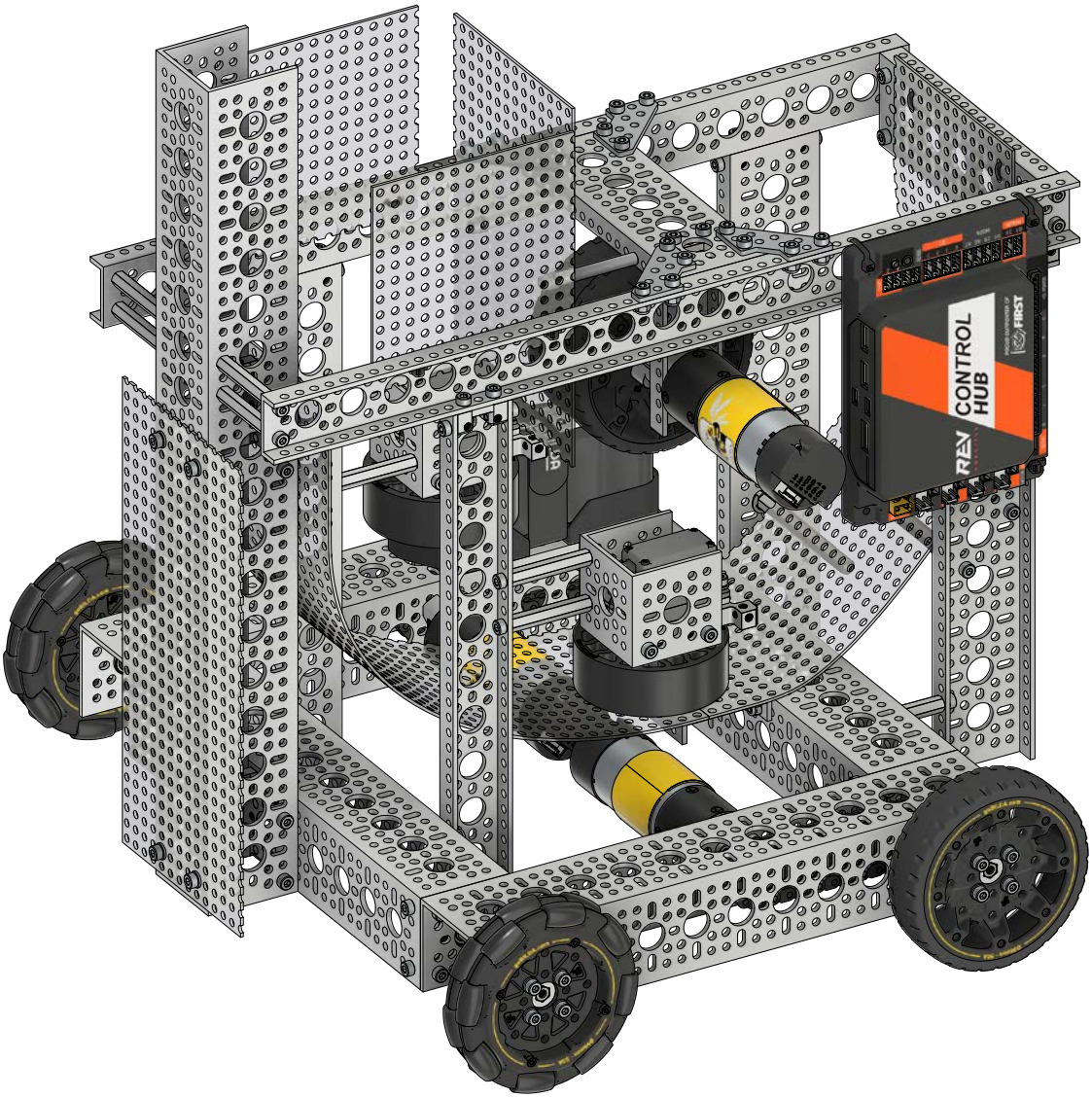
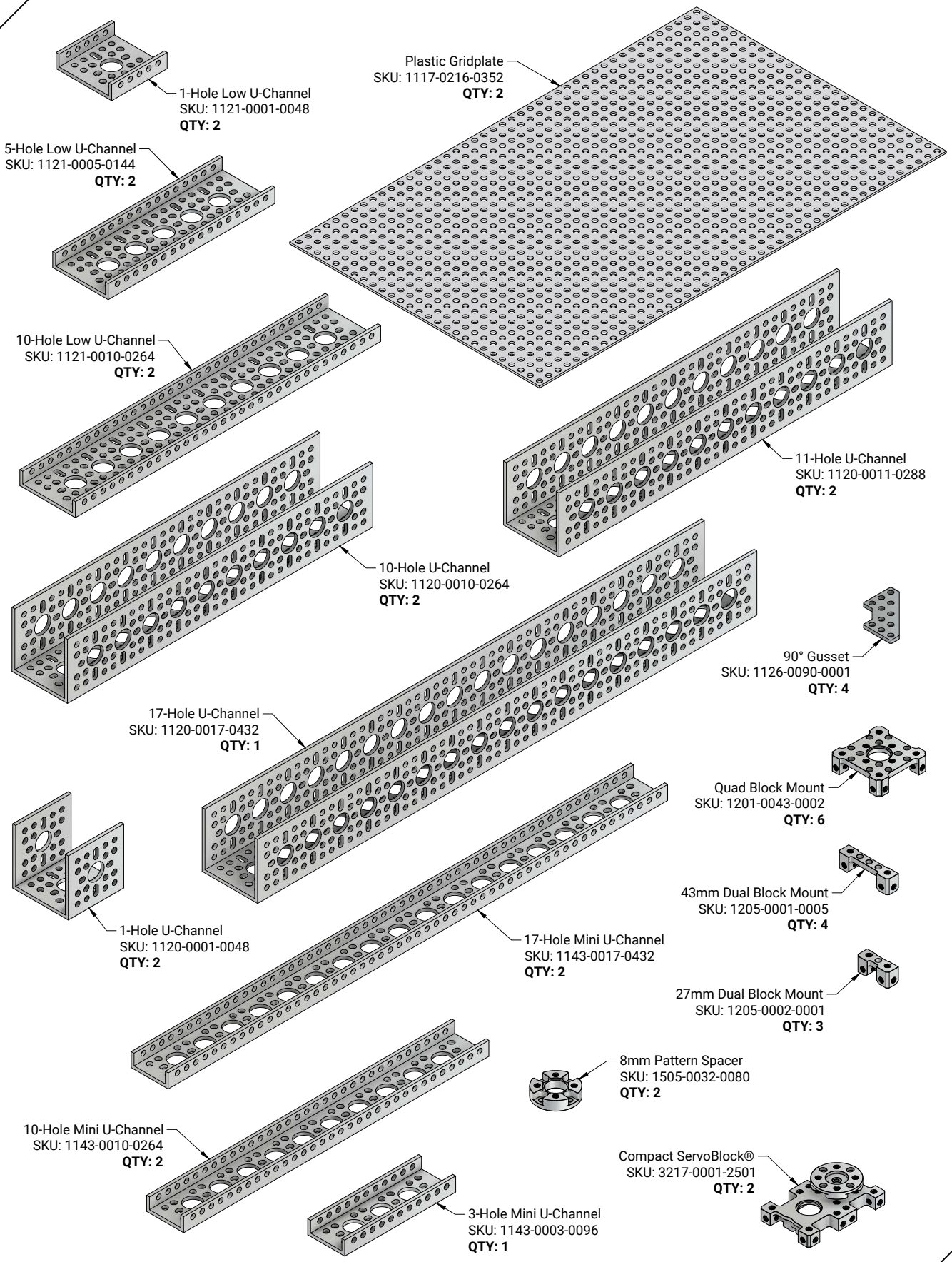
Assembly Instructions for
FTC Starter Bot (for DECODE™)
Built from the FTC Starter Kit (SKU: 3200-4008-2526)

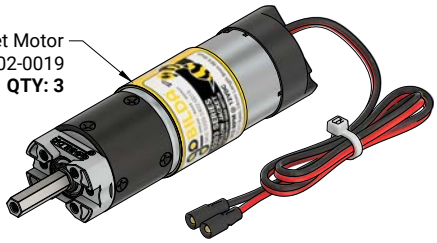


Kit Contents



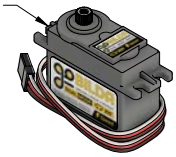
Kit Contents *(Cont)*

Omni Wheel
SKU: 3624-0014-0096
QTY: 2



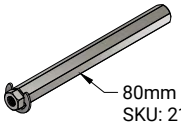
19.2:1 Ratio Yellow Jacket Motor
SKU: 5203-2402-0019
QTY: 3

Hogback Wheel
SKU: 3626-0014-0096
QTY: 4



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

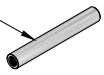
Gecko® Wheel
SKU: 3613-0014-0072
QTY: 2



80mm Length, 8mm REX™ Shaft
SKU: 2106-4008-0800
QTY: 8

Chain Link
SKU: 3309-0108-0050
QTY: 68

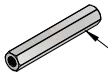
1:1 Coupler
SKU: 5105-0208-0019
QTY: 1



43mm Length, 6mm Round Standoff
SKU: 1501-0006-0430
QTY: 2

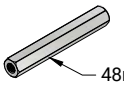
24mm Length, 8mm REX™ Standoff
SKU: 1516-4008-0240
QTY: 2

8mm REX™ Hyper Hub
SKU: 1310-0016-4008
QTY: 5

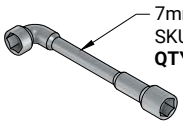


43mm Length, 8mm REX™ Standoff
SKU: 1516-4008-0430
QTY: 4

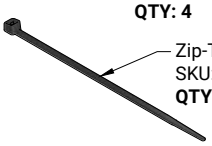
10-Tooth Sprocket
SKU: 3307-4008-0010
QTY: 4



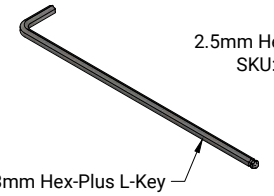
48mm Length, 8mm REX™ Standoff
SKU: 1516-4008-0480
QTY: 4



7mm Nut Driver
SKU: 4206-0070-0001
QTY: 1



Zip-Tie
SKU: 2909-0101-0100
QTY: 11

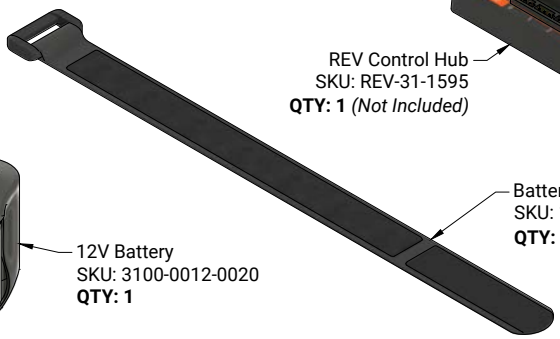


3mm Hex-Plus L-Key
SKU: 5027104001
QTY: 1

2.5mm Hex-Plus L-Key
SKU: 5027103001
QTY: 1

Battery Mount
SKU: 1209-0001-0001
QTY: 1

REV Control Hub
SKU: REV-31-1595
QTY: 1 *(Not Included)*



Battery Strap
SKU: 1209-0001-0001
QTY: 1 *(Included w/ Battery Mount)*

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

8mm Socket Head Screw
SKU: 2800-0004-0008
QTY: 80

10mm Socket Head Screw
SKU: 2800-0004-0010
QTY: 70

12mm Socket Head Screw
SKU: 2800-0004-0012
QTY: 32

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

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

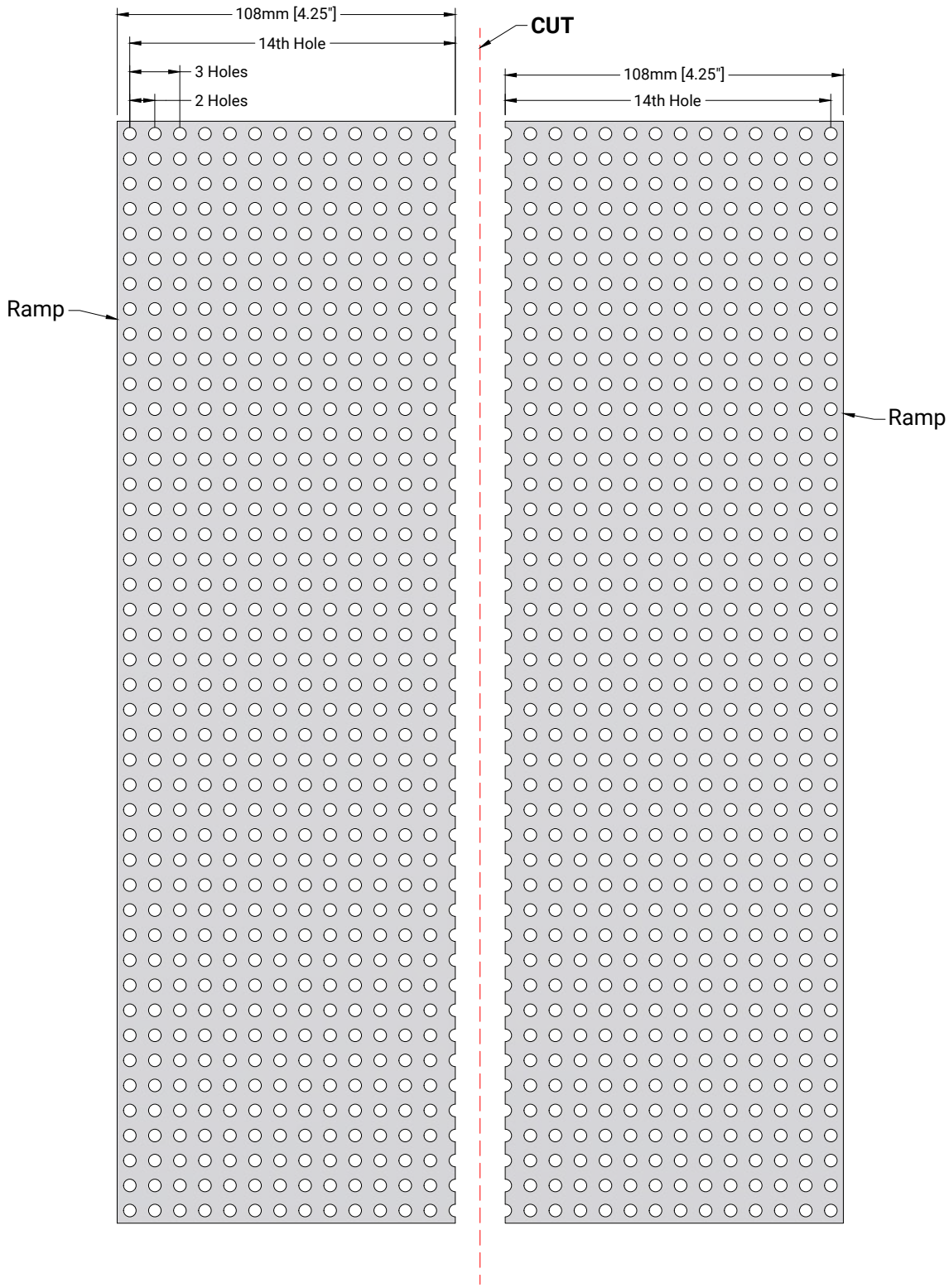
Washer
SKU: 2801-0004-0008
QTY: 40

Locknut
SKU: 2812-0004-0007
QTY: 36

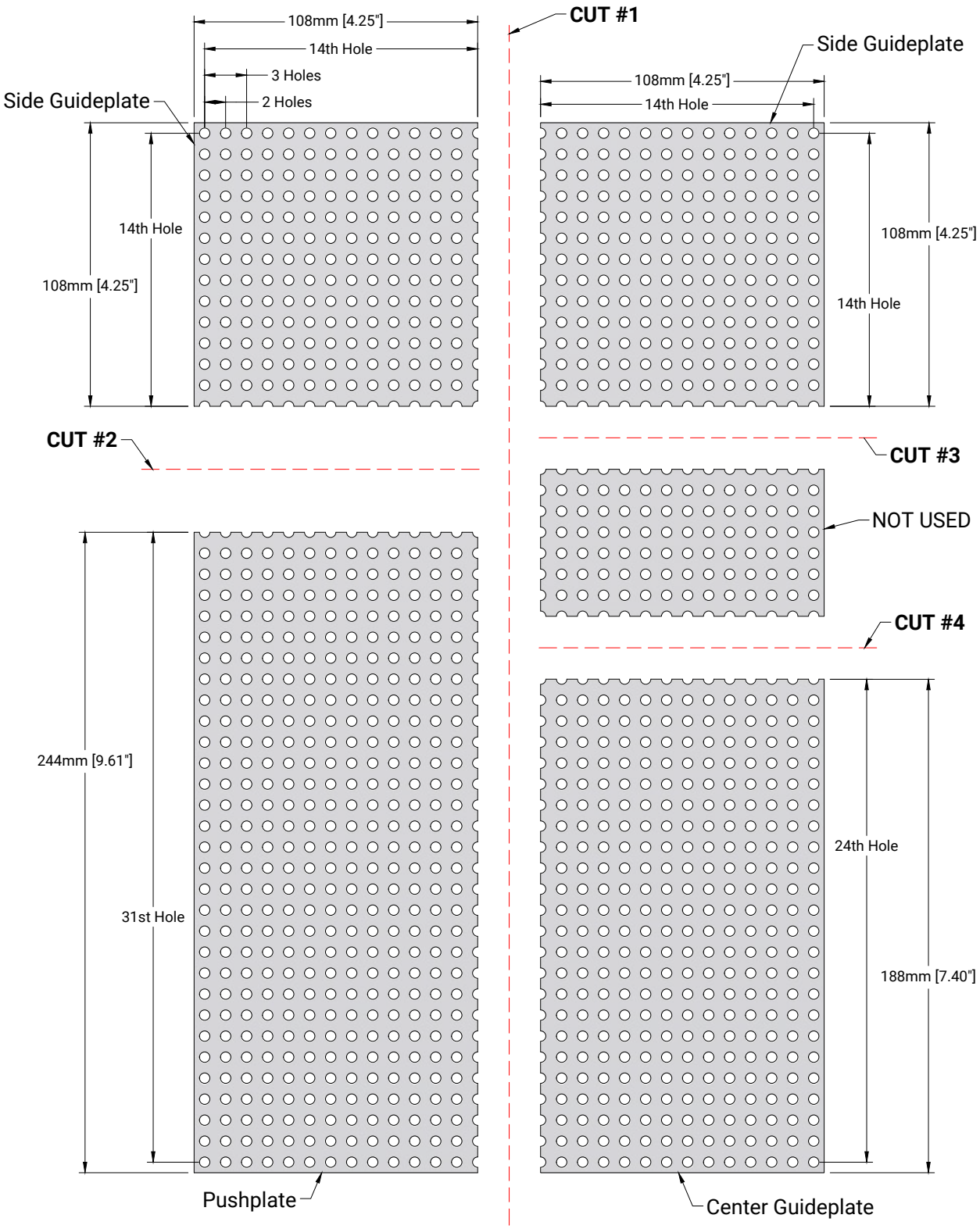
8mm ID Spacer
SKU: 1522-0010-0120
QTY: 2

8mm REX™ Bearing
SKU: 1611-0514-4008
QTY: 8

Plastic Gridplate #1 Cutlines

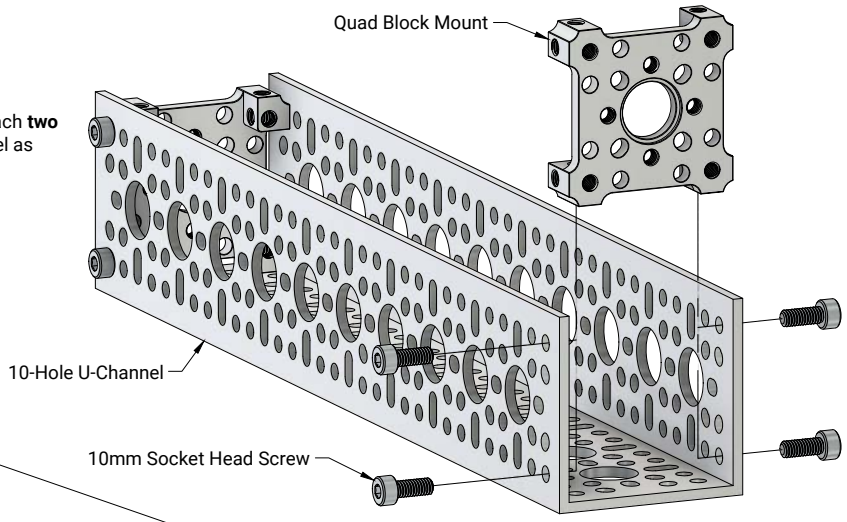


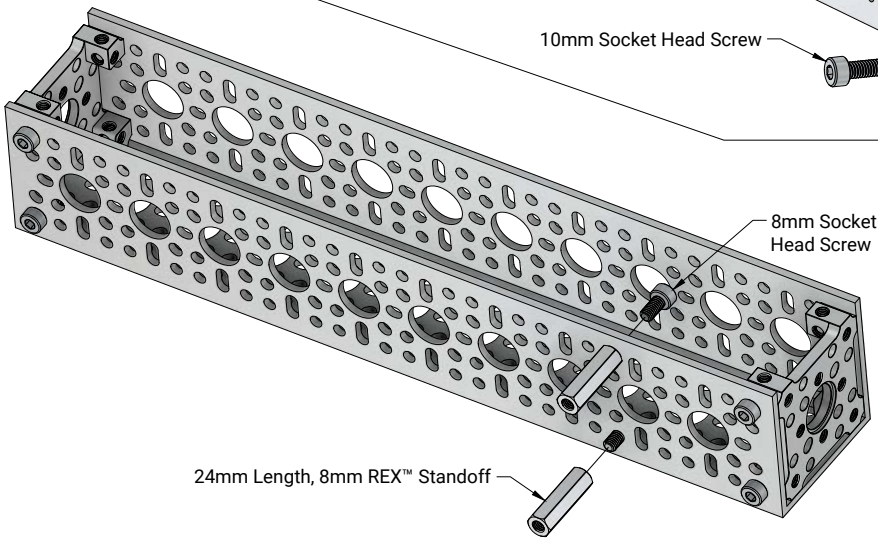
Plastic Gridplate #2 Cutlines



STEP 1:

Use **eight** 10mm Socket Head Screws to attach **two** Quad Block Mounts to **one** 10-Hole U-Channel as shown.





