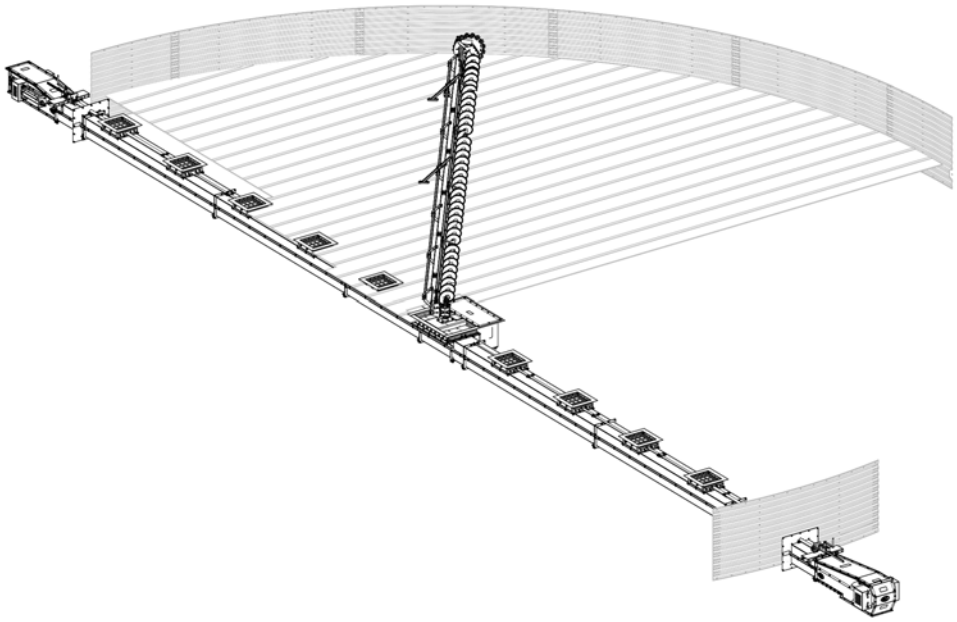

Under Bin Chain Conveyor

Installation and Operation Manual

PNEG-2294

Version 2.1

Date: 12-21-20

PNEG-2294

All information, illustrations, photos, and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

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1 Safety Precautions

Topics Covered in this Chapter

- Safety Guidelines
- Cautionary Symbol Definitions
- Safety Cautions
- Safety Decals
- Safety Sign-off Sheet

Safety Guidelines

Safety guidelines are general-to-specific safety rules that must be followed at all times. This manual is written to help you understand safe operating procedures and problems that can be encountered by the operator and other personnel when using this equipment. Read and save these instructions.

As owner or operator, you are responsible for understanding the requirements, hazards, and precautions that exist and to inform others as required. Unqualified persons must stay out of the work area at all times.

Alterations must not be made to the equipment. Alterations can produce dangerous situations resulting in SERIOUS INJURY or DEATH.

This equipment must be installed in accordance with the current installation codes and applicable regulations, which must be carefully followed in all cases. Authorities having jurisdiction must be consulted before installations are made.

When necessary, you must consider the installation location relative to electrical, fuel and water utilities.

Personnel operating or working around equipment must read this manual. This manual must be delivered with equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

ST-0001–4

Cautionary Symbol Definitions

Cautionary symbols appear in this manual and on product decals. The symbols alert the user of potential safety hazards, prohibited activities and mandatory actions. To help you recognize this information, we use the symbols that are defined below.

Table 1-1 *Description of the different cautionary symbols*

Symbol	Description
	This symbol indicates an imminently hazardous situation which, if not avoided, **will result in serious injury or death.**
	This symbol indicates a potentially hazardous situation which, if not avoided, **can result in serious injury or death.**
	This symbol indicates a potentially hazardous situation which, if not avoided, **can result in minor or moderate injury.**
	This symbol is used to address practices not related to personal injury.
	This symbol indicates a general hazard.
	This symbol indicates a prohibited activity.
	This symbol indicates a mandatory action.

ST-0005–2

Safety Cautions

This is all the topics contained in the Master Safety Reference File. Mainly used to verify formatting before releasing the topic.

Use Personal Protective Equipment

- Use appropriate personal protective equipment:

Eye Protection

Respiratory Protection

Foot Protection

Hearing Protection

Head Protection

Fall Protection

Hand Protection

- Wear clothing appropriate to the job.
- Remove all jewelry.
- Tie long hair up and back.

ST-0004–1

Follow Safety Instructions

- Carefully read all safety messages in this manual and safety signs on your machine. Keep signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from the manufacturer.
- Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.
- If you do not understand any part of this manual or need assistance, contact your dealer.

ST-0002–1

Maintain Equipment and Work Area

- Understand service procedures before doing work. Keep area clean and dry.
- Never service equipment while it is operating. Keep hands, feet, and clothing away from moving parts.
- Keep your equipment in proper working condition. Replace worn or broken parts immediately.

ST-0003–1

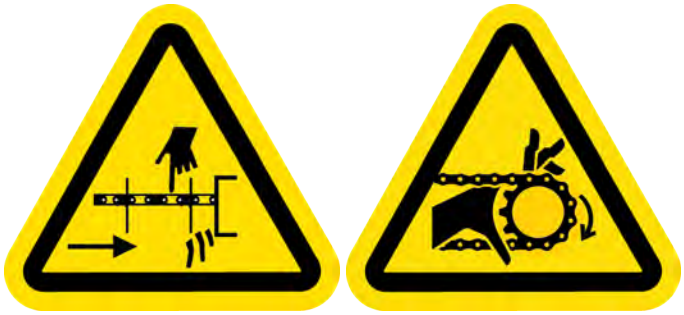
Operate Motor Properly

- All electrical connections must be made in accordance with applicable local codes (National Electrical Code for the US, Canadian Electric Code, or EN60204 along with applicable European Directives for Europe). Make sure equipment and bins are properly grounded.
- Lock-out power before resetting motor overloads.
- Do not repetitively stop and start the drive in order to free a plugged condition. Jogging the drive in this manner can damage the equipment and drive components.

ST-0009–3

Stay Clear of Moving Parts

- Entanglement in rotating sprocket or moving chain will cause serious injury or death.
- Keep all guards and covers in place at all times.
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.



ST-0017–1

Sharp Edge Hazard

- This product has sharp edges, which can cause serious injury.
- To avoid injury, handle sharp edges with caution and always use proper protective clothing and equipment.

ST-0036–2

Use Unload Equipment Properly

- Do not operate this equipment alone. Make sure someone nearby is aware of the proper shut down sequence in the event of an emergency.
- Do not allow any person intoxicated or under the influence of drugs to operate this equipment. All operators must be adequately rested and prepared to perform all functions of operating the equipment.
- Do not start equipment until all persons are clear of the work area and safety guards are in place.
- Do not allow anyone inside a bin, truck, or wagon which is being unloaded by an auger. Flowing grain can trap and suffocate in seconds.
- Use ample overhead lighting after sunset to light the work area.
- Always use caution to not hit the auger when positioning the load.
- Do not leave equipment operating while unattended.
- Be aware of pinch points, which can trap or catch objects and cause injury.
- Be sure all equipment is locked in position before operating.
- Always lock out all power sources to the equipment when unloading is finished.

ST-0051–1

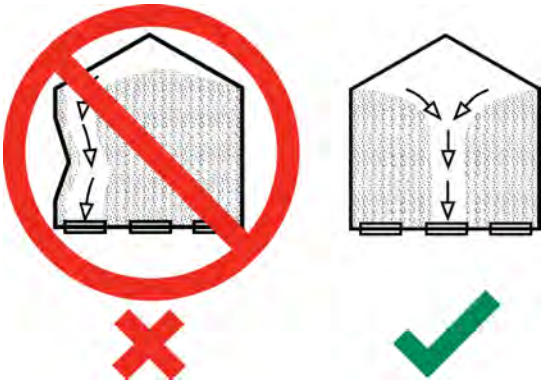
Stay Clear of Hoisted Equipment

- Always use proper lifting or hoisting equipment when assembling or disassembling equipment
- Do not walk or stand under hoisted equipment.
- Always use sturdy and stable supports when needed for installation. Not following these safety precautions creates the risk of falling equipment, which can crush personnel and cause serious injury or death.

ST-0047–1

Unload the Bin Correctly

- Use CENTER FLOOR OUTLET ONLY until NO grain remains above this outlet.
- Side floor outlets to be used ONLY when above condition is satisfied.
- Lock all side floor outlets to avoid accidental premature use.
- See manufacturers instructions for proper use of factory supplied sidedraw (wall) discharge systems.



ST-0060–1

Safety Decals

The safety decals on your equipment are safety indicators which must be carefully read and understood by all personnel involved in the installation, operation, service and maintenance of the equipment.

Location	Decal No.	Decal	Description
Belt guard cover	DC-994		Decal, Danger Shear Point
Belt guard cover	DC-995		Decal, Warning Shear Point
Head and tail sections	DC-996		Decal, Warning Chain Sprocket
Head section	DC-997		Decal, Danger Chain Sprocket

Location	Decal No.	Decal	Description
Head, tail and intermediate sections	DC-1230		Decal, Chain and Flight Warning
Bin sidewall	DC-1395		Decal, Rotating Flight

To replace a damaged or missing decal, contact us to receive a free replacement.

GSI Decals

1004 E. Illinois St.
Assumption, IL 62510
Tel: 1-217-226-4421

Safety Sign-off Sheet

Below is a sign-off sheet that can be used to verify that all personnel have read and understood the safety instructions. This sign-off sheet is provided for your convenience and personal record keeping.

Date	Employee Name	Supervisor Name

ST-0007

2 General Information

CAUTION

1. ***Read and understand the Operator's Manual BEFORE operating the unit.***
2. ***Keep all safety shields and devices in place.***
3. ***Keep all covers in place.***
4. ***Make certain everyone is clear of the equipment before operating.***
5. ***Keep hands, feet and clothing away from moving parts.***
6. ***Shut OFF and lock out all power to adjust, service, clean or unclog the unit.***
7. ***Keep off the equipment at all times***
8. ***Keep children, visitors and all untrained personnel away from the machine when in operation..***
9. ***Do not operate electric motor equipped units until motors are properly grounded.***
10. ***Disconnect power on electrical driven units before re-setting motor overloads.***
11. ***Do not repetitively stop and start the drive in order to free a plugged condition. "Jogging" the drive in this manner can damage the conveyor and/or drive components.***

Welding

WARNING

Remove paint before welding or heating. Toxic fumes can be generated when paint is heated by welding, soldering or using a torch. Always wear an approved respirator and work in well-ventilated area.

1. Welding on or to the conveyor may cause damage to both the conveyor and its electrical system.
2. If welding is necessary, precautions should be taken to protect the conveyor.
3. If it is necessary to fasten anything to the conveyor permanently, careful consideration should be given to methods of maintenance, removal and replacement of the conveyor and/or its parts.

Receiving Inspection

1. Carefully inspect the shipment as soon as it is received. Verify that the quantity of parts or packages actually received corresponds to the quantity shown on the packing slip. Any discrepancies should be clarified immediately.
2. Please remember that any damaged or missing parts must be noted on the bill of lading at the time of delivery.
3. Report any damage or shortage to the delivering carrier as soon as possible. GSI's responsibility for damage to the equipment ends with acceptance by the delivering carrier.

Pre-Installation Preparation

1. Familiarize yourself thoroughly with this manual and all the conveyor parts. Read all manuals and safety signs before using or servicing equipment. Taking the time to do so will aid in the assembly of the conveyor.
2. Remove all banding and crating material. Arrange the conveyor components so that they are easily accessible.
3. Locate sturdy items to serve as blocking. (i.e. wood blocks, saw horses, etc.) Blocking is used to support the conveyor sections above the ground to aid in assembly.
4. Locate and place the conveyor sections on the blocking in order, starting with the head section and concluding with the tail section.

Support

1. Include adequate support for the conveyor assembly to be installed at intervals no greater than 10'.
2. It is recommended that supports be installed at vertical portions of flanges leaving bottoms of intermediate sections clear.
3. By attaching supports in this manner, the removable bottoms are unobstructed for ease of replacement. Support legs are available as an option.

Discharge

1. The standard conveyor is constructed with one discharge located at the drive end. If intermediate discharges are to be used, the location(s) must be determined before proceeding with the conveyor assembly.
2. Intermediate discharges cannot be installed over a trough joint; therefore, it may be necessary to position a shorter trough section to serve as a spacer in order to accommodate the placement of the discharge(s) where they are required. See inline gate manual (**PNEG-1732** for instructions for cutting intermediate bottom).

NOTE: *The owner assumes all responsibility for any alterations to the equipment.*

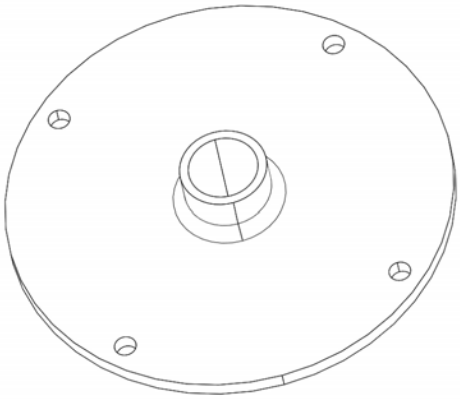
3 Components Identification

Topics Covered in this Chapter

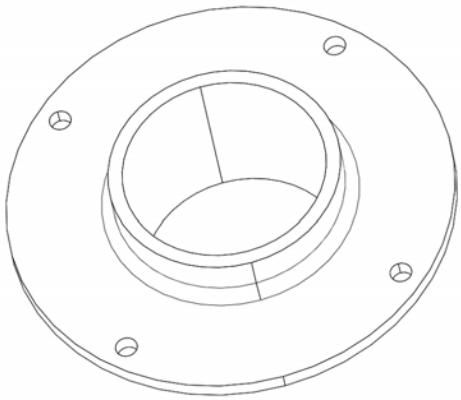
- Conveyor Components
- Power Sweep Components
- Bridging Components
- Conveyor Layout

Conveyor Components

Table 3-1 *Identifying the conveyor components*

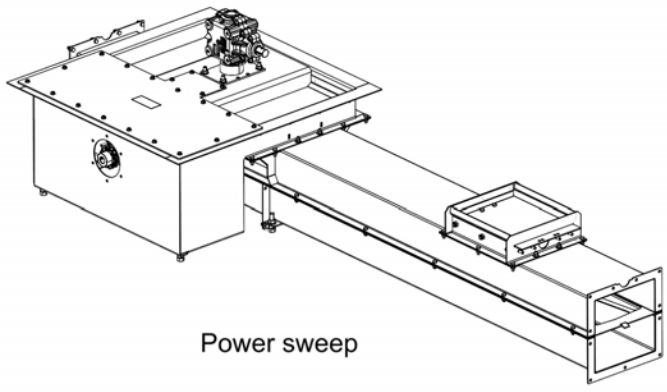


1"

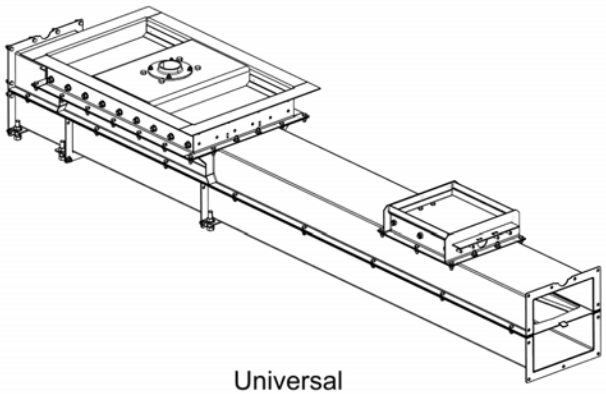


3"

Bushings



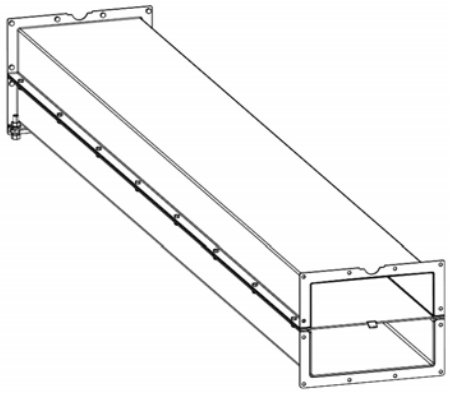
Power sweep



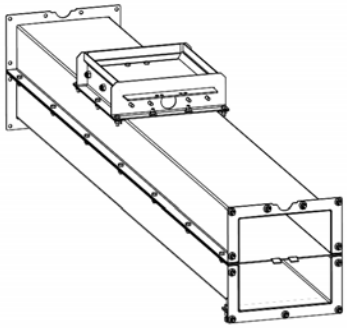
Universal

Center wells

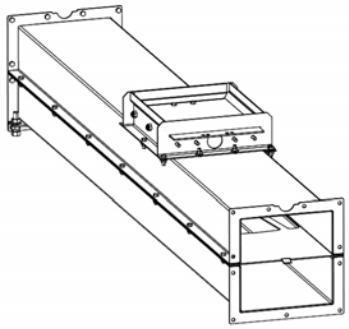
Table 3-1 *Identifying the conveyor components (cont'd.)*



Section without wells

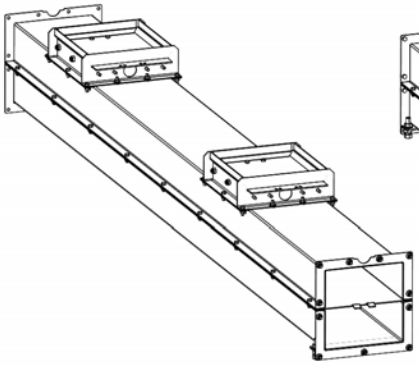


Head section with one well

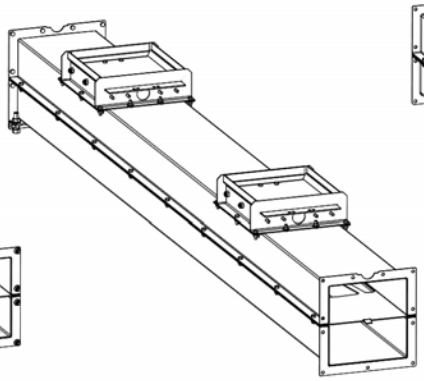


Tail section with one well

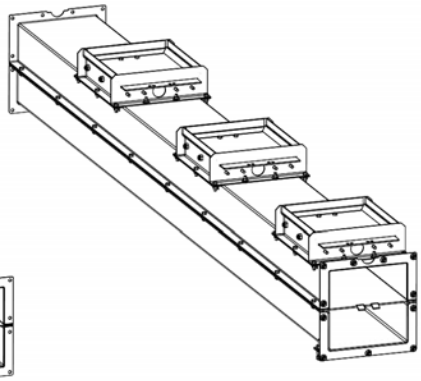
Intermediate sections



Head section with two wells

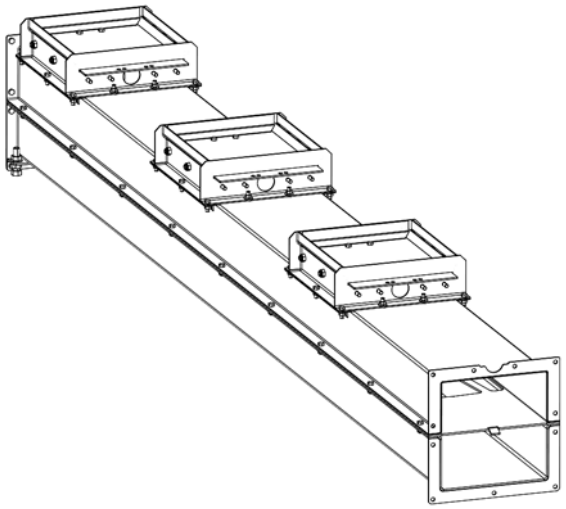


Tail section with two wells

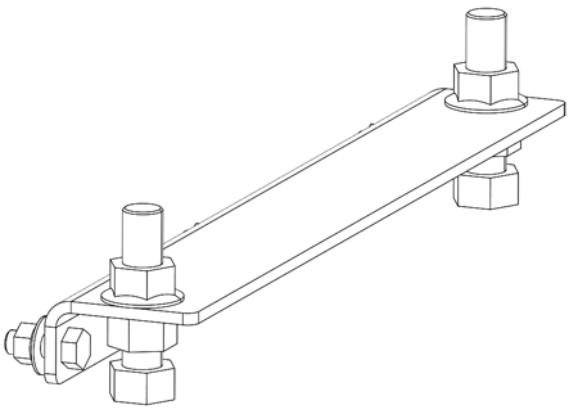


Head section with three wells

Intermediate sections

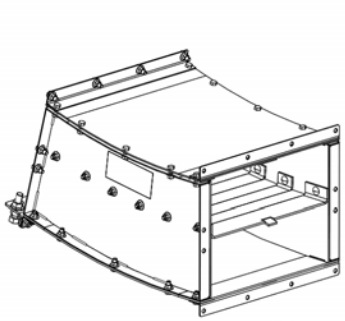


Tail section with three wells

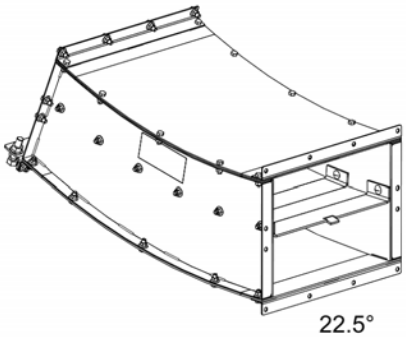


Floor support

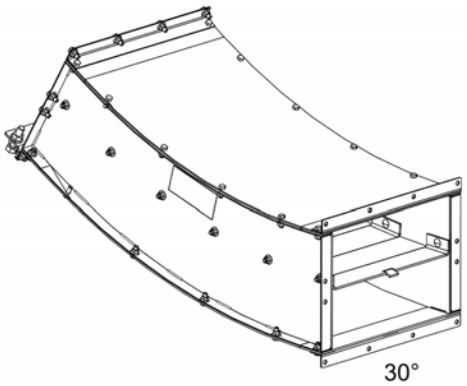
Table 3-1 *Identifying the conveyor components (cont'd.)*



