

DC Approved Repair Procedure

HDT Torsion Assembly Repair

E-00152Prepared by: **Evan B**Date: **Feb. 10, 25**Approved by: **Roby P**Date: **Mar. 20, 25**Revision: **002**Issue: **Mar. 20, 25**

SCOPE

This document outlines the DC-approved repair procedure for structural failure in the HDT torsion bracket assembly due to a previously insufficient doubler design. It includes tooling requirements, component identification tables, and step-by-step repair and installation instructions.

The directions contained herein are applicable to Engineered Beam HDT trailers manufactured after May 14th, 2022. Structural I-beam HDT trailers and those with previous revisions of torsion axle assemblies are not compatible. Contact Diamond C if you are unsure whether your trailer will be covered by this procedure.

IMPORTANT SAFETY NOTES

- **Wear appropriate PPE**, including gloves, hardhat, and safety glasses, when handling heavy-duty components.
- **Use appropriate lifting equipment** to safely raise the trailer. Securely position it on stands before beginning any work.
- **Use good judgement** when evaluating your trailer's condition. If you're unsure or believe the damage exceeds the scope of this document, for further warranty assistance contact Diamond C at contactus@diamondc.com

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1. IDENTIFYING YOUR KIT

There are 3 different torsion repair kits depending on which suspension your HDT has.

The HDT 207 & 210 (80" width) share the kit #A-07375-000 which is detailed in Fig. 3a.

The HDT 208 (82" width) has its own kit #A-07376-000 which is detailed in Fig. 3b.

The HDT 307 or triple axle variant has its own kit #A-07855-000 which is detailed in Fig. 3c.

NOTE: This document primarily references and illustrates tandem axles. However, the instructions also apply to triple axle variants.

2. RECOMMENDED TOOLS

- Angle Grinder/Die Grinder
- 1/8" Cobalt/Carbide-Tipped Drill Bit Recommended
- Torque Wrench: range 159-201 ft/lb
- Safety Stands/Jacks
- Tape Measure
- Feeler Gauges Recommended
- Impact Driver, As Needed
- Welding Machine and Appropriate Wire
 - E.g. ER70S-6, .035"
- Plasma Cutter/Carbon Arc Gouger Recommended
- 1 Ton Crane Recommended

3. PREPARATION AND PART REMOVAL

- a. Ensure the trailer is safely supported on a level, stable surface.
- b. Raise the trailer using jacks or lifting equipment and secure it with safety stands.
- c. Remove wheels to allow for ease of installation.
- d. Remove the existing nuts and bolts securing the torsion axle to the torsion assembly. Then remove the torsion bracket assembly.
 - i. Discard removed torsion assembly hardware – IT CANNOT BE REUSED.
 - ii. Replacement hardware can be found in the repair kit
- e. When performing the following steps, take great care to support the trailer frame as structural components are removed to prevent it from becoming twisted or misaligned as it settles. Use jacks or clamps to support the frame beams horizontally and vertically before cutting.
 - i. Cut off the welds connecting both tilt bed hinges to the tilt bed frame, shown in Fig. 8.
 1. Mark the position of the bed for reference for later installation.
 2. Minimize damage to bed material. Clean and deburr newly exposed surfaces to prepare for weld.
 3. Lift the bed up, or remove completely, to allow access to the inner trailer frame.

- ii. Cut off the existing torsion assembly. The weld locations for the torsion assembly are shown on Fig. 1.
 - 1. Minimize damage to beam flange material.
 - 2. Clean and deburr newly exposed surfaces to prepare for weld.
- iii. Cut away both inside web doublers, shown in green on Fig. 5.
 - 1. Cut through the doubler material and grind down to the flanges or web.
 - 2. Damage to the flanges should be kept to a minimum.
 - 3. Clean and deburr newly exposed surfaces to prepare for weld.
- iv. Cut bolt relief holes into the tilt frame beams, as specified in Fig. 10.

4. REPAIR PROCEDURE

New areas of the trailer will now be visible. Inspect frame suspension area and assess for structural damage. Where found:

- a. Clean the area. Remove any rust, paint or debris around the crack or tear using a grinder or wire brush.
- b. Drill stop holes. Drill small holes (1/8") at the end of each crack to prevent it from propagating further.
- c. Prepare the crack for weld. Use a grinder to bevel the edges of the crack into a "V" shape, allowing for proper weld penetration.
- d. Clamp the material to prevent movement during weld.
- e. Weld along the crack using a suitable filler metal.
- f. Grind and smooth the weld if a smooth finish is desired.
- g. Inspect the weld for defects to ensure appropriate fusion.
- h. Paint the repair. Using primer and paint can protect the repaired area from oxidation and corrosion.

5. WELD PROCEDURE

- a. Install the Torsion Bracket Assembly. The assembly is designed with a notch on the side that is used to indicate suspension center. HDT beams have a pinhole cutout to indicate suspension center. Align these features during installation as seen in Fig. 9. Weld instructions can be found in Fig. 1.
 - i. It is essential to align the torsion bracket assembly square to the coupler, as torsion axles are non-adjustable. Proper alignment prevents the trailer from dog-tracking and reduces uneven tire wear.
 - 1. The most effective method is to measure directly from the coupler to the torsion assembly using a plumb bob. Alternatively, measure from the coupler to each beam front, then from each beam front to the torsion assembly to ensure proper alignment.
 - a. If you need further assistance with axle squaring, please contact Diamond C at contactus@diamondc.com



- b. Install the Web Doublers on both sides of the trailer. Installation and weld instructions are outlined in Fig. 2.
 - i. Position each doubler over the affected areas to ensure proper alignment.
 1. Use clamps or tack welds to hold the material in place.
 2. If necessary, grind any irregular surfaces to ensure a flush fit.
 3. Complete full welds along all specified edges using an appropriate method.
 4. Allow the welds to cool gradually to minimize stress buildup.

