

Installation, Maintenance and Operation Manual

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The Wood Chip Hopper is part of a total off-loading system for wood chips or granular materials. The overall system, shown in Figure 1, consists of a truck dumper, hopper and foundation with an on-off ramp for the truck. This document is for the Wood Chip Hopper. References are made to the other components as required.

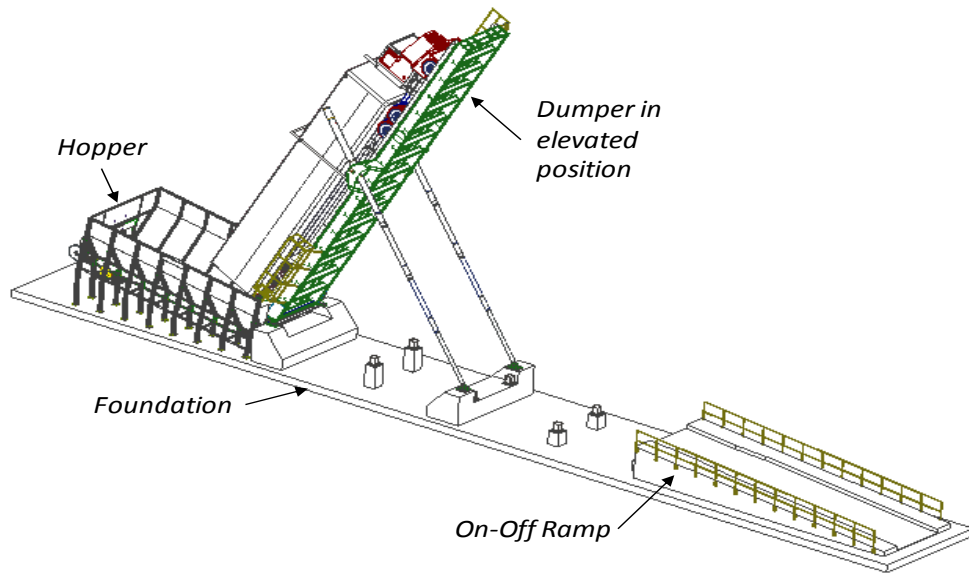


Figure 1. American International's Complete Wood Chip Off-Loading System

Overall dimensions of the Wood Chip Hopper are shown in Figures 2 and 3. Weight and capacities are shown in Table 1.

Electrical requirements are shown in Table 2.

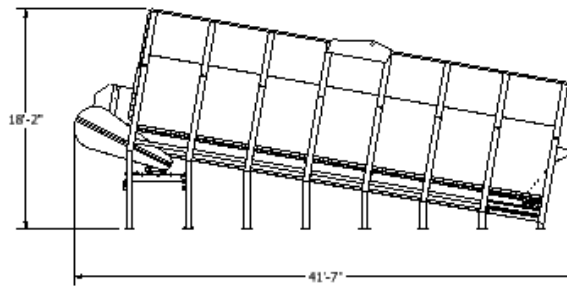


Figure 2. Overall Dimensions – Elevation View.

Table 1: Weights and Capacities

Empty Weight	54,000lb
Wood Chip Volume	5,800ft ³
Wood Chip Weight	134,000lb

Wood chip weight is based on a specific gravity of 28lb/ft³

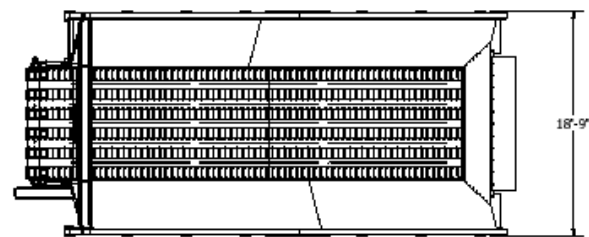


Figure 3. Overall Dimensions – Plan View.

Table 2: Electrical Requirements

Horsepower	40
Voltage/Phase	230/460/3
Full load Amps: 230/460	93.1/46.5 Amp

-60 hp motor option information available upon request.

This section provides general safety and precautionary information. All operators, maintenance personnel and others working around the hopper should be familiar with these safety instructions and other instructions developed by the hopper owner. The drag chain contained in the hopper is driven by a powerful motor. Care must be taken to ensure that personnel cannot fall into the drag chain, especially when it is moving.

- 1. Only authorized personnel should operate the dumper.*
- 2. The hopper should not be operating when maintenance or other personnel are working on it.*
- 3. Personnel should stay clear of the discharge end of the hopper when wood chips or other product is being emptied.*
- 4. All safety guards must be in place during the operation of the hopper.*
- 5. Workers should wear personal safety equipment (hard hats, safety glasses, and safety shoes) when working around the hopper.*
- 6. An emergency kill switch (red) is located on the operator's console. This switch should be activated immediately in the case of an emergency.*

The hopper is designed to automatically start the drag chain when the operator turns on the dumper hydraulic power system prior to raising the dumper. There is an emergency stop switch located on the operator control panel and another located on the first outside leg of the hopper, close to the motor/drive unit assembly. Both emergency stop switches must be enabled before the hopper will function.

