots in the chassis as you go.

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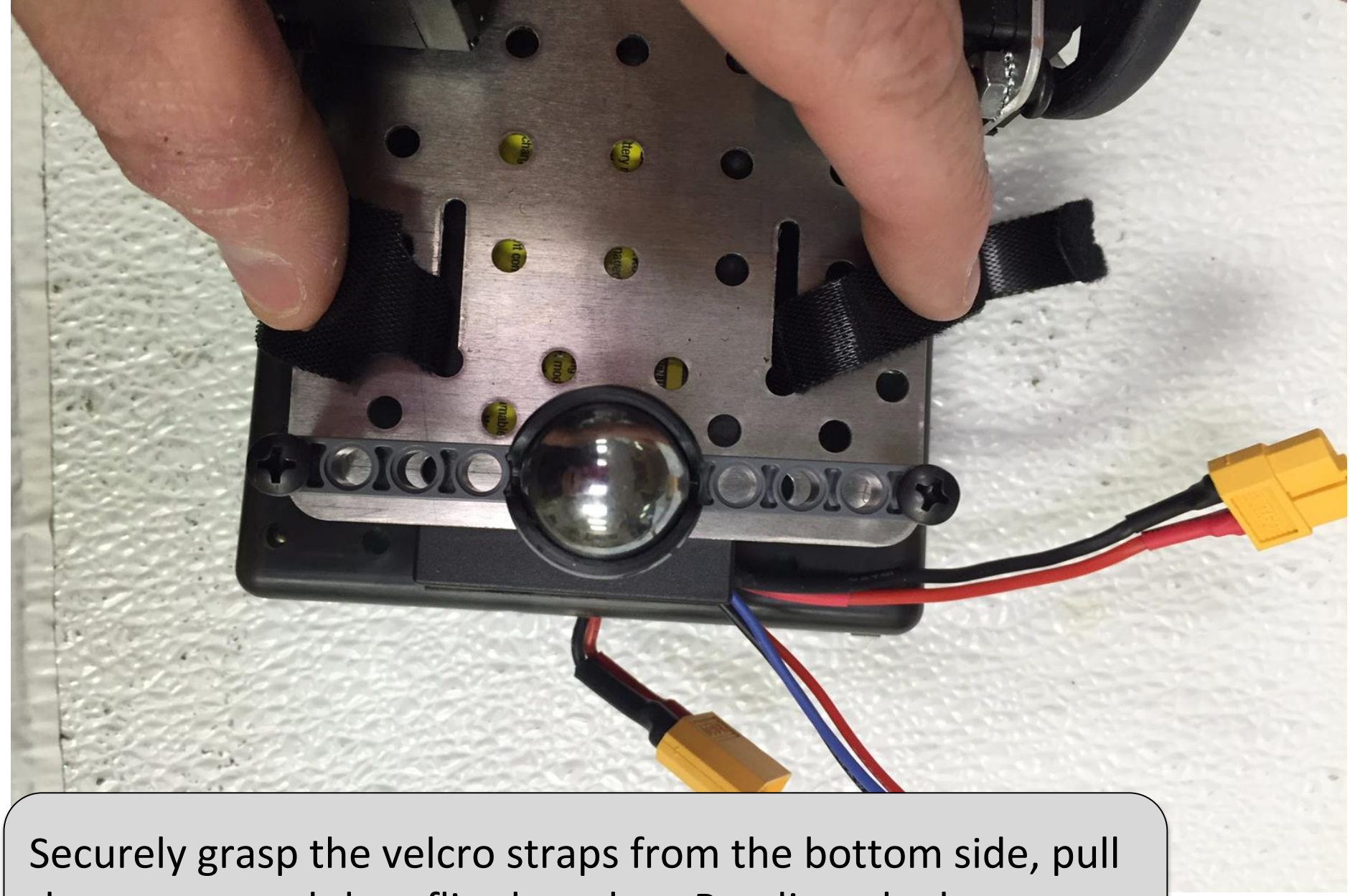

Securely grasp the velcro straps from the bottom side, pull them snug, and then flip the robot. Readjust the battery and controller for squareness if needed.

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Take the unslotted lead and insert it through the slot in the other end. Pull firmly as to secure the wallaby and the battery to the chassis. The velcro does not attach by turning backwards, but instead by being pressed into the area after being inserted into the slot.