STEP 2:

Use **two** 8mm Socket Head Screws to attach **two** 24mm Length, 8mm REX™ Standoffs as shown.

STEP 3:

Fasten **two** 1-Hole Low U-Channels using **four** 10mm Socket Head Screws and **four** Locknuts as shown.

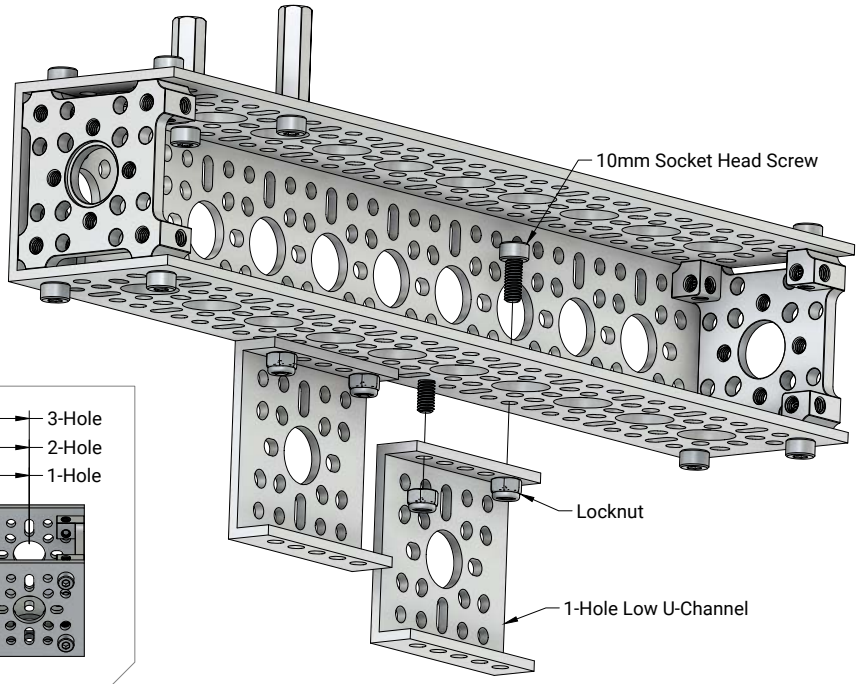
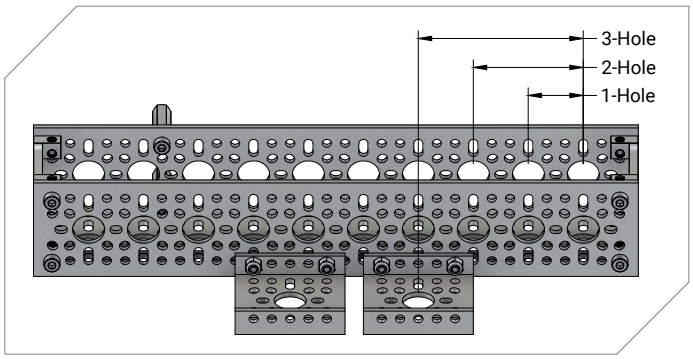
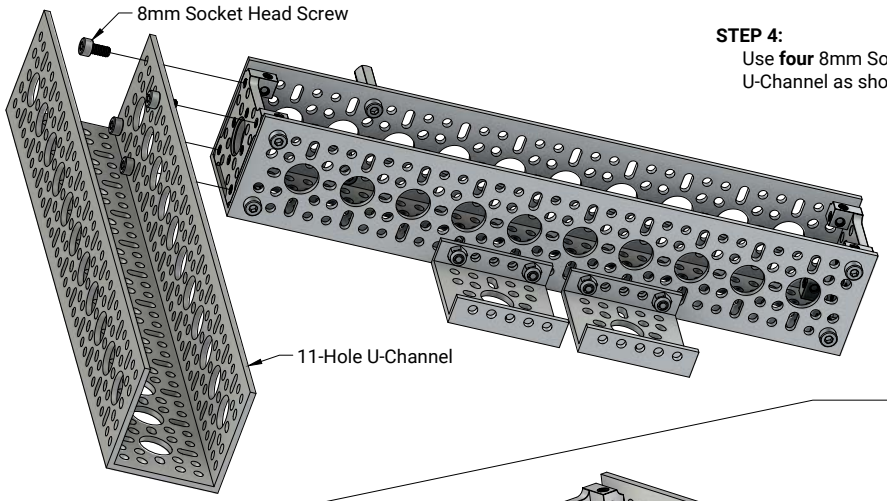


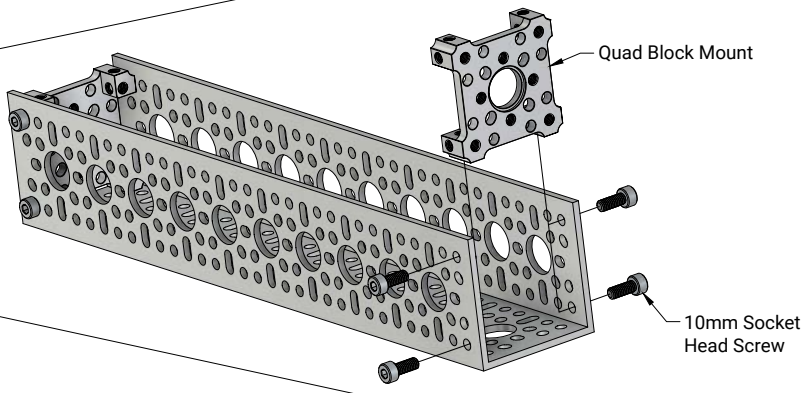
FIGURE 3-A





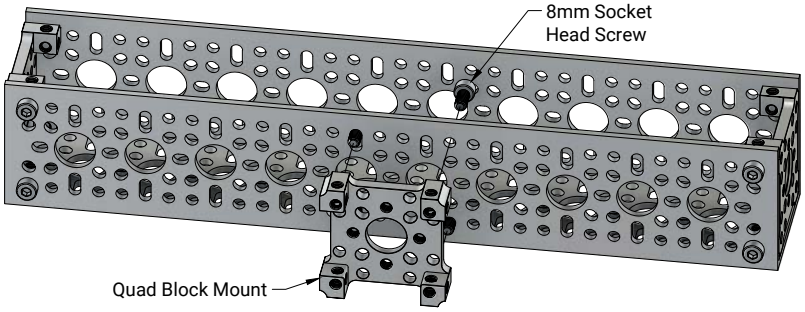
STEP 4:

Use **four** 8mm Socket Head Screws to attach **one** 11-Hole U-Channel as shown.



STEP 5:

Use **eight** 10mm Socket Head Screws to attach **two** Quad Block Mounts to **one** 10-Hole U-Channel as shown.

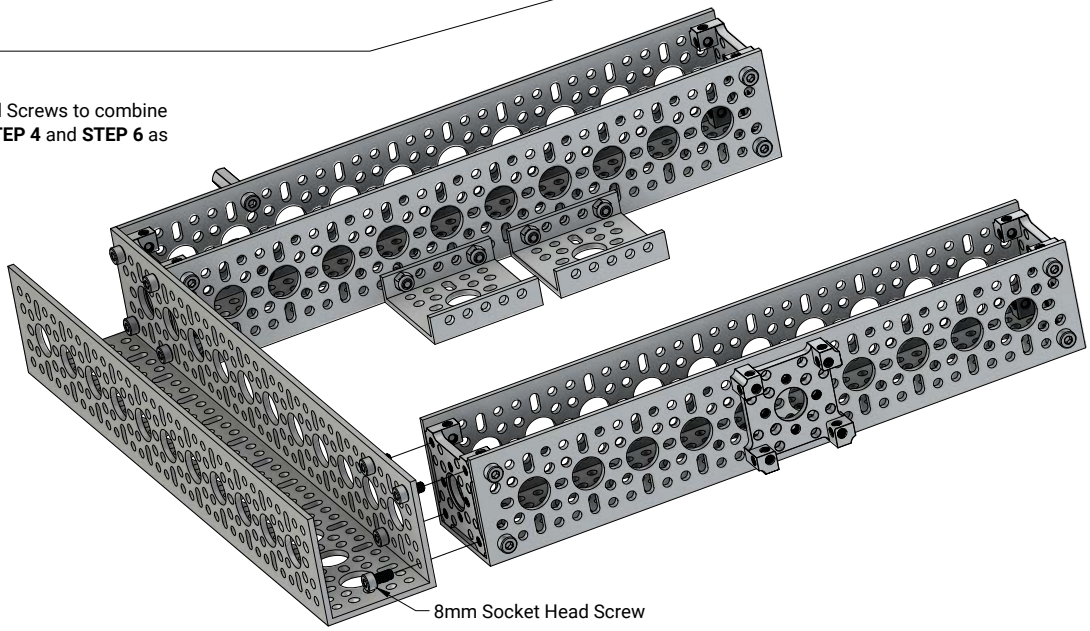


STEP 6:

Use **four** 8mm Socket Head Screws to attach **one** Quad Block Mount as shown. Note the location. When positioned correctly, the large hole of the Quad Block Mount will *not* align with the large holes of the 10-Hole U-Channel.

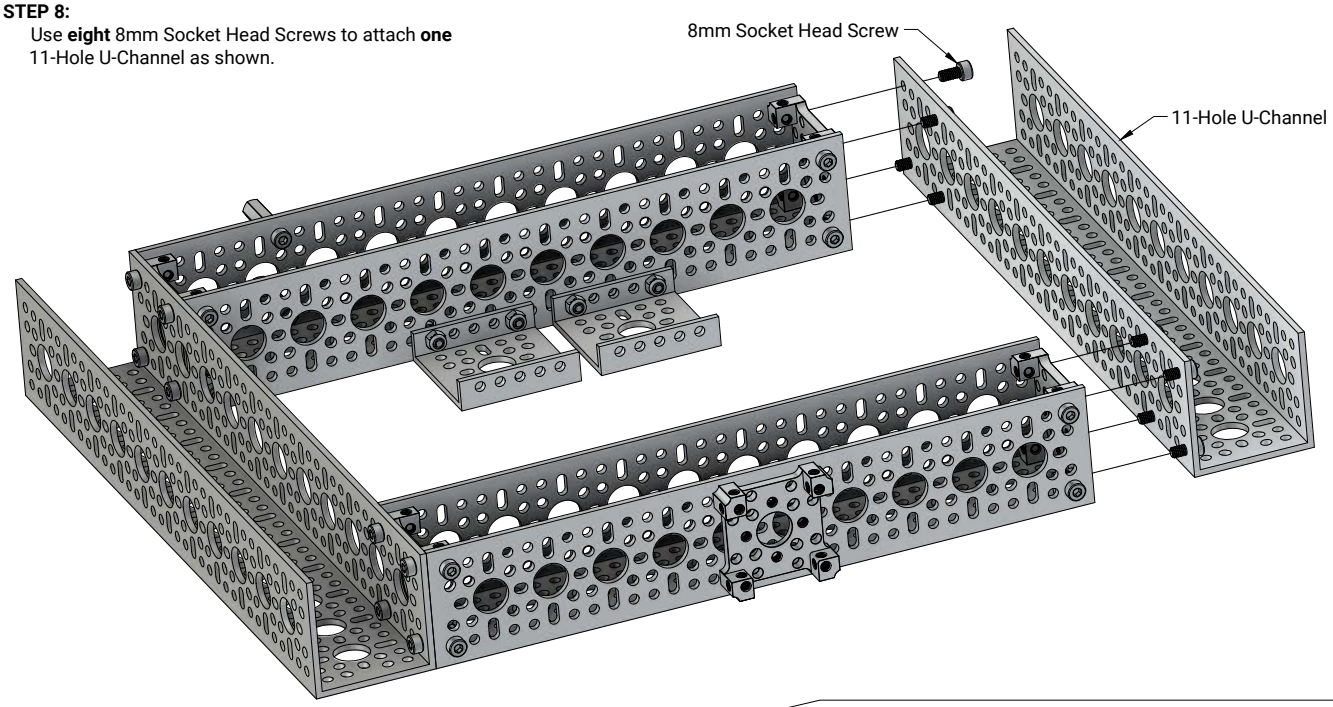
STEP 7:

Use **four** 8mm Socket Head Screws to combine the subassemblies from **STEP 4** and **STEP 6** as shown.



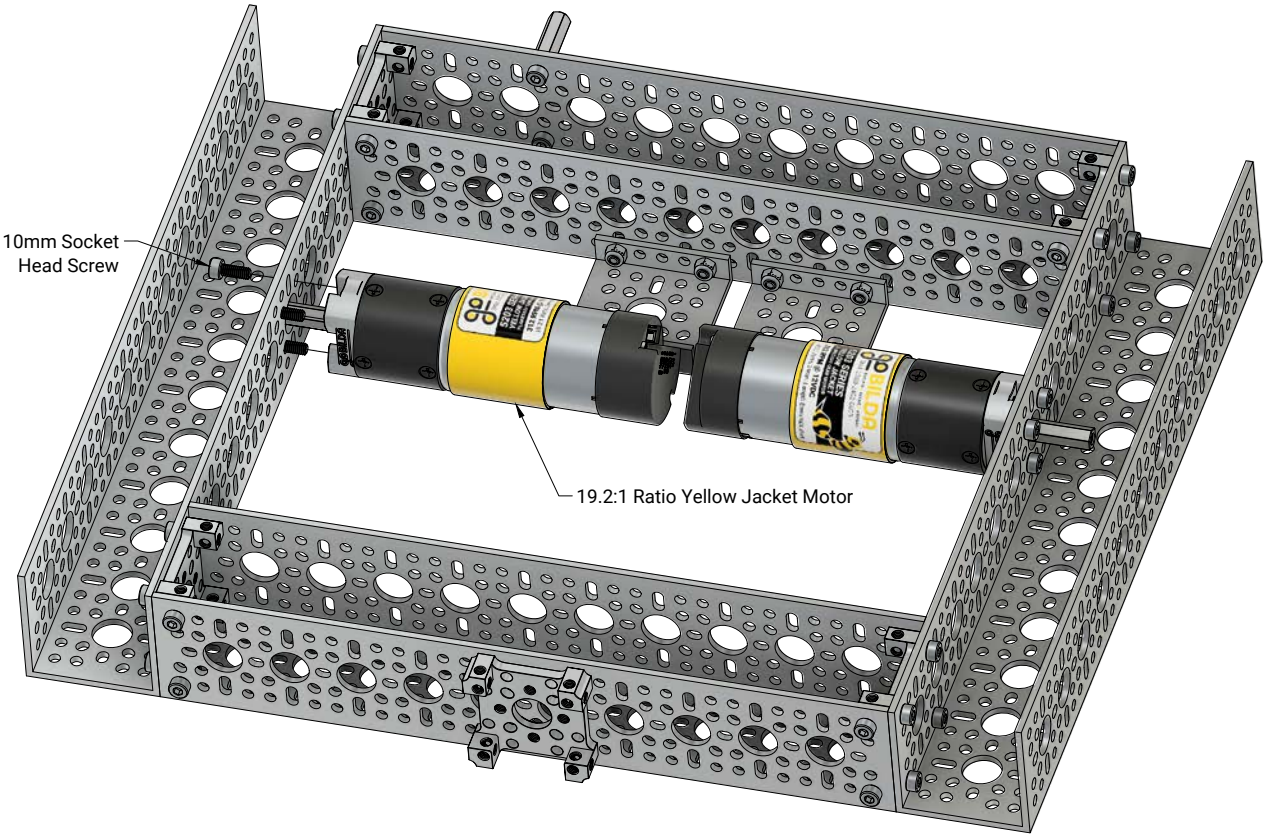
STEP 8:

Use **eight** 8mm Socket Head Screws to attach **one** 11-Hole U-Channel as shown.



STEP 9:

Mount **two** 19.2:1 Ratio Yellow Jacket Motors using **eight** 10mm Socket Head Screws as shown.

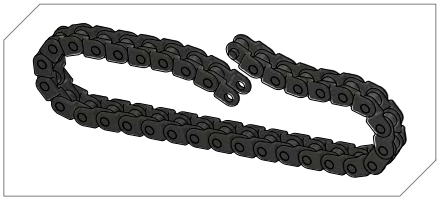


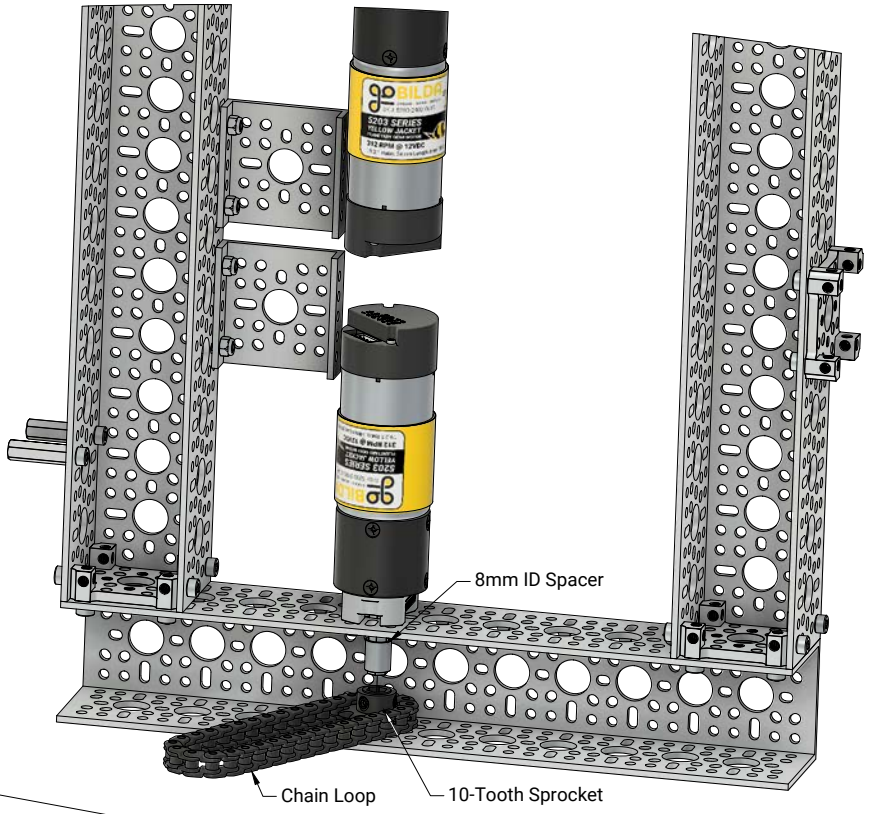
STEP 10:

Use **thirty-four** Chain Links to create a Chain Loop (**FIGURE 10-A**).