6. AXLE & WHEEL INSTALLATION

- a. Lift each torsion axle into place and fit them into the torsion bracket assembly. Refer to Fig. 7 for visual aid and parts labelling.
 - i. Measure the gaps on both sides between the torsion axle mounts and the torsion bracket assembly. If the TOTAL of both gaps meets or exceeds $\frac{1}{4}$ ", you will need to use the torsion axle spacers contained in your repair kit.
 - ii. Fit up torsion axle components found in your kits and install bolts as seen in Fig. 7 using spacer if necessary. Pay particular attention to bolt orientation.
 1. Start all bolts or nuts by hand to prevent cross-threading.
 - iii. Tighten bolts incrementally using a cross pattern to a target final torque value of **180 ft/lb (Min 159 ft/lb - Max 201 ft/lb)**. Using D for driver's side and P for passenger side and the number labels found in Fig. 7, a recommended cross pattern for tandem is:

$D1 \rightarrow P4 \rightarrow D4 \rightarrow P1 \rightarrow D3 \rightarrow P2 \rightarrow D2 \rightarrow P3$

 1. Tighten bolts to 30% of final torque value using the cross-pattern.
 2. Tighten bolts to 60% of final torque value using the cross-pattern.
 3. Tighten bolts to 100% of final torque value using the cross-pattern.
- b. Install wheels using the procedure described in Fig. 6.

7. FINAL STEPS

- **Conduct a final test** by inspecting the trailer still and in motion, noting any unusual noises, pulling or drifting, or vibrations.
- **Do not drive the trailer** until all safety checks have been completed.
- **If any issues persist** after the installation, contact DC Customer Service for further assistance.

8. REFERENCES

- Diamond C Service & Maintenance Manuals
 - <https://www.diamondc.com/service-maintenance-manuals/#/>
- Diamond C Customer Service Department
 - Office – (903) 572-2834
 - Email – Dcwest@diamondc.com, Dccentral@diamondc.com, Dceast@diamondc.com

FIG. 1

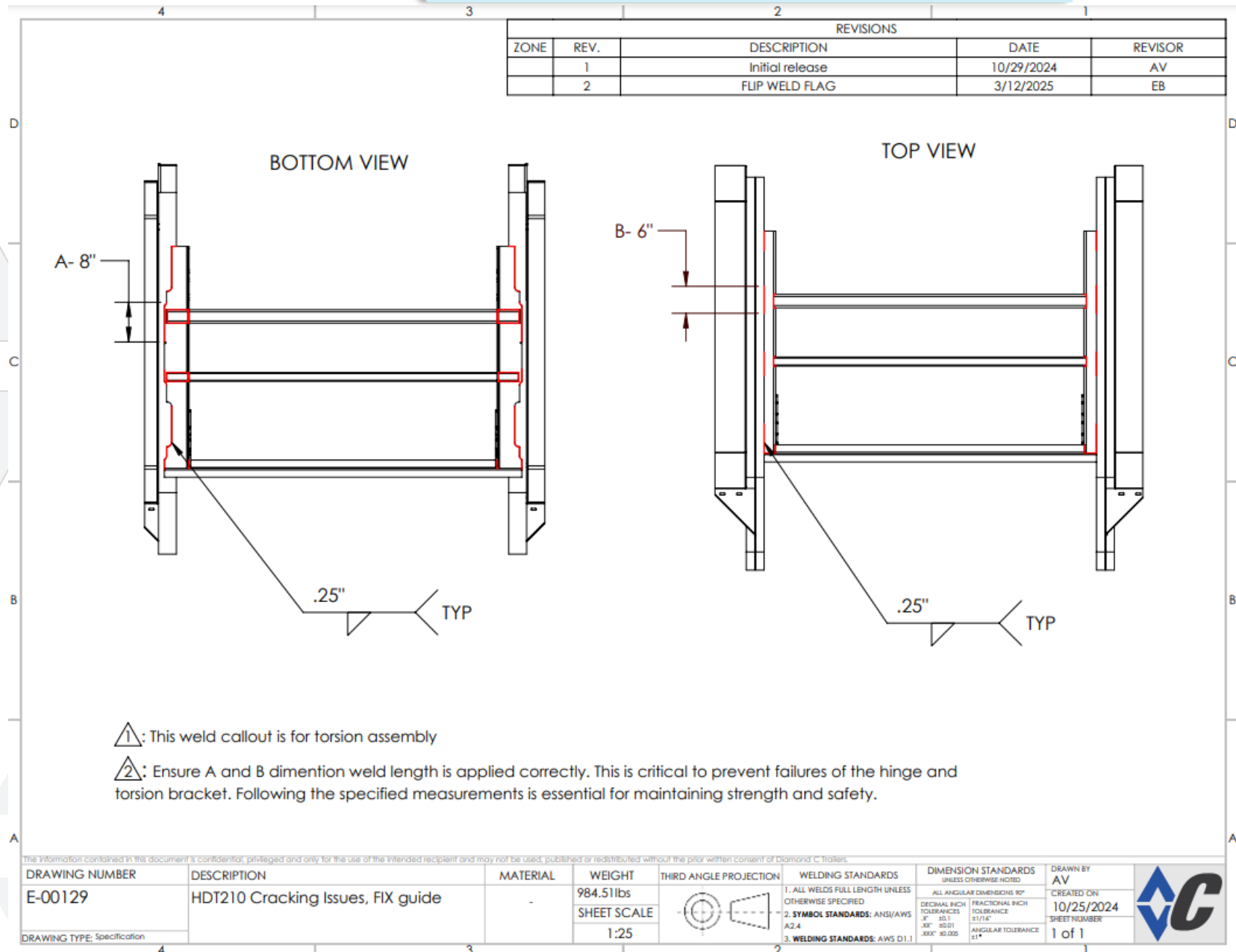
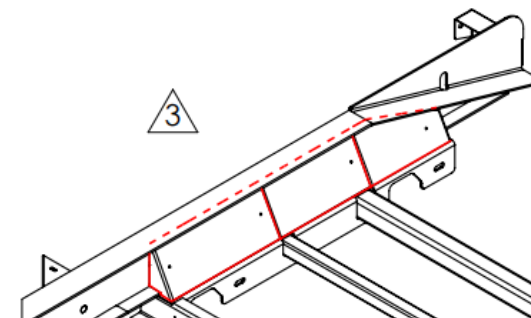
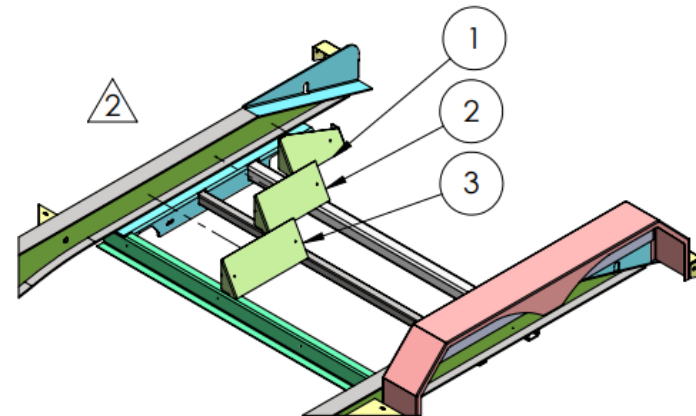
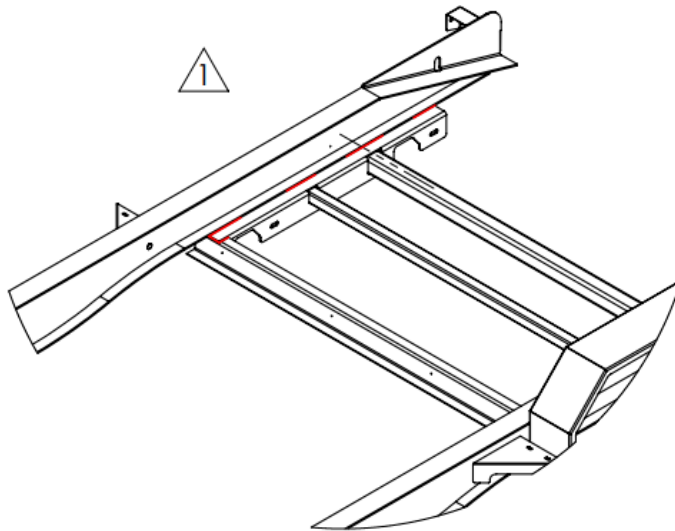