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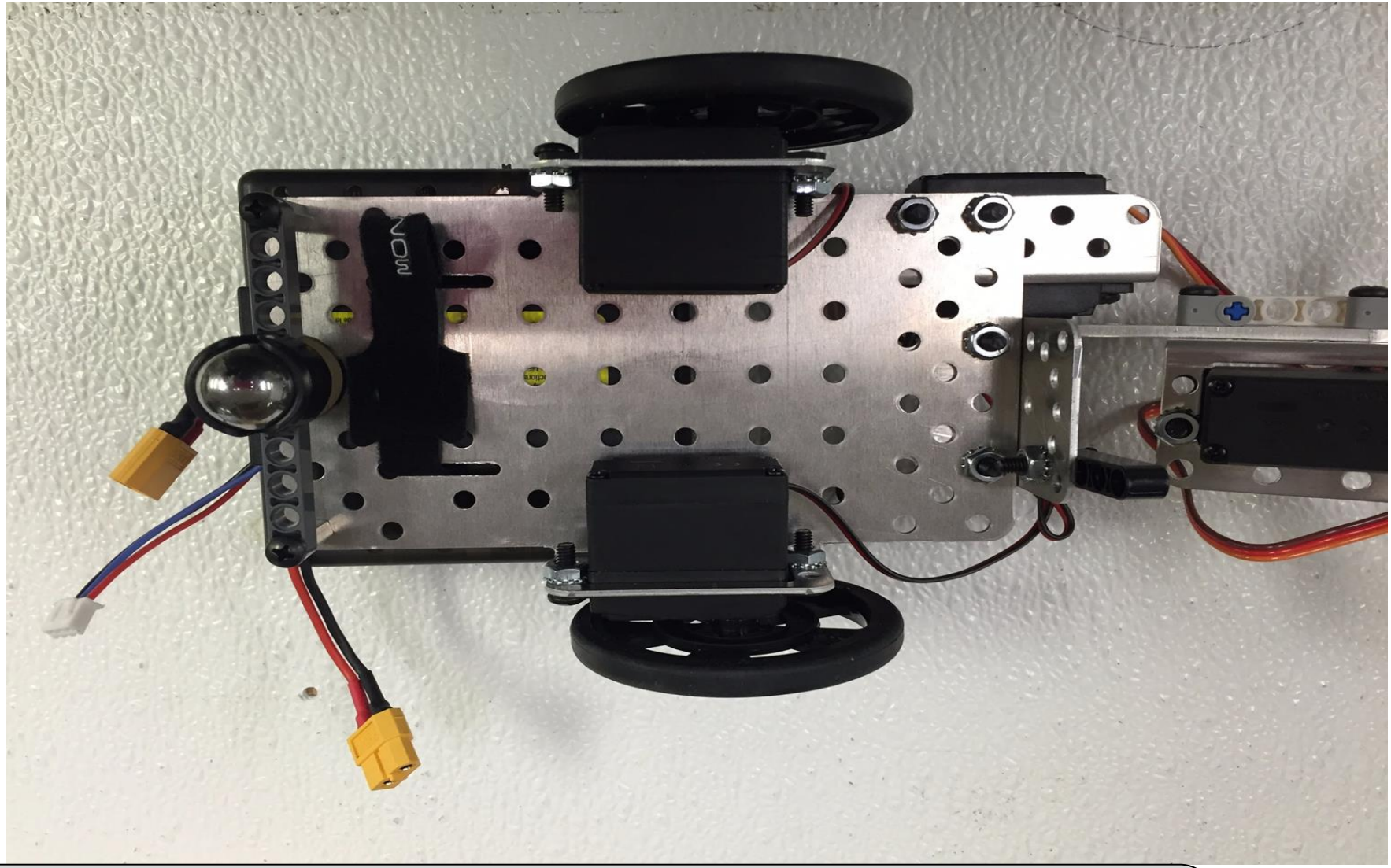

Pull tight and lock in place with the velcro. It will be a little loose, but this is okay and will not effect the robot performance.

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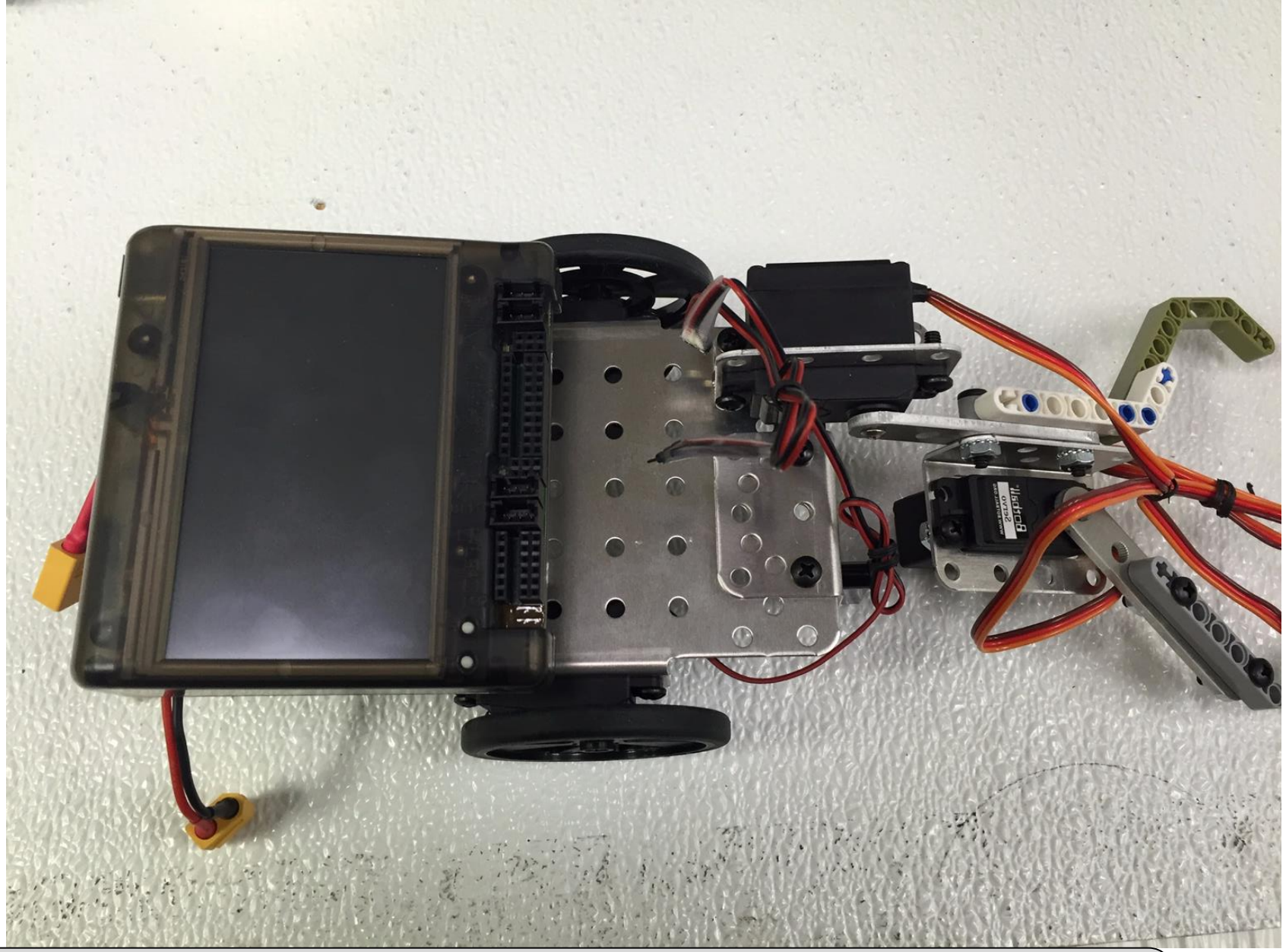

After you flip the robot back over, it should look like this.

