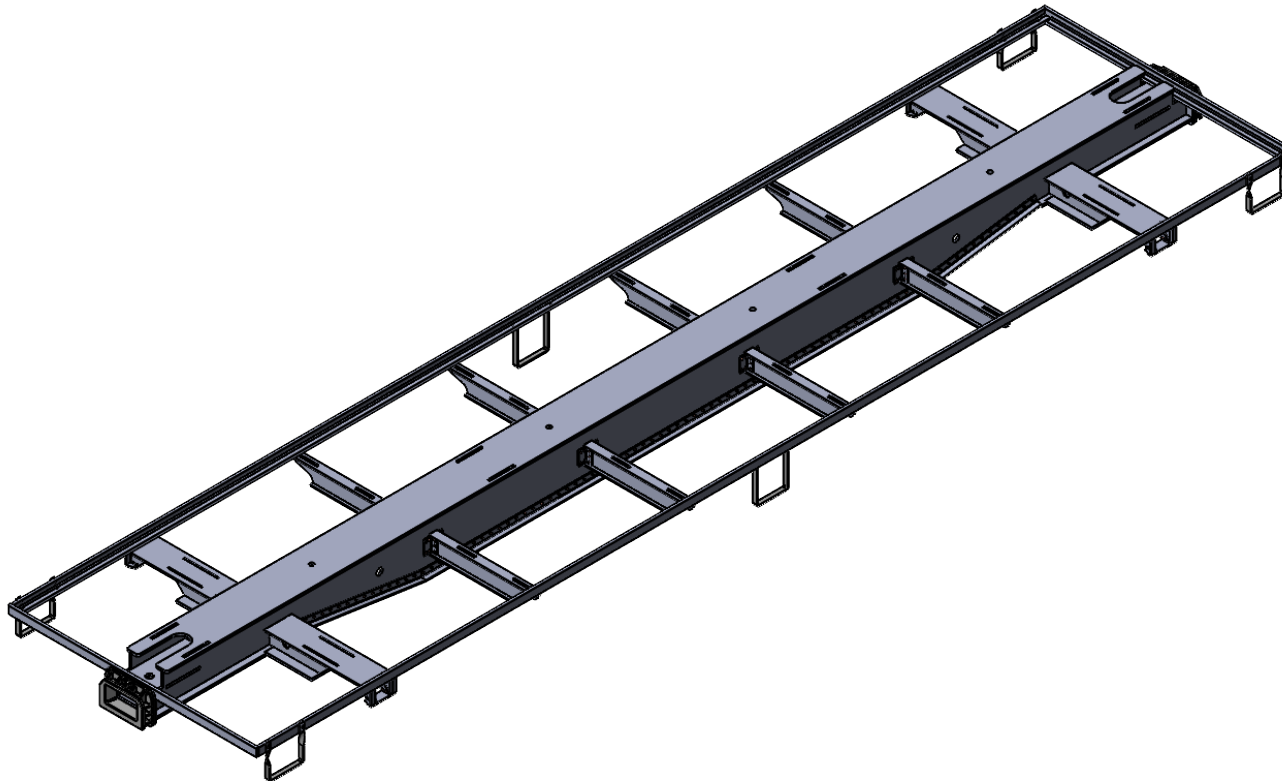


PFE REEFER FRAME KIT FOR 1:8 SCALE



INSTRUCTION MANUAL

PACIFIC DESIGN SHOPS

REVISION: A
REVISION DATE: 4/30/26

KIT OVERVIEW

THE INFORMATION CONTAINED IN THIS INSTRUCTION MANUAL IS THE SOLE PROPERTY OF PACIFIC DESIGN SHOPS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF PACIFIC DESIGN SHOPS IS PROHIBITED.

Tools you may need to assemble the kit:

- Welder
- Grinder
- Clamps
- Rivet squeezer or rivet gun
- Squeezer dies, air hammer bits or bucking bar
- 1/16" Clecos (minimum 2 needed) & cleco pliers
- Cordless Drill
- Multi-Tool or Wood Router
- 1/16" drill bits
- 4-40 Tap and #43 drill bit
- 2-56 Tap and #50 drill bit

Extra materials you may need (see page 4 for list of hardware):

- Trucks
- Couplers
- Truck and coupler mounting hardware
- Safety chain mounts
- Paint
- Decals

Common acronyms:

- BOM - Bill of Material
- PDS - Pacific Design Shops
- PSC - Precision Steel Car
- LSP - Live Steamer Parts
- MMC - McMaster Carr
- HRS - Hanson Rivet & Supply Co.

Helpful Tips

- Assemble kit together before welding to see how the parts go together.
- Tack weld the pieces together. It is easier to undo a tack than a bead.
- When applying the finishing welds, use skip welds instead of a continuous welding to avoid extreme warping and twisting.
- Weld from one end to the other to avoid warping.
- Use clamps to keep joints tight together when welding.

See the FAQ page for more helpful tips and answers to common questions.

We want your feedback! If you see an area to improve either on the kit or the instructions, please let us know. Send your feedback to info@pacificdesignshops.com.

PACIFIC DESIGN SHOPS IS NOT RESPONSIBLE FOR DEFECTS RESULTING FROM POOR ASSEMBLY OR CARELESS HANDLING. REPLACEMENT PARTS MAY BE AVAILABLE TO PURCHASE.

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PFE REEFER BODY MODS

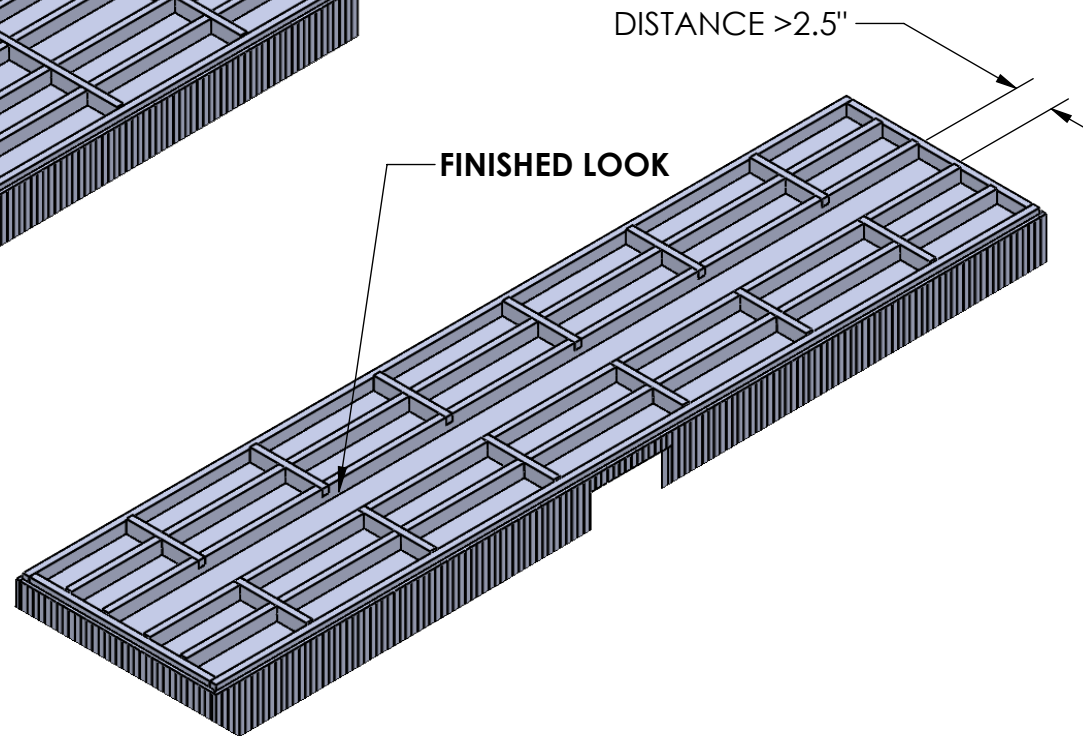
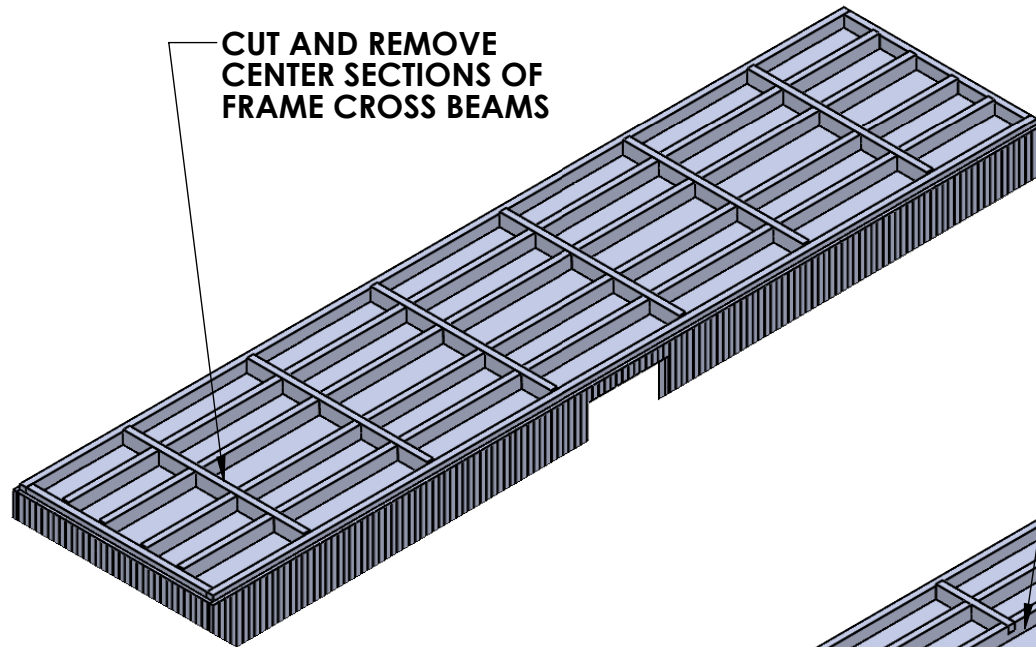
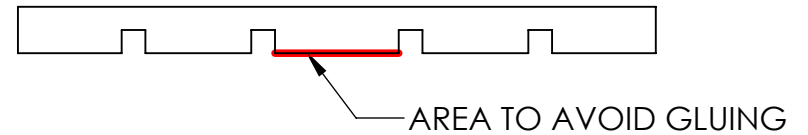
To fit the PFE Frame to the body, cut and remove the center sections of the Frame Cross Beams as shown below.