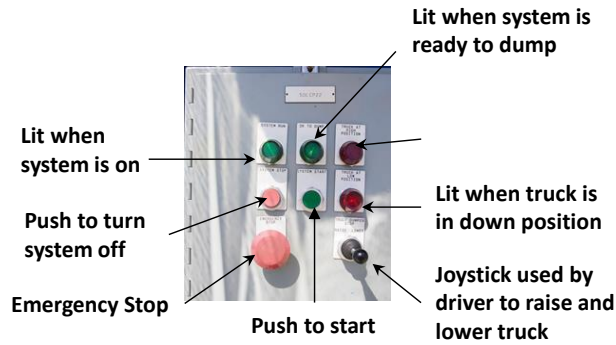


Figure 4. Operator Control Panel

The Wood Chip Hopper is unassembled when shipped. Assembly requires that the components be unloaded from the delivery truck, be identified and organized in the vicinity of the mounting location on the foundation and be lifted into place and bolted together. This section describes the steps required during the assembly process.

1/4	Grade 8	10ft-lbs
3/8	Grade 8	35ft-lbs
1/2	Grade 8	90ft-lbs
5/8	Grade 8	180ft-lbs
3/4	Grade 8	320ft-lbs

Bolt Torque Specifications

All bolts to be torqued to the values shown in Table 3 unless noted otherwise. All bolts and nuts should be SAE Grade 8 with zinc or zinc-cadmium plating. Washers should be installed on both the head and nut ends.

Step 1 – Lifting the Chain Bed

The Chain Bed, shown in Figure 5, is the heaviest component in the hopper. It weighs 32,500 lbs as shipped. It must be lifted with two 10 ton or equivalent cranes using the four lifting lugs (two per side).

The sling angles, shown in Figure 6, must be equal to or greater than 70 degrees. This angle is required to keep the shackles and rigging from bearing against the sides of the Chain Bed. The lifting lugs are designed for 14,000 lb shackles having a pin diameter of 7/8 inch.

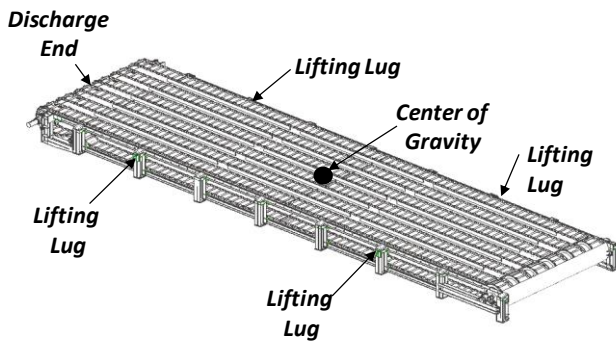


Figure 5. Location of Lifting Lugs on Chain Bed

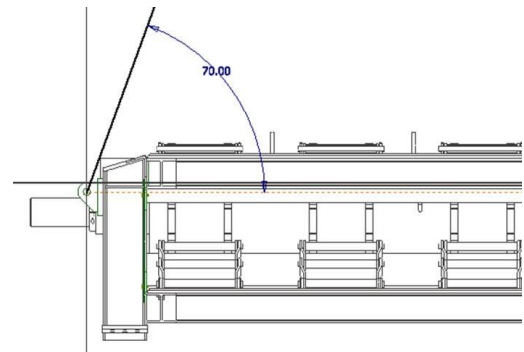


Figure 6. Minimum Sling Angle

Step 2 – Installing the Inside Legs

The weight of the chain bed should be carried by the cranes until a minimum of three inside legs per side are installed as shown in Figure 7. Once the three legs are installed, the cranes can be disconnected and the remaining inside legs can be installed. Figure 8 shows the connection of a typical inside leg to the Chain Bed. Figure 9 shows the Chain Bed with all inside legs installed.

It may be necessary to lift the chain bed slightly while the other legs are being installed.

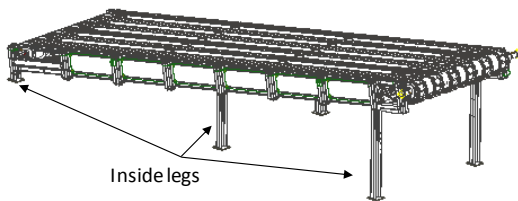


Figure 7. First inside legs to be installed.