FIG. 2

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	REVISOR
	0	Initial release	6/26/2024	AV



① : WELD TORSION BRACKET BEFORE INSTALL WEB DOUBLERS

② : INSTALL IN ORDER OF 1, 2, 3 TO BE ABLE TO WELD FLANGES OF EACH PIECE TO THE BEAM WEB.

③ : All 3 pieces must be fully welded.

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DRAWING NUMBER	DESCRIPTION	MATERIAL	WEIGHT	THIRD ANGLE PROJECTION	WELDING STANDARDS	DIMENSION STANDARDS UNLESS OTHERWISE NOTED	DRAWN BY System Administrator
E-00118	HDT WEB DOUBLER ENGINEER BEAM ONLY	-	1000.02lbs		1. ALL WELDS FULL LENGTH UNLESS OTHERWISE SPECIFIED	ALL ANGULAR DIMENSIONS 90°	CREATED ON 06/25/2024
DRAWING TYPE: Specification			SHEET SCALE 1:30		2. SYMBOL STANDARDS: ANSI/AWS	DECIMAL INCH TOLERANCES ".00" ±0.01 ".000" ±0.005	SHEET NUMBER 1 of 1
					3. WELDING STANDARDS: AWS D1.1	FRACTIONAL INCH TOLERANCE 1/16" ±1/32" ANGULAR TOLERANCE ±1°	



