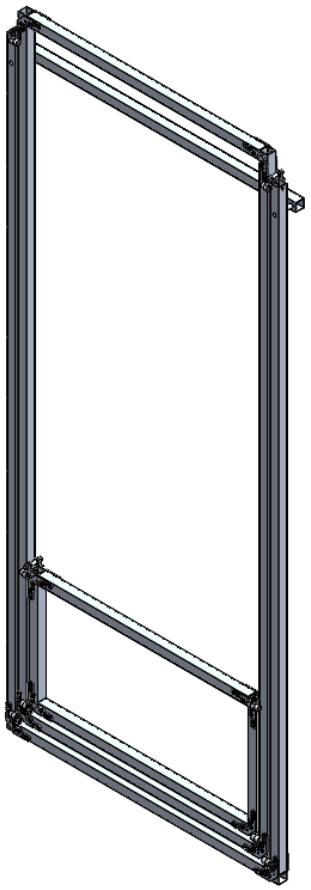
1x1 Compact Elevator Kit

(am-4873/am-4874)

Assembly Guide



Revision #	Date	Author	Purpose
0	12/13/2022	Ethan Scime	Original Document
1	1/17/2022	Ethan Scime	Fixed Mistake in Elevator Drawing

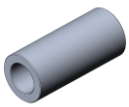
N. Massouda	1/17/2023
Reviewer Name	Date Reviewed

Table of Contents

Recommended Tools List

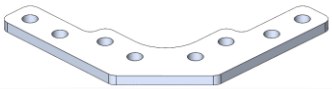
Component	Part #	QTY	Photo
Fold Up 12 Set Hex Tool	am-3864	1	
3/8-7/16 Open-End Wrench	am-2745	1	
Cordless Drill or Driver	N/A	1	
0.375" Drill Bit	N/A	1	
#7 Drill Bit	am-4613	1	
3/16" Drill Bit	am-4273	1	
3" C-Clamp	N/A	1	

1x1 Bearing Kit Parts List

Component	Part #	QTY	Photo
Cam Follower, Elevator, 1x1 Bearing Block	am-4410	1	
Bearing, Small Deep Groove, 5mm ID, 13mm OD, 4mm thick (695ZZ)	am-4724	2	
Bearing, Cam Follower, CF5, 13mm, M5 Thread, Crowned, Steel CFU5-13	am-4246	2	
Spacer, 0.313 OD x .192 ID x 0.688 Long, Aluminum	am-1682	1	

Screw, SHCS, 10-32 x 1750	am-1048	1	
Screw, FHCS, 10-32 x 625	am-1252	1	
Nut, Nylock, M5-0.8	am-1022	2	
Nut, Nylock, 10-32	am-1063	2	

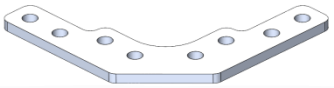
(1 Stage) 1x1 Compact Elevator Hardware Kit Parts List

Component	Part #	QTY	Photo
Elevator Corner Bracket	am-4866	16	
Rivet, Blind 3/16" Dia. Buttonhead, Steel, Grip Range 1/8 to 1/4	am-1226	125	

Additional Components Parts List

Component	Part #	QTY	Photo
6' Long 1"x1"x0.063" Wall Square Tubing	am-4203-6	4 OR 7	

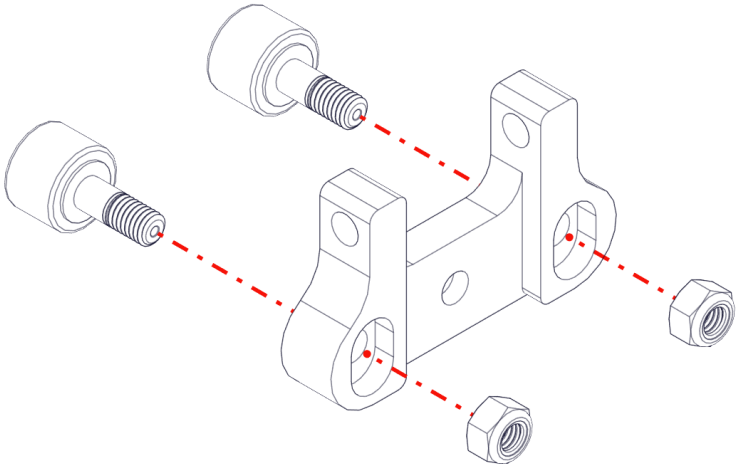
(2 Stage) 1x1 Compact Elevator Hardware Kit Parts List

Component	Part #	QTY	Photo
Elevator Corner Bracket	am-4866	20	
Rivet, Blind 3/16" Dia. Buttonhead, Steel, Grip Range 1/8 to 1/4	am-1226	150	
Spacer, 0.375 OD x 0.192 ID x 1.000 Long Aluminum	am-3876	4	
Nut, Nylock Jam, 10-32	am-1063	4	
Screw, SHCS, 10-32 x 1375	am-1154	4	