Slide the Chain Loop, **one** 10-Tooth Sprocket, and **one** 8mm ID Spacer onto the 19.2:1 Ratio Yellow Jacket Motor as shown.

FIGURE 10-A



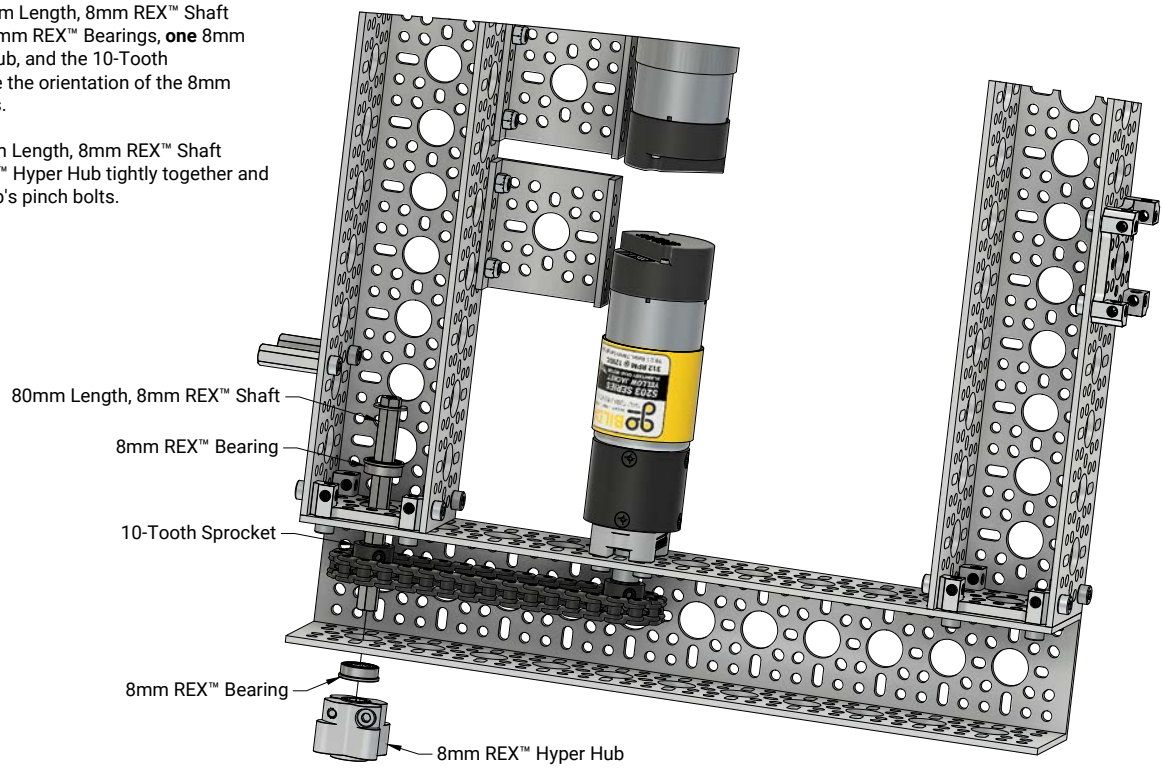


STEP 11:

Position **one** 10-Tooth Sprocket into the Chain Loop.

Slide **one** 80mm Length, 8mm REX™ Shaft through **two** 8mm REX™ Bearings, **one** 8mm REX™ Hyper Hub, and the 10-Tooth Sprocket. Note the orientation of the 8mm REX™ Bearings.

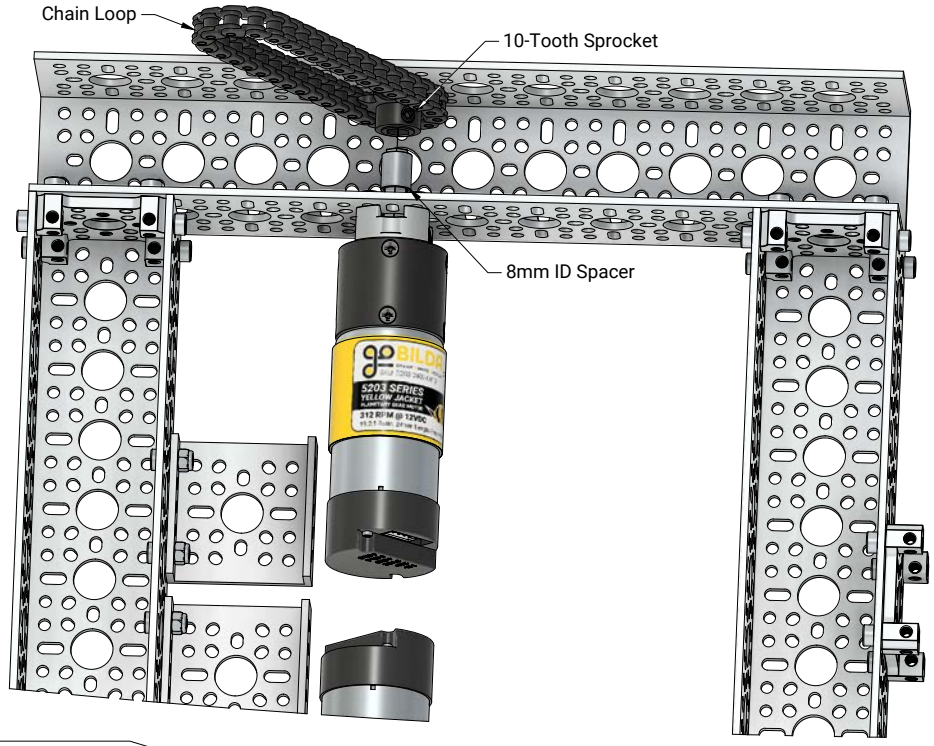
Hold the 80mm Length, 8mm REX™ Shaft and 8mm REX™ Hyper Hub tightly together and tighten the hub's pinch bolts.



STEP 12:

Use **thirty-four** Chain Links to create a Chain Loop.

Slide the Chain Loop, **one** 10-Tooth Sprocket, and **one** 8mm ID Spacer onto the 19.2:1 Ratio Yellow Jacket Motor as shown.

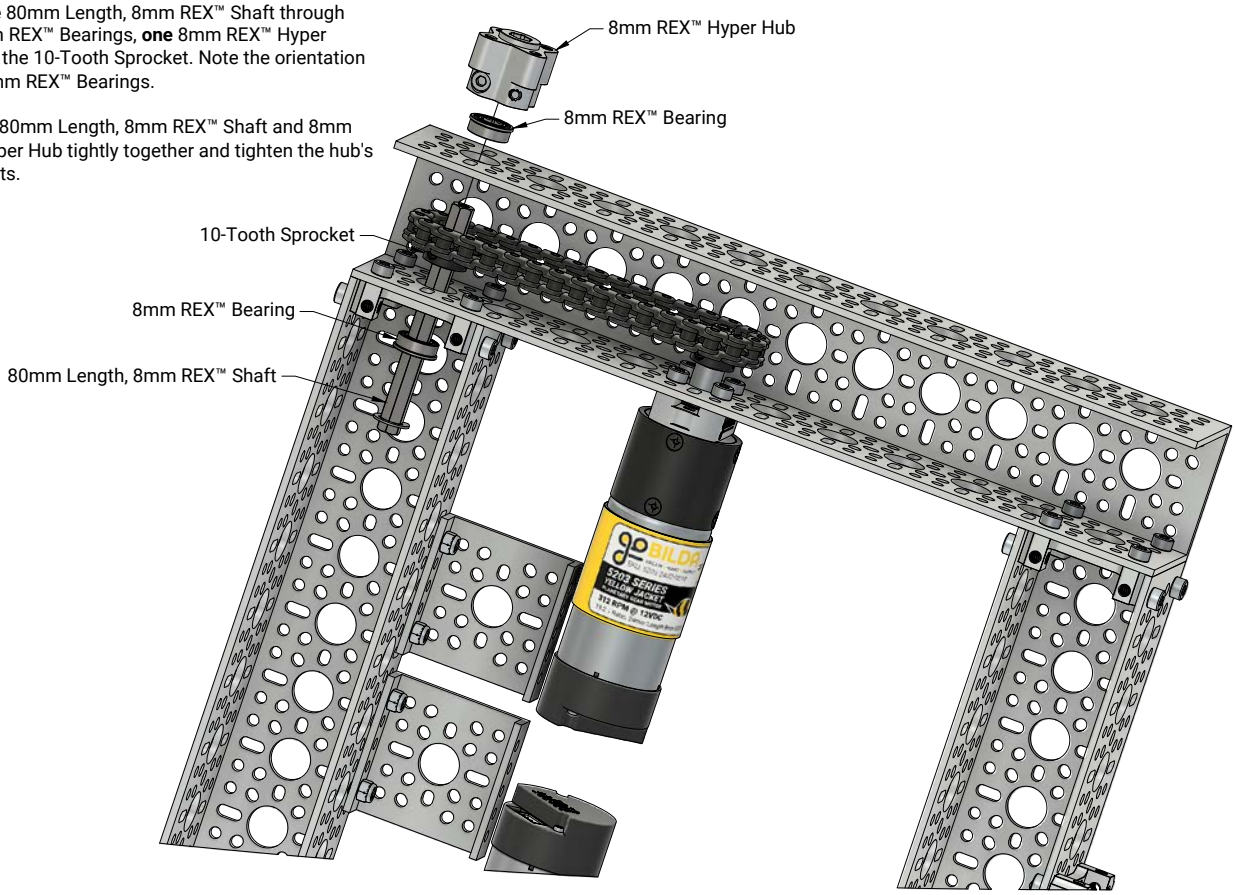


STEP 13:

Position **one** 10-Tooth Sprocket into the Chain Loop.

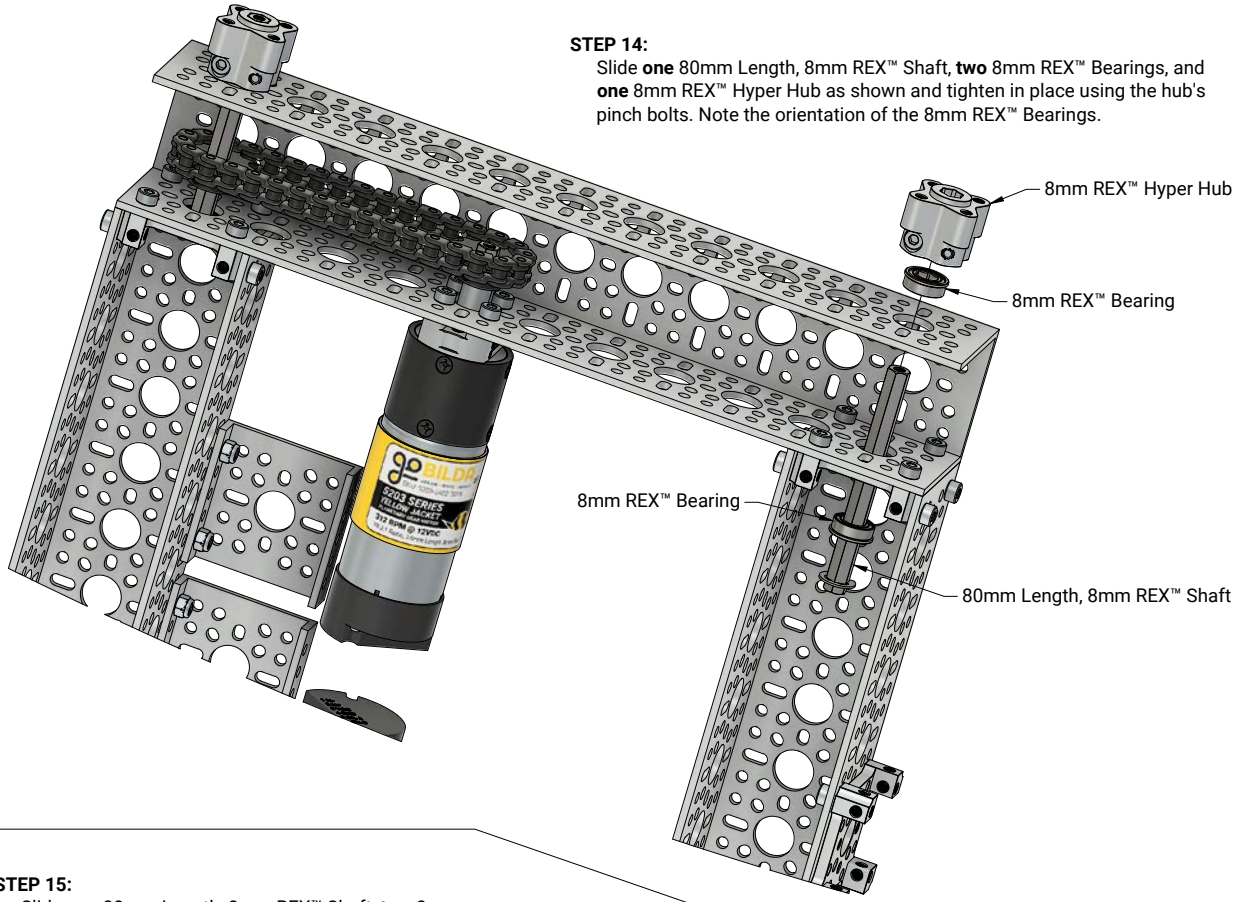
Slide **one** 80mm Length, 8mm REX™ Shaft through **two** 8mm REX™ Bearings, **one** 8mm REX™ Hyper Hub, and the 10-Tooth Sprocket. Note the orientation of the 8mm REX™ Bearings.

Hold the 80mm Length, 8mm REX™ Shaft and 8mm REX™ Hyper Hub tightly together and tighten the hub's pinch bolts.



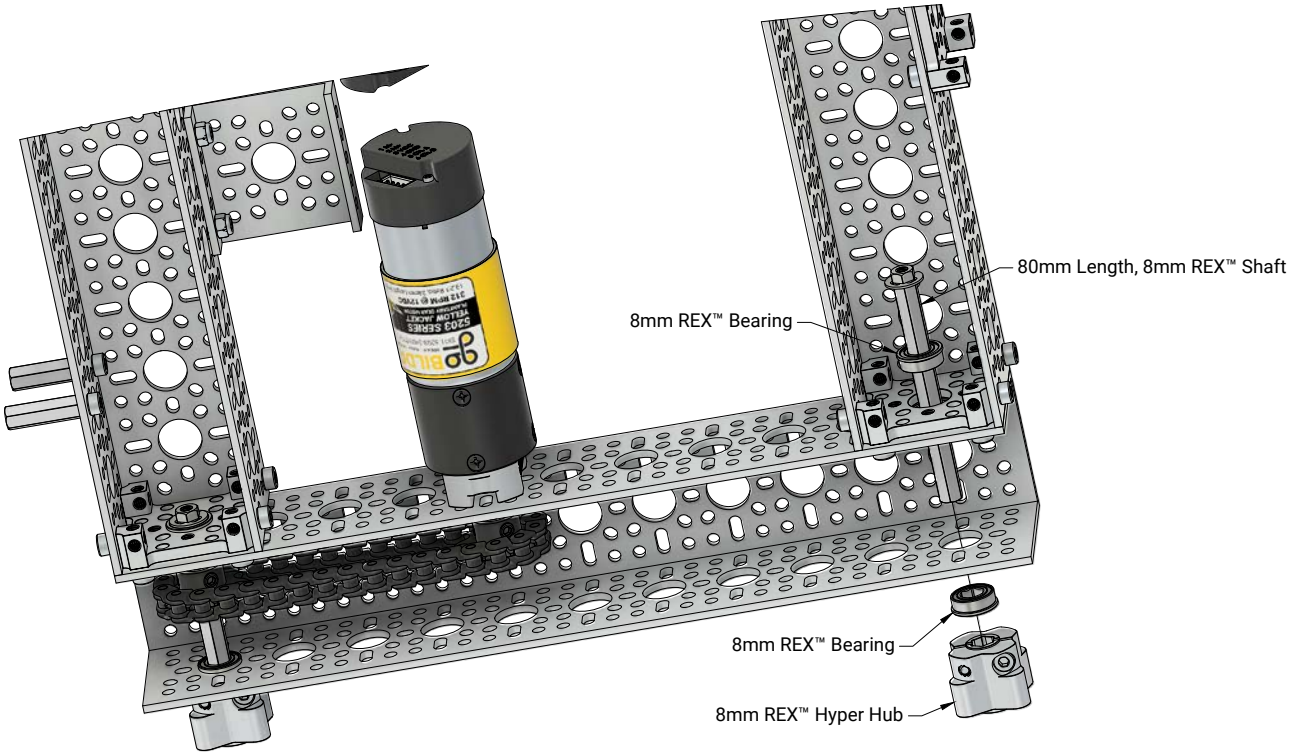
STEP 14:

Slide **one** 80mm Length, 8mm REX™ Shaft, **two** 8mm REX™ Bearings, and **one** 8mm REX™ Hyper Hub as shown and tighten in place using the hub's pinch bolts. Note the orientation of the 8mm REX™ Bearings.



STEP 15:

Slide **one** 80mm Length, 8mm REX™ Shaft, **two** 8mm REX™ Bearings, and **one** 8mm REX™ Hyper Hub as shown and tighten in place using the hub's pinch bolts. Note the orientation of the 8mm REX™ Bearings.



STEP 16:

Use **four** 10mm Socket Head Screws and **four** Locknuts to fasten **one** Battery Mount and **one** Battery Strap as shown. Note the screw locations.

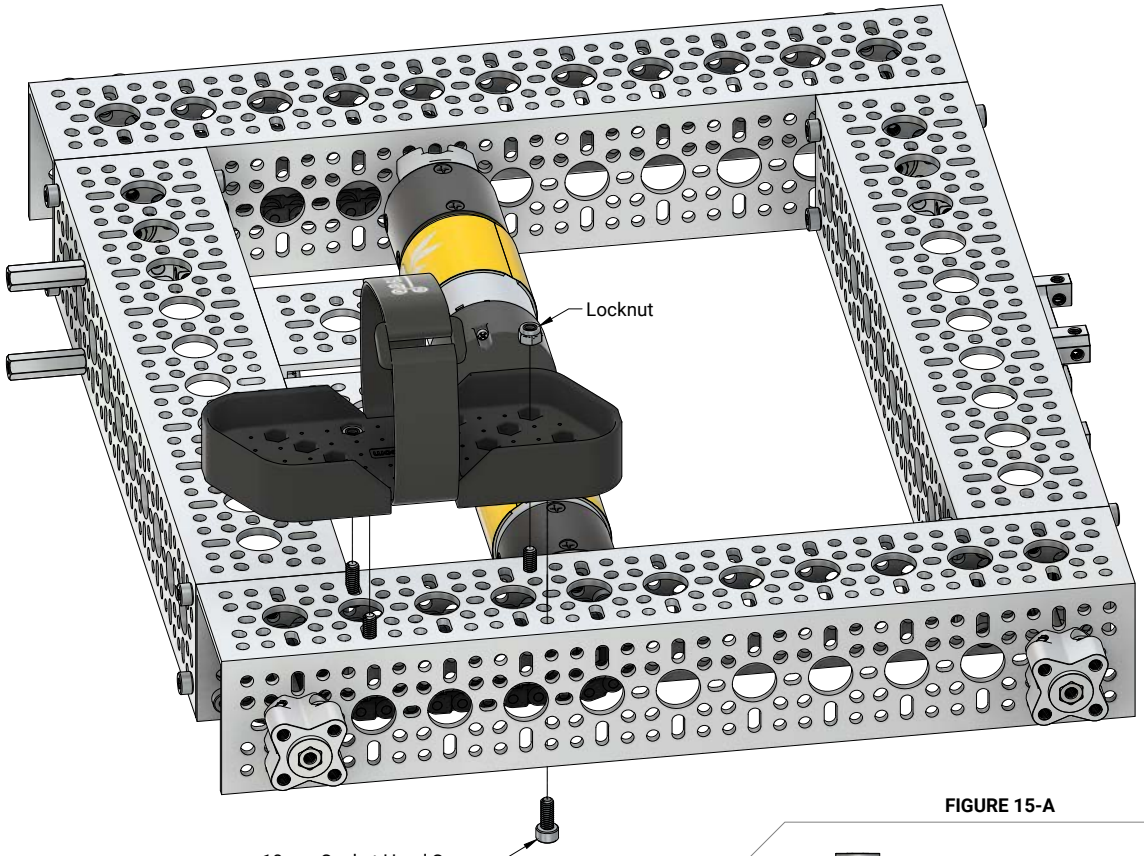
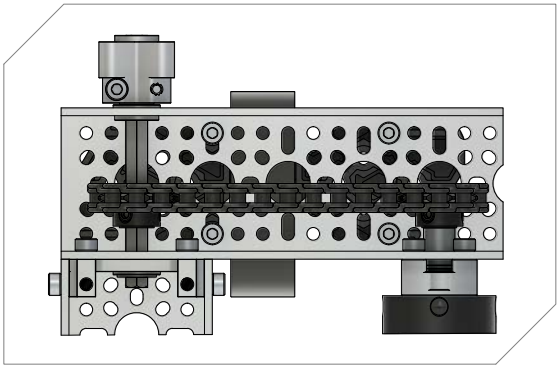
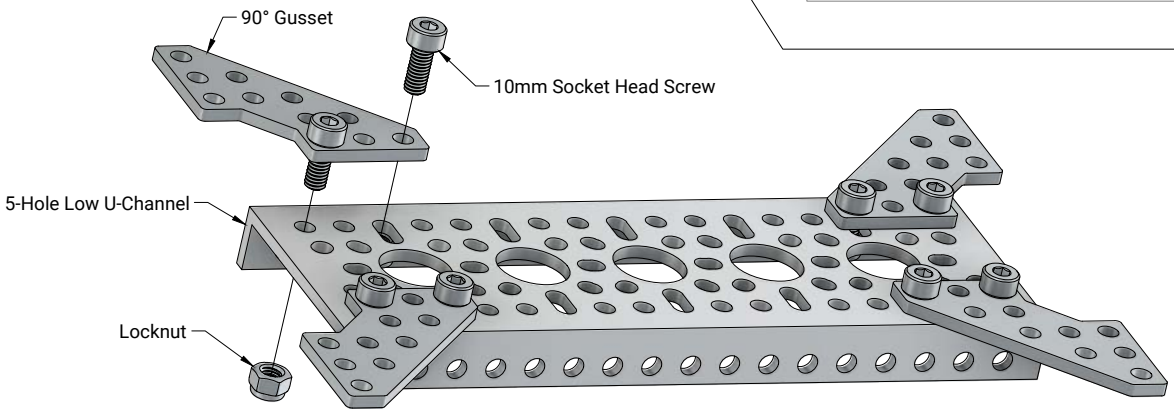