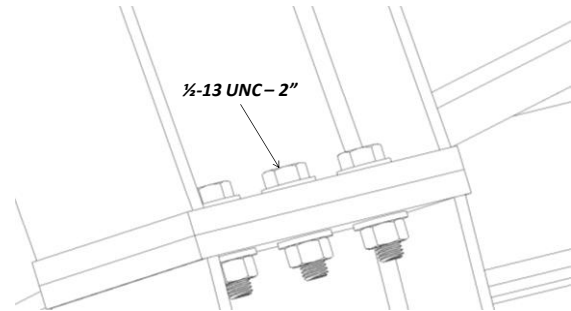


Figure 8. Typical Inside Leg Bolted Connection

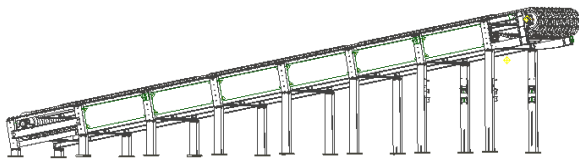


Figure 9. Chain Bed with All Inside Legs Installed

Step 3 – Inside Leg Wedge Anchor Installation

The next step is to position the assembly on the foundation and connect it with concrete wedge anchors. The inside leg base plates contain holes for four (4) concrete wedge anchors. The wedge anchors should be Concrete Fasteners Part No. WA34614 or equivalent and should be placed in 3/4 inch x 4.5 inch deep holes drilled in the concrete. A typical base plate to foundation connection is shown in Figure 10.

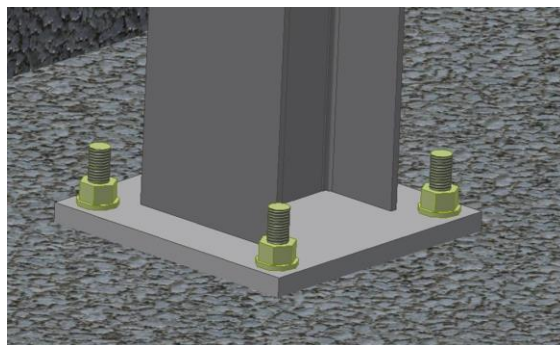


Figure 10. Typical Inside Leg Base Plate Connection

Step 4 – Drive Assembly Installation

The next step is to mount the drive assembly shown in Figure 11 into the overall system. The bottom support mounts should first be installed onto the first two inside legs at the discharge end. These are shown in Figure 12.

The motor/drive assembly must be lifted into place using a forklift and bolted to the bottom support mounts. The top angle brackets and connection bolts are then installed as shown in Figure 13.

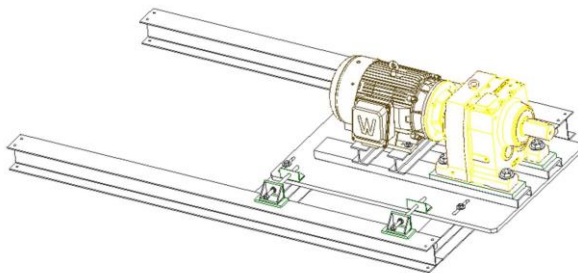


Figure 11. Electric Motor/Gear Drive Assembly

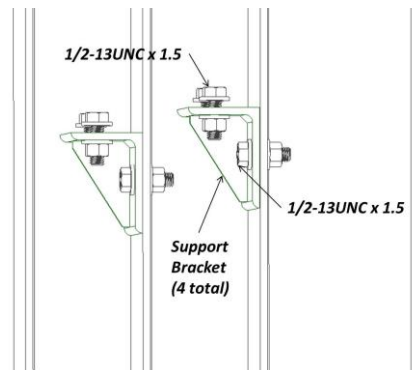


Figure 12. Bottom Support Mounts

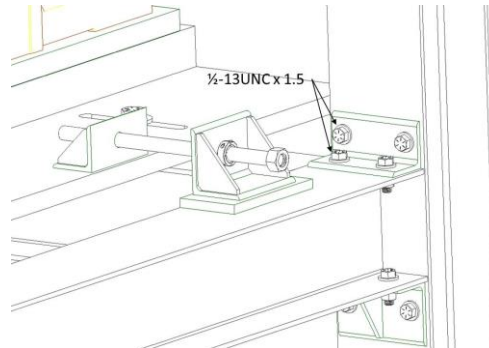


Figure 13. Top Angle Brackets

Step 5 –Side Panel Installation

The next step is to install the two side panels. Note that there is a right and left version of the panels. The discharge end of each panel has a connection plate as shown in Figure 14.

Each panel weighs 6,500 lb and has a lifting lug mounted as shown in Figure 14. The lifting lug is positioned over the longitudinal c.g. of the panel. It will be necessary to rotate the bottom of the side panels to angle of 33 degrees as shown in Figure 15 so that they will align with the mating holes on the chain bed. The side panels should be bolted to the chain bed as shown in Figure 16. The cranes used to lift the side panels in place should remain connected until the

discharge chute and outside legs are installed in a subsequent assembly step. The assembly will appear as shown in Figure 17 when both panels are mounted.