Assembly

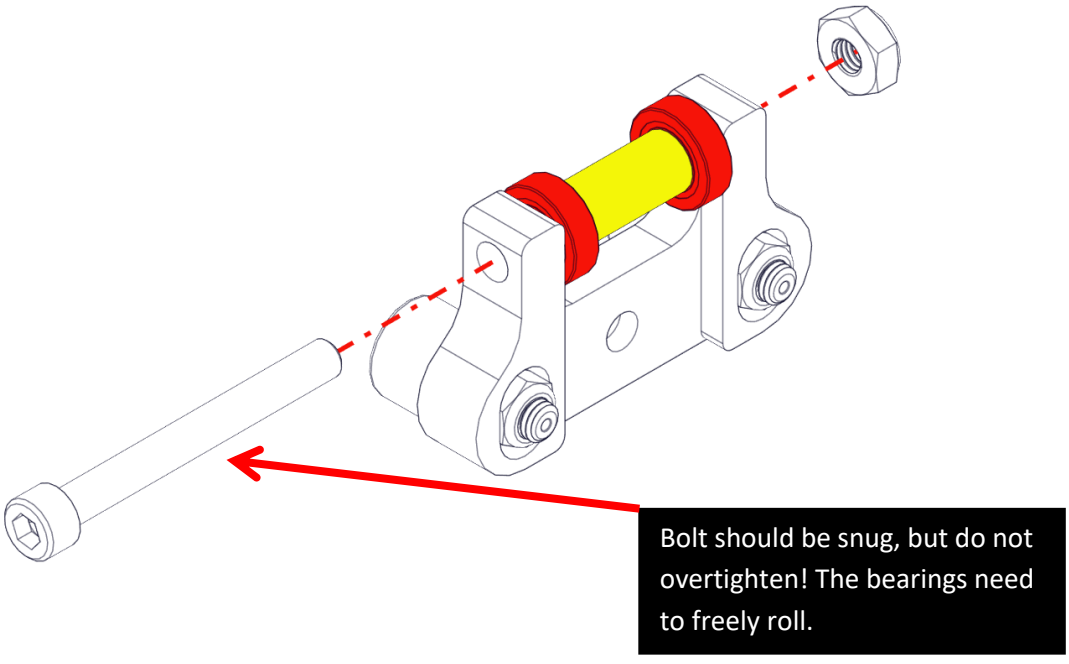
Step 1

Remove and discard the nuts that come attached to the cam followers (am-4246). Screw the cam followers into M5 nylock nuts (am-1022) through the bearing block (am-4410). The cam followers can be turned using a 3mm Allen key, but due to geometry of the bearing block, a wrench is not required for the nuts.



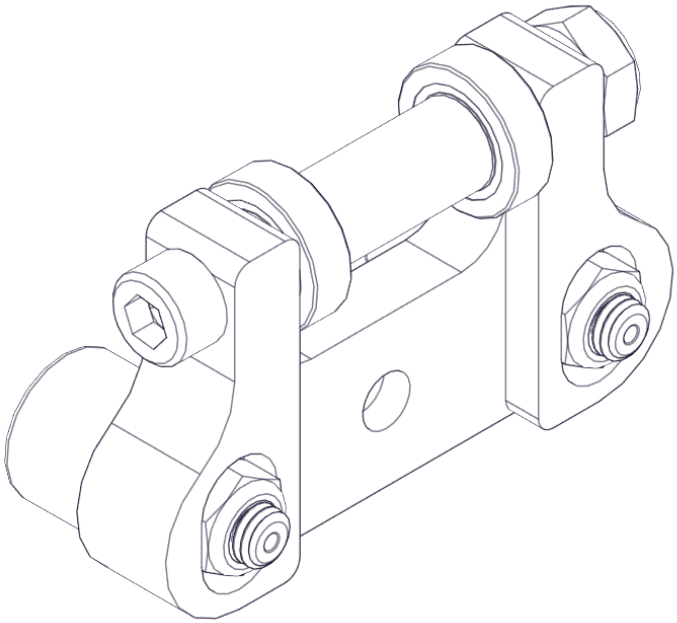
Step 2

Insert a 10-32, 1.75" long bolt (am-1048) through the tabs on the bearing block. On the bolt between the two tabs, slide on a 5mm bearing (am-4724) followed by a 0.688" long spacer (am-1682) followed by a second 5mm bearing. Secure in place with a 10-32 nylock jam nut (am-1063) outside the second tab.



Step 3

Repeat steps 1 and 2 for each bearing block your assembly requires. For a 1 stage elevator, that is 4 bearing blocks. For a 2 stage elevator, that is 8 bearing blocks.



Step 4

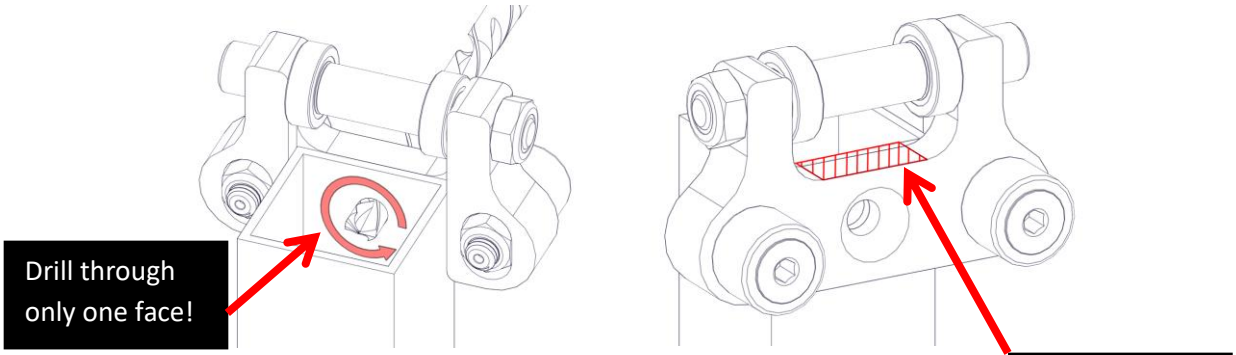
Cut the tube lengths you desire for your elevator from am-4203-6 according to the guide in **Appendix A**.