15°

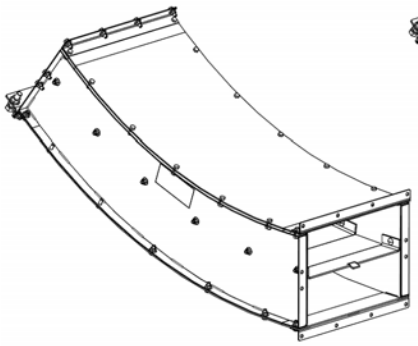


22.5°

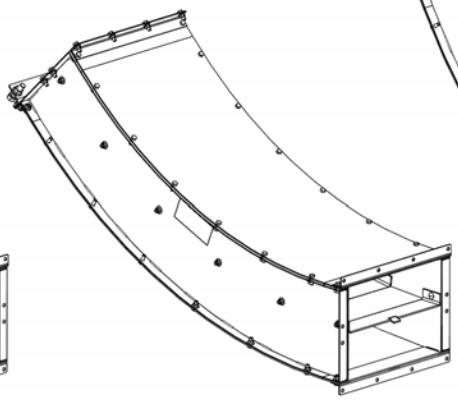


30°

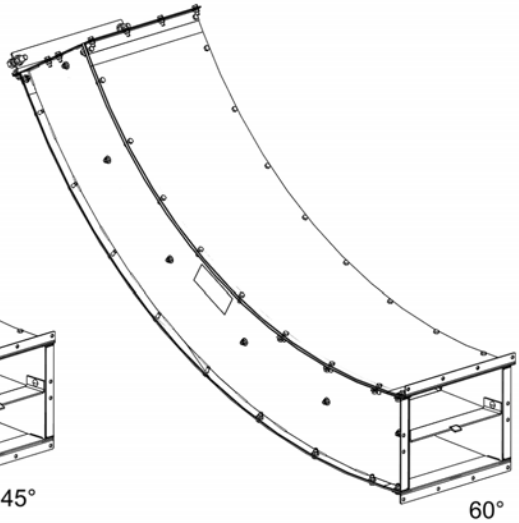
Bend sections



37.5°

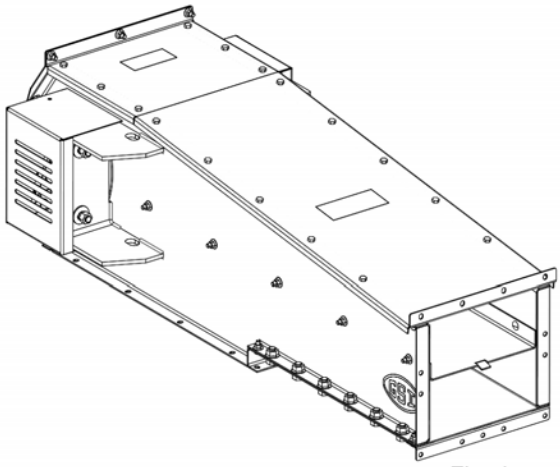


45°

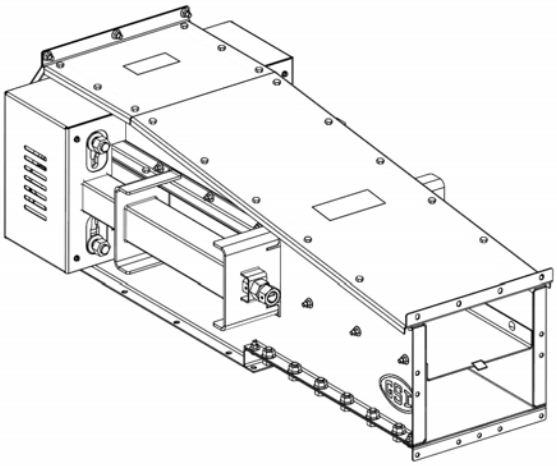


60°

Bend sections



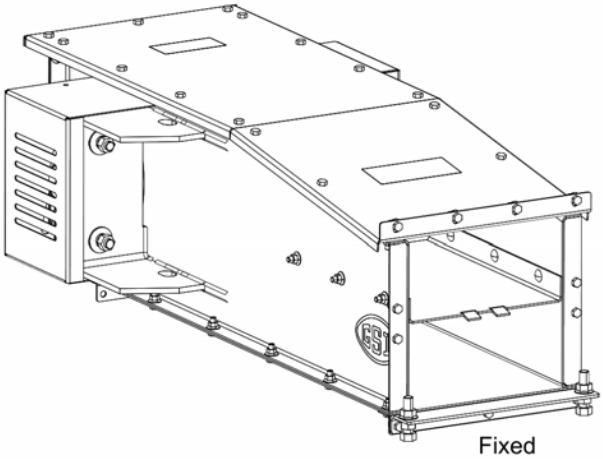
Fixed



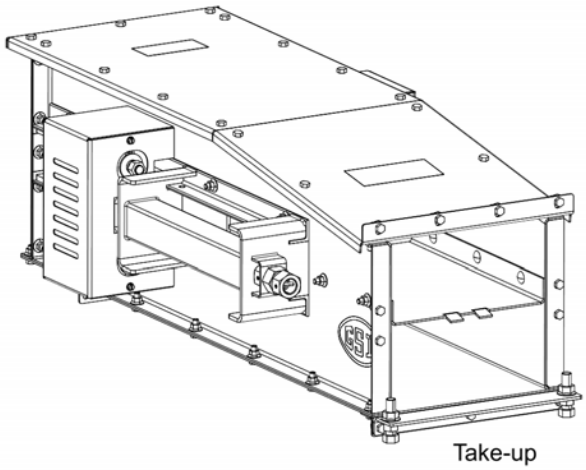
Take-up

Head sections

Table 3-1 *Identifying the conveyor components (cont'd.)*

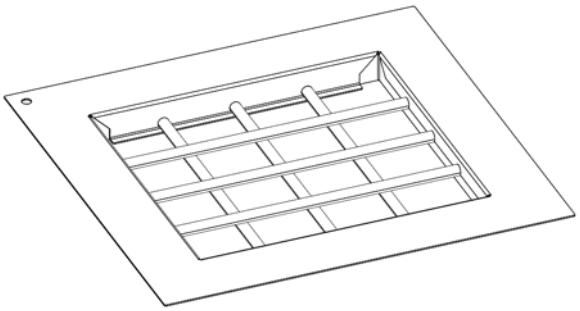


Fixed

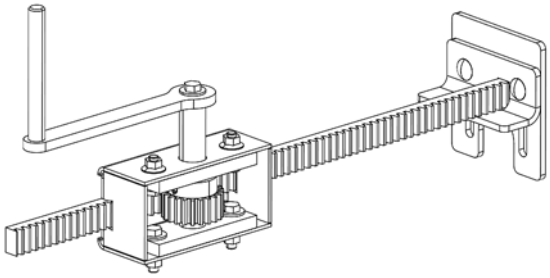


Take-up

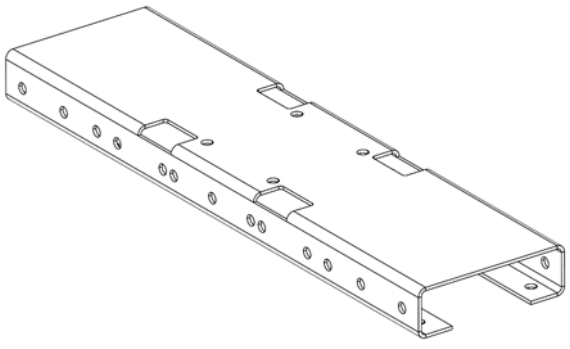
Tail sections



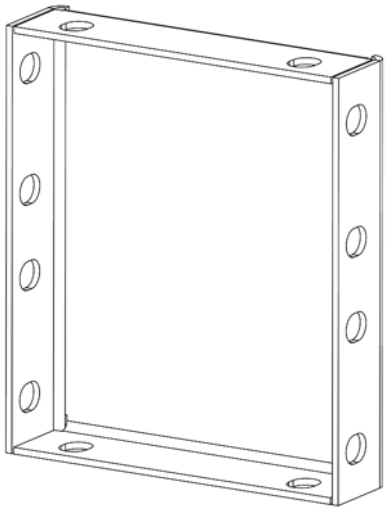
Intermediate well flange



Jack assembly

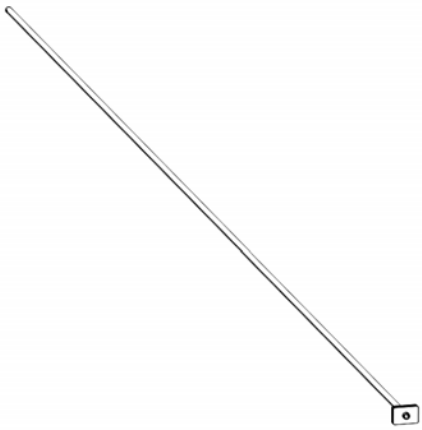


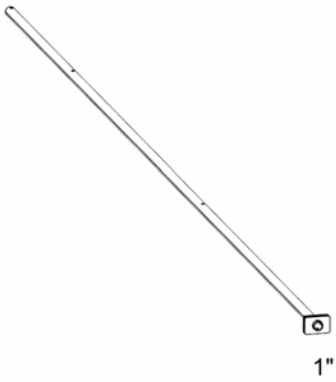
Jack mounting bracket

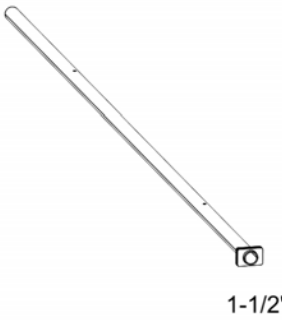


Jack mounting side bracket

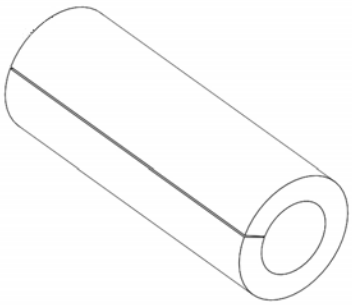
Table 3-1 *Identifying the conveyor components (cont'd.)*

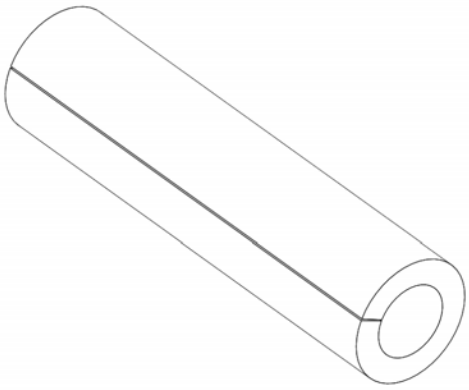




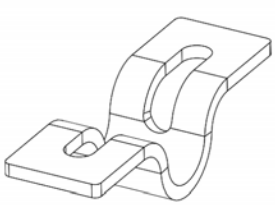


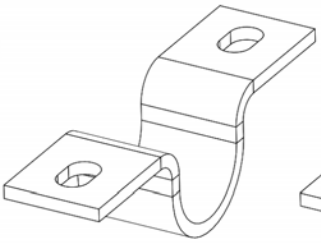
Control rods

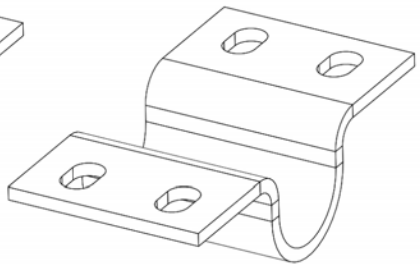


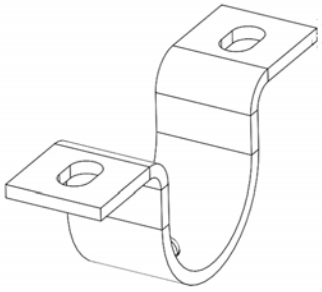


Spring pins



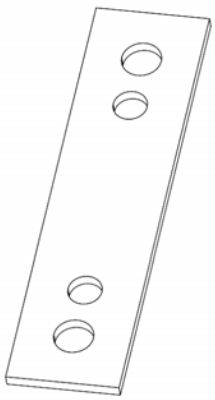




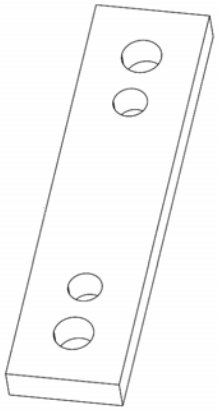


Control rod clamps

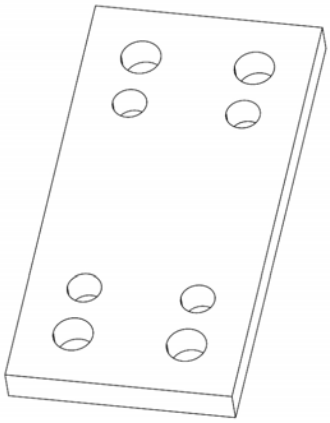
Table 3-1 *Identifying the conveyor components (cont'd.)*



1/8" Thick shim

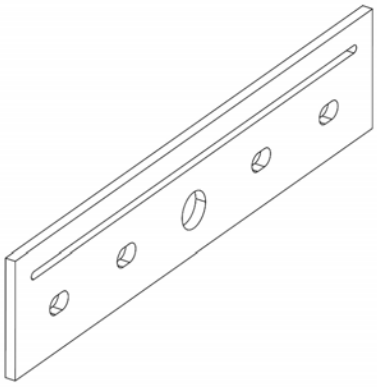


3/8" Thick shim

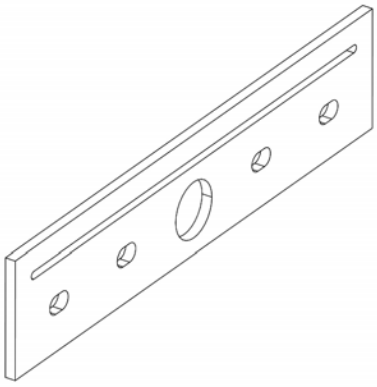


3/8" Thick shim
(Dual width)

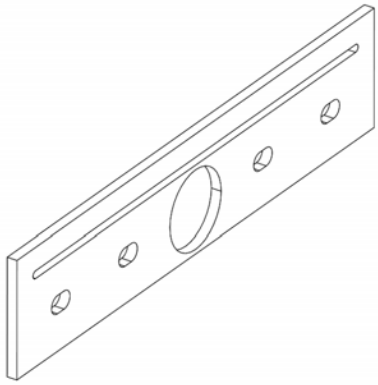
Control rod clamp shims



1/2"

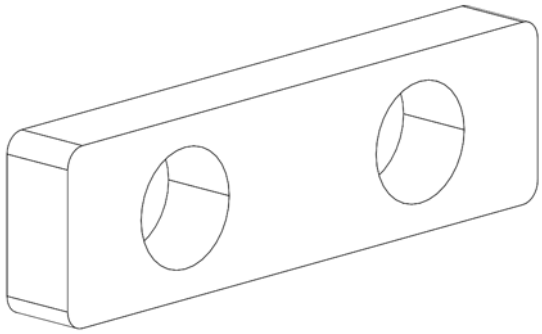


1"

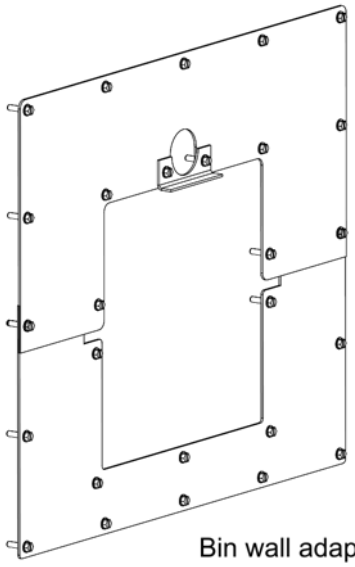


1-1/2"

Gate seals

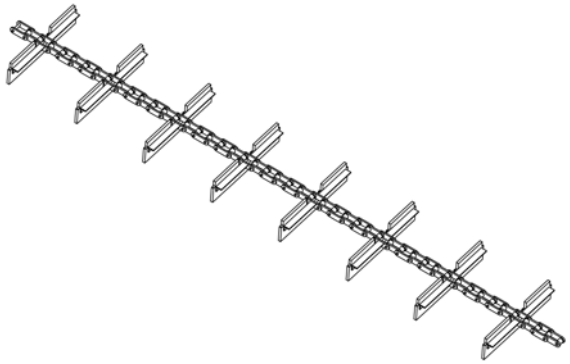


1/2" Connecting link

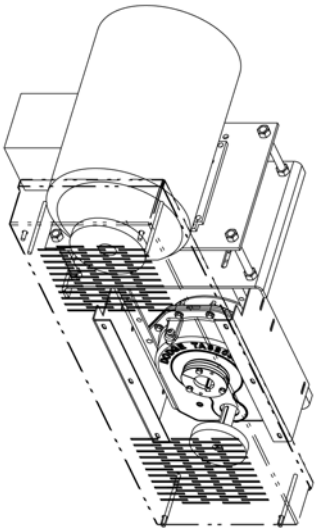


Bin wall adapter plate

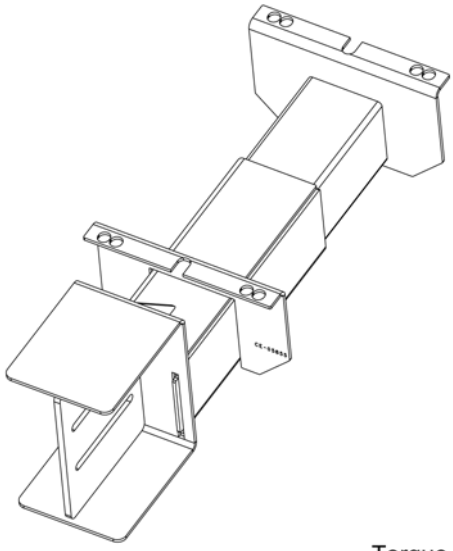
Table 3-1 *Identifying the conveyor components (cont'd.)*



Chain assembly



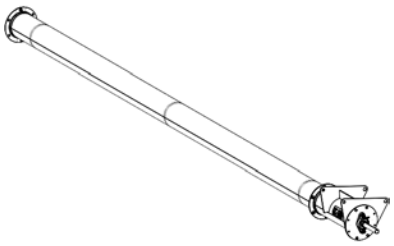
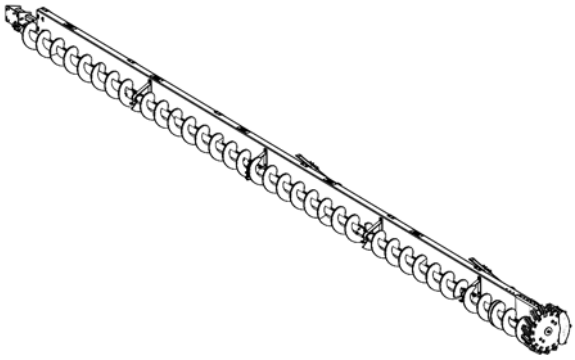
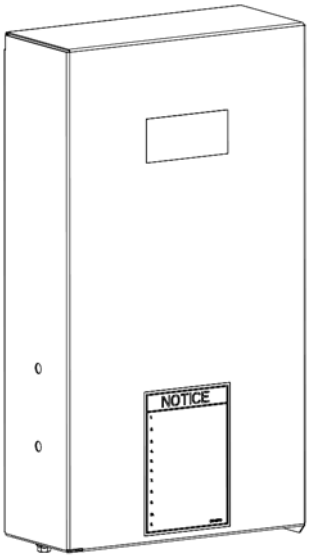
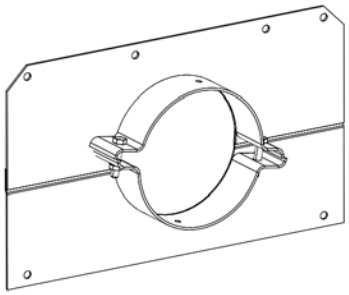
Drive assembly



Torque arm

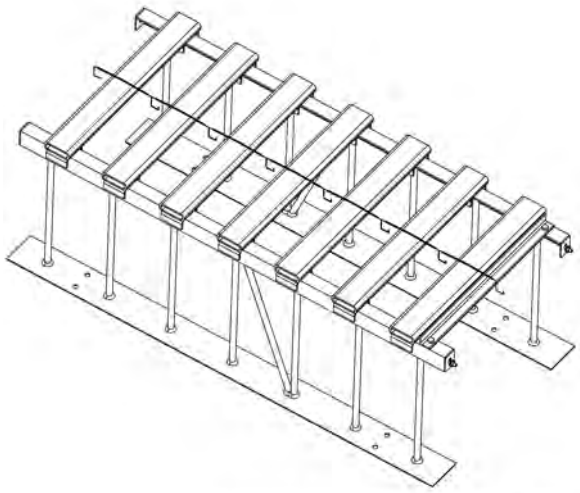
Power Sweep Components

Table 3-2 *Identifying the power sweep components*

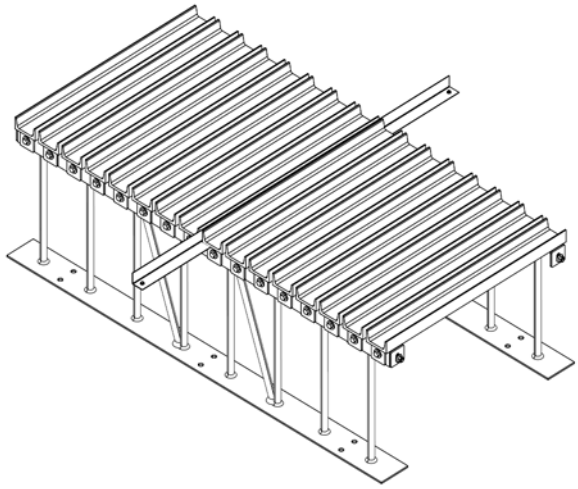
 Drive tube	 Backshield with sweep
 Drive	 Bin wall adapter

Bridging Components

Table 3-3 *Identifying the bridging components*



Cut-Lok and Cor-Lok floor bridge



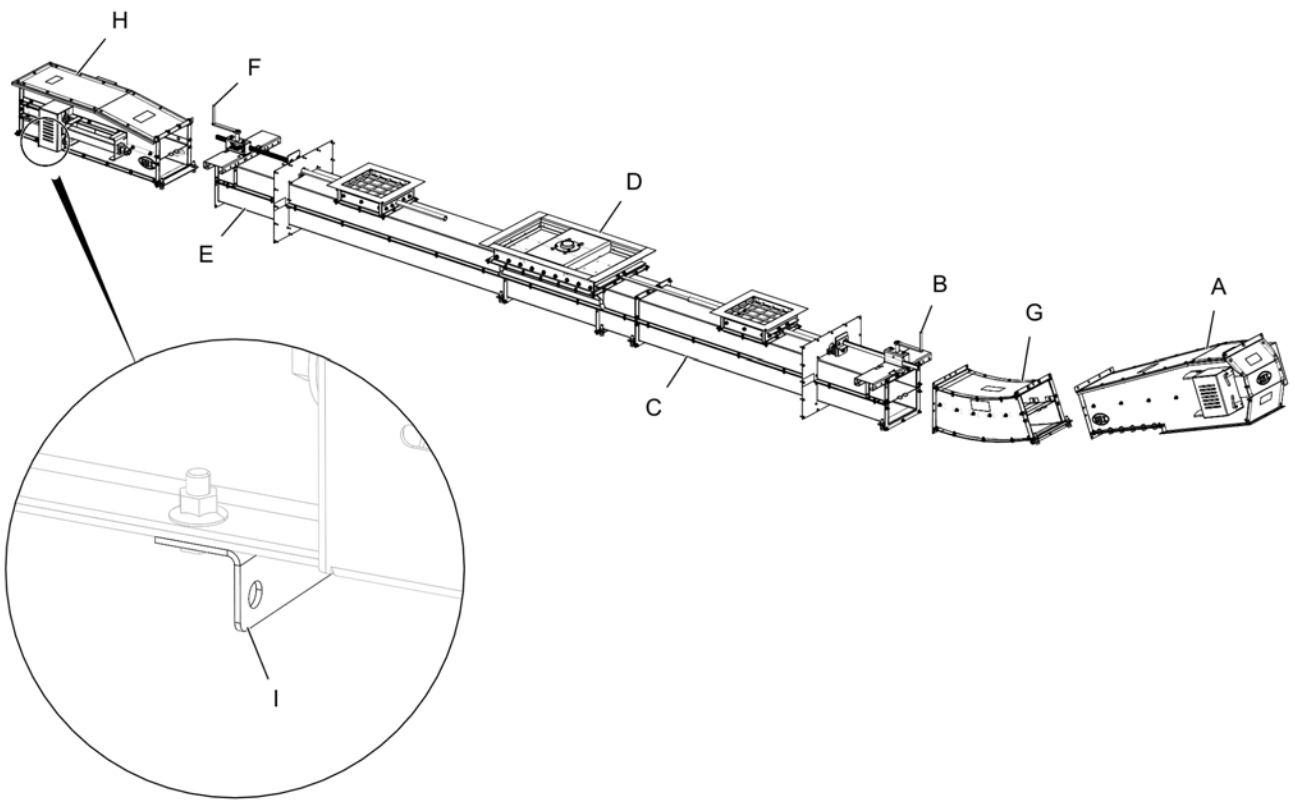
Dura-Lok floor bridge

Power sweep drive tube floor bridge

Conveyor Layout

Refer to the below image to understand the different sections of a conveyor.

Figure 3-1 *Conveyor layout*



A	Head section (fixed)	F	Tail end gate control
B	Head end gate control	G	Bend section
C	Head end intermediate section	H	Tail section (take-up)
D	Center well intermediate section	I	Tail end support bracket
E	Tail end intermediate section		

4 Installing the Conveyor

Topics Covered in this Chapter

- Location of Center Well Inside the Bin
- Installing the Leveling Foot Brackets
- Installing the Center Well Intermediate Section
- Installing the Intermediate Section
- Modifying the Bin Wall for Conveyor
- Installing the Intermediate Well Gate Seal
- Overview of Control Rods
- Installing the Center Well Control Rods
- Installing the Intermediate Well Control Rods
- Installing the Emergency Well Control Rod (Optional)
- Installing the Control Rod Jack Assembly
- Installing the Bin Wall Adapter Plates
- Installing the Intermediate Sections Between Multiple Bins
- Installing the Chain Assemblies
- Changing the Carry-In Sweep Bushings
- Installing the Intermediate Well Flanges

Location of Center Well Inside the Bin

Before You Begin

You need to locate and mark the center of the bin, this is where the pivot point of the sweep will be set.

1. Place the center well into position with the vertical shaft in the gearbox at the center of the bin.

   NOTE: *When placing the center well at the center of the bin, GSI recommends a tolerance of +/-1/4" (both directions) for the slight adjustment of sweep length to enable the sweep to run without any interference.*

2. Draw a line with chalk or use a string line during this phase of the assembly to ensure proper alignment of the surfaces and expected discharge location.