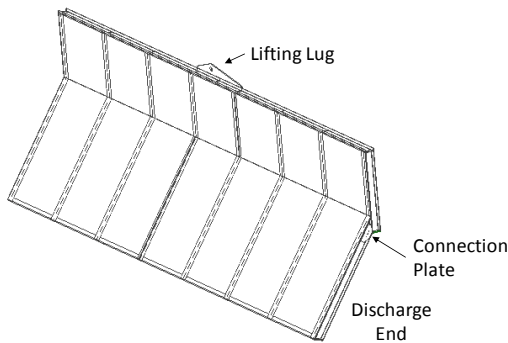


Figure 14. Side Panel showing connection plate on discharge end.

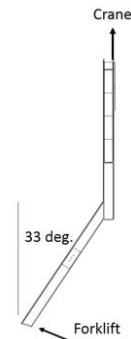


Figure 15. Lift angle for side panels.

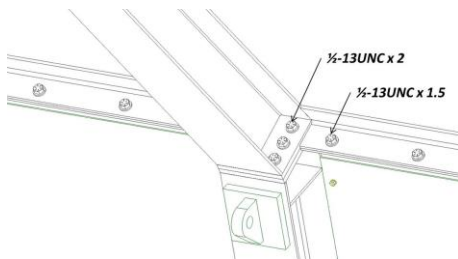


Figure 16. Slanted side panel bolt details.

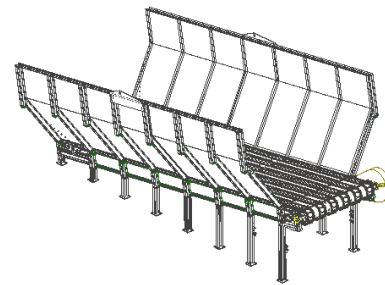


Figure 17. Appearance with both side panels in place. The lifting cranes should still be connected.

Step 6 – Installation of Outside Legs

The next step is to install the outside legs. These connect to the side panels and the foundation. Figure 18 shows a typical outside leg upper connection, while Figure 10 shows a typical connection to the foundation using wedge anchors. The wedge anchors should be Concrete Fasteners Part No. WA34614 or equivalent and should be placed in 3/4 inch x 4.5 inch deep holes drilled in the concrete. Figure 19 shows how the assembly appears with all outside legs attached.

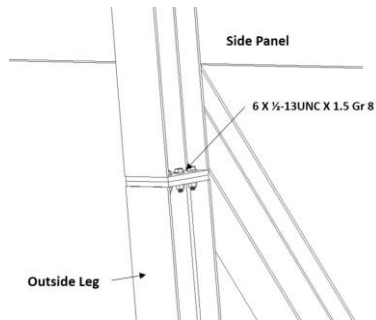


Figure 18. Upper bolted connection for outside legs.

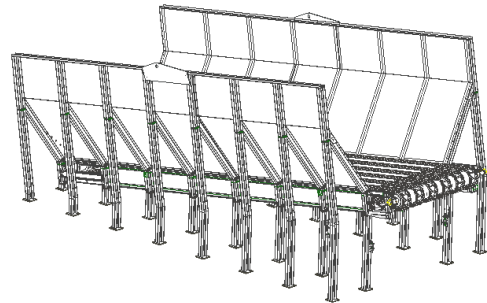


Figure 19. Assembly with outside legs installed.

Step 7 – Installation of Discharge Panel

The Discharge Panel (Figure 20) bolts between the side panels. The holes are matched drilled during fabrication. However, tolerance stack-up during assembly may make it necessary to loosen already connected components or to enlarge the holes to make them align properly. It is recommended that a drift pin be used to facilitate alignment of the holes. Figure 21 shows the Discharge End Panel installed in the hopper using $\frac{1}{2}$ -13 UNC X 1.5" bolts and associated washers and nuts. The channel running across the bottom of the Discharge Panel bolts into tapped holes using $\frac{1}{2}$ -13 UNC X 1.5" bolts and washers.

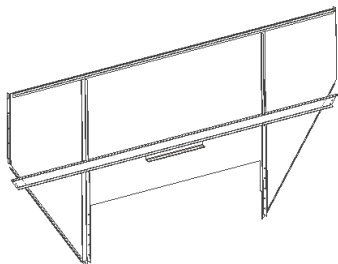


Figure 20. Discharge End Panel

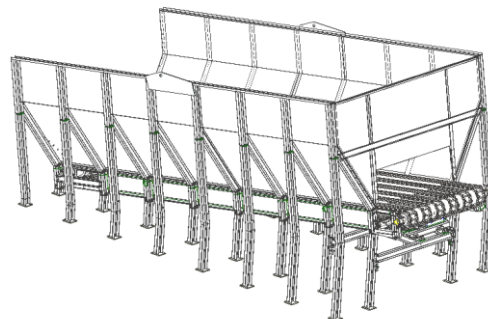


Figure 21. Installed Discharge End Panel

Step 8 – Installation of Discharge Chute Panels

The two Discharge Chute Panels bolt to the Discharge End Panel and to the Chain Bed. Figure 22 shows one of the Discharge Chute Panels and the $\frac{1}{2}$ -13 UNC X 1.5" bolts and associated washers and nuts required for installation. Figure 22 also notes how some bolt holes will not be used until Step 9.