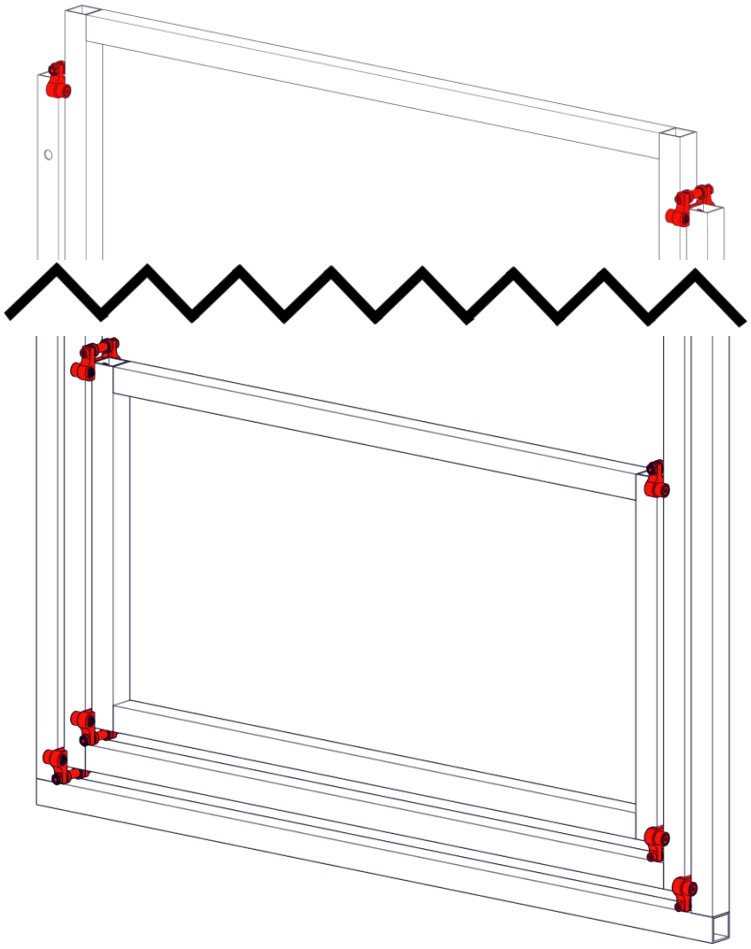
The steps outlined in Appendix A must be completed before continuing. We also highly recommend reading the ENTIRE assembly guide before going any farther. A complete understanding of the elevator assembly will help ensure you build it correctly and without error.

Step 5

See Appendix B for a detailed view of how each tube is attached in the elevator. Use the bearing blocks to match drill holes at the proper position in the vertical 1x1 rails with a #7 drill bit. For the smallest vertical tubes (B), a hole should be drilled at both the top and bottom of the tube.

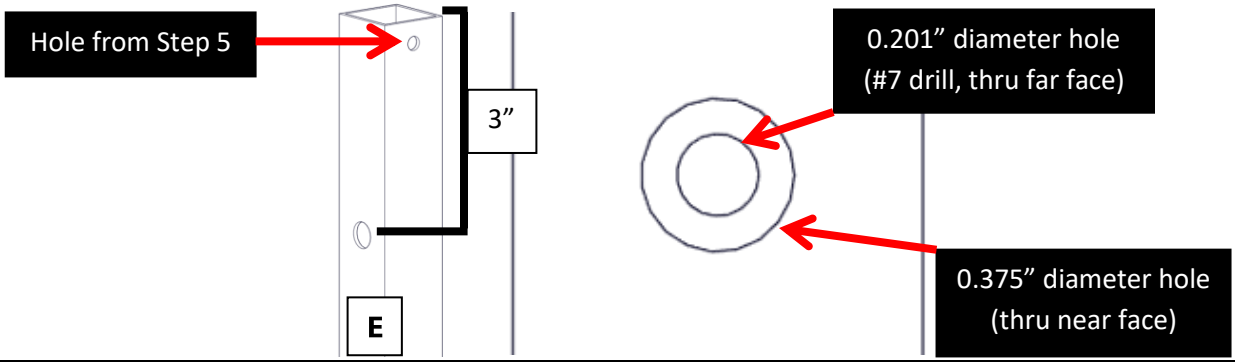
For a 2 stage elevator, holes should also be drilled at the bottom of the 1st stage tubes (B) and the top of the outermost tubes (C). Do **NOT** attach the bearing blocks at this time.





