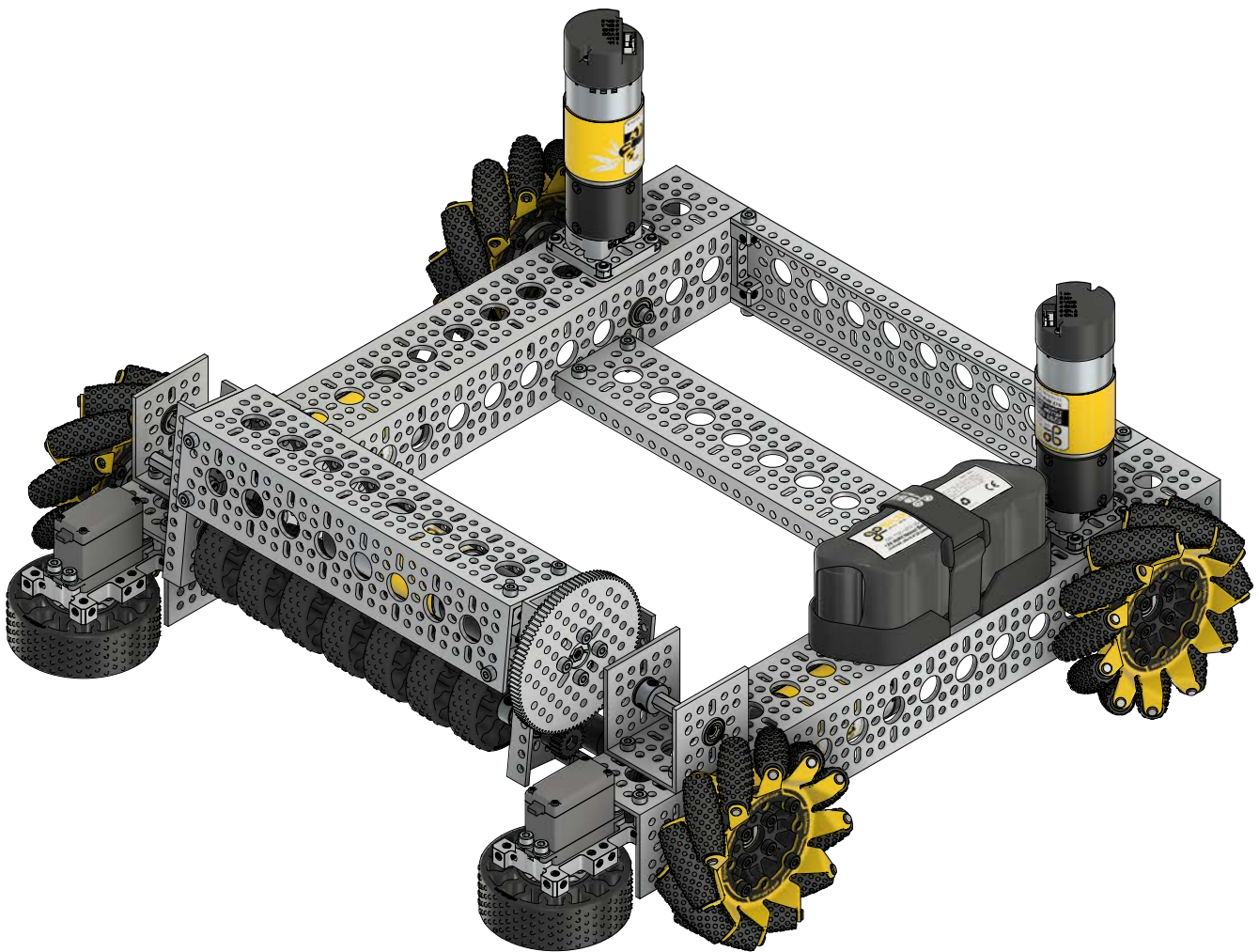




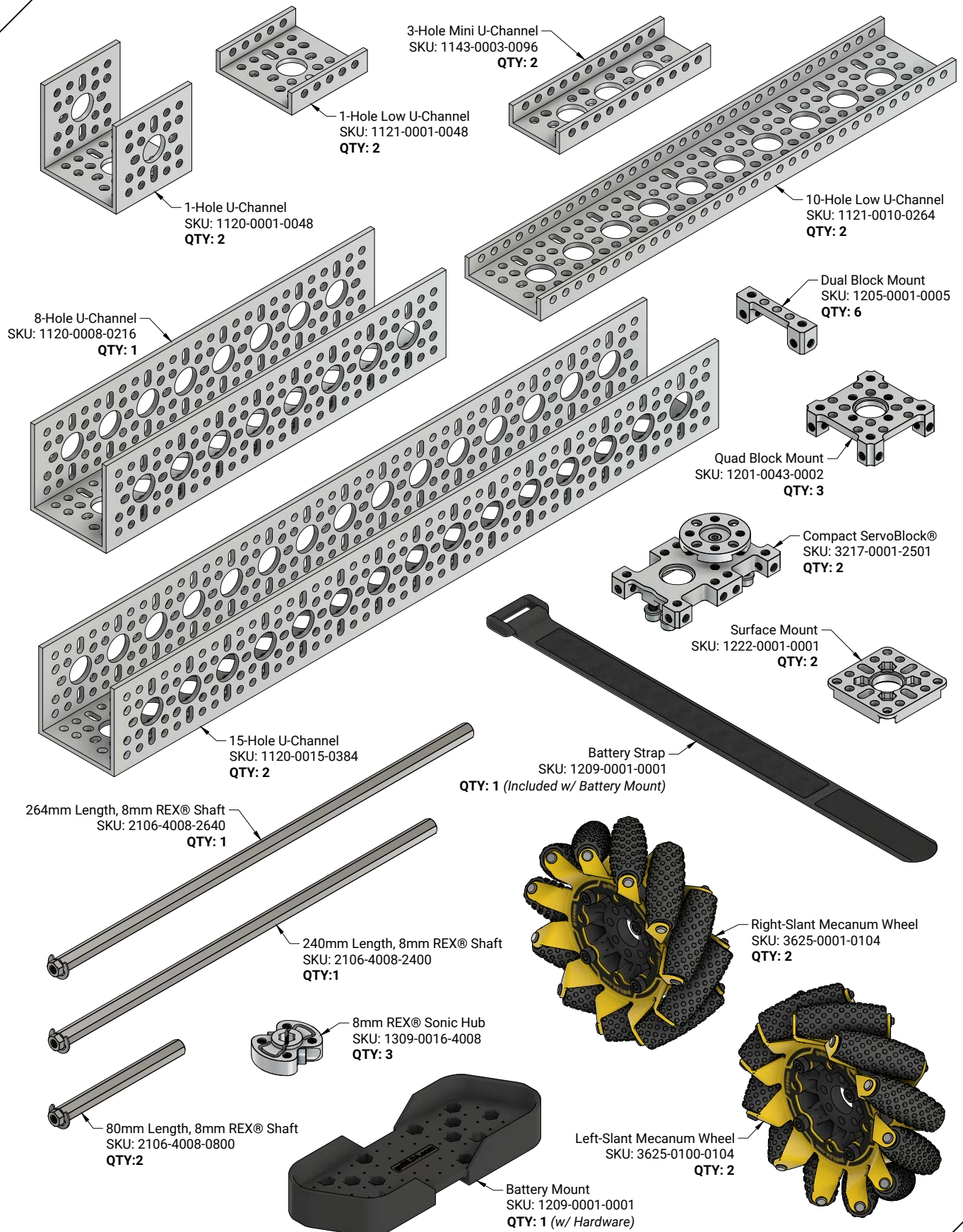
Assembly Instructions for
StarterBot Base with Mecanum Wheels (for 2026-2027 Preseason)

Built from:

- 1 x FTC Starter Kit (SKU: 3200-4008-2627)
- 1 x Strafer® Chassis (SKU: 3209-0001-0007)
- 2 x Flat Pattern Mount (SKU: 1222-0001-0001)



Kit Contents



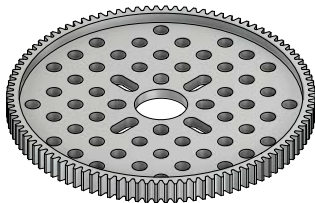
Kit Contents (Cont)



19.2:1 Yellow Jacket Motor
SKU: 5203-2402-0019
QTY: 4



50.9:1 Yellow Jacket Motor
SKU: 5203-2402-0051
QTY: 1



100-Tooth Gear
SKU: 2302-0014-0100
QTY: 1



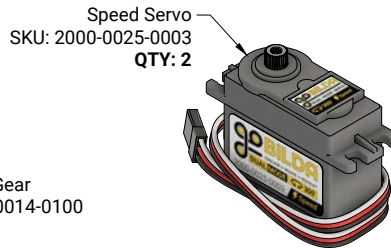
72mm GripForce® Gecko Wheel
SKU: 3613-4008-0072
QTY: 2



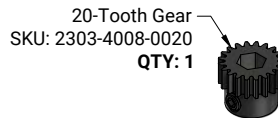
48mm GripForce® Gecko Wheel
SKU: 3613-4008-0048
QTY: 7



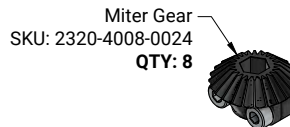
12V Battery
SKU: 3100-0012-0020
QTY: 1



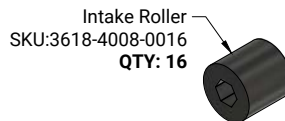
Speed Servo
SKU: 2000-0025-0003
QTY: 2



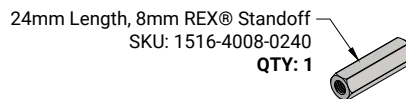
20-Tooth Gear
SKU: 2303-4008-0020
QTY: 1



Miter Gear
SKU: 2320-4008-0024
QTY: 8



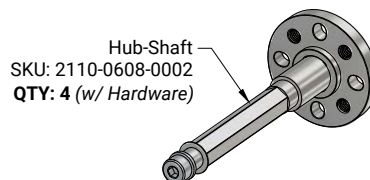
Intake Roller
SKU: 3618-4008-0016
QTY: 16



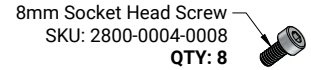
24mm Length, 8mm REX® Standoff
SKU: 1516-4008-0240
QTY: 1



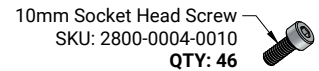
43mm Length, 8mm REX® Standoff
SKU: 1516-4008-0430
QTY: 2



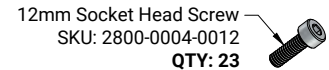
Hub-Shaft
SKU: 2110-0608-0002
QTY: 4 (w/ Hardware)



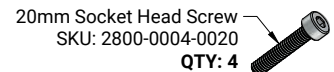
8mm Socket Head Screw
SKU: 2800-0004-0008
QTY: 8



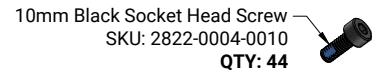
10mm Socket Head Screw
SKU: 2800-0004-0010
QTY: 46



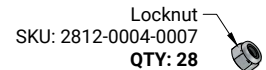
12mm Socket Head Screw
SKU: 2800-0004-0012
QTY: 23



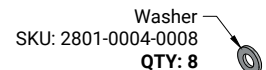
20mm Socket Head Screw
SKU: 2800-0004-0020
QTY: 4



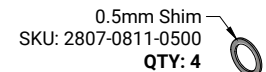
10mm Black Socket Head Screw
SKU: 2822-0004-0010
QTY: 44