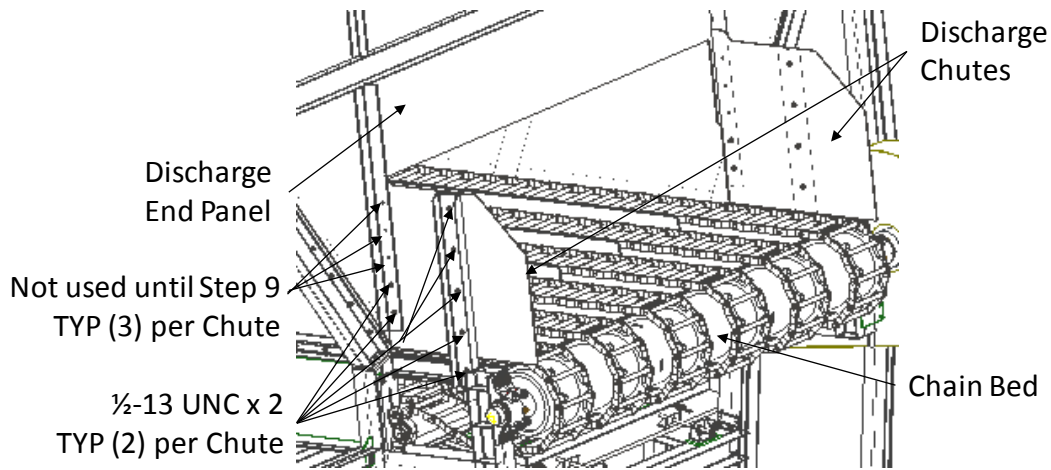


Figure 22. One of two Discharge Chutes Bolted to Discharge Panel and Chain Bed.

Step 9 – Installation of Door Assembly

The next step is to install the Door Assembly shown in Figure 23. The Door Assembly connects to a mounting angle already welded to the Discharge End Panel, below the cross brace, shown in Figure 20. Install the Door Assembly on the hopper centerline and bolt the “thick & thin” plates (Figure 24) with 1/2-13 UNC X 3” bolts and associated washers and nuts to each Discharge Chute plate using the holes left open in Step 8. The plates create a groove for the Door Assembly to ride up and down in. Ensure the Door Assembly travels freely, and then weld out the Mounting Angle. Figure 25 shows the final assembly of the Door Assembly onto the Hopper.

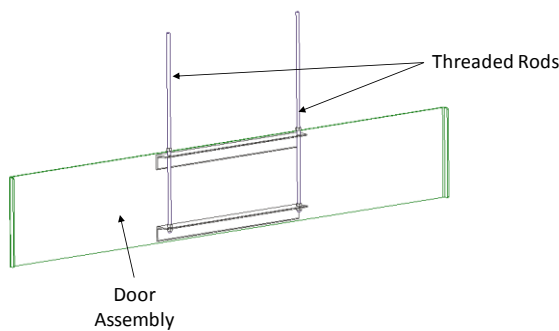


Figure 23. Door Assembly & Threaded Rods

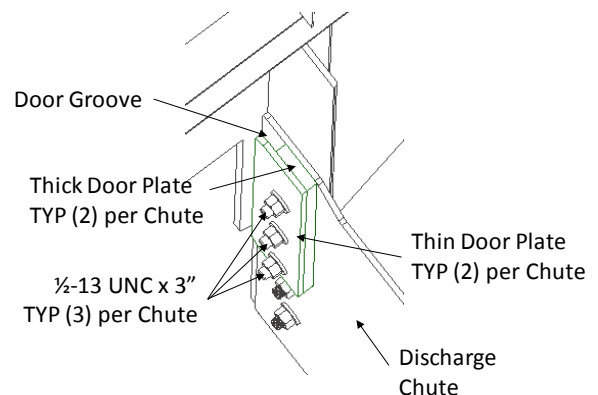


Figure 24. Door Plates Bolted to Discharge Chute

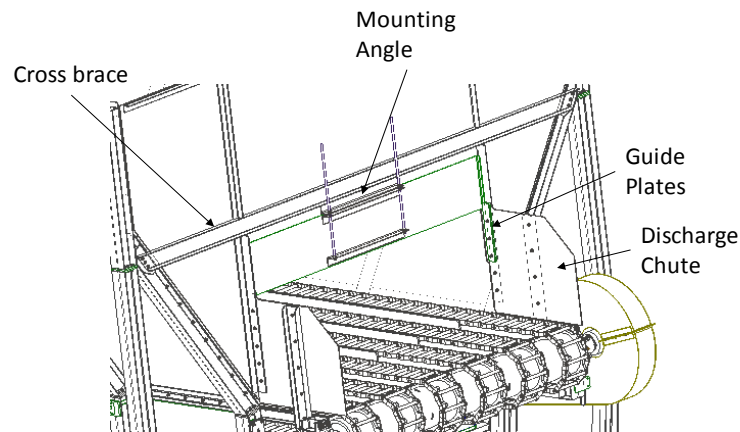


Figure 25. Door Plates Bolted to Discharge Chute

Step 10 – Installation of End Panel

The End Panel (Figure 26) bolts to the Side Panels at the dumper end of the hopper. The mating holes are also matched drilled during fabrication, but may require adjustment to make them align properly. Figure 27 shows the End Panel installed in the hopper. $\frac{1}{2}$ -13 UNC X 1.5" bolts are used.