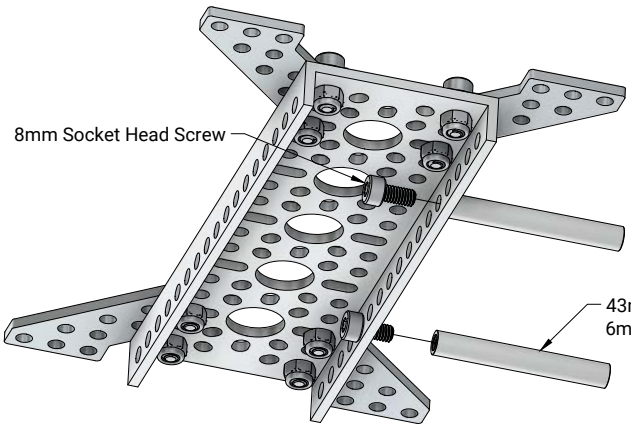
FIGURE 15-A



STEP 17:

Assemble **one** 5-Hole Low U-Channel and **four** 90° Gussets using **eight** 10mm Socket Head Screws and **eight** Locknuts as shown. Leave these screws slightly loose.



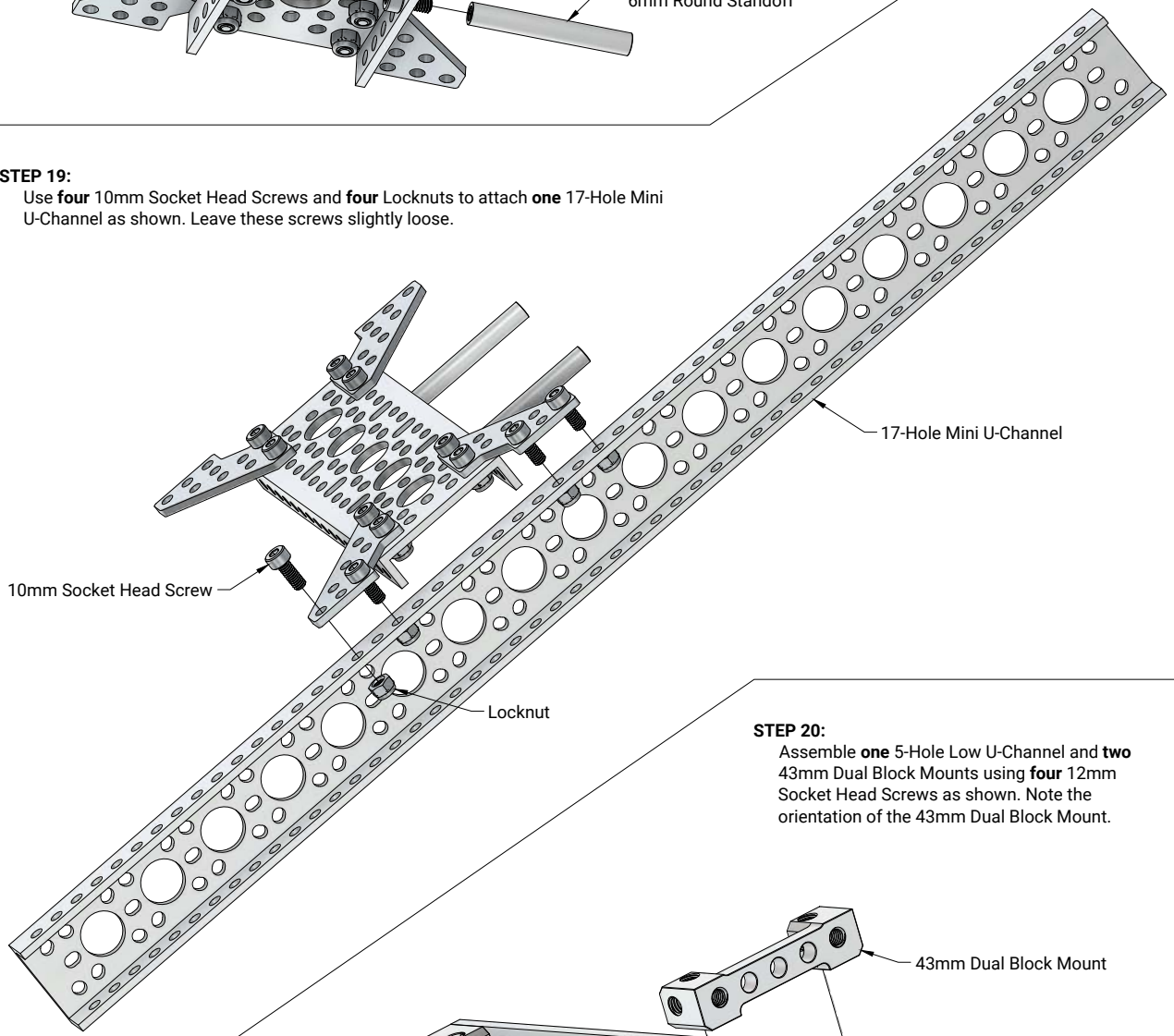


STEP 18:

Use **two** 8mm Socket Head Screws to attach **two** 43mm Length, 6mm Round Standoffs as shown.

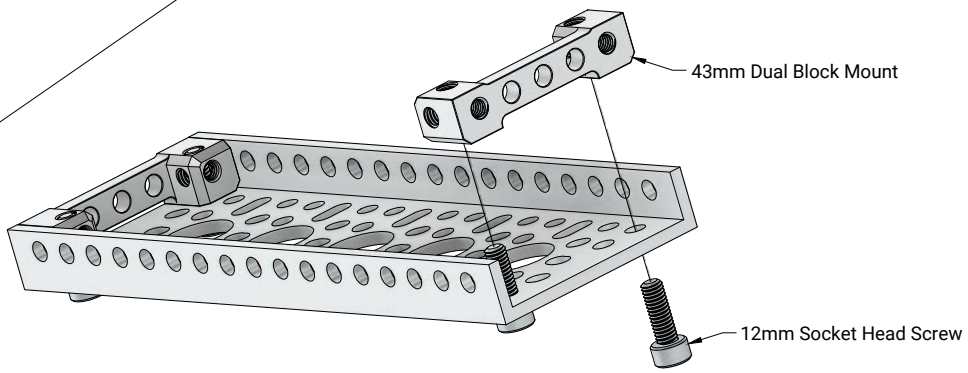
STEP 19:

Use **four** 10mm Socket Head Screws and **four** Locknuts to attach **one** 17-Hole Mini U-Channel as shown. Leave these screws slightly loose.



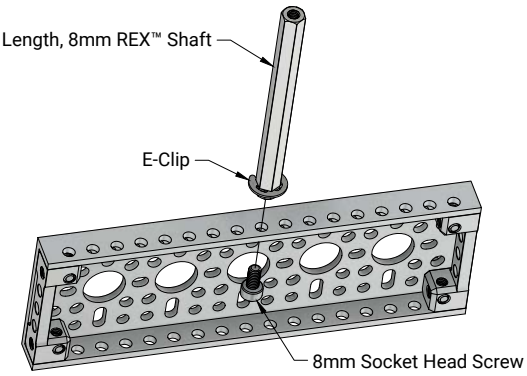
STEP 20:

Assemble **one** 5-Hole Low U-Channel and **two** 43mm Dual Block Mounts using **four** 12mm Socket Head Screws as shown. Note the orientation of the 43mm Dual Block Mount.



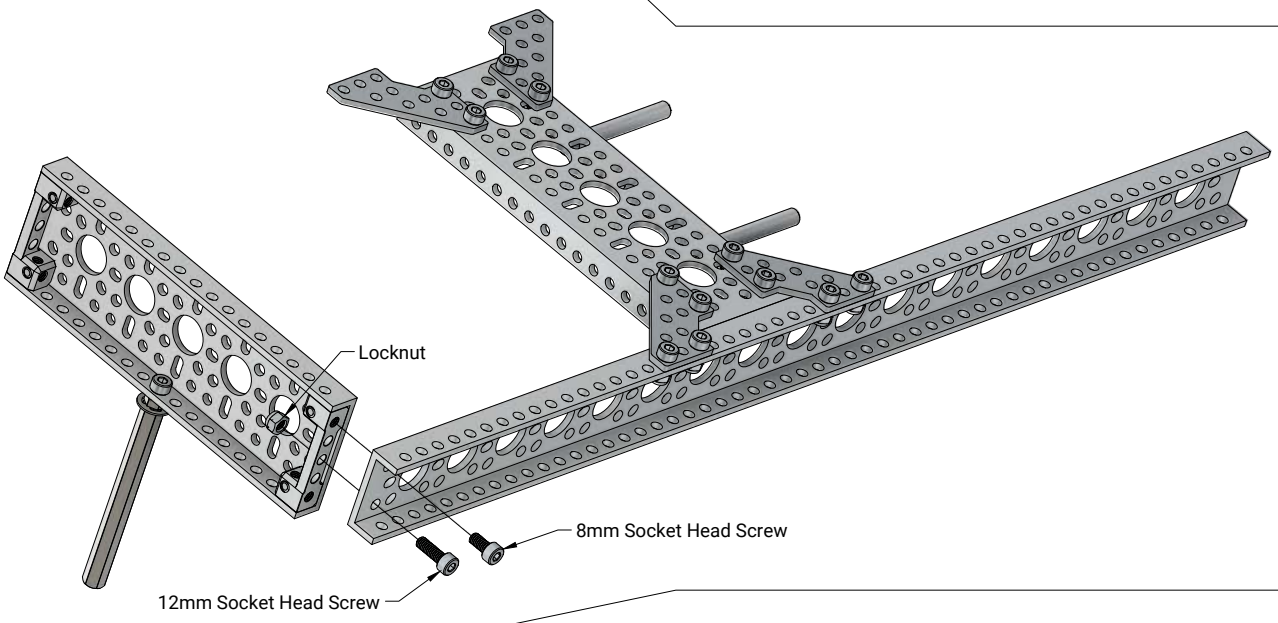
STEP 21:

Use **one** 8mm Socket Head Screw to attach **one** 80mm Length, 8mm REX™ Shaft as shown. Note the location of the E-Clip.



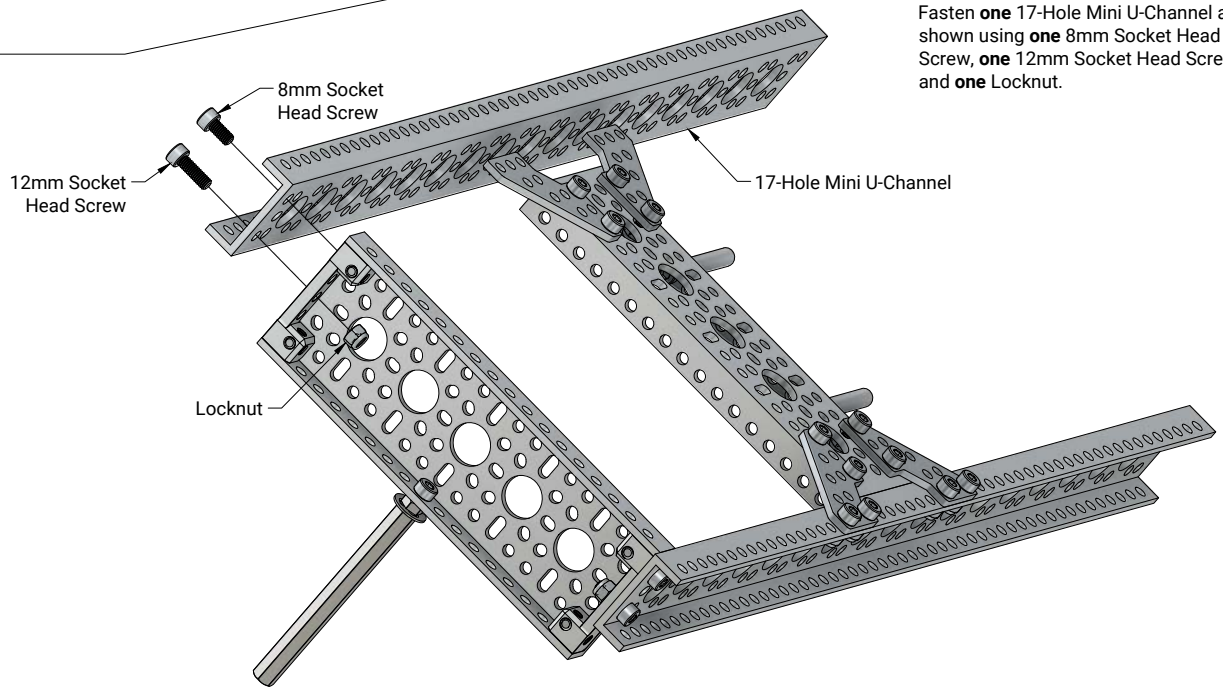
STEP 22:

Use **one** 8mm Socket Head Screw, **one** 12mm Socket Head Screw, and **one** Locknut to attach the assembly from **STEP 18** as shown.



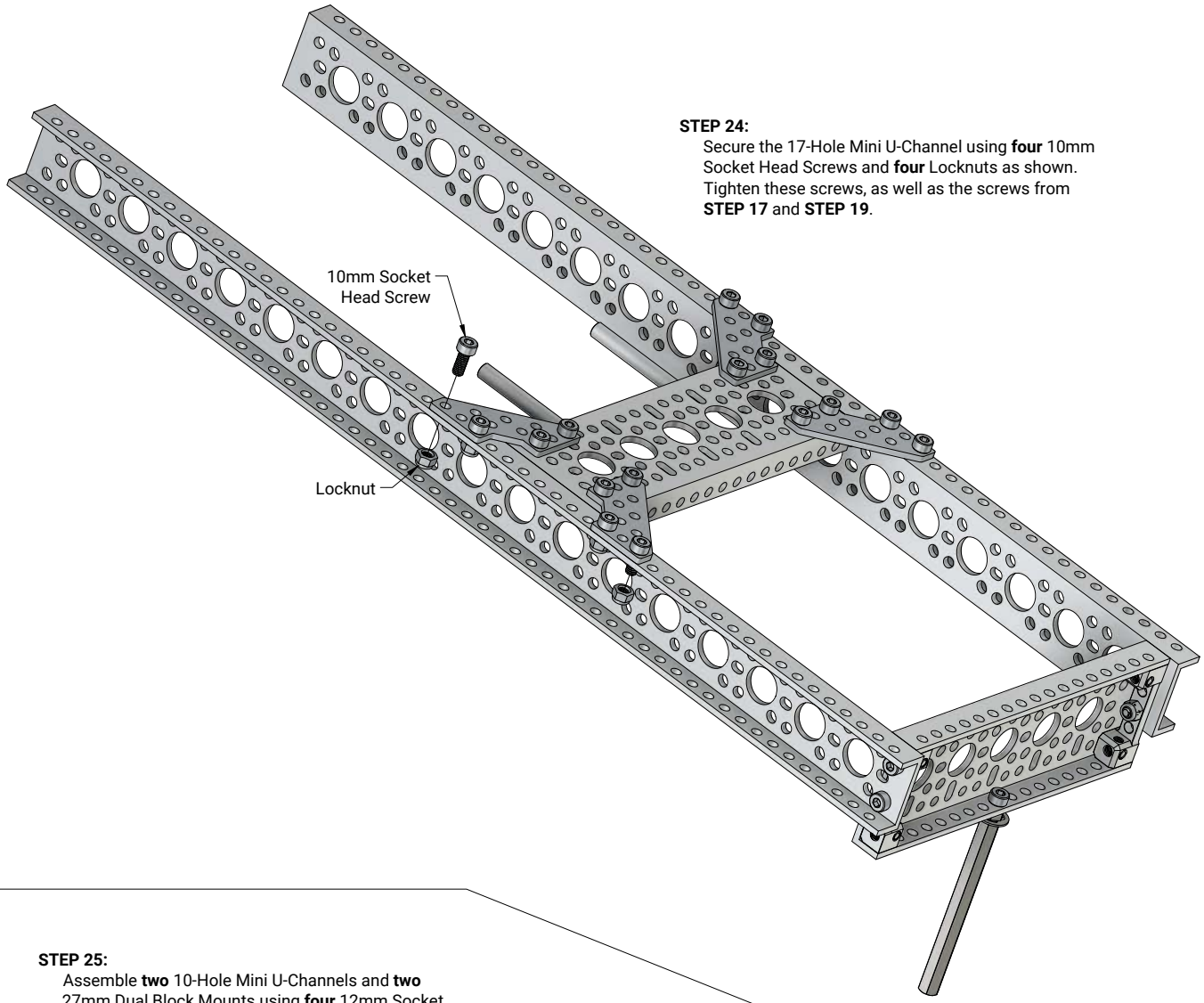
STEP 23:

Fasten **one** 17-Hole Mini U-Channel as shown using **one** 8mm Socket Head Screw, **one** 12mm Socket Head Screw, and **one** Locknut.



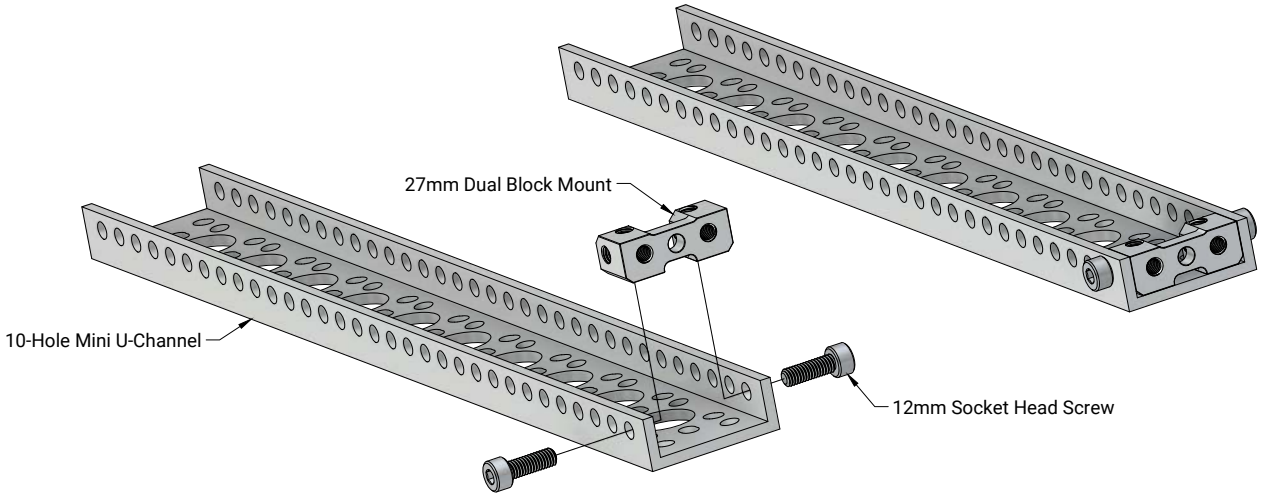
STEP 24:

Secure the 17-Hole Mini U-Channel using **four** 10mm Socket Head Screws and **four** Locknuts as shown. Tighten these screws, as well as the screws from **STEP 17** and **STEP 19**.



