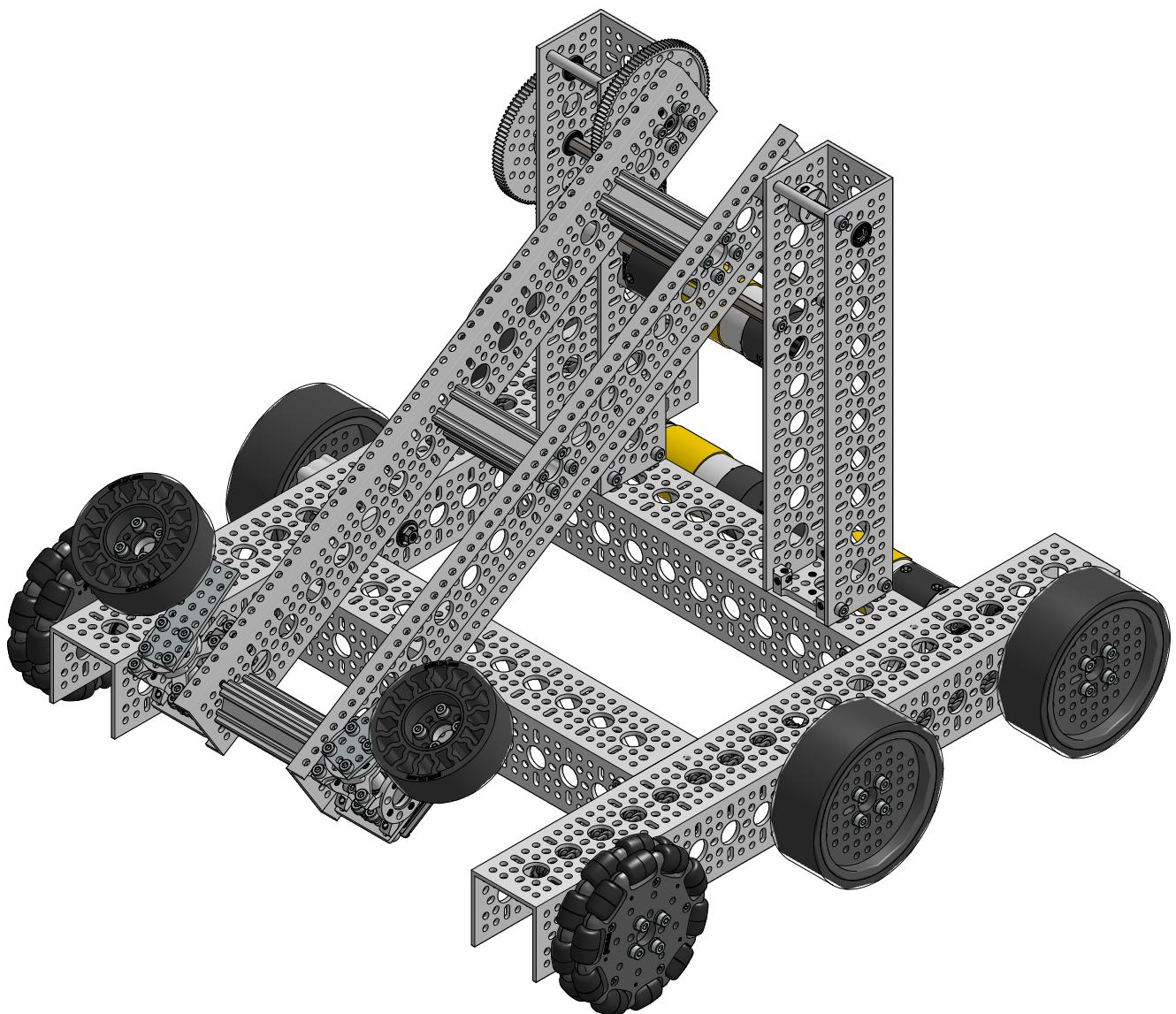
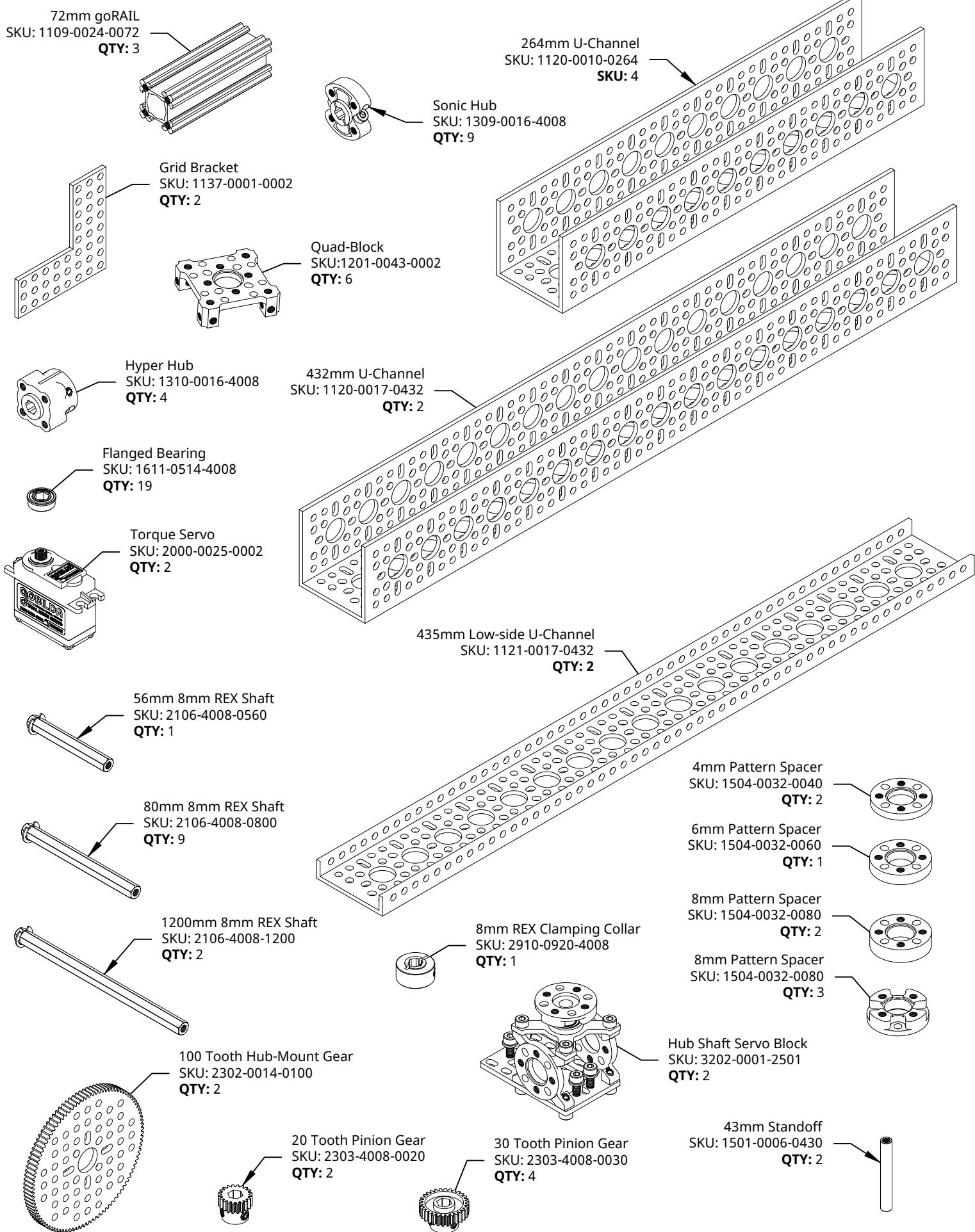


Assembly Instructions for
FTC Kit Chassis/Robot
SKU: 3200-4008-2122



Parts Used in Assembly:



Parts Used in Assembly:

8mm M4 Socket Head Screw
SKU: 2800-0004-0008
QTY: 36

10mm M4 Socket Head Screw
SKU: 2800-0004-0010
QTY: 68

12mm M4 Socket Head Screw
SKU: 2800-0004-0012
QTY: 16

14mm M4 Socket Head Screw
SKU: 2800-0004-0014
QTY: 4

18mm M4 Socket Head Screw
SKU: 2800-0004-0018
QTY: 32

20mm M4 Socket Head Screw
SKU: 2800-0004-0020
QTY: 8

30mm M4 Socket Head Screw
SKU: 2800-0004-0030
QTY: 8

4mm Washer
SKU: 2801-0004-0008
QTY: 33

8mm ID 0.5mm Thick Shim
SKU: 2807-0811-0500
QTY: 18

M4 Locknut
SKU: 2812-0004-0007
QTY: 8

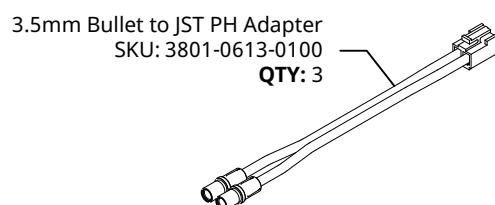
96mm Rhino Wheel
SKU: 3601-0014-0096
QTY: 4

96mm Omni-Wheel
SKU: 3604-0014-0096
QTY: 4

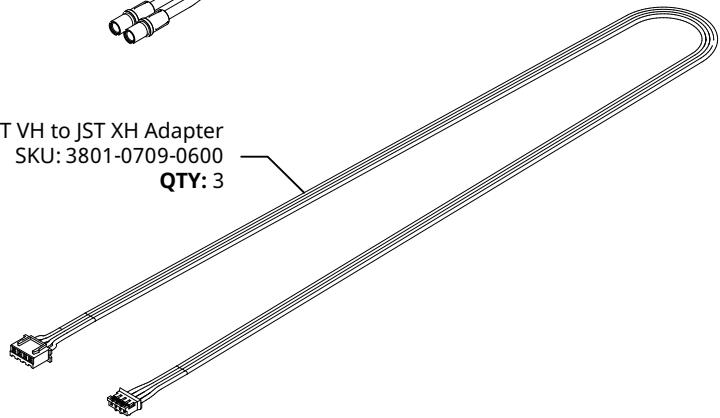
10 Tooth Pinion Sprocket
SKU: 3307-4008-0010
QTY: 4

8mm Pitch Plastic Chain
SKU: 3309-0108-0050
QTY: 216 Links

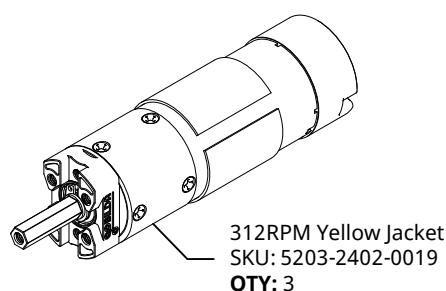
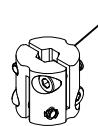
14 Tooth Hub-Mount Sprocket
SKU: 3310-0014-0014
QTY: 4



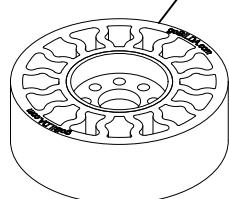
600mm JST VH to JST XH Adapter
SKU: 3801-0709-0600
QTY: 3