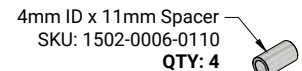
Locknut
SKU: 2812-0004-0007
QTY: 28



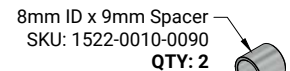
Washer
SKU: 2801-0004-0008
QTY: 8



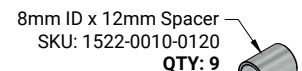
0.5mm Shim
SKU: 2807-0811-0500
QTY: 4



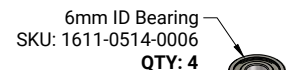
4mm ID x 11mm Spacer
SKU: 1502-0006-0110
QTY: 4



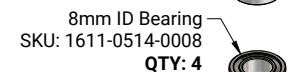
8mm ID x 9mm Spacer
SKU: 1522-0010-0090
QTY: 2



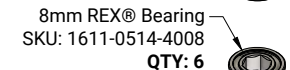
8mm ID x 12mm Spacer
SKU: 1522-0010-0120
QTY: 9



6mm ID Bearing
SKU: 1611-0514-0006
QTY: 4



8mm ID Bearing
SKU: 1611-0514-0008
QTY: 4



8mm REX® Bearing
SKU: 1611-0514-4008
QTY: 6

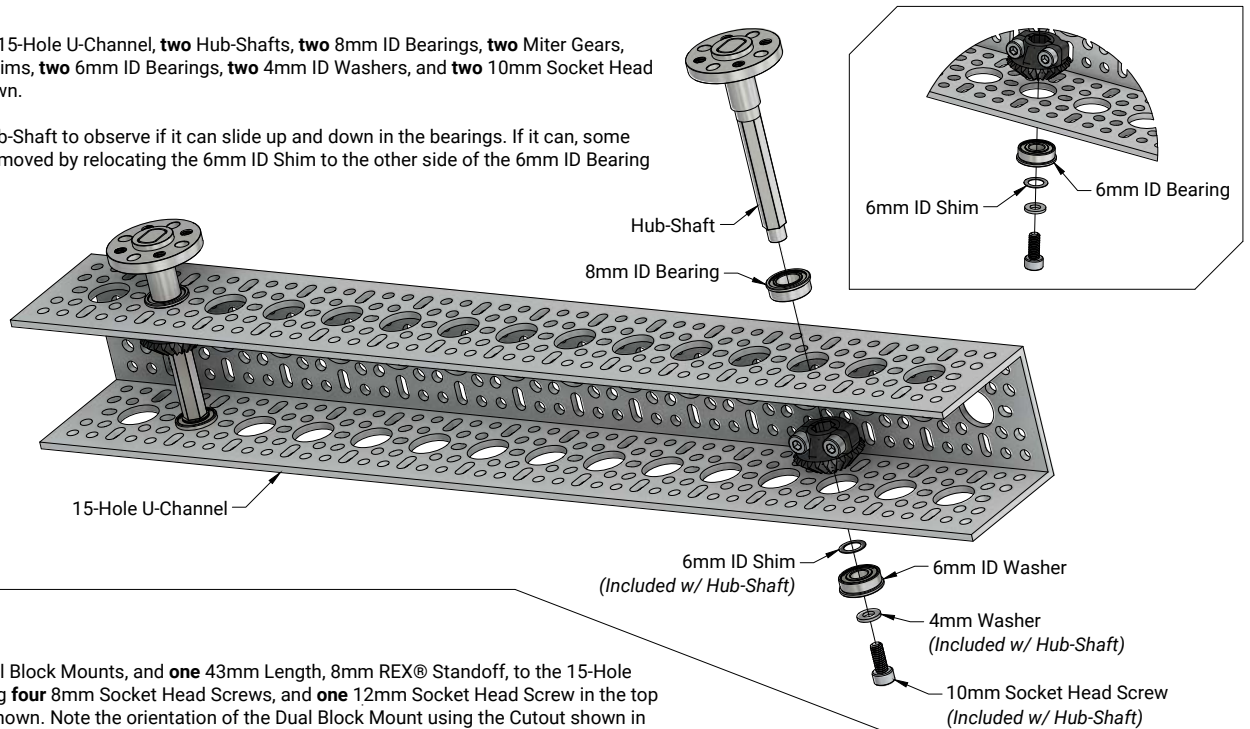


8mm REX® Collar
SKU: 2920-0001-4008
QTY: 4

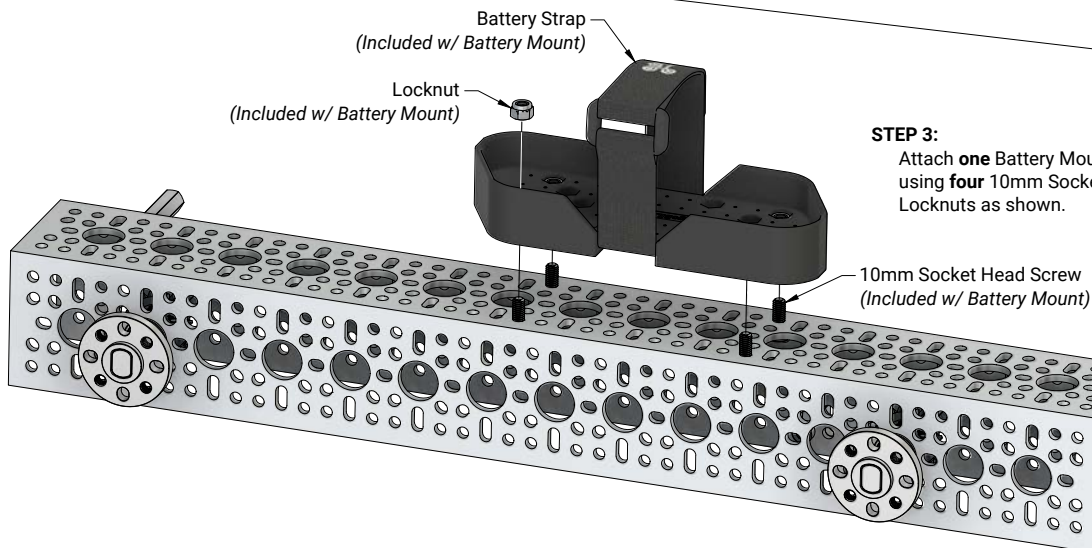
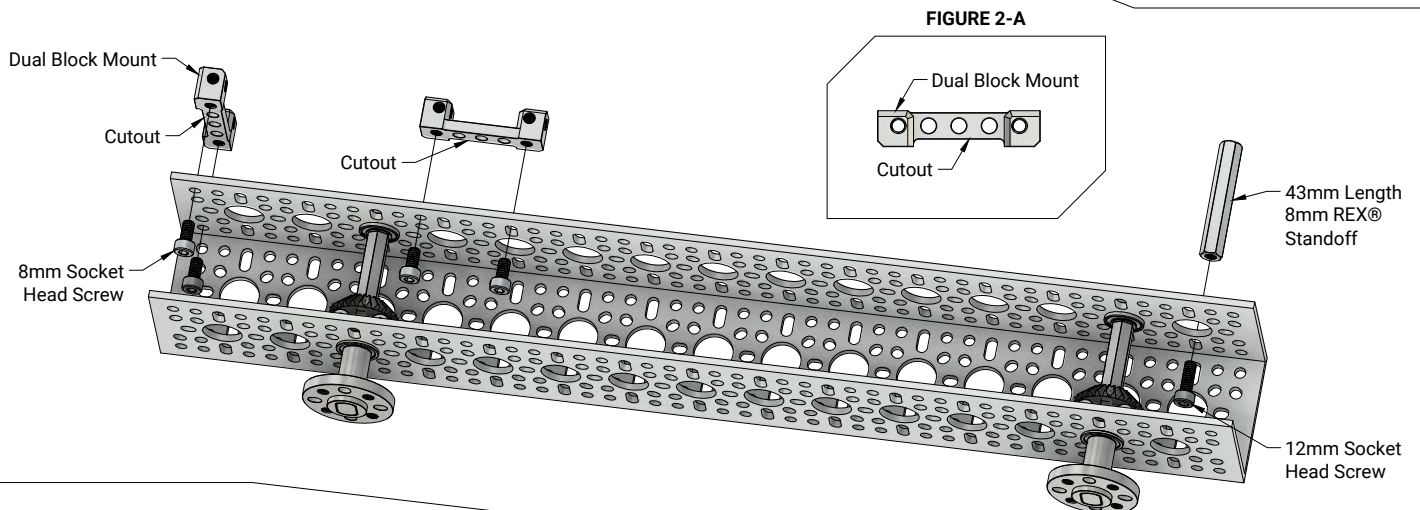
STEP 1:

Assemble **one** 15-Hole U-Channel, **two** Hub-Shafts, **two** 8mm ID Bearings, **two** Miter Gears, **two** 6mm ID Shims, **two** 6mm ID Bearings, **two** 4mm ID Washers, and **two** 10mm Socket Head Screws as shown.

Check each Hub-Shaft to observe if it can slide up and down in the bearings. If it can, some slack can be removed by relocating the 6mm ID Shim to the other side of the 6mm ID Bearing (FIGURE 1-A).

**STEP 2:**

Attach **two** Dual Block Mounts, and **one** 43mm Length, 8mm REX® Standoff, to the 15-Hole U-Channel using **four** 8mm Socket Head Screws, and **one** 12mm Socket Head Screw in the top of the slot as shown. Note the orientation of the Dual Block Mount using the Cutout shown in FIGURE 2-A.

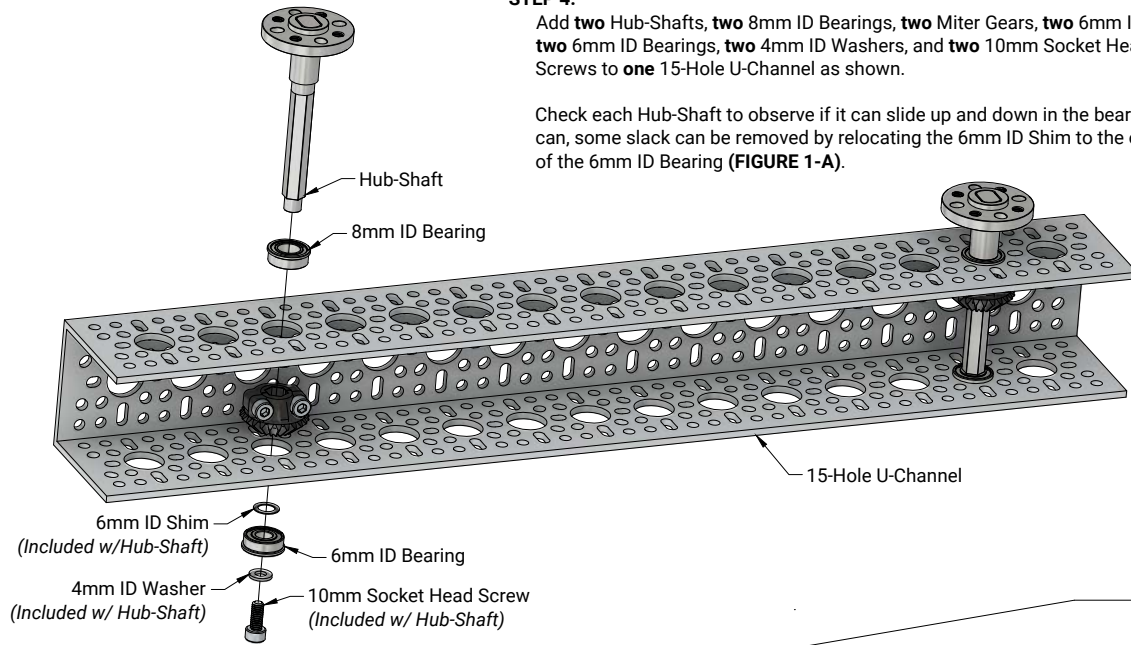
**STEP 3:**

Attach **one** Battery Mount and **one** Battery Strap using **four** 10mm Socket Head Screws and **four** Locknuts as shown.