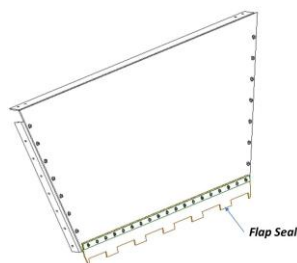


Figure 26. End Panel

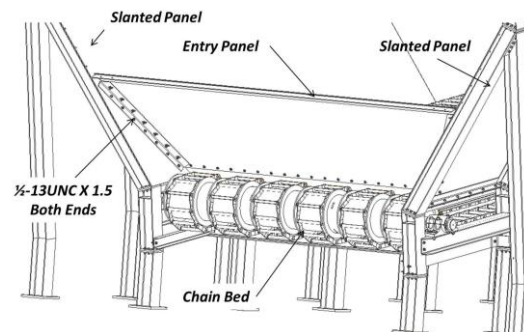


Figure 27. Installed End Panel

Step 11 – Installation of Upper End Panels & Rear Chute

The left and right upper end panels (Figure 31) bolt to the slanted side panels and the end panel using $\frac{1}{2}$ -13 UNC X 1.5" bolts and associated nuts and washers. The left upper end panel is shown in Figure 28 & Figure 29 after being bolted onto the hopper. The rear chute is shown in Figure 30 and Figure 31 after being bolted onto the Upper End Panels and End Panel using $\frac{1}{2}$ -13 UNC X 1.5" bolts.

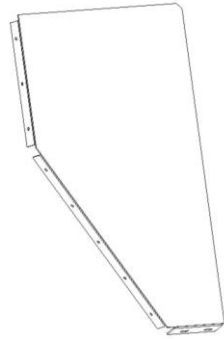


Figure 28. The Left Upper End Panel

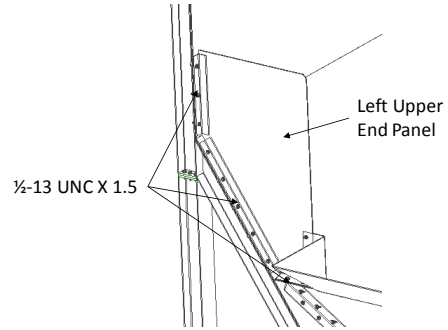


Figure 29. Left Upper End Panel Installed in the Hopper.

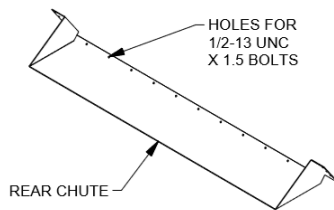


Figure 30. Rear Chute

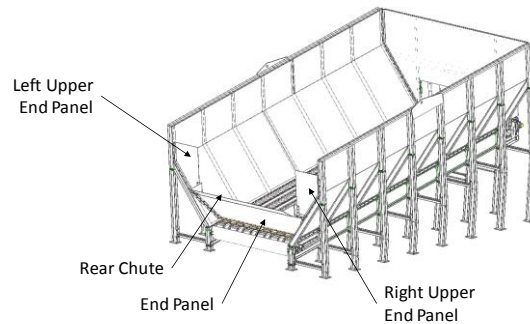


Figure 31. Upper End Panels & Chute Installed on Hopper.

Step 12 – Installation of Leg Supports

Leg supports connect all of the outside legs on each side of the hopper together, and also connect the outside legs to the inside legs as shown in Figure 32. The lateral supports are connected to the mounting plates using 1/2-13 UNC X 2" bolts, washers and nuts (Figure 33). The longitudinal supports are bolted to the outside legs using 1/2-13 UNC X 1.5" bolts, washers and nuts (Figure 34). Reference Appendix Figure 1 for additional layout information.

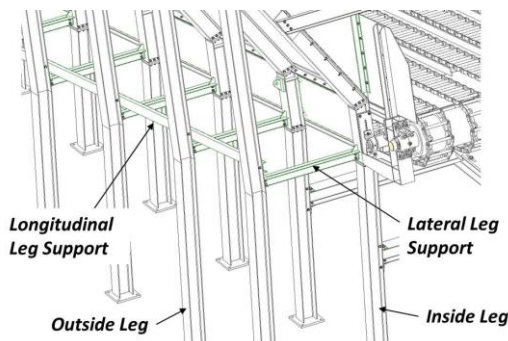


Figure 32. Left side lateral and longitudinal leg supports.