8mm REX to 8mm REX Coupler
SKU: 4007-4008-4008
QTY: 1

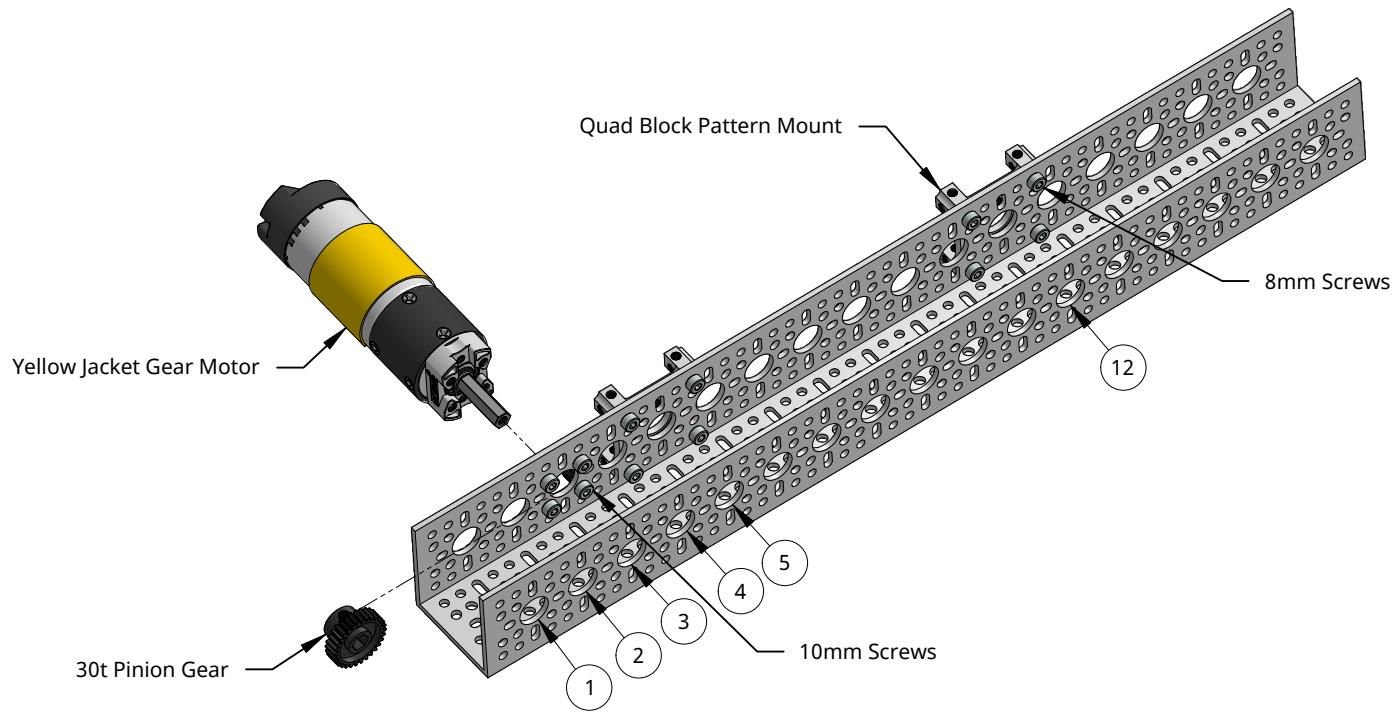


72mm Gecko Wheel
SKU: 3613-0014-0072
QTY: 2



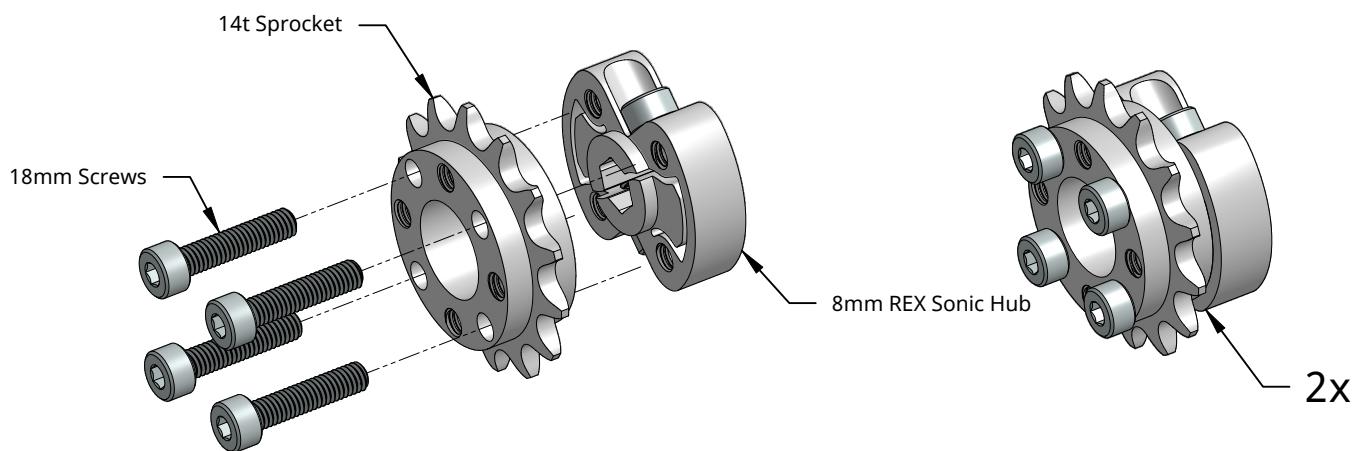
Chassis-Step 1

Add your motor to the 3rd hole in the 17 Hole U-Channel with 4x 10mm screws, then slide the 30t gear onto the output shaft of the motor. Add a Quad Block Pattern Mount to the 5th and 12th hole on the U-Channel using 8mm screws.



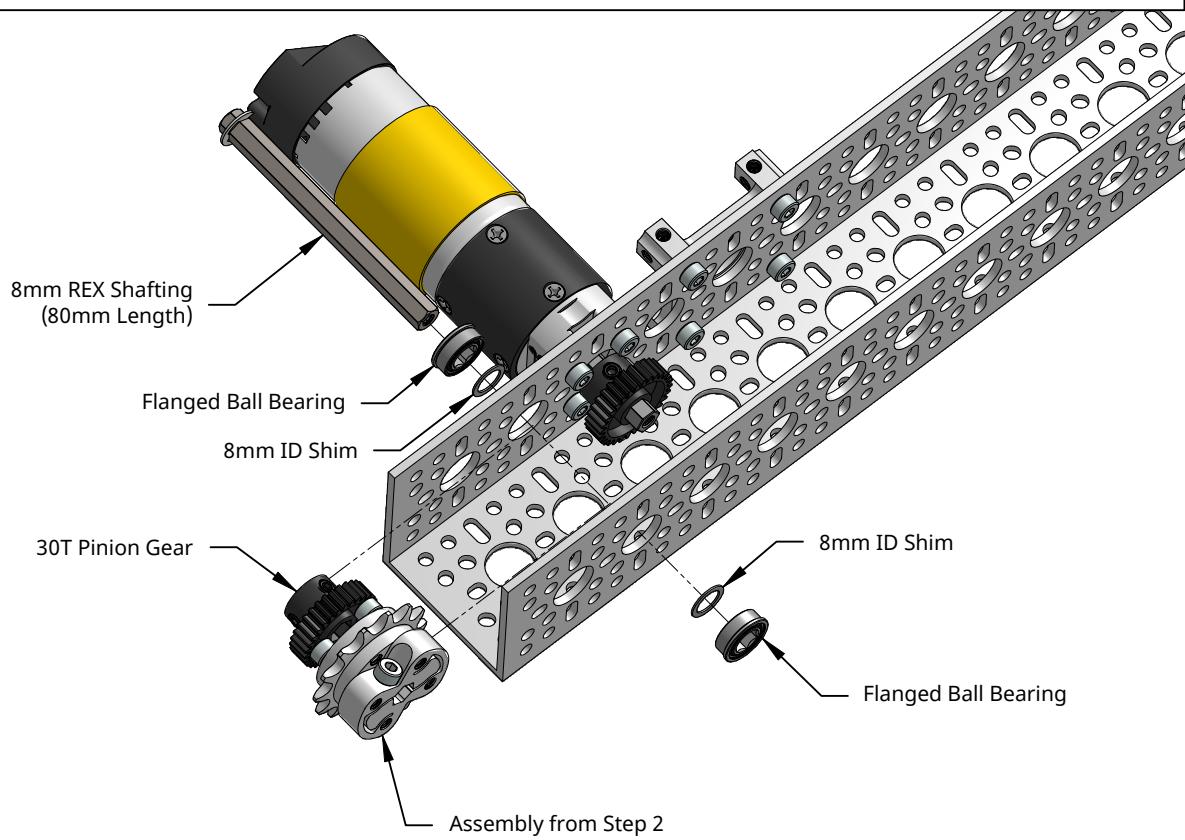
Chassis-Step 2

Create a small sub-assembly using the 14t sprocket, 8mm REX Bore Sonic Hub, and 4 18mm screws. Create two of this assembly.



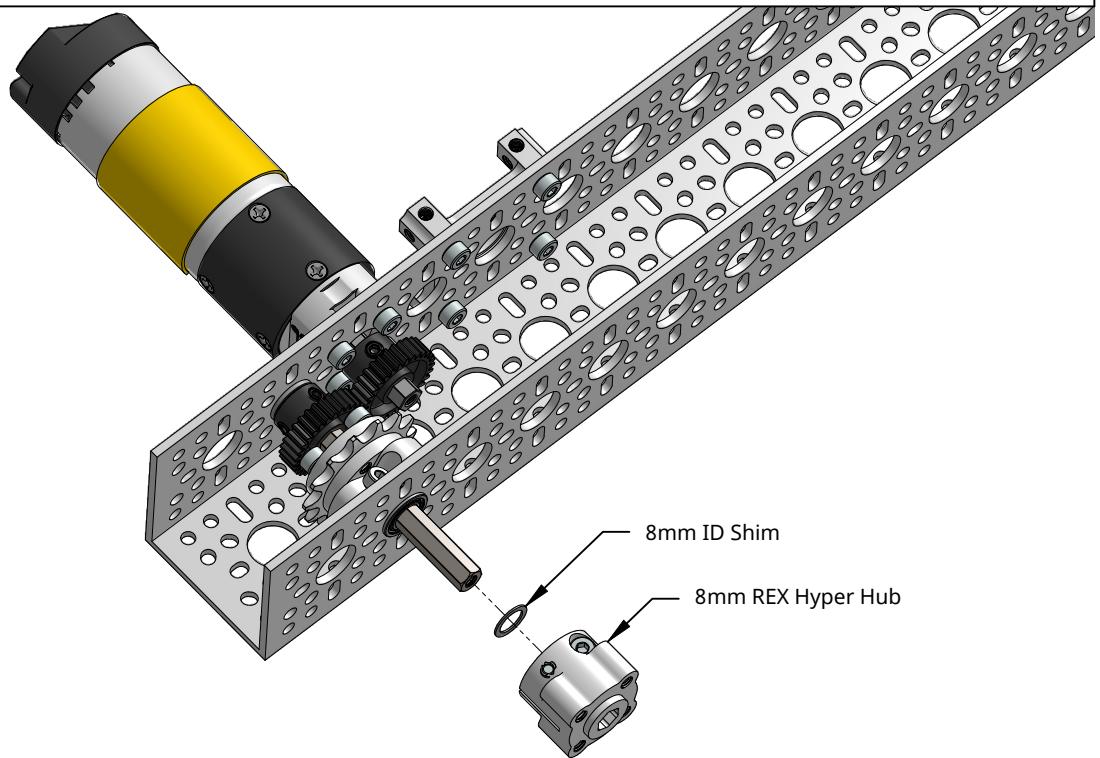
Chassis-Step 3

In this step you will assemble the drive system for the back wheel, start by putting a Flanged Ball Bearing onto the 8mm REX Shafting and insert it into the hole adjacent to the motor, then add a shim and a 30T Pinion Gear. Followed by the assembly you made in Step 2. After that add a shim and a flanged bearing. At this step leave all the pinch bolts and set screws loose.



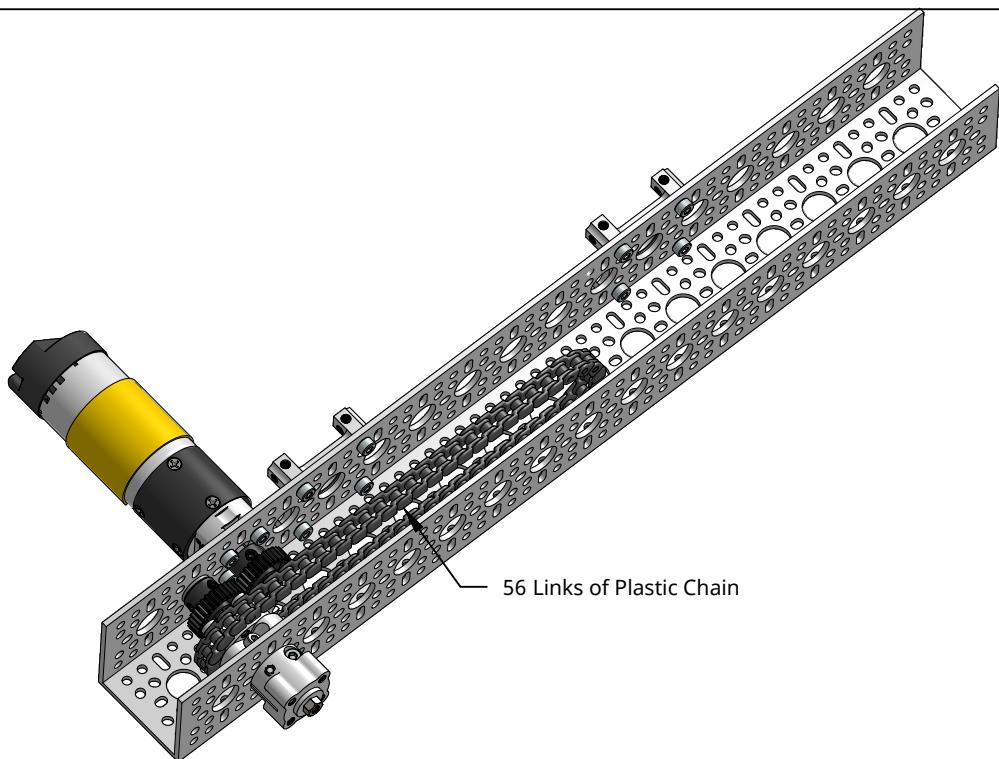
Chassis-Step 4

Because the shaft in this step is constrained by pinching the bearings between the shaft e-clip and the Hyper Hub, you'll want to make sure the flanges of the bearings are tight against the channel wall, then tighten the pinch bolts on the Hyper Hub. Make sure your shaft has no linear play, then push the Pinion Gear up against the inside of the bearing and tighten the screw screws. Then push the assembly you made in step 2 up against the bearing and shim and tighten the pinch bolts on the Sonic Hub. You can now align the gear on your motor shaft with its mating gear, and tighten its set screws.



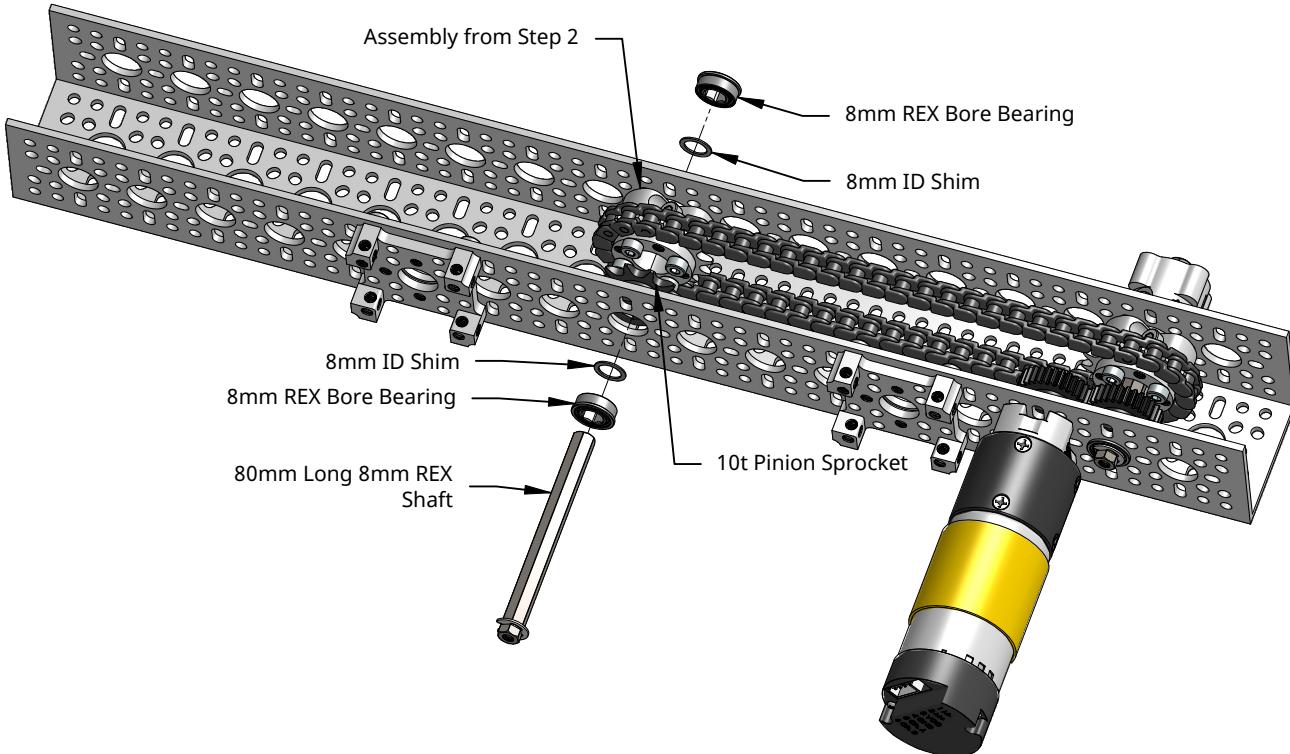
Chassis-Step 5

Assemble 56 links of plastic chain and join them as a loop around the 14 tooth sprocket you've assembled.