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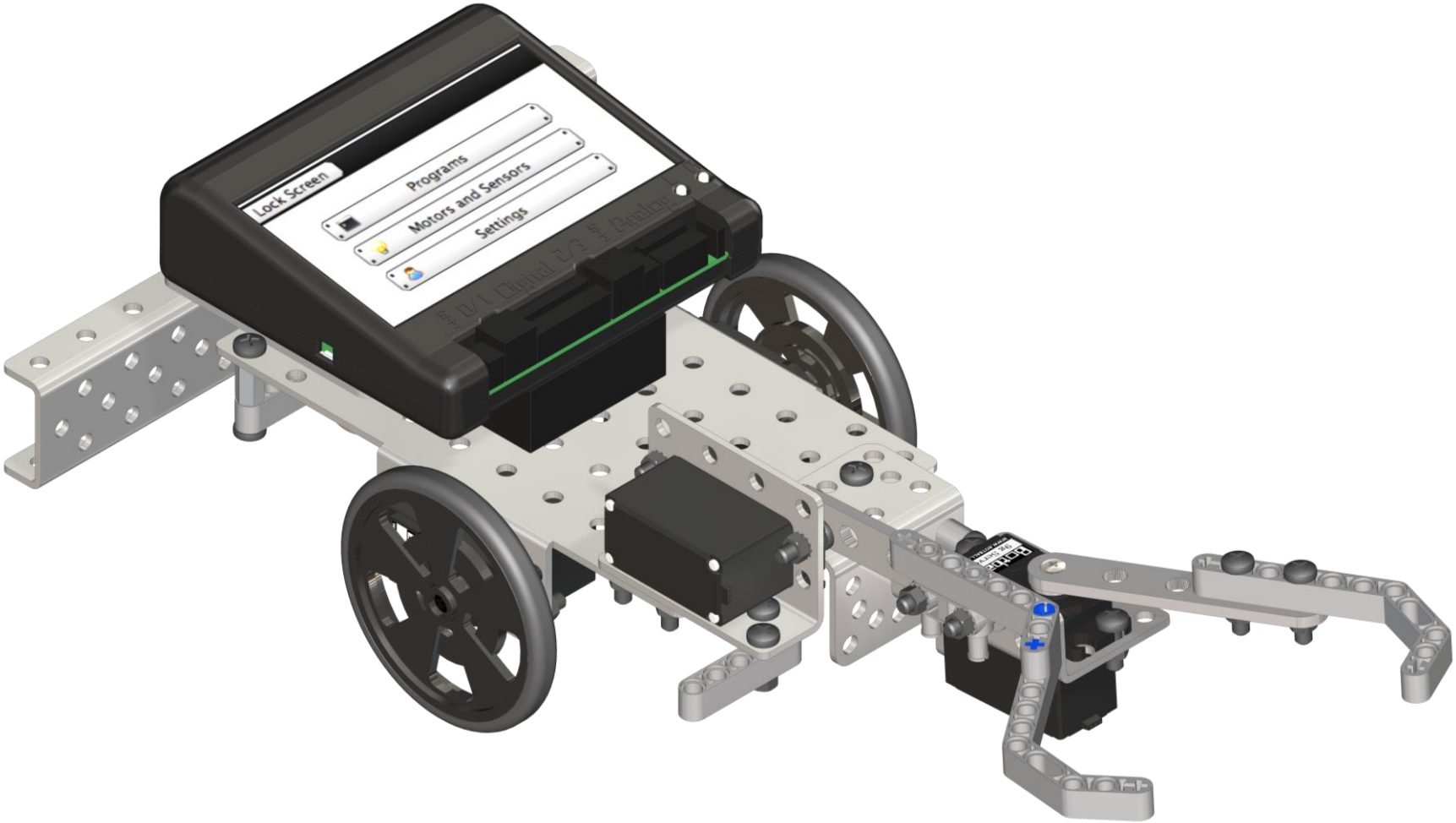


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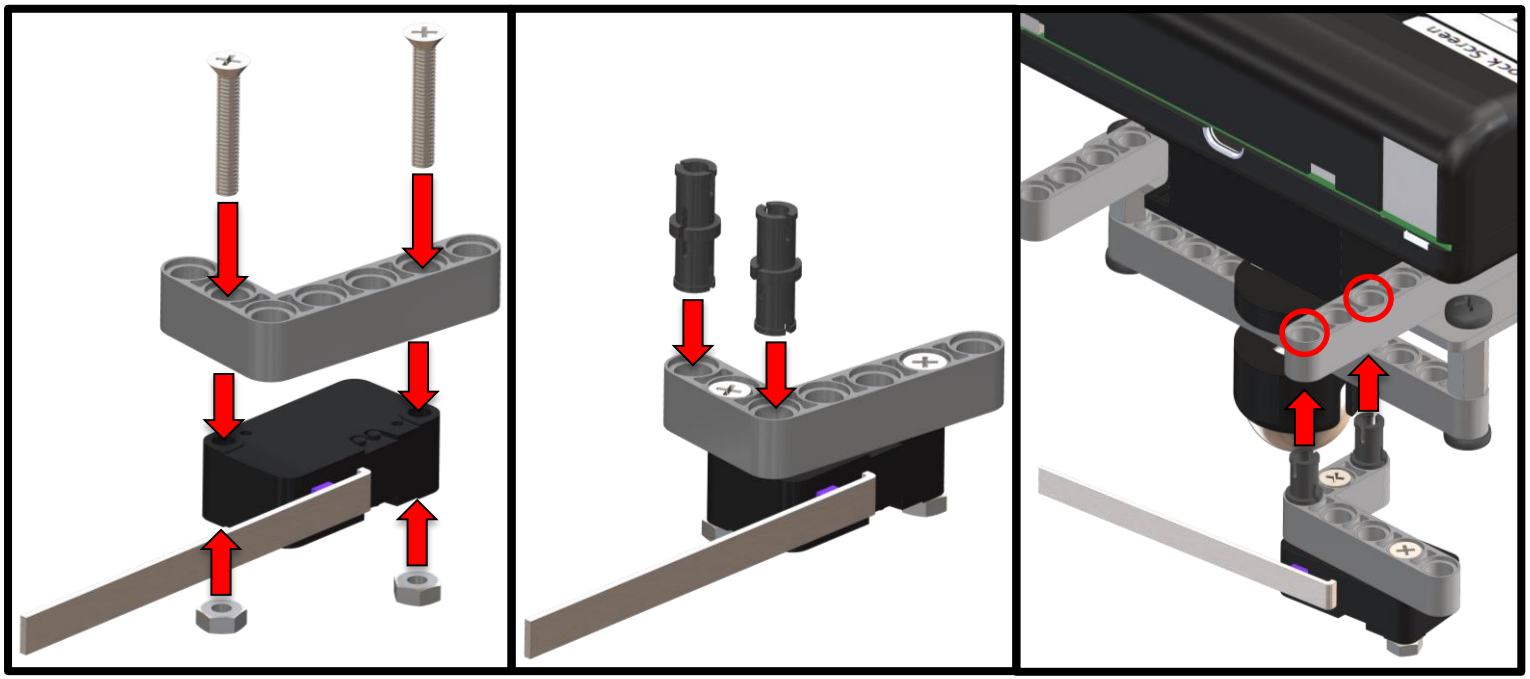
# Mounting the Lever Sensor