> **WARNING** ***Failure to follow these installation guidelines may result in sweep operation problems, wear on chain assembly flight pads and other potential damage to the conveyor or bin.***

Figure 4-1 *Placement of center well (standard sweep)*

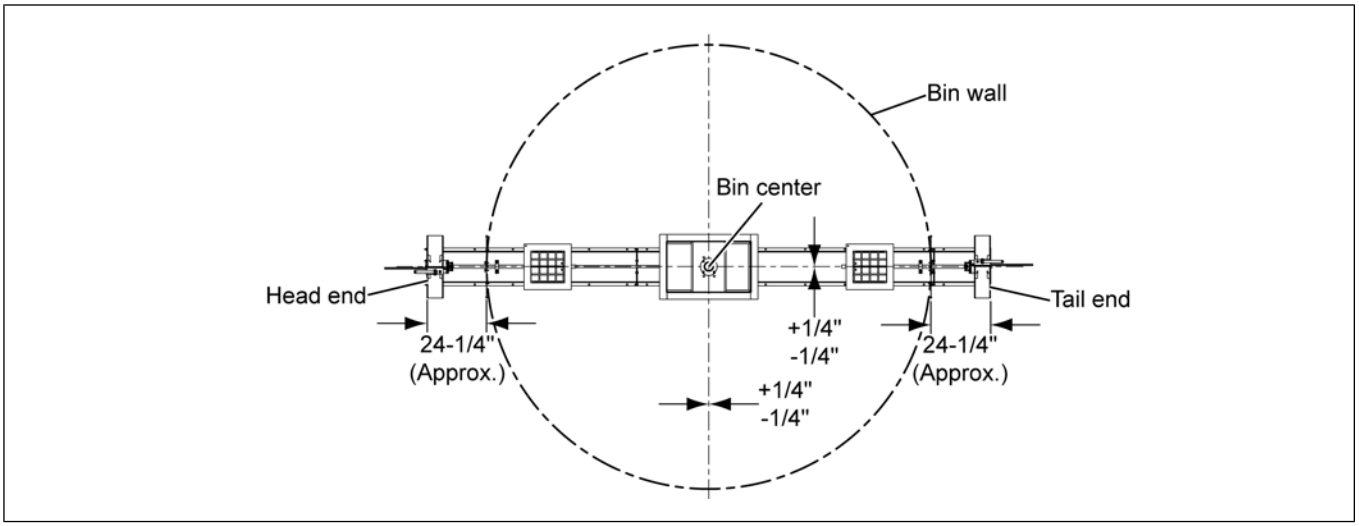
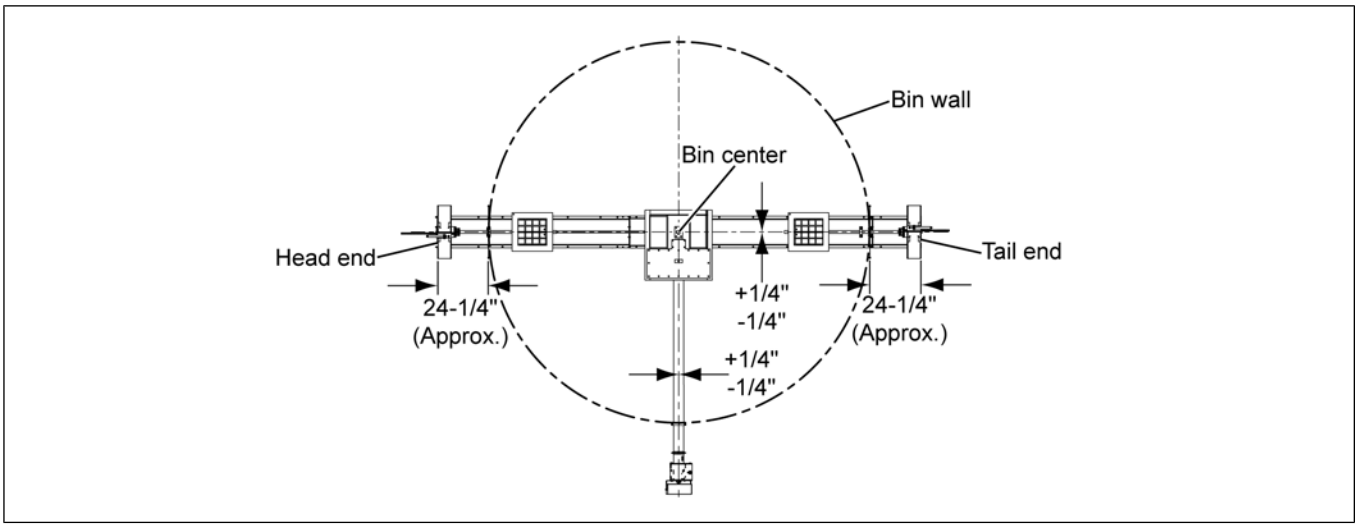


Figure 4-2 *Placement of center well for (power sweep)*



Installing the Leveling Foot Brackets

Use the leveling foot brackets along with the hardware to support the conveyor sections off the floor.

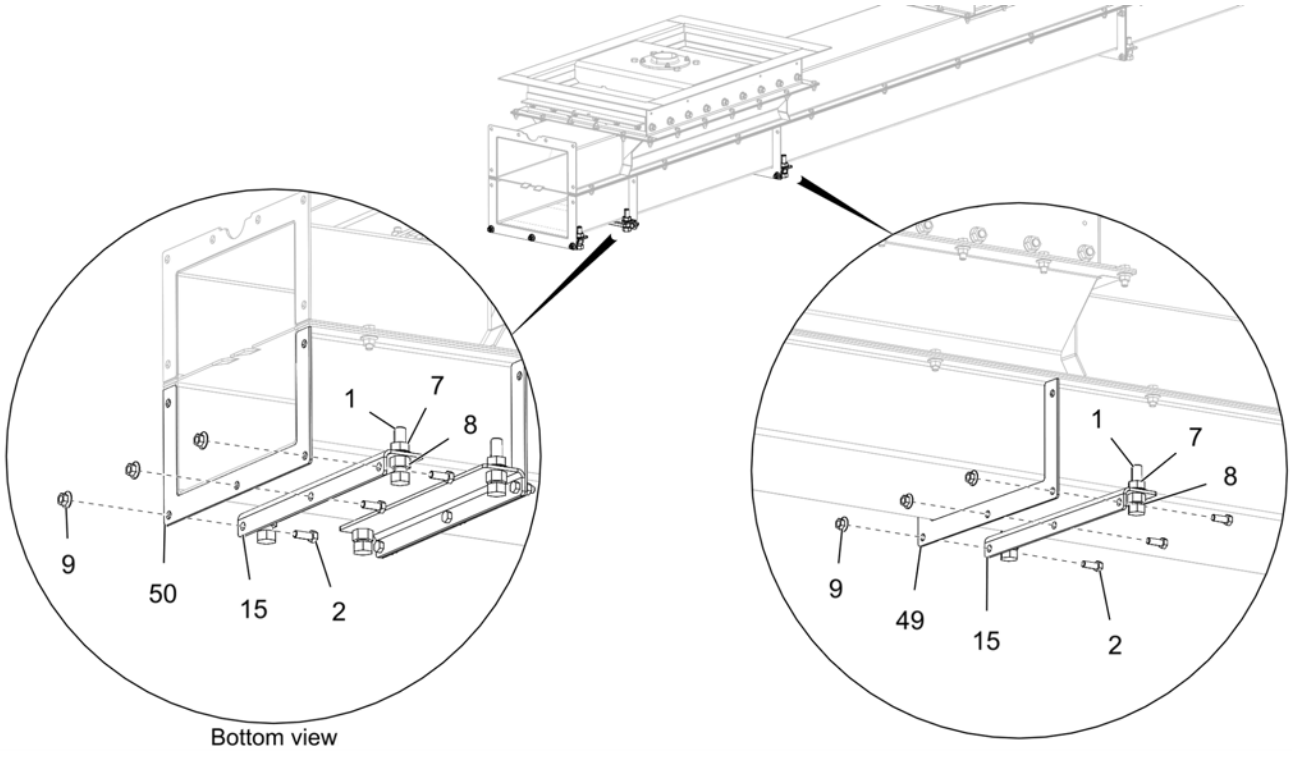
What You Should Know

You need to install one support per seam connection. The center well section will have two additional supports, that need to be installed to the flanges below the center well.

1. For each intermediate section, install the floor support (15) to the flange (50) at the head end seam connection using 3/8" x 1" hex bolts (2) and 3/8" flange nuts (9).
2. For the center well section, additionally install two floor supports (15) to the flanges (49) below the center well using 3/8" x 1" hex bolts (2) and 3/8" flange nuts (9).

   NOTE: *You need to install the floor supports (15) before connecting the conveyor sections.*
3. Level the conveyor sections to the floor by adjusting the length of each 5/8" x 2-1/2" HHTB bolts (1) using 5/8" hex nut (8) and 5/8" flange nut (7).

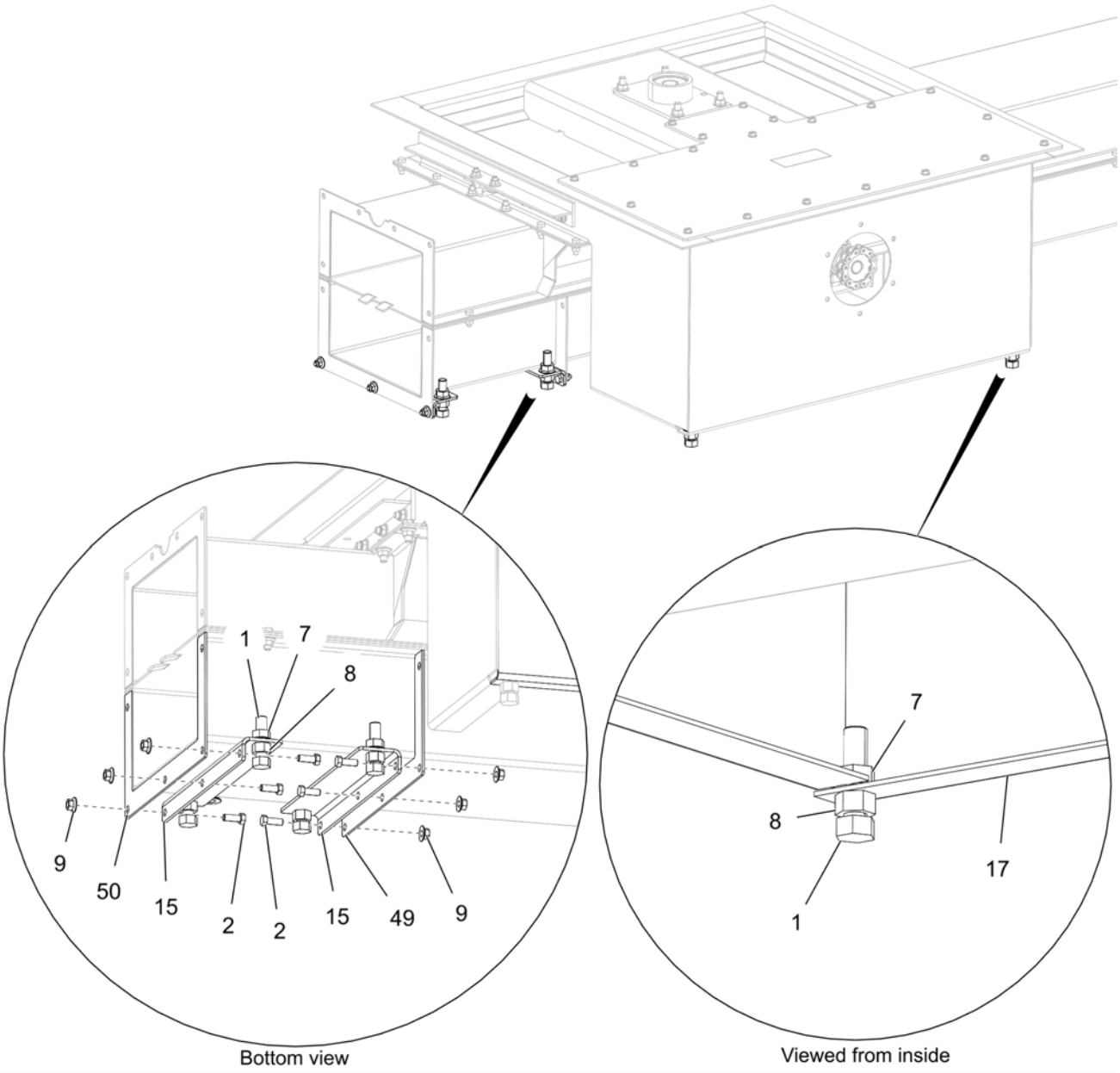
Figure 4-3 *Installing the leveling foot brackets and hardware (standard sweep)*



1	5/8" x 2-1/2" HHTB bolt	9	3/8" flange nut
2	3/8" x 1" hex bolt	15	Floor support
7	5/8" flange nut	49	Flange below the center well
8	5/8" hex nut	50	Head end seam flange

NOTE: *For chain loop power sweeps, there will be two additional 5/8" x 2-1/2" hex bolts (1) at the bottom corners of the center well section (17).*

Figure 4-4 *Installing the leveling foot brackets and hardware (power sweep)*



1	5/8" x 2-1/2" HHTB bolt	15	Floor support
2	3/8" x 1" hex bolt	17	Center well intermediate section
7	5/8" flange nut	49	Flange below the center well
8	5/8" hex nut	50	Head end seam flange
9	3/8" flange nut		

Installing the Center Well Intermediate Section

The first section that will be placed when installing the under bin conveyor is the center well intermediate.

What You Should Know

There are two types of center wells available, one is used for the drop-in sweeps and the other is used only with GSI power sweeps. Refer to the *Conveyor Components, page 15* to identify the center well sections.

IMPORTANT: *The conveyor installation requires planning to avoid interference with bin wall stiffeners, sidewall vertical seams and other components and accessories. Planning the location of the conveyor and how it fits into the rest of the system is important. You can use the chalk lines or the string to determine the conveyor area. Refer to Modifying the Bin Wall for Conveyor, page 35 for details.*

The correct installation of the under bin conveyor depends upon locating and orienting the center well intermediate. Follow the below two steps to ensure the center well intermediate is installed correctly.

a. Make sure to place the center well sweep pivot tube directly over the mark locating the center of the bin.

b. The head end of the center well intermediate should be facing the intended head discharge location.

NOTE: *The return pan end with two tabs is identified as the head end of the section and the return pan end with one tab is identified as the tail end of the section.*

Figure 4-5 *Center well intermediate placement at the center of bin*

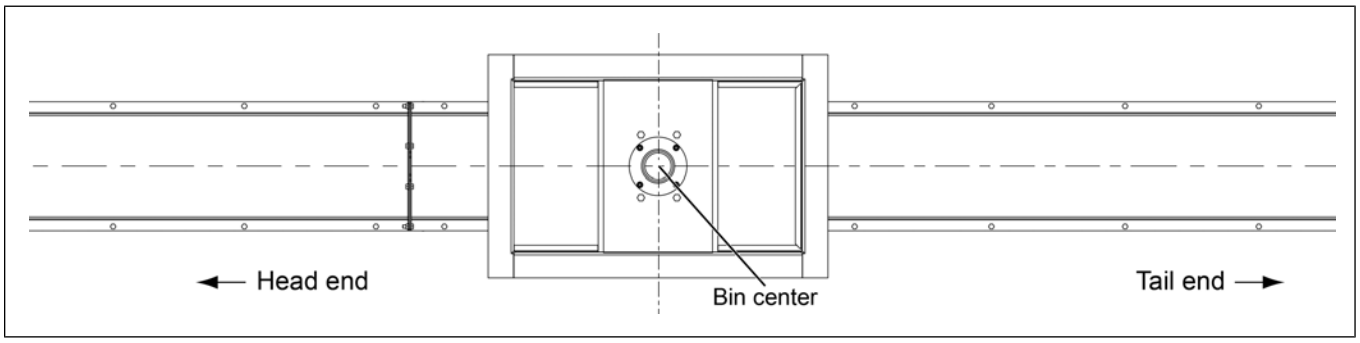
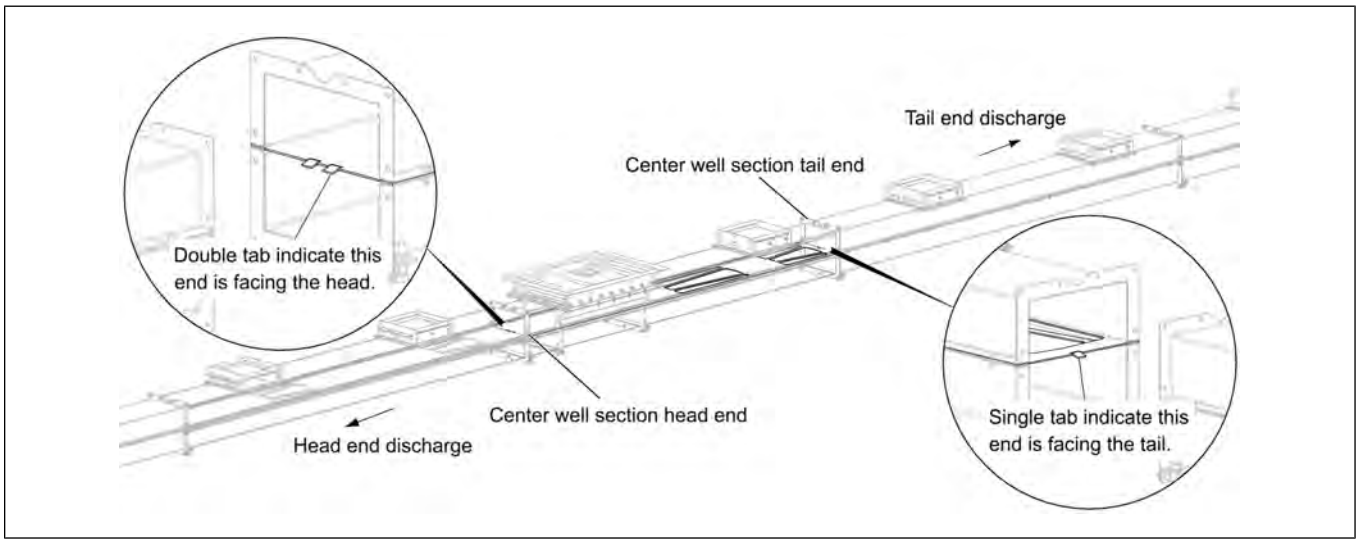


Figure 4-6 *Center well intermediate orientation*

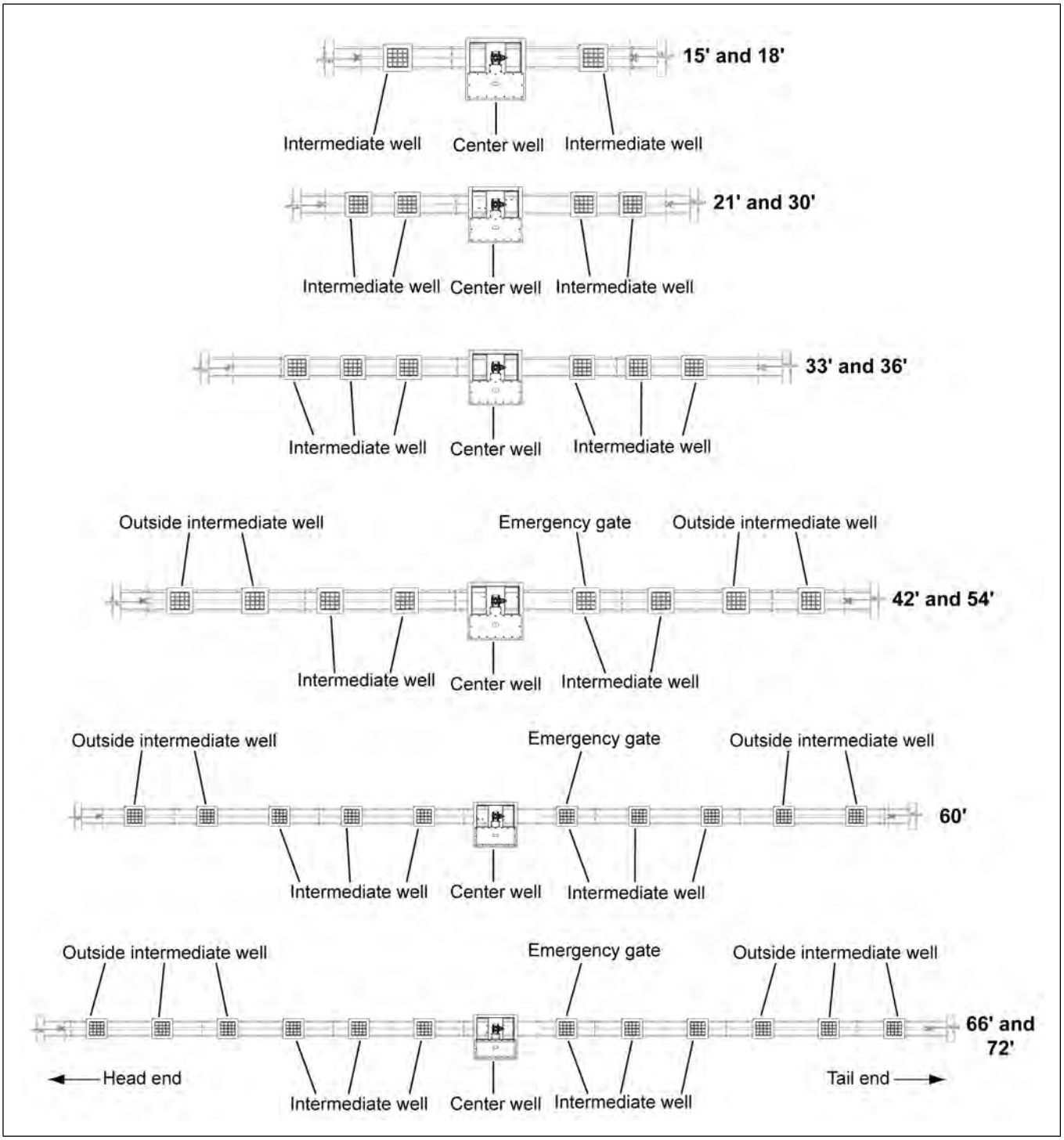


Installing the Intermediate Section

Following the center well intermediate, you need to install the intermediate sections at both sides of the center well. Refer to below layout for details.

What You Should Know

Figure 4-7 *Intermediate well layout*



NOTE: *You can identify the intermediate sections by following any of the three methods mentioned below.*

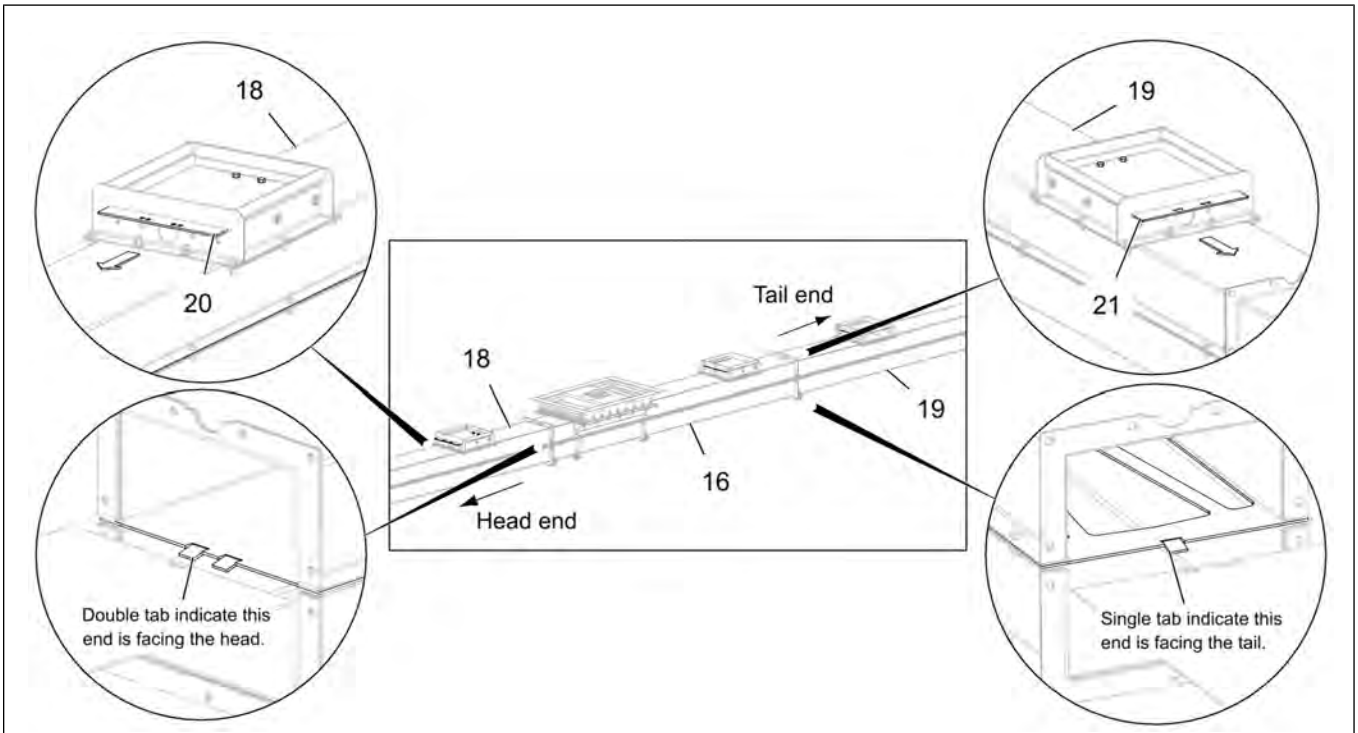
1. *Refer to the final assembly print included with your shipping. This print has the detailed layout specific to your order.*
2. *Also, all conveyor sections are identifiable with their barcode sticker, which contains both part number and description.*
3. *In addition to this, you can also refer to the Conveyor Components, page 15 to identify the different intermediate sections.*

NOTE: *The intermediates will have self-locating/locking tabs at the ends of the return pans. These tabs not only help in aligning the return pans, but also orienting the intermediates as they will allow the intermediates to be assembled in only one way.*

IMPORTANT: *You can differentiate between the head end intermediates (18) and tail end intermediates (19) by checking the gate slide opening direction with reference to the return pan tabs.*

1. *Head end intermediates gate slide (20) will always open in the direction where the return pan has two tabs.*
2. *Tail end intermediates gate slide (21) will always open in the direction where the return pan has one tab.*

Figure 4-8 *Identifying the head end and tail end intermediates*



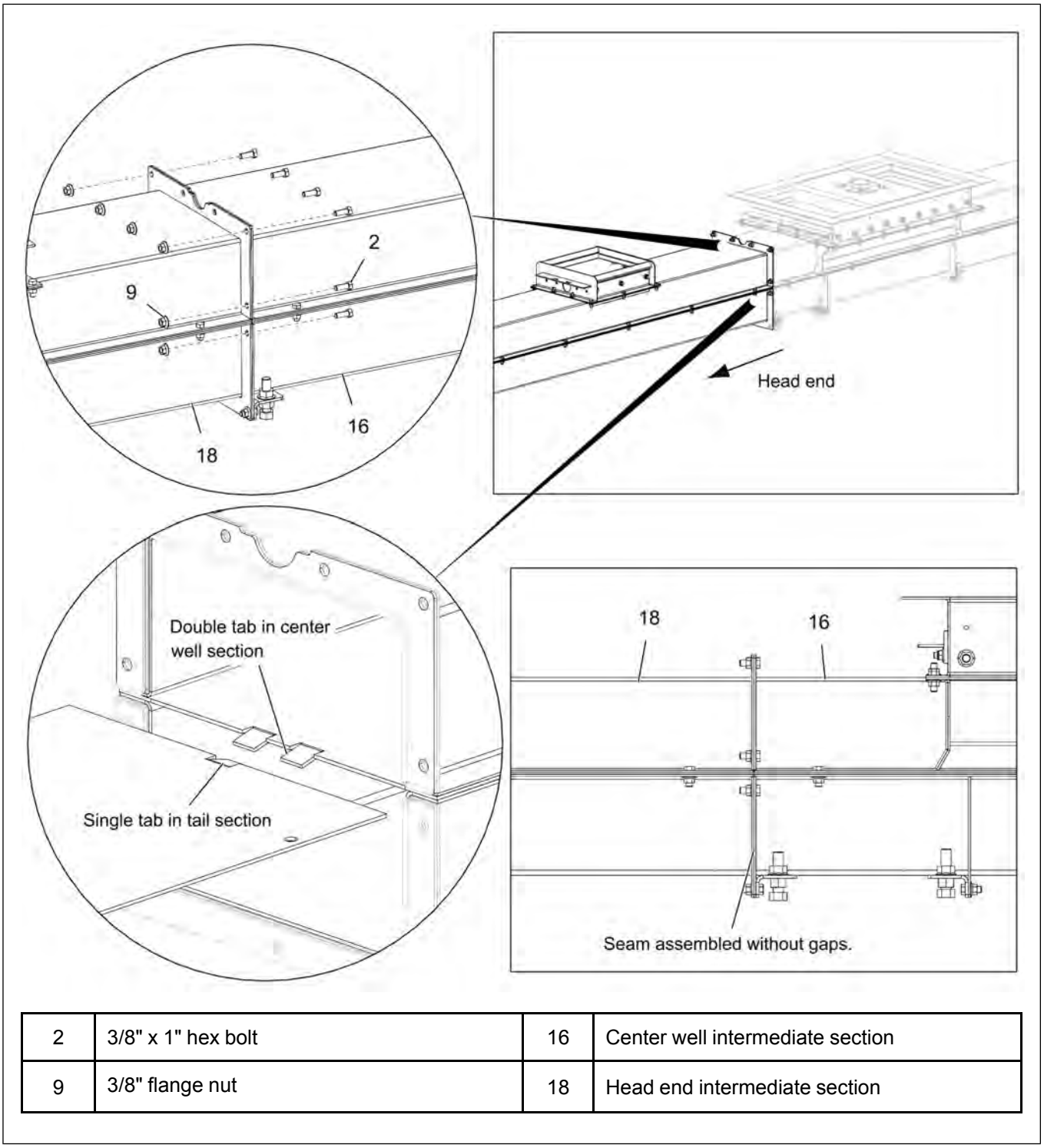
16	Center well intermediate section	20	Head end intermediate gate slide
18	Head end intermediate section	21	Tail end intermediate gate slide
19	Tail end intermediate section		

1. The performance of the under bin conveyor depends on installing the intermediate sections with gate slides in the proper sequence and locations about the center well. Follow the below steps to install the intermediate sections correctly.