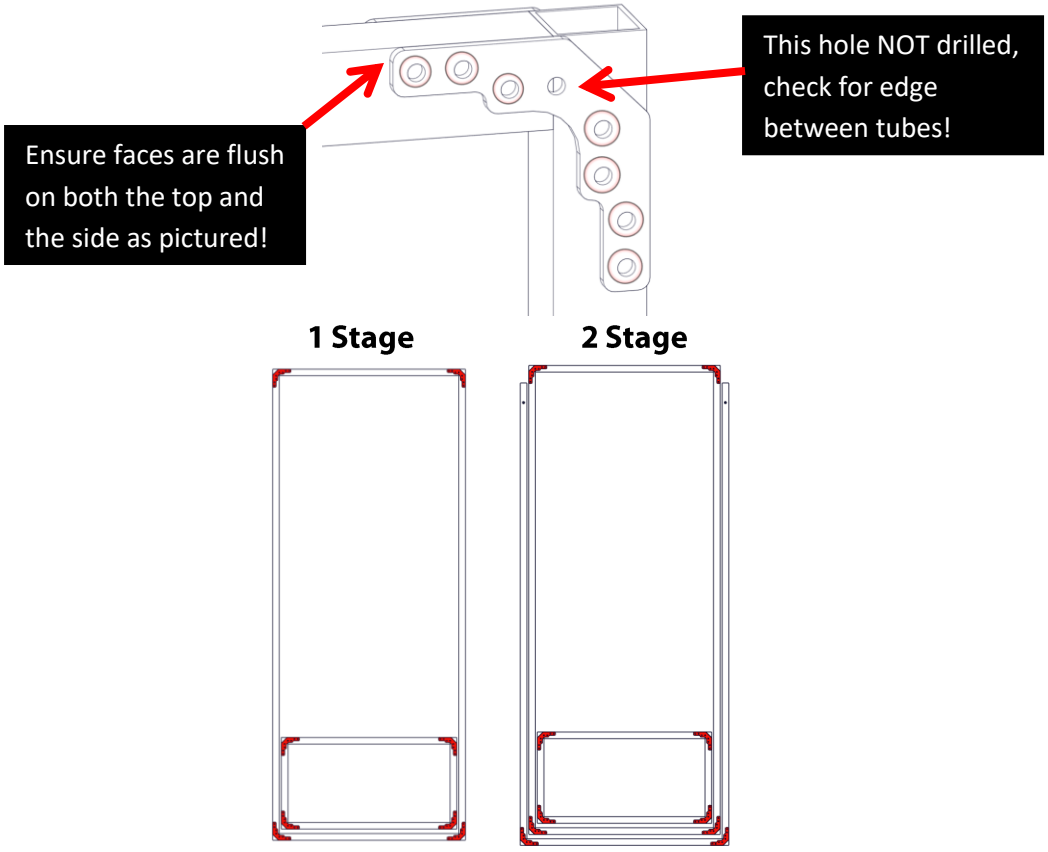
Step 6

If assembling a single-stage elevator, **SKIP THIS STEP.** Otherwise, in the tubes intended for the outermost section of the elevator (E), drill a hole through the perpendicular faces to the holes drilled in step 5 as shown. You can use the bearing block to match drill the hole, which is 3" from the top of the tube. On the face you intend to be the front of the elevator, drill out the hole to be 0.375" in diameter. Note that this will define one (E) as left and one as right.



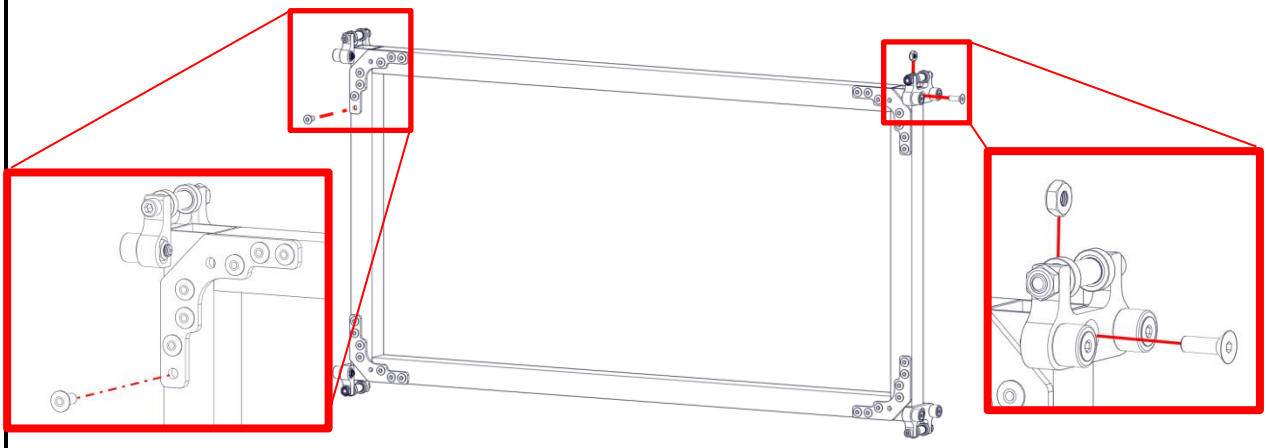
Step 7

Using the elevator corner brackets (am-4866), match drill the holes to mount them to each tube in the orientations shown using a 3/16" drill bit. Do not drill a hole in location where a hole sits on the boundary between two tubes. There should be TWO corner brackets in each corner when complete, one on the front and one on the back of each corner. Do **NOT** rivet the gussets on yet.