To add the lever sensor mount. Remove the channel you used for the bulldozer on the back of the Wallaby and then follow the steps above.

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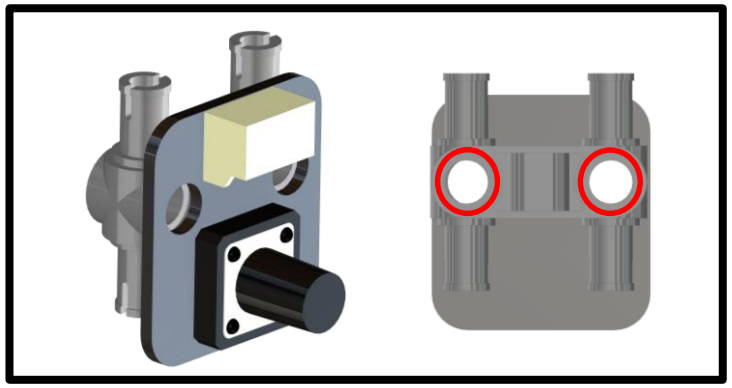
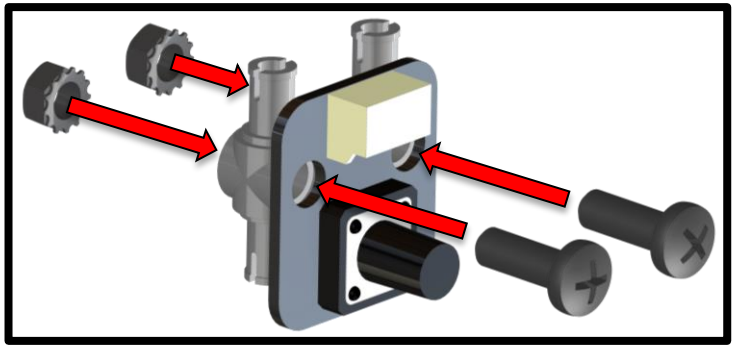
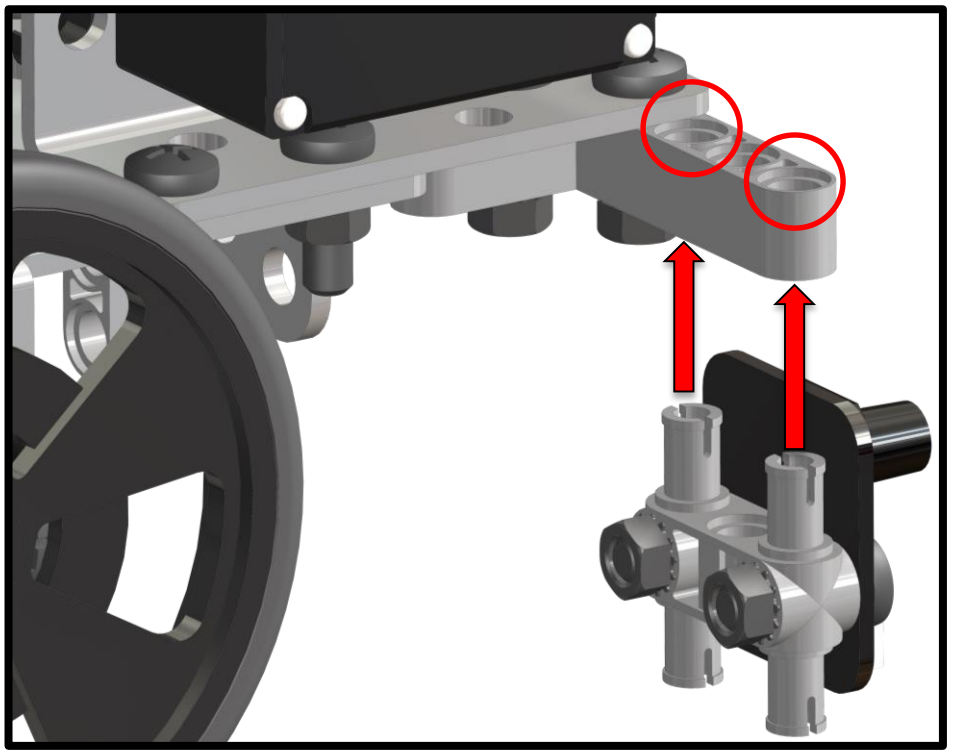
# Mounting the Large Touch Sensor







Line up the touch sensor with the axel joiner 3 long with 4 pins. Then add medium black screws and nuts to secure it.

Once it has been secured add it to the front of the Demobot as shown above.