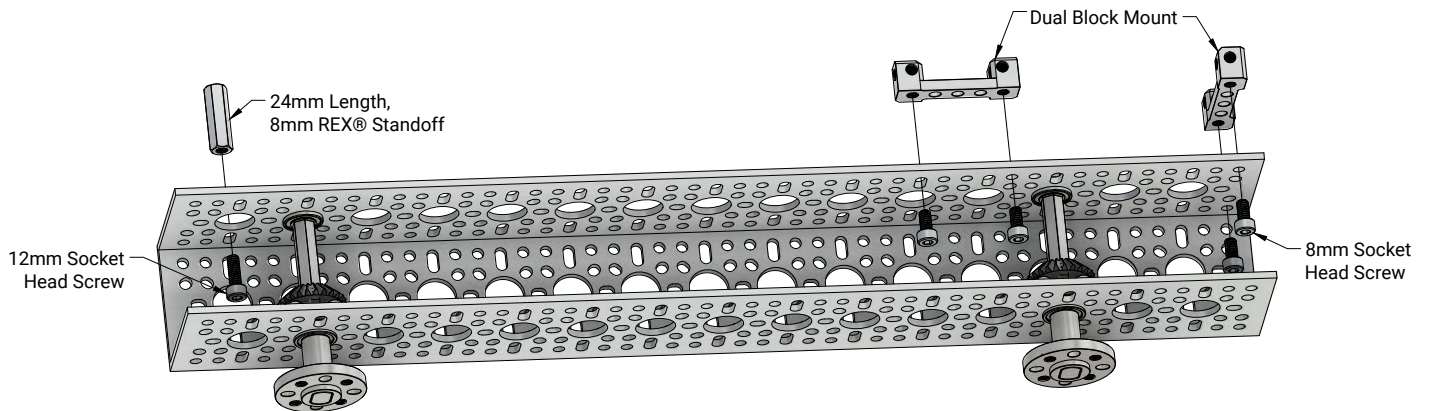
STEP 4:

Add **two** Hub-Shafts, **two** 8mm ID Bearings, **two** Miter Gears, **two** 6mm ID Shims, **two** 6mm ID Bearings, **two** 4mm ID Washers, and **two** 10mm Socket Head Screws to **one** 15-Hole U-Channel as shown.

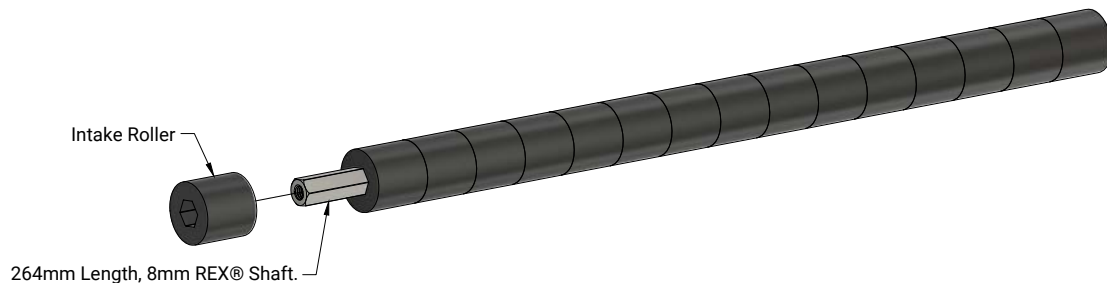
Check each Hub-Shaft to observe if it can slide up and down in the bearings. If it can, some slack can be removed by relocating the 6mm ID Shim to the other side of the 6mm ID Bearing (**FIGURE 1-A**).

**STEP 5:**

Use **four** 8mm Socket Head Screws and **one** 12mm Socket Head Screw to attach **two** Dual Block Mounts and **one** 24mm Length, 8mm REX® Standoff to the 15-Hole U-Channel located in the top of the slot as shown.

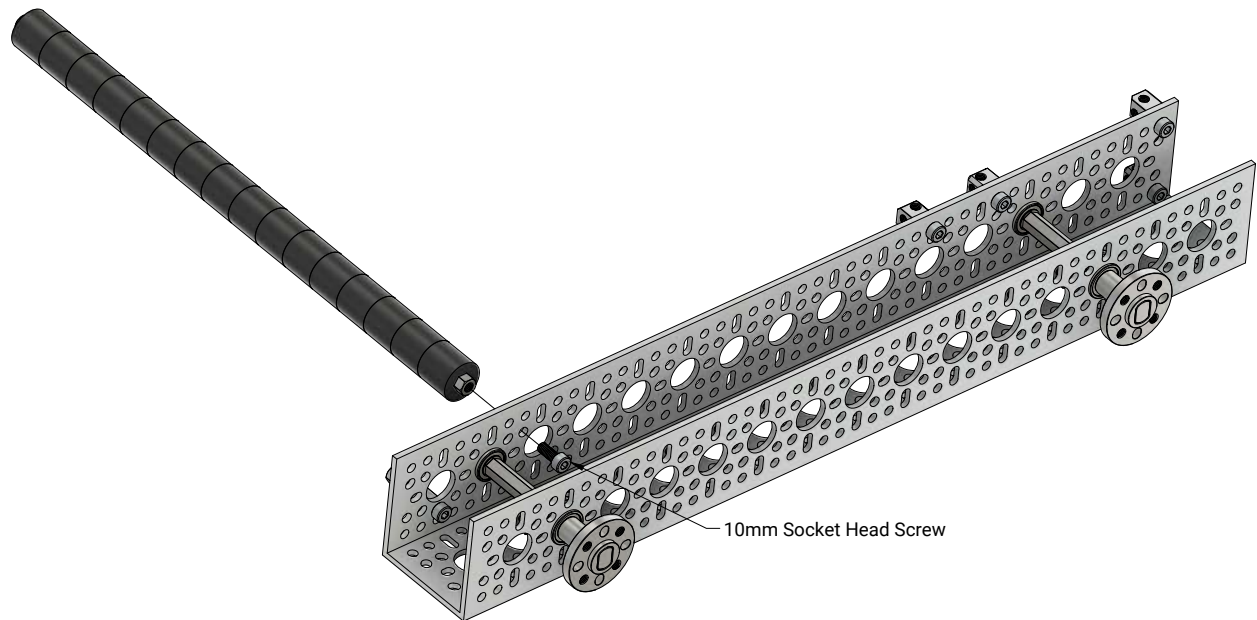
**STEP 6:**

Slide **sixteen** Intake Rollers onto **one** 264mm Length, 8mm REX® Shaft as shown.



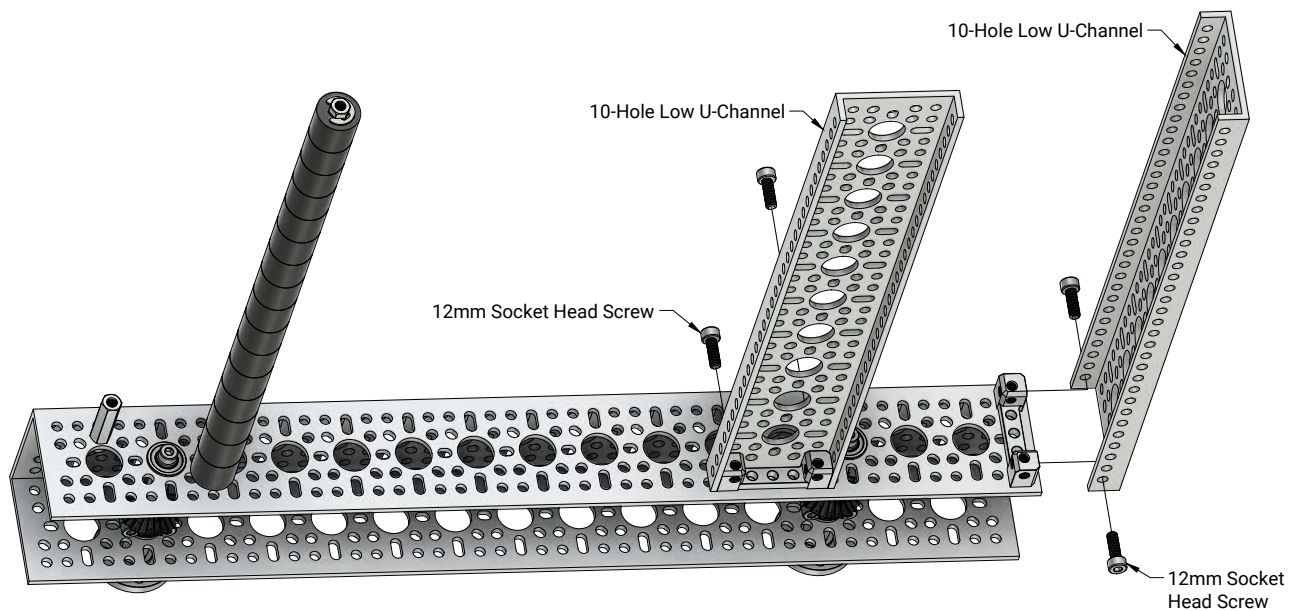
STEP 7:

Combine the subassemblies from **STEP 5** and **STEP 6** using **one** 10mm Socket Head Screw as shown.



STEP 8:

Attach **two** 10-Hole Low U-Channels using **four** 12mm Socket Head Screws as shown.



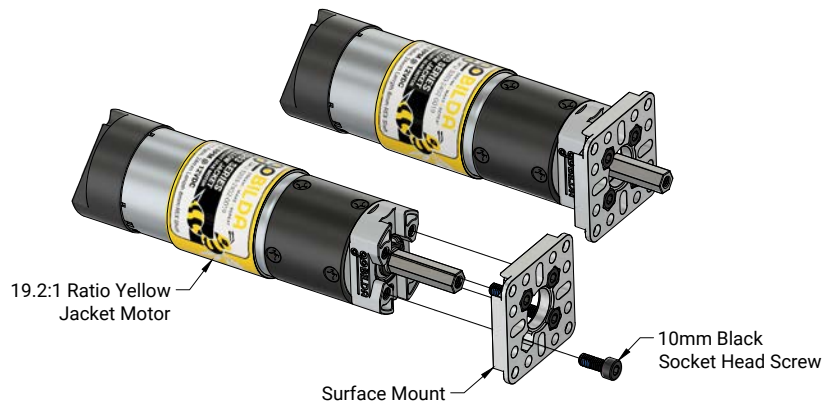
STEP 9:

Combine the subassemblies from **STEP 3** and **STEP 8** using **four** 12mm Socket Head Screws and **one** 10mm Socket Head Screw as shown.