Step 8

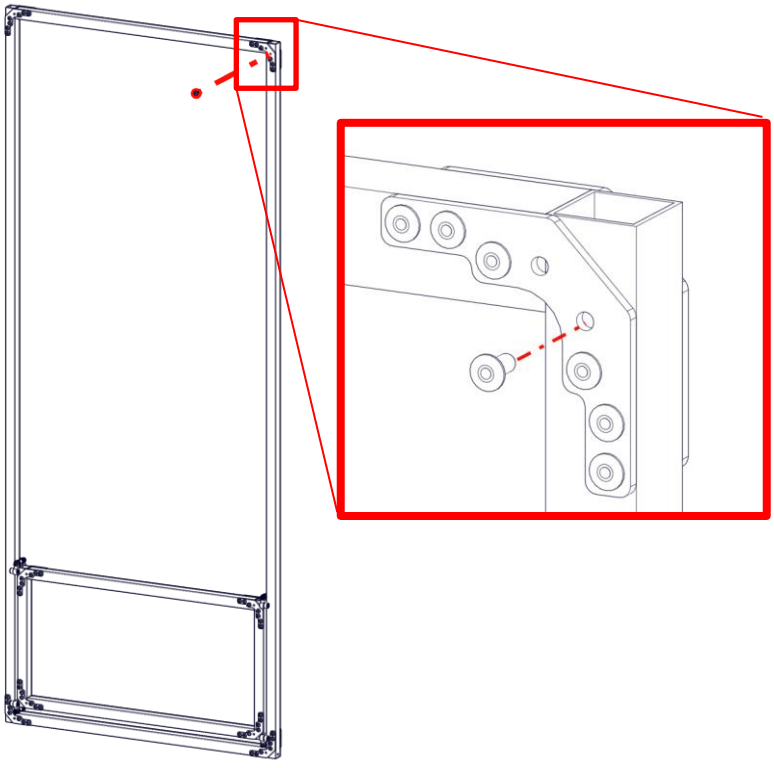
Assemble the innermost carriage by attaching the four bearing blocks as shown and riveting the eight brackets to the tubes as shown using the 3/16" rivets (am-1226).



Step 9

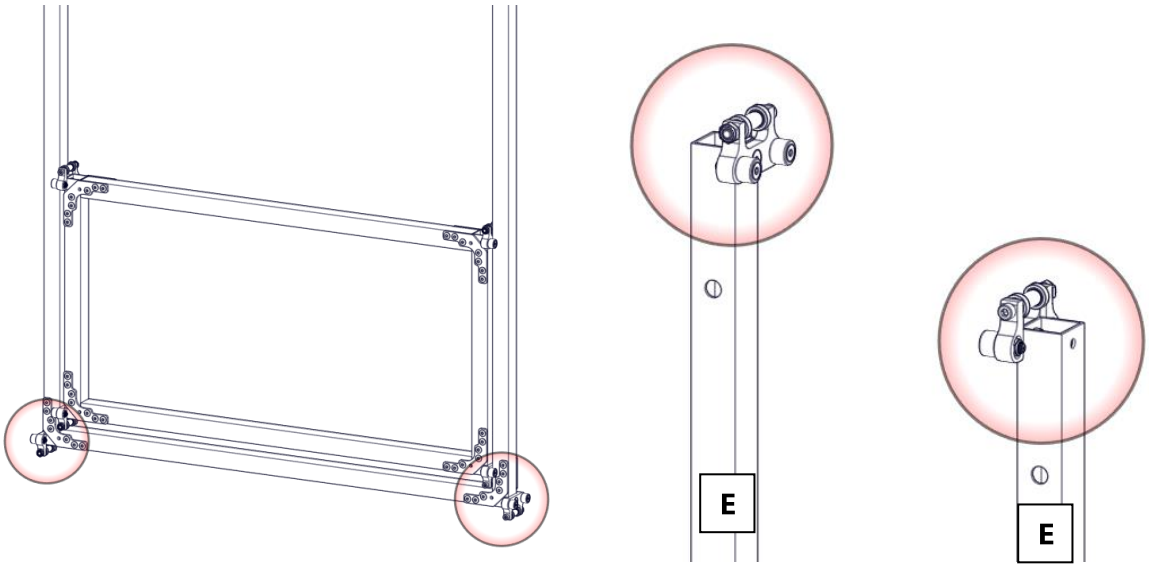
Construct the 1st stage around the innermost carriage, riveting eight more brackets into each corner. If intending to complete only a single stage elevator, congratulations, you've done it! Otherwise, keep going.

If this proves too challenging to assemble in this fashion, you can remove the cam followers on one side to remove the inner carriage and then replace it when completed.