FIG. 3a

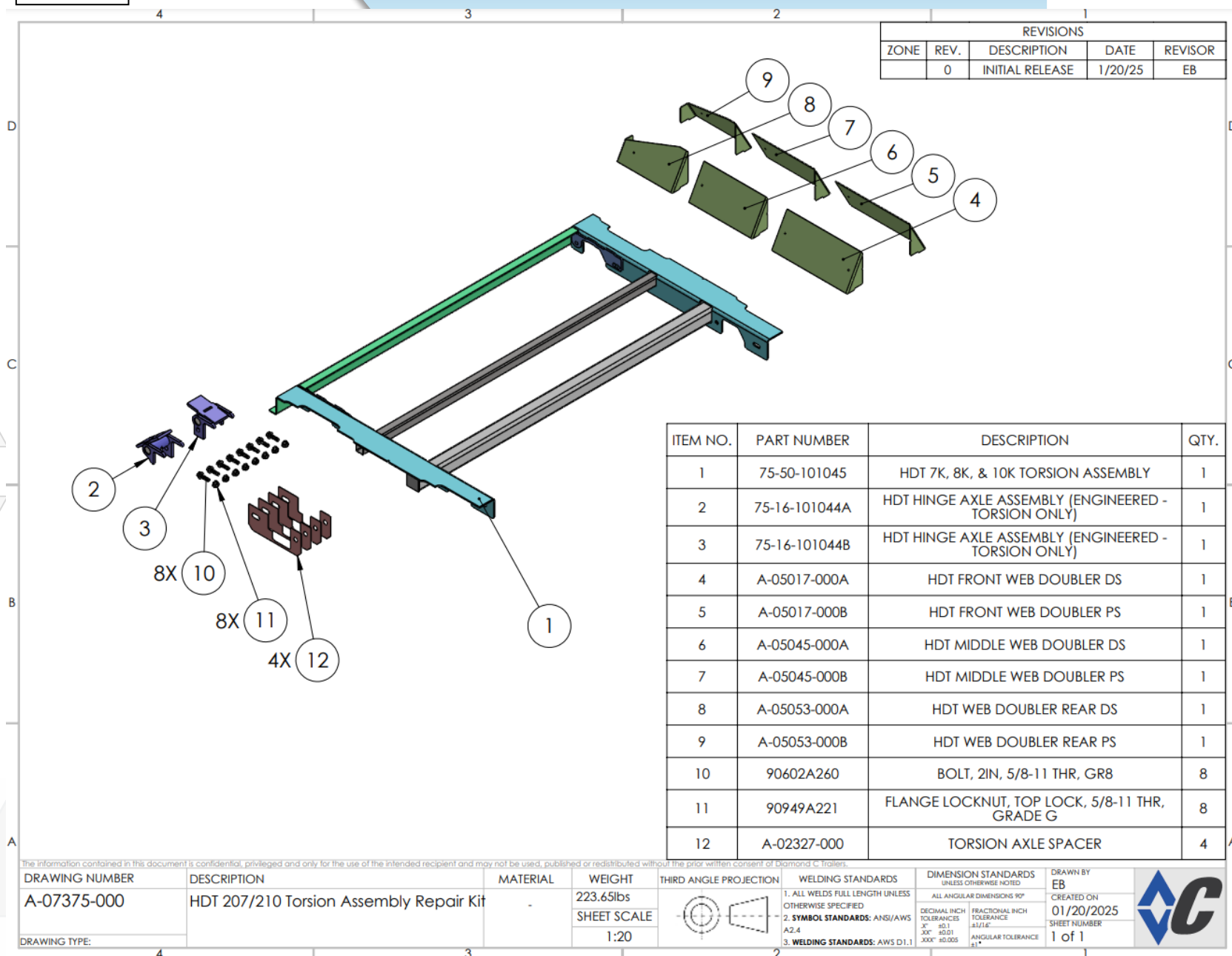


FIG. 3b

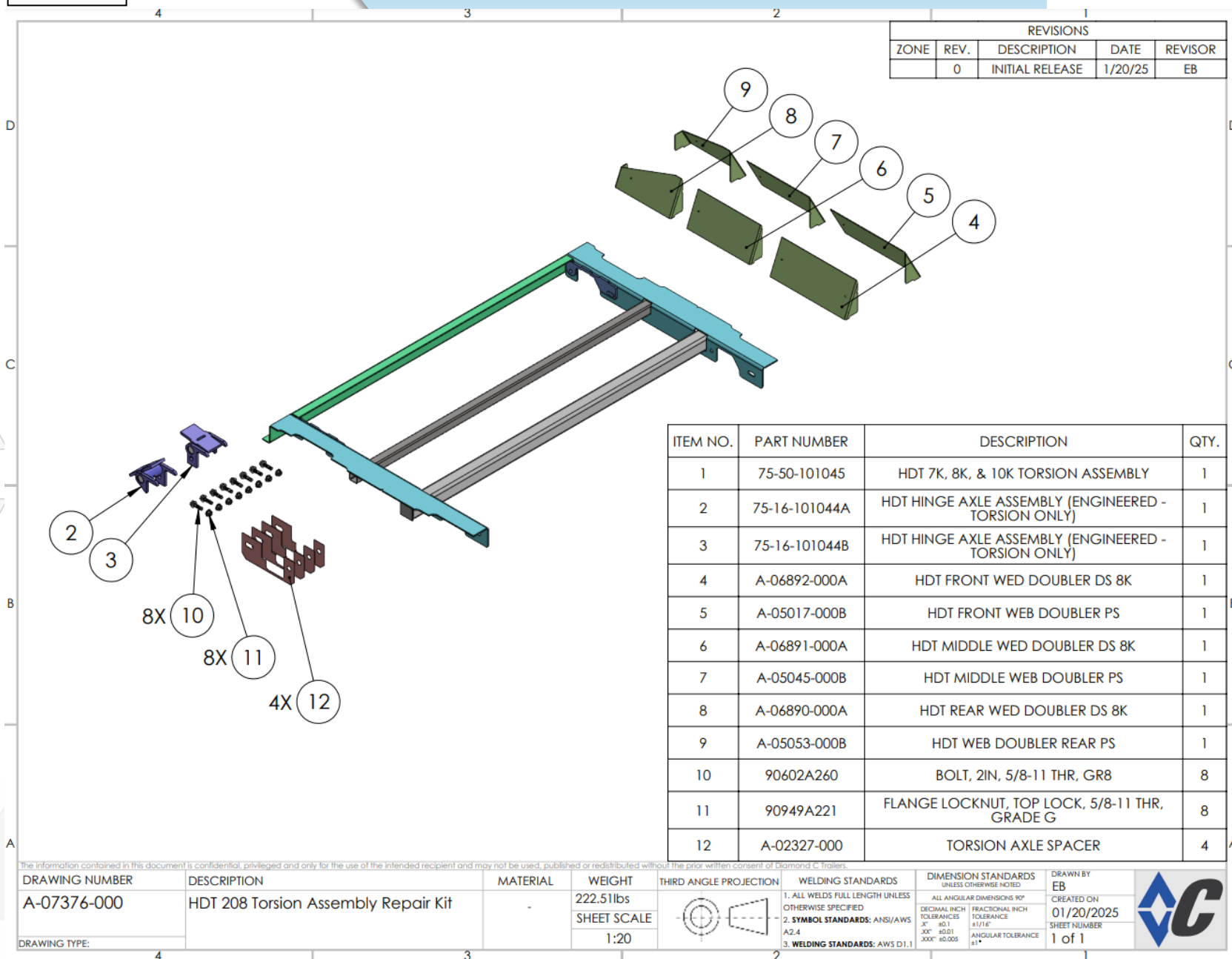


FIG. 3c

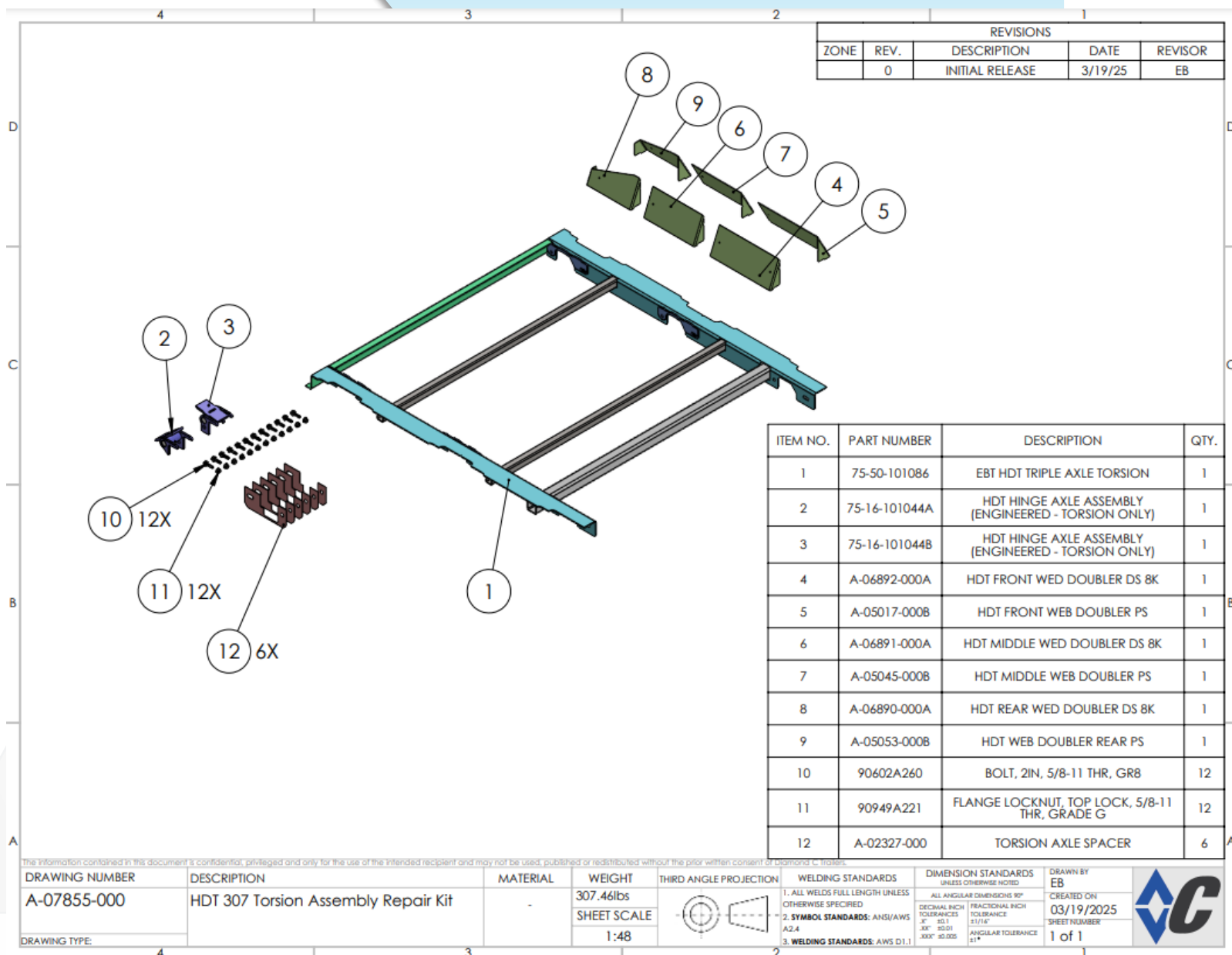


FIG. 5

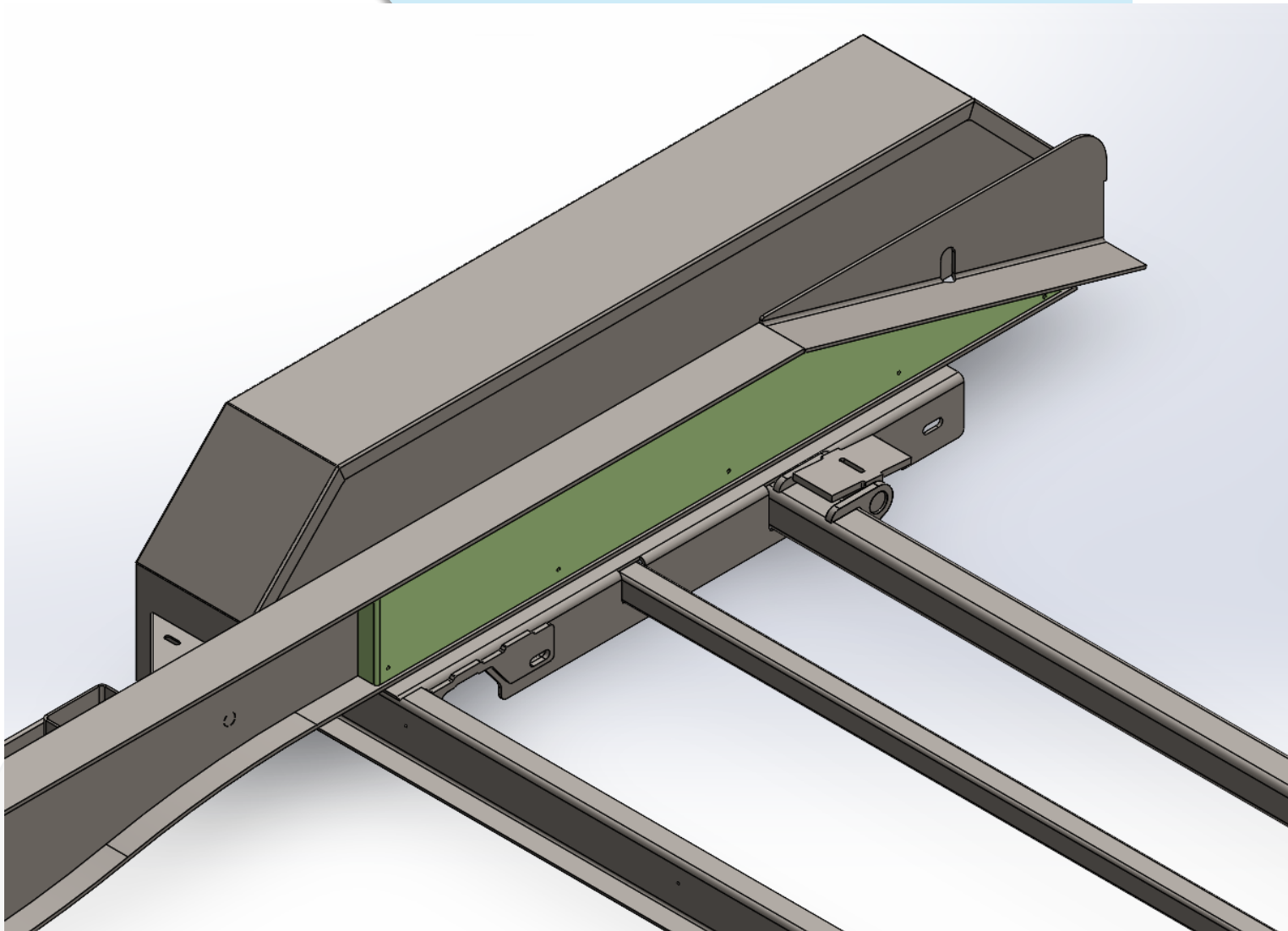


FIG. 6

Torque Requirements

It is extremely important to maintain proper wheel mounting torque limits on your trailer axle. Use of torque wrenches will ensure proper torque limits are applied to wheel mounting lug nuts. Use no other method to torque wheel lug nuts.