Distance between middle Frame Stringers needs to be $>2.5''$ over full length.

Pre 2022 models: Remove MDF Fishbelly pieces.

Recommended assembly: During gluing of the underframe (Body Step 2), avoid applying glue to center section of Frame Cross Beam when attaching to floor (see below). After glue is dried, cut along Frame Stringers to remove center section.

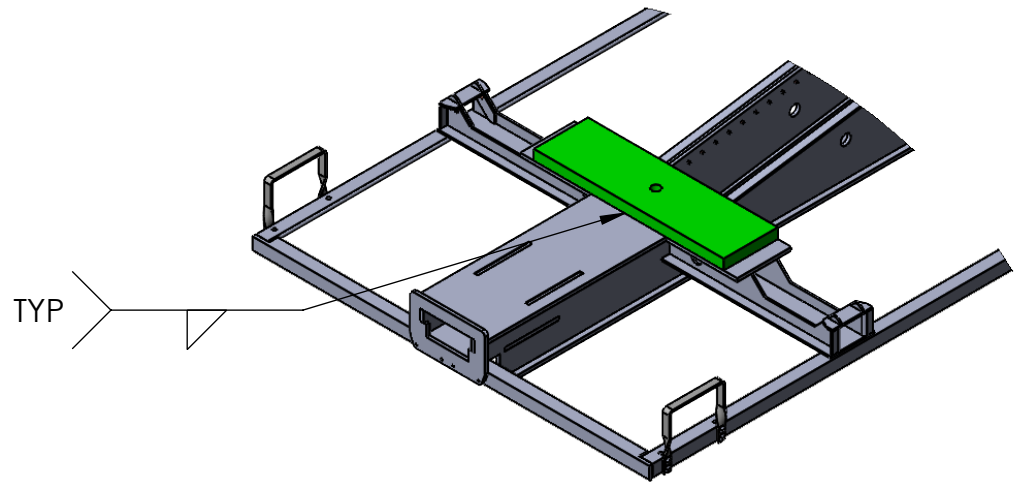
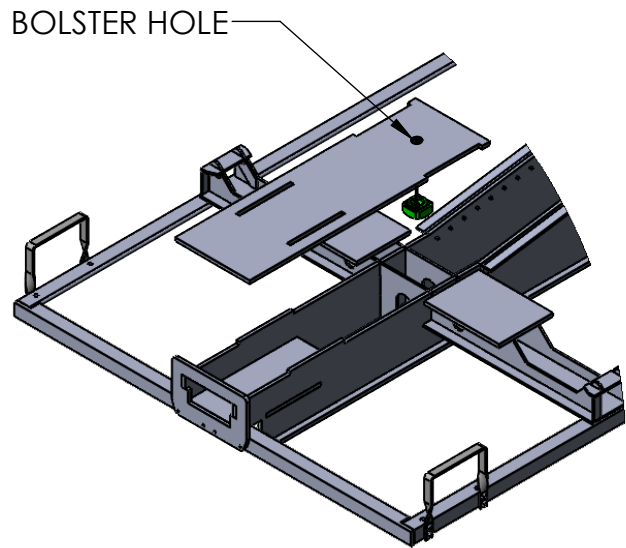
Recommended tool: Use Multi-Tool w/ Oscillating Blade to remove middle section of Frame Cross Beam.



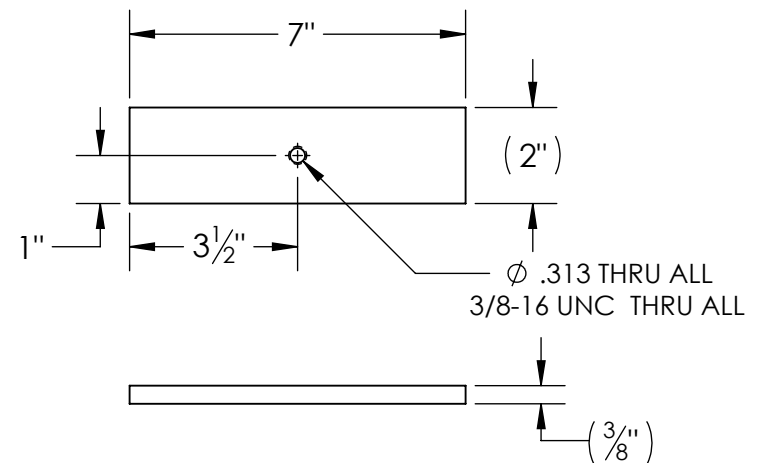
TRUCK MOUNTING OVERVIEW

Titan Train Mounting: Weld a 3/8" nut to back of bottom plate to bolt truck at bolster hole location. Repeat on both ends. Recommended nut: McMaster Carr P/N: 93975A300.

LSP Mounting: Fabricate bolster plate (see below) and weld to bottom plate following the picture below. Repeat on both ends.



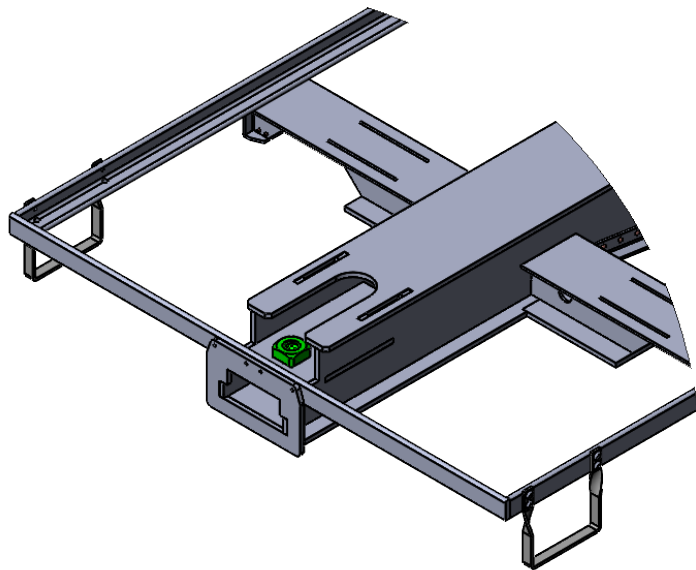
Titan Train Alternate Mounting: Use a 3/8" x 2 1/2" hex bolt and insert through bolster hole before tack welding bottom plate to frame. After final welding, use hole in top plate to plug weld top of hex bolt, making sure to keep bolt square in both directions.