    - On the head discharge side, align the head end intermediate (18) with the center well intermediate (16) and connect the flanges using 3/8" x 1" hex bolts (2) and 3/8" flange nuts (9).

      NOTE: *The single tab in the return pan of the head end intermediate (18) locks with the double tab in the return pan of the center well intermediate (16).*

Figure 4-9 *Installing the head end intermediate*

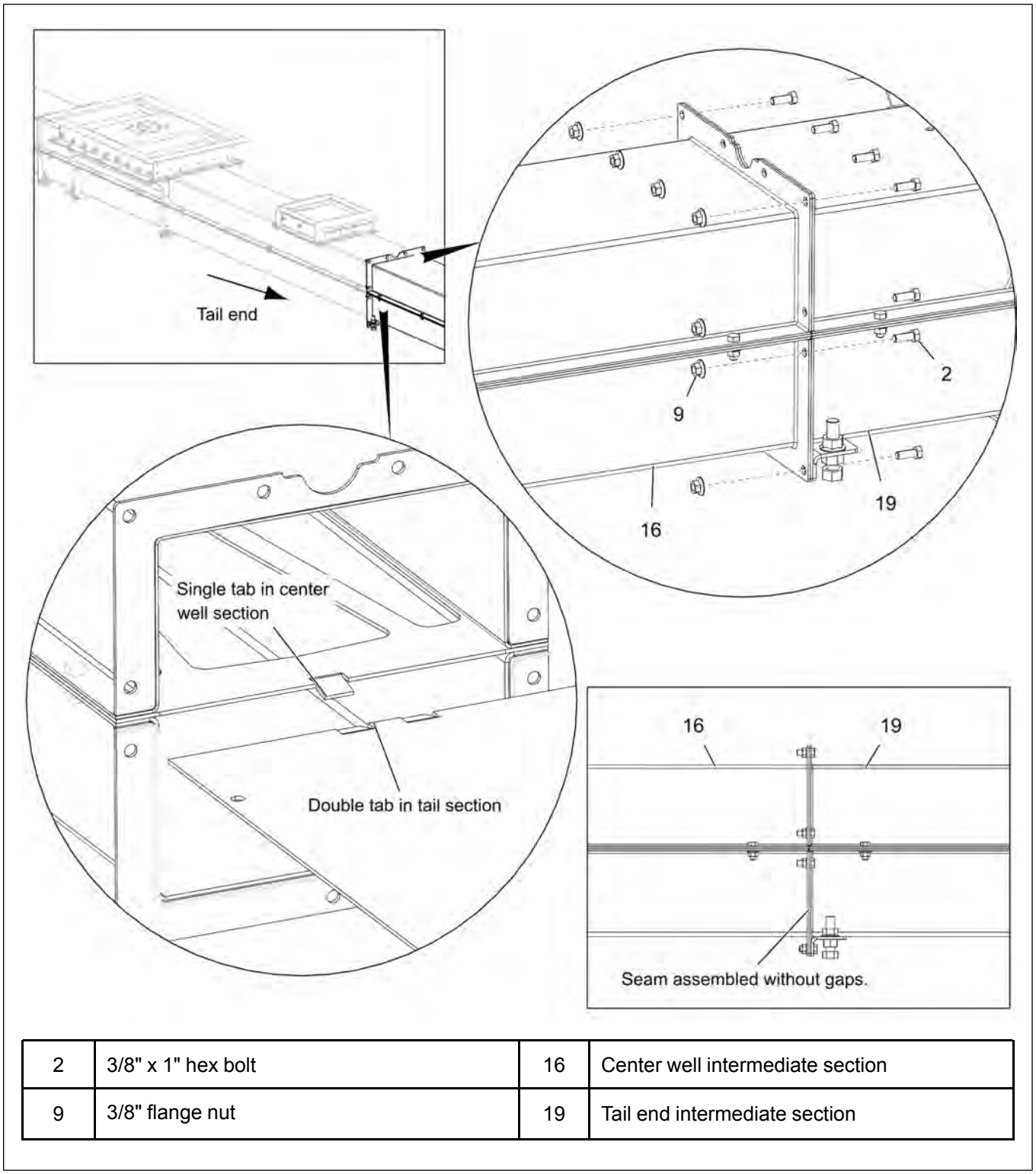


2	3/8" x 1" hex bolt	16	Center well intermediate section
9	3/8" flange nut	18	Head end intermediate section

- On the tail discharge side, align the tail end intermediate (19) with the center well intermediate (16) and connect the flanges using 3/8" x 1" hex bolts (2) and 3/8" flange nuts (9).

  NOTE: *The double tab in the return pan of the tail end intermediate (19) locks with the single tab in the return pan of the center well intermediate (16).*

Figure 4-10 *Installing the tail end intermediate*



2	3/8" x 1" hex bolt	16	Center well intermediate section
9	3/8" flange nut	19	Tail end intermediate section

2. The flanges of the sections should be installed flush without any gaps. If a gap occurs during installation, check the return pan tabs for interference.

   NOTE: *The return pan tabs are factory set to avoid interference between sections during installation. If the tabs are causing interference, bend them down incrementally to remove the interference.*

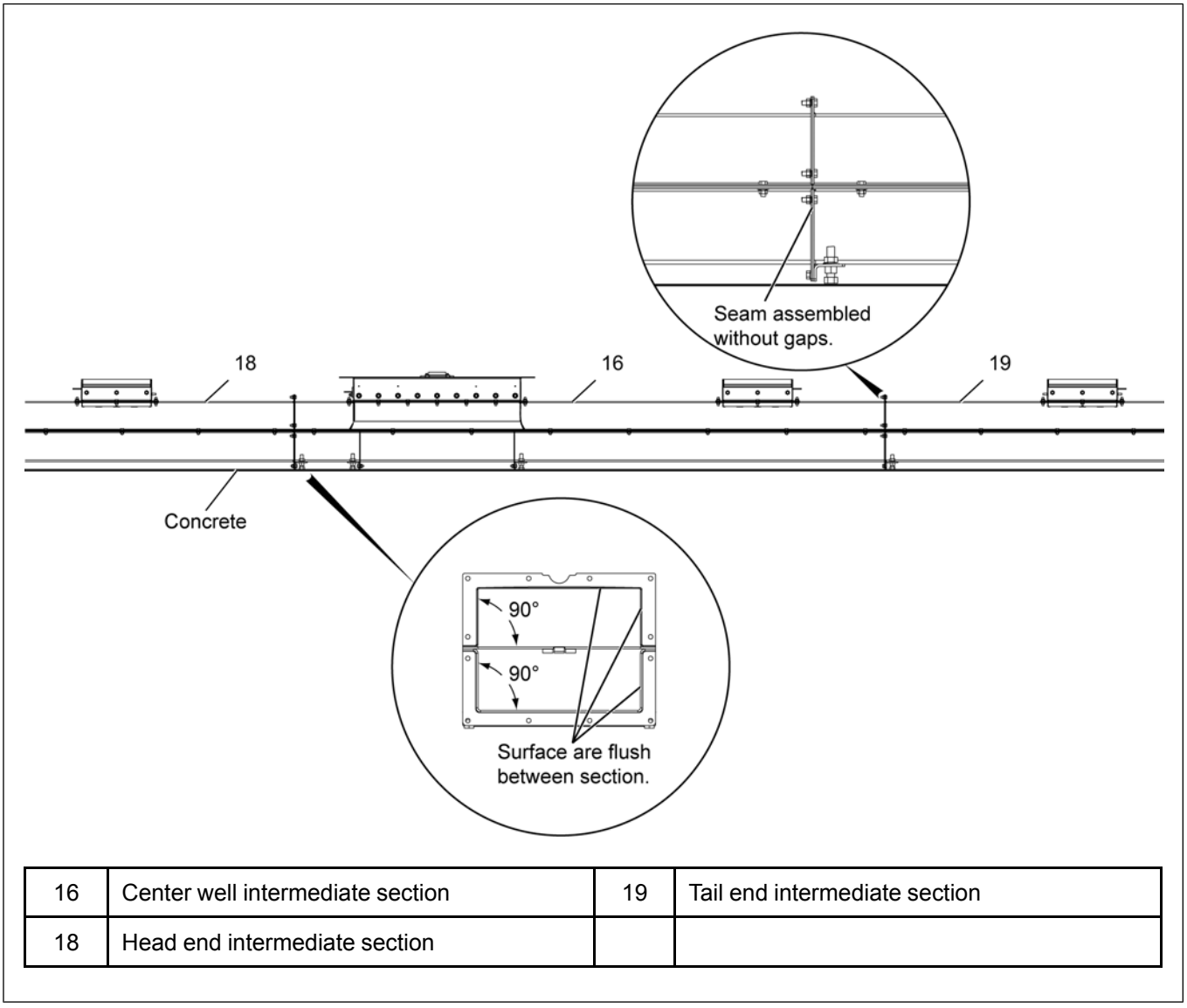
3. If your conveyor includes bend section, follow the same procedure to install those sections after the control rods are installed. Installing the bend sections at this stage would interfere with the installation of control rods.

4. You need to make sure the conveyor is level and straight to prevent the chain assembly damage. The straightness of the conveyor can be checked as follows.

   a. Align the outer edges of the seam flanges properly, so that the bottom, side and return pan interior surfaces be flush from one intermediate section to the next section.

   b. At seam connections where the return pan interlocks, check the transition from one return pan to the next pan. You can access the seam through an intermediate well opening and feel the same with the fingers.

Figure 4-11 *Checking the conveyor straightness*



16	Center well intermediate section	19	Tail end intermediate section
18	Head end intermediate section		

Modifying the Bin Wall for Conveyor

It is necessary to cut clearance holes in the bin sidewall for the conveyor to pass through.

1. Using the chalk line or string line as a reference, cut a hole of L x 15-1/4" in the sidewall.

   NOTE: *The value of "L" varies depending on your model.*

   a. *For 1212 model, L = 15-1/2".*

   b. *For 1612 model, L = 19-1/2".*

   c. *For 2112 model, L = 24-1/2".*

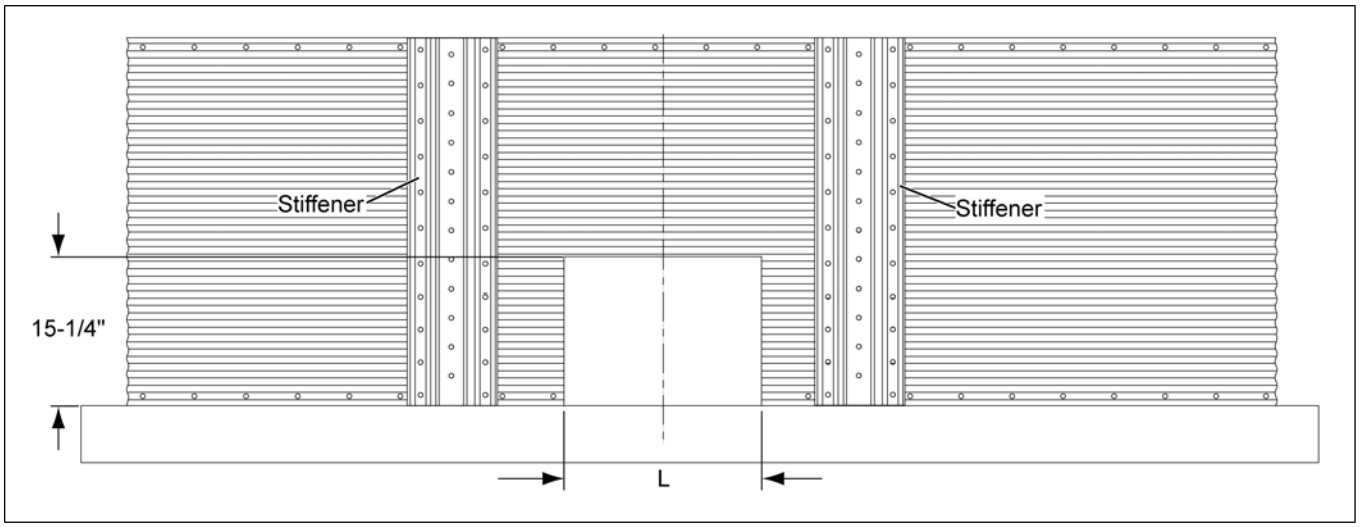
   IMPORTANT:

   a. *The field cut opening shall not interrupt any stiffener column. If a bin wall stiffener is within the conveyor area, you need to go back and adjust the placement of center well intermediate section. Refer to Installing the Center Well Intermediate Section, page 29 for details.*

   b. *The field cut opening should avoid interrupting the vertical sidewall seam if possible.*

   c. *Contact the bin manufacturer regarding any restrictions on bin wall penetrations or any required bin modifications at the penetration location.*

Figure 4-12 *Cutting hole in the sidewall*



2. You can also use the intermediate section flange close to the sidewall as a guide for marking the hole cutout.

   NOTE: *Additionally, you need to mark and cut a round hole in the sidewall above the previously cut hole for installing the control rods later.*

Installing the Intermediate Well Gate Seal

The intermediate well gate seals need to be installed before installing the control rods.

What You Should Know

NOTE:

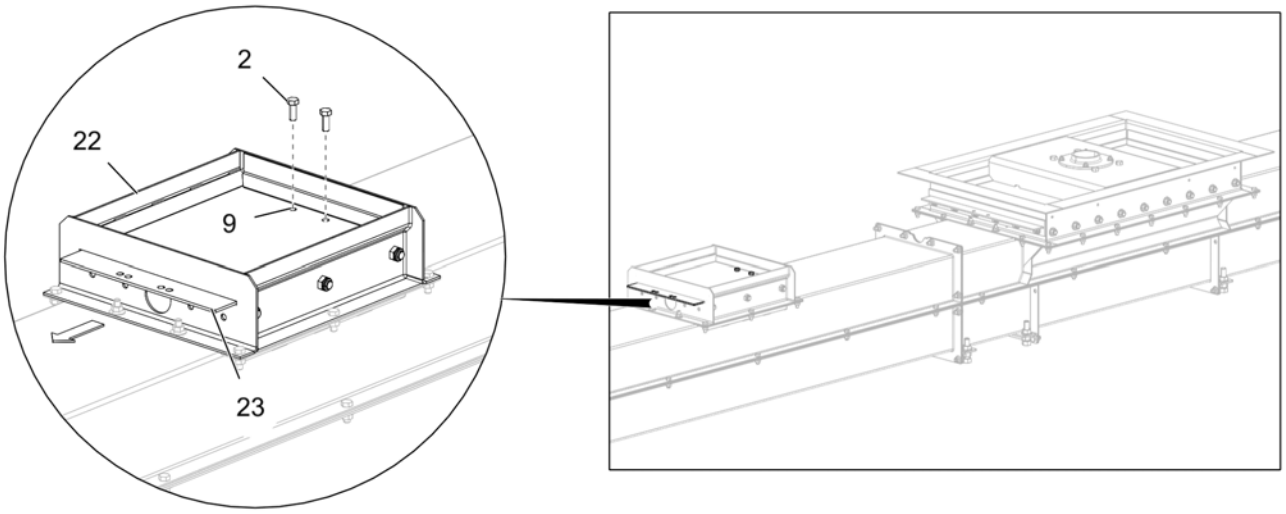
1. *The control rods will be installed tube-in-tube and step down in diameter from outside of the bin to the center. The seal installed to each intermediate well gate slide will be specific to the largest diameter rod, that is passing through the well.*
2. *For each intermediate well, there will be two seals of same pipe diameter. You need to install one seal to the gate opening side and other to the backside of the intermediate well.*
3. *The conveyor for 15' to 36' diameter bins will have 1" pipe diameter seal for all the intermediate wells.*
4. *The conveyor for 42' to 72' diameter bins will have both 1" and 1-1/2" pipe diameter seals. The seals with 1-1/2" pipe diameter are installed to the outside intermediate wells (close to the bin wall, away from the center well).*
5. *Since the rods are graduated in length, you can measure the diameter of the control rods to identify the corresponding seal location for the each intermediate wells.*

NOTE: *The conveyor for 42' to 72' diameter bins will have an additional pair of seals for 1/2" rods. This will be used if you choose to modify the intermediate gate slide, located on the center well intermediate section into an emergency gate slide.*

1. To install the 1" seals (27) to the intermediate well (22), you need to remove the gate slide (23) from the well. Pull and partially open the intermediate gate slide (23) to remove the 3/8" x 1" hex bolts (2) and 3/8" flange nuts (9).

2. After removing the 3/8" x 1" bolts (2), pull and completely remove the gate slide (23) from the intermediate well (22).

Figure 4-13 *Removing the intermediate well gate slide*

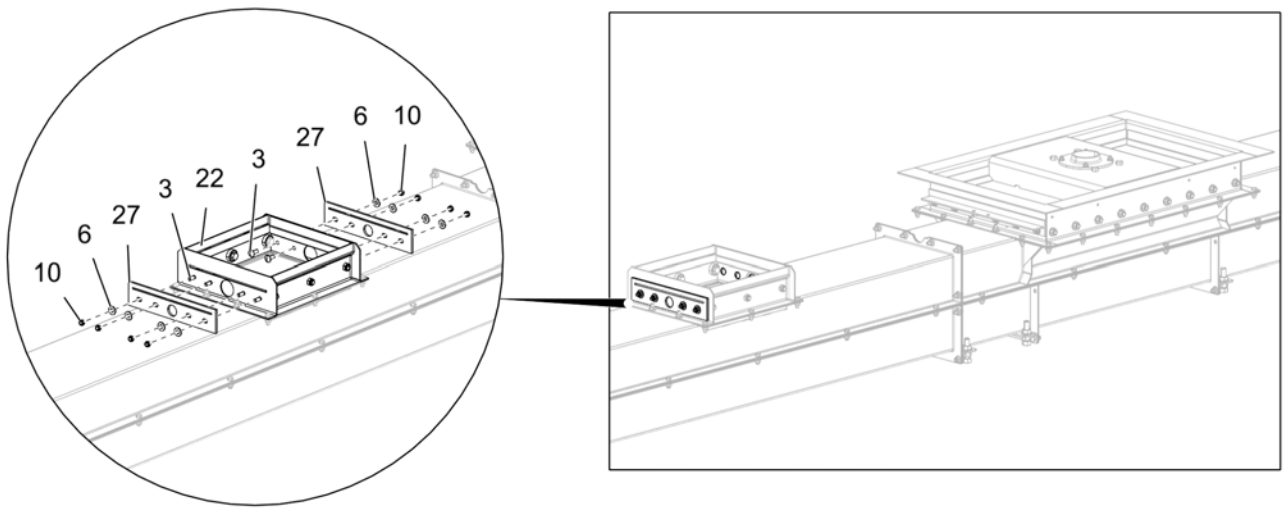


2	3/8" x 1" hex bolt	22	Intermediate well
9	3/8" flange nut	23	Intermediate well gate slide

3. Install one seal (27) to the gate opening side and other to the backside of the intermediate well (22) using 3/8" x 1" carriage bolts (3), 3/8" flat washers (6) and 3/8" nylock nuts (10).

   NOTE: *Install the carriage bolts (3) with bolt head on the inside of the intermediate well (22). Do not tighten the hardware until the control rods are installed.*

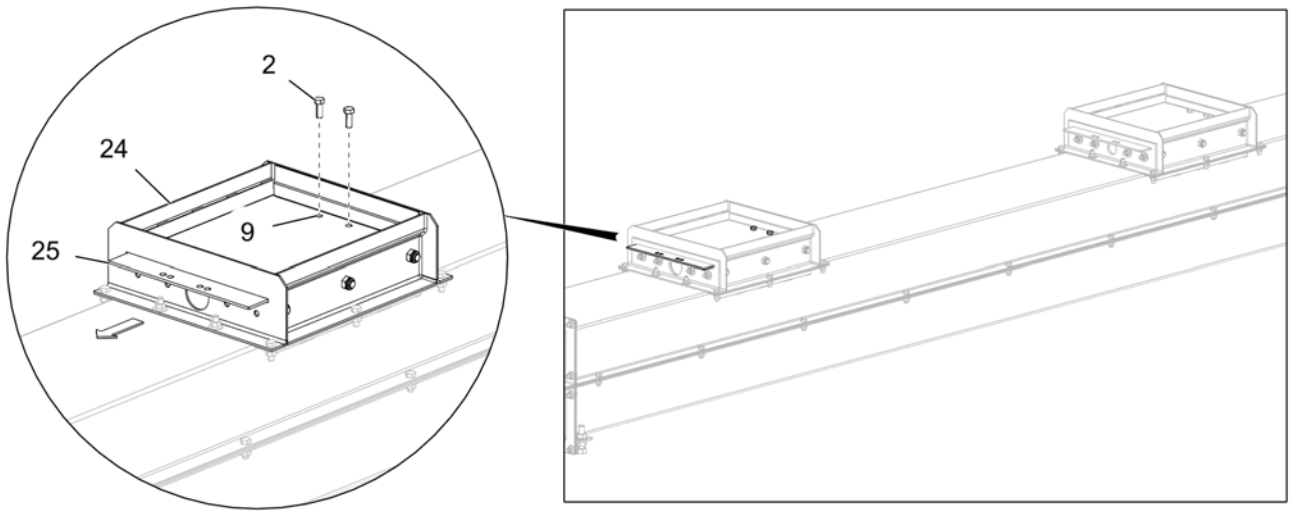
Figure 4-14 *Installing the intermediate well gate seals*



3	3/8" x 1" carriage bolt	22	Intermediate well
6	3/8" washer	27	1" seal for intermediate well
10	3/8" nylock nut		

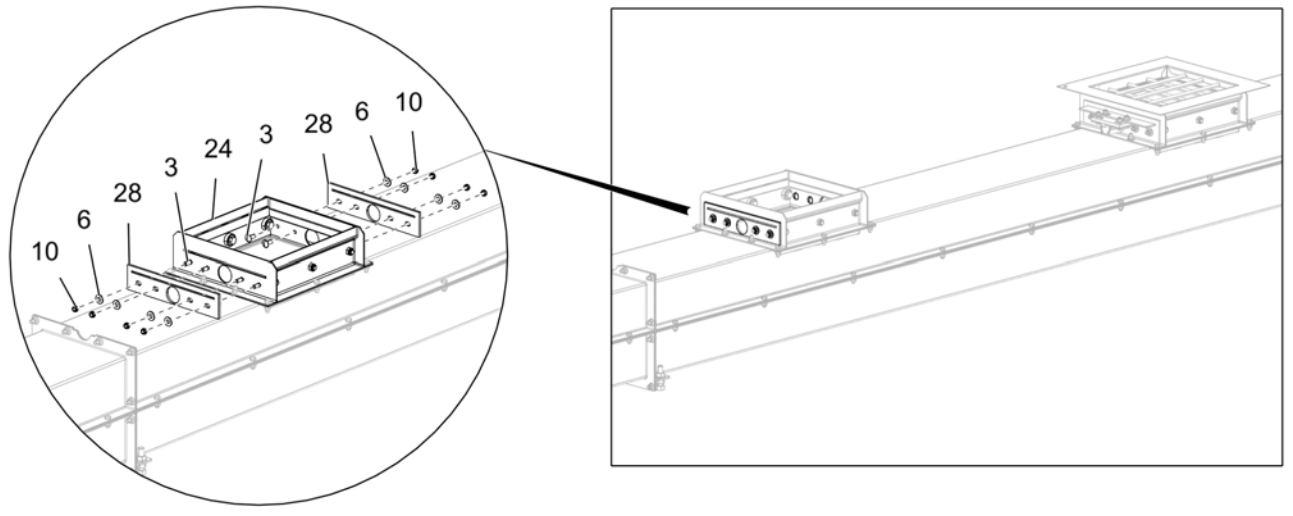
4. Re-insert the gate slide (23) back into the intermediate well (22) and re-install the 3/8" x 1" hex bolts (2) and 3/8" flange nuts (9), before closing the gate slide (23) completely.
5. Repeat the above steps to install the 1-1/2" gate seals (28) for outside intermediate well (24).