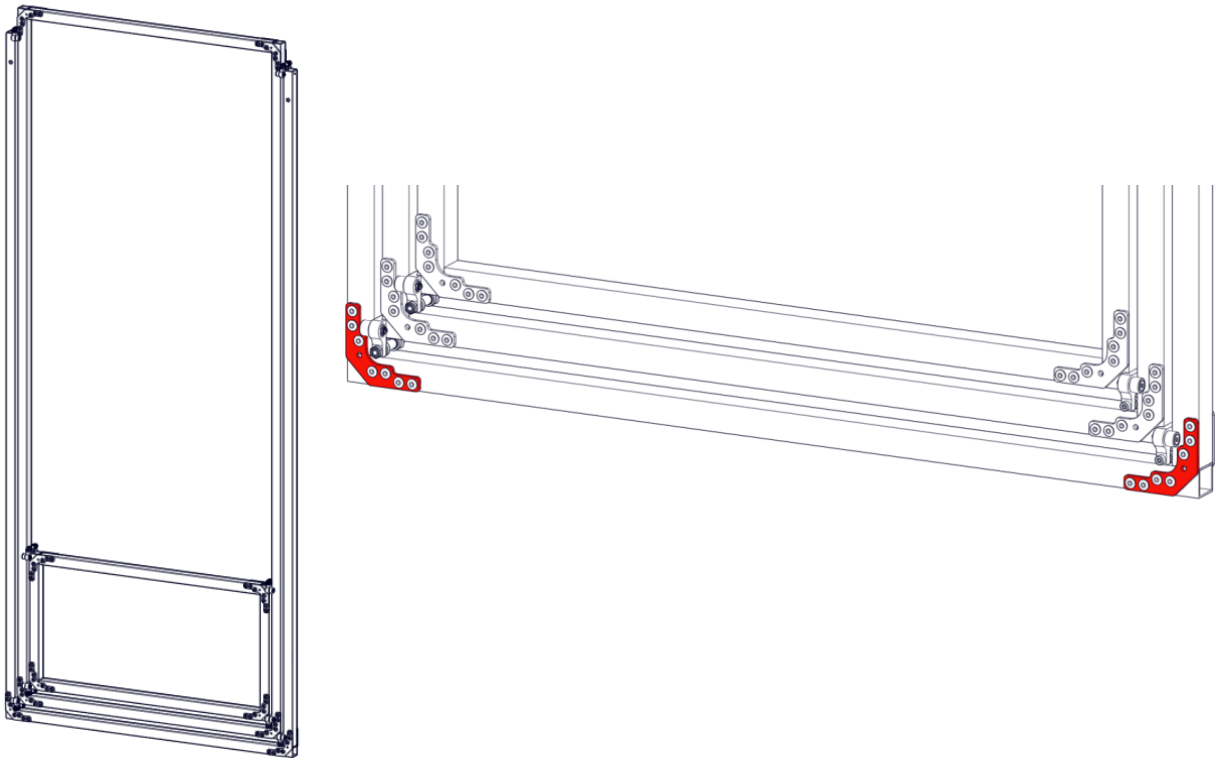
Step 10

Attach the remaining four bearing blocks as shown on both the first and second stages.



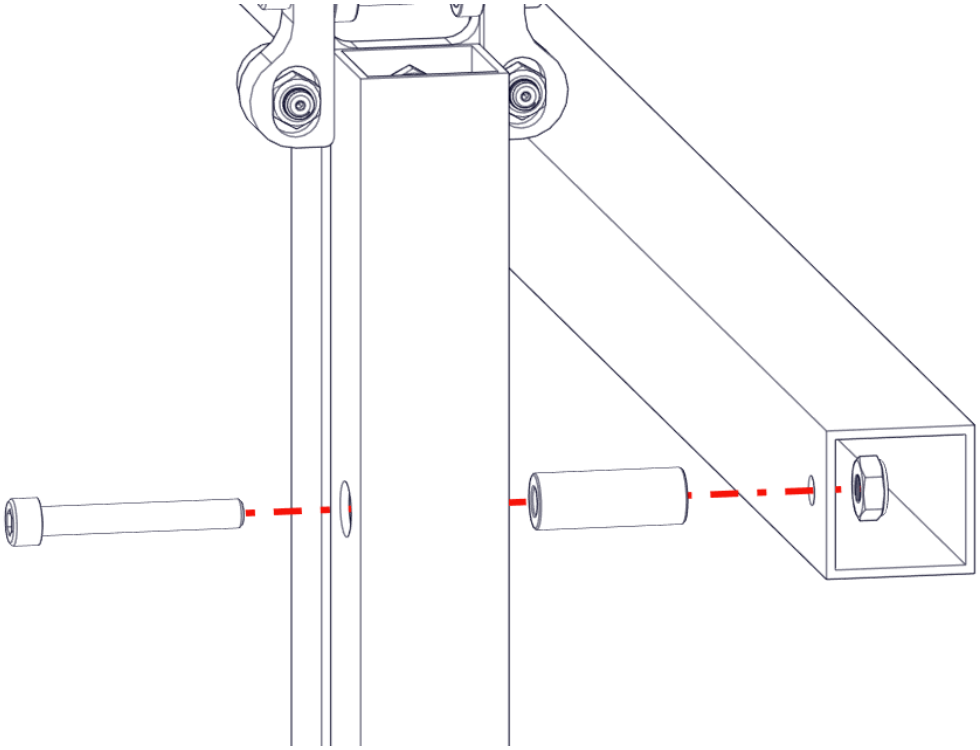
Step 11

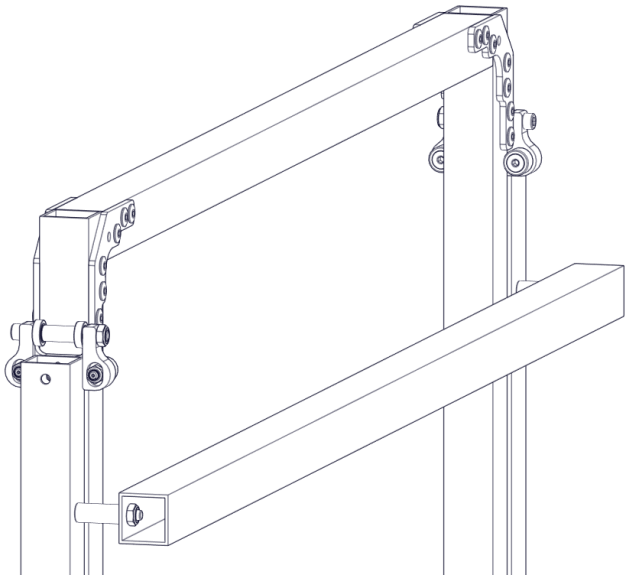
Rivet on the remaining 4 corner brackets at the bottom of the outermost stage. Slide the completed first stage elevator inside the outermost stage as shown.



Step 12

Drill two holes in the final, leftover tube (F) to match the extra holes in the second stage outer tubes. Connect the tube to the lift with two 1.375" long 10-32 bolts (am-1154), two 1" long spacers (am-3876), and two 10-32 nylock nuts (am-1063.) The two stage elevator is now complete.