STEP 25:

Assemble **two** 10-Hole Mini U-Channels and **two** 27mm Dual Block Mounts using **four** 12mm Socket Head Screws as shown. Note the orientation of the 27mm Dual Block Mount.



STEP 26:

Use **four** 8mm Socket Head Screws to combine the subassemblies from **STEP 24** and **STEP 25** as shown. Note the mounting locations (**FIGURE 26-A**).

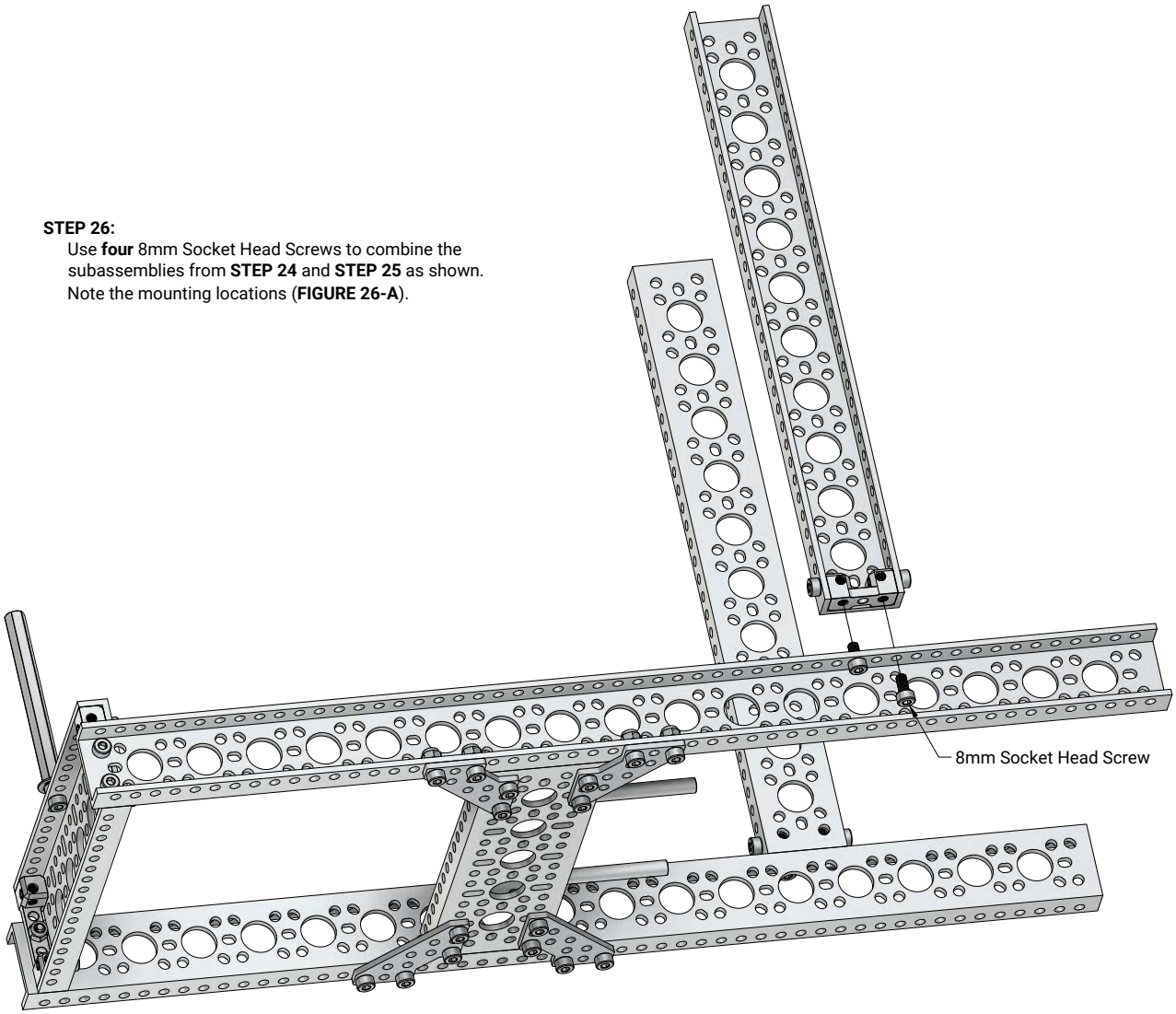
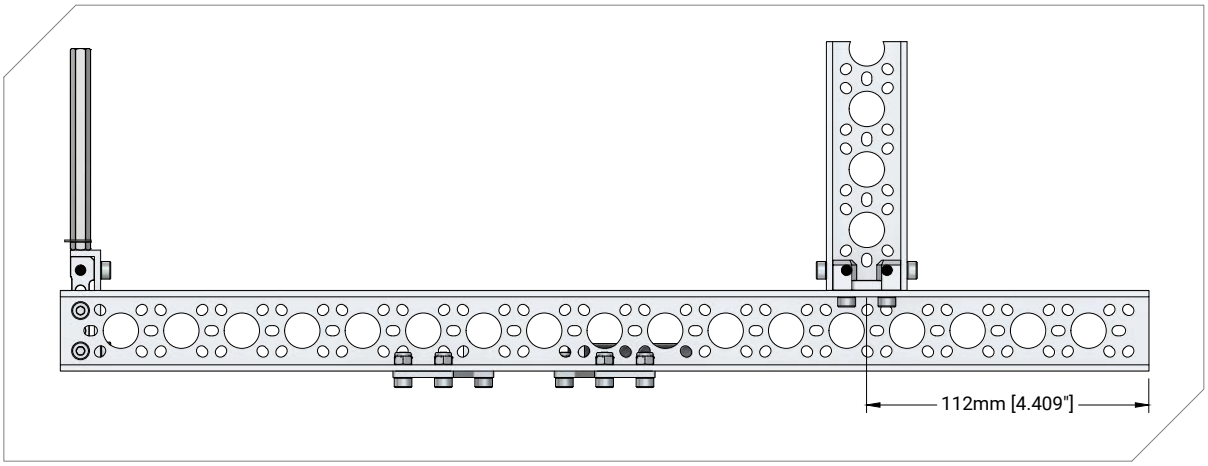
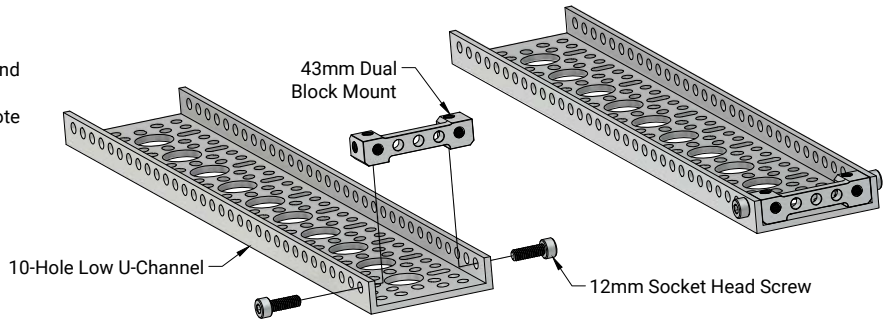


FIGURE 26-A



STEP 27:

Assemble **two** 10-Hole Low U-Channels and **two** 43mm Dual Block Mounts using **four** 12mm Socket Head Screws as shown. Note the orientation of the 43mm Dual Block Mounts.



STEP 28:

Use **four** 8mm Socket Head Screws to combine the subassemblies from **STEP 26** and **STEP 27** as shown. Note the different mounting locations (**FIGURE 28-A**).

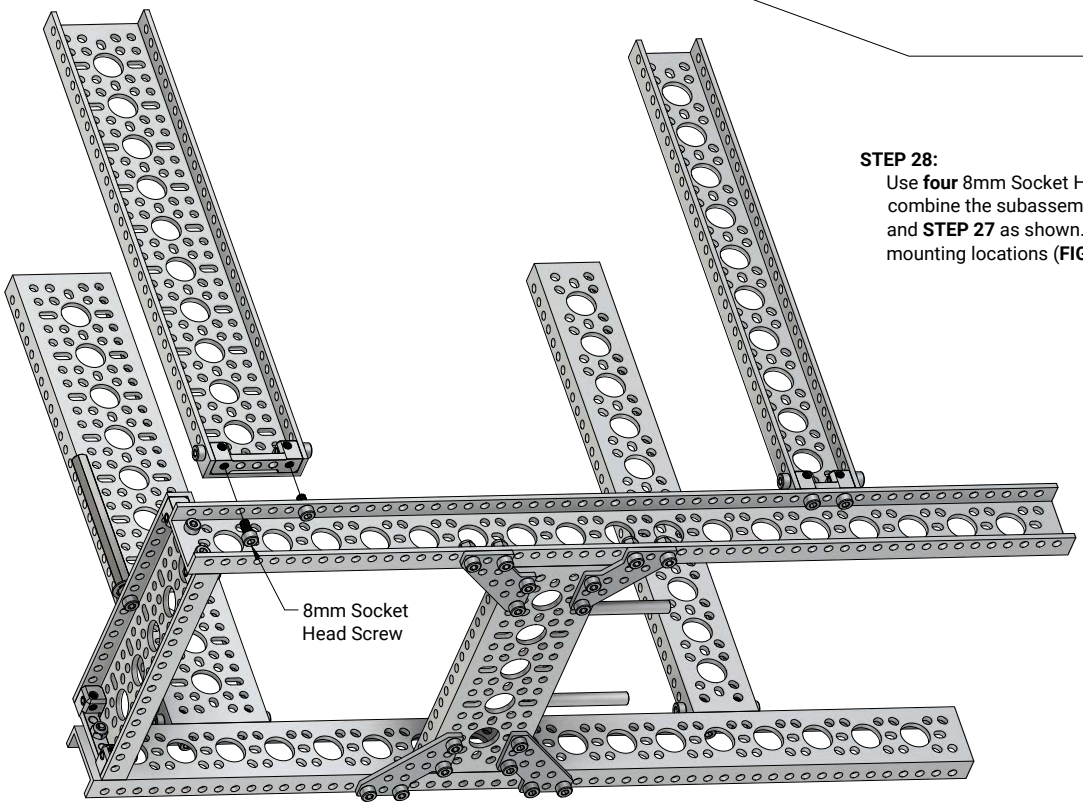
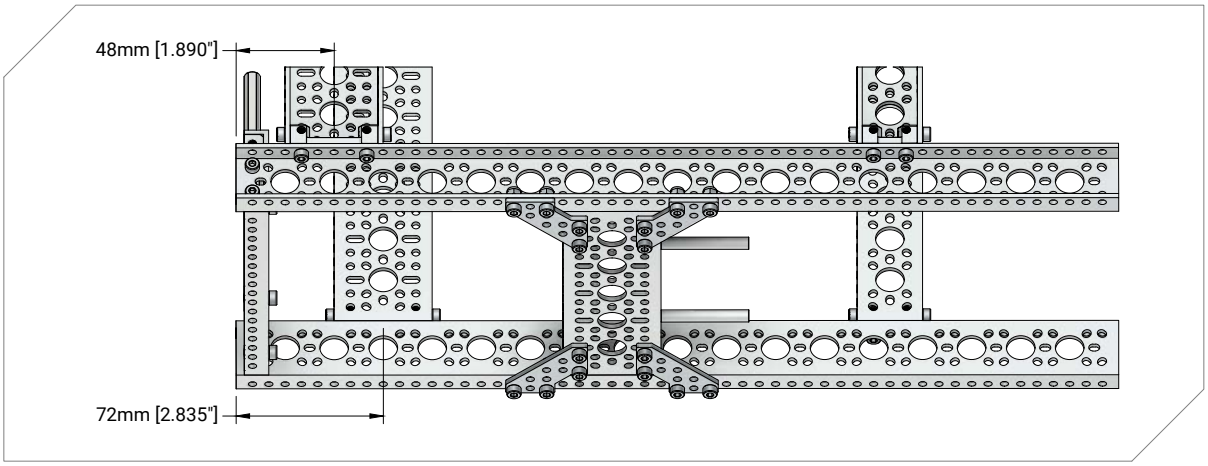
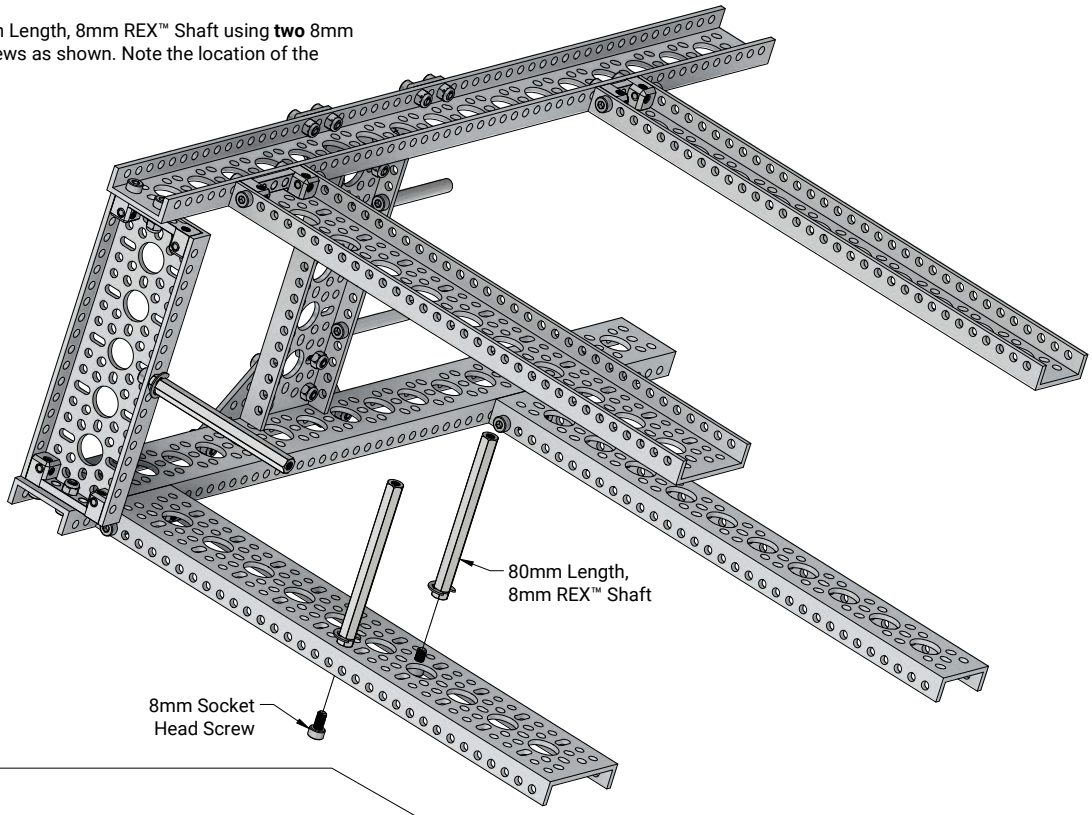


FIGURE 28-A



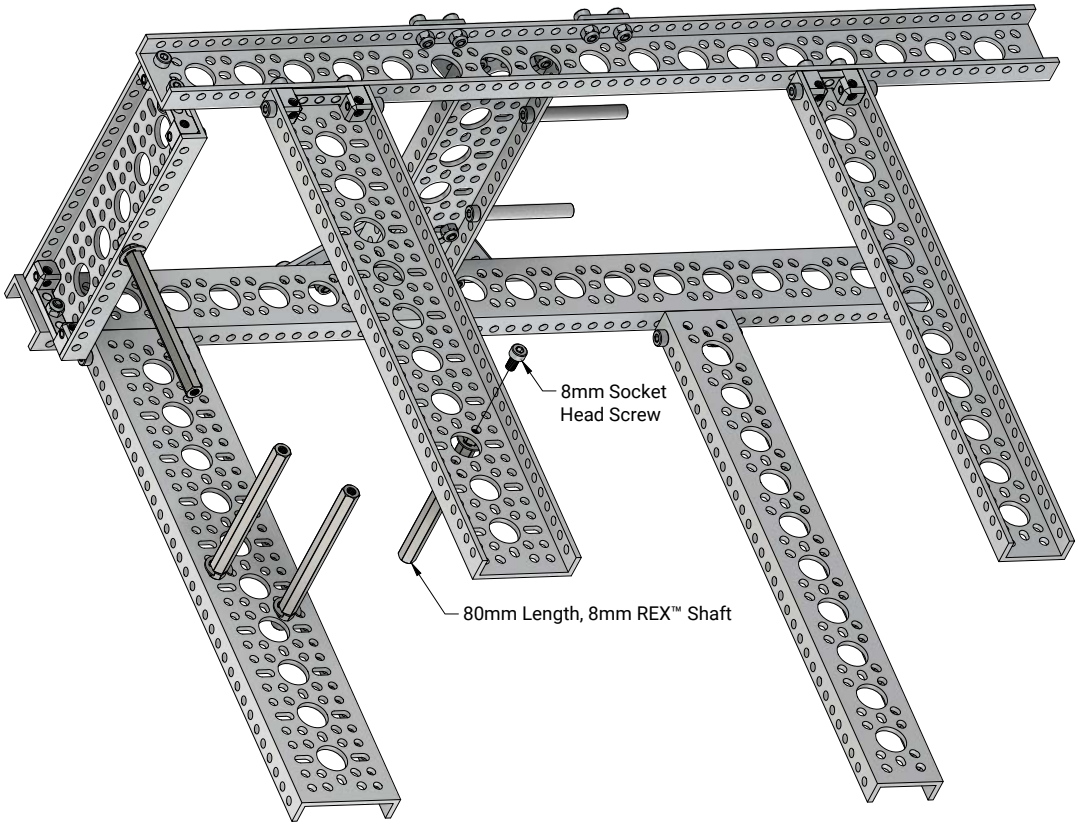
STEP 29:

Attach **two** 80mm Length, 8mm REX™ Shaft using **two** 8mm Socket Head Screws as shown. Note the location of the E-Clips.

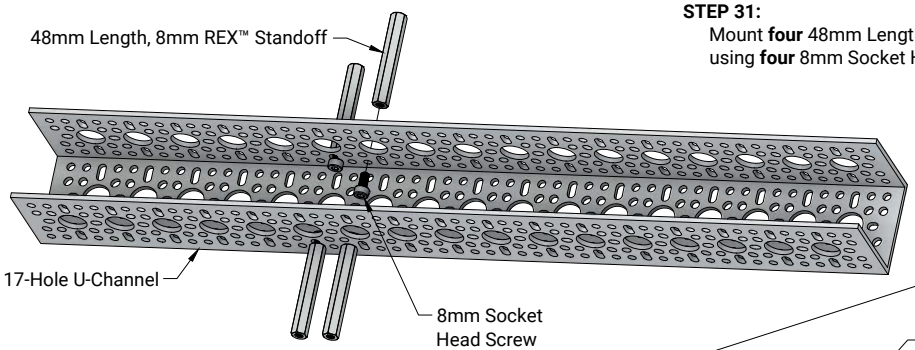


STEP 30:

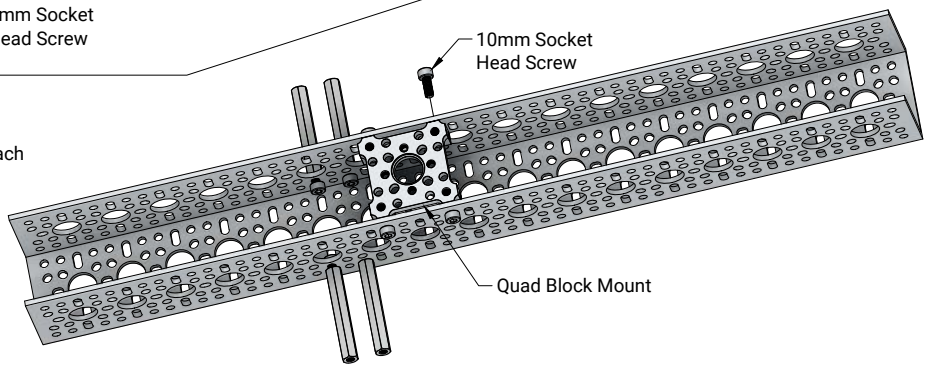
Fasten **one** 80mm Length, 8mm REX™ Shaft using **one** 8mm Socket Head Screw as shown. Note the location of the E-Clip.