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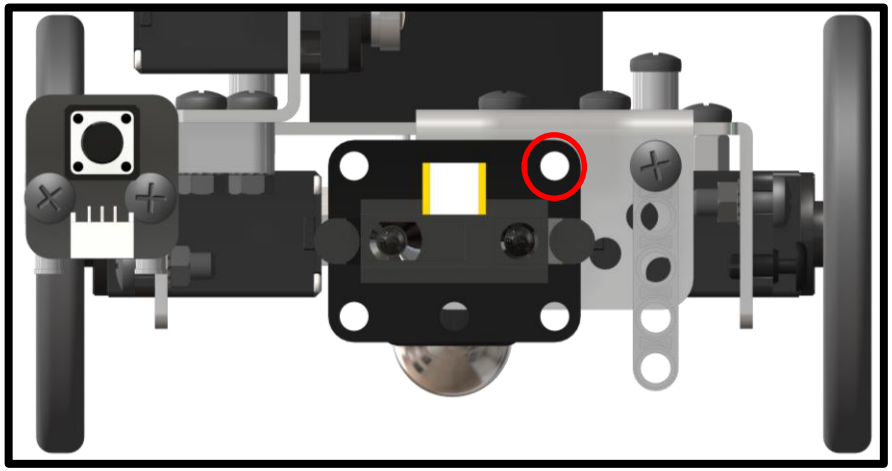
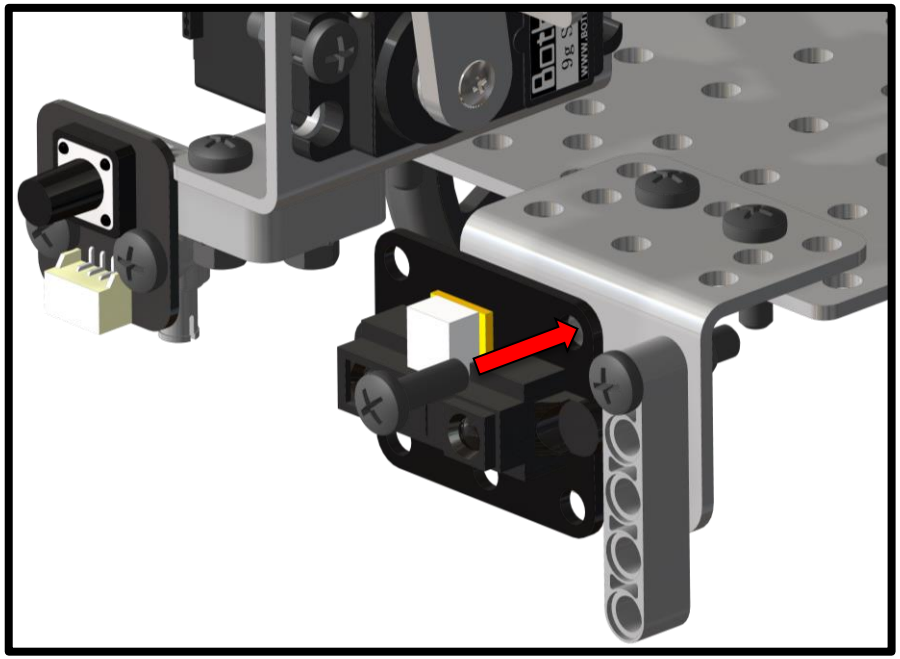
# Mounting the Rangefinder Sensor





To add the rangefinder sensor, line up the hole on the sensor with the hole on the L-bracket as shown above and then attach it with a medium bolt and a nut.

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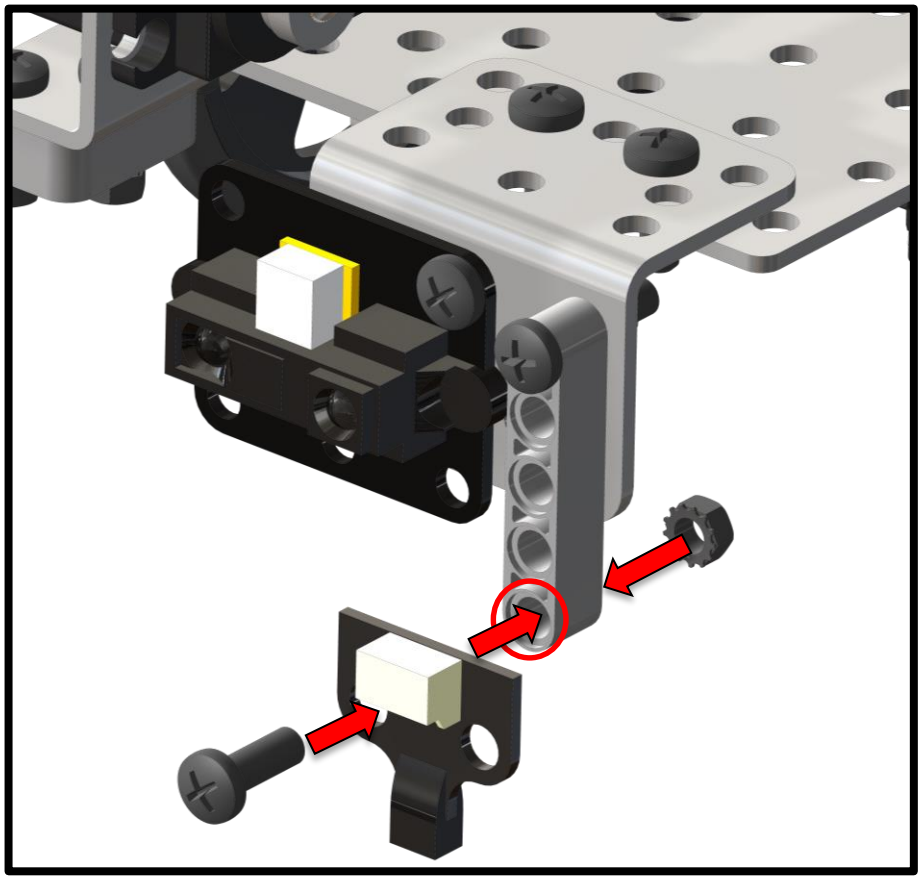
# Mounting the IR Sensor



To add the IR sensor, line up the hole on the sensor with the hole on the 1x5 liftarm as shown above and then attach it with a medium bolt and a nut.