Make sure wheel fasteners match the cone angle of the wheel (usually 60° or 90°) being serviced. Attach new wheel to the axle hub as follows:

1. Start all bolts or nuts by hand to prevent cross-threading.
2. Continue to hand-tighten wheel lug nuts in the sequential pattern shown in Figure 9.

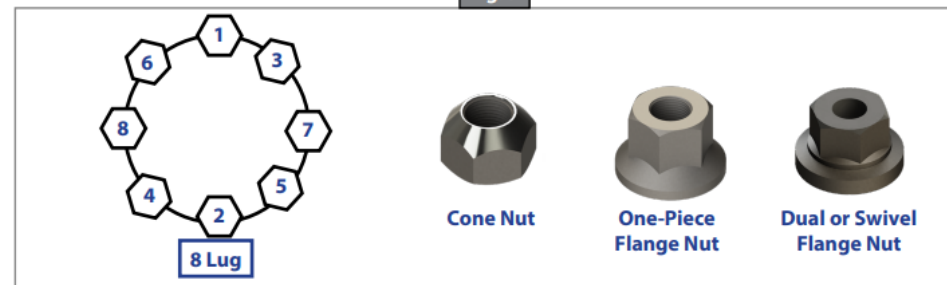
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3. After wheel lug nuts are fully hand-tightened, torque nuts in stages in the sequential pattern shown in Figure 9.
 - A. Torque wheel lug nuts to the torque values listed in the Wheel Torque Requirement Chart.

Fig. 9



Wheel Torque Requirement Chart				
Wheel Size	Stud Size	Torque Sequence		
		1st Stage	2nd Stage	3rd Stage
16" Dual and 17.5" Cone Nut	5/8"	50-60 ft-lbs	100-120 ft-lbs	190-210 ft-lbs
16" Dual and 17.5" One-Piece Flange Nut	5/8"	50-60 ft-lbs	150-200 ft-lbs	275-325 ft-lbs
16" Dual and 17.5" Swivel Flange Nut	5/8"	50-60 ft-lbs	90-100 ft-lbs	150-175 ft-lbs
17.5" Dual Flange Nut	M22	50-100 ft-lbs	250-300 ft-lbs	450-500 ft-lbs