STEP 10:

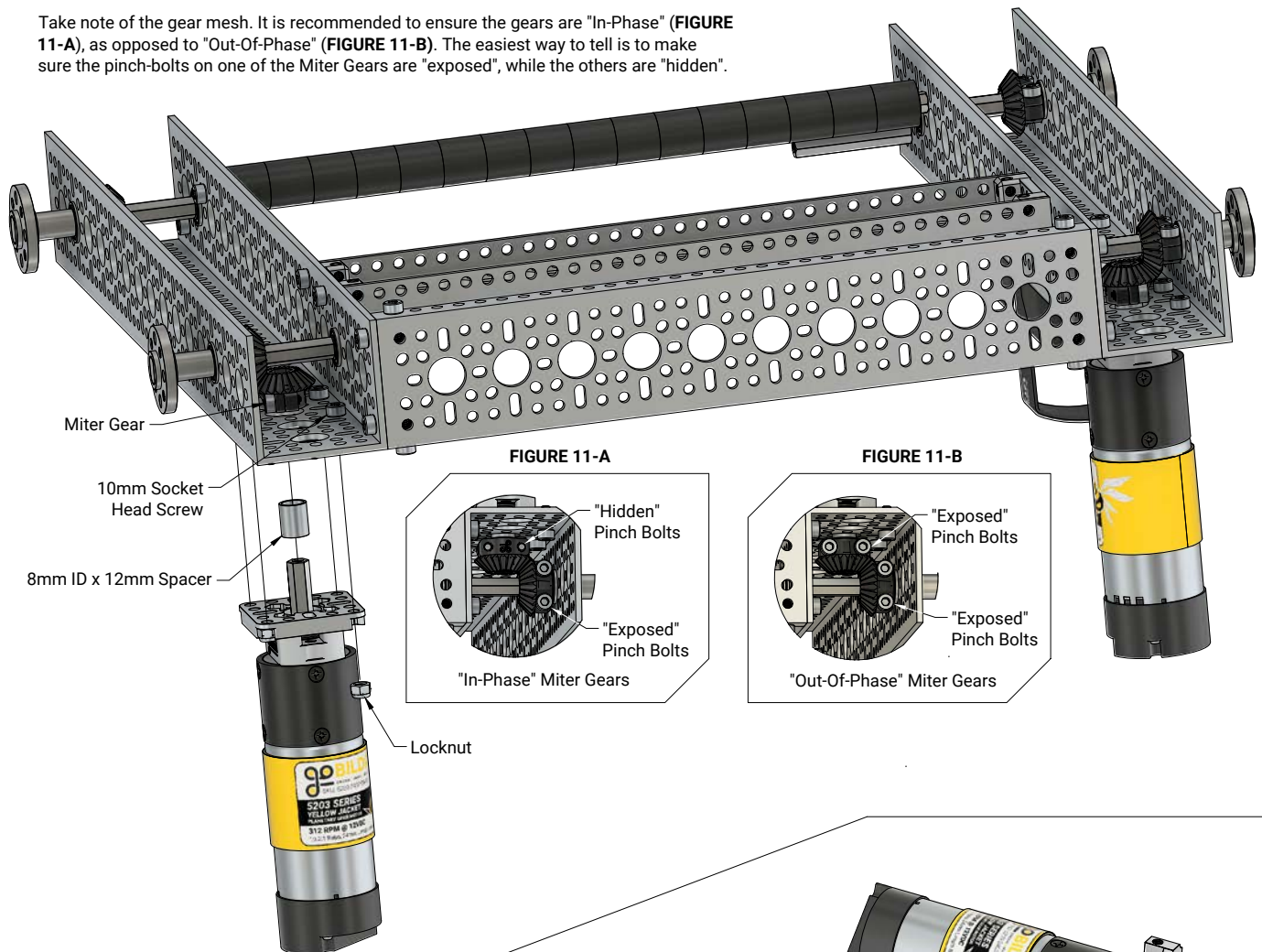
Assemble **two** 19.2:1 Ratio Yellow Jacket Motors and **two** Surface Mounts with **eight** 10mm Black Socket Head Screws as shown.



STEP 11:

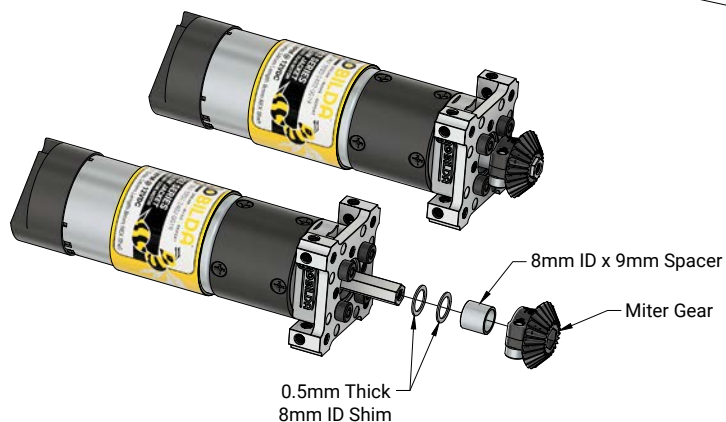
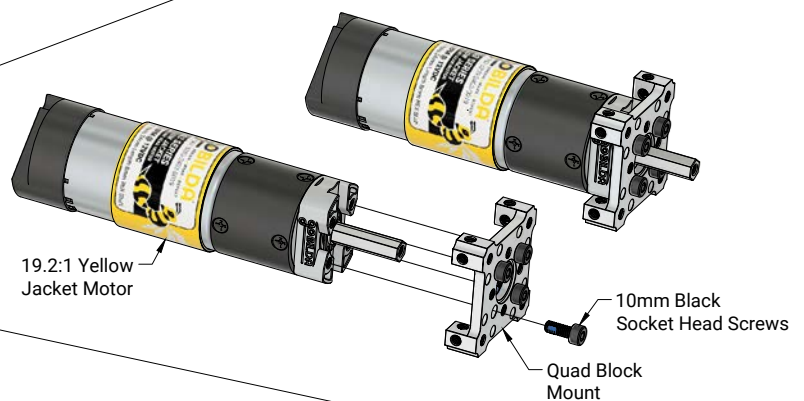
Combine the subassemblies from **STEP 9** and **STEP 10** using **eight** 10mm Socket Head Screws and **eight** Locknuts while installing **two** 8mm ID x 12mm Spacers and **two** Miter Gears as shown.

Take note of the gear mesh. It is recommended to ensure the gears are "In-Phase" (**FIGURE 11-A**), as opposed to "Out-Of-Phase" (**FIGURE 11-B**). The easiest way to tell is to make sure the pinch-bolts on one of the Miter Gears are "exposed", while the others are "hidden".



STEP 12:

Attach **two** 19.2:1 Ratio Yellow Jacket Motors to **two** Quad Block Mounts using **eight** 10mm Black Socket Head Screws as shown



STEP 13:

Attach **four** 0.5mm Thick, 8mm ID Shims, **two** 8mm ID x 9mm Spacers, and **two** Miter Gears as shown.

STEP 14:

Combine the subassembly from **STEP 11** with the subassemblies from **STEP 13** using **eight** 10mm Black Socket Head Screws as shown.

Take note of the gear mesh. It is recommended to ensure the gears are "In-Phase" (**FIGURE 14-A**), as opposed to "Out-Of-Phase" (**FIGURE 14-B**). The easiest way to tell is to make sure the pinch-bolts on one of the Miter Gears is "exposed", while the others are "hidden".

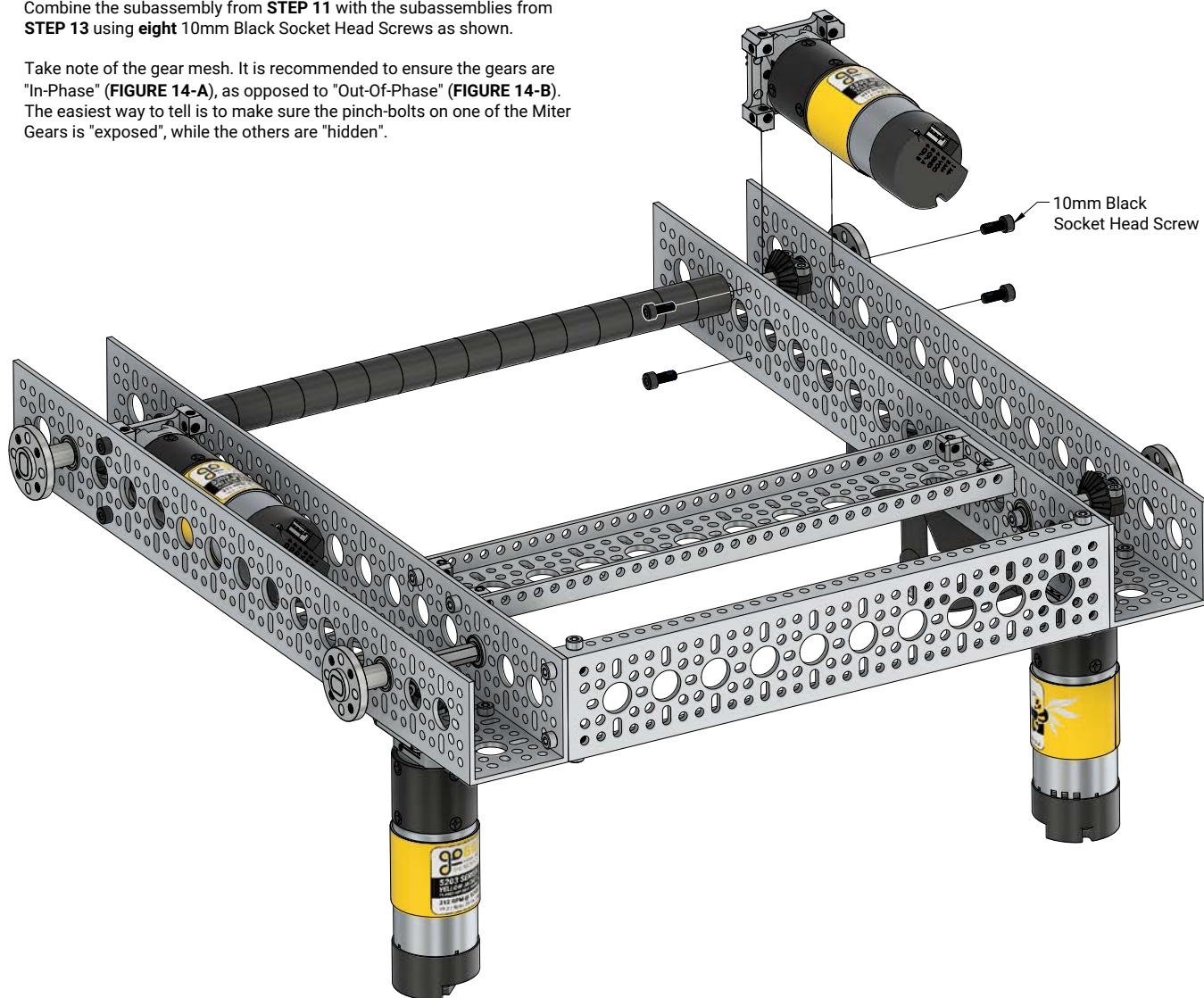


FIGURE 14-A

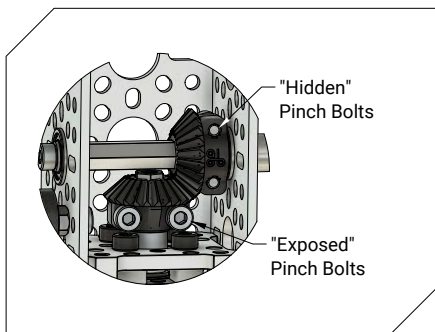
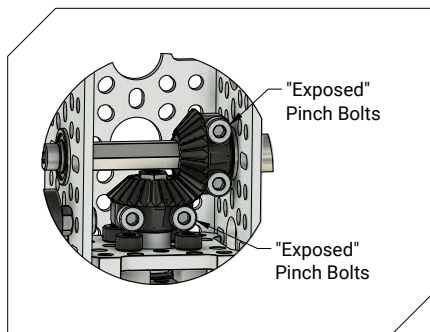
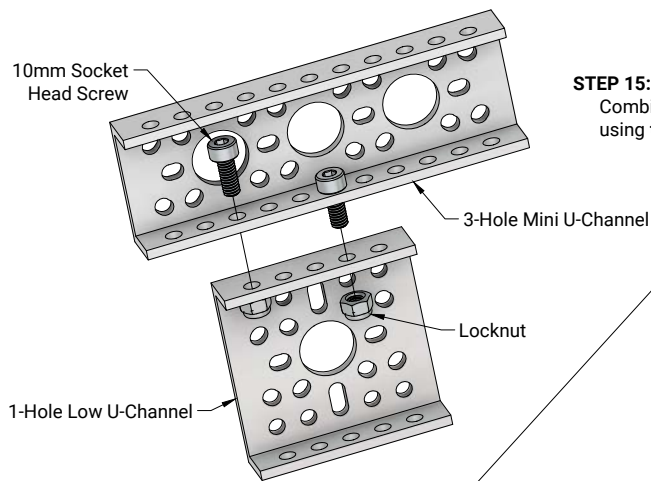