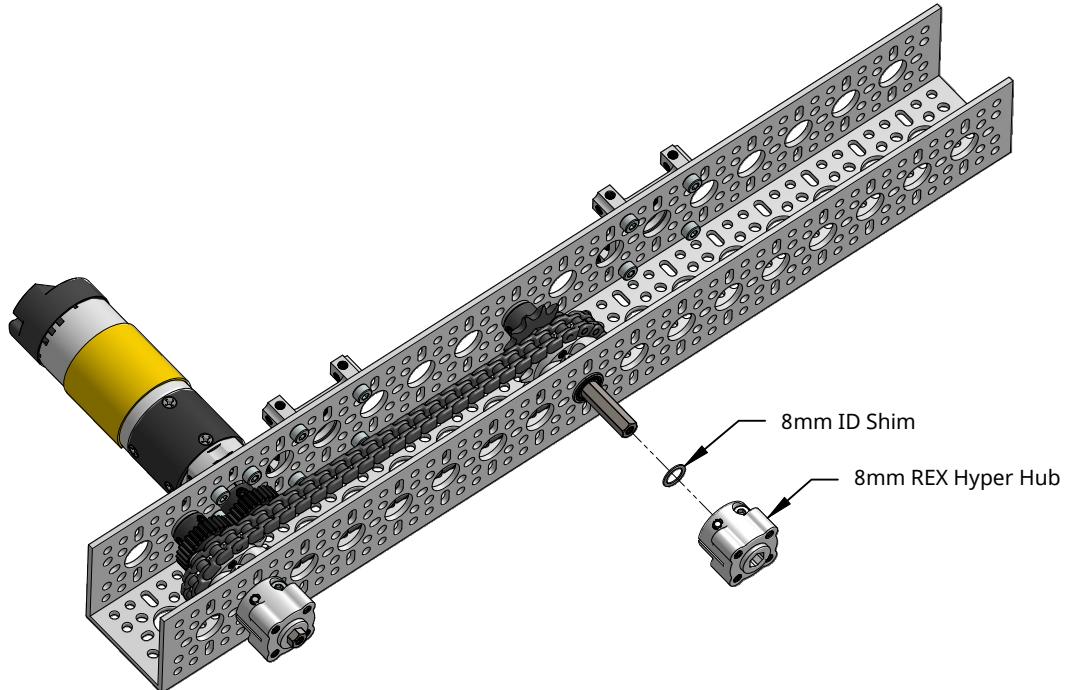
Chassis-Step 6

Add an 8mm REX Bore bearing to an 80mm long 8mm REX Shaft with the flange of the bearing against the E-Clip of the shaft. Then add a shim to the face of the bearing, slide it into the center hole of channel and add a 10 Tooth Pinion Sprocket, then the Sonic Hub and Sprocket assembly you made in Step 2. Follow it up with a shim and bearing which you can insert from the far side of the channel.



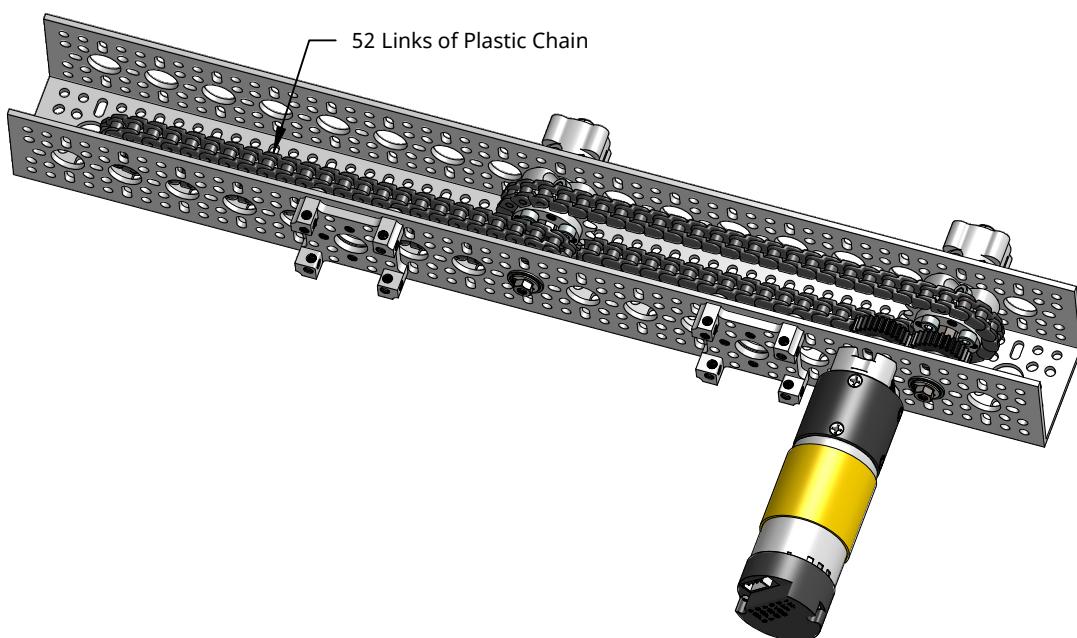
Chassis-Step 7

This step is very similar to step 5, slide a shim and a Hyper Hub onto the shaft while making sure the flanges of the bearings are tight against the channel, and the E-clip on the shaft is pressed up against its bearing. Then tighten the pinch bolts on the Hyper Hub. Make sure your shaft has no linear play, then push the Pinion Gear up against the inside of the bearing and tighten the screw screws. Then push the assembly you made in step 2 up against the bearing and shim and tighten the pinch bolts on the Sonic Hub.



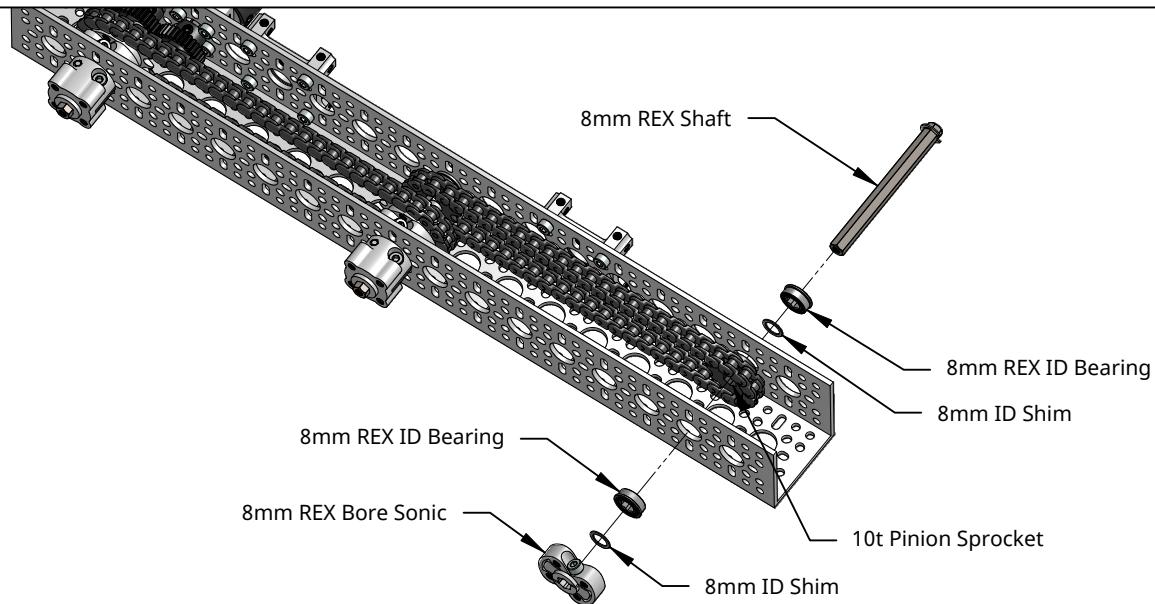
Chassis-Step 8

Assemble 52 links of plastic chain and loop them around the 10t Pinion Sprocket before closing the loop.



Chassis-Step 9

Insert a 10t Pinion Sprocket into the run of plastic chain, then insert an 80mm long 8mm REX Shaft into a bearing with the flanged-side of the bearing in contact with the E-clip. Then add an 8mm ID shim and slide the shaft assembly into the bore of the sprocket, on the far side of the channel add another 8mm REX ID Bearing, followed by an 8mm ID shim, and an 8mm REX Bore Sonic Hub. Making sure your bearings are tight against the channel, and the E-clip is tight against the bearing, tighten the pinch bolts on the Sonic Hub. Then slide your sprocket against the shim and bearing, and tighten its set-screws.

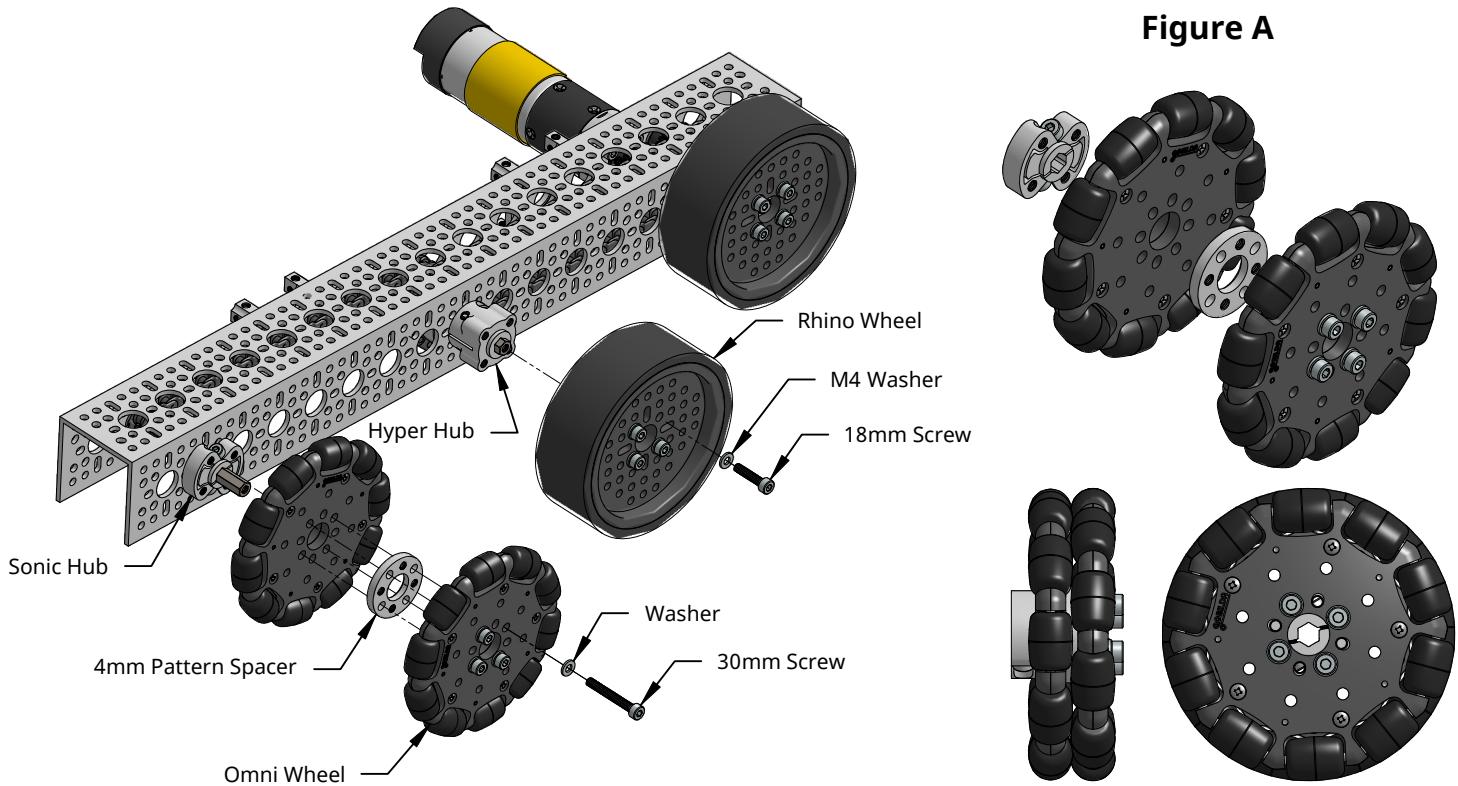


Chassis-Step 10

Mount the Omni and Rhino Wheels to your chassis using Sonic and Hyper Hubs.