FIG. 7

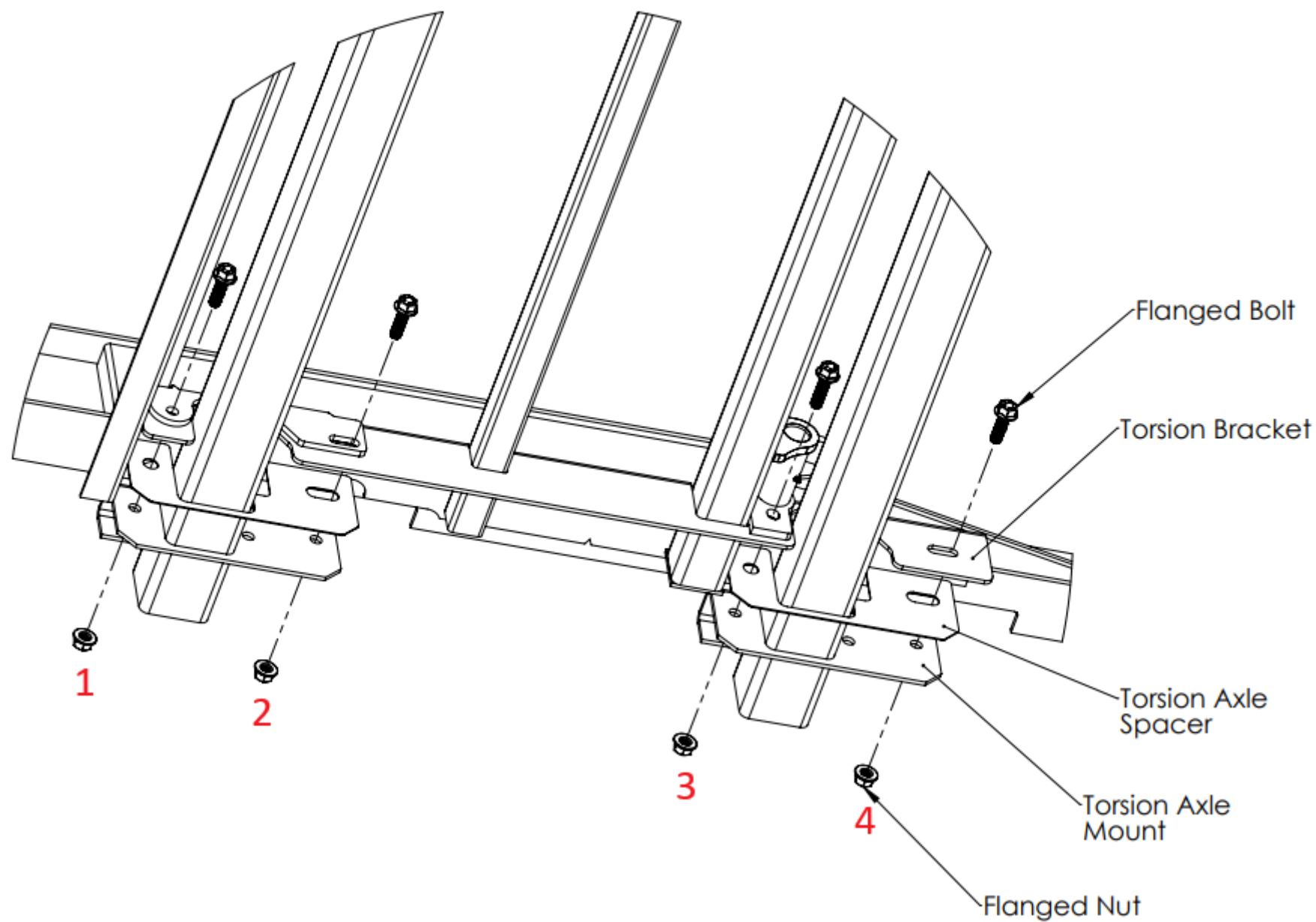


FIG. 8

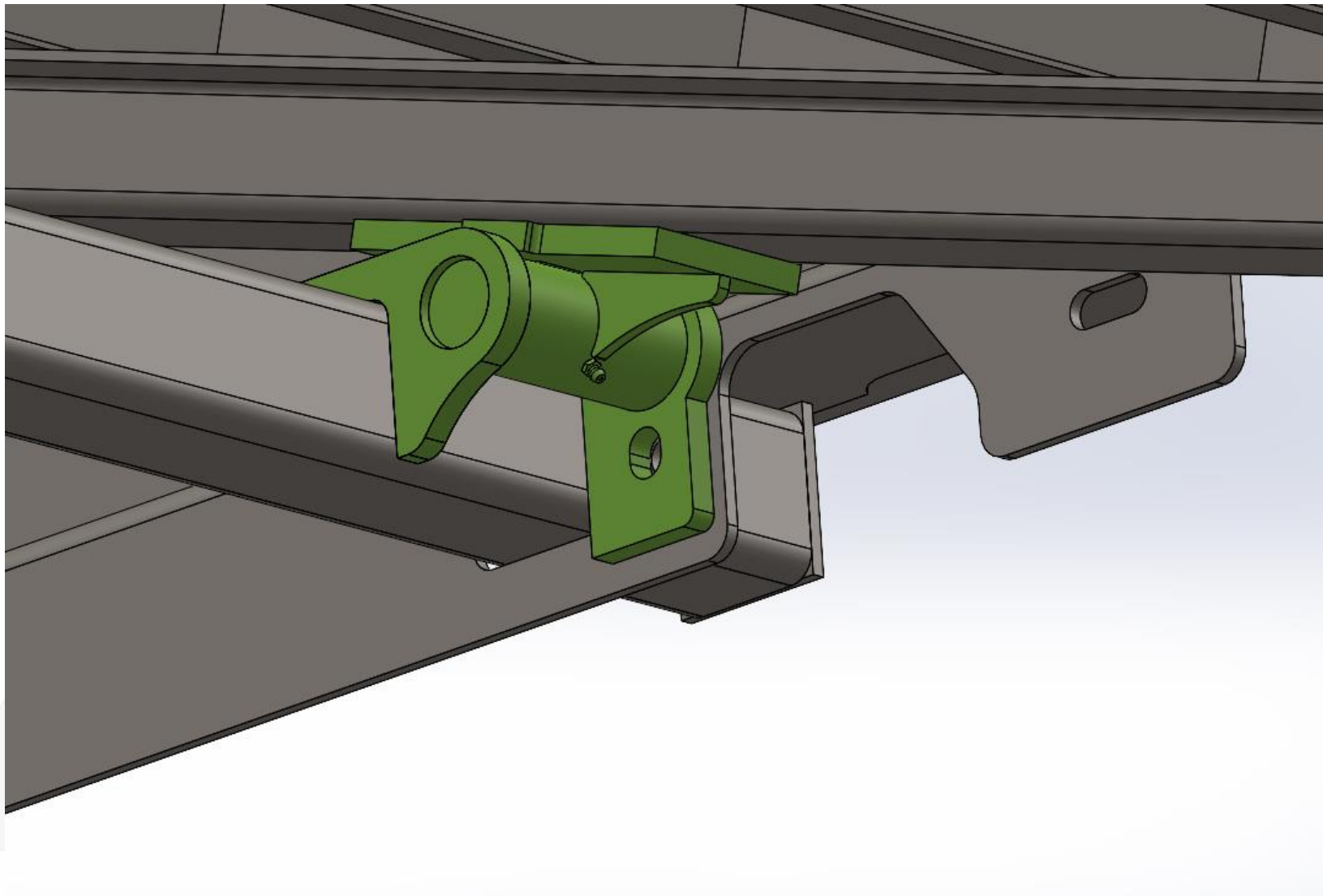