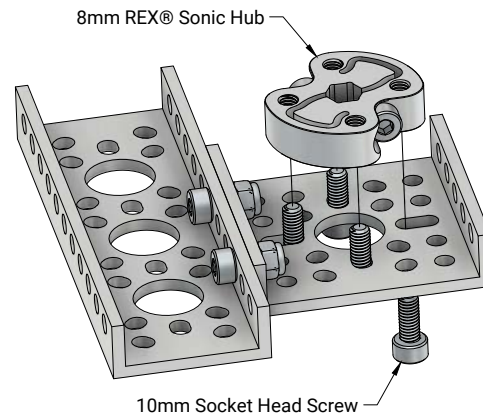
FIGURE 14-B





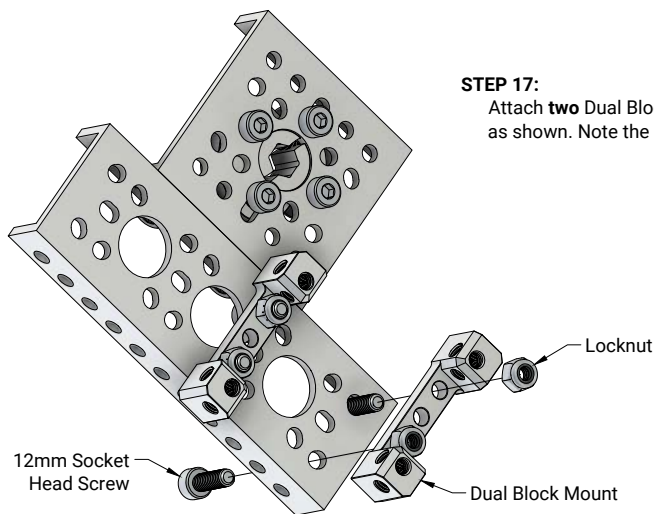
STEP 15:

Combine **one** 3-Hole Mini U-Channel and **one** 1-Hole Low U-Channel as shown using **two** 10mm Socket Head Screws and **two** Locknuts.



STEP 16:

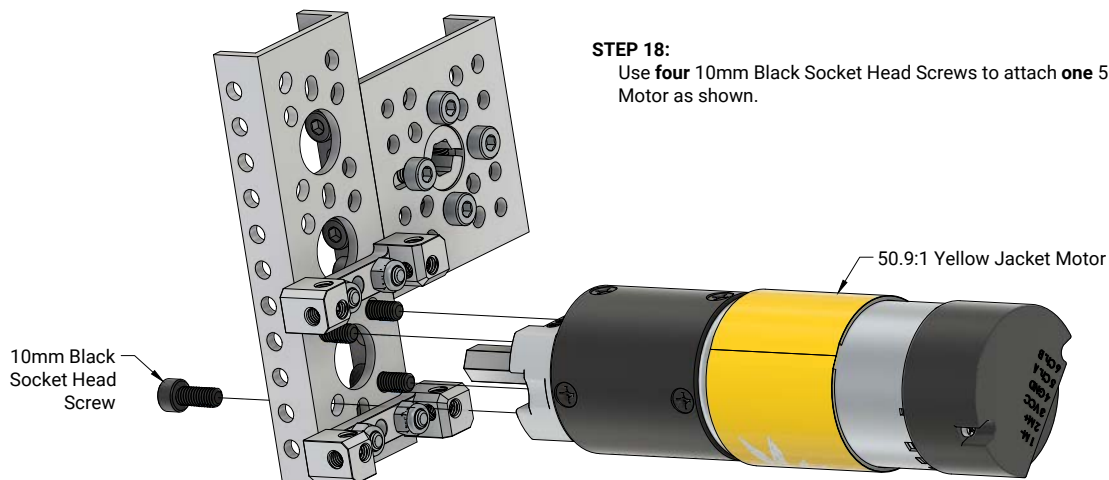
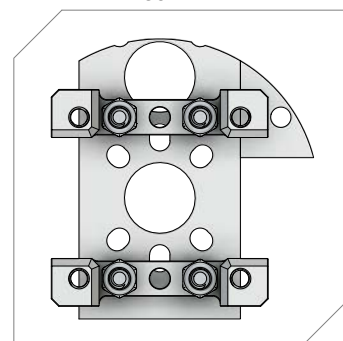
Attach **one** 8mm REX® Sonic Hub using **four** 10mm Socket Head Screws as shown. Note the orientation of the Sonic Hub.



STEP 17:

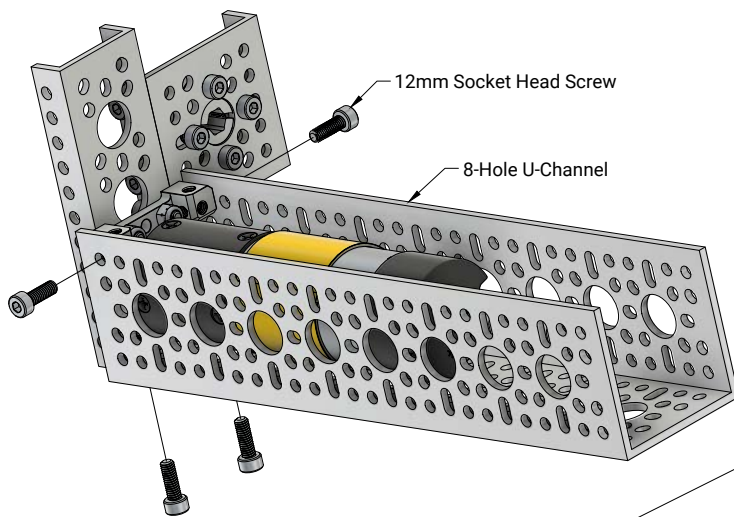
Attach **two** Dual Block Mounts using **four** 12mm Socket Head Screws and **four** Locknuts as shown. Note the orientation of the Dual Block Mounts (**FIGURE 17-A**).

FIGURE 17-A



STEP 18:

Use **four** 10mm Black Socket Head Screws to attach **one** 50.9:1 Yellow Jacket Motor as shown.

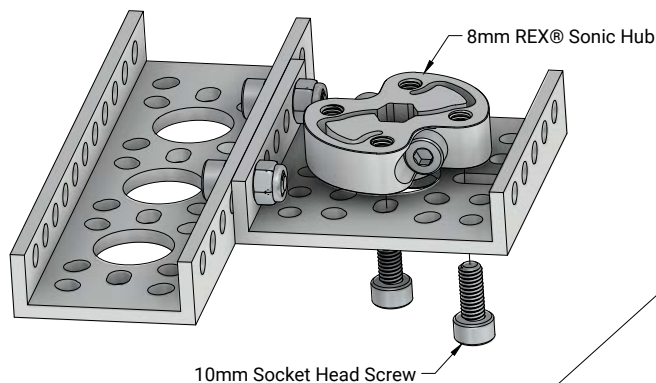
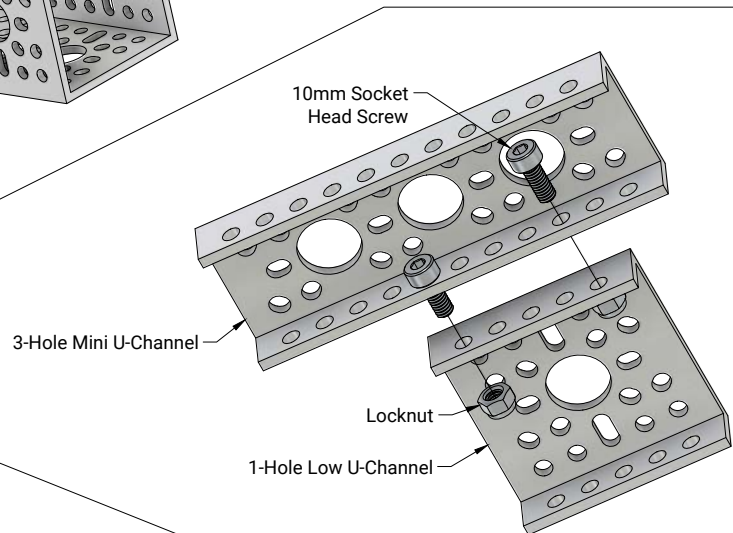


STEP 19:

Attach **one** 8-Hole U-Channel using **four** 12mm Socket Head Screws as shown.

STEP 20:

Combine **one** 3-Hole Mini U-Channel and **one** 1-Hole Low U-Channel as shown using **two** 10mm Socket Head Screws and **two** Locknuts.

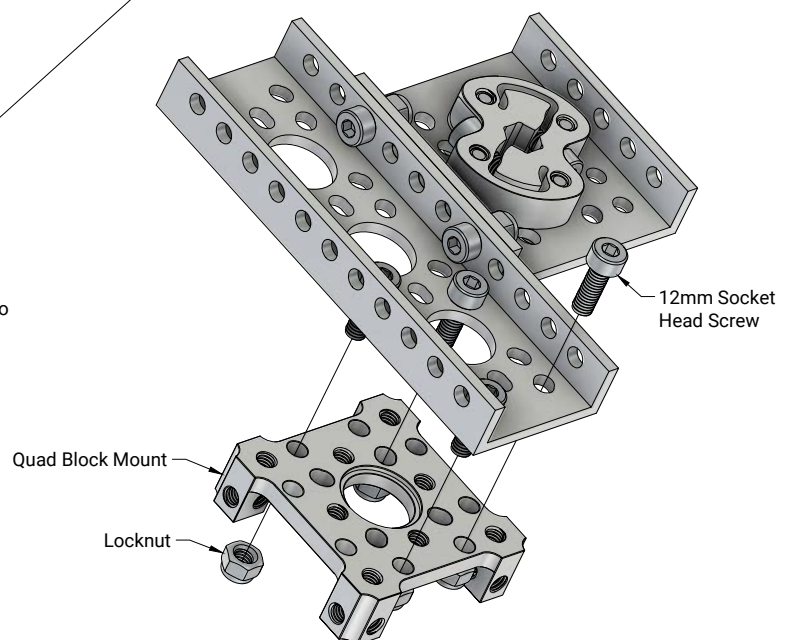


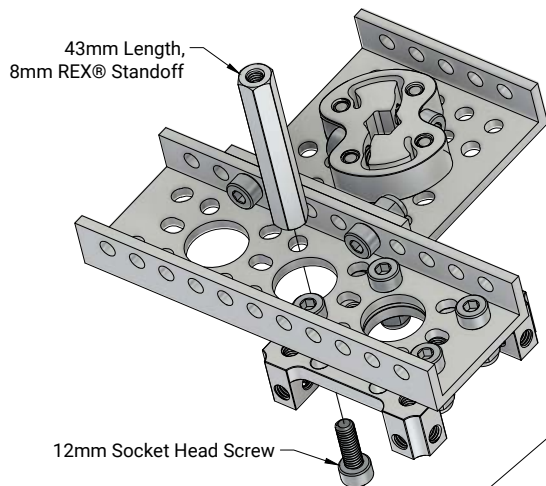
STEP 21:

Attach **one** 8mm REX® Sonic Hub using **four** 10mm Socket Head Screw as shown. Note the orientation of the Sonic Hub.