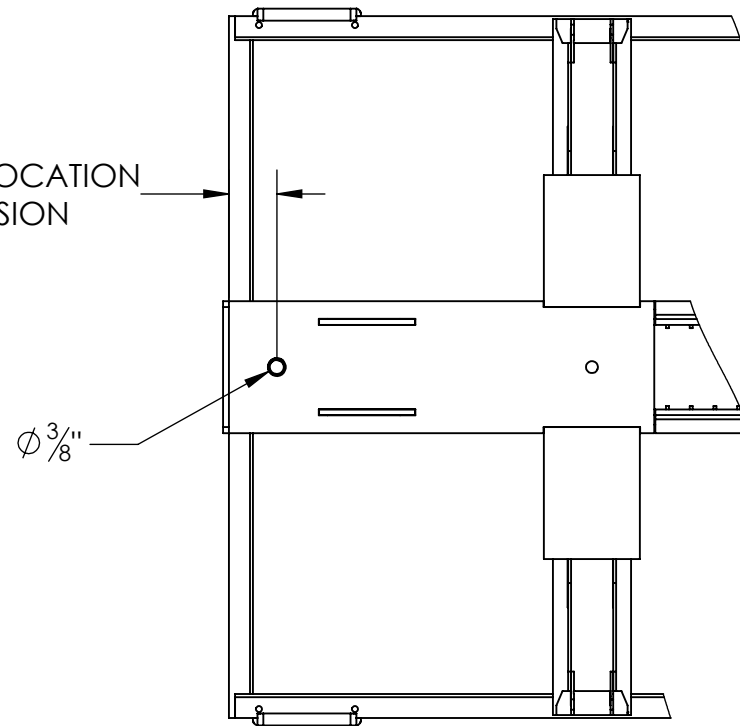
COUPLER MOUNTING OVERVIEW

For adding holes for coupler, first measure the distance from the rear face on the coupler to the coupler mounting hole location. Subtract 1" and mark that distance on bottom plate and top coupler pocket. Drill the hole per the drawing below.

Weld a 3/8" nut to the top coupler plate to allow bolt to be threaded in from below.
Recommended nut: McMaster Carr P/N: 93975A300.



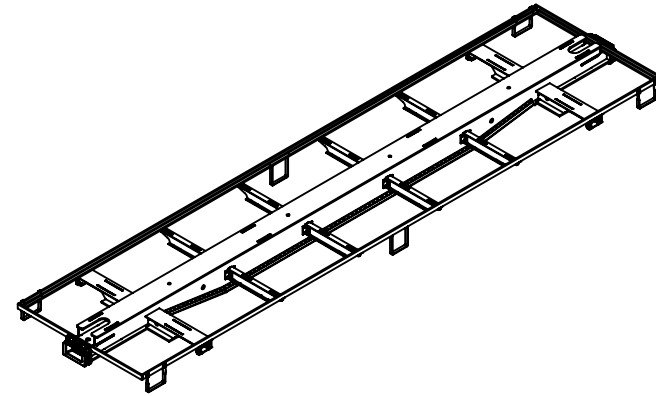
COUPLER LOCATION
DIMENSION



BOM OVERVIEW

- Use the BOM's below for pages 5-14
- Items below may be included in kit depending on Tier ordered.
- Rivet part numbers listed below are for copper and can be sourced from Hanson Rivet & Supply Co.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	PFE75_ST11G_A2	Frame Sides	2
2	PFE75_ST11G_B1	Frame Top	1
3	PFE75_ST11G_C2	Frame Ends	2
4	PFE75_ST11G_D2	Top Coupler Plate	2
5	PFE75_ST11G_E4	Cross Braces	4
6	PFE75_ST11G_F2	Bolster Bottom	2
7	PFE75_ST11G_G4	Bolster Pads	4
8	PFE75_ST16G_A8	I Beam Top	8
9	PFE75_ST16G_B8	I Beam Bottom	8
10	PFE75_ST16G_C16	I Beam Angle	16
11	PFE75_ST16G_D4	Bolster Supports	4
12	PFE75_ST16G_E4	Bolster Tops	4
13	PFE75_ST16G_G2	Side Angles	2
14	PFE75_ST16G_H8	Bolster Detail Sides	8
15	PFE75_ST16G_J4	Bolster Detail Bottom	4
16	-	Angle Iron End	2
17	-	Angle Iron Side	2



Recommended Copper Rivets

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
18	HRS_35C0203	1/16" x 3/16"L Rivet	16
19	HRS_35C0204	1/16" x 1/4"L Rivet	238
20	HRS_35C0205	1/16" x 5/16"L Rivet	24

Recommended Detail Parts

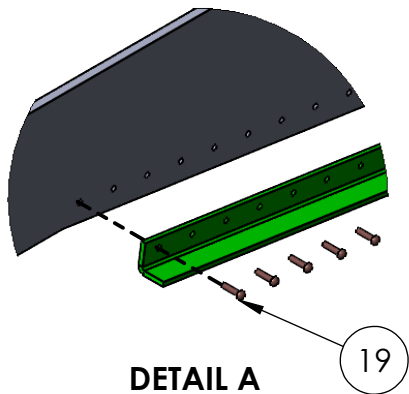
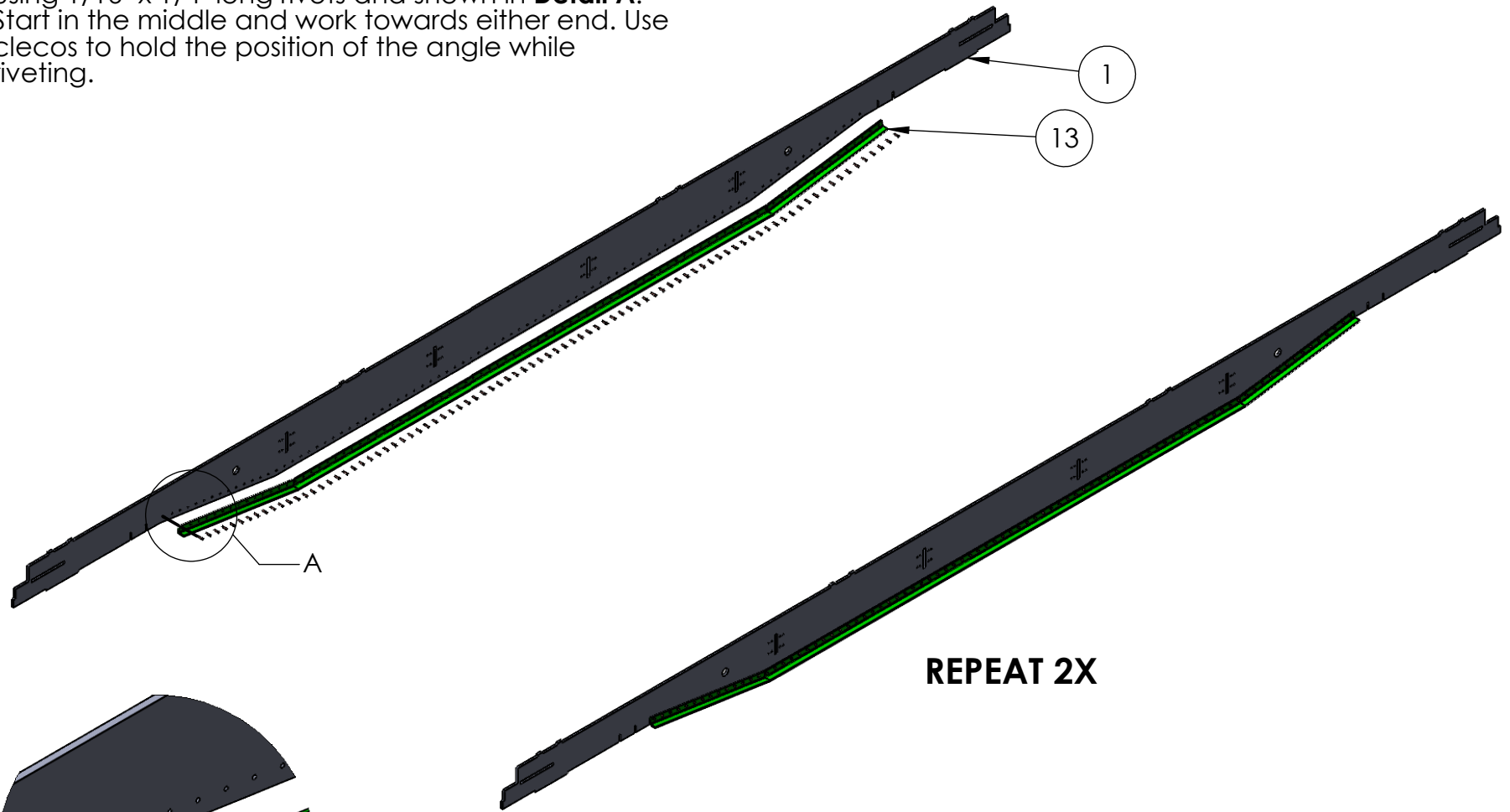
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
21	PSC_F-005	Stirrup Step A	4
22	PSC_F-006	Stirrup Step B	2
23	-	PFE Coupler Pocket	2

Recommended Hardware

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
24	MMC_92949A076	2-56 x 3/16" BHCS, 18-8 SS	8
25	MMC_92949A103	4-40 x 1/8" BHCS, 18-8 SS	20