Figure 4-15 *Removing the outside intermediate well gate slide*



2	3/8" x 1" hex bolt	24	Outside intermediate well
9	3/8" flange nut	25	Outside intermediate well gate slide

Figure 4-16 *Installing the outside intermediate well gate seals*

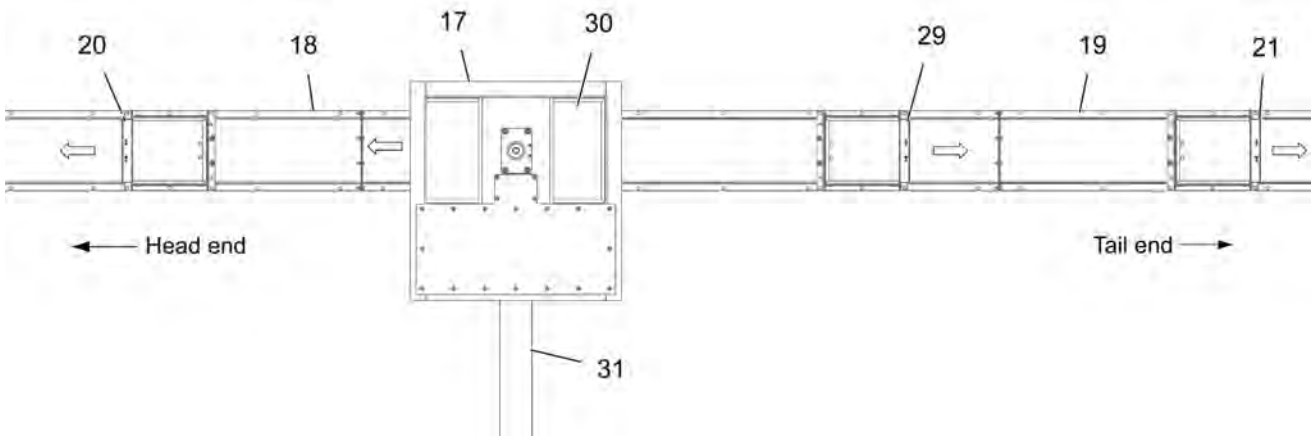


3	3/8" x 1" carriage bolt	24	Outside intermediate well
6	3/8" washer	28	1-1/2" seal for outside intermediate well
10	3/8" nylock nut		

Overview of Control Rods

1. If the intermediates are assembled correctly, all the intermediate gate slides will open away from the center of the bin.
2. The center well gate slide (30) orientation is factory set to open towards the head discharge end of the conveyor. If it is desired to operate the center well gate slide (30) from the tail end, you need to remove the center well gate slide (30), rotate it 180° and then reinstall.
3. If you are using a power sweep, the drive tube (31) is factory set to extend on the left hand side from the run of the conveyor, when viewed from the tail end. If there is a cause for the drive tube (31) to extend on the right hand side, you need to remove the center well gate (30) frame, rotate it 180° and then reinstall. **Do not** rotate the center well section as a whole. Also note that rotating the center well frame will also lead to operation of the center well gate slide from the tail end.

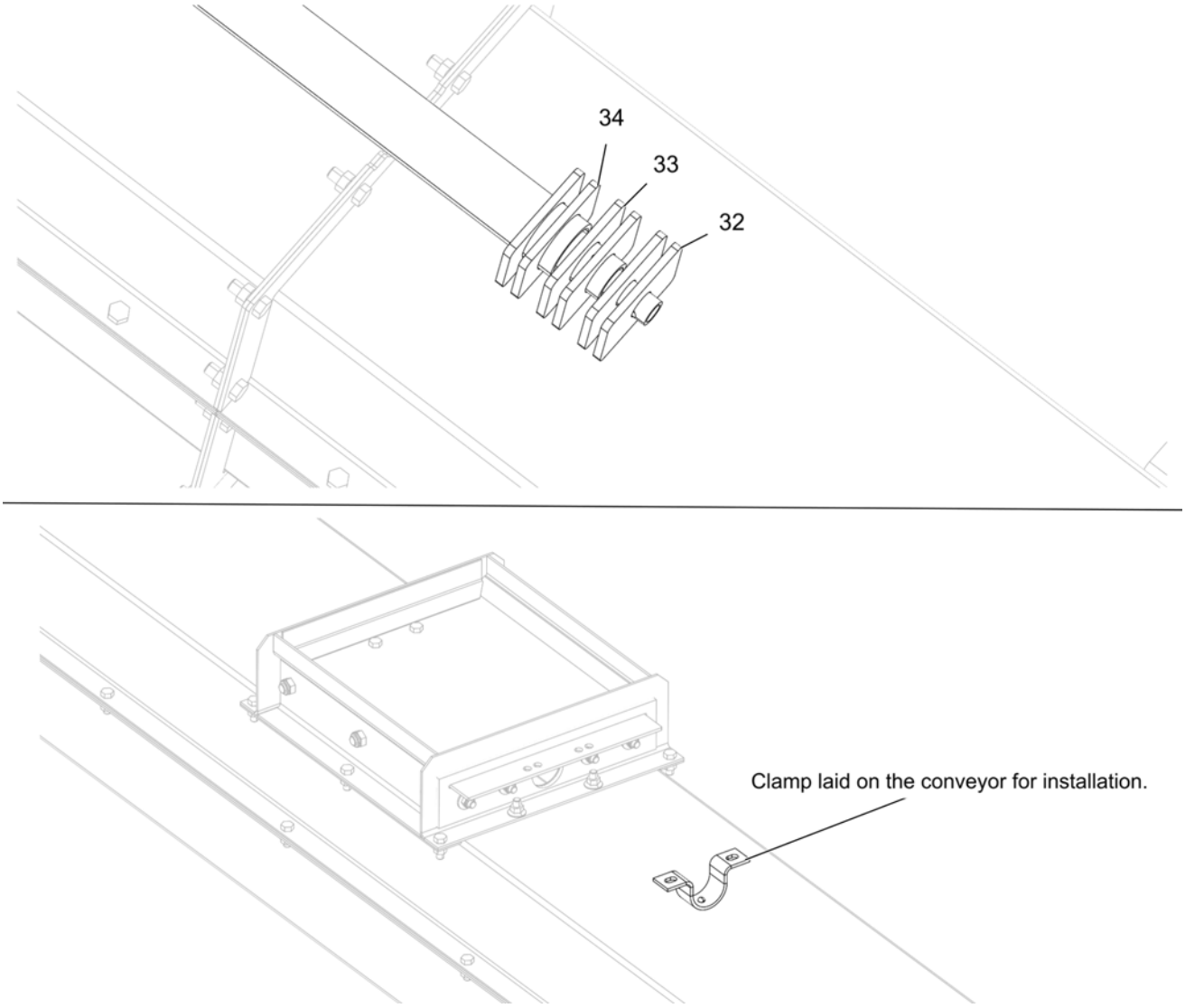
Figure 4-17 *Overview of center well and intermediate well gates*



17	Center well intermediate section	21	Tail end intermediate gate slide
18	Head end intermediate section	29	Intermediate gate slide on center well section
19	Tail end intermediate section	30	Center well gate slide
20	Head end intermediate gate slide	31	Power tube

4. The control rods (32, 33 and 34) are installed tube-in-tube for all the bin diameters. You can either install from the largest tube to smallest tube or pre-assemble the rod stacks and install all rods at once.
5. If there are space limitations outside the bin, you cannot insert the control rods (32, 33 and 34) through the gate seals. In such cases, it may be necessary to remove the gate slides from the intermediate well so that the gate slides and the rods can be assembled and installed as a single unit.
6. The control rods (32, 33 and 34) will be connected to the gate slides with gate clamps. It will be easier if you lay the appropriate gate clamp and the hardware on the conveyor, near to each intermediate well before installing the control rods.

Figure 4-18 *Overview of control rods*



32	1/2" center well control rod	34	1-1/2" outside intermediate well control rod
33	1" intermediate well control rod		

Installing the Center Well Control Rods

Before You Begin

If you are installing the control rods one by one, from largest to smallest, make sure to install the 1-1/2" and 1" intermediate well control rods before installing the 1/2" center well control rods. Refer to *Installing the Intermediate Well Control Rods, page 42* for details.

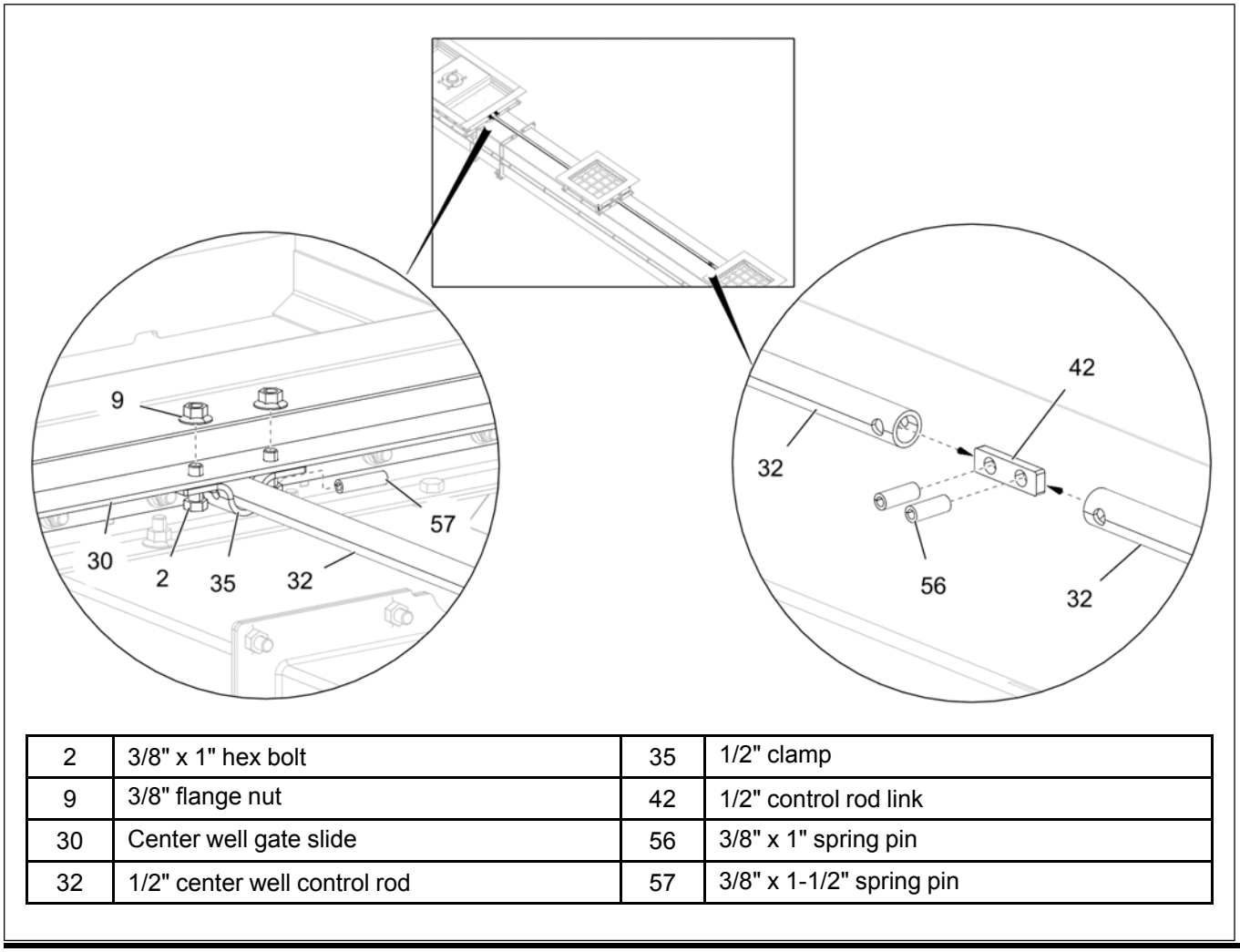
What You Should Know

Conveyors for bins from 15' to 48' diameters will have one 1/2" control rod and conveyors for bins from 54' to 72' diameters will have two spliced 1/2" control rods per side of the center well.

1. Align the 1/2" control rod (32) between the two holes in the center well gate slide (30).
2. Align the 1/2" pipe clamp (35) with the 1/2" control rod (32) and insert a 3/8" x 1-1/2" spring pin (57) through the hole in the control rod (32) and clamp (35).
3. Secure the 1/2" pipe clamp (35) to the center well gate slide (30) using two 3/8" x 1" hex bolts (2) and 3/8" flange nuts (9).

   NOTE: *Install bolts (2) with bolt head under the gate clamp (35).*
4. In case of bins from 54' to 72' diameters, the two 1/2" control rods (32) must be connected using a control rod link (42) and two 3/8" x 1" spring pins (56) to get the desired rod length.

Figure 4-19 *Installing the control rod to the center well gate slide*



2	3/8" x 1" hex bolt	35	1/2" clamp
9	3/8" flange nut	42	1/2" control rod link
30	Center well gate slide	56	3/8" x 1" spring pin
32	1/2" center well control rod	57	3/8" x 1-1/2" spring pin

Installing the Intermediate Well Control Rods

Install the 1-1/2" and 1" intermediate well control rods before installing the 1/2" center well control rods.

What You Should Know

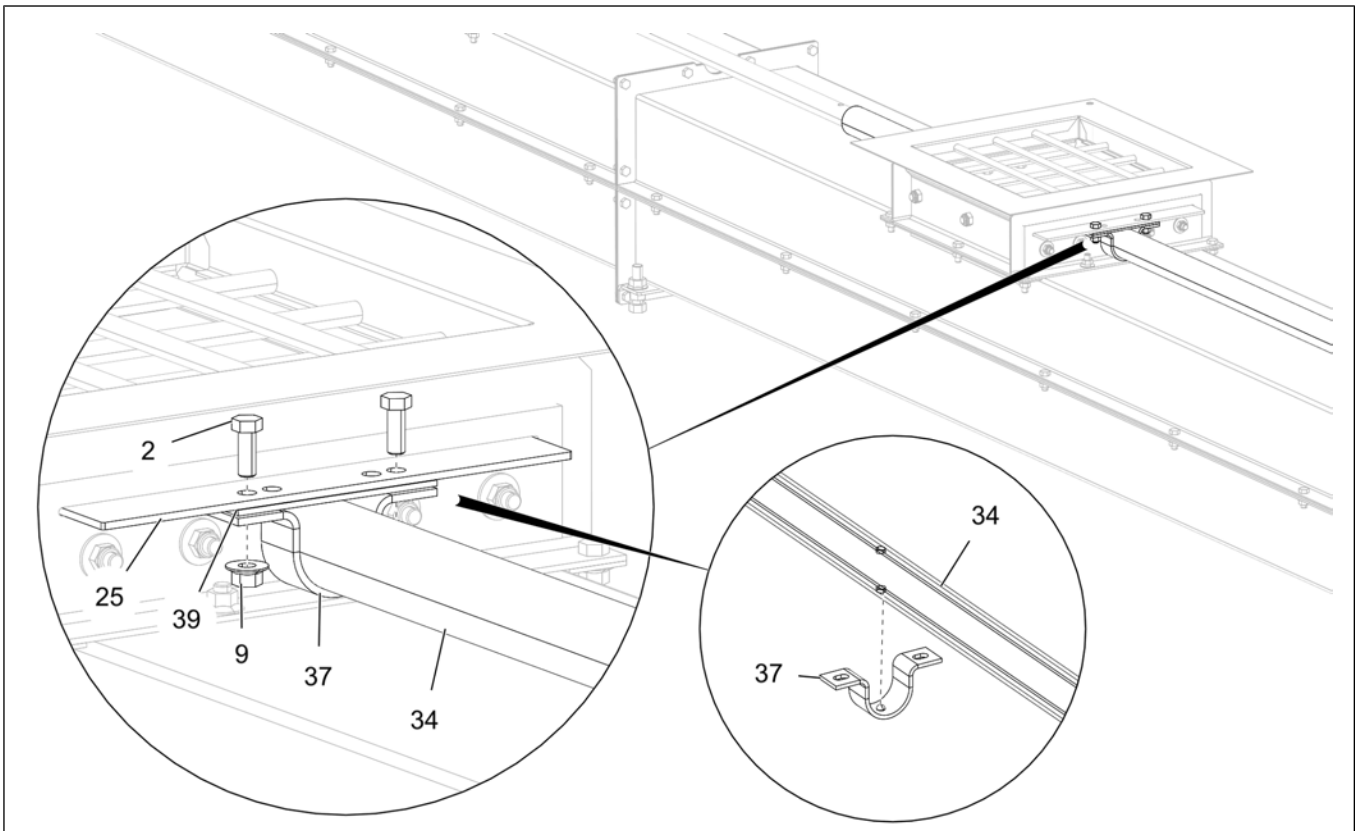
Conveyors for bins from 15' to 48' diameters will have one 1" control rod and conveyors for bins from 54' to 72' diameters will have two spliced 1" control rods per side of the center well.

NOTE: *The 1-1/2" control rods are installed to the outside intermediate wells (gate slides that are close to the bin wall, away from the center well). Make sure you install the 1-1/2" control rods before installing the 1" control rods.*

1. Align the 1-1/2" control rod (34) between the two holes in the outside intermediate well gate slide (25).
2. Align the 1-1/2" pipe clamp (37) with the 1-1/2" control rod (34) and make sure that the nipple formed in the bottom of the clamp (37) loop is inserted through the hole in the rod (34).
3. Place a 1/8" thick shim plate (39) above the 1-1/2" pipe clamp (34) and secure the clamp to the outside intermediate well gate slide (25) using two 3/8" x 1" hex bolts (2) and 3/8" flange nuts (9).

   NOTE: *Install bolts (2) with bolt head under the pipe clamp (34).*

Figure 4-20 *Installing the 1-1/2" control rods to the outside intermediate well gate slides*



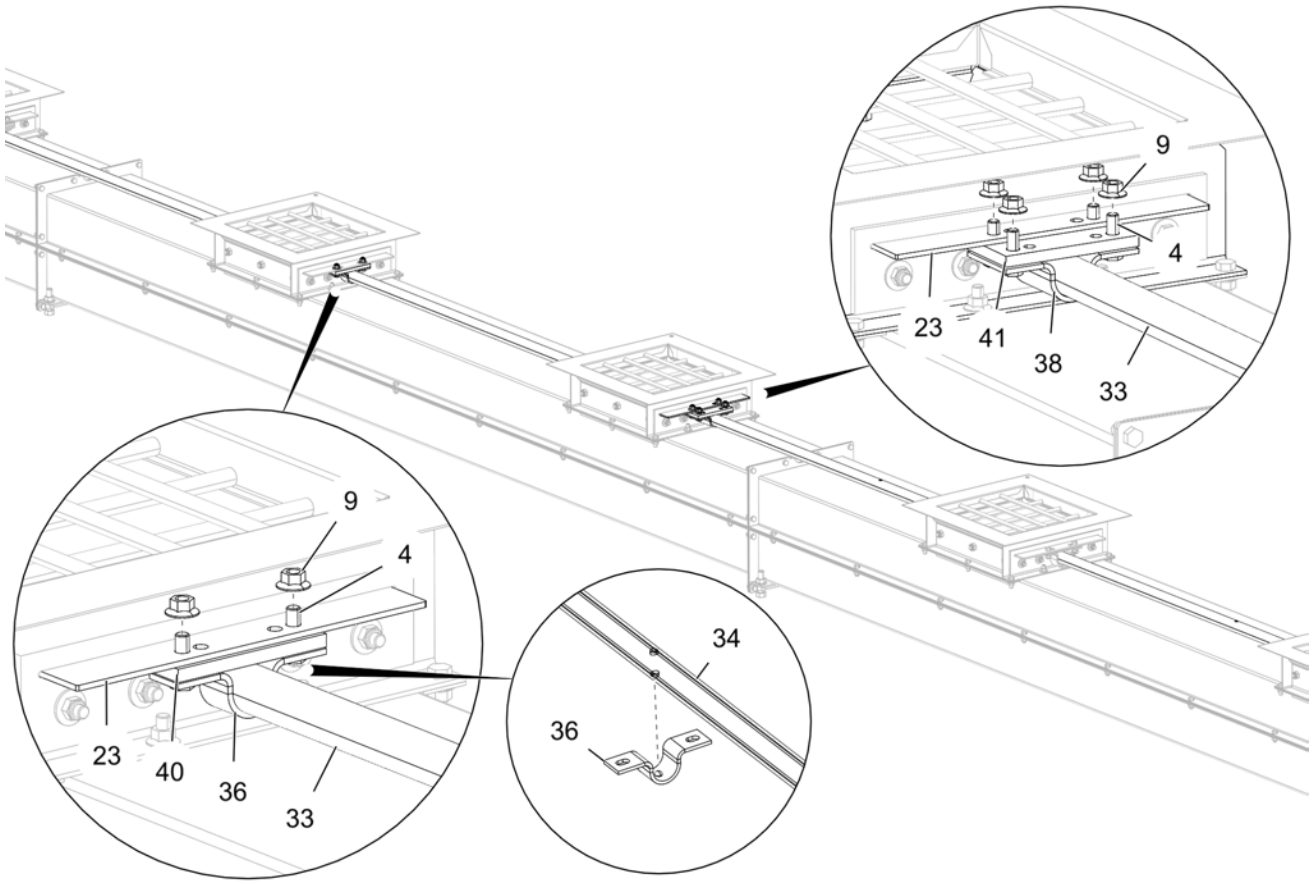
2	3/8" x 1" hex bolt	34	1-1/2" outside intermediate well control rod
9	3/8" flange nut	37	1-1/2" pipe clamp
25	Outside intermediate well gate slide	39	1/8" thick shim for 1-1/2" rod

4. Align the 1" control rod (33) between the two holes in the intermediate well gate slide (23).
5. Align the 1" pipe clamp (36) with the 1" control rod (33) and make sure that the nipple formed in the bottom of the clamp (36) loop is inserted through the hole in the rod (33).
6. Place a 3/8" thick shim plate (40) above the 1" pipe clamp (36) and secure the clamp (36) to the intermediate well gate slide (23) using two 3/8" x 1-1/4" hex bolts (4) and 3/8" flange nuts (9).

   NOTE: *Install bolts (24) with bolt head under the gate clamp.*
7. In case of bins from 54' to 72' diameters, the two 1" control rods (33) must be connected using a double width 1" pipe clamp (38), double width 3/8" thick shim plate (41), four 3/8" x 1-1/4" hex bolts (4) and 3/8" flange nuts (9). This dual width clamp (38) and shim (41) not only connects the 1" control rods (33) together but also secures the 1" control rods (33) to the nearest intermediate well gate slide (23).