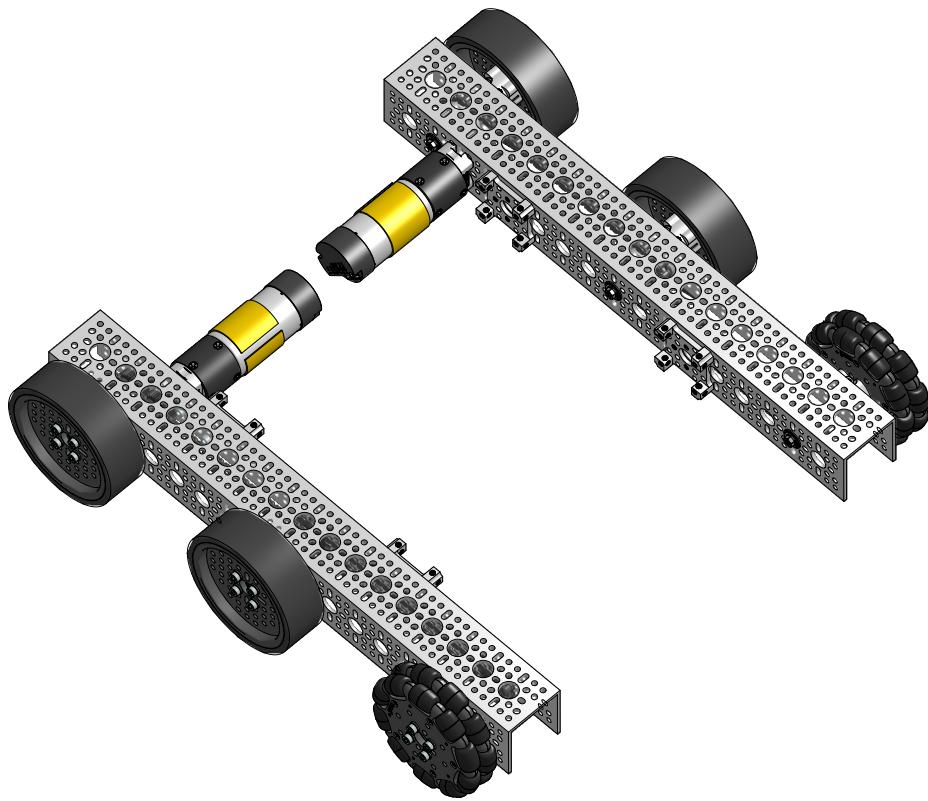
Tech Tip: When mounting the Omni Wheels, clock the two Omni Wheels 180 degrees from one another (compare the goBILDA logos in Figure A) with a Pattern Spacer in-between.

Figure A



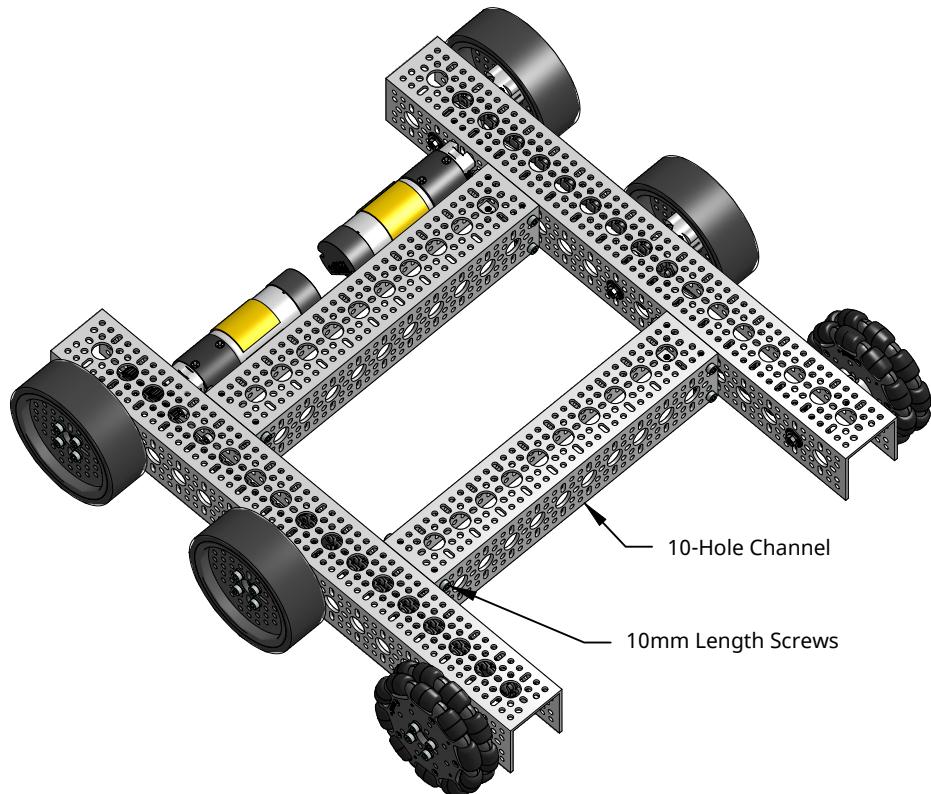
Chassis-Step 11

Follow steps 1-9 to create a mirror image of the assembly you've made. When finished you should have the two sides of your drivetrain.



Chassis-Step 12

Using 10mm long screws, fasten the 10 Hole U-Channel to the Quad Block Mounts attached to your chassis rails. These will act as cross-bars to hold your chassis together. This step completes your chassis! You're good to get rolling if your focus is drivetrains, in the next steps we will focus on building an arm assembly for this chassis.

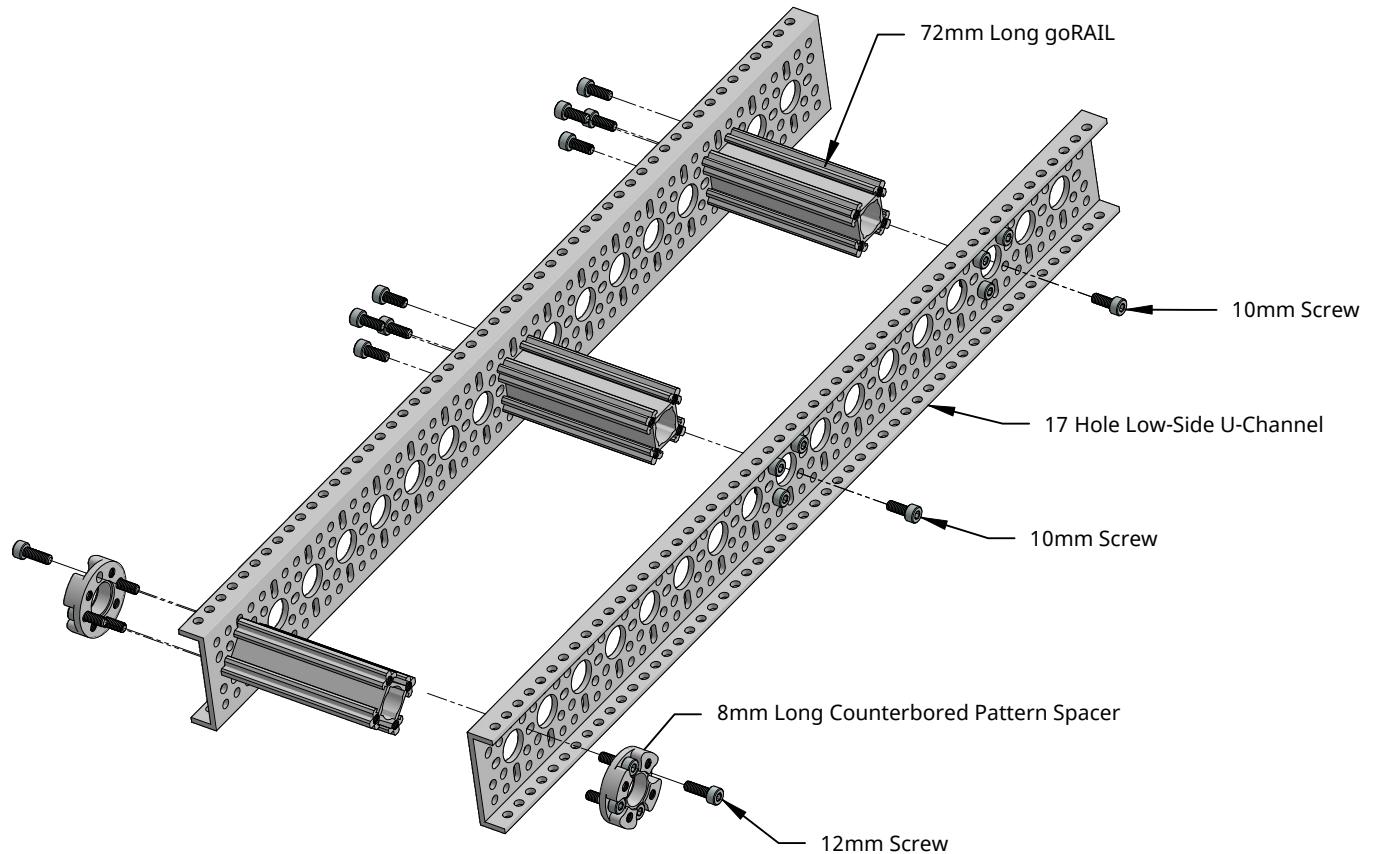


Arm - Step 1

The arm assembly of this kit is based around 17 Hole Low-Side U-Channel. Use 3 72mm goRAILS to bolt the two pieces of Low-Side U-Channel together. Make sure to follow the orientation of the goRAIL shown.

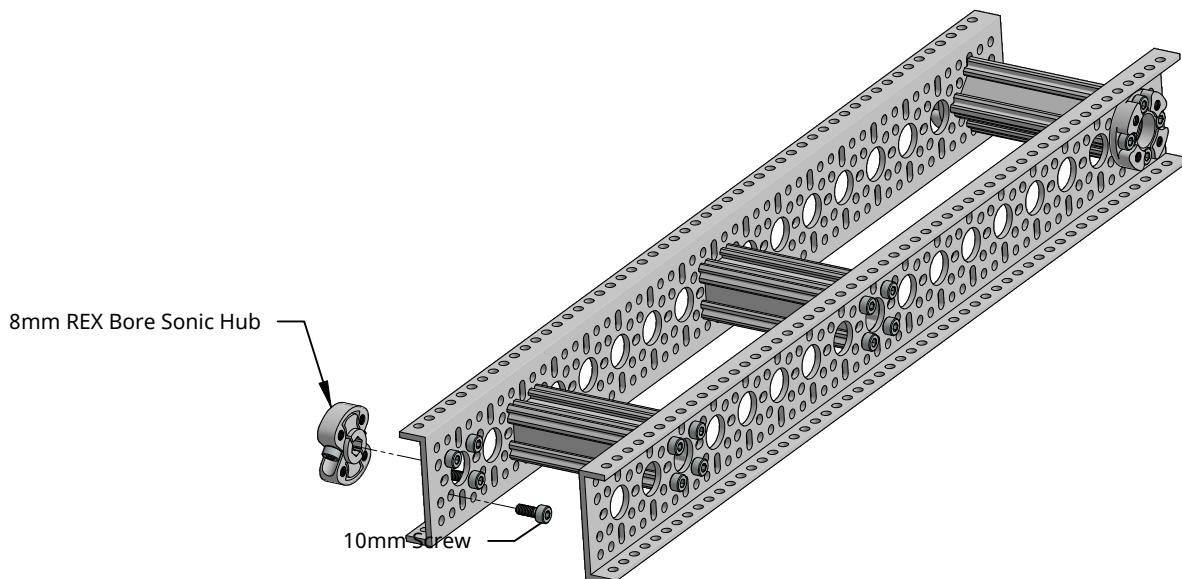
Tech Tips:

- 1: Make careful note of the orientation (the open side of the U out) in order to keep it on-pattern.
- 2: The Counterbored Pattern Spacers and the last goRAIL are clocked 45°, this is to facilitate mounting the claw assembly parallel or perpendicular to the arm, if instead, you want your claw system to be clocked 45°, orient the goRAIL with a flat side parallel to the Low-Side Channel.



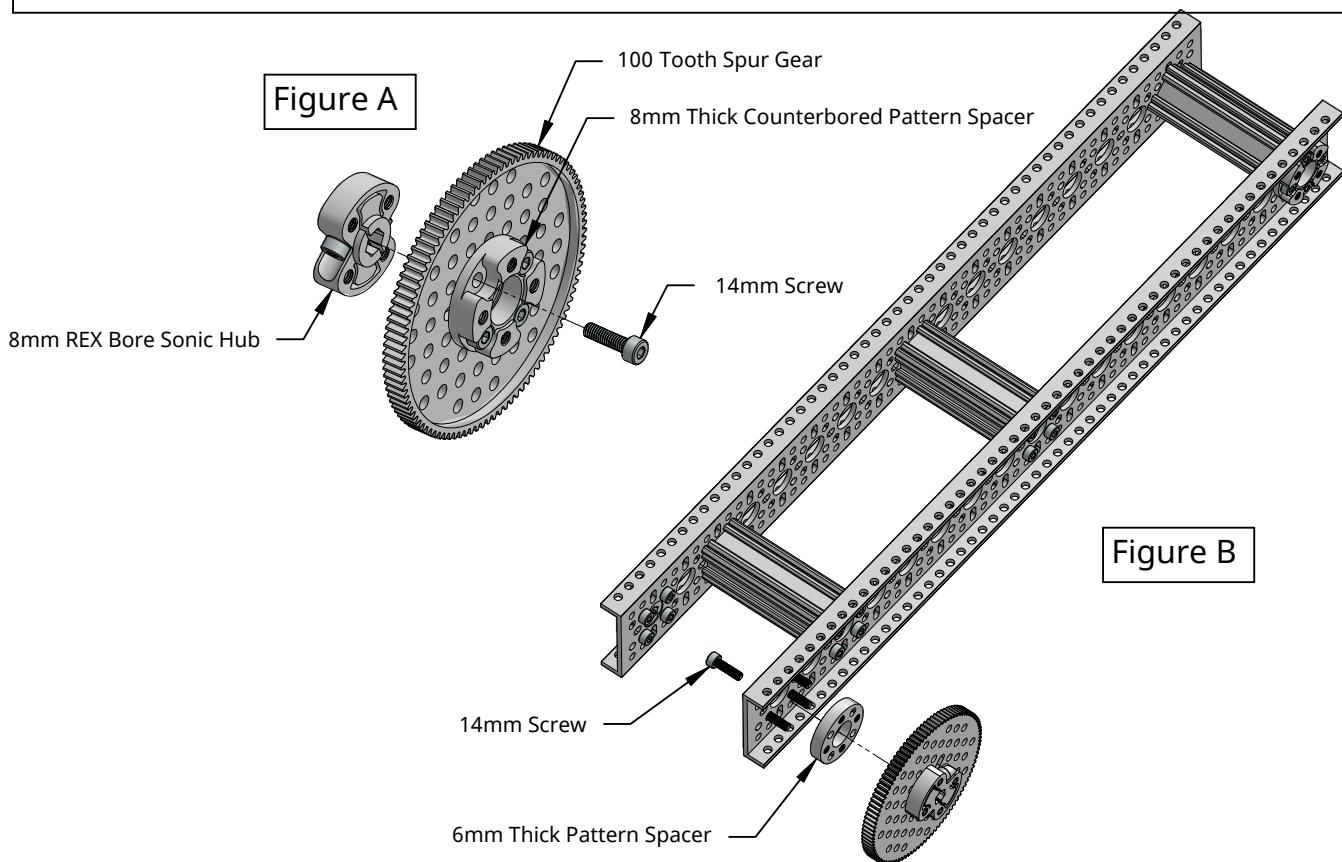
Arm - Step 2

Attach a Sonic Hub to the last hole of the Low-Side U-Channel using 10mm Screws.