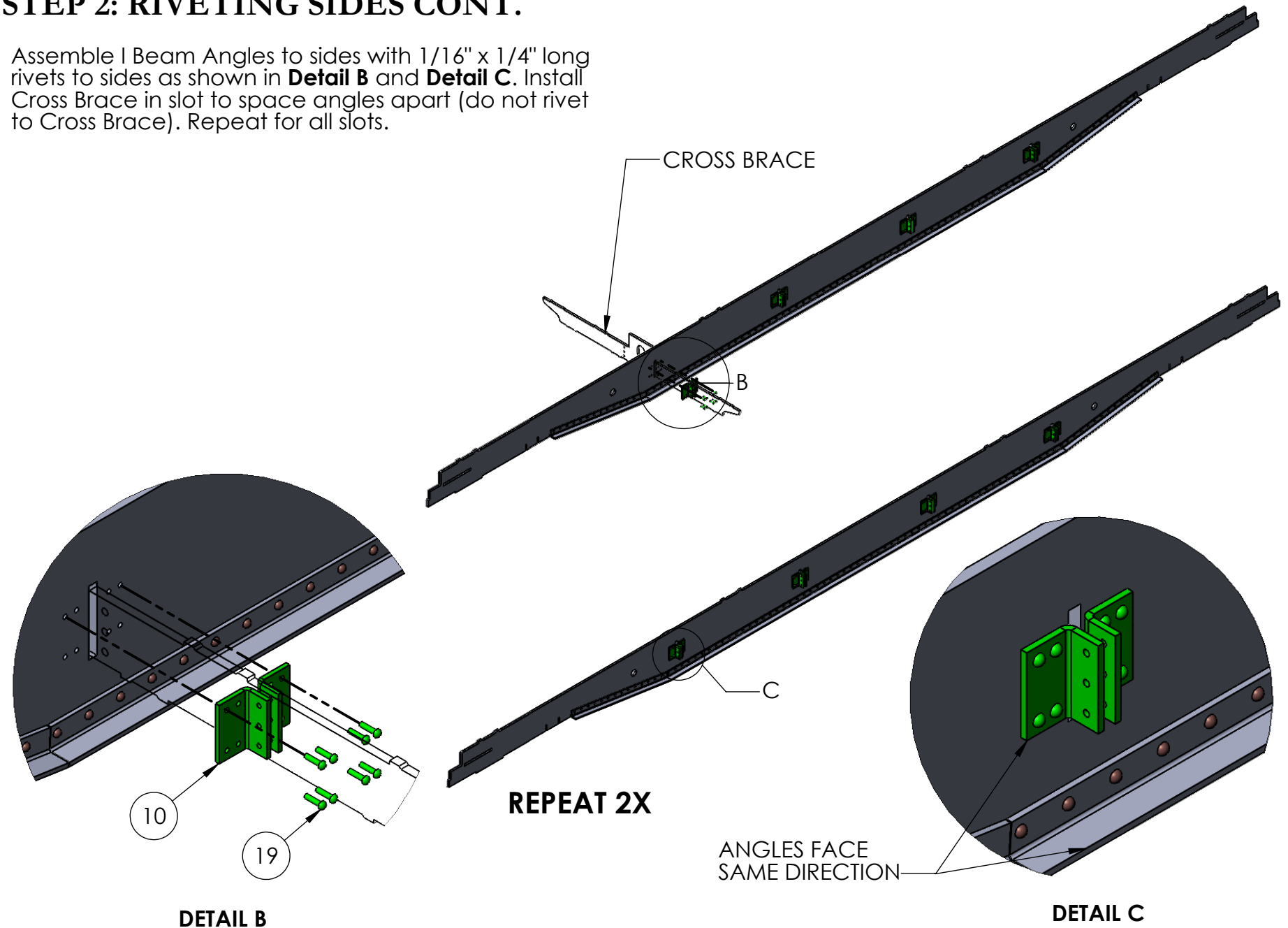
STEP 1: RIVETING SIDES

Assemble side angles along bottom of side frames using 1/16" x 1/4" long rivets and shown in **Detail A**. Start in the middle and work towards either end. Use clecos to hold the position of the angle while riveting.



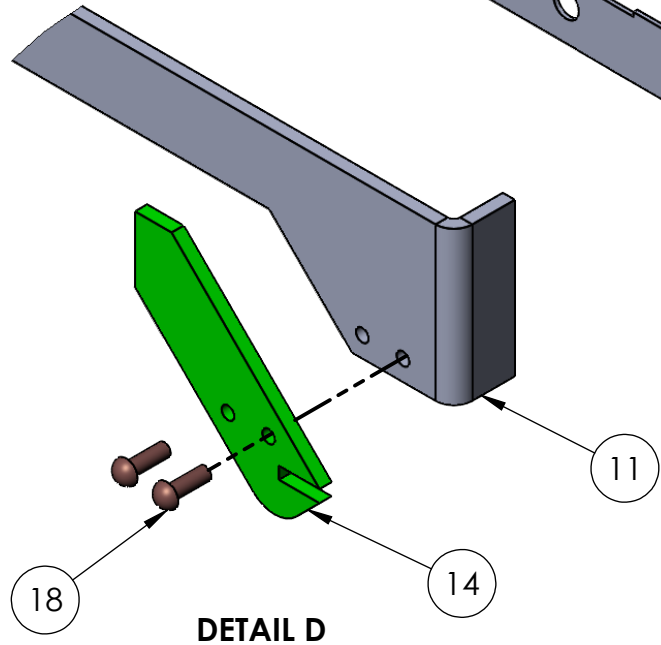
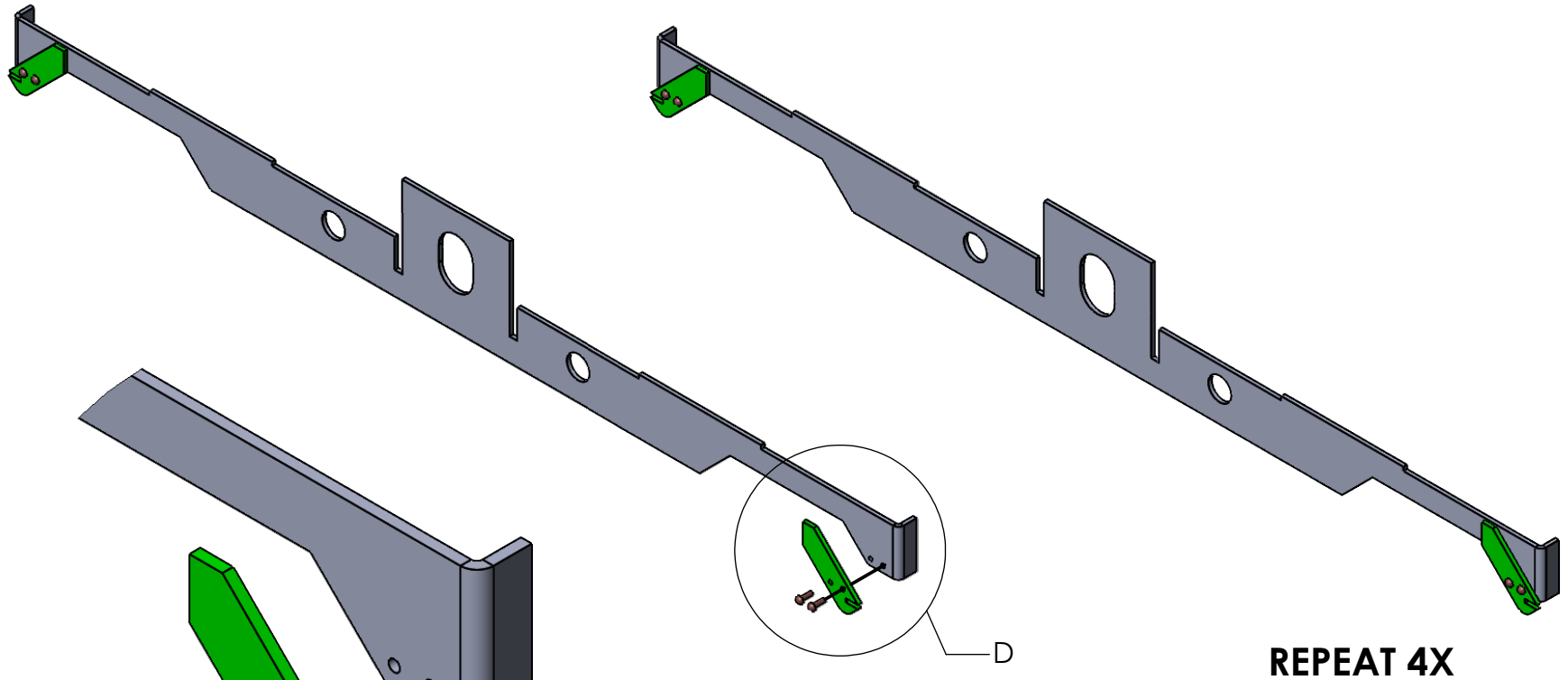
STEP 2: RIVETING SIDES CONT.