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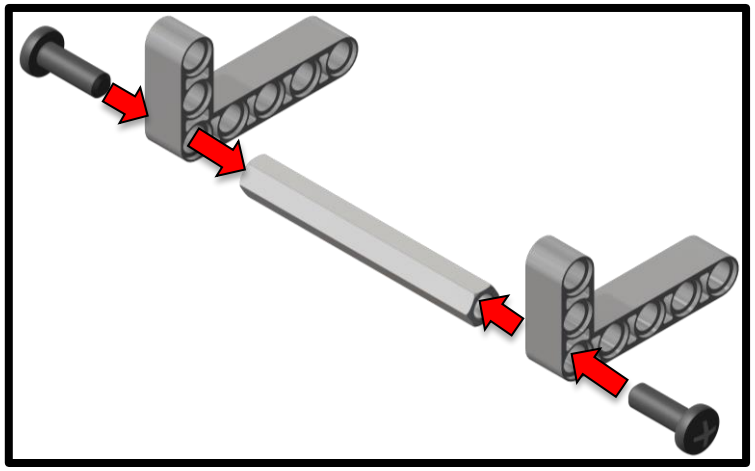
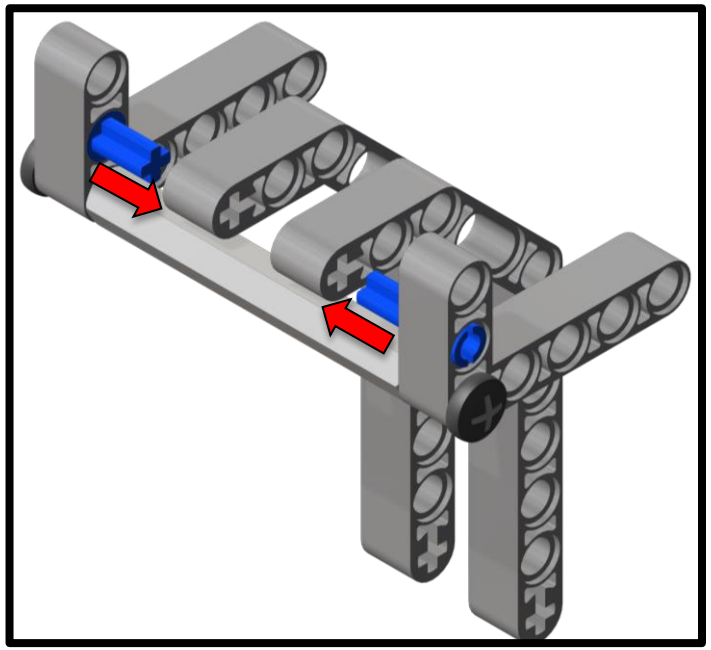
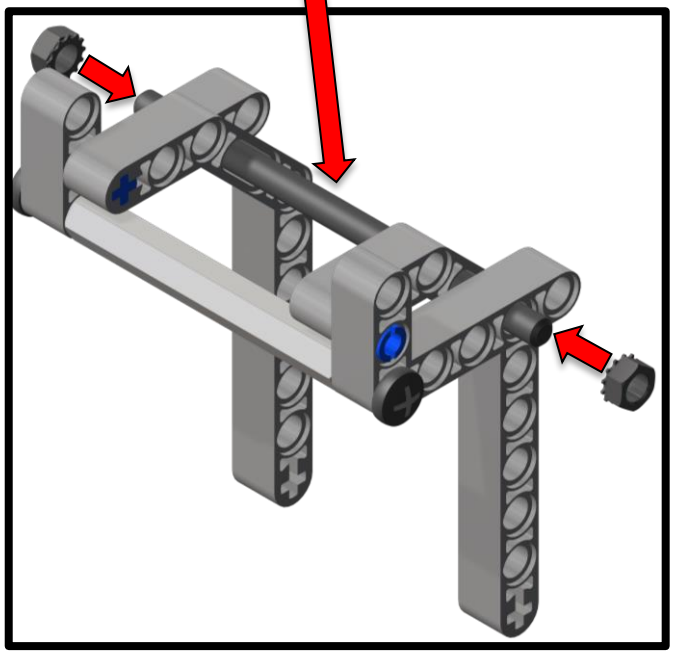
# Mounting the Camera



Start with a 2” Standoff attach a 3x5 liftarm to each end at the hole in the bend with regular screws.
Attach the large bent liftarms using the blue axel-pins as shown.
Run a 3” headless screw through the holes as shown and secure it with two nuts.





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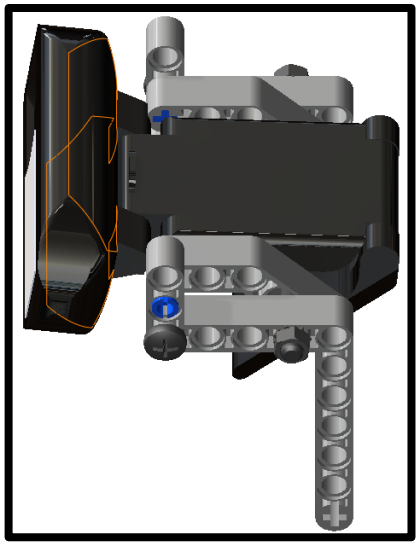
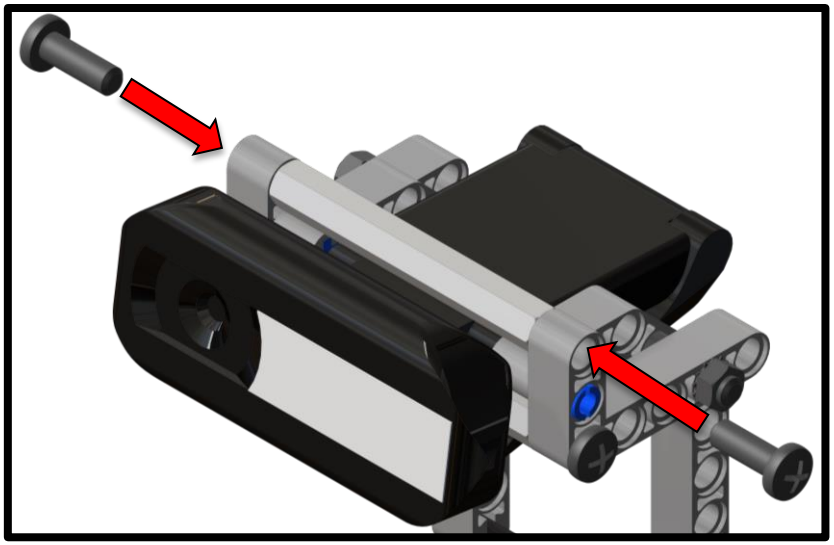
# Mounting the Camera