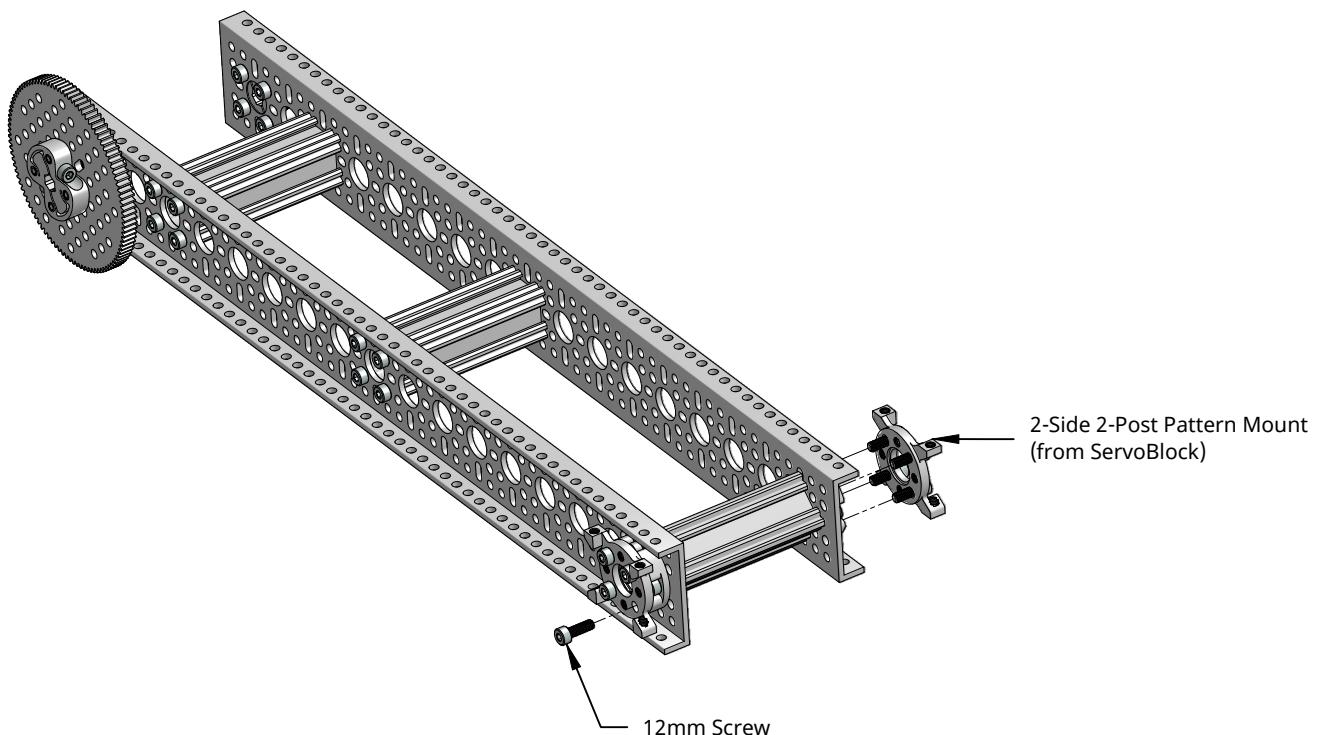
Arm - Step 3

Attach a Sonic Hub and a Counterbored Pattern Spacer to a 100 Tooth gear as shown in Figure A. Then attach that assembly to the arm assembly as shown in Figure B.



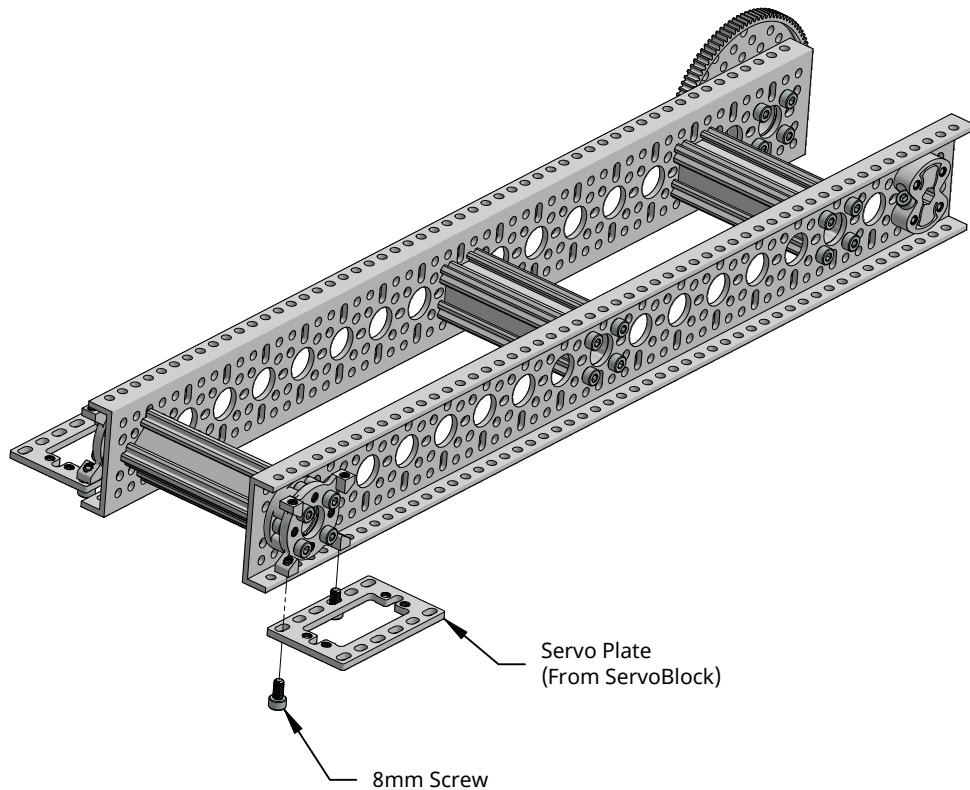
Arm - Step 4

Attach a 2-Side 2-Post Pattern Mount (from your ServoBlock kits) to the Counterbored Pattern Spacer using 12mm screws.



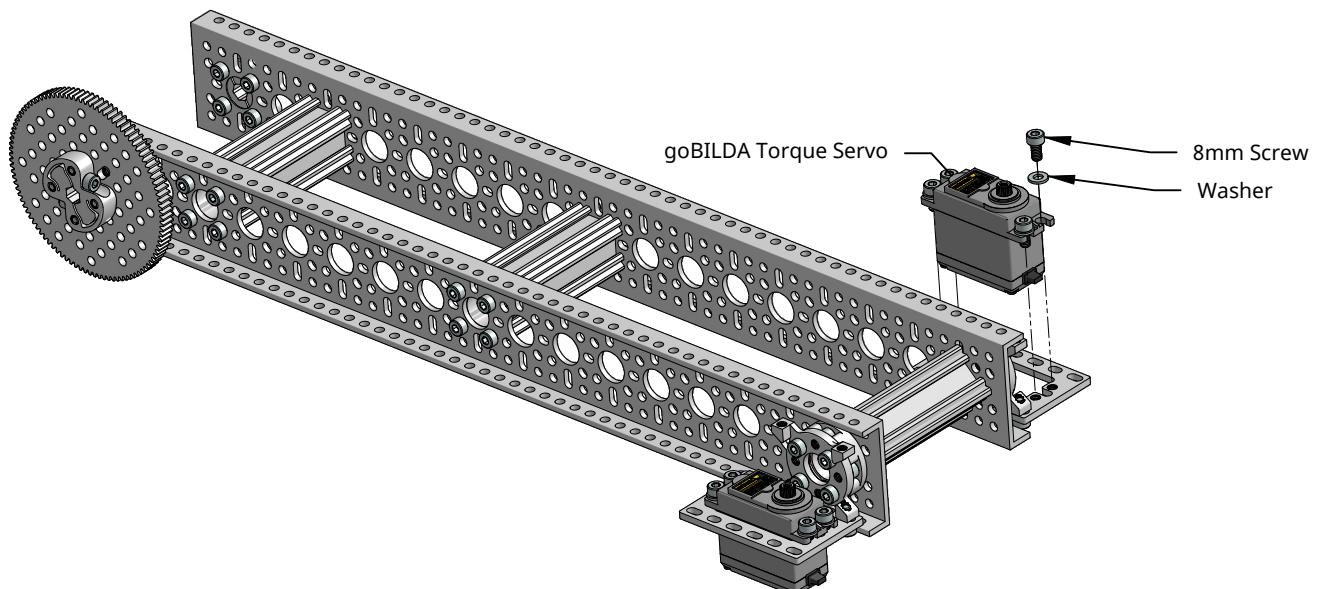
Arm - Step 5

Attach a Servo Plate (from ServoBlock kit) to the bottom of the 2-Side 2-Post Pattern Mounts (when viewed with the gear on the left) using 8mm Screws.



Arm - Step 6

Mount a goBILDA Torque Servo to each Servo Plate installed in the last step. Note the orientation of the output spline of the servo.



Arm - Step 7

Using 8mm screws, mount another 2-Side 2-Post Pattern Mount to each Servo Plate as shown in Figure A. Losen the 4 screws shown in Figure B 1/4 turn, allowing the Pattern Mounts to slide in the slots on the Servo Plate. Repeat this process for the other Servo Plate.