Assemble I Beam Angles to sides with 1/16" x 1/4" long rivets to sides as shown in **Detail B** and **Detail C**. Install Cross Brace in slot to space angles apart (do not rivet to Cross Brace). Repeat for all slots.



STEP 3: BOLSTER SUPPORT ASSY

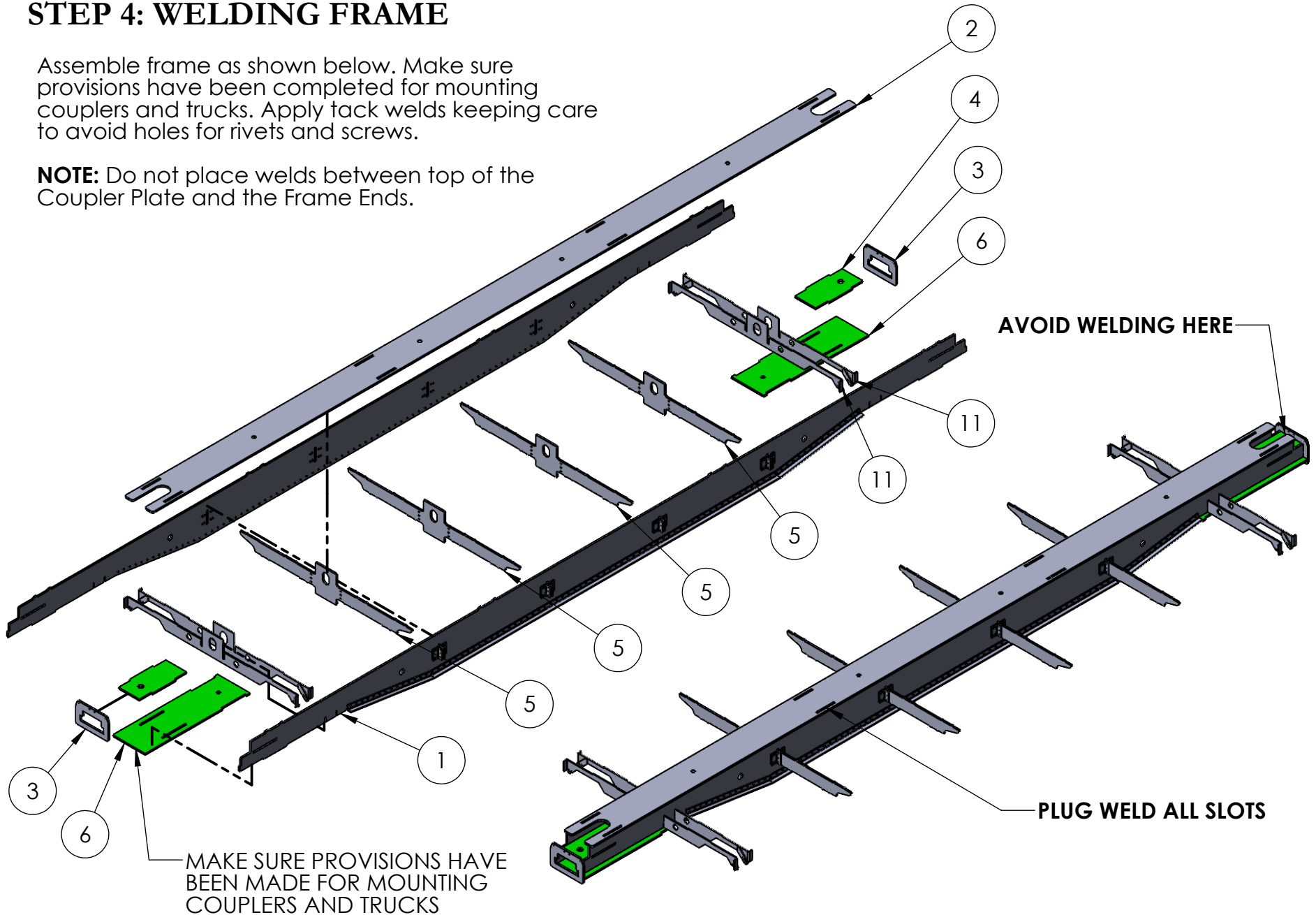
Assemble Bolster Details to Bolster Supports with 1/16" x 3/16" long rivets as shown in **Detail D**. Repeat on both ends.



STEP 4: WELDING FRAME

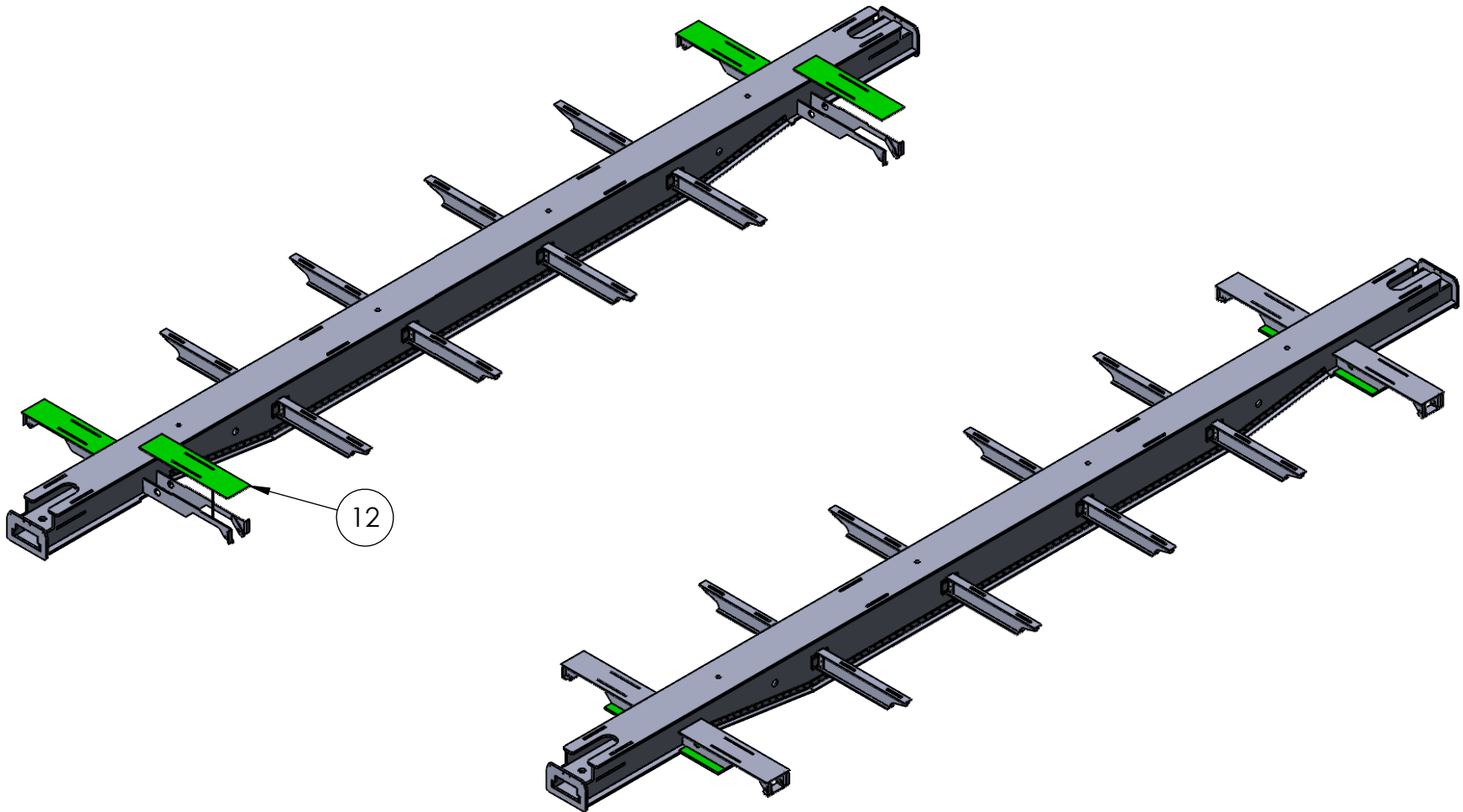
Assemble frame as shown below. Make sure provisions have been completed for mounting couplers and trucks. Apply tack welds keeping care to avoid holes for rivets and screws.

NOTE: Do not place welds between top of the Coupler Plate and the Frame Ends.