STEP 22:

Use **four** 12mm Socket Head Screws and **four** Locknuts to attach **one** Quad Block Mount as shown.



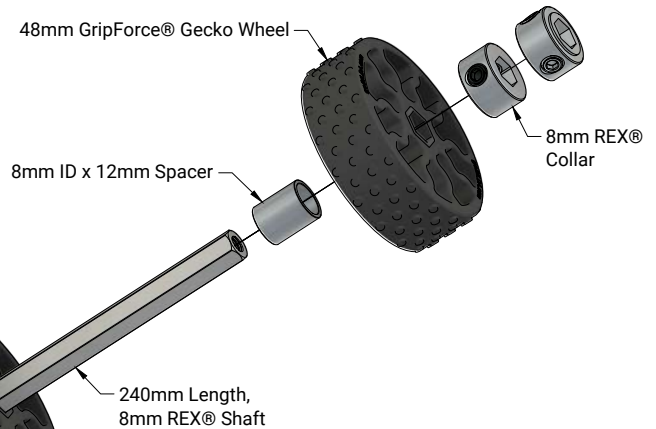


STEP 23:

Attach **one** 43mm Length, 8mm REX® Standoff using **one** 12mm Socket Head Screw as shown.

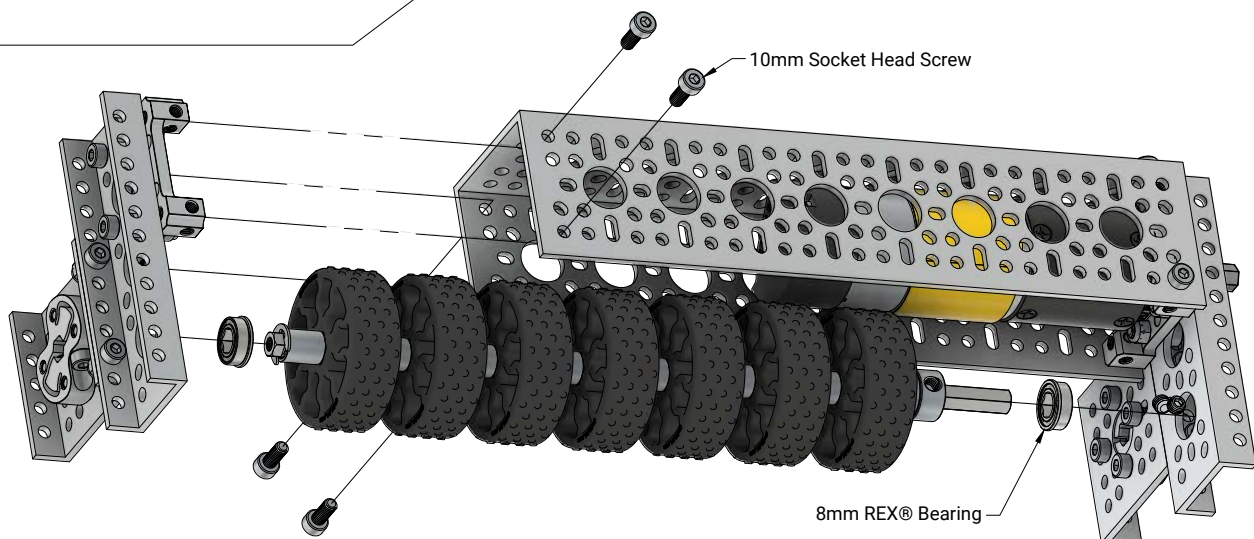
STEP 24:

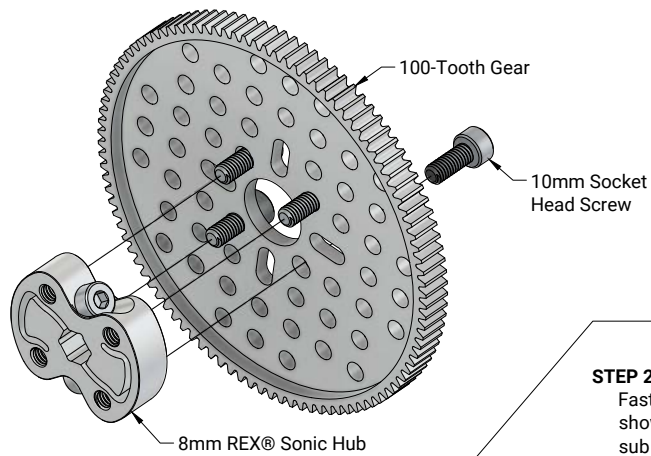
Slide **seven** 8mm ID x 12mm Spacers, **seven** 48mm GripForce® Gecko Wheels, and **two** 8mm REX® Collars onto **one** 240mm Length, 8mm REX® Shaft as shown.



STEP 25:

Combine the subassemblies from **STEP 19**, **STEP 23**, and **STEP 24** with **two** 8mm REX® Bearings and fasten together using **four** 10mm Socket Head Screws as shown.





STEP 26:

Fasten **one** 8mm REX® Sonic Hub to **one** 100-Tooth Gear using **four** 10mm Socket Head Screws as shown.

STEP 27:

Fasten the subassembly from **STEP 26** to the subassembly from **STEP 25** as shown. The 8mm REX® Sonic Hub should be spaced approximately 1mm the sub assembly from **STEP 25** as seen in **(FIGURE 27-A)**.

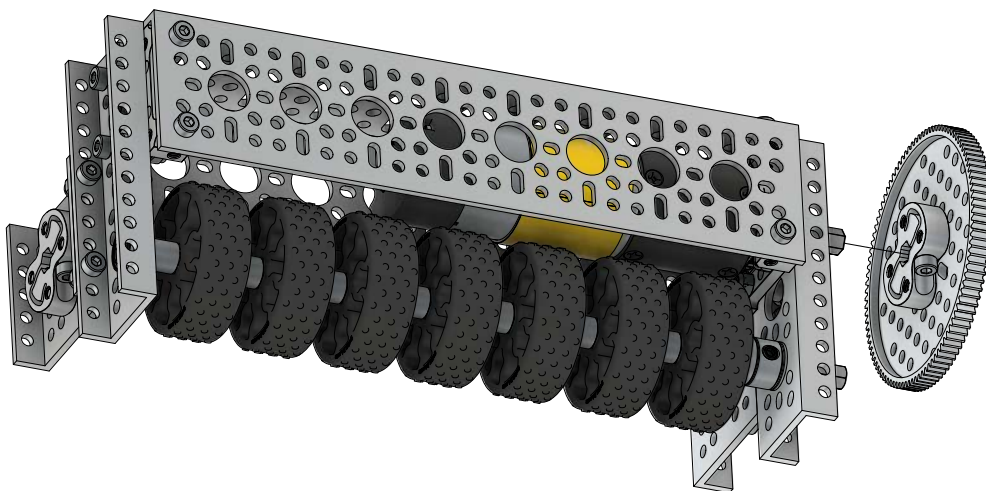
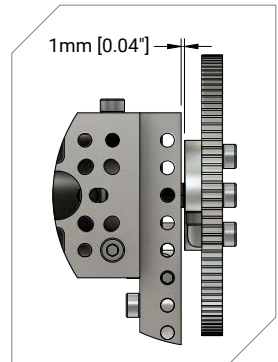


FIGURE 27-A



STEP 28:

Fasten **one** 20-Tooth Gear as shown.

Align the gears before tightening its set-screws **(FIGURE 28-A)**.

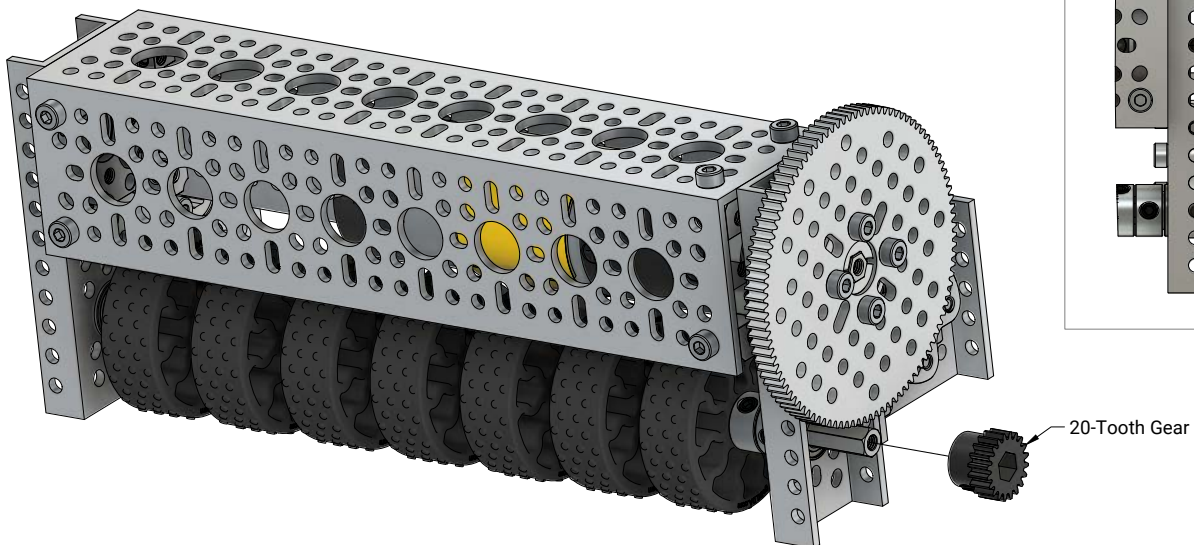
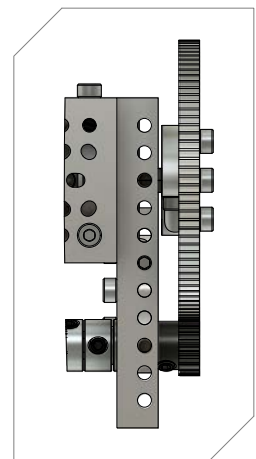
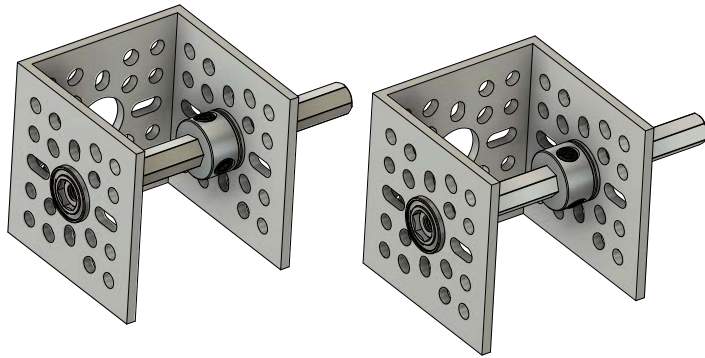


FIGURE 28-A





STEP 29:

Follow the procedure below to create two subassemblies using **two** 1-Hole U-Channels, **four** 8mm REX® Bearings, **two** 8mm REX® Collars, and **two** 80mm Length, 8mm REX® Shafts.

FIGURE 29-A

Slide one 80mm Length, 8mm REX® Shaft through one 8mm REX® Collar, one 8mm REX® Bearing, and one 1-Hole U-Channel as shown.

Do not tighten the Collar.

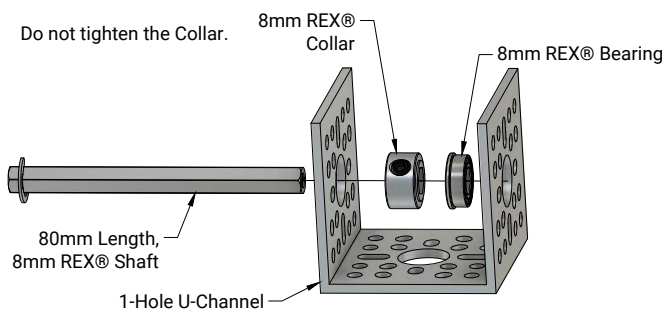


FIGURE 29-B

Slide one 8mm REX® Bearing into the 1-Hole U-Channel as shown.