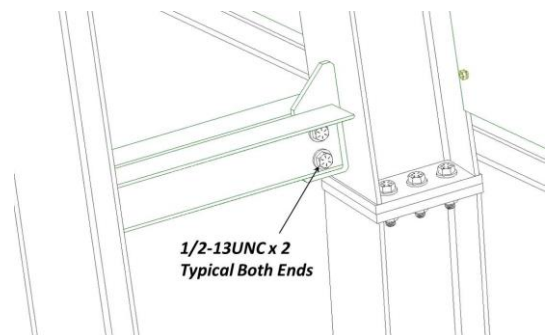


Figure 33. Lateral Leg Support Bolted Connection.

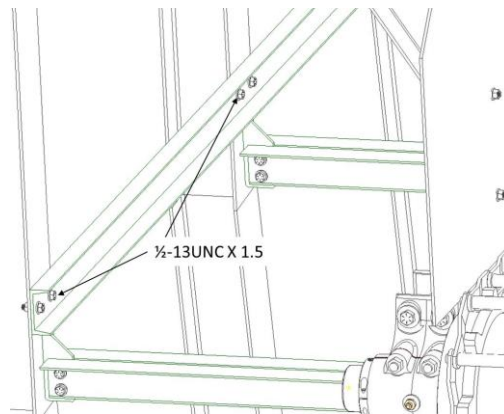


Figure 34. Longitudinal Leg Support Bolted Connection.

Step 13 – Installation of Drive Chain & Guard

All structural components of the hopper have been installed at this point in the assembly process. The last steps are to install the driven sprocket, drive chain and chain guard. The driven sprocket is held in position using two shaft collars as shown in Figure 35. A key is used to transmit the torque from the sprocket to the shaft and must be installed prior to installing the sprocket on the shaft. Care must be taken to make sure that the driven sprocket is aligned with the driver sprocket and that the drive shaft is parallel to the driven shaft. Once the driven sprocket is installed, the double-80 chain may be installed.

The chain guard has a lower and upper half that is bolted together as shown in Figure 36. The lower chain guard half should be installed first and is bolted to the overall assembly by two mounting plates as shown in Figure 37. The upper chain guard half is bolted to the overall assembly using a mounting plate as shown in Figure 38.

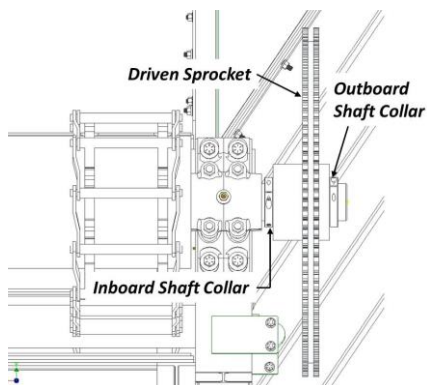


Figure 35. Location of Shaft Collars on Driven Sprocket Shaft

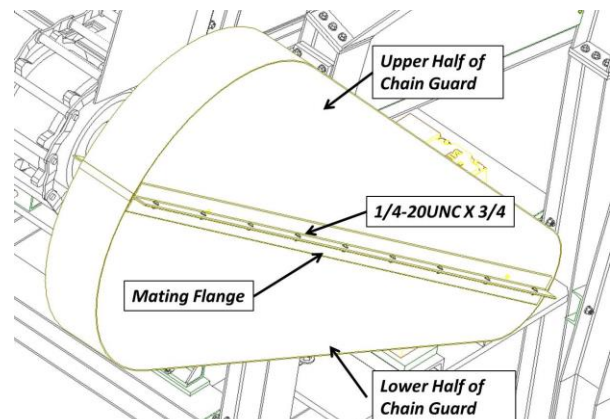


Figure 36. Chain Guard Components

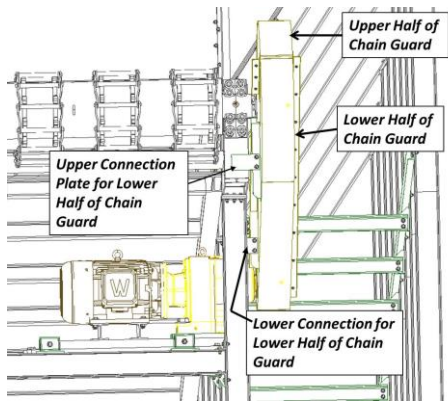


Figure 37. Location of Chain Guard Connection Plates for Lower Half of Chain Guard