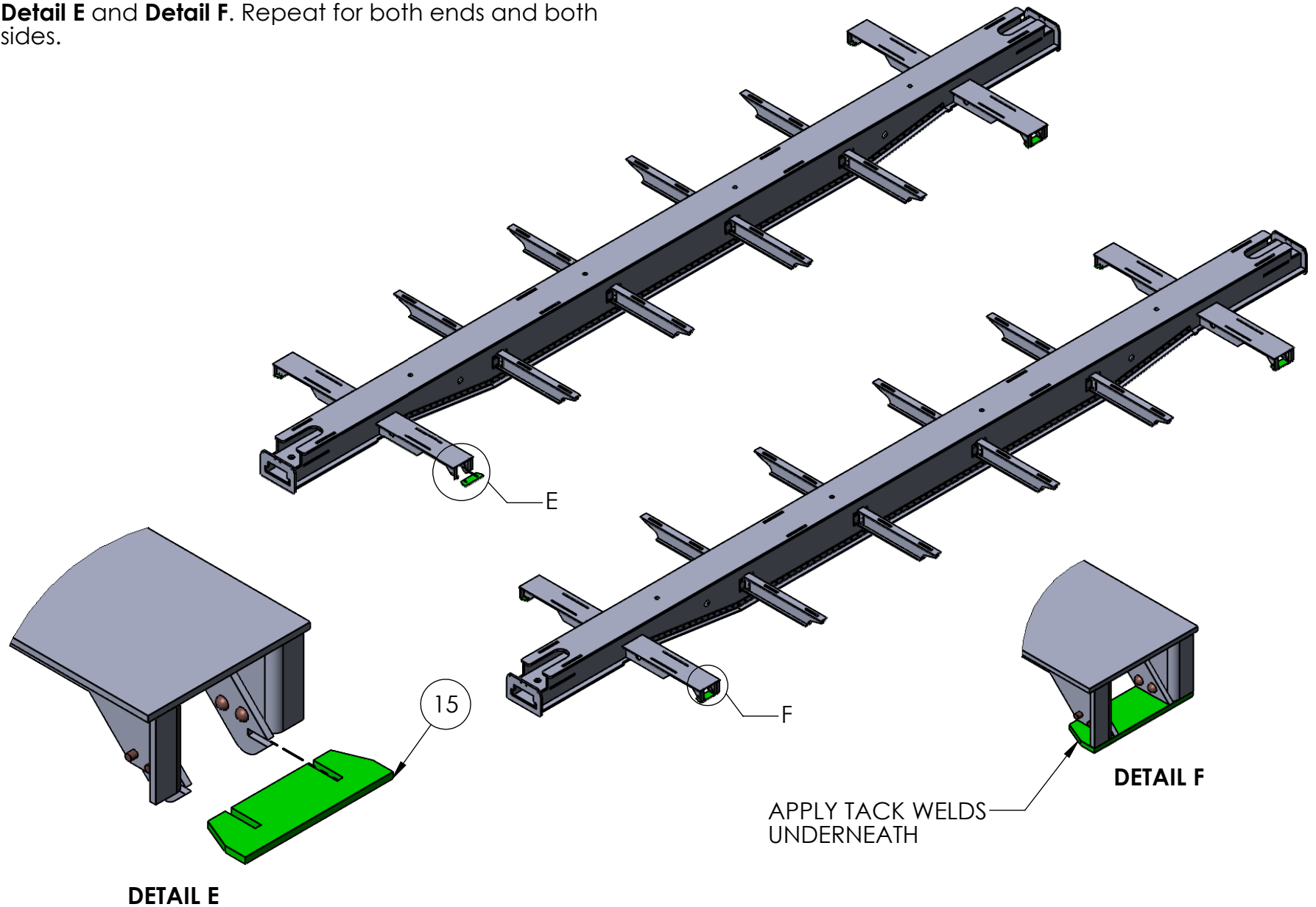
STEP 6: BOLSTER TOPS

Assemble Bolster Tops to frame as shown below.



STEP 7: BOLSTER DETAILS

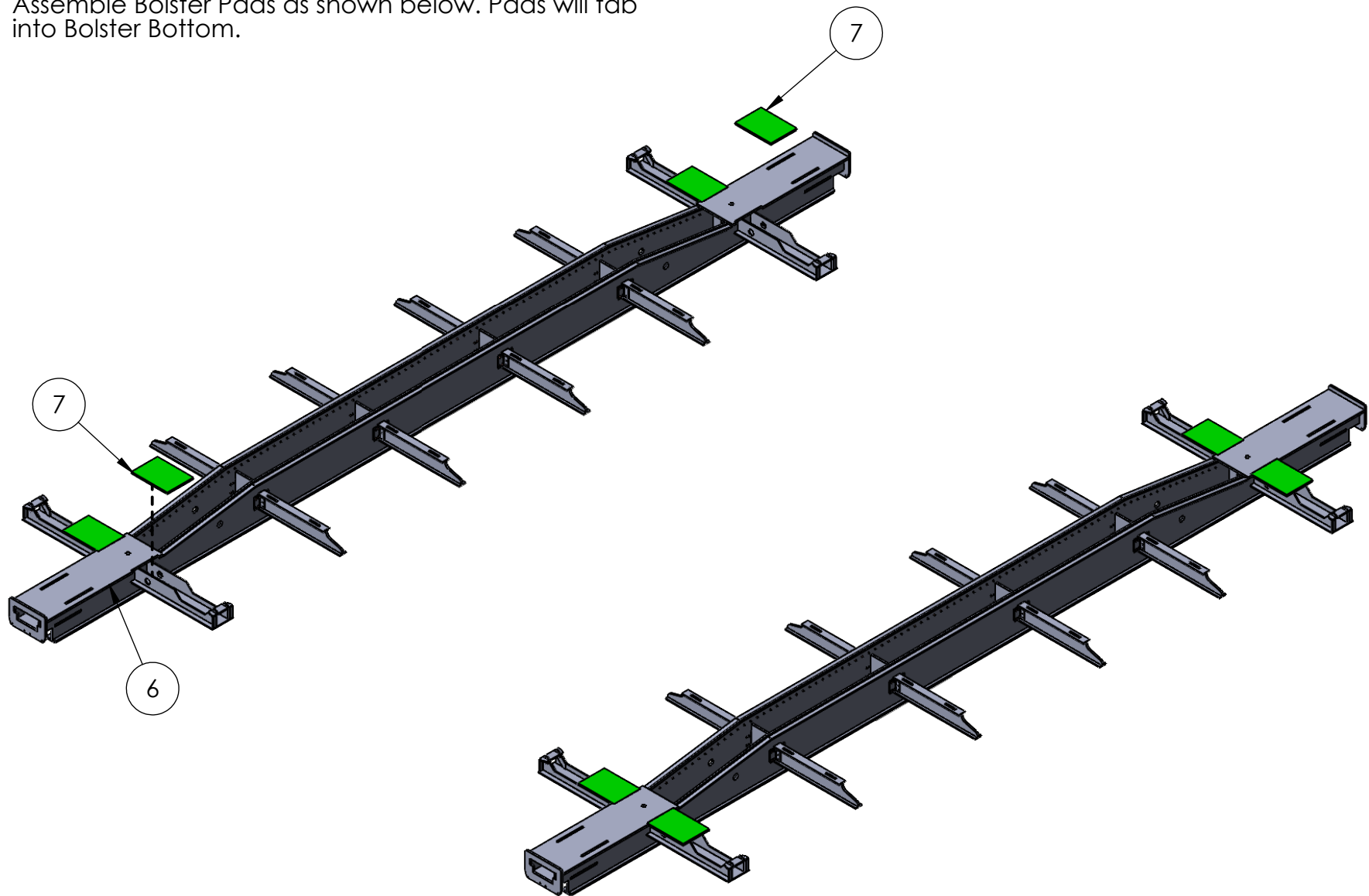
Assemble Bolster Detail Bottom to frame as shown in **Detail E** and **Detail F**. Repeat for both ends and both sides.