Do NOT make this assembly too tight! The inner carriages should freely and smoothly move inside the outer frame. If this proves too challenging to assemble in this fashion, you can remove the cam followers on one side to remove the inner carriage and then replace it when completed.

Appendices

Appendix A: Tube Cutting Guide

To continue constructing your elevator, you must make some decisions!

Choose how wide and how tall you want your completed elevator to be.

- The MAX HEIGHT for a two stage elevator should be less than 73.75" based on the material provided. The MAX HEIGHT for a one stage elevator should be less than or equal to 72" (6ft) based on the material provided.
- The MAX WIDTH for a two stage elevator should be less than 32" and greater than 13" based on the material provided. The MAX WIDTH for a one stage elevator should be less than 29.375" based on the material provided.
- CARRAIGE HEIGHT must be greater than 5.50" and nominally greater than 8" to prevent racking.

Based on the cutting guides that follow, you should end up with the following cut tubes.

1 Stage Elevator

A. 2 Width pieces for the innermost carriage, longer than 5.50" and 2" shorter than the MAX WIDTH.
B. 2 Height pieces for the innermost carriage, equal to CARRAIGE HEIGHT.
C. 2 Height pieces for the outer frame, equal to the MAX HEIGHT.
D. 2 Width pieces for the outer frame, equal to the MAX WIDTH.

OR

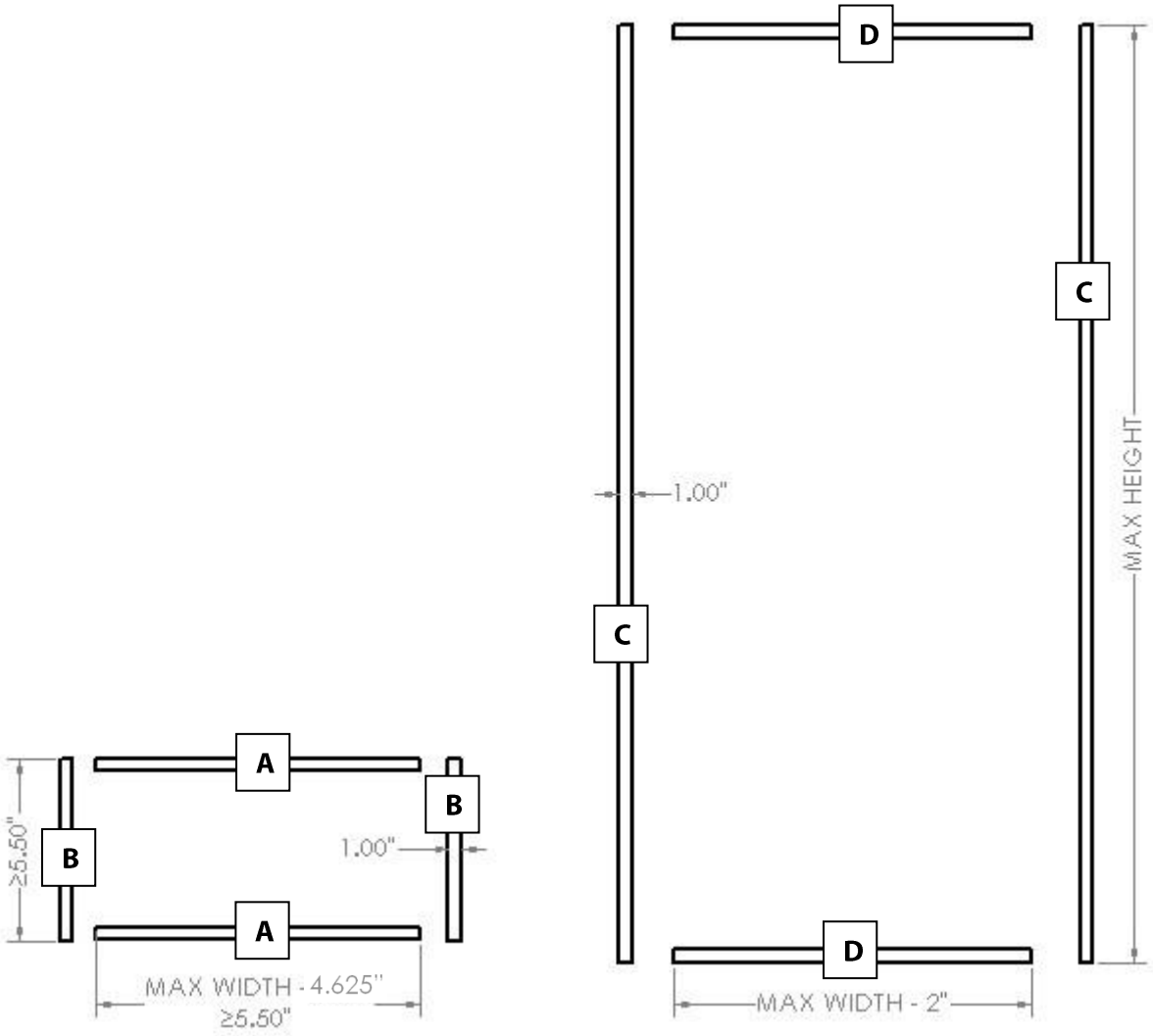
2 Stage Elevator

A. 2 Width pieces for the innermost carriage, longer than 5.50" and 7.25" shorter than the MAX WIDTH.
B. 2 Height pieces for the innermost carriage, equal to CARRAIGE HEIGHT.
C. 2 Height pieces for the middle carriage, 1.75" shorter than the MAX HEIGHT.
D. 2 Width pieces for the middle carriage, 4.625" shorter than the MAX WIDTH.
E. 2 Height pieces for the outer frame, 3.75" shorter than the MAX HEIGHT.
F. 2 Width piece for the outer frame, equal to the MAX WIDTH.