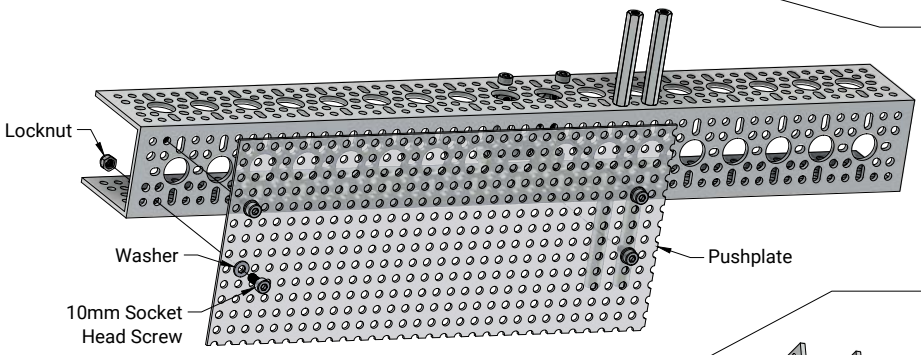
STEP 31:
Mount **four** 48mm Length, 8mm REX™ Standoffs to **one** 17-Hole U-Channel using **four** 8mm Socket Head Screws as shown.



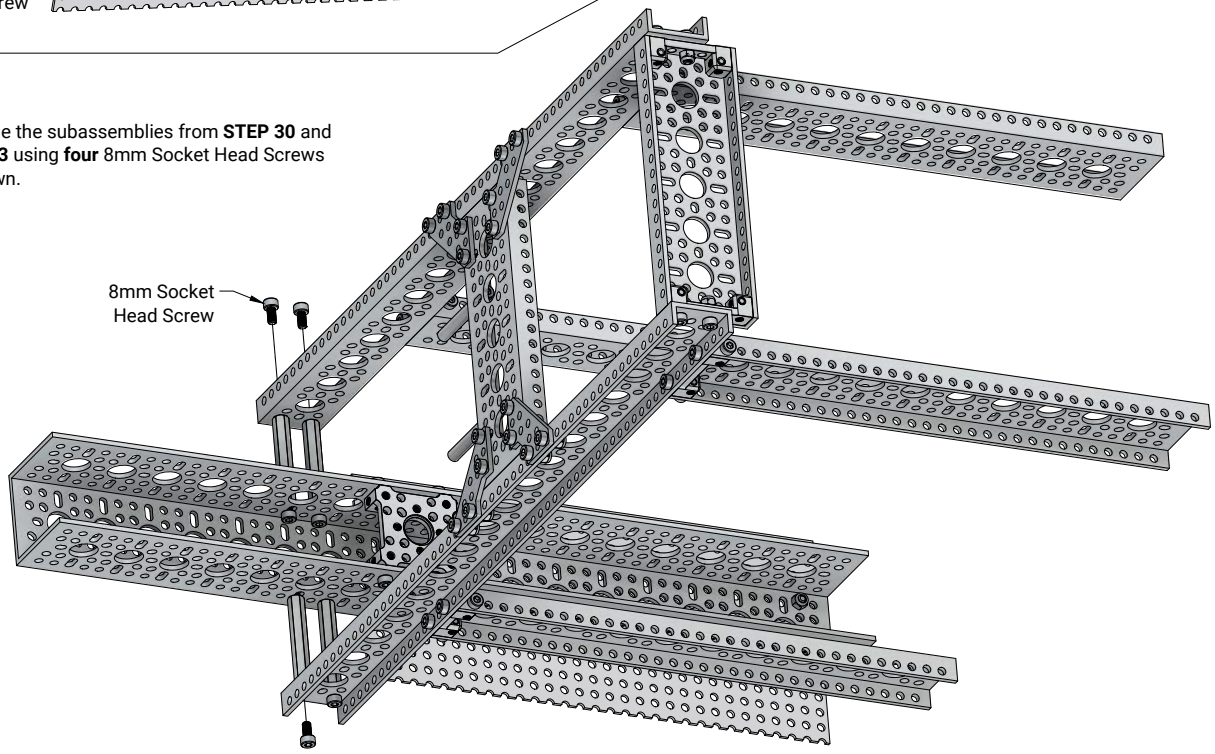
STEP 32:
Use **four** 10mm Socket Head Screws to attach **one** Quad Block Mount as shown.



STEP 33:
Attach **one** Pushplate using **four** 10mm Socket Head Screws, **four** Washers, and **four** Locknuts as shown.



STEP 34:
Combine the subassemblies from **STEP 30** and **STEP 33** using **four** 8mm Socket Head Screws as shown.



STEP 35:

Combine the subassemblies from **STEP 16** and **STEP 34**:

Use **four** 10mm Socket Head Screws as shown in **FIGURE 35A**.

Use **four** 10mm Socket Head Screws and **four** Locknuts as shown in **FIGURE 35B**.

Use **two** 8mm Socket Head Screws as shown in **FIGURE 35C**.

Use **two** 10mm Socket Head Screws and **two** Locknuts as shown in **FIGURE 35D**.

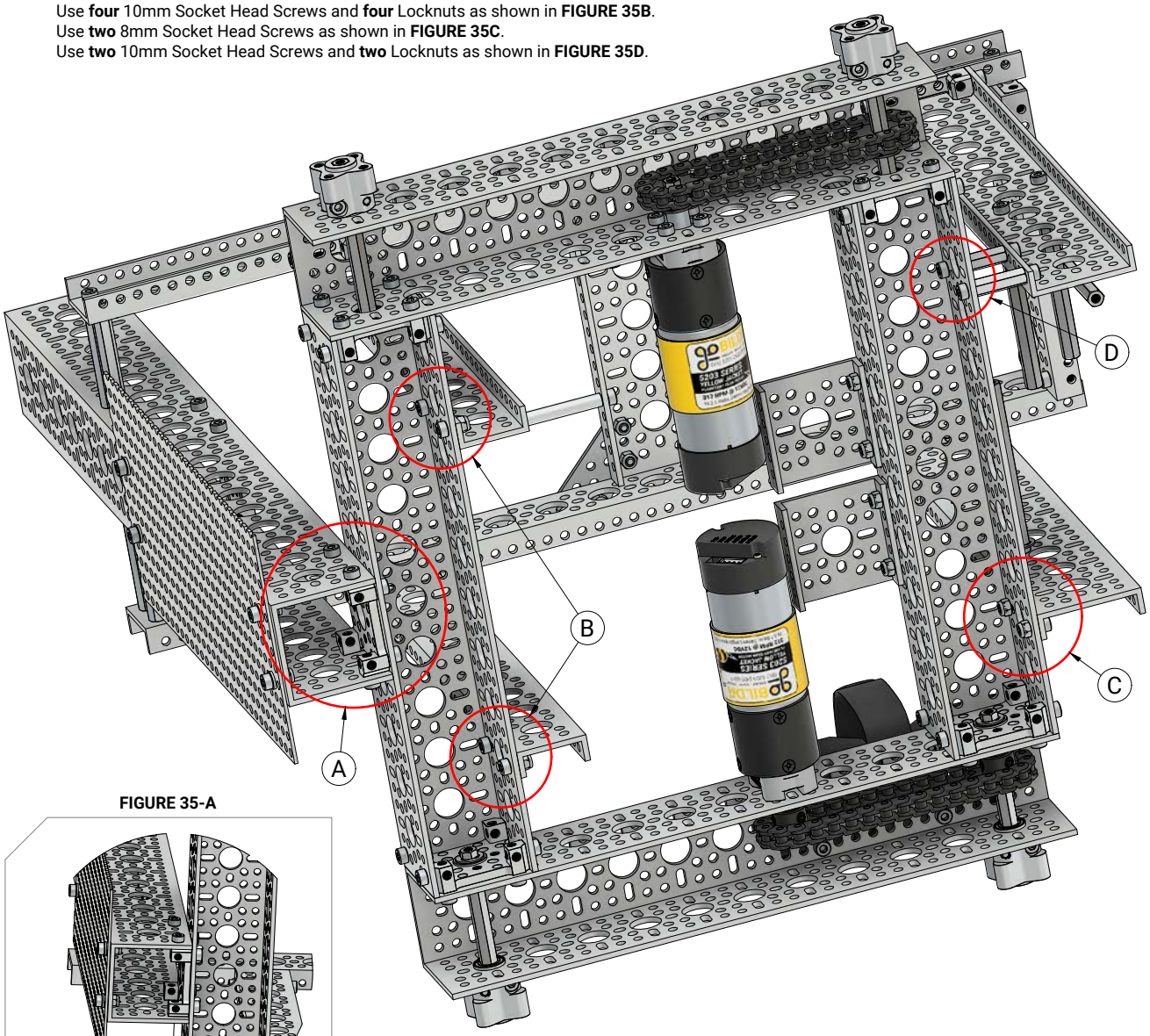


FIGURE 35-A

FIGURE 35-B

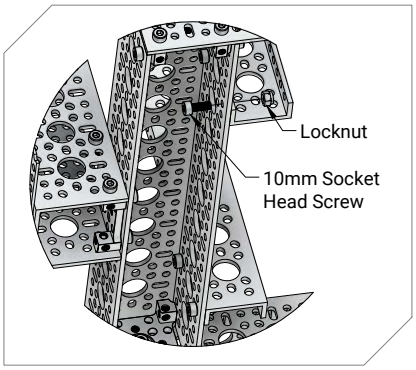


FIGURE 35-C

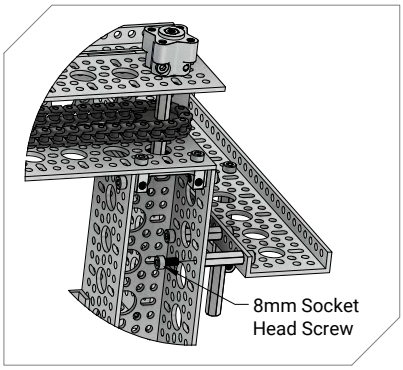
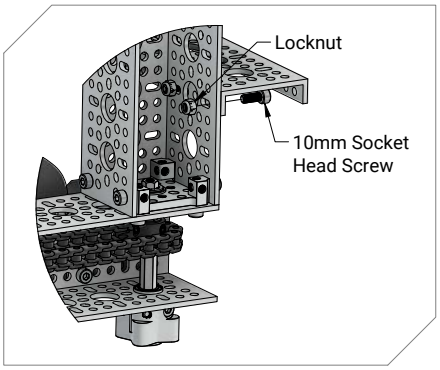


FIGURE 35-D

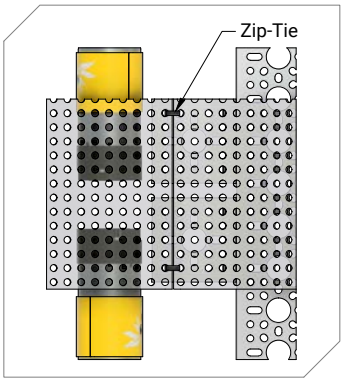


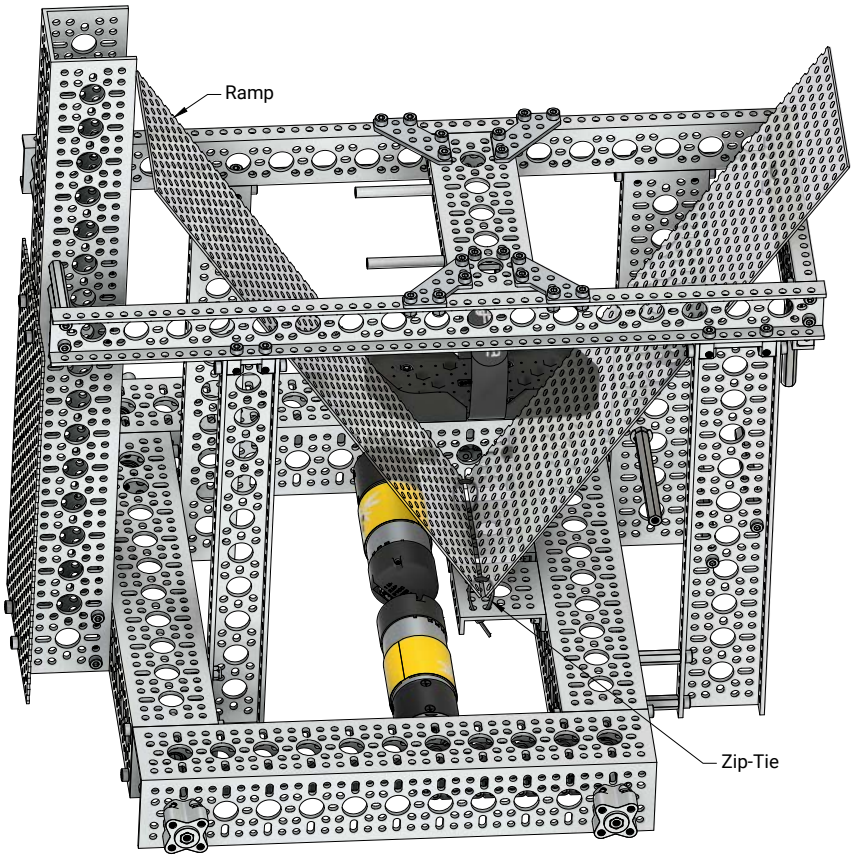
STEP 36:

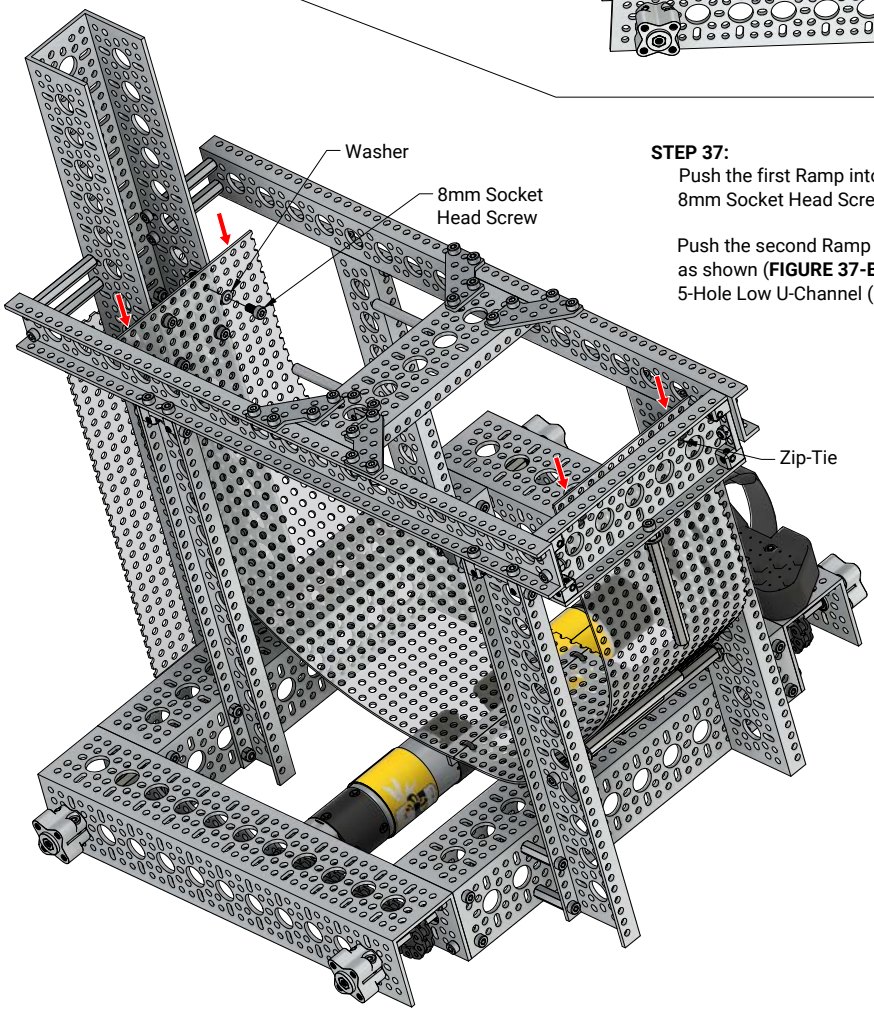
Use **two** Zip-Ties to fasten **two** Ramps in place as shown.

Make sure the "heads" of the Zip-Ties are below the 1-Hole Low U-Channel and that the Ramps both bend into position and lie flat against the 1-Hole Low U-Channels (**FIGURE 36-A**).

FIGURE 36-A







STEP 37:

Push the first Ramp into place and fix in place using **four** Washers and **four** 8mm Socket Head Screws as shown (**FIGURE 37-A**).

Push the second Ramp into place and fasten in position using **two** Zip-Ties as shown (**FIGURE 37-B**). Make sure the heads of the Zip-Ties are within the 5-Hole Low U-Channel (behind the ramp).

FIGURE 37-A

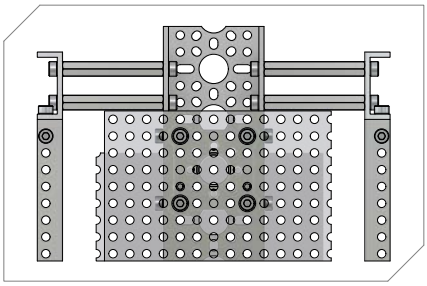
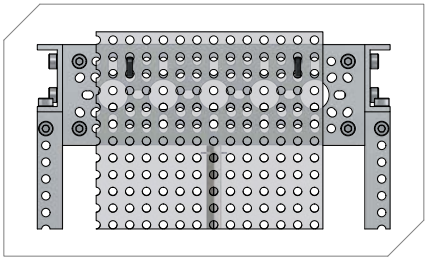
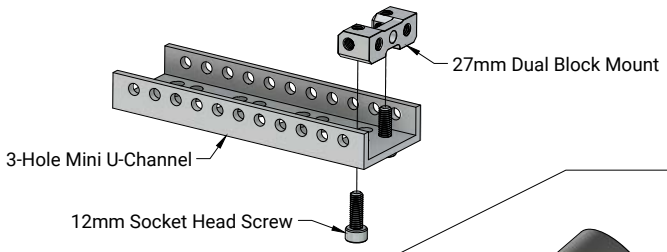


FIGURE 37-B



STEP 38:

Attach **one** 27mm Dual Block Mount to **one** 3-Hole Mini U-Channel as shown using **two** 12mm Socket Head Screws. Note the orientation of the 27mm Dual Block Mount.

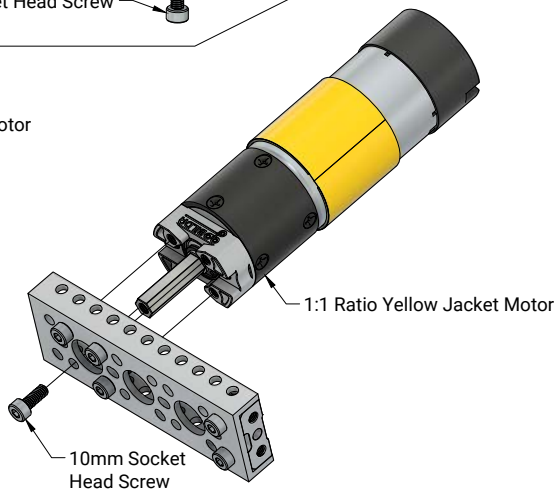


STEP 39:

Convert **one** 19.2:1 Ratio Yellow Jacket Motor to a 1:1 Ratio Yellow Jacket Motor using **one** 1:1 Coupler (**FIGURE 39-A**). Attach the 1:1 Ratio Yellow Jacket Motor using **four** 10mm Socket Head Screws as shown.

FIGURE 39-A

Watch this video to see how to convert a 19.2:1 Ratio Yellow Jacket Motor to a 1:1 Ratio Yellow Jacket Motor: **http://bit.ly/41fQtuj**

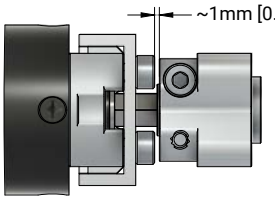


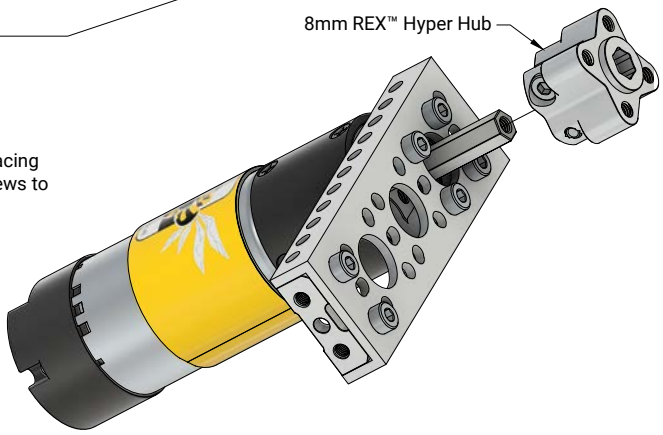
STEP 40:

Attach **one** 8mm REX™ Hyper Hub as shown.