DETAIL E

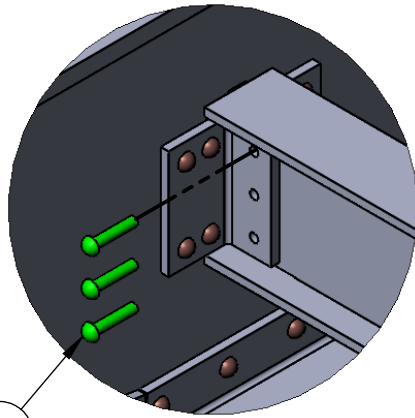
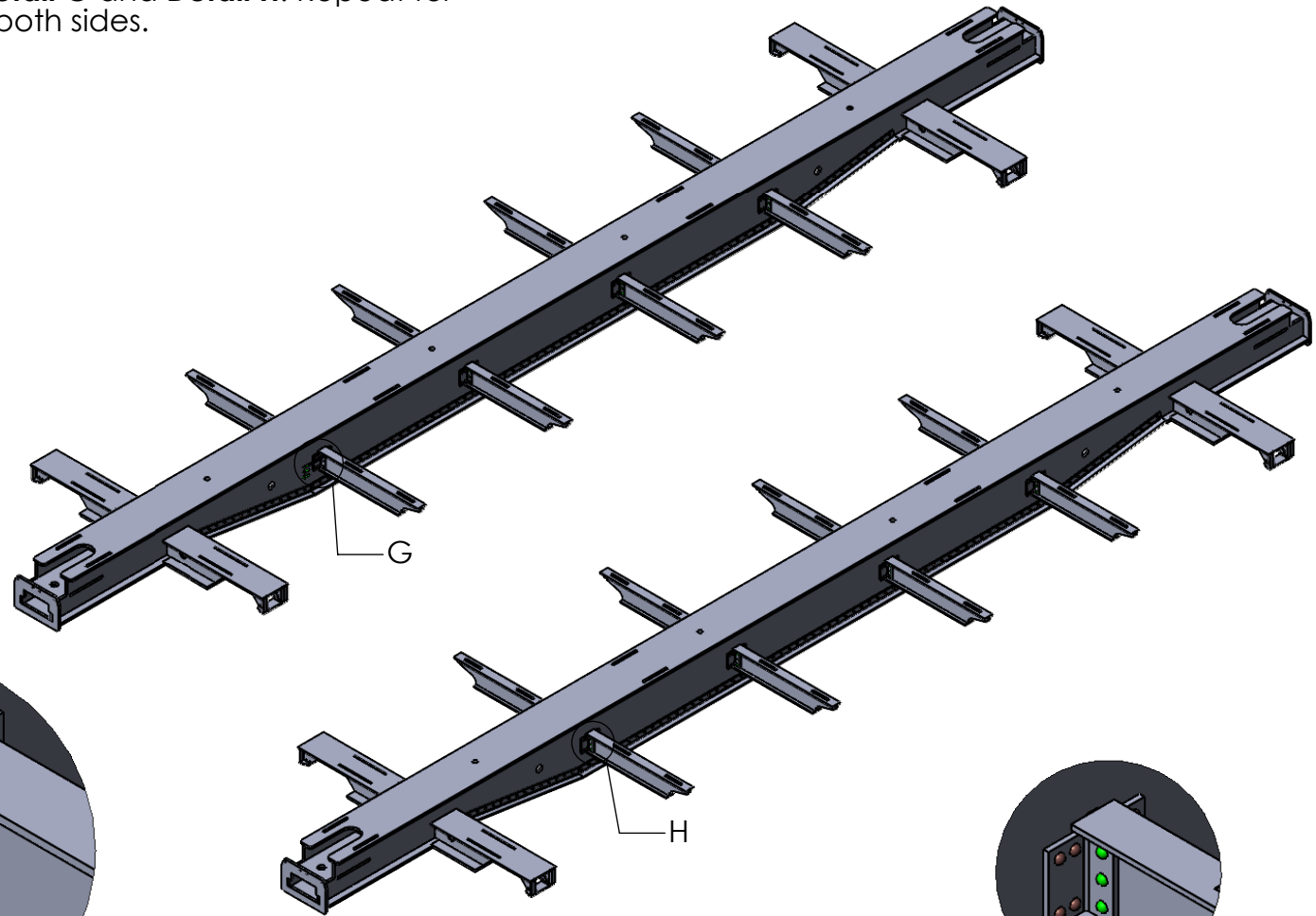
STEP 8: BOLSTER PADS

Assemble Bolster Pads as shown below. Pads will tab into Bolster Bottom.



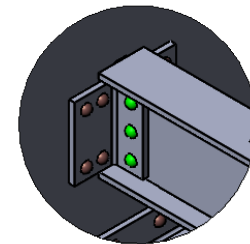
STEP 9: I BEAM RIVETS

Assemble 1/16" x 5/16" long rivets through I Beam Angles as shown in **Detail G** and **Detail H**. Repeat for all I Beam Angles on both sides.



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DETAIL G

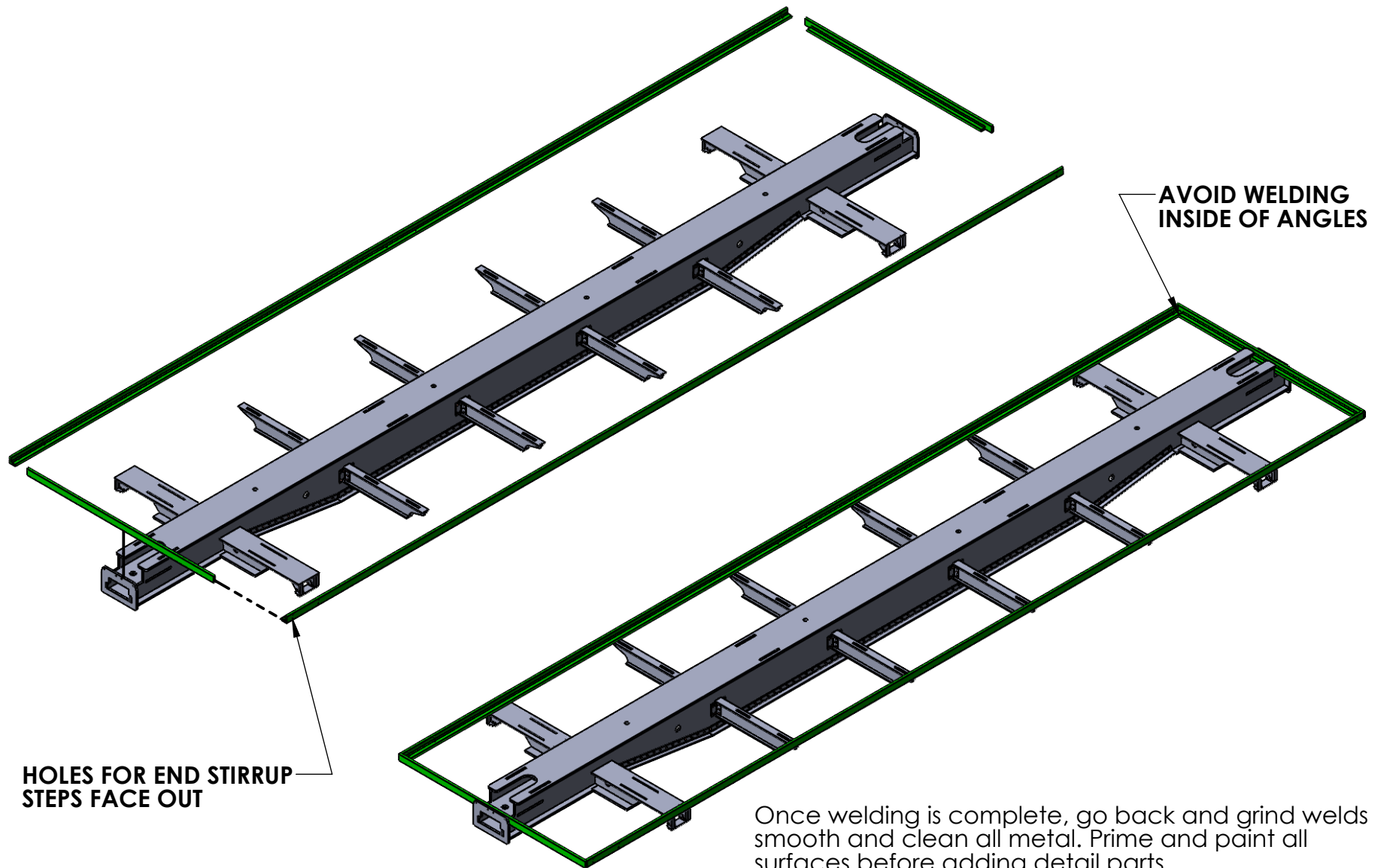


DETAIL H

STEP 10: ANGLE IRON

Assemble angle iron to frame as shown below. Center the angles side to side and front to back.

Recommended assembly: Use completed PFE Body to space angles. Tack weld angles together on the body then transfer to the frame.