   NOTE: *Make sure that the nipple formed in the bottom of the dual width clamp (38) loop is inserted through the hole in the each pipe (33).*

Figure 4-21 *Installing the 1" control rods to the intermediate well gate slides*



4	3/8" x 1-1/4" hex bolt	36	1" pipe clamp
9	3/8" flange nut	38	1" double width pipe clamp
23	Intermediate well gate slide	40	3/8" thick shim for 1" rod
33	1" intermediate well control rod	41	3/8" thick double width shim for 1" rod

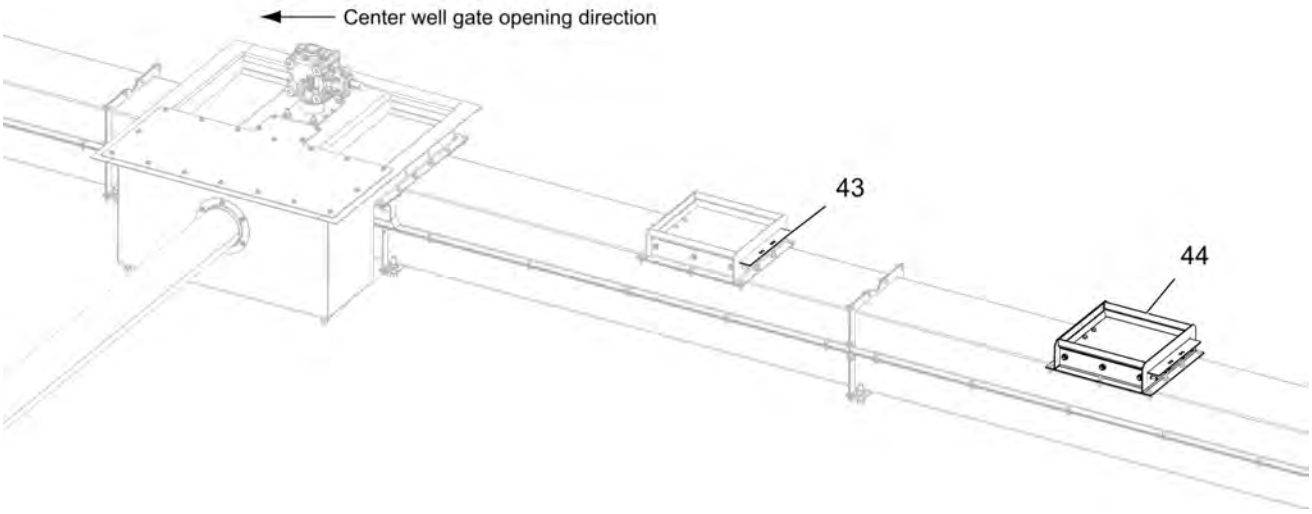
Installing the Emergency Well Control Rod (Optional)

What You Should Know

NOTE:

1. *Conveyors for bins from 42' to 72' diameters have the option to change the intermediate gate slide located on the center well intermediate section into an emergency gate slide (43) by making changes to the 1" rod that controls that gate slide.*
2. *This emergency option allows you to open the emergency well gate slide without opening any other intermediate wells.*
3. *There well be extra 1/2" control rods, 1/2" gate seals, 1/2" pipe clamp, two 3/8" thick shims and hardware to install the emergency well gate slide. If you prefer not to use the emergency well gate slide, you can skip the below instructions and leave the extra 1/2" control rods unused.*

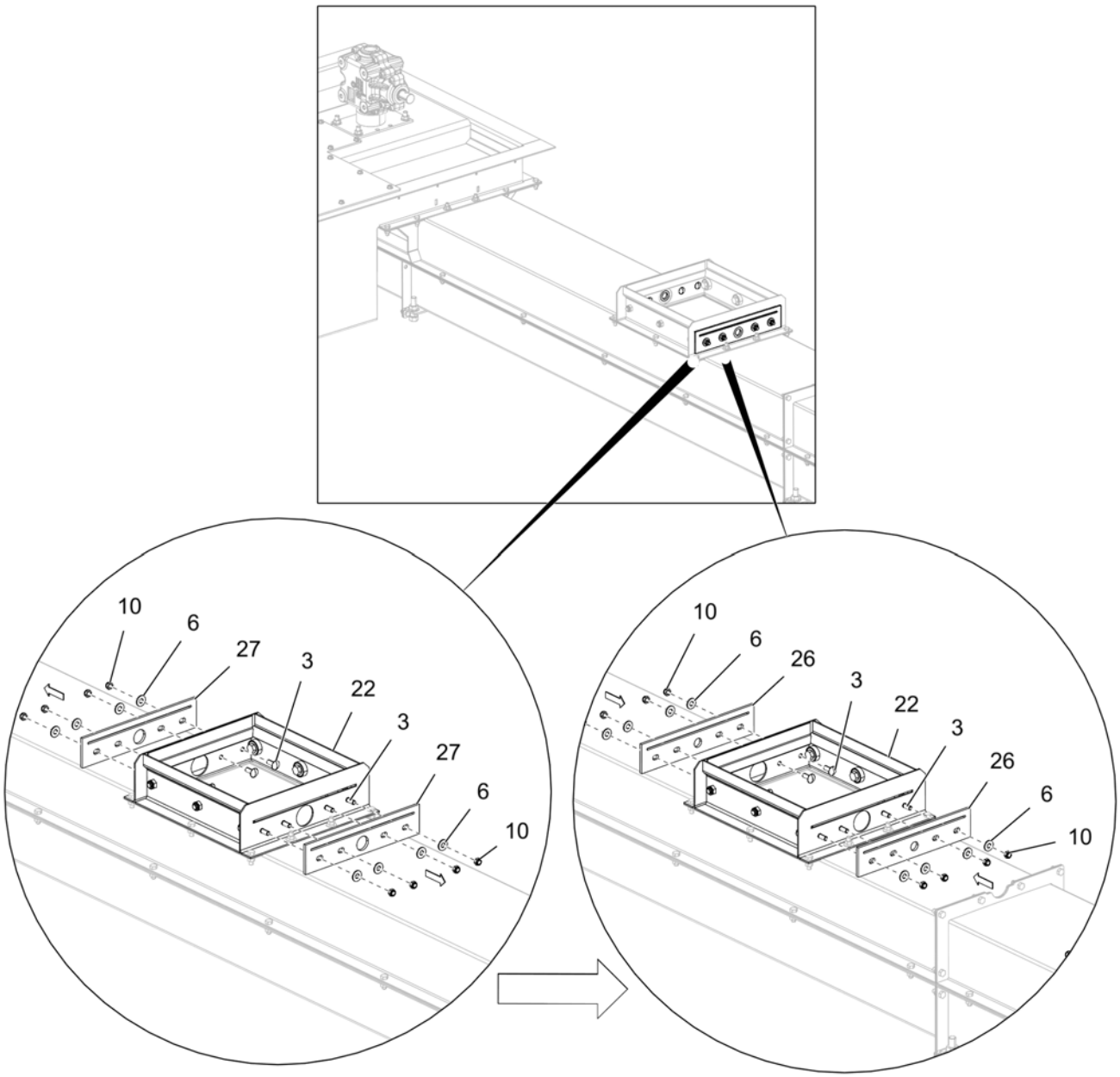
Figure 4-22 *Identifying the emergency well gate slide*



43	Emergency gate slide (Intermediate well on center well section)	44	Intermediate well (next to emergency gate slide)

1. Before you remove the seal (27), you need to remove the gate slide from the intermediate well (22). To remove the gate slide, refer to *Figure 4-13, page 37*.
2. Remove the 1" seals (27) and reinstall the 1/2" seals (26) to the intermediate well (22) located on the center well intermediate section.

Figure 4-23 *Replacing the 1" gate seal with 1/2" gate seal*



3	3/8" x 1" carriage bolt	22	Intermediate well
6	3/8" washer	26	1/2" seal
10	3/8" nylock nut	27	1" seal

3. You need to cut down the 1" control rod (33) to expose the 1/2" emergency gate control rod (59). Measure and mark 16-1/2" on the 1" control rod (33) from the intermediate well (44), which is the immediate next to the emergency well gate slide (43).

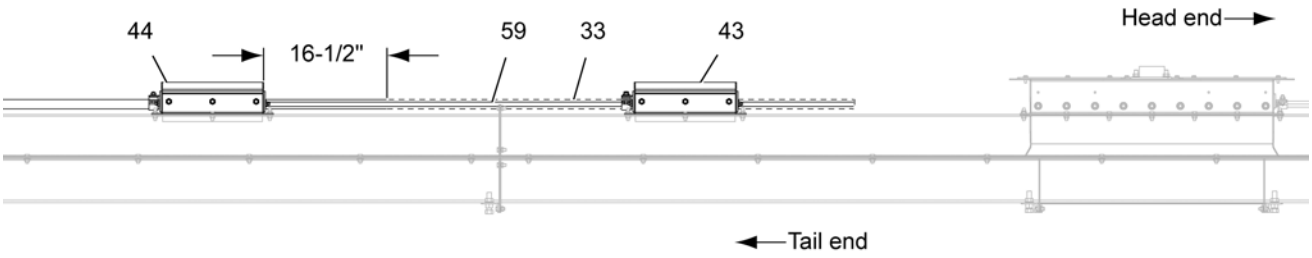
   NOTE:

   a. *Make sure you measure from the vertical surface of the intermediate well (44) in the direction of center well gate slide opening.*

   b. *Make sure the intermediate well (44) gate slide is fully closed before measuring and cutting the 1" control rod (33).*

4. Remove the 1" control rod (33) and cut the tube at the marked location. Deburr and re-install the 1" control rod (33). Now the 1/2" emergency gate control rod (59) will be exposed.

Figure 4-24 *Cutting down the 1" control rod*



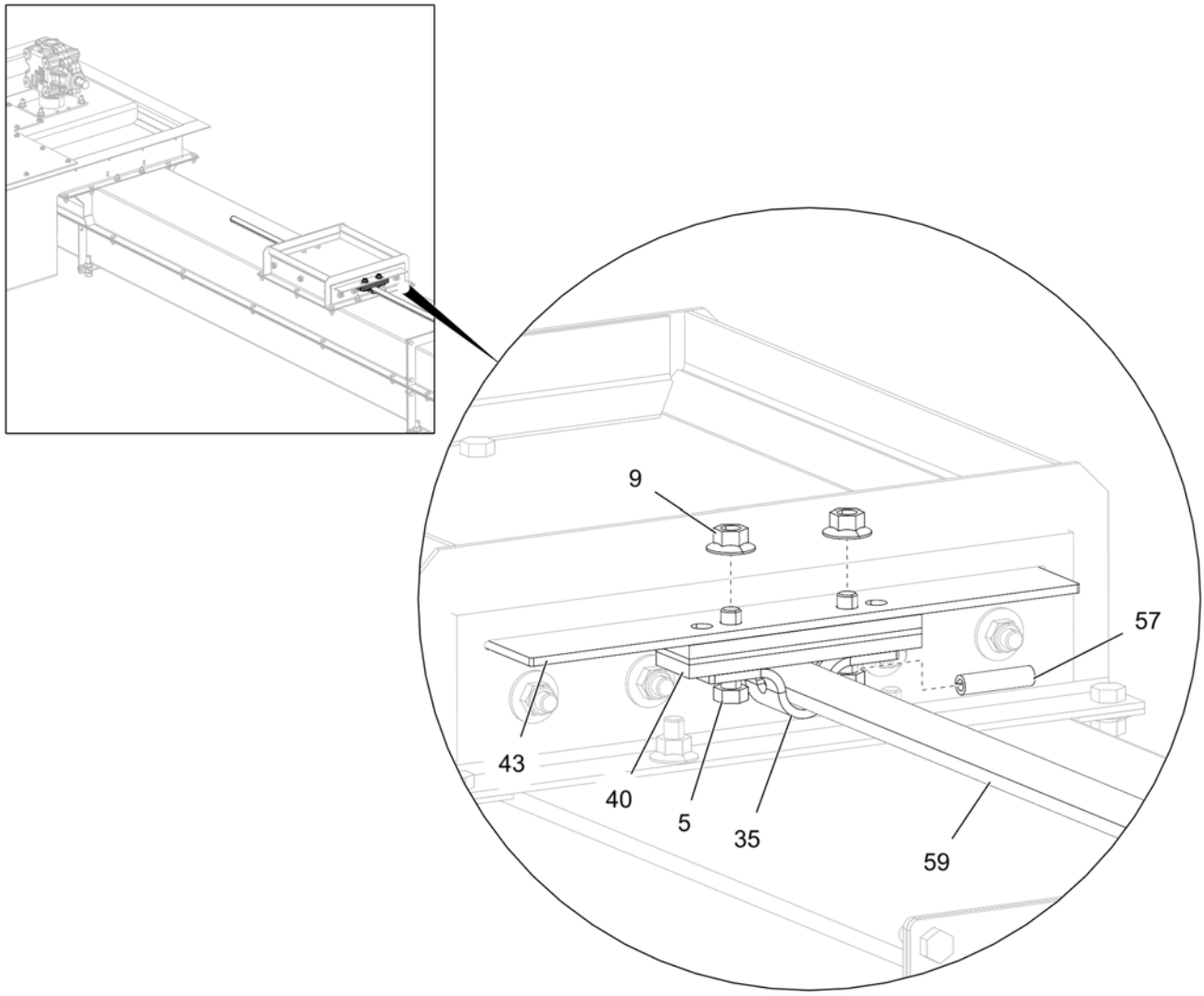
NOTE: *Cut and remove the 1" control rod (33) to expose the 1/2" control rod (59).*

33	1" intermediate well control rod	44	Intermediate well (next to emergency gate slide)
43	Emergency gate slide	59	1/2" emergency well control rod

5. Align the 1/2" pipe clamp (35) with the 1/2" emergency gate control rod (59) and insert a 3/8" x 1-1/2" spring pin (57) through the hole in the control rod (59) and clamp (35).
6. Place the two 3/8" thick shim plates (40) above the 1/2" pipe clamp (35) and secure the clamp (35) to the emergency gate slide (43) using two 3/8" x 1-1/2" hex bolts (5) and 3/8" flange nuts (9).

   NOTE: *Install bolts (5) with bolt head under the gate clamp.*

Figure 4-25 *Installing the 1/2" control rod to the emergency well gate slide*



5	3/8" x 1-1/2" hex bolt	43	Emergency gate slide
9	3/8" flange nut	57	3/8" x 1-1/2" spring pin
35	1/2" pipe clamp	59	1/2" emergency gate control rod
40	3/8" thick shim for 1" rod		

After You Finish

After all the control rods are installed, go back and snug-tight the nylock nuts that are securing the gate seals. Since the UHMW will expand and contract with temperature, lightly snugging will allow the seal to move thereby avoiding potential binding.

Installing the Control Rod Jack Assembly

The control rod jacks will be installed to the first intermediate seam flange outside the bin with the ‘paw’ end of the jack’s rack arm facing the bin.

What You Should Know

NOTE:

1. *The well seals hold the control rods tight, so that the rods do not move on their own due to vibration. By using the jack, you can open the center well independent of the intermediate wells or in groups of center well and intermediate wells or all the wells at once. To operate a control rod, you need to move and captivate the ‘paw’ plate at the end of the rack arm between the two plates that are welded to the ends of the individual control rods.*
2. *The control rod that is closer to the jack is the 1/2" center well control rod. Next to the center well control rod is the 1” control rod for the innermost set of intermediate gate slides and the next control rod closer to the bin is the 1-1/2" control rod for the outer intermediate gate slides. Factory setup of the center well gate slide will put the jack operation at the head discharge end of the conveyor.*
3. *You need to open the center well gate slide first to cone out the full bin. Once this is achieved, you need to open the innermost intermediate gate slides first and then followed by the outer gate slides. Opening the gate slides should be done in sequence to safely expose the sweep. Do not open all the gate slides at once when the bin is full.*

1. Mount the jack assembly (45) to the jack mounting bracket (46) using the existing 3/8" x 1-1/2" hex bolts (5) , 3/8" flat washers (6) and 3/8" flange nuts (9).

   NOTE:

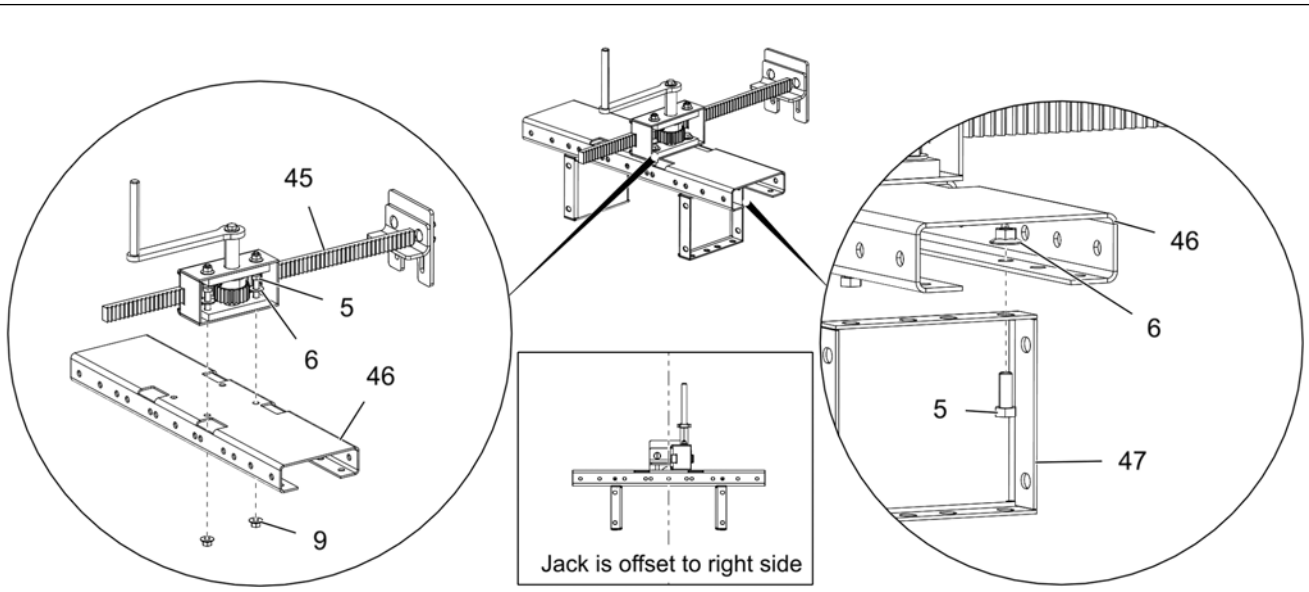
   a. *Make sure to install the jack assembly (45) to the holes on the right side of the bracket (46), so that jack assembly (45) will be offset to the right when viewed at the bin wall from the outside.*

   b. *Use the bolts (5) that were holding the lower bearing block inside the jack assembly (45).*

2. Install the two side brackets (47) to the bottom of the jack mounting brackets (46) using 3/8" x 1" hex bolts (2) and 3/8" flange nuts (9).

   NOTE: *There will be three sets of holes at each ends of the jack mounting bracket (46). You need to check your conveyor size, to find the suitable set of holes for installing the side brackets (47).*

Figure 4-26 *Mounting the jack assembly to the jack mounting and side brackets*

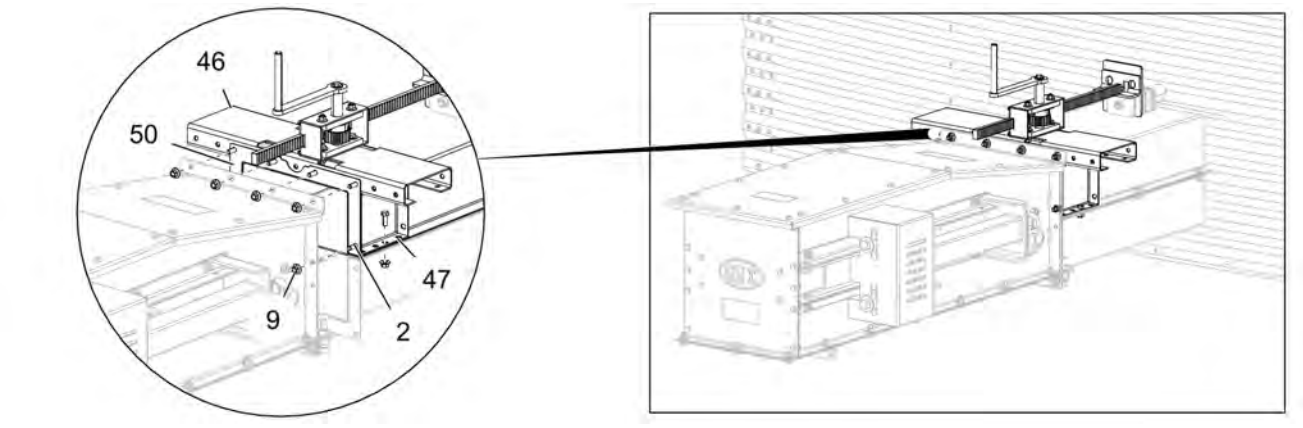


5	3/8" x 1-1/2" hex bolt	45	Jack assembly
6	3/8" washer	46	Jack mounting bracket
9	3/8" flange nut	47	Side brackets

3. Install the side brackets (47) and jack mounting brackets (46) to the conveyor seam flange (50) using existing 3/8" x 1" hex bolts (2) and 3/8" flange nuts (9).

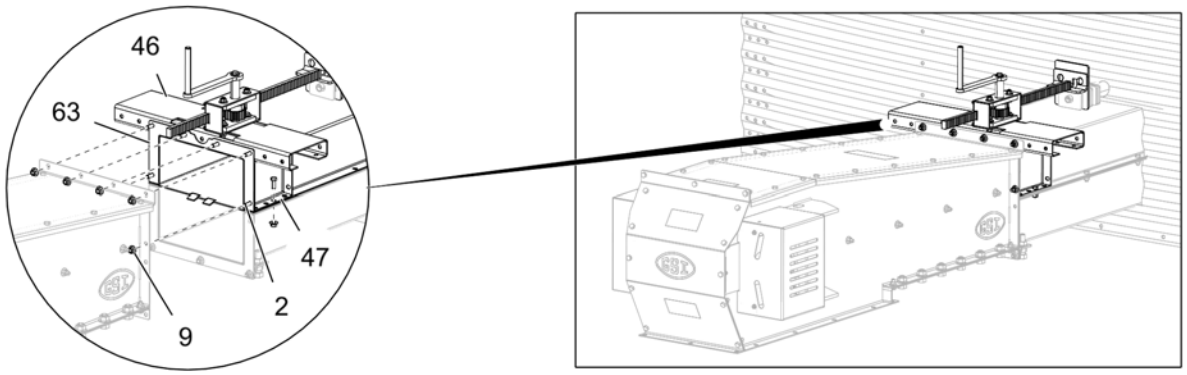
   NOTE: *Make sure to remove the 3/8" bolts (2) from the seam flange before installing the brackets (46 and 47).*

Figure 4-27 *Installing the jack mounting brackets and side brackets to the conveyor (tail end)*



2	3/8" x 1" hex bolt	47	Side brackets
9	3/8" flange nut	50	Tail end seam flange
46	Jack mounting bracket		

Figure 4-28 *Installing the jack mounting brackets and side brackets to the conveyor (head end)*

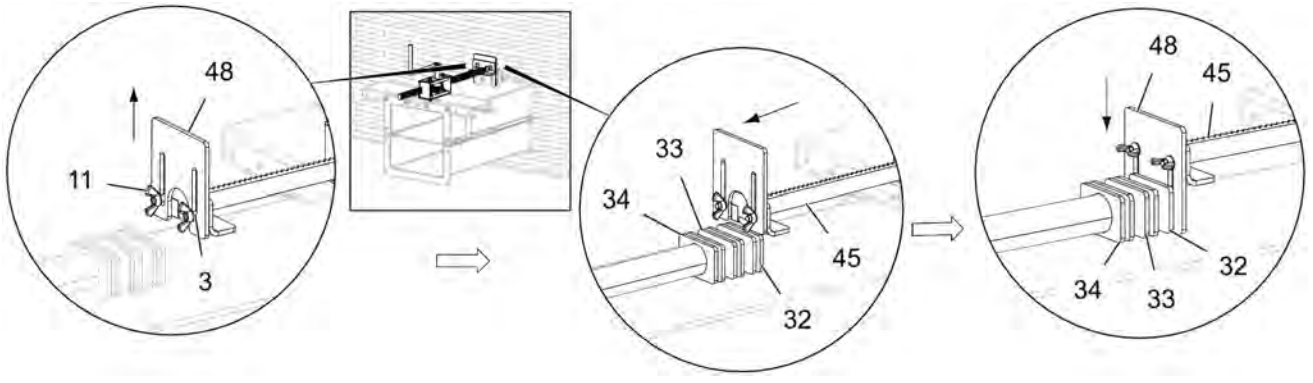


2	3/8" x 1" hex bolt	47	Side brackets
9	3/8" flange nut	63	Head end seam flange
46	Jack mounting bracket		

4. To operate a control rod, loosen the 3/8" wing nuts (11) and slide the 'paw' plate (48) at the end of the rack arm upwards.
5. Rotate the jack handle to position the rack arm between the two welded plates of the control rod (32 or 33 or 34), that needs to be moved.
6. Lower the 'paw' plate (48) between the welded plates of the control rod (32 or 33 or 34) and re-tighten the wing nuts (11).

   NOTE: *It would be enough to sung-tighten the wing nuts (11). Make sure the 'paw' plate (48) is properly captivated between the weld plates.*

Figure 4-29 *Operating the control rods using the jack assembly*



3	3/8" x 1" carriage bolt	34	1-1/2" outside intermediate well control rod
11	3/8" wing nuts	45	Jack assembly
32	1/2" center well control rod	48	'Paw' plate
33	1" intermediate well control rod		

After You Finish

After installing the control rods and verifying the gate slide openings based on the jack operation, ensure the hardware is tightened for all pipe connections (splices and clamps) before installing the bin floor.

Installing the Bin Wall Adapter Plates

Before You Begin

Make sure the control jack assembly is installed and the control rods are functional.

1. Attach the upper adapter plate (52) and the lower adapter plate (53) to the conveyor. Slide the adapter plates over the conveyor till they are flush with the bin sidewall (51).
2. Drill through the holes in the adapter plates (52 and 53) and install using 1/4" x 1" sheet metal screws (12).
3. It will be necessary to measure and field cut the lower adapter plate (53) to match with your installation.