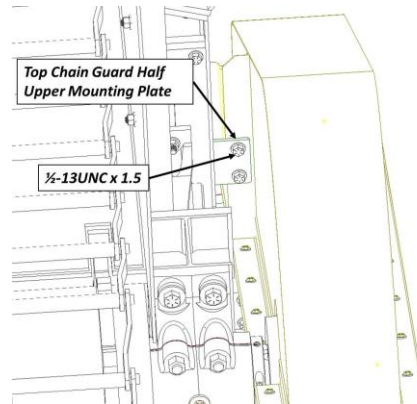


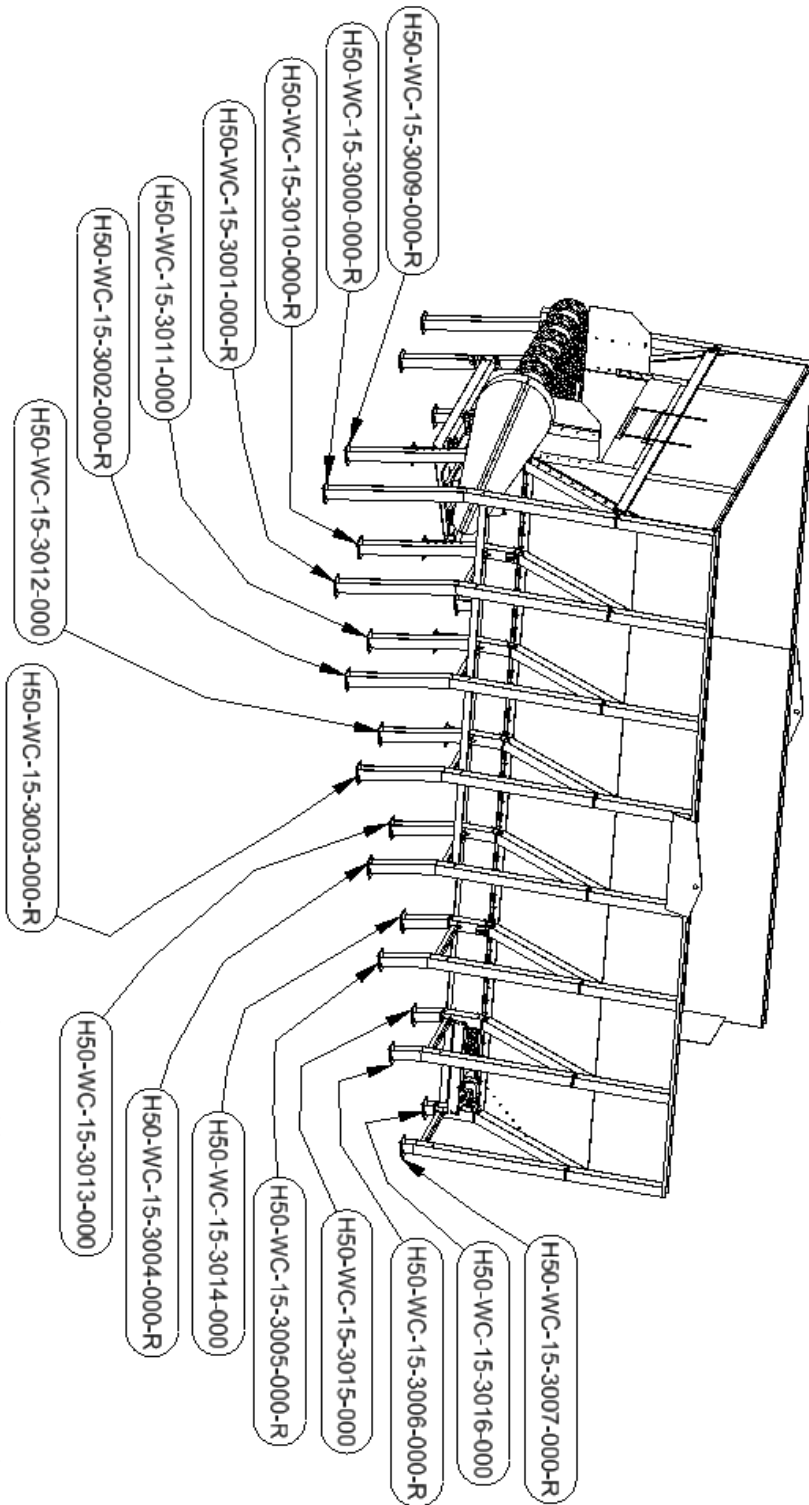
Figure 38. Location of Chain Guard Connection Plate for Upper Half of Chain Guard

Periodic maintenance is required to keep the hopper functioning properly. Items that should be routinely checked include: 1) the level of oil in the drive chain bath, and 2) grease in the four babbit bearings. In addition, wear of the drag chain and mating plates and wear of the drive chain should be routinely monitored.

The bottom half of the chain guard has a plug to facilitate draining the chain oil. A SAE 30 non-detergent petroleum or synthetic oil should be used. Sufficient oil should be added to make sure that the chain is submerged as it rotates around the bottom side of the drive sprocket. The chain will not be properly lubricated without sufficient oil. Oil will leak out of the chain guard if too much oil is added.

Grease fittings are provided on each of the four babbit bearings.

Appendix



NOTE: LEGS HAVE PART NUMBER DISPLAYED ON THE BOTTOM OF THEIR MOUNTING PADS