Figure A

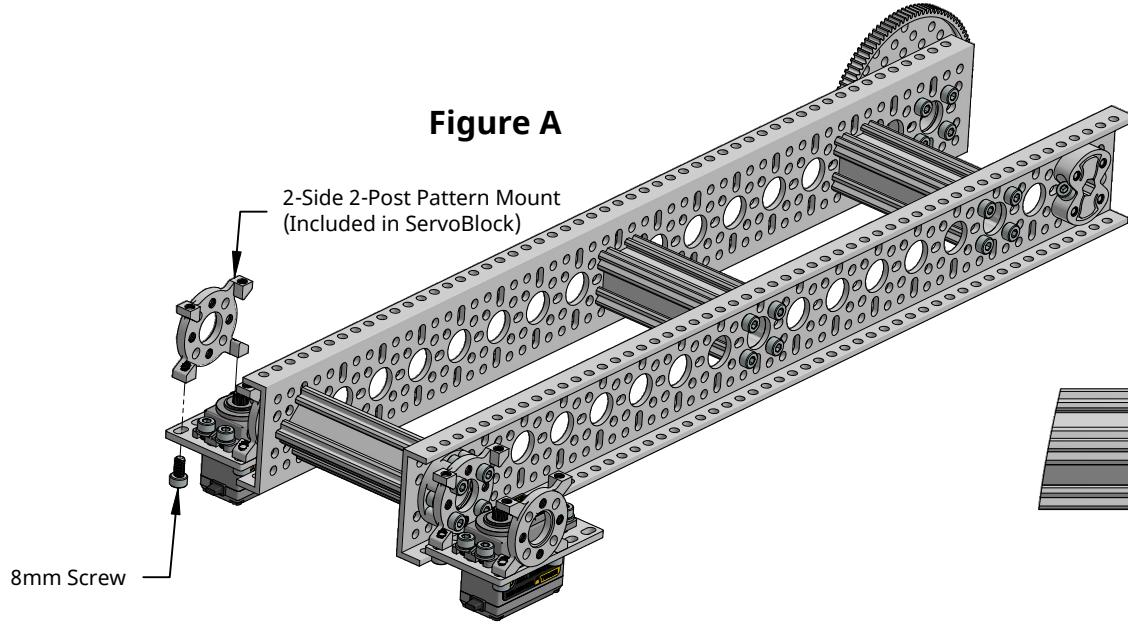
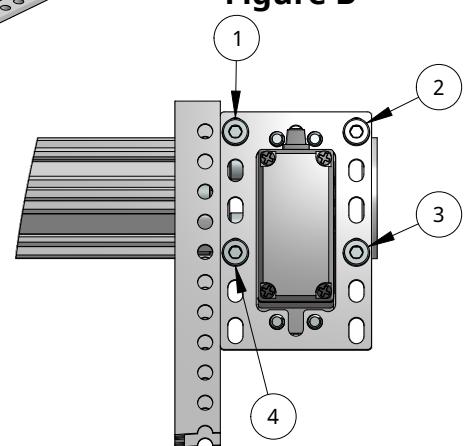
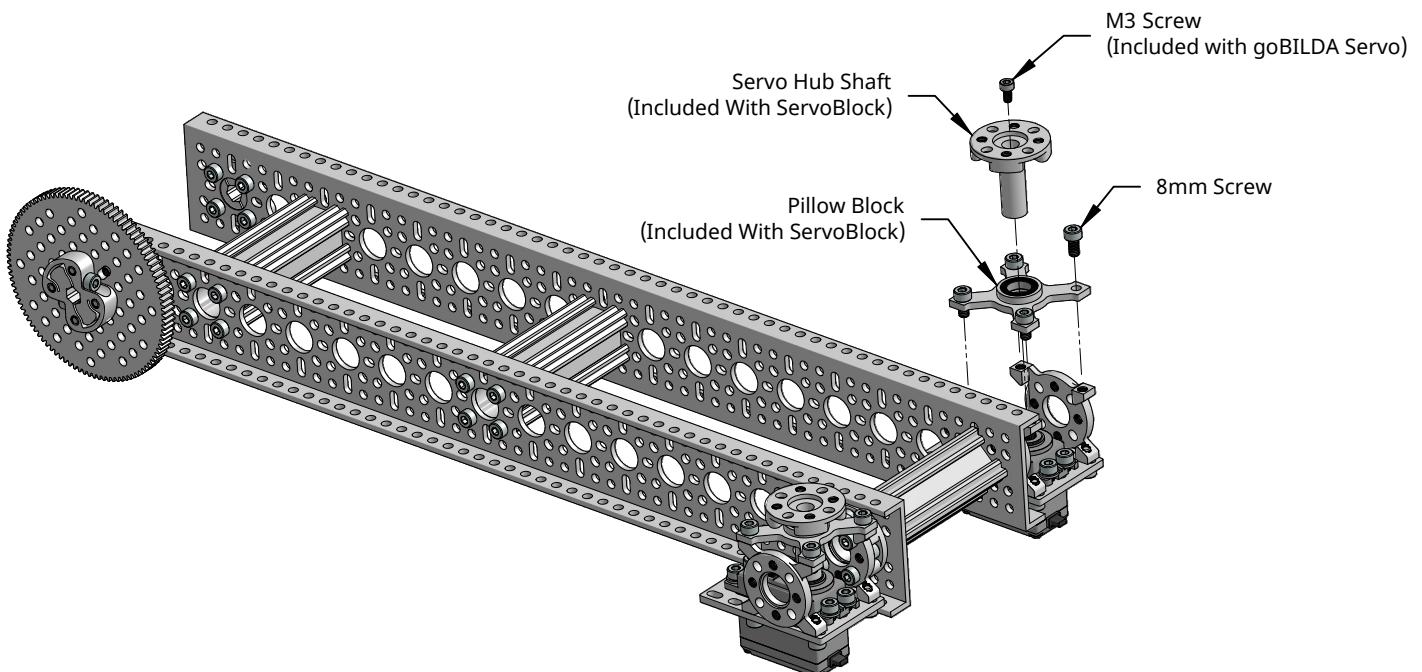


Figure B



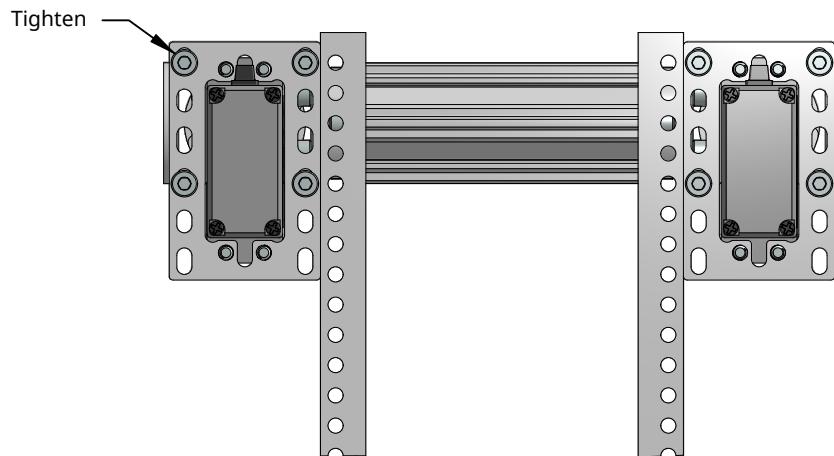
Arm - Step 8

Mount the Pillow Block that was included with your Servo Block to the two Pattern Mounts you installed in earlier steps, you may have to slide them in their mounting slots to align the pillow block correctly. Then install the Servo Hub Shaft onto the Servo output spline. Finally install the M3 screw that was included with your servo into the output spline, fastening the Servo Hub Shaft to the Servo. Complete this step on both sides of the arm.



Arm - Step 9

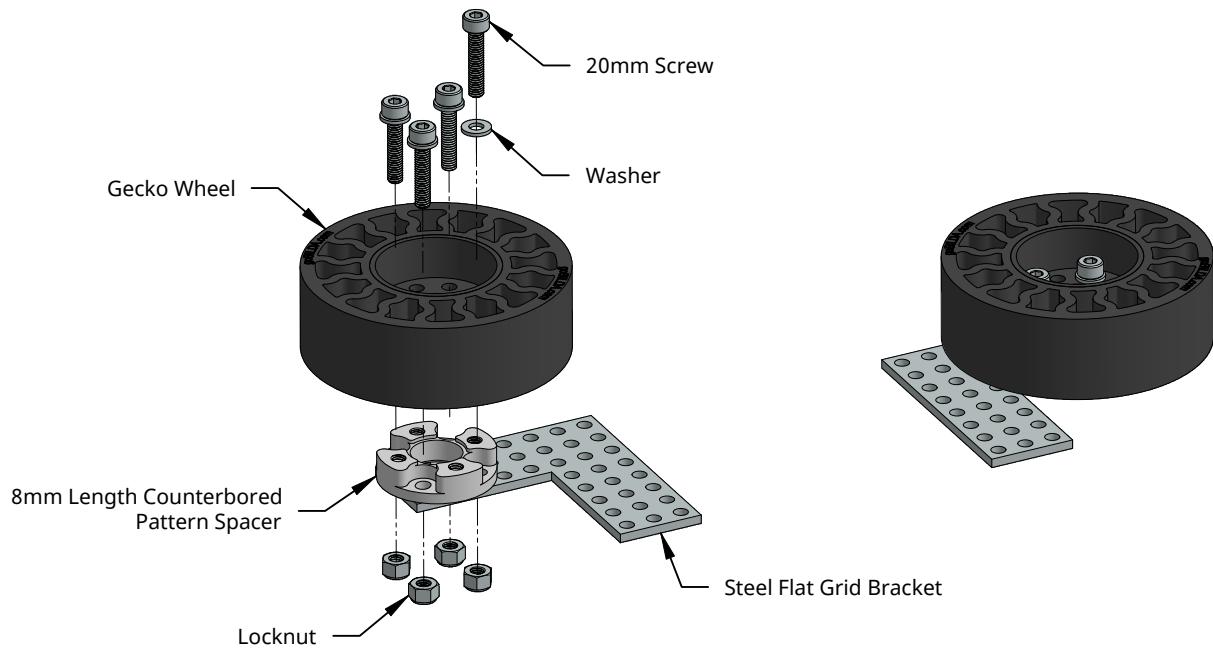
Now that the Servo Hub Shafts are installed in each ServoBlock, tighten the screws you loosened in Step 7.



Arm - Step 10

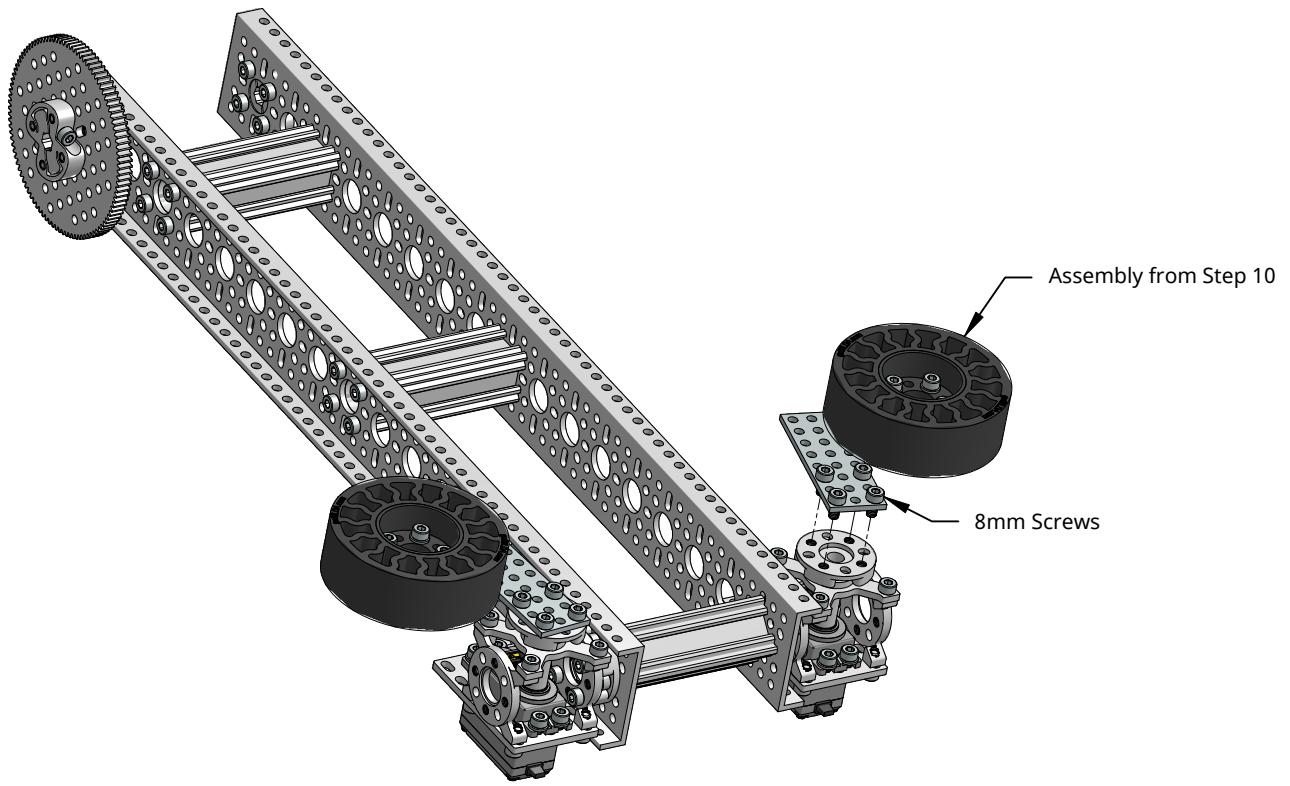
Setting aside the arm for this step, create two claw sub-assemblies made up of a Grid Bracket, Pattern Spacer, and a Gecko Wheel.

Tech Tip: Make sure to run the 20mm Screws through the "Thru" Holes, not the threaded ones.



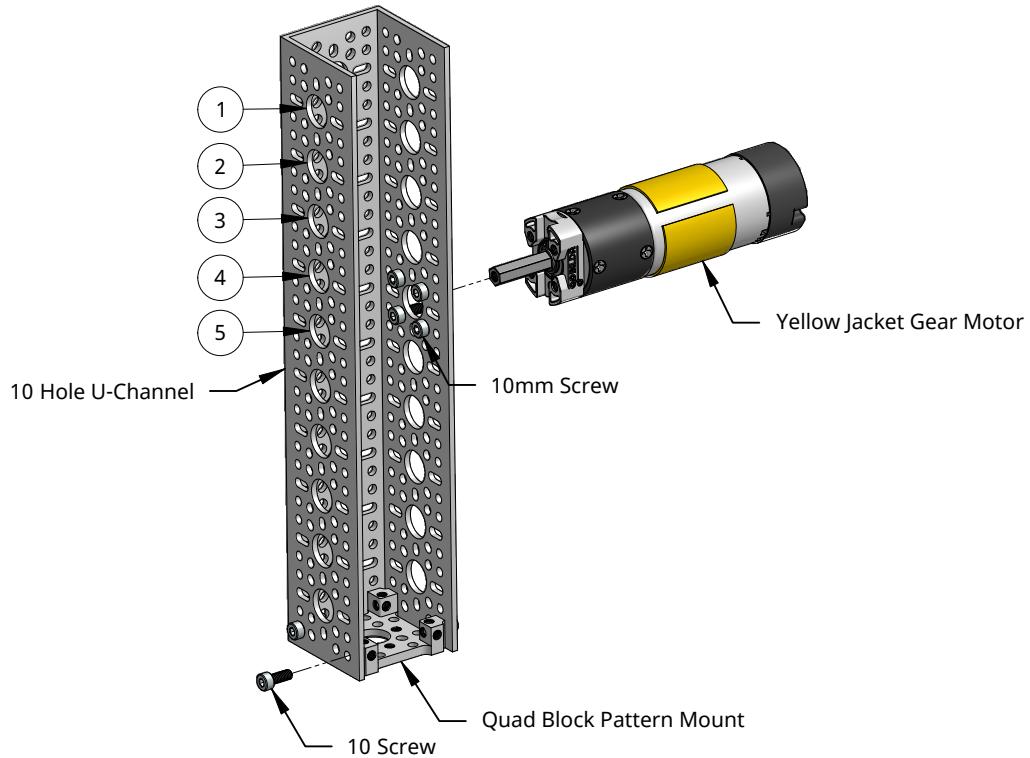
Arm - Step 11

Attach the assemblies you created in Step 10 to the ServoBlocks using 8mm screws. With this step, your arm subassembly is complete. Set it aside for now.