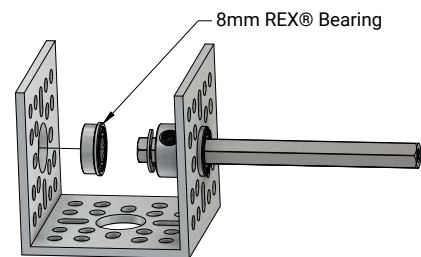
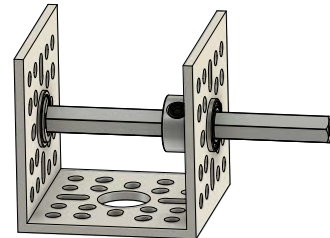


FIGURE 29-C

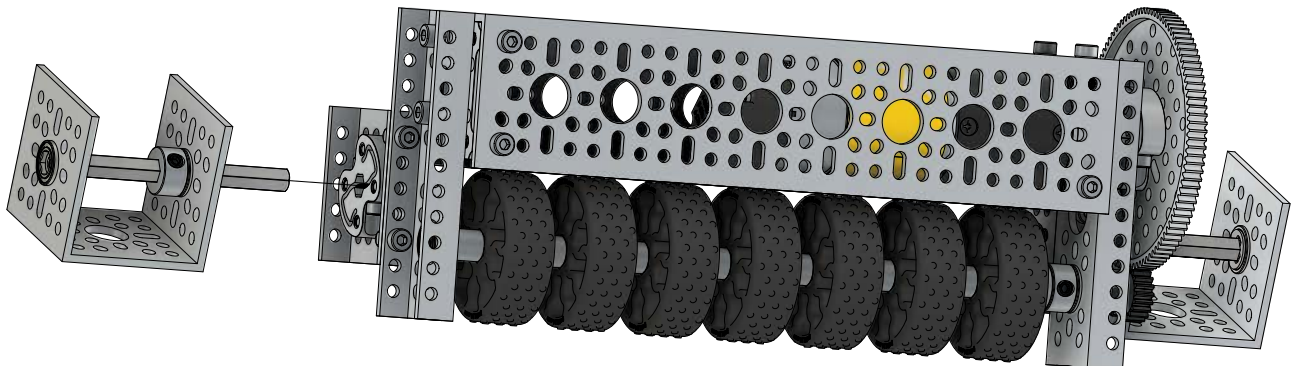
Pull the 80mm Length, 8mm REX® Shaft and the Collar against the 8mm REX® Bearings as shown, then tighten the 8mm REX® Collar in place.



STEP 30:

Combine the subassemblies from **STEP 28** and **STEP 29** as shown.

Do not tighten in place.



STEP 31:

Use **eight** 10mm Socket Head Screws and **eight** Locknuts to fasten the subassembly from **STEP 30** to the subassembly from **STEP 14** as shown.

Center the components (**FIGURE 31-A**), then tighten the 8mm REX® Sonic Hubs. A 4mm thick component such as an 1102 Series Flat Beam can be used to achieve acceptable spacing between the 100-Tooth Gear and the 1-Hole U-Channel.

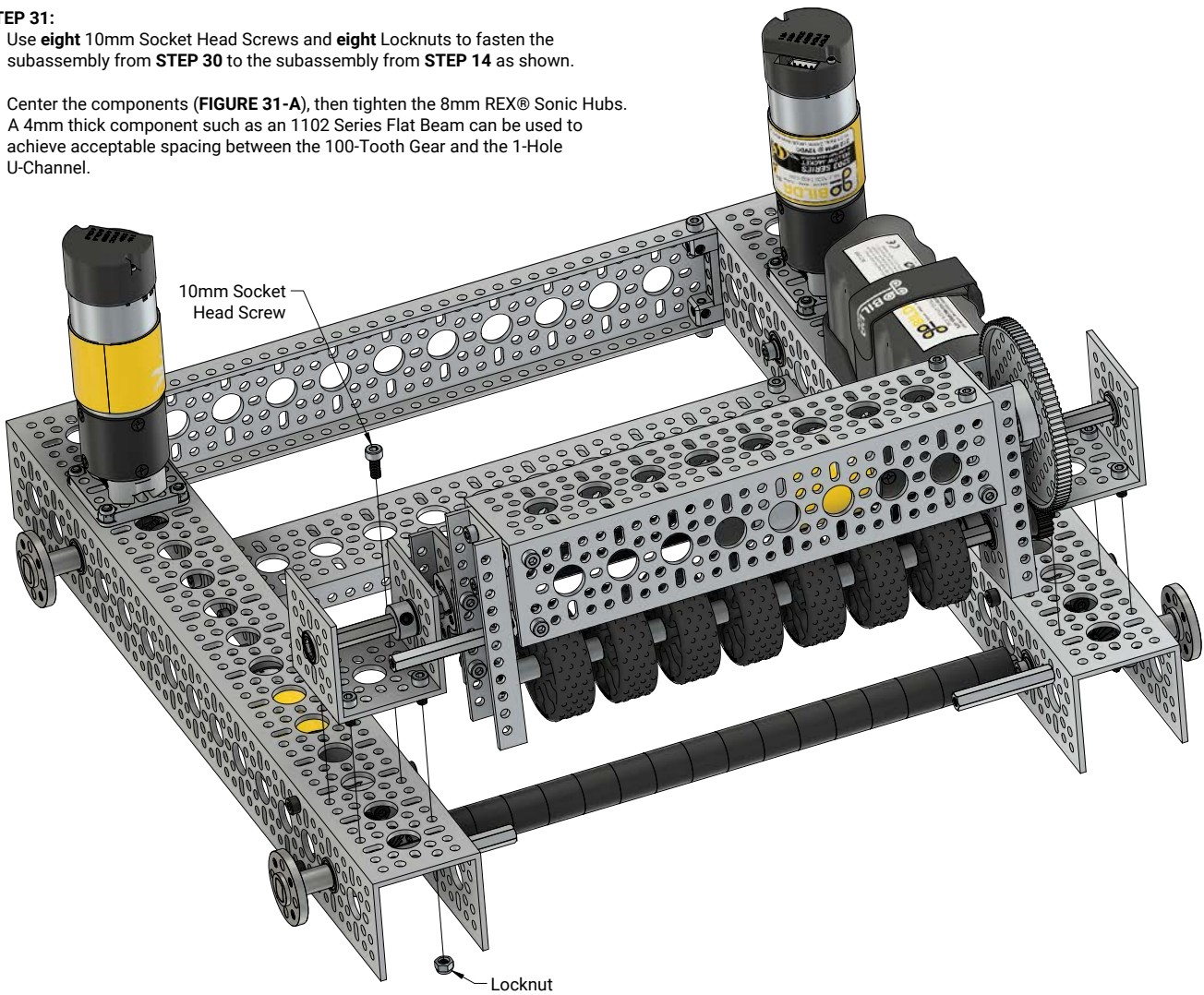


FIGURE 31-A

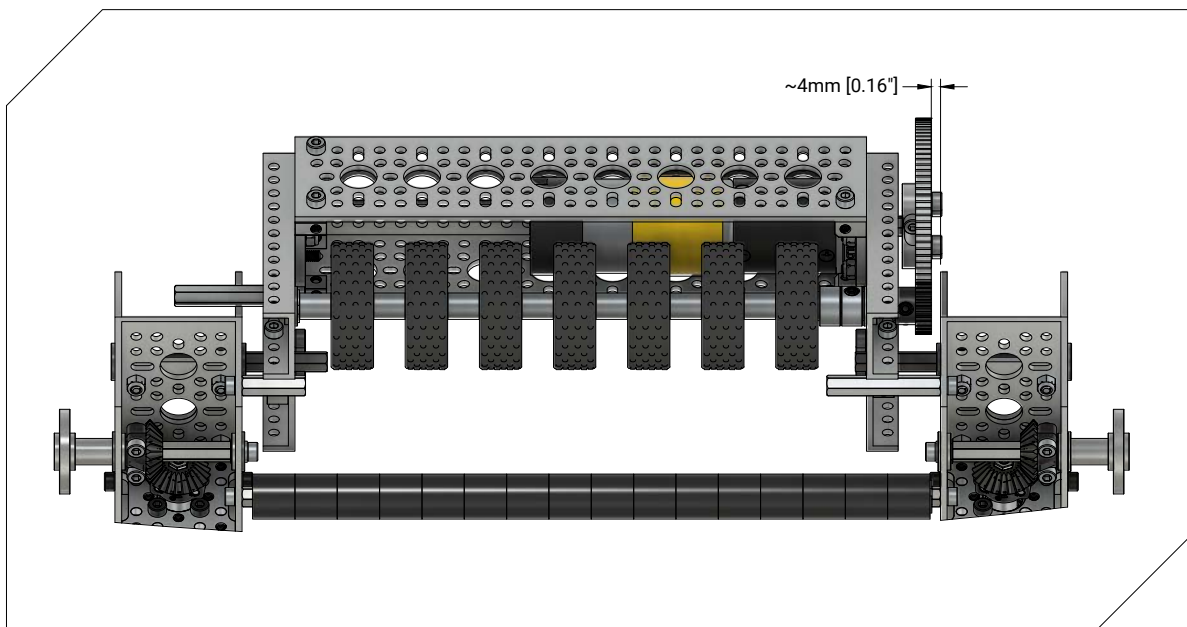
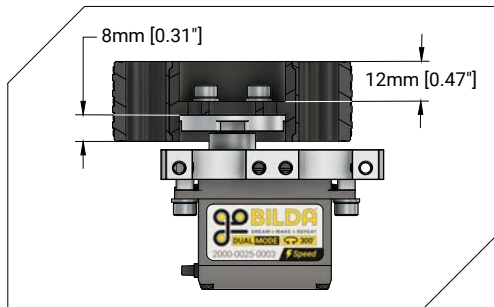




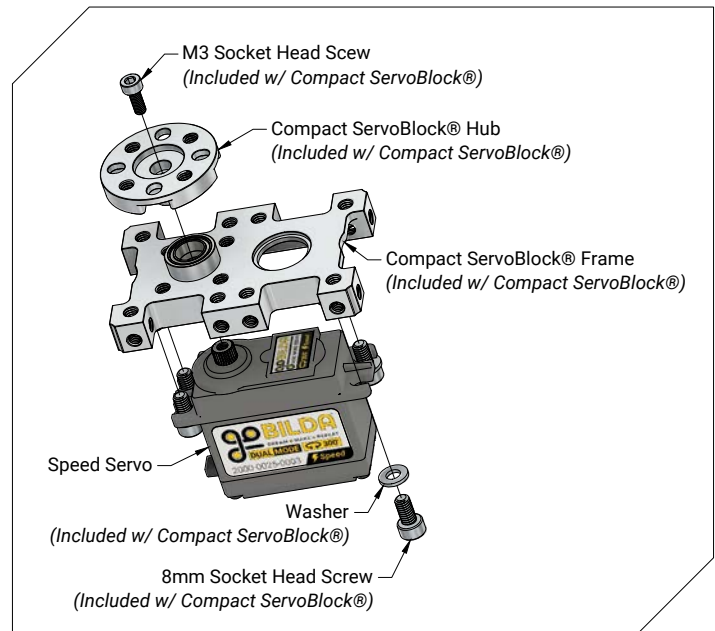
FIGURE 32-B



STEP 32:

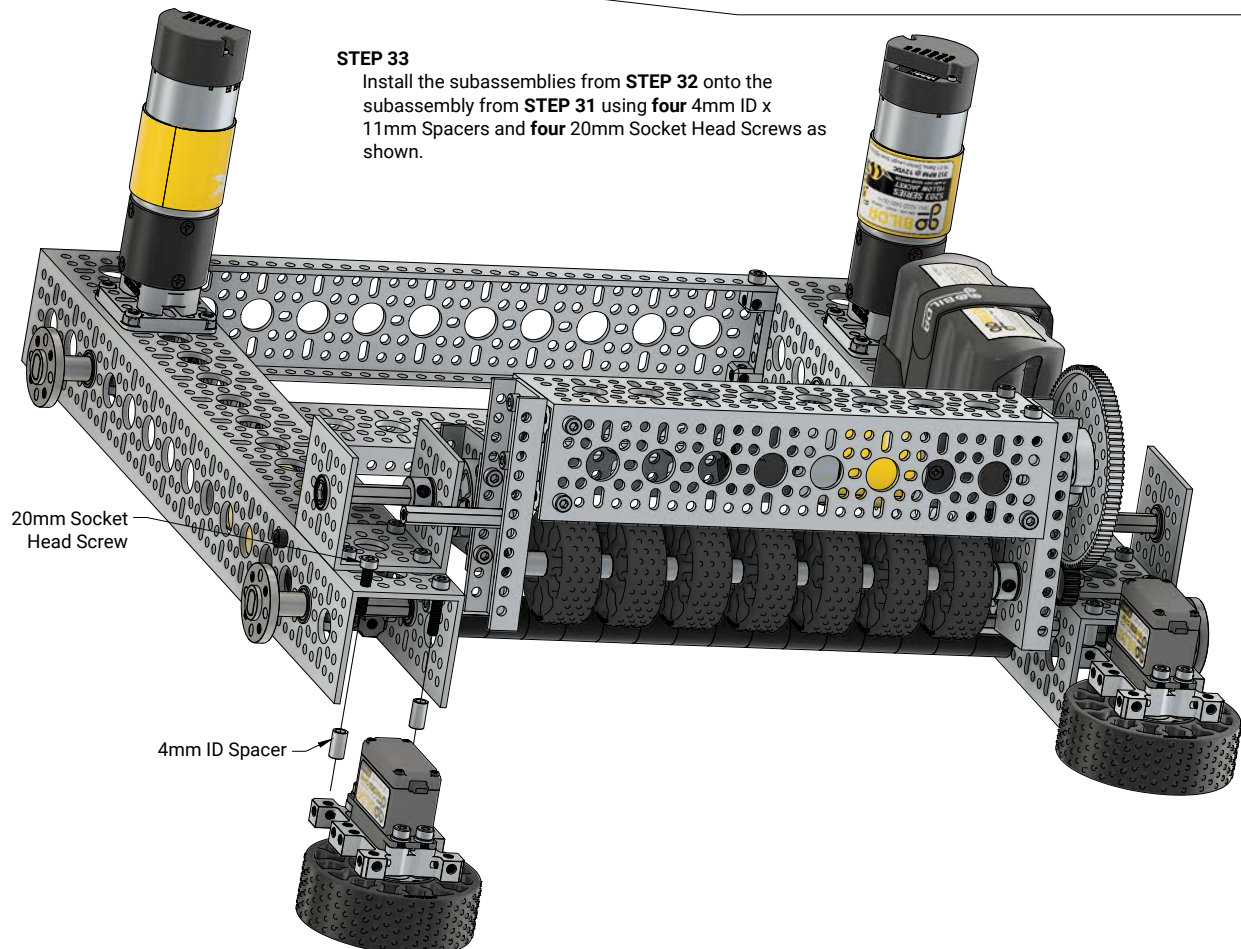
Install **two** Speed Servos in **two** Compact ServoBlocks® (FIGURE 32-A) and attach **two** 72mm GripForce® Gecko Wheels as shown (FIGURE 32-B) using **eight** Washers and **eight** 10mm Socket Head Screws.

FIGURE 32-A



STEP 33

Install the subassemblies from STEP 32 onto the subassembly from STEP 31 using **four** 4mm ID x 11mm Spacers and **four** 20mm Socket Head Screws as shown.

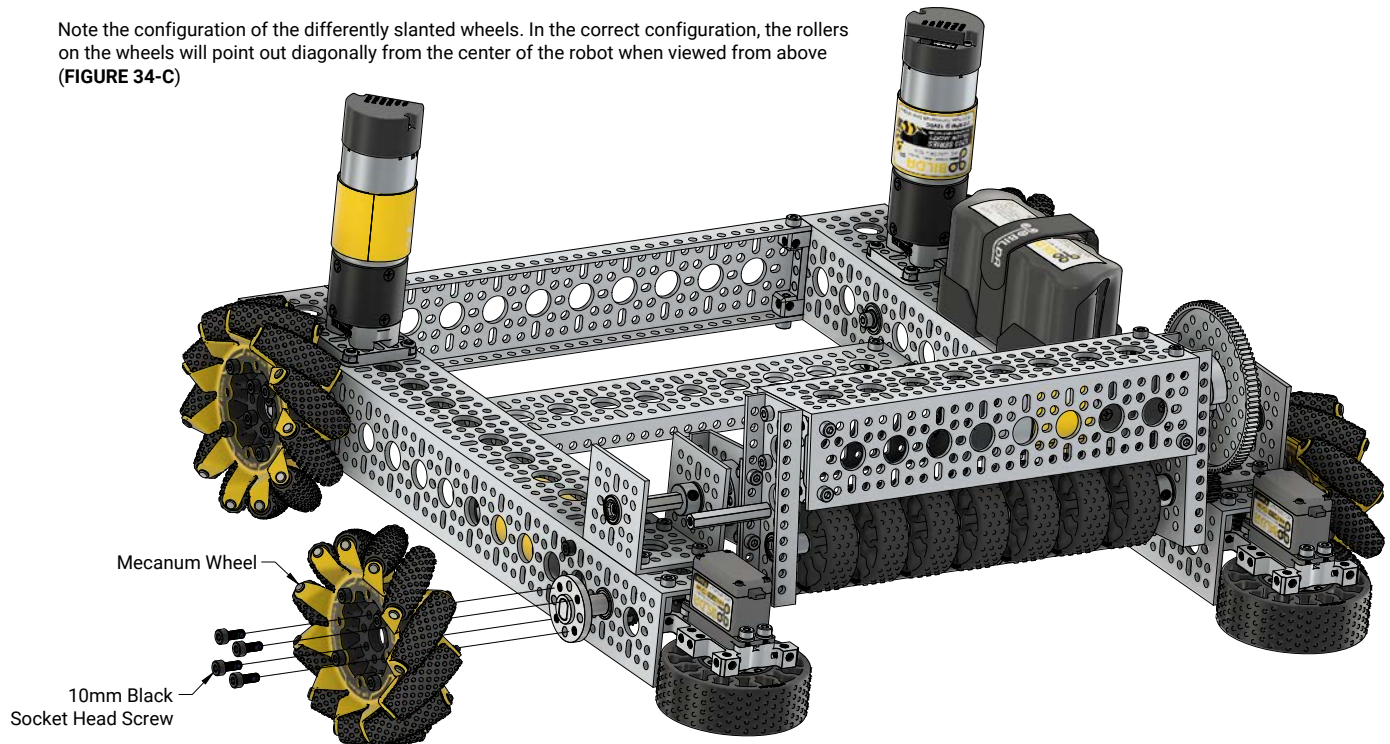
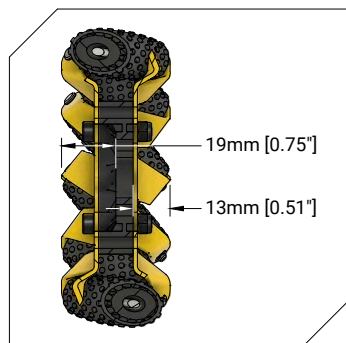
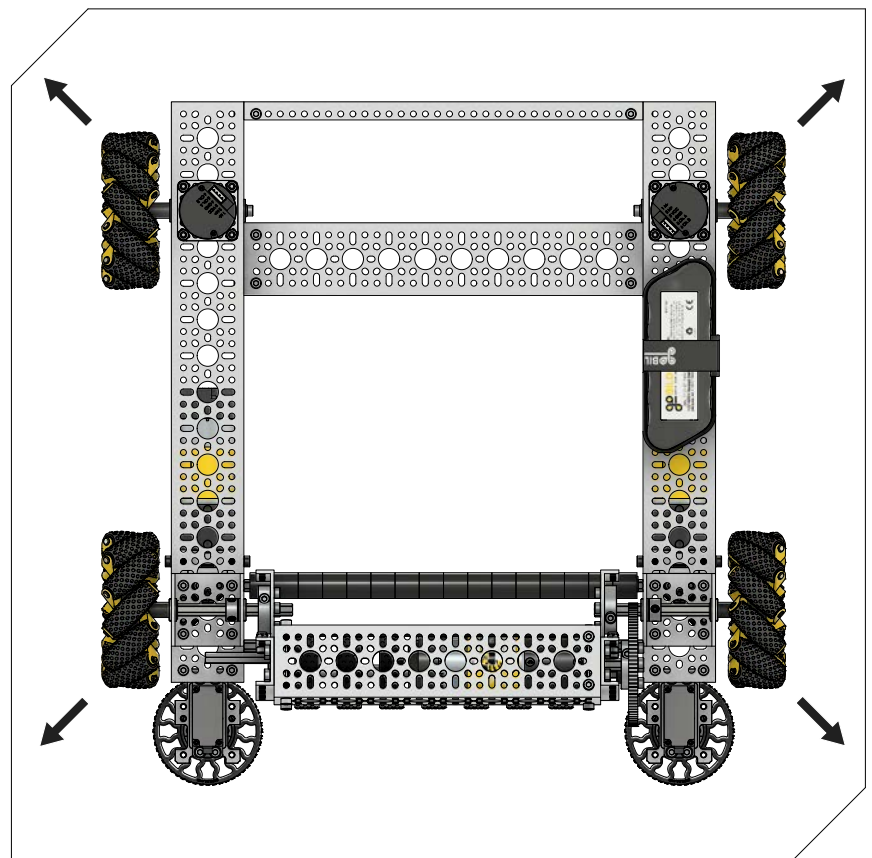
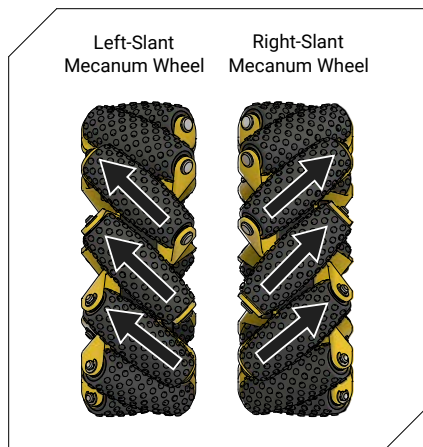


STEP 34:

Attach **two** Right-Slant Mecanum Wheels and **two** Left-Slant Mecanum Wheels using **sixteen** 10mm Black Socket Head Screws as shown.

The Mecanum Wheels should mount to the Hub-Shafts from the "shallow" side of the Mecanum Wheels (**FIGURE 34-A**).

Note the configuration of the differently slanted wheels. In the correct configuration, the rollers on the wheels will point out diagonally from the center of the robot when viewed from above (**FIGURE 34-C**)

**FIGURE 34-C****FIGURE 34-A****FIGURE 34-B**

Great Job!

You've completed the assembly! You're almost there—next up is wiring and programming your robot. Remember, this is just the beginning of what you can accomplish. Stay curious, and enjoy the journey ahead!