Wrap the camera around the standoff and headless screw as shown.
Then secure it with another standoff on top of it screwed in with two regular screws as shown above.

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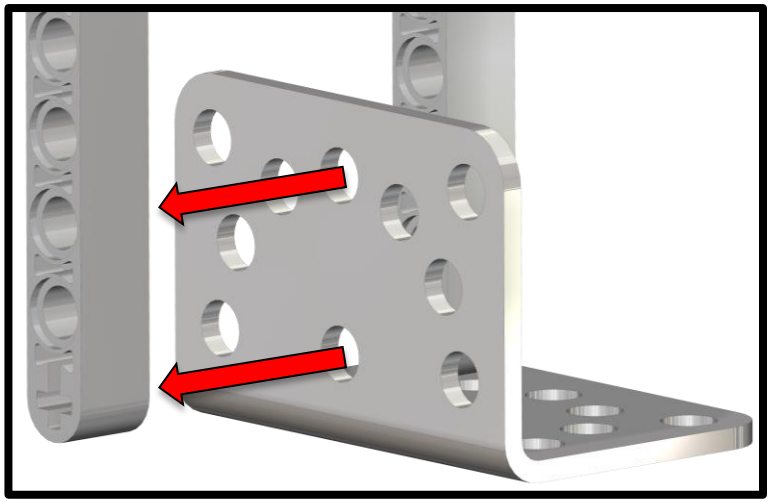
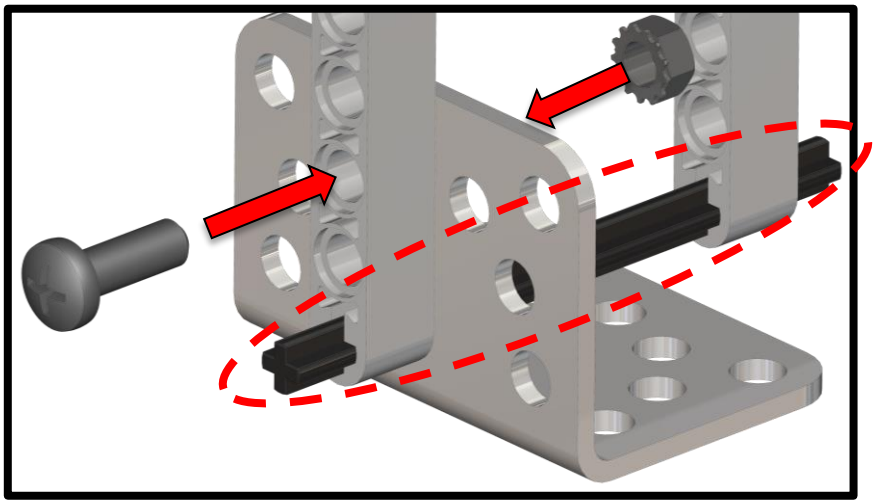
# Mounting the Camera





Line up the L-bracket holes with the bottom holes of the mount on the inside as shown above.
Then attach it by running an axle through both pieces of lego and the bottom middle hole of the bracket and securing the top of the bracket with a medium screw.