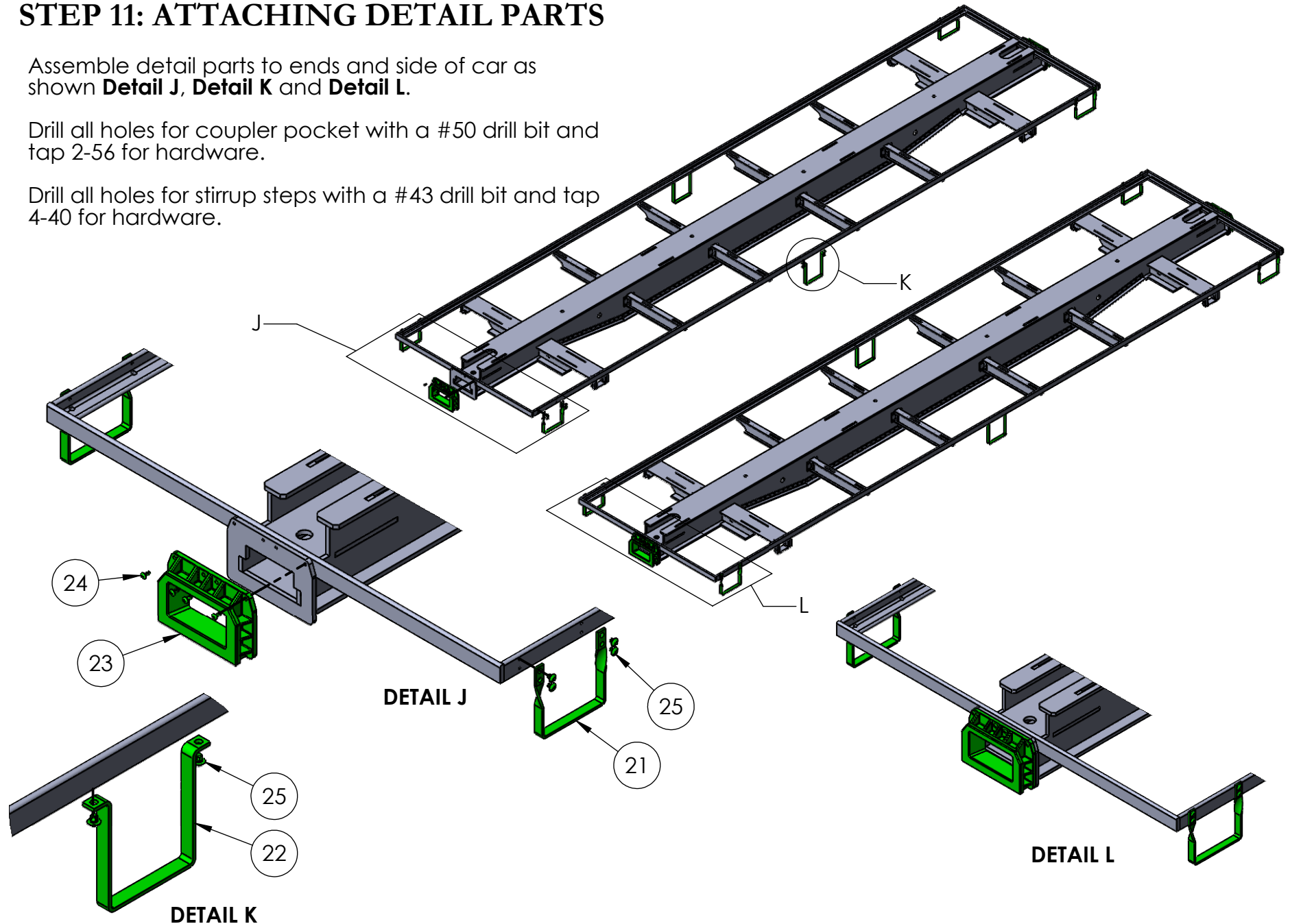
Once welding is complete, go back and grind welds smooth and clean all metal. Prime and paint all surfaces before adding detail parts.

STEP 11: ATTACHING DETAIL PARTS

Assemble detail parts to ends and side of car as shown **Detail J**, **Detail K** and **Detail L**.

Drill all holes for coupler pocket with a #50 drill bit and tap 2-56 for hardware.

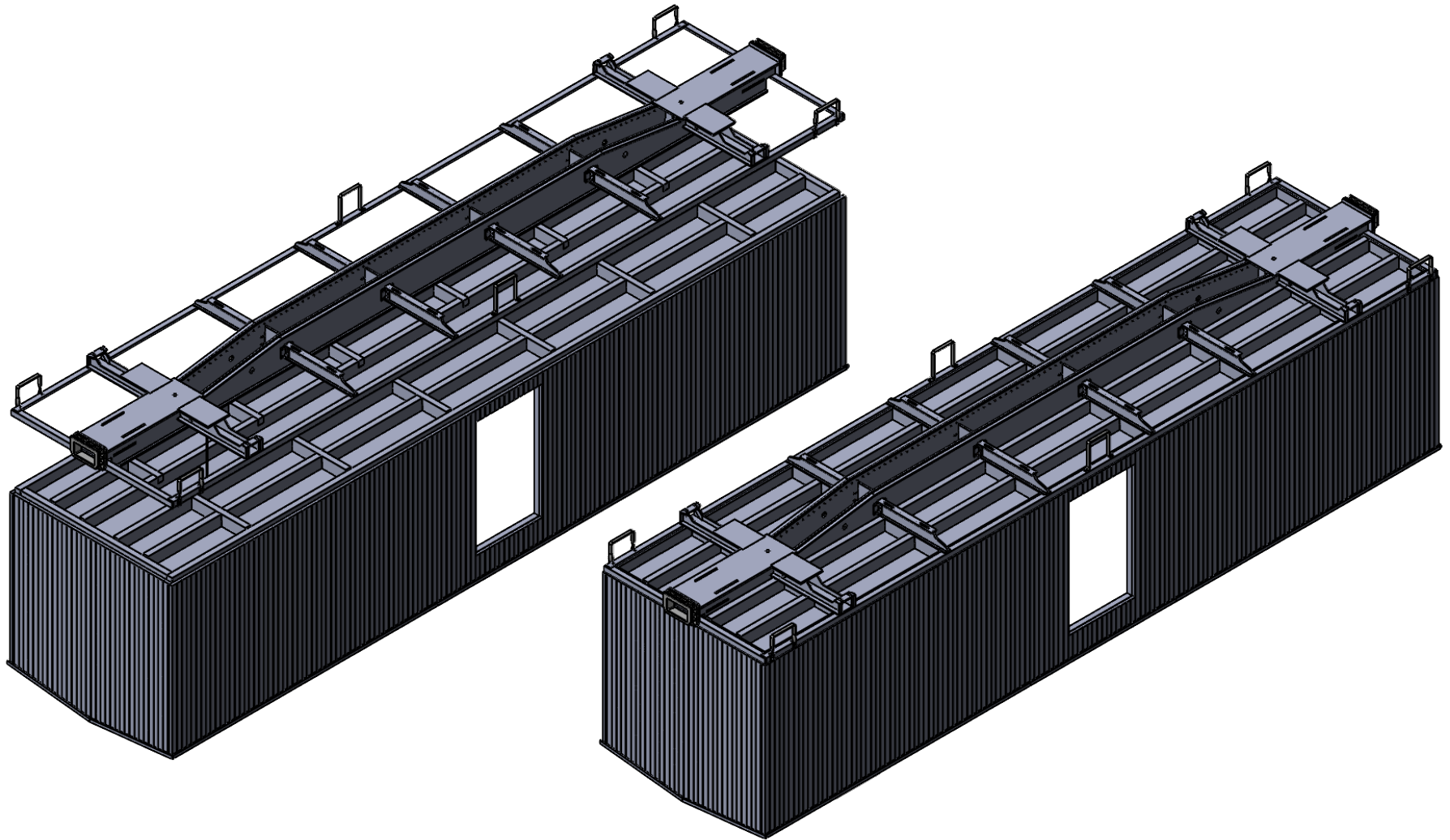
Drill all holes for stirrup steps with a #43 drill bit and tap 4-40 for hardware.



STEP 12: ATTACHING FRAME TO BODY

Assemble completed PFE frame to completed PFE Body. Locate (4) $\frac{1}{4}$ " holes in frame and drill through floor with $\frac{1}{4}$ " drill bit.

Attach assemblies together with $\frac{1}{4}$ "-20 x $1\frac{1}{2}$ " Carriage Bolts, Lock Washer, and Nut.



FREQUENTLY ASKED QUESTIONS

Q: My frame isn't fitting together and there are gaps, what is going on?

A: Care was taken in the design to incorporate tab and slot construction to avoid having to use jigs or special clamps to hold items in the correct positions for welding but that also increases the locations for interferences to occur. Wiping down all the parts prior to welding is a good first step to remove grit from mating surfaces that may have accumulated from storage or the manufacturing process. Because of the laser cutting process used to cut out the parts, there may be some burrs on the corners. Use a file or grinder to remove them. Making sure to fit all the parts together before welding will help you locate where a problem is before items are welded together. During welding, weld BB's may get stuck to faces and should be grinded off as the steps are followed.