FIG. 9

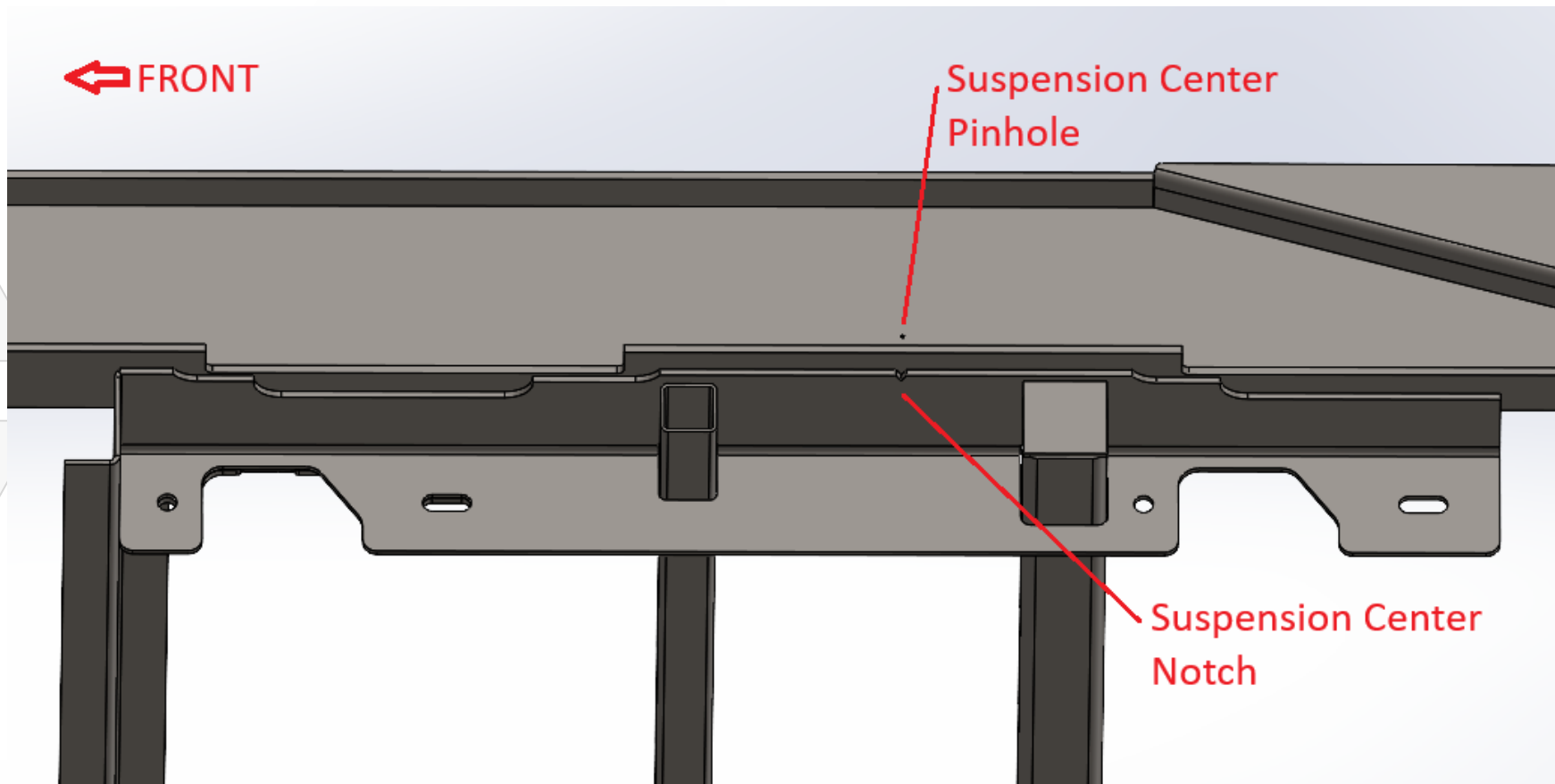


FIG. 10