Figure 4-30 *Installing the bin wall adapter plates (tail end)*

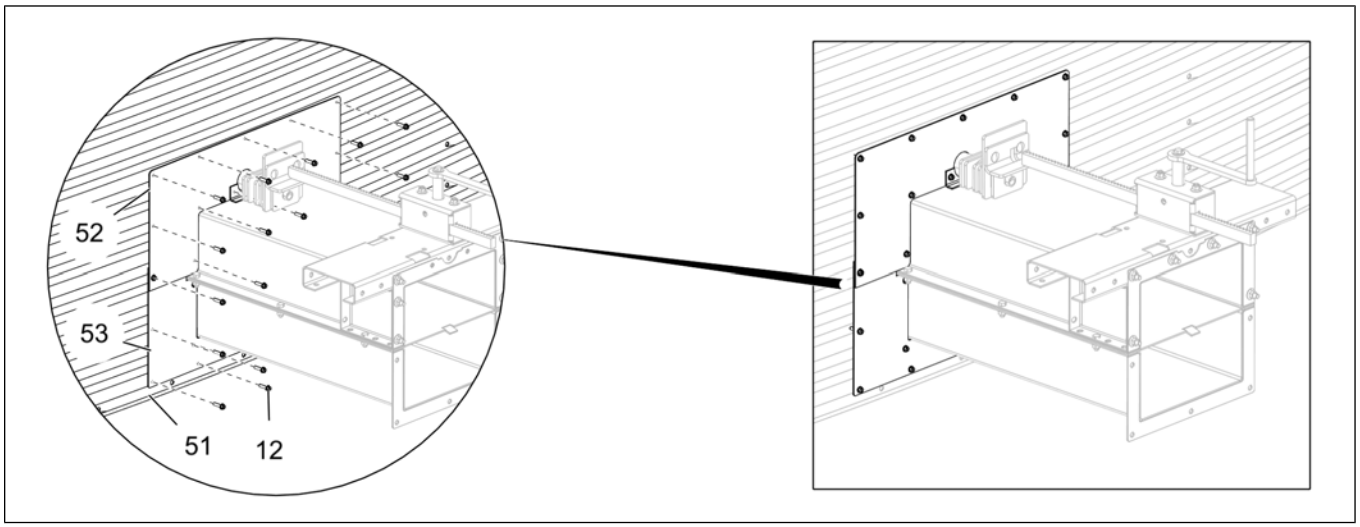
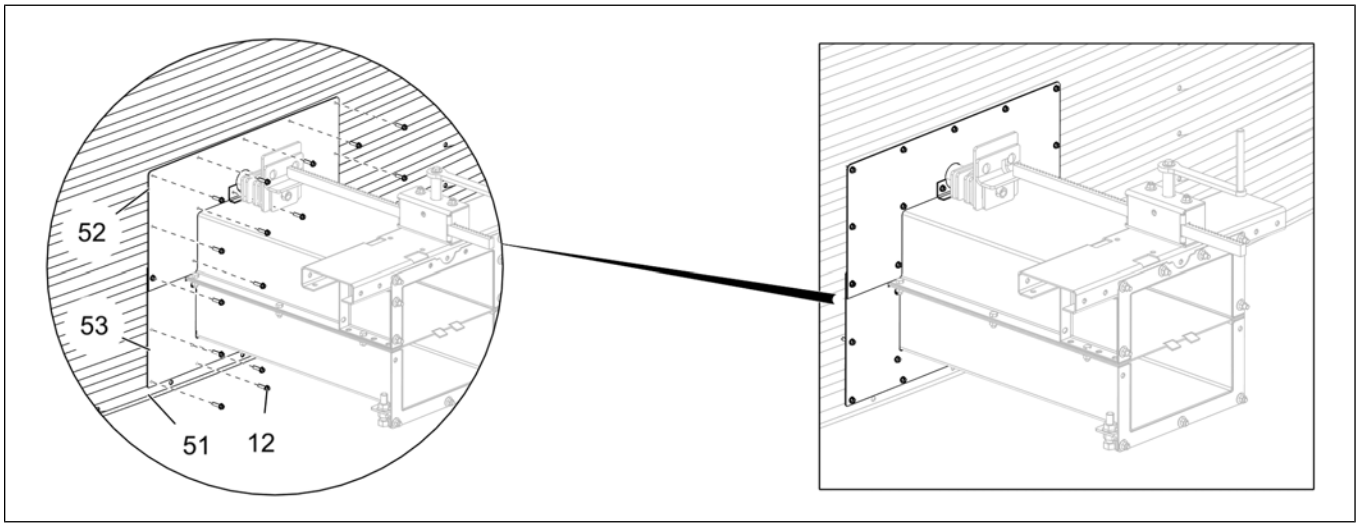


Figure 4-31 *Installing the bin wall adapter plates (head end)*



12	1/4" x 1" sheet metal screw	52	Upper adapter plate
51	Bin sidewall	53	Lower adapter plate

Installing the Intermediate Sections Between Multiple Bins

If a single conveyor spans between multiple bins, it will be necessary to make field modifications to the specific intermediate sections.

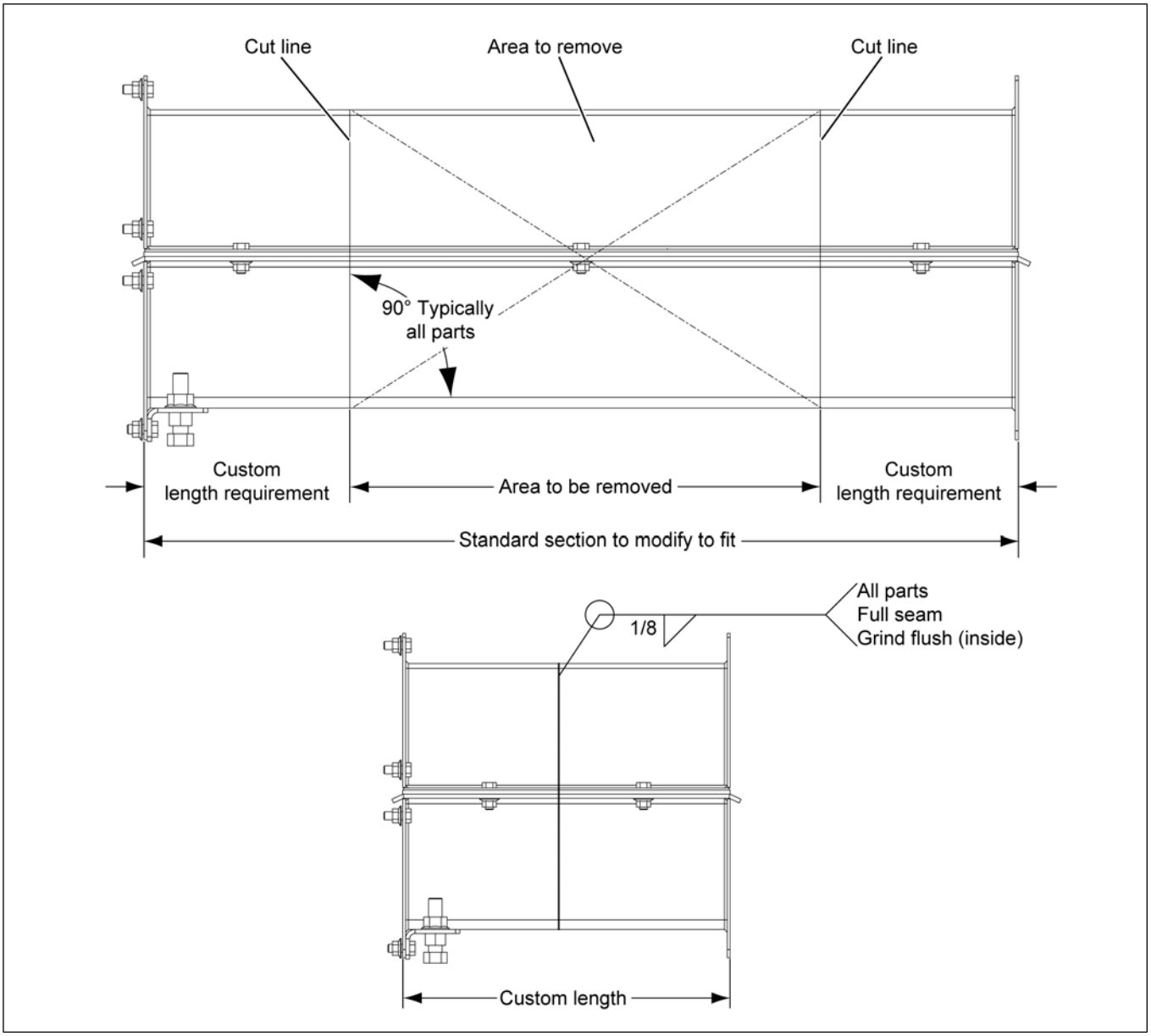
1. As per the requirement, measure and make two marks in the intermediate section that needs to be modified.

   NOTE: *The measurement between the two marks is the part of the intermediate section that will be removed.*

2. Cut and remove the middle section as marked. Weld back the two end sections together and install this modified intermediate section to the conveyor.

   NOTE: *The modification to the intermediate section between the bins varies based on each location.*

Figure 4-32 *Modifying the intermediate section*



Installing the Chain Assemblies

The chain assembly can be installed at anytime during the conveyor assembly.

What You Should Know

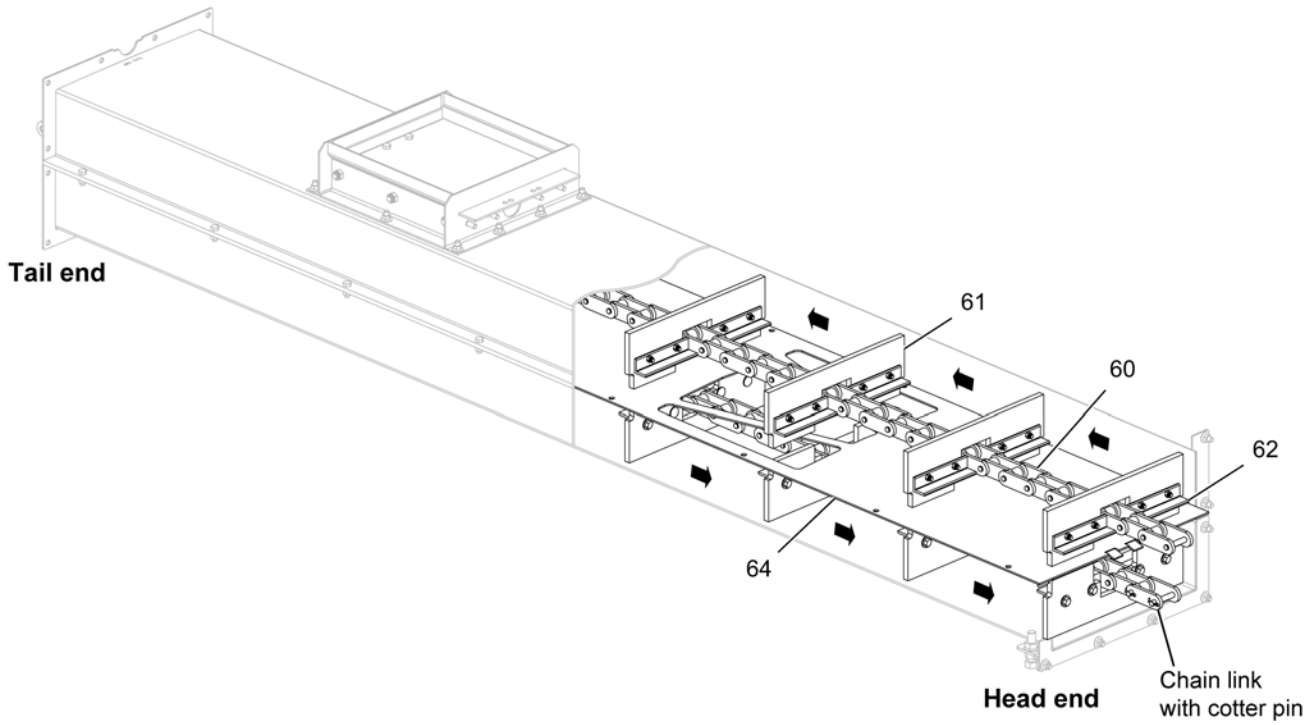
The total length of the chain is predetermined by the manufacturer for each conveyor. The conveyor drag chain is shipped with flights pre-assembled from factory. The UHMW paddles are notched at the middle to go around the sprockets at each ends.

NOTE: *The chain will travel with the UHMW paddles in the front with the chain flight trailing behind. The chain will slide on the bottom surface of the conveyor while travelling towards the discharge (head section). When returning, the chain will travel towards the tail section sliding on top of the return pans.*

1. Install the chain (60) so that the notch is next to the center pan or rails and the UHMW paddles (61) are in front of the welded chain flights (62) in the direction of chain travel.
2. Always install the 5' sections as they are required for adjusting the chain length for proper tension.
3. Connect the chain (60) lengths together by using connecting links and/or pins.

   NOTE: *All 10' chain assemblies are riveted and all 5' chain assemblies are cotter pinned.*

Figure 4-33 *Installing the chain assembly*

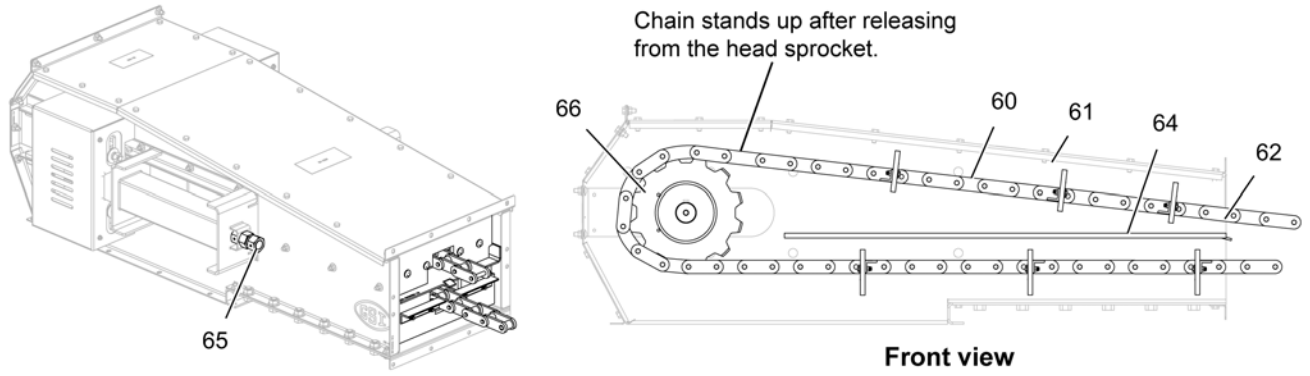


60	Chain	62	Chain flight
61	UHMW paddle	64	Return pan

4. Use the take-up screws (65) located on each side of the take-up head or tail section to tighten the drag chain (60) assembly. Tighten the chain (60) until the paddles on the return side stand up. Do not overtighten.

   NOTE: *The tension would be enough if the return side of the chain (60) stands up after releasing from the head sprocket (66) under load.*

Figure 4-34 *Tightening the chain assembly*



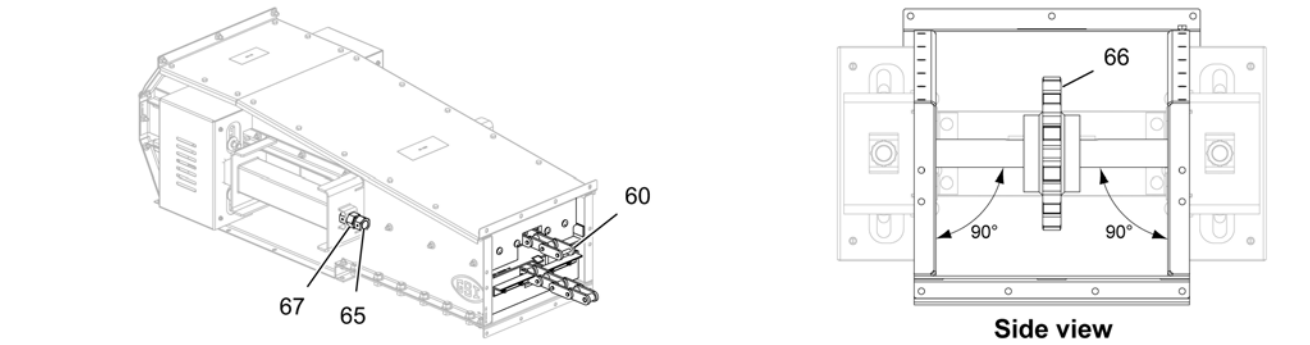
60	Chain	64	Return pan
61	UHMW paddle	65	Take-up screw
62	Chain flight	66	Sprocket

5. After the chain (60) is tight, make sure the head and tail sprocket (66) shafts are square to the box sides. If the sprocket (66) shafts are not square, loosen the hex nuts (67) on each side of take-up screws (65) and adjust them until the shafts are square. Lock the take-up (65) screws by tightening the hex nuts (67) against the C-channel.

6. Rotate the chain (60) one complete revolution and check if the paddles are not catching any flanges or the chain is rubbing against the sides of the conveyor. Ensure a break-in period, where the chain (60) is allowed to run and seat itself. After running the chain (60) for the adequate period, check and re-tighten the chain if necessary and remove any excess chain (60). Repeat the process as needed.

   NOTE: *While performing any checkups or maintenance activity to the chain (60), always make sure to stop the machine, disconnect and lock out the power source.*

Figure 4-35 *Checking the sprocket shafts*



60	Chain	66	Sprocket
65	Take-up screw	67	Hex nut

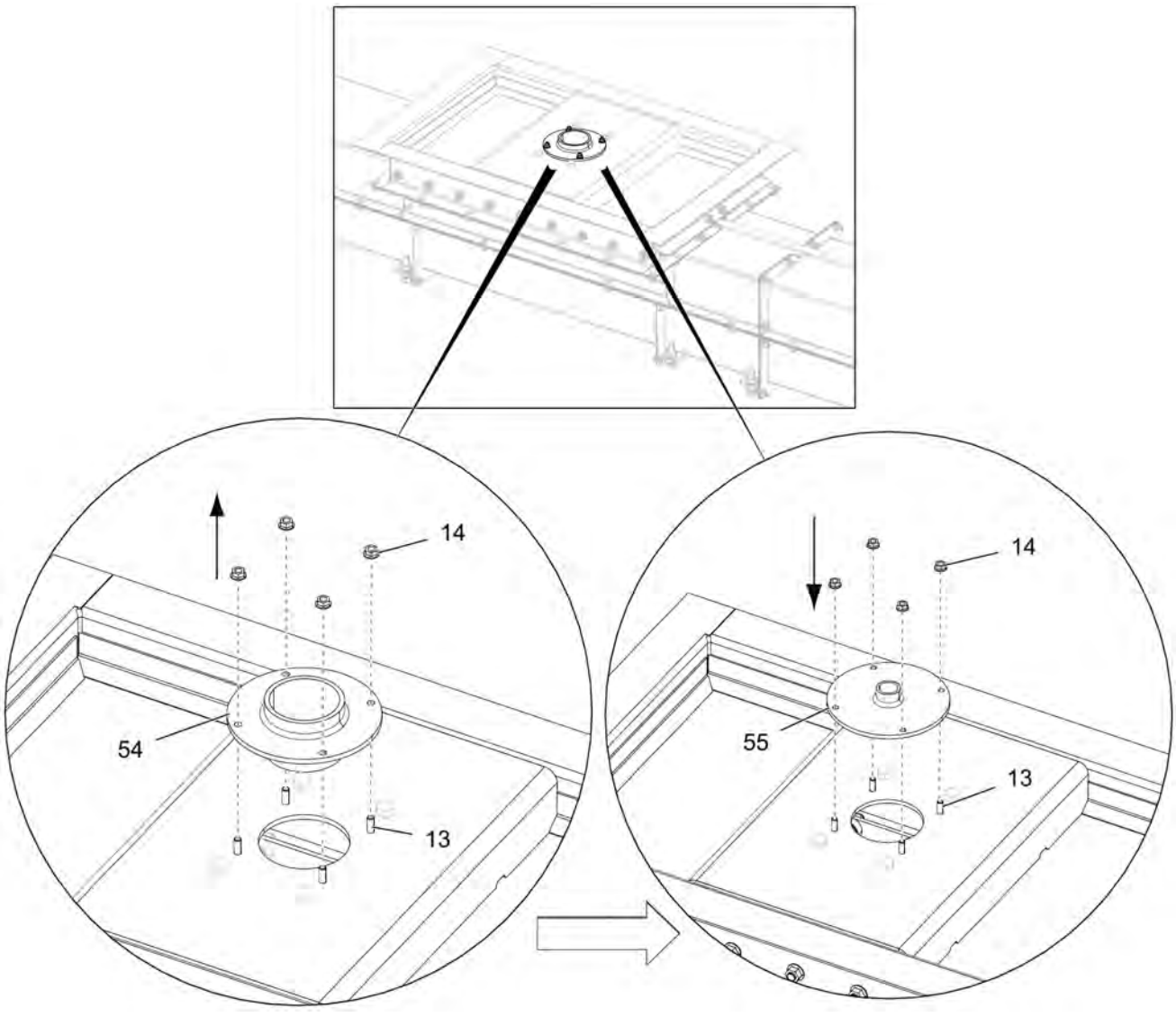
Changing the Carry-In Sweep Bushings

What You Should Know

The universal center well intermediate section will have sweep bushing for 3" pivot pin as factory installed. A bushing to fit a 1" diameter pivot pin for carry-in sweeps is also include in your shipping.

1. If you are using a carry-in sweep with 1" diameter pivot pin, you can replace the bushing. Remove the four 5/16" flange nuts (14) from the 5/16" x 1" hex bolts (13) and the 3" bushing (54) from the center well.
2. Install the 1" bushing (55) to the center well and re-install the 5/16" flange nuts (14) to the 5/16" x 1" hex bolts (13).

Figure 4-36 *Changing the sweep bushings for carry-in universal sweeps*

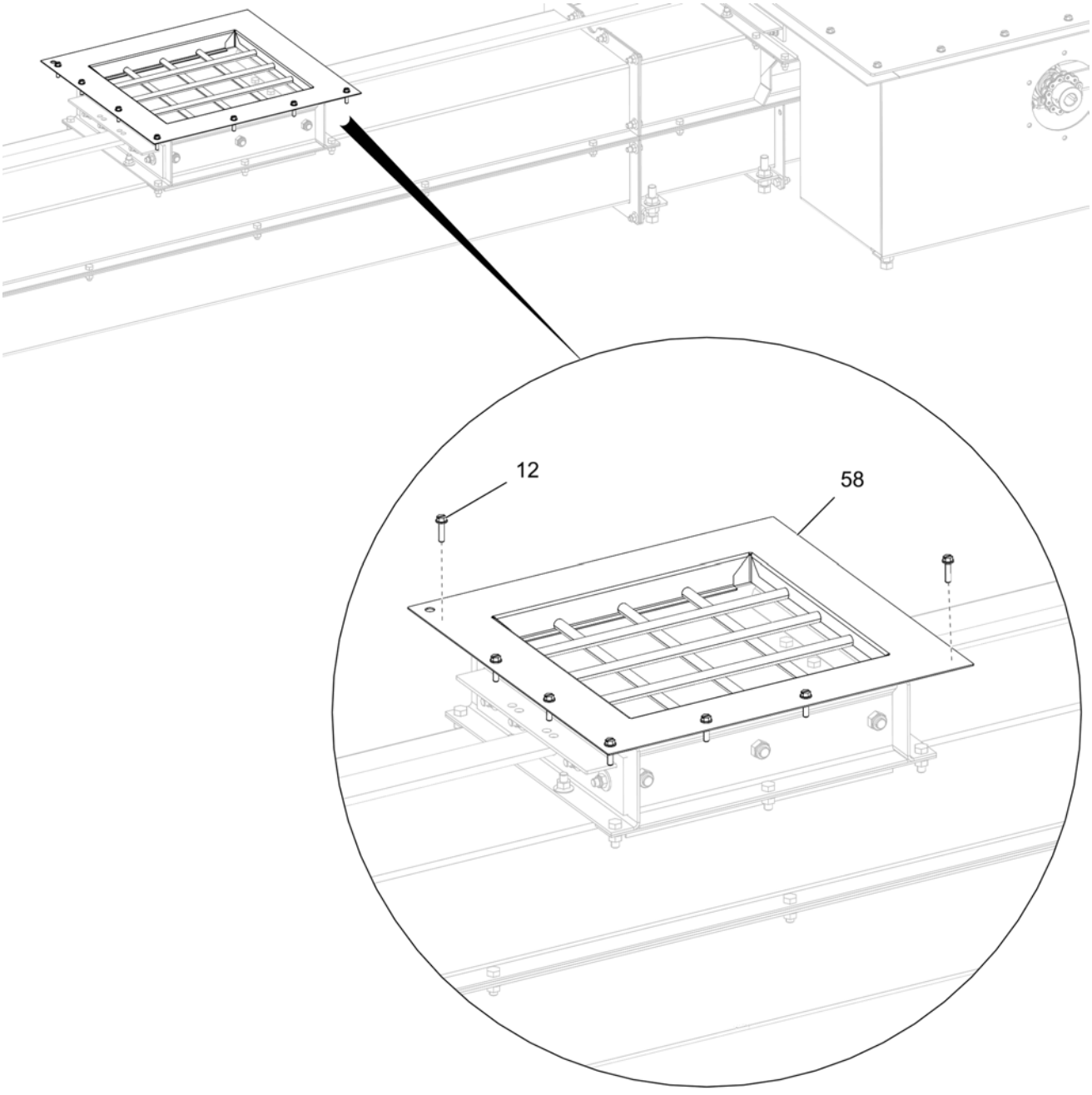


13	5/16" x 1" hex bolt	54	3" bushing
14	5/16" nut	55	1" bushing

Installing the Intermediate Well Flanges

1. Place the intermediate well flanges (58) onto the intermediate wells.
2. Use 1/4" x 1" sheet metal screws (12) to install the intermediate well flange (58) to the bin floor.