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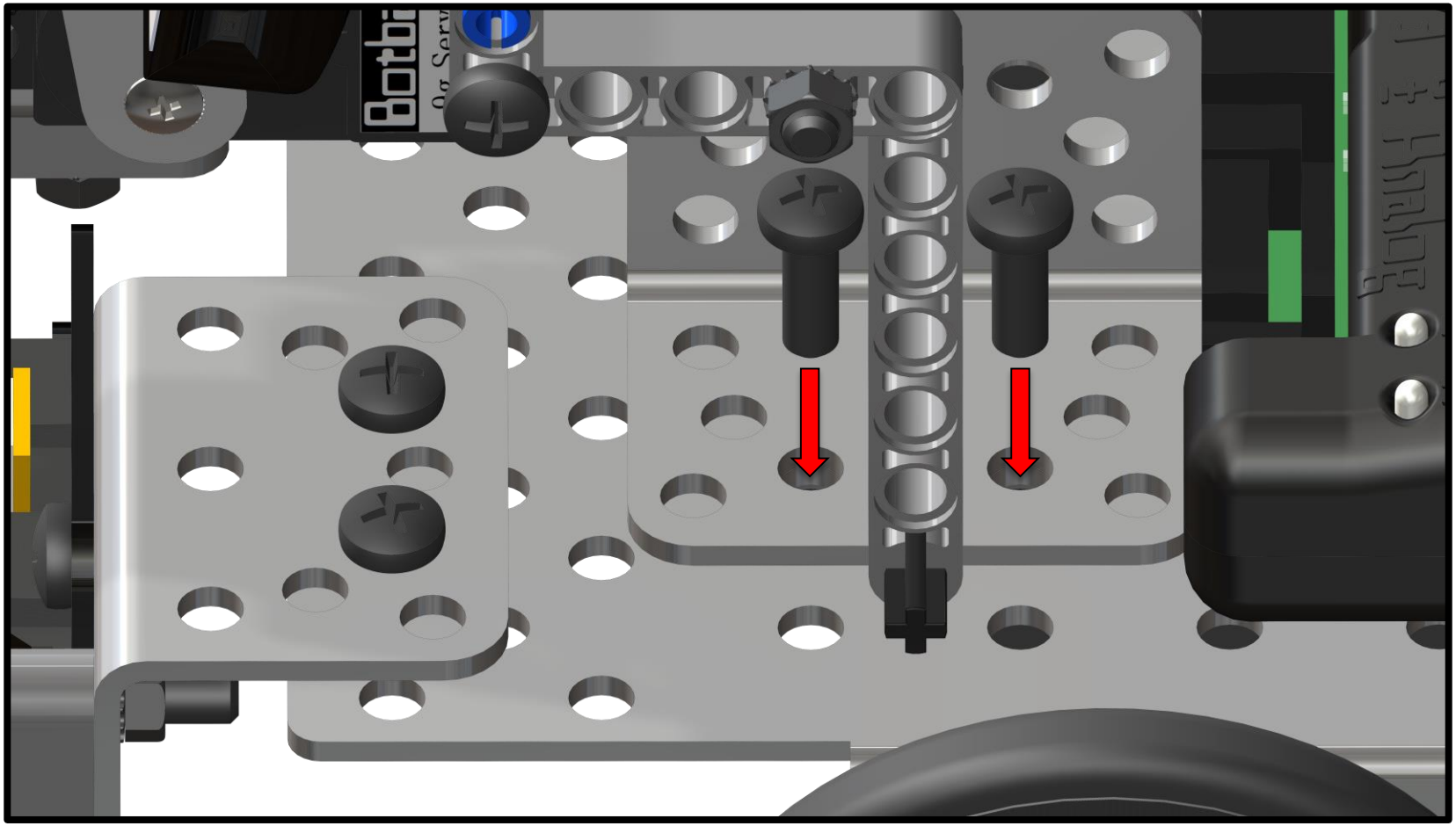
# Mounting the Camera



Secure your camera mount to the rest of the robot as show above using two regular screws.

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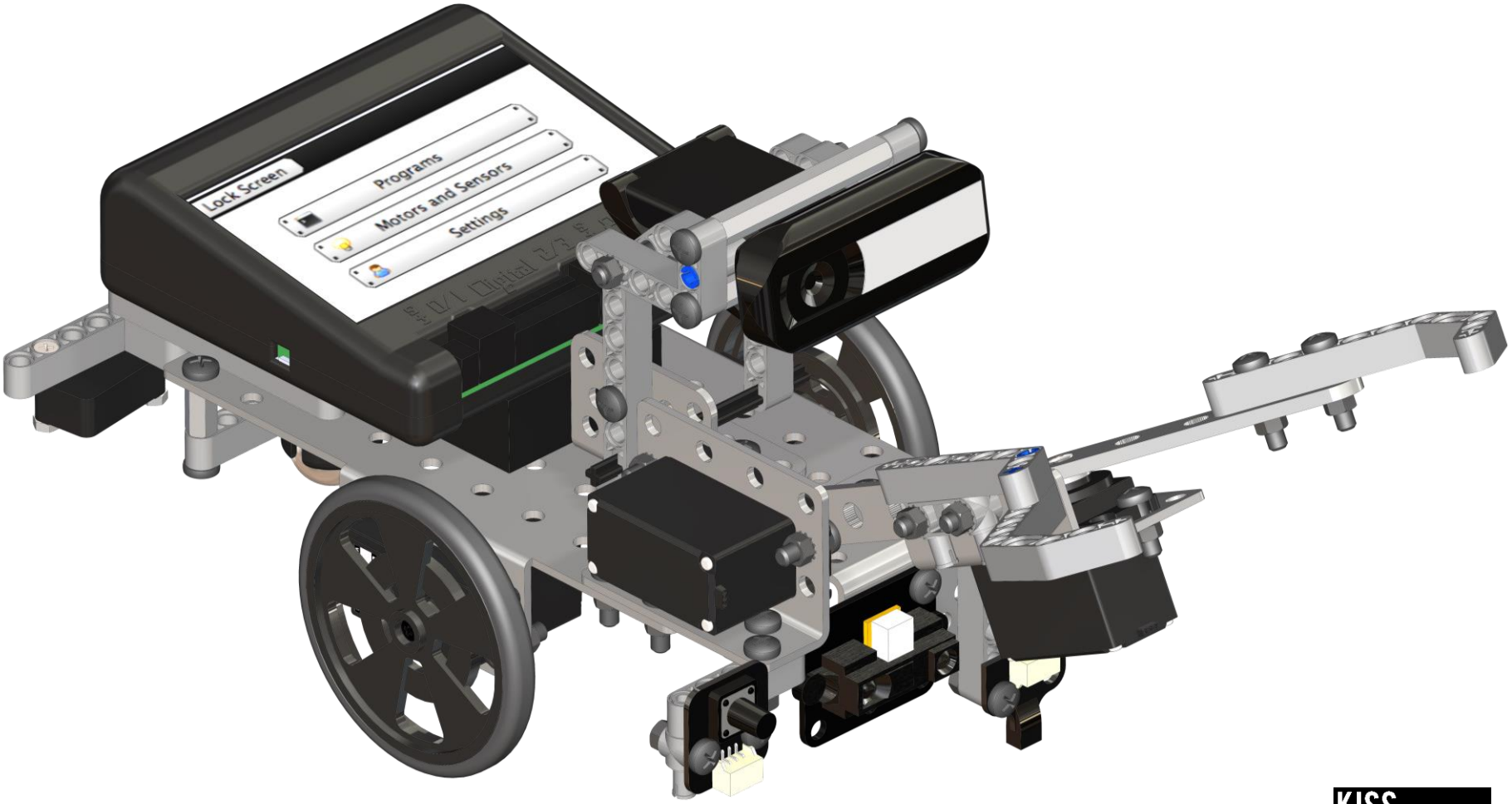
# Finished!

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