A credit card is approximately 1mm thick and can be helpful in spacing the 8mm REX™ Hyper Hub away from the 10mm Socket Head Screws to achieve proper alignment.

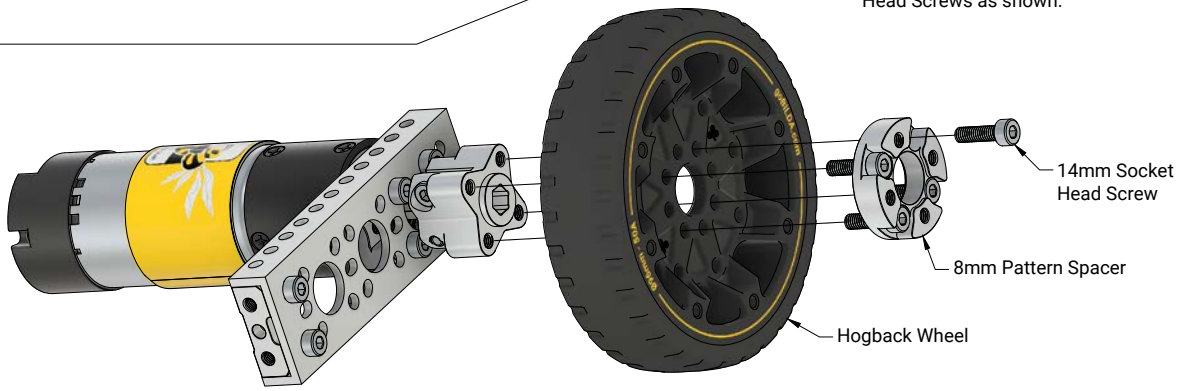
FIGURE 40-A





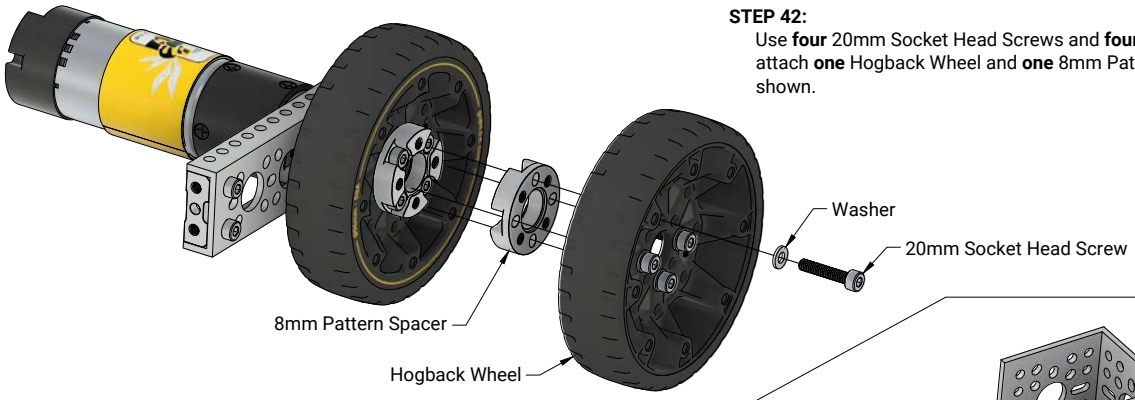
STEP 41:

Attach **one** Hogback Wheel and **one** 8mm Pattern Spacer using **four** 14mm Socket Head Screws as shown.



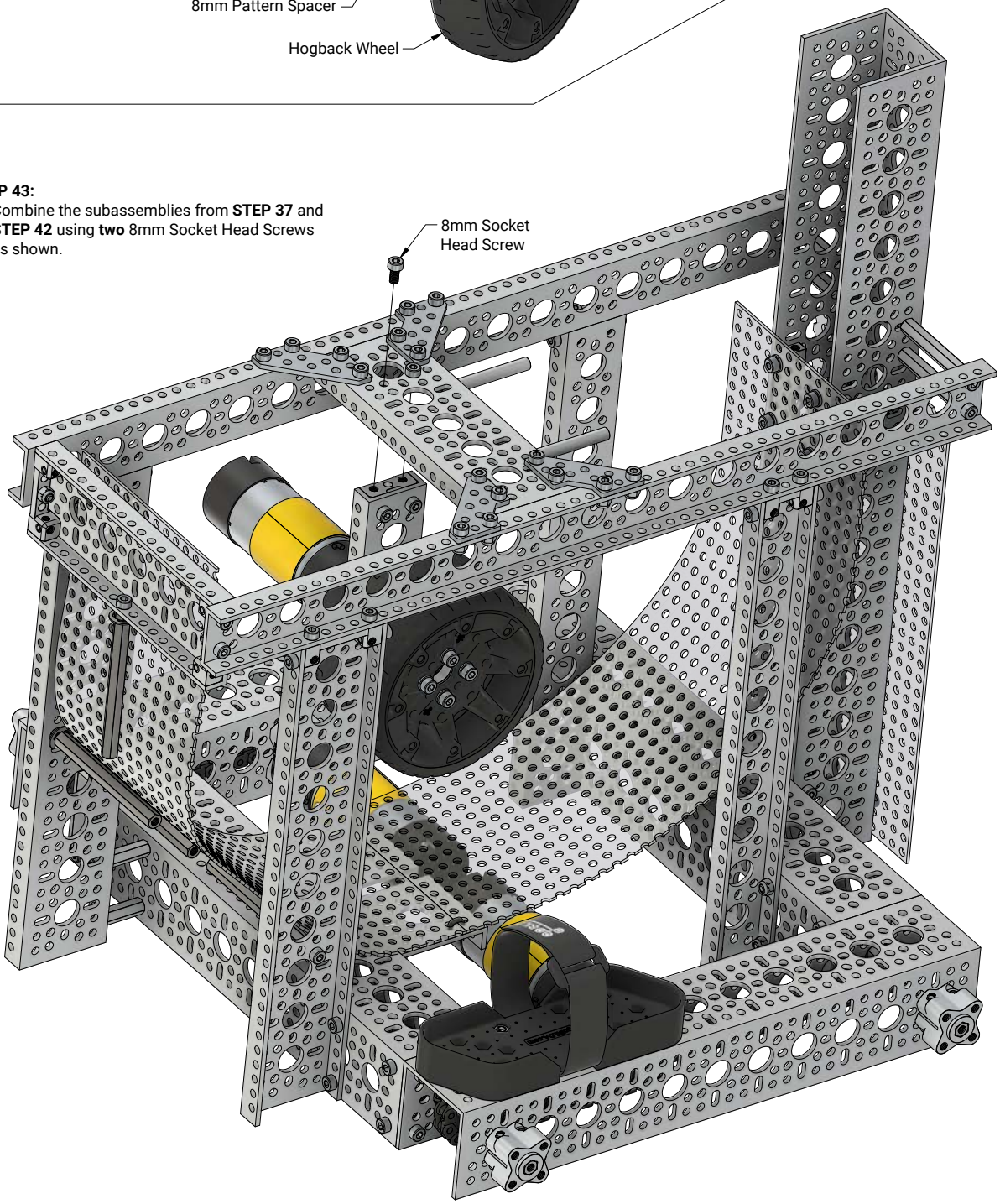
STEP 42:

Use **four** 20mm Socket Head Screws and **four** Washers to attach **one** Hogback Wheel and **one** 8mm Pattern Spacer as shown.



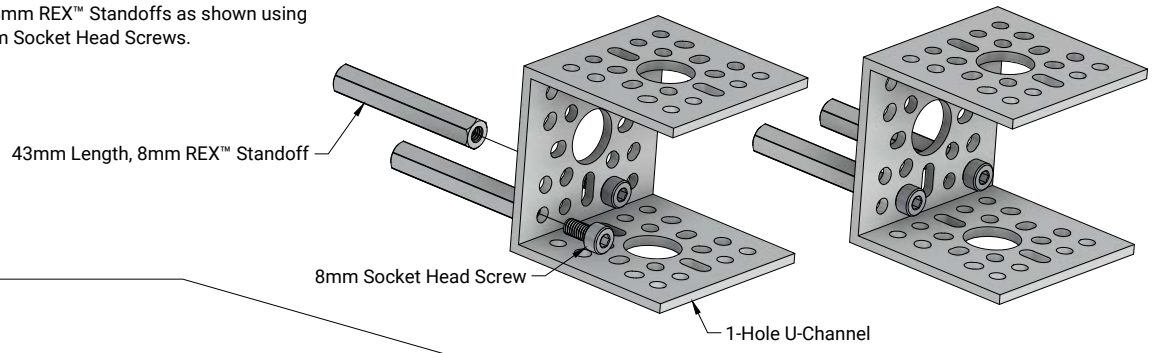
STEP 43:

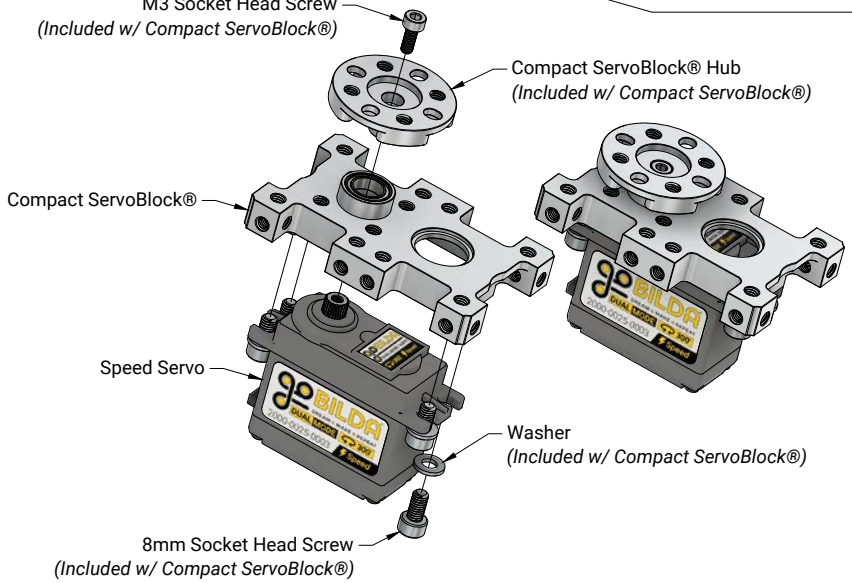
Combine the subassemblies from **STEP 37** and **STEP 42** using **two** 8mm Socket Head Screws as shown.



STEP 44:

Assemble **two** 1-Hole U-Channels and **four** 43mm Length, 8mm REX™ Standoffs as shown using **four** 8mm Socket Head Screws.



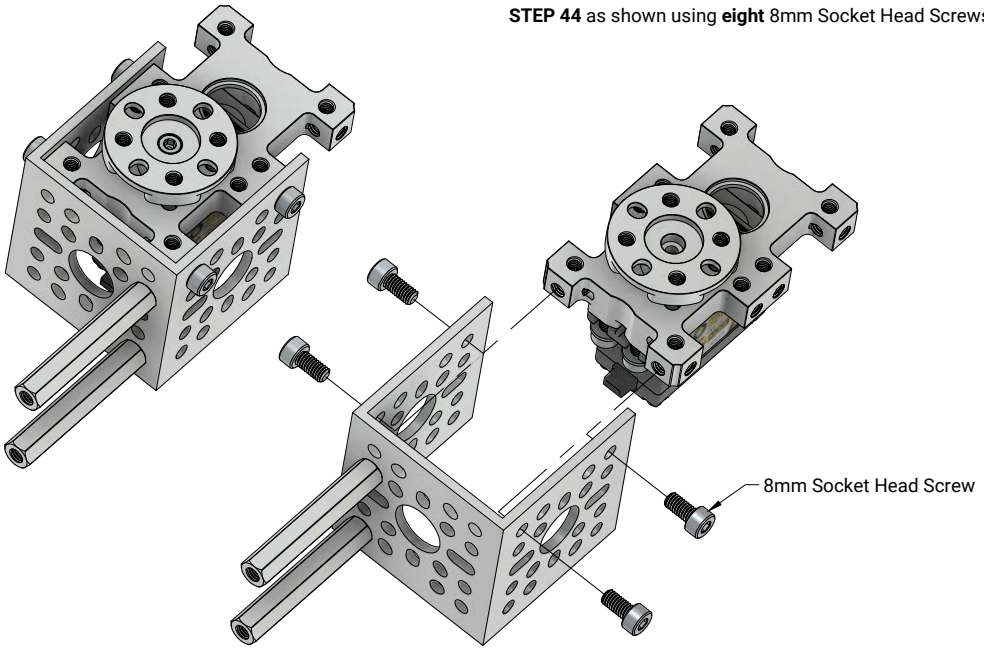


STEP 45:

Assemble **two** Compact ServoBlocks® with **two** Speed Servos as shown.

STEP 46:

Combine the assembled ServoBlocks® with the 1-Hole U-Channels from **STEP 44** as shown using **eight** 8mm Socket Head Screws.



STEP 47:

Attach **two** Gecko® Wheels with **eight** 8mm Socket Head Screws and **eight** Washers as shown.

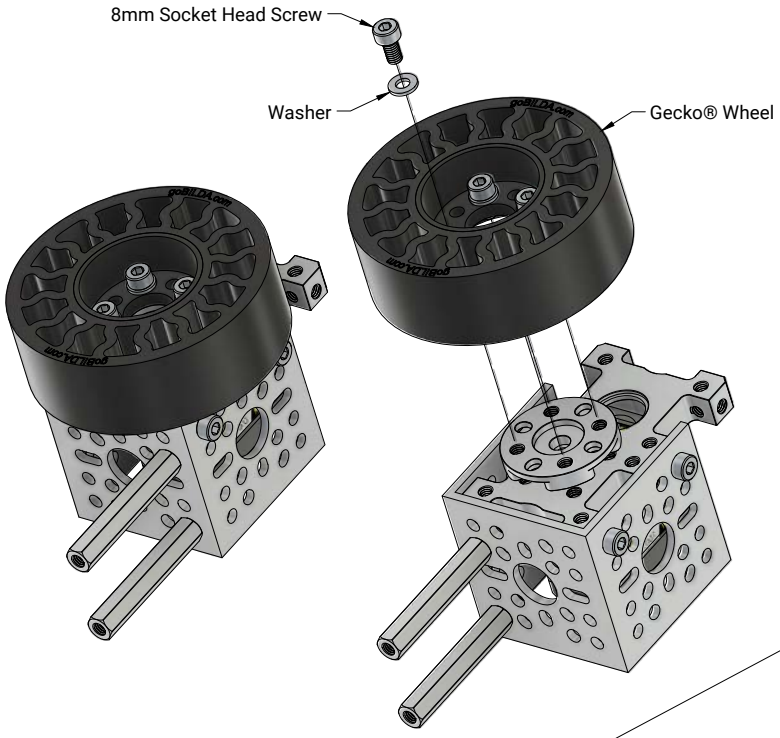
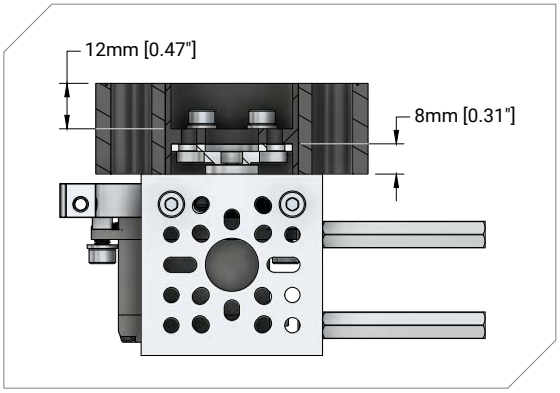


FIGURE 47-A



STEP 48:

Attach the assemblies from **STEP 43** and **STEP 47** using **four** 8mm Socket Head Screws as shown. Note the locations (**FIGURE 48-A**).

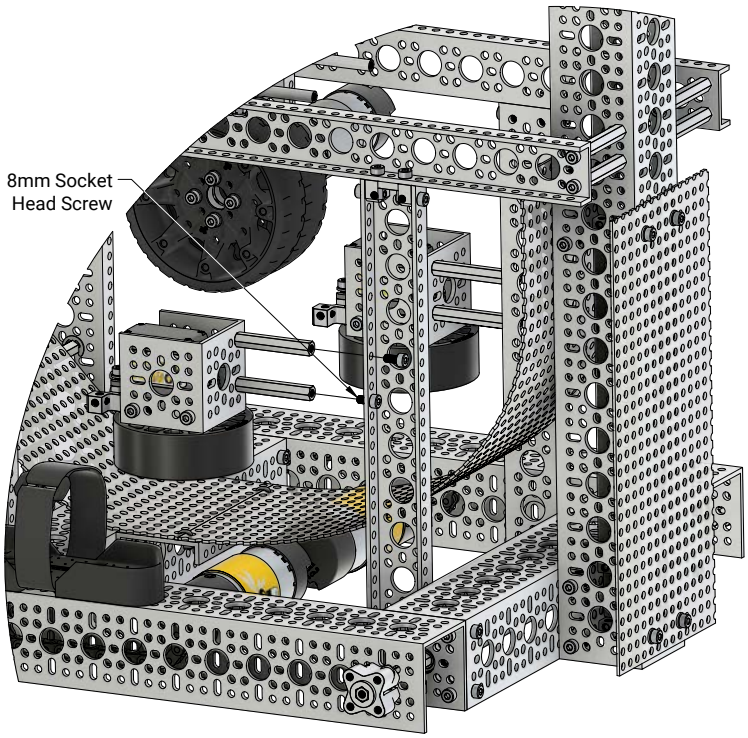
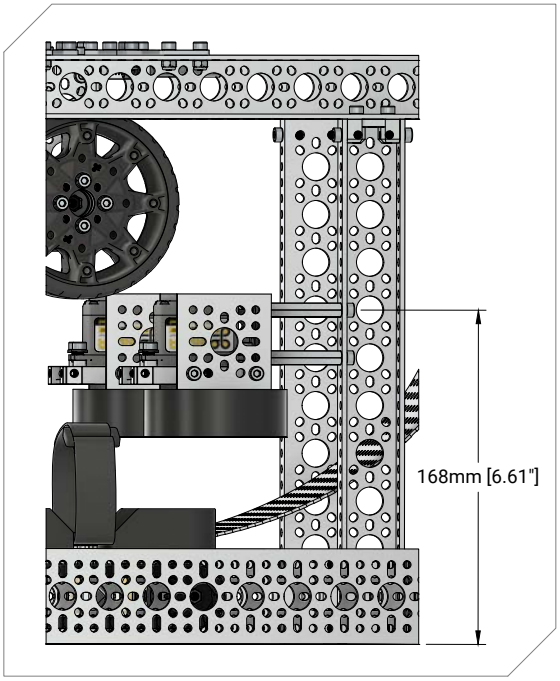


FIGURE 48-A



STEP 49:

Fasten **two** Side Guideplates using **four** Zip-Ties as shown.