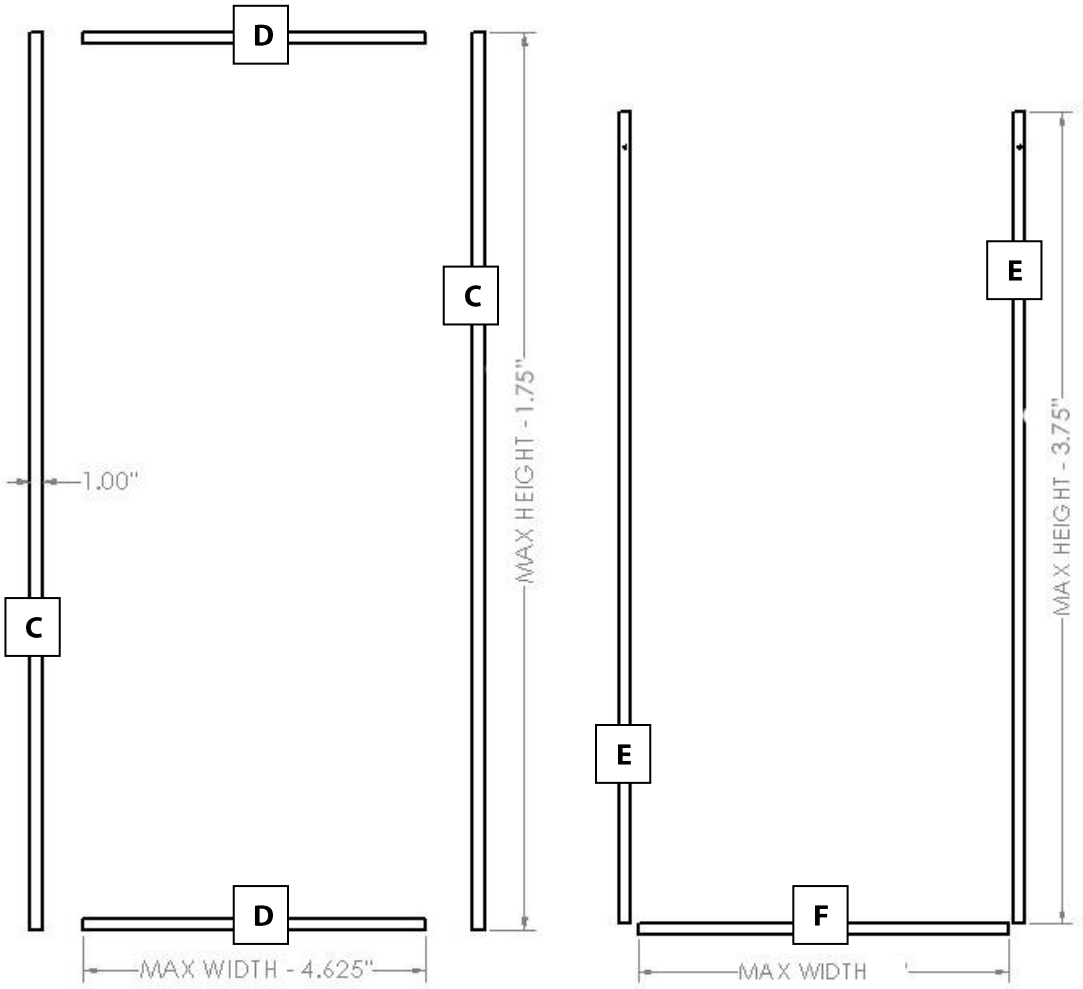
Make sure that whichever MAX HEIGHT, MAX WIDTH, and CARRAIGE HEIGHT you select, you can still manufacture that from the material provided. For a 1 stage elevator, all your tubes must be able to be made with **four** 6ft long tubes of starting material. For a 2 stage elevator, you have **seven** 6ft long tubes.

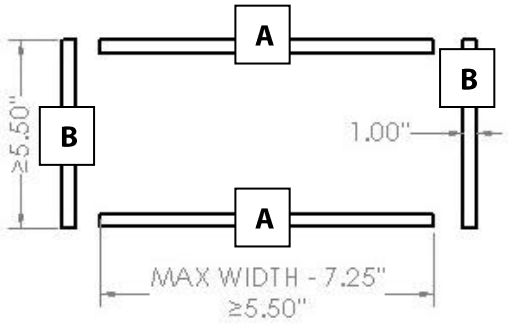
<u>For example:</u>
With MAX HEIGHT set to 6 feet for a 1 stage elevator, 2 sticks are used to create C. With MAX WIDTH set to 12", A is then set to 10" and D to 12". With the remaining material, the CARRAIGE HEIGHT can be set to 10" and still end with 1 72" tube and 1 8" tube remaining unused.

SINGLE STAGE

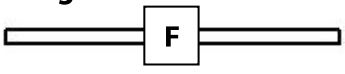


TWO STAGE





Additionally, cut one extra tube to the length of MAX WIDTH. This will be used to join the two sides of the second stage together.



Appendix B: Elevator Tube Detail