Arm - Step 12

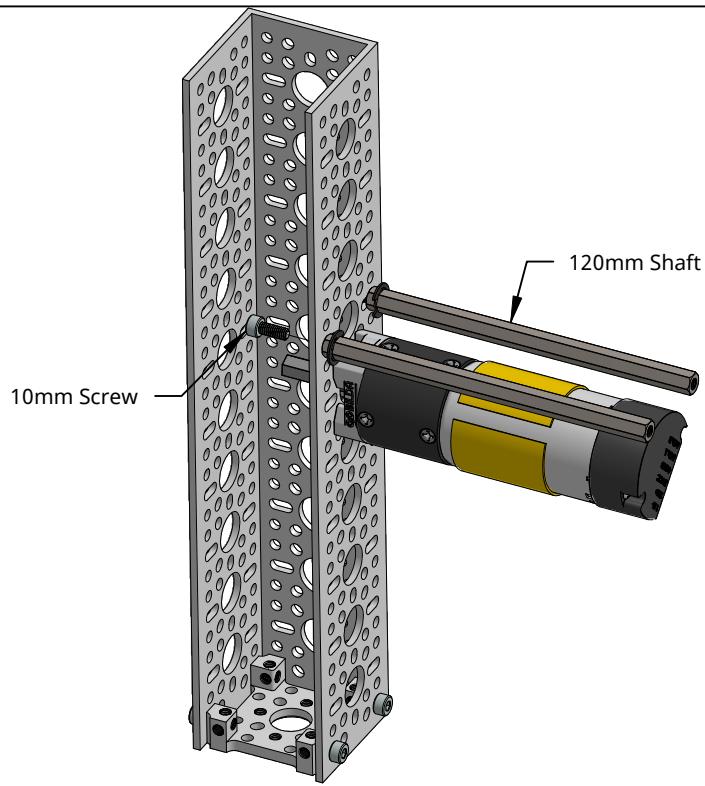
Bolt on a Quad Block Pattern Mount to the bottom of a 10 Hole U-Channel. Then attach a Yellow Jacket Gear Motor to the 5th hole from the top of the channel.



Arm - Step 13

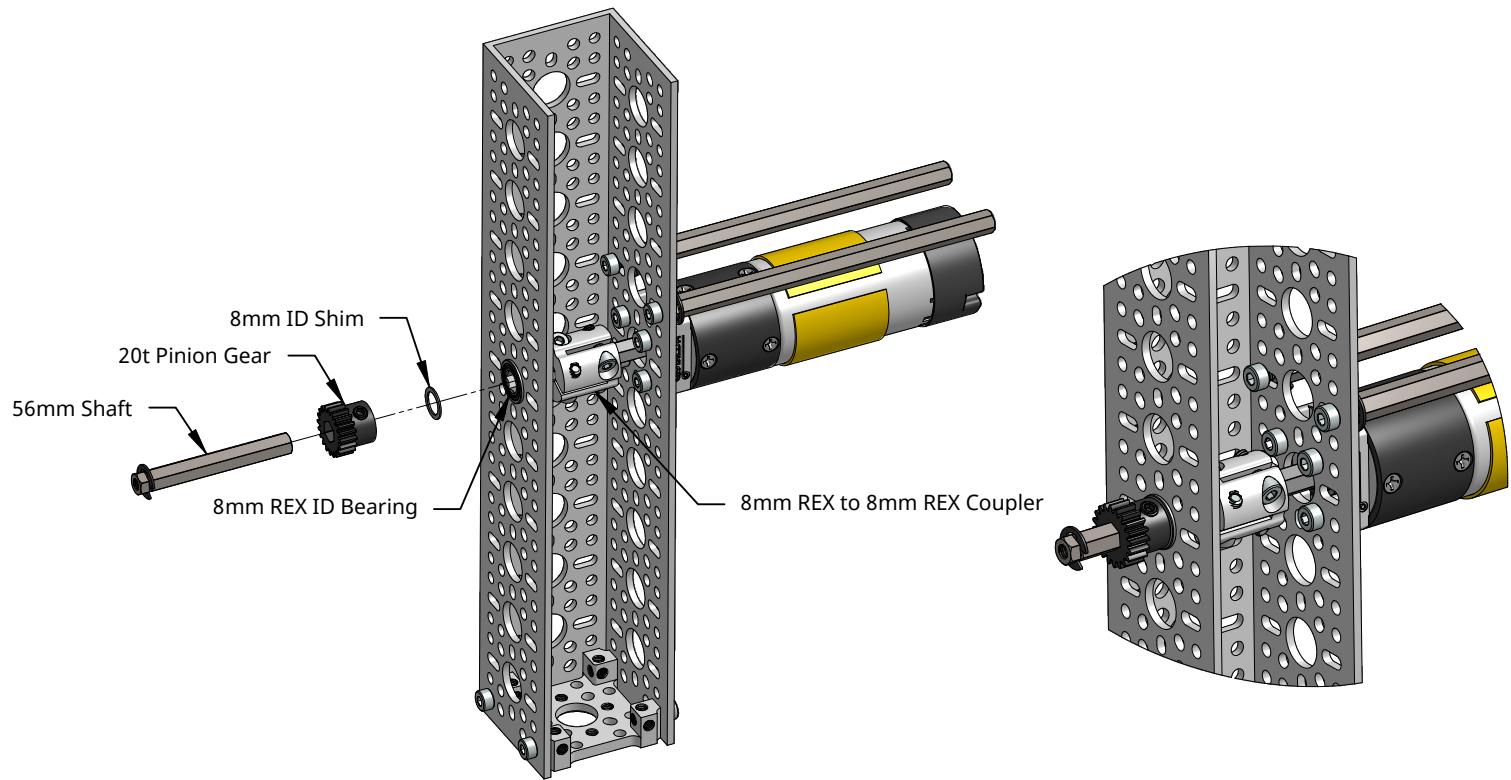
Attach a 120mm shaft to the slots directly above the motor

Tech Tip: The 2106 Series 8mm REX Shafting has threaded ends, so even though it is sold as shafting they make great standoffs!



Arm - Step 14

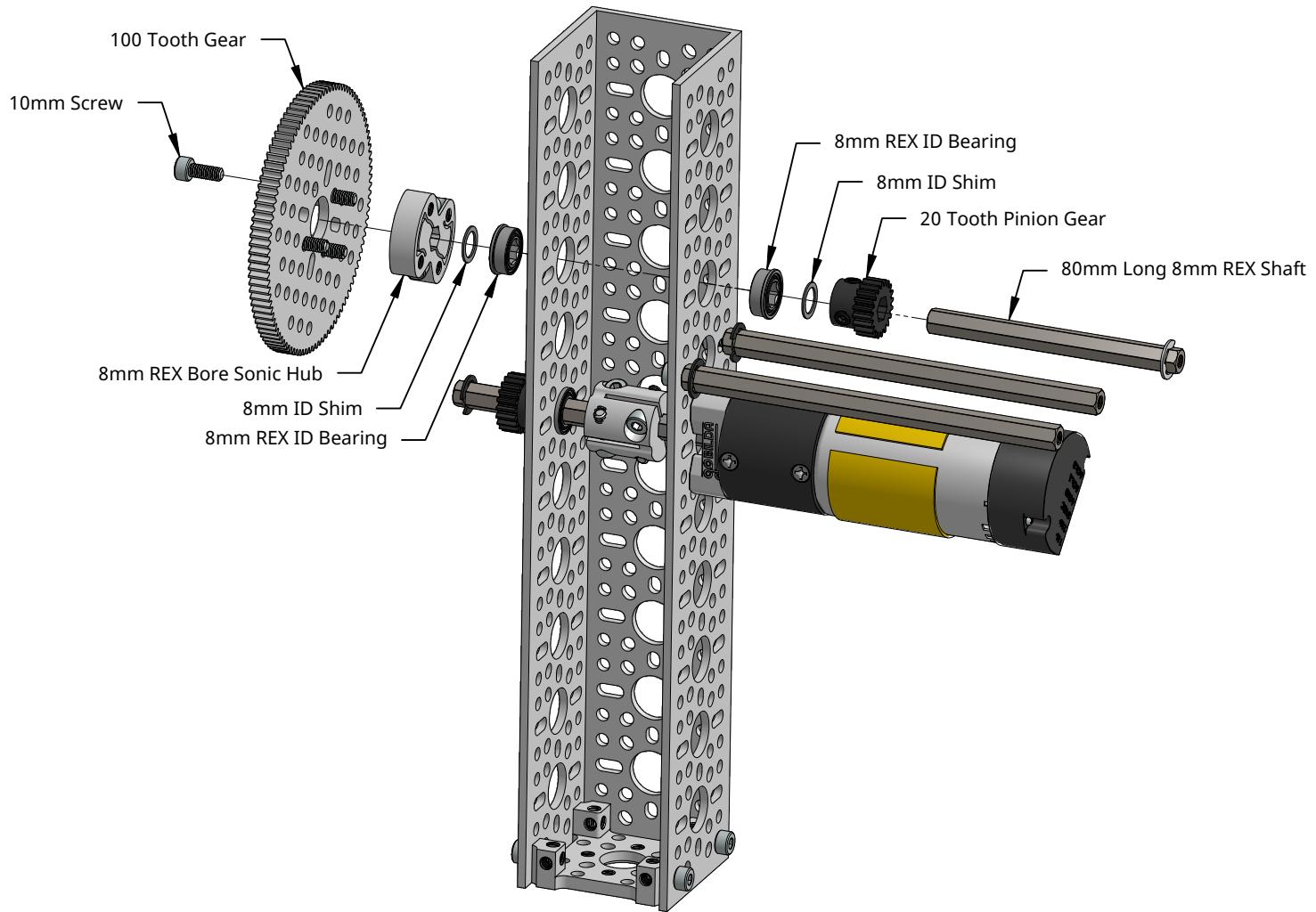
Add an 8mm REX to 8mm REX Coupler to the motor shaft by sliding it in-between the wall of the U-Channel and the motor shaft, then sliding it onto the motor shaft. Slide a 20 Tooth Pinion Gear onto a 56mm 8mm REX shaft in the orientation shown, so that it bottoms out against the E-clip. Then add a shim. Add a bearing to the U-Channel with the flange on the outside, then slide your shaft assembly through the bearing, and into the coupler. Before tightening the pinch bolts on the coupler and tightening the set screws on the Pinion Gear.



Arm - Step 15

Bolt a 100 Tooth Gear to an 8mm REX Bore Sonic Hub using 10mm screws.

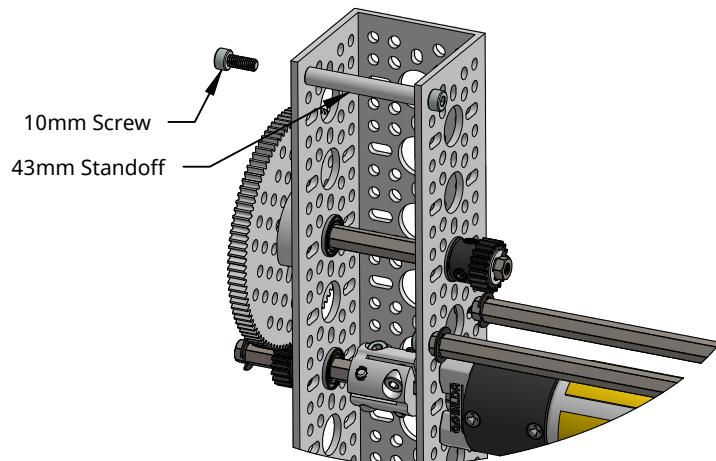
Add a 20 Tooth Pinion Gear to an 80mm Long 8mm REX Shaft, followed by a shim and an 8mm REX ID Bearing. Then slide the shaft assembly into the channel as shown, before adding a bearing, shim, and the Sonic Hub+Gear assembly.



Arm - Step 16

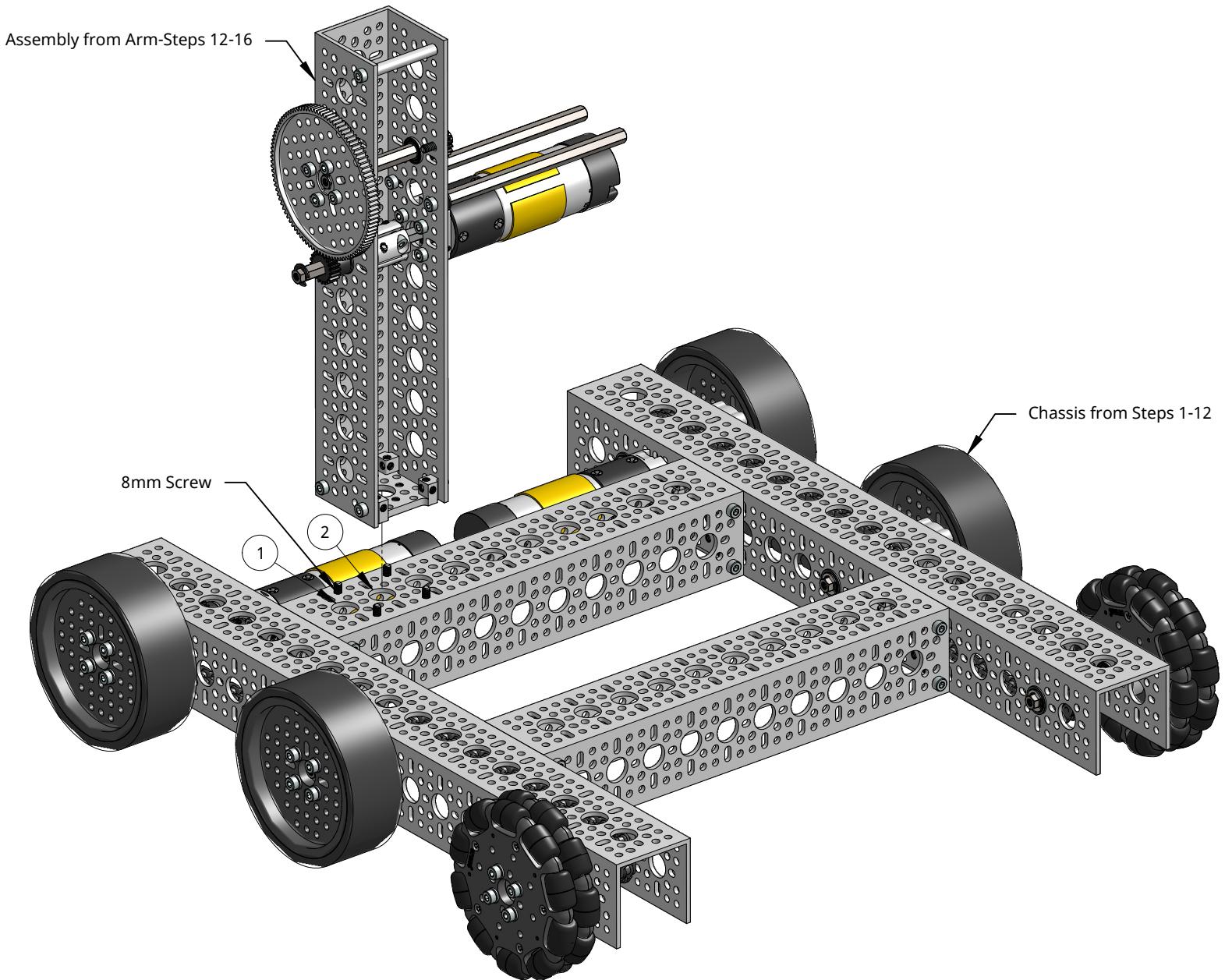
Attach a 43mm Standoff into the U-Channel to add rigidity to the arm.