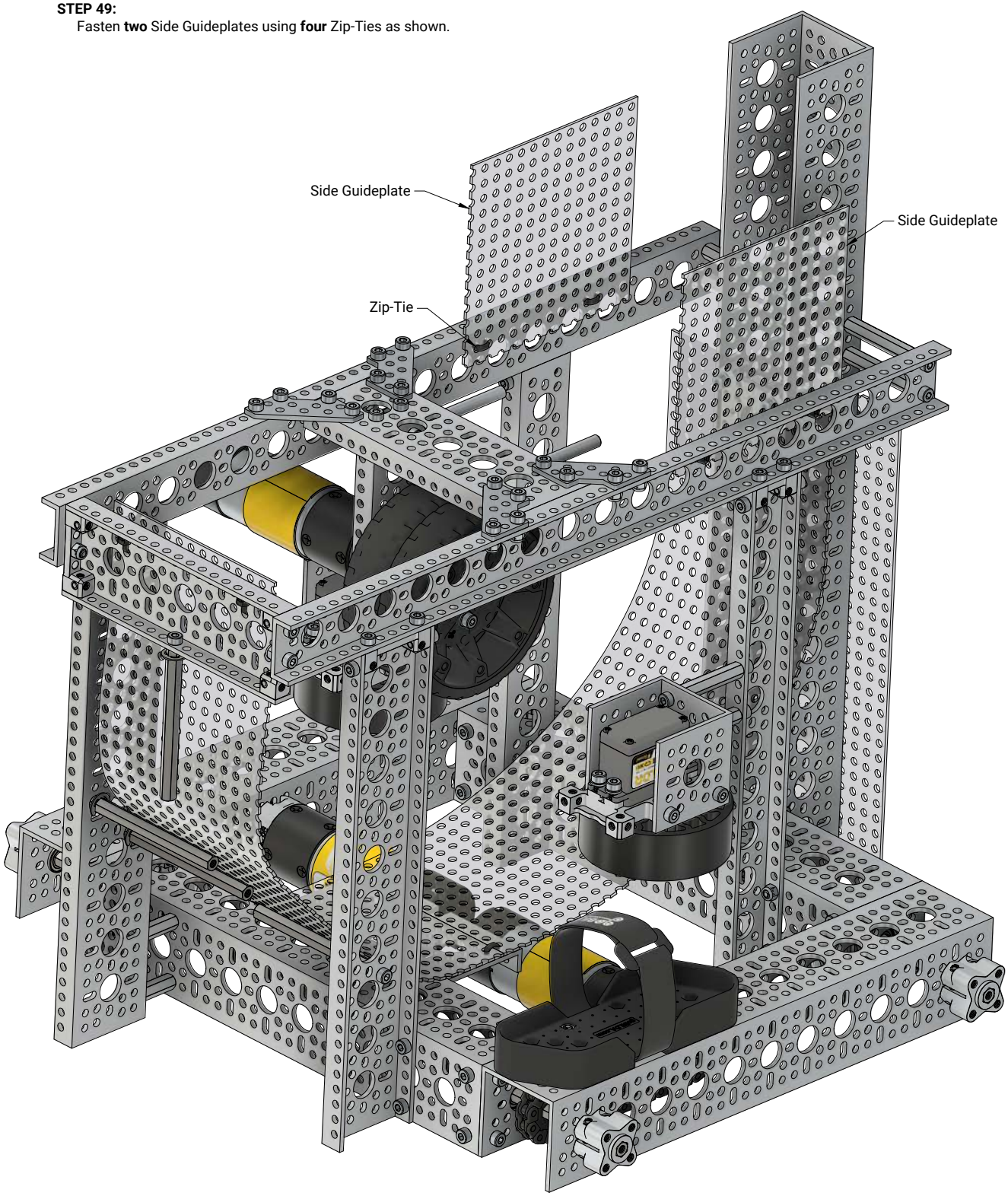
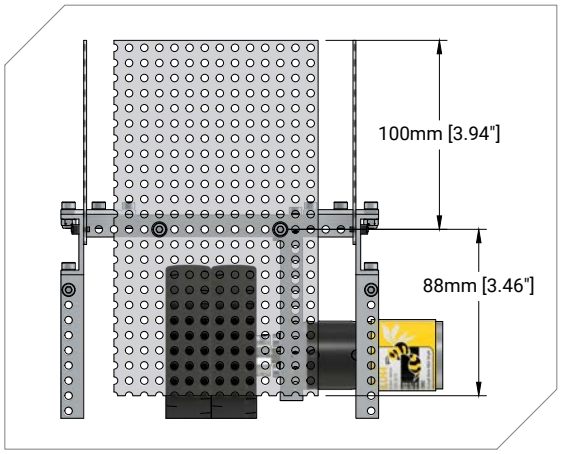
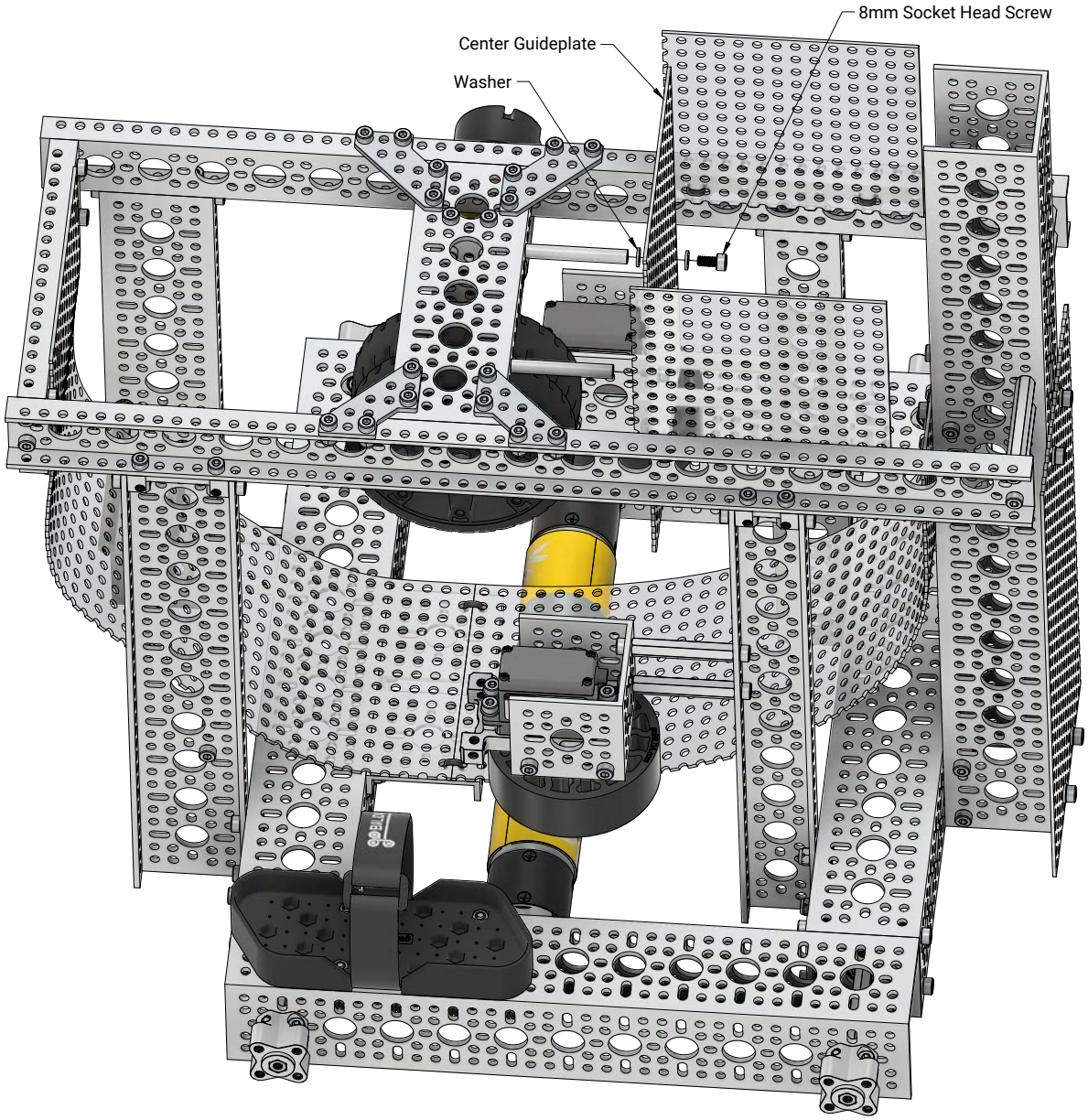


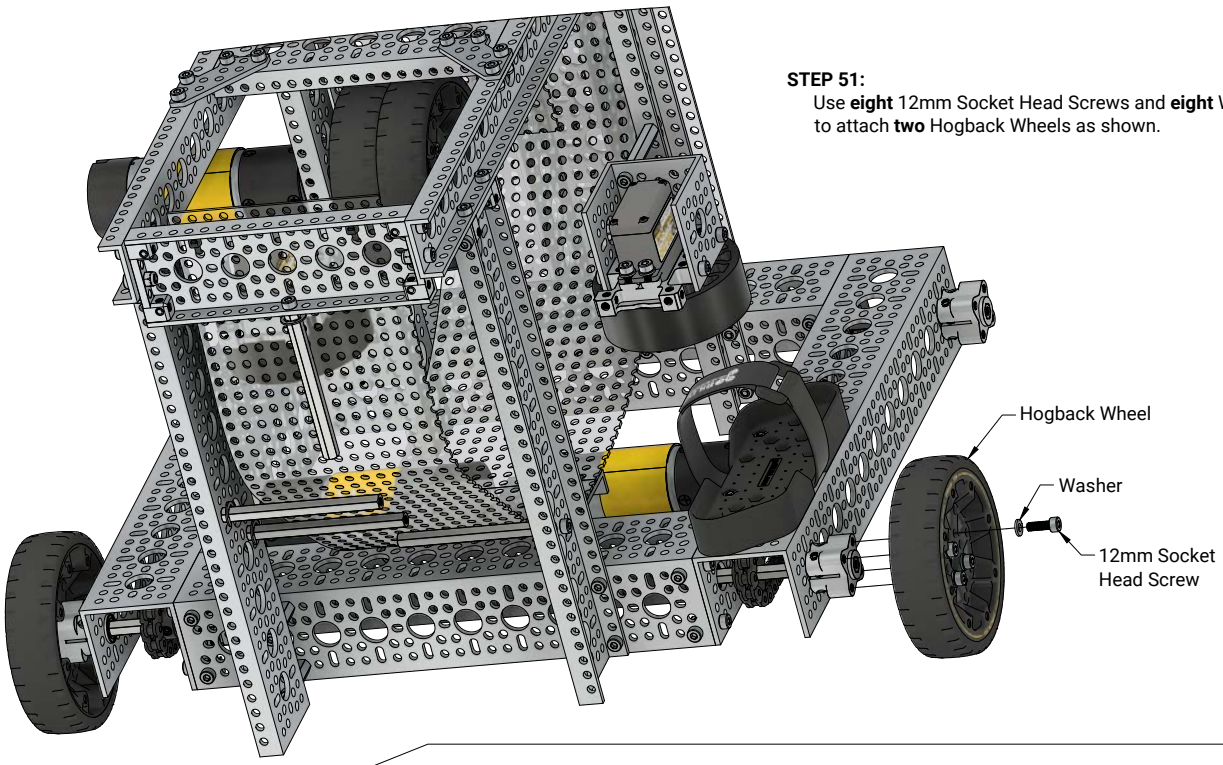
FIGURE 50-A



STEP 50:

Use **two** 8mm Socket Head Screws and **four** Washers to fasten **one** Center Guideplate as shown. The height should match the Side Guideplates (**FIGURE 50-A**).





STEP 51:

Use **eight** 12mm Socket Head Screws and **eight** Washers to attach **two** Hogback Wheels as shown.

STEP 52:

Use **eight** 12mm Socket Head Screws and **eight** Washers to attach **two** Omni Wheels as shown.

The Omni Wheels should mount to the 8mm REX™ Hyper Hubs from the "deep" side of the Omni Wheels, as shown (**FIGURE 52-A**).

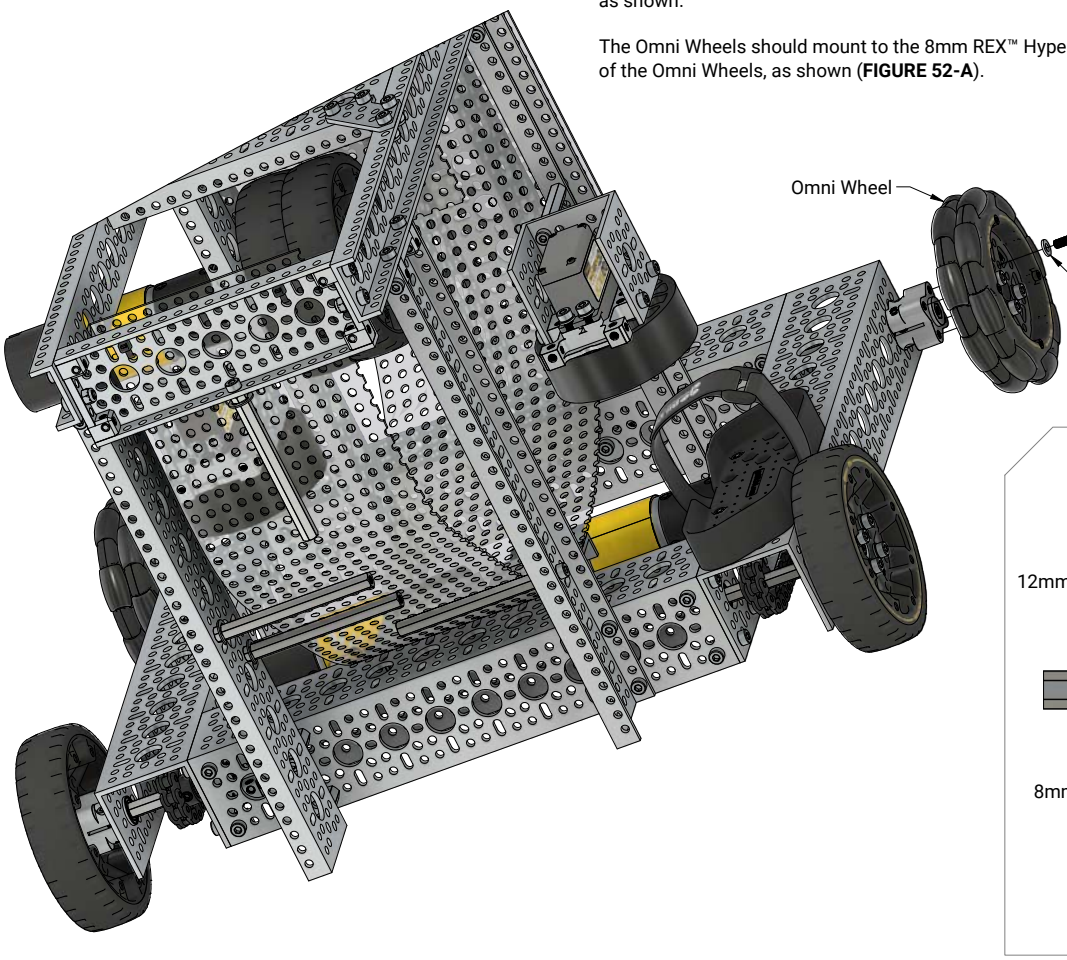
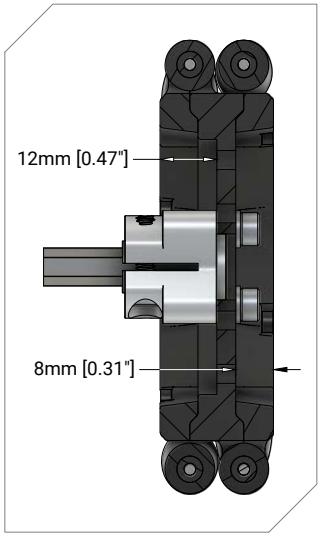
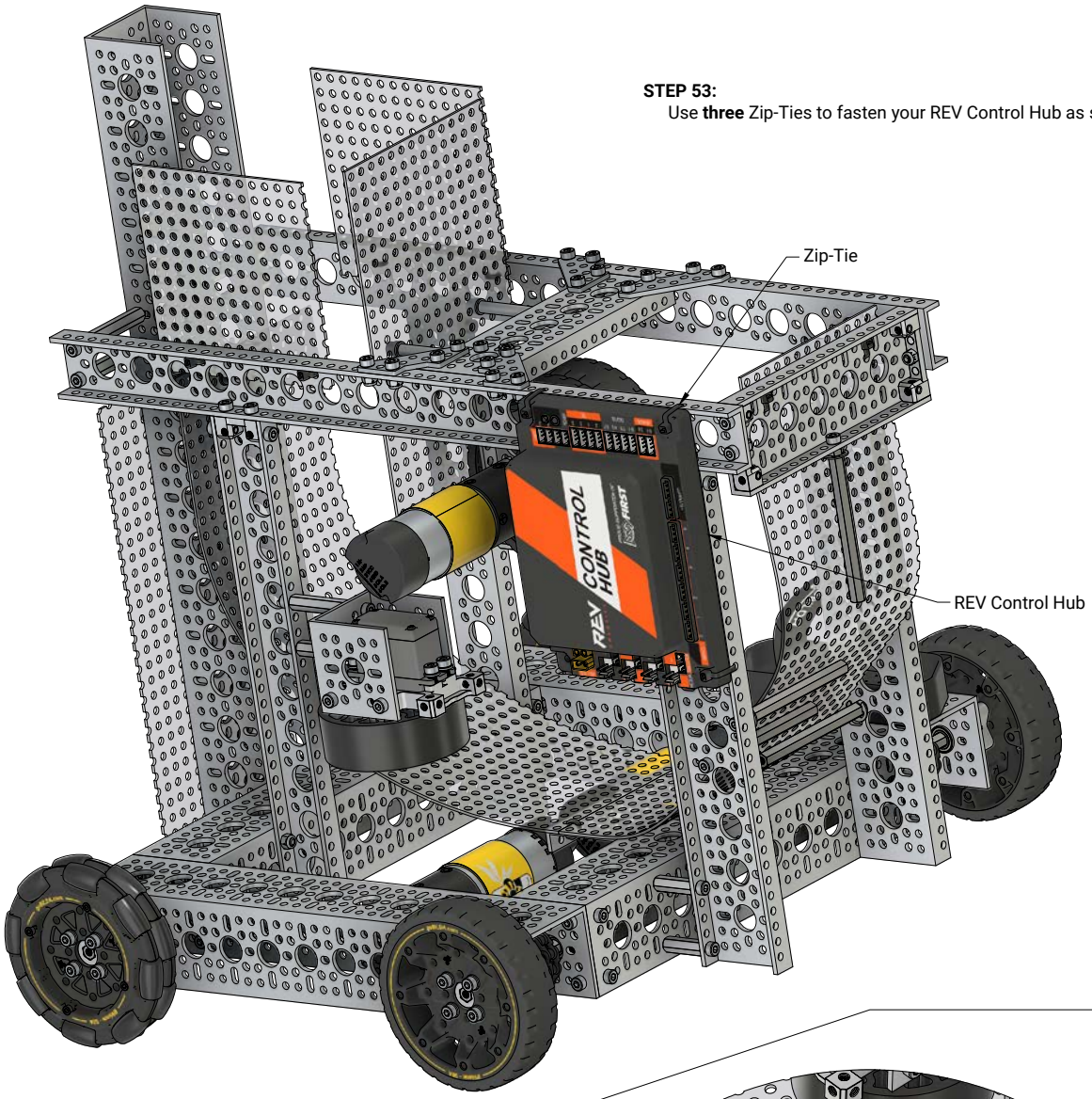


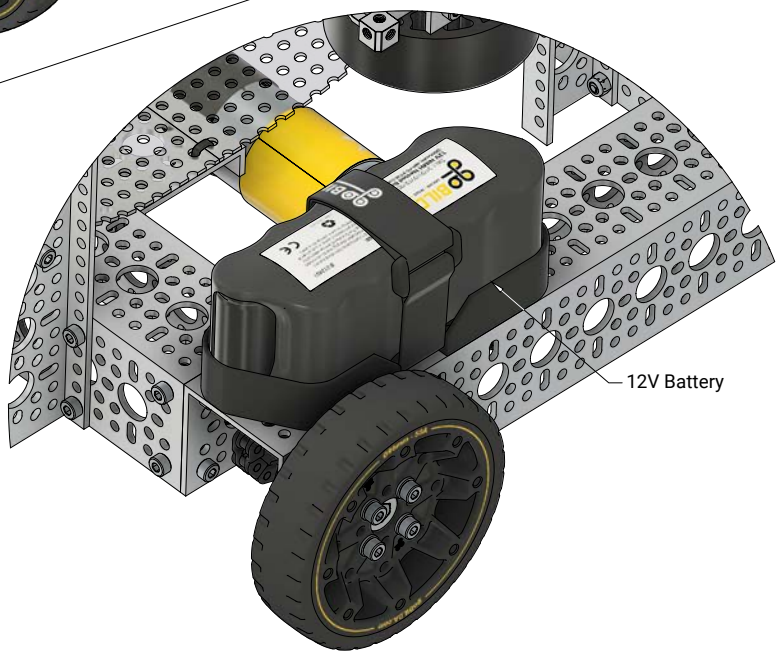
FIGURE 52-A



STEP 53:
Use **three** Zip-Ties to fasten your REV Control Hub as shown.



STEP 54:
Install **one** 12V Battery as shown.



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!