Tech Tip: 43mm Standoffs can be a great way to strengthen the open side of U-Channel in heavy-duty applications.



Arm - Step 17

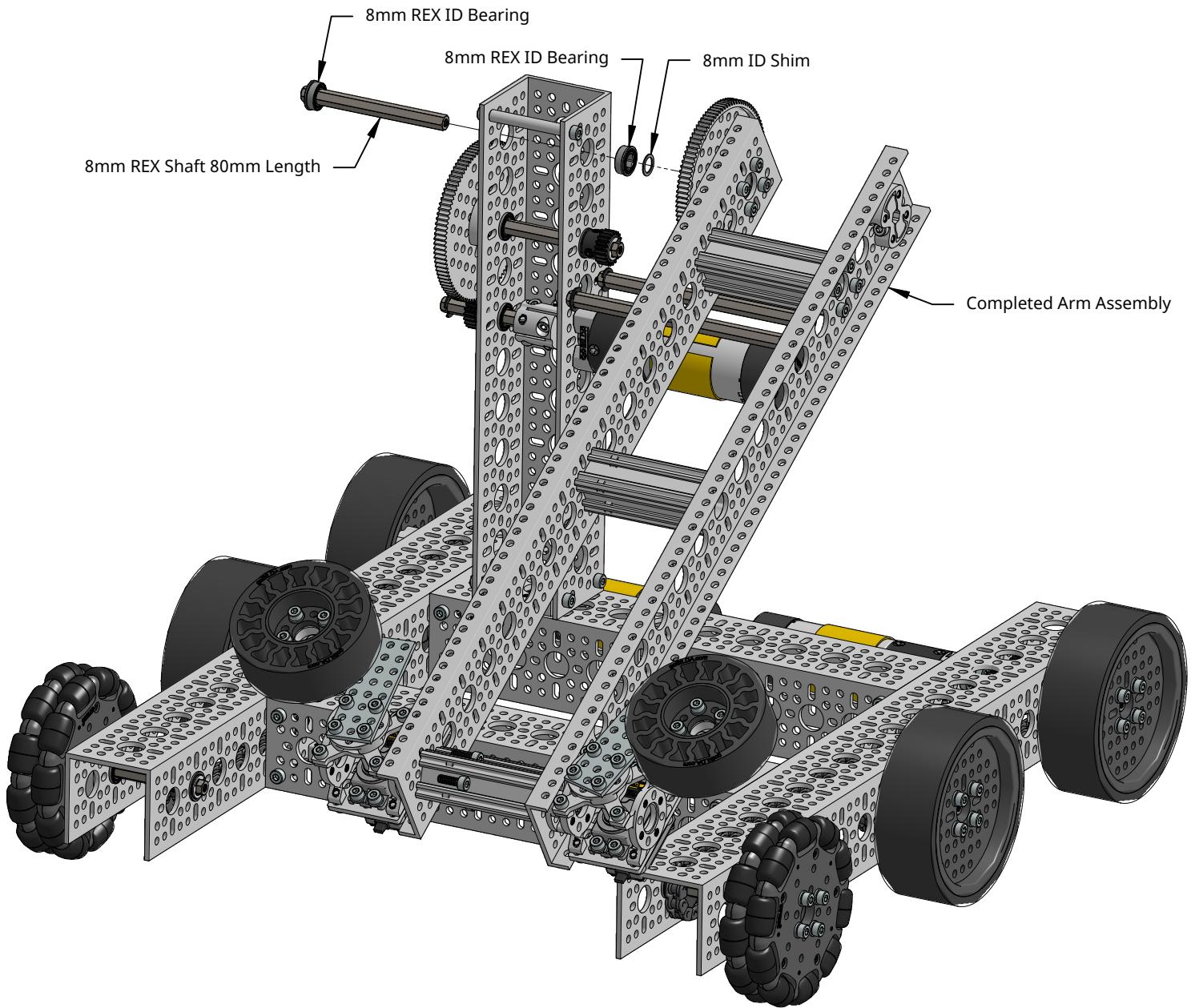
Fix the assembly from the last few steps to the Chassis you created earlier. Mount the U-Channel vertically on the hole labeled 2 below.



Arm - Step 18

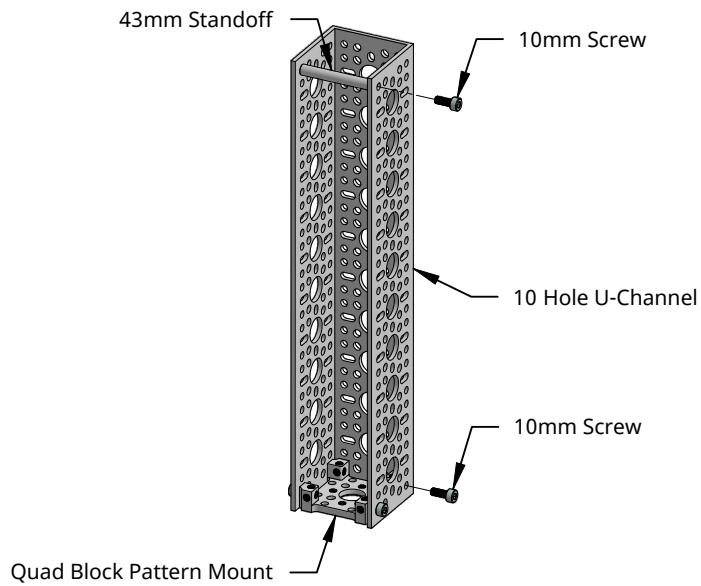
In the topmost hole on the vertical U-Channel, insert an 8mm REX shaft and flanged bearing to the left side, making sure that the E-clip of the shaft is on the flanged side of the bearing. Then on the other side add another bearing and a shim, before butting the Sonic Hub from the arm assembly against it and tighten its pinch bolts. Make sure that the arm is fully constrained (so that it can not slide in or out axially)

Tech Tip: We will be building another point of support for the arm, so do not worry about the little bit of wobble you have at this step.



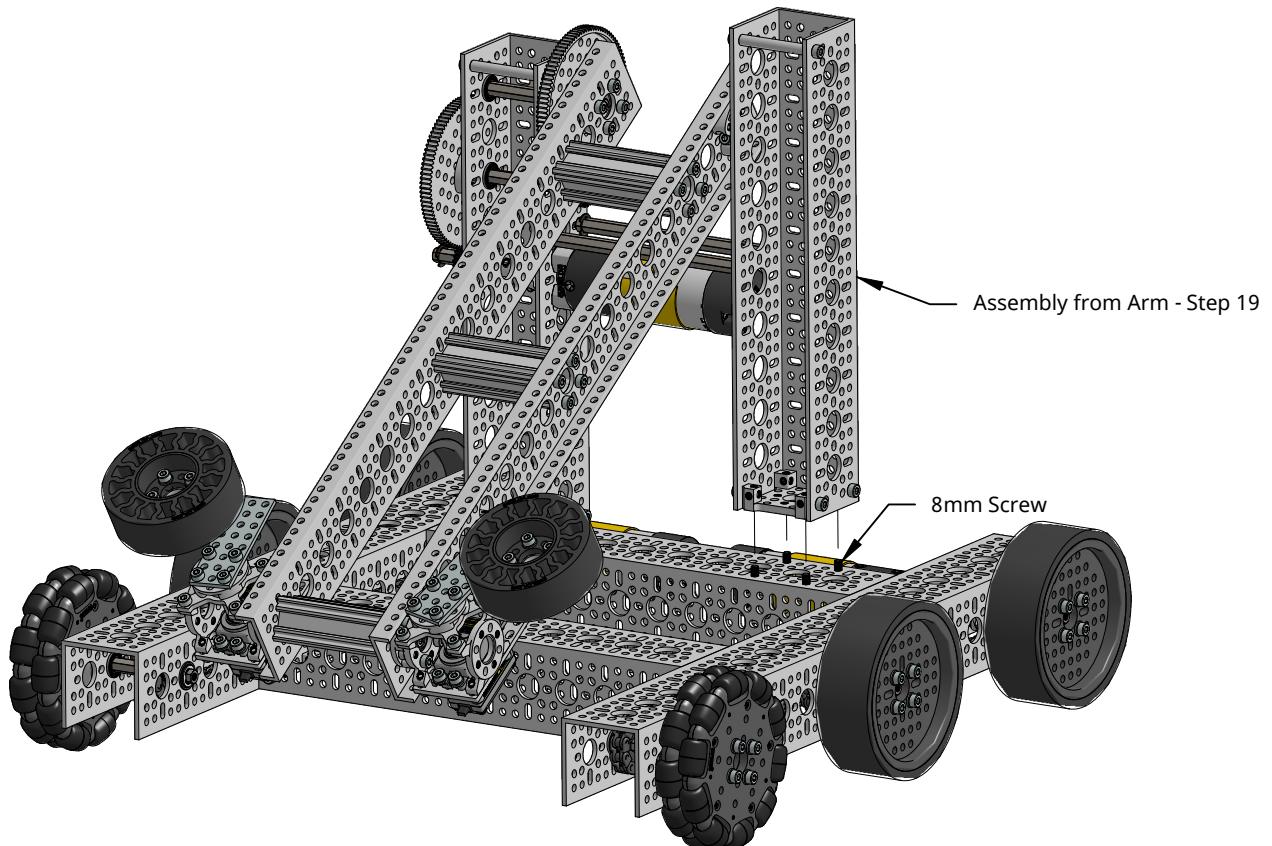
Arm - Step 19

Attach a Quad Block Pattern Mount to one end of a 10 Hole U-Channel, and a 43mm Standoff to the other.



Arm - Step 20

Attach the assembly you created in Arm - Step 20 to the Chassis opposite the other 10 Hole U-Channel.



Arm - Step 21

First, bolt the recently installed 10 Hole U-Channel to the 2 120mm long 8mm REX Shafts using 10mm screws. Then insert a bearing into the topmost hole on the channel, with the flange on the inside. Taking advantage of the 8mm REX Shaft's ability to slide through the 14mm hole, slide it into an 8mm REX ID Collar and into the bearing you just installed, before going through the 8mm REX Sonic Hub installed on the arm. (As shown in Figure A) Then, slide another 8mm REX ID Bearing into the 14mm hole opposite the one you just installed, with the flange on the inside of the channel before sliding the shaft back until the E-clip bottoms out against the face of the bearing. Then tighten the pinch bolt in your collar, then the pinch bolts in the Sonic Hub.

Figure A

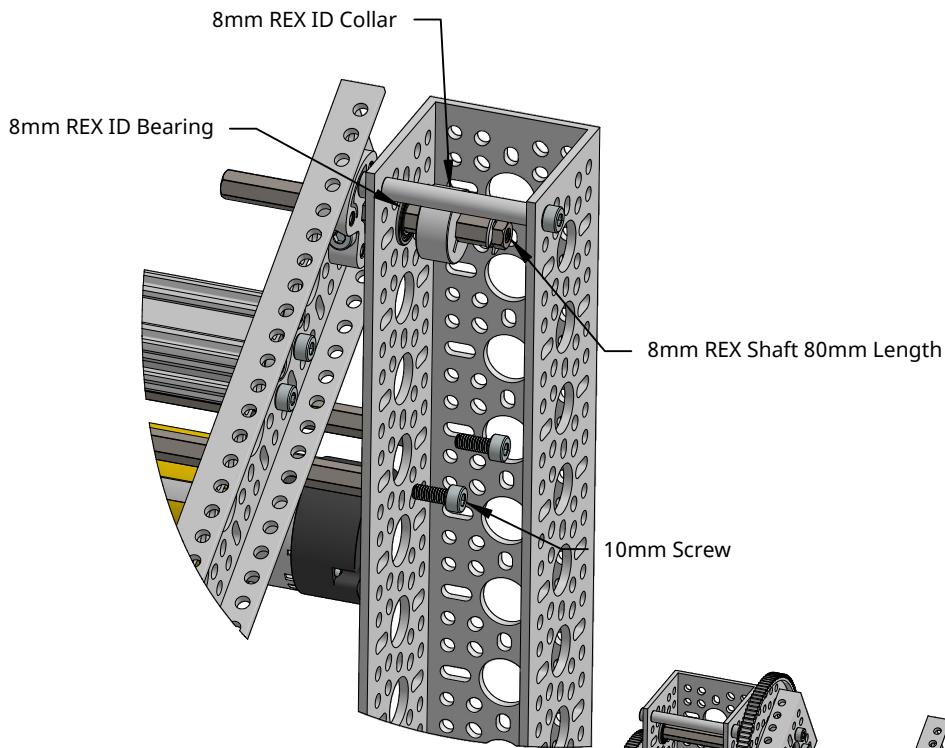


Figure B