Figure 4-37 *Installing the intermediate well flanges*



12	1/4" x 1" sheet metal screw	58	Intermediate well flange

5 Installing the Flight Auger and Power Tube

Topics Covered in this Chapter

- Assembling the Sweep Flighting to the Backshield (60' - 72' Bins)
- Installing the Sweep Flighting
- Installing the Flighting Shield
- Installing the Sweep Wheel Assembly
- Installing the Backshield Support Assembly
- Adjusting the Wiper
- Assembling and Adjusting the Sweep Support Skid
- Installing the Sweep Stop
- Drive Assembly and Power Tube Layout
- Installing the Power Tube
- Assembling the Drive Shafts (42' - 72' Only)
- Installing the Bin Flanges for Power tube
- Assembling the Drive Head

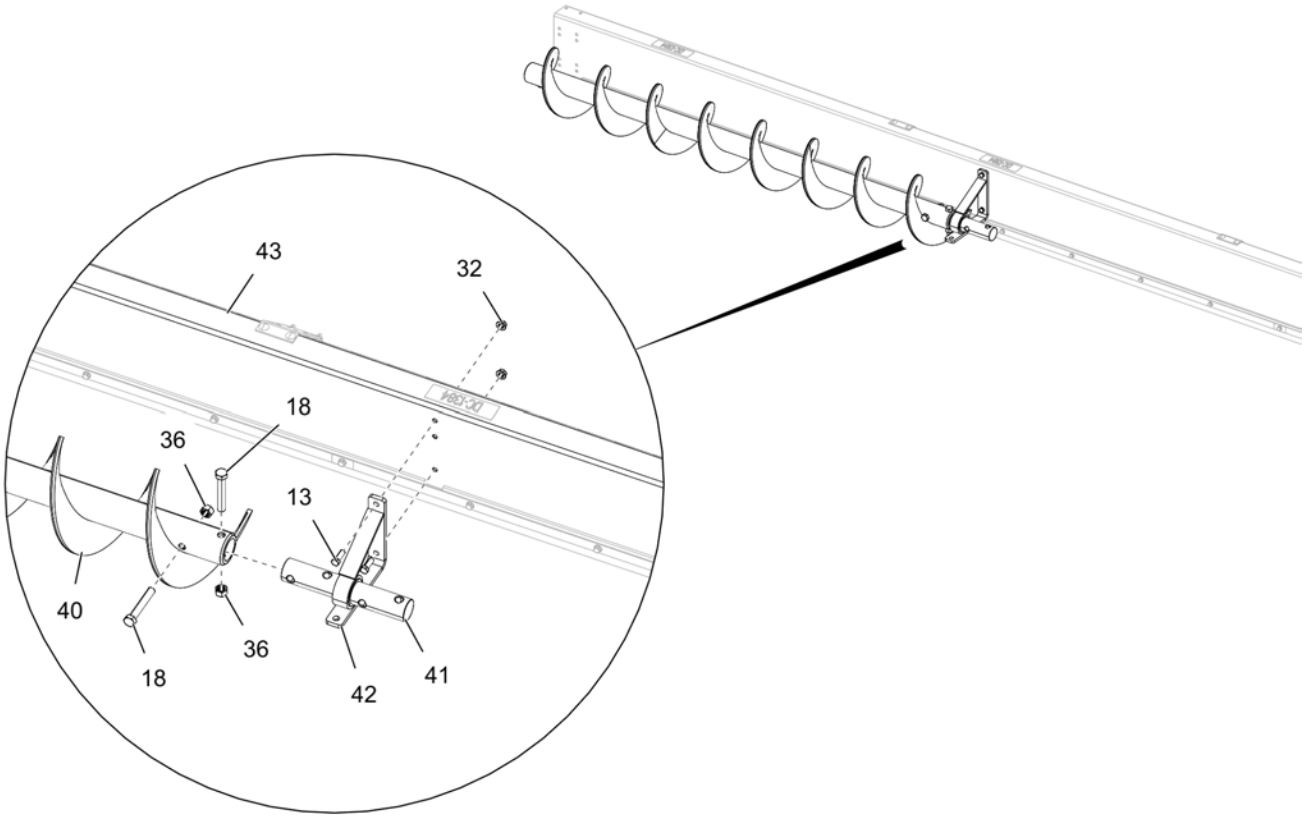
Assembling the Sweep Flighting to the Backshield (60' - 72' Bins)

For sweeps up to 54' diameter bins, the sweep flighting is pre-assembled to the shield before being shipped. For sweeps above 60' diameter bins, the sweep flighting and the shield are not pre-assembled and will need to be assembled before installing them to the U-joint shaft attached to the gearbox.

1. Attach the first hanger bracket assembly (42) to the backshield (43) using two 7/16" x 1-1/4" HHCS bolts (13) and 7/16" flange nuts (32).
2. Slide the connecting shaft (41) into the hanger bracket assembly (42).
3. Attach the first flight section (40) to one end of the connecting shaft (41) using two 5/8" x 4" HHCS bolts (18) and 5/8" stover nuts (36).

   NOTE: *Make sure to assemble the augers with the Dura-Edge® on the grain side (discharge to the pivot) of the flighting.*

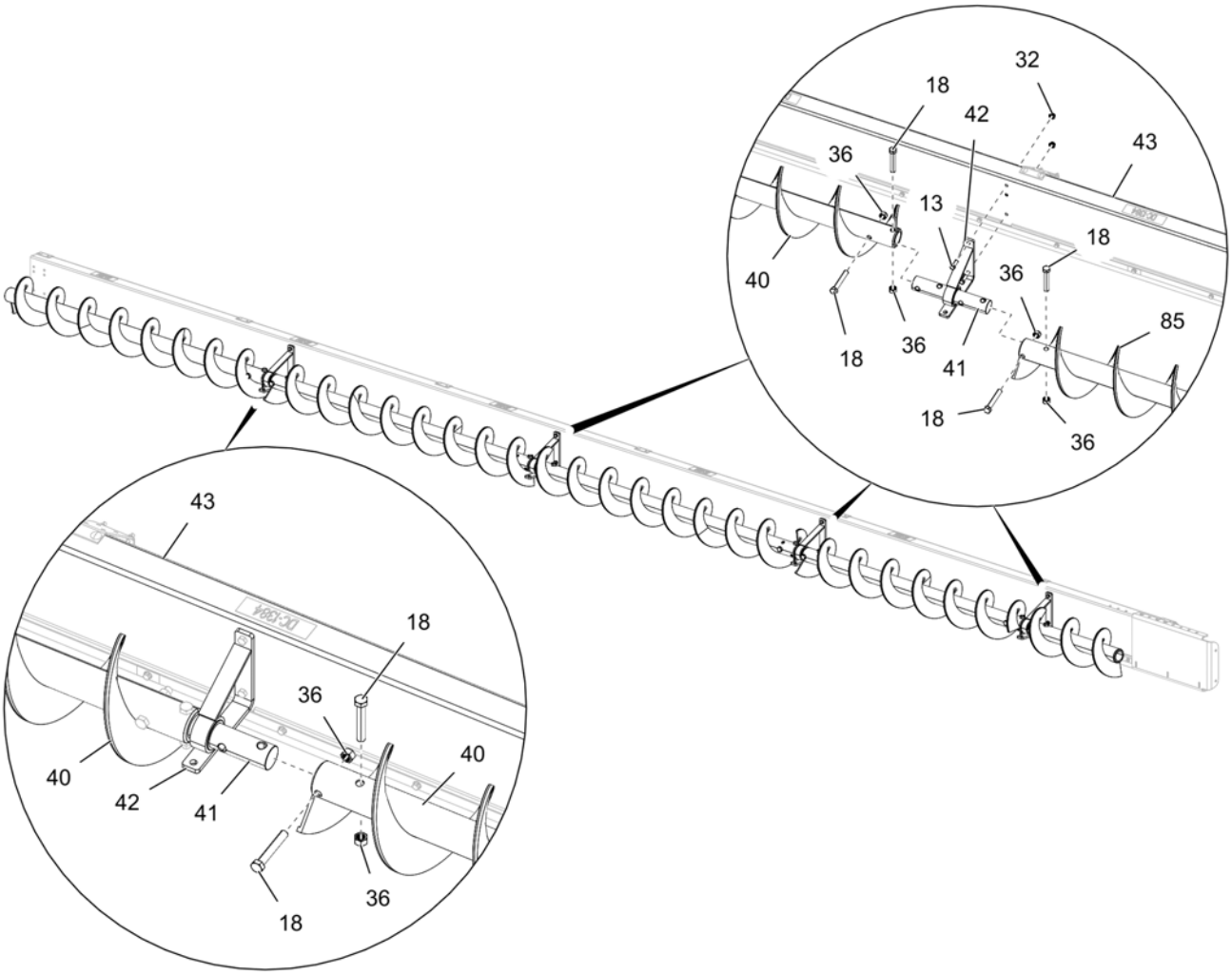
Figure 5-1 *Attaching the first flight section with hanger bracket to the backshield*



13	7/16" x 1-1/4" HHCS bolt	40	Flight section
18	5/8" x 4" HHCS bolt	41	Connecting shaft
32	7/16" flange nut	42	Hanger bracket assembly
36	5/8" stover nut	43	Backshield

4. Attach the second hanger bracket assembly (42) to the backshield (43) using two 7/16" x 1-1/4" HHCS bolts (13) and 7/16" flange nuts (32).
5. Slide the connecting shaft (41) into the hanger bracket assembly (42).
6. Attach one end of second flight section (40) to the connecting shaft (41) in the first hanger bracket assembly (42) and the other to the connecting shaft (41) in the second hanger bracket assembly (42) using two 5/8" x 4" HHCS bolts (18) and 5/8" stover nuts (36).
7. Repeat the above steps to continue installing the remaining flight sections and the short flight section (85) to the backshield.

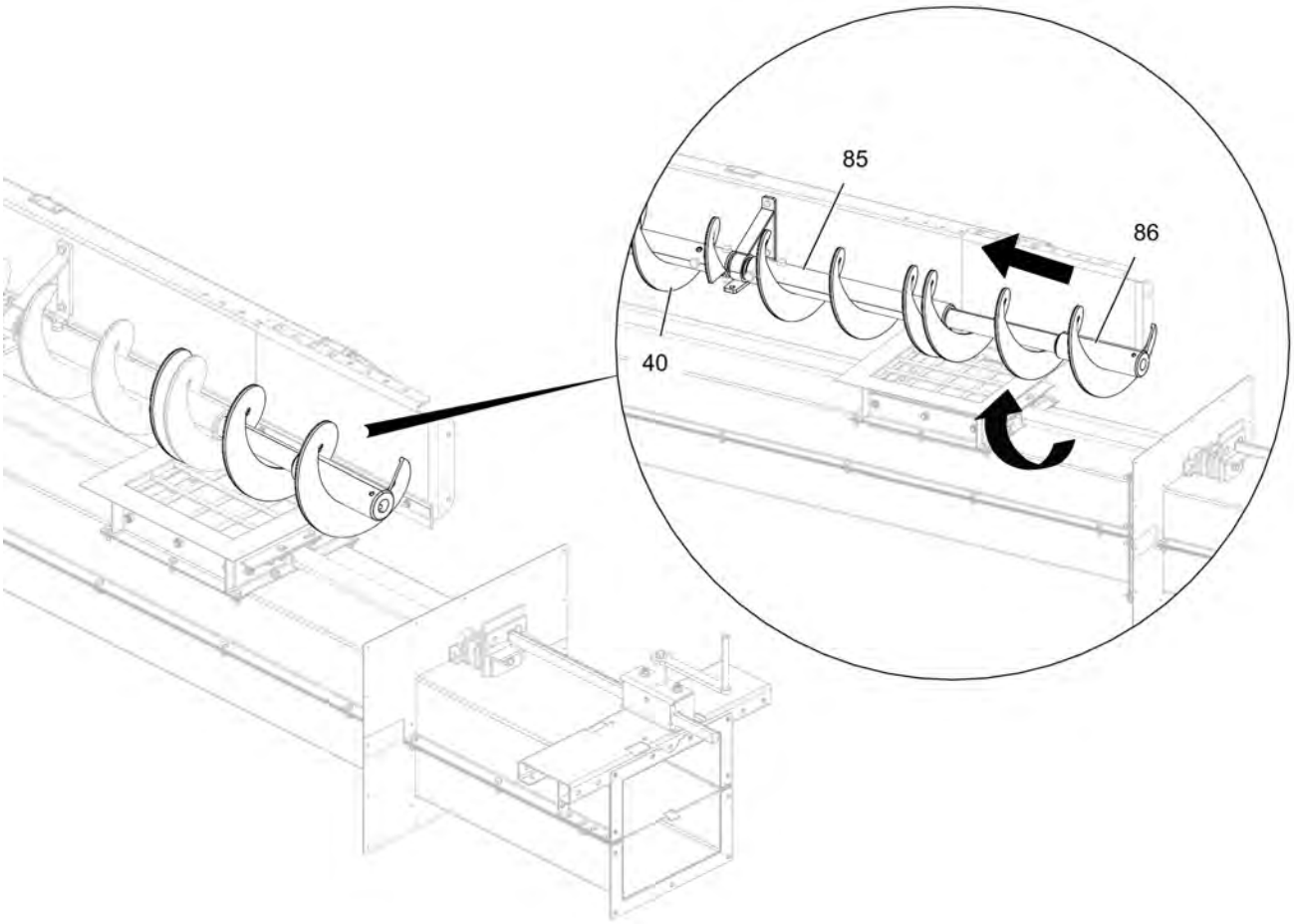
Figure 5-2 *Attaching the second flight section with hanger bracket to the backshield*



13	7/16" x 1-1/4" HHCS bolt	41	Connecting shaft
18	5/8" x 4" HHCS bolt	42	Hanger bracket assembly
32	7/16" flange nut	43	Backshield
36	5/8" stover nut	85	Short flight section
40	Flight section		

NOTE: *When installing the last flight section (86) to the short flight section (85), after inserting the shaft, rotate it two revolutions to move the auger blade closer to the last blade of the previous flight section (85) as shown.*

Figure 5-3 *Attaching the last flight section*



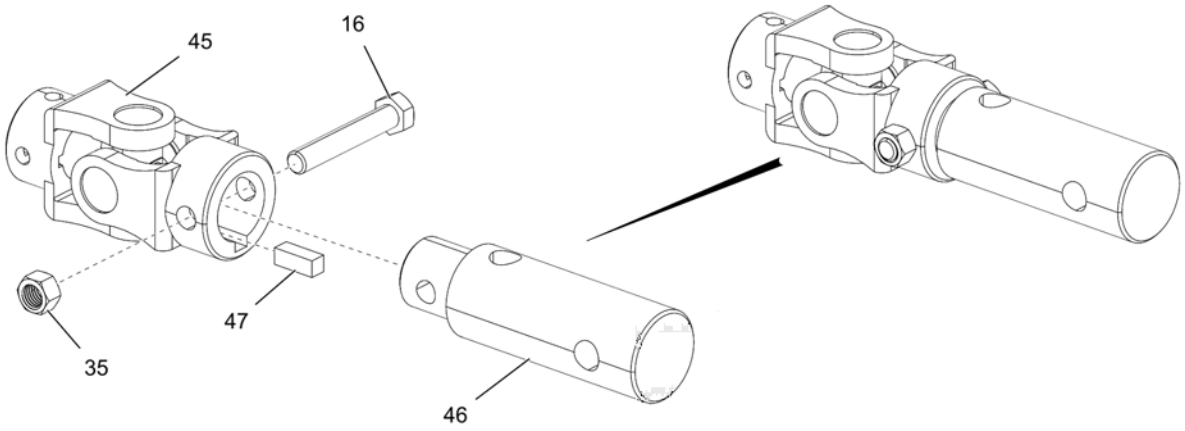
40	Flight section	86	Last flight section
85	Short flight section		

Installing the Sweep Flighting

1. Assemble the U-joint (45).

   NOTE: *Insert the connecting shaft (46) into the U-joint (45) and secure using a 1/2" x 3" HHCS bolt (16), 1/2" lock nut (35) and key (47).*

Figure 5-4 *Assembling the U-joint*

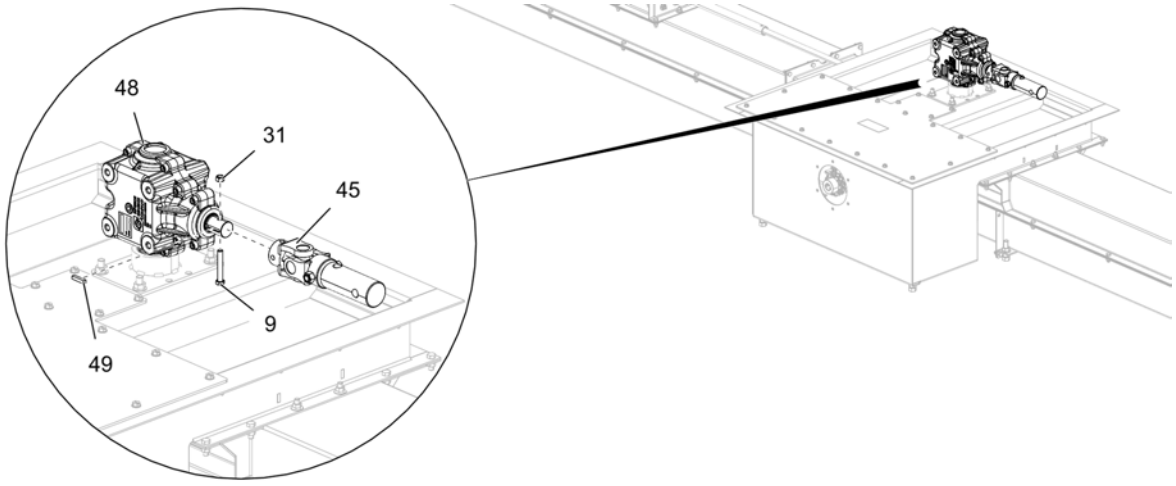


16	1/2" x 3" HHCS bolt	46	U-joint connecting shaft
35	1/2" lock nut	47	Key
45	U-joint		

2. Attach the U-joint (45).

   NOTE: *Slide the U-joint (45) onto the top gearbox (48) output shaft and secure using a 3/8" x 2-1/2" HHCS bolt (9), 3/8" stover nut (31) and key (49).*

Figure 5-5 *Attaching the U-joint to the gearbox*

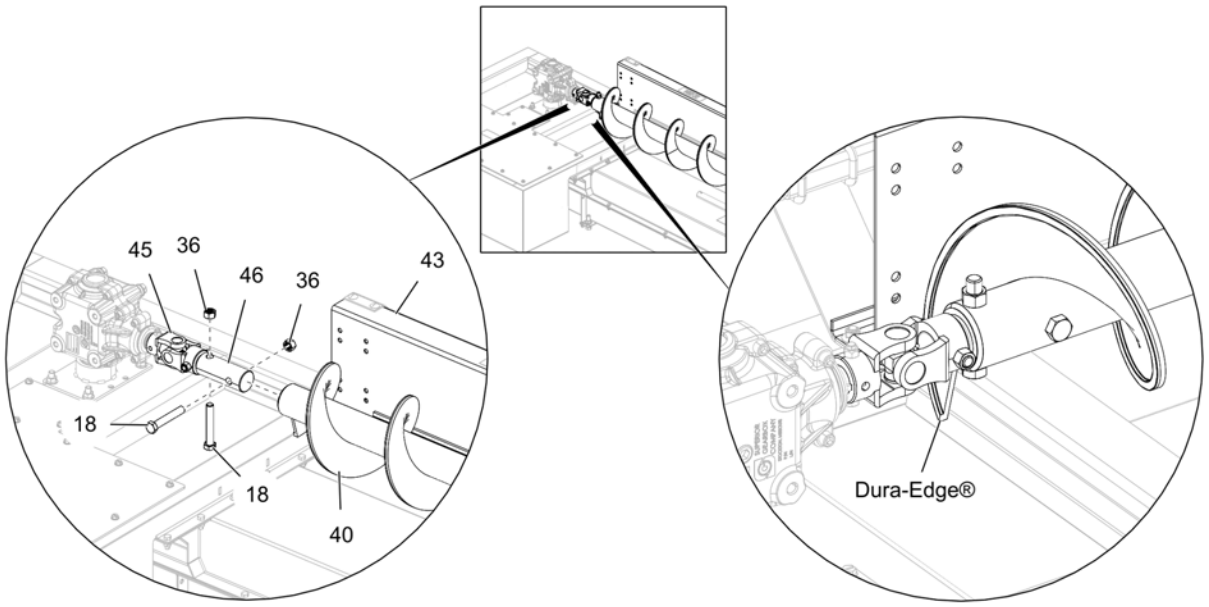


9	3/8" x 2-1/2" HHCS bolt	48	Top gearbox
31	3/8" stover nut	49	Key
45	U-joint		

3. Attach the first auger section (40) to the U-joint shaft (46) using 5/8" x 4" HHCS bolts (18) and 5/8" stover nuts (36).

   NOTE: *Make sure that the Dura-Edge® side of the flight (40) faces the center of the bin.*

Figure 5-6 *Attaching the auger to the U-joint*

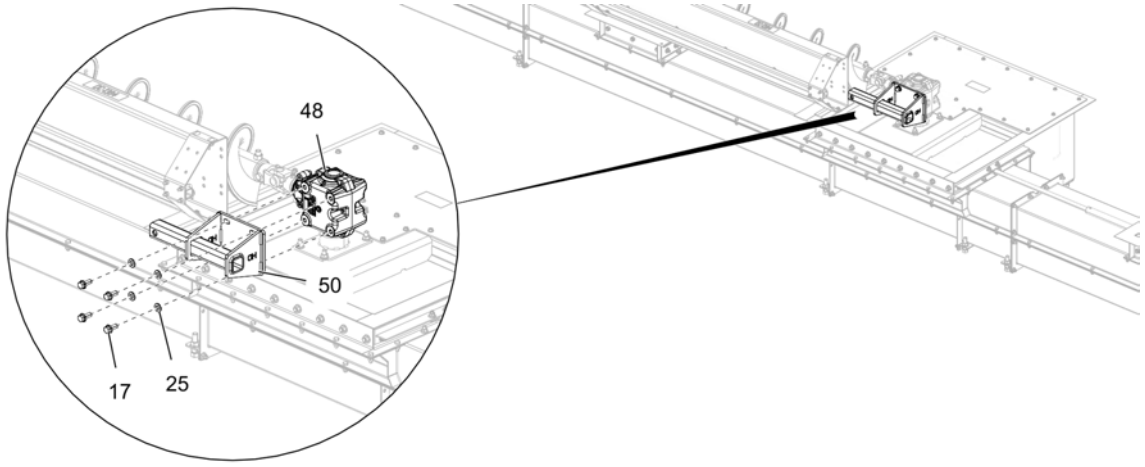


18	5/8" x 4" HHCS bolt	43	Backshield
36	5/8" stover nut	45	U-joint
40	Flight section	46	U-joint connecting shaft

4. Attach the pivot bracket (50) to the side of the gearbox (48) using 1/2" x 1-1/4" flange bolts (17) and 1/2" flat washers (25).

   NOTE: *Do not tighten the flange bolts (17).*

Figure 5-7 *Attaching the pivot bracket to the gearbox*



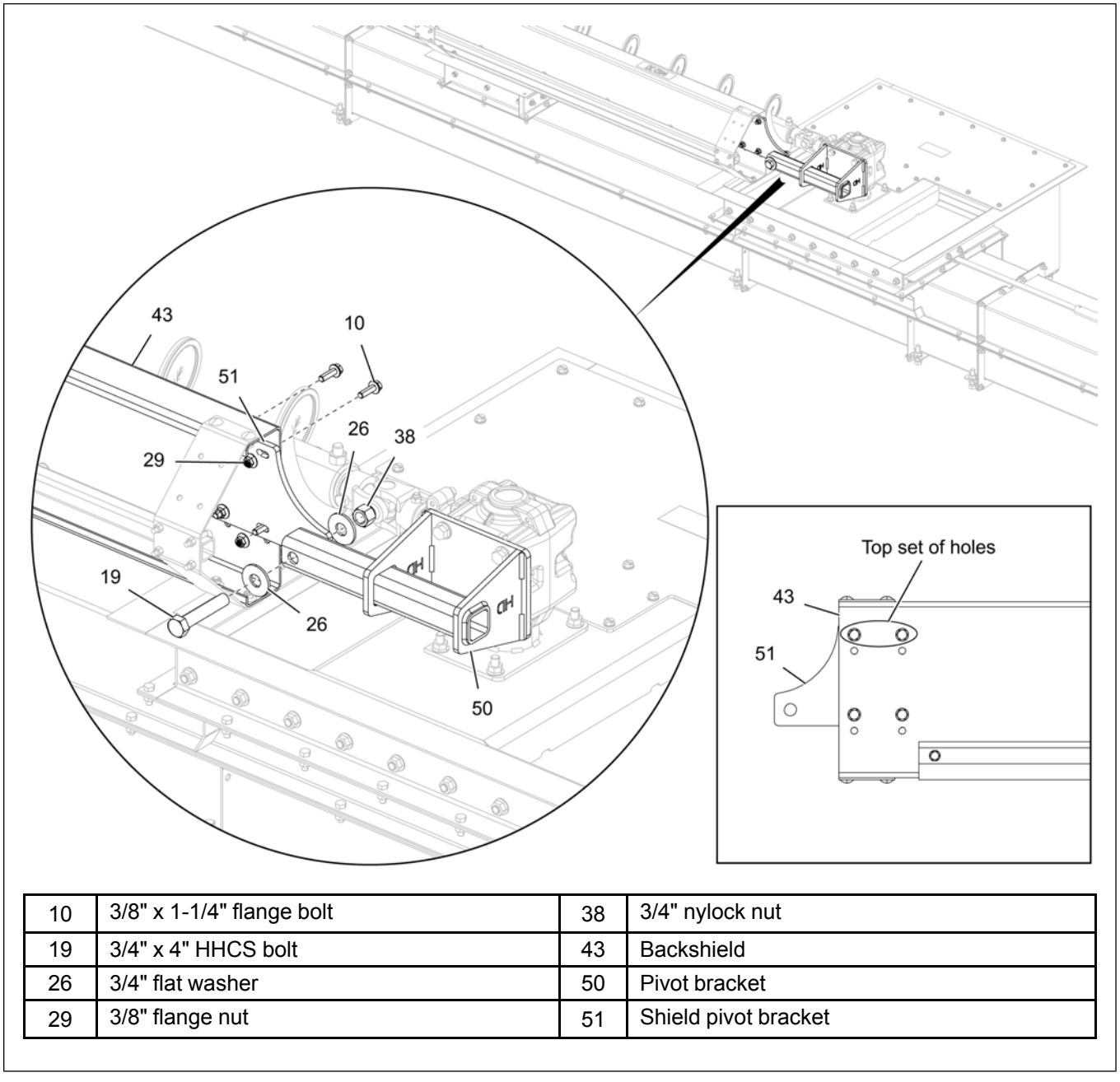
17	1/2" x 1-1/4" flange bolt	48	Top gearbox
25	1/2" flat washer	50	Pivot bracket

Installing the Flighting Shield

1. Assemble the shield pivot bracket (51) to the flighting shield using four 3/8" x 1-1/4" flange bolts (10) and four 3/8" flange nuts (29).
2. Attach the flighting shield pivot bracket (51) to the pivot bracket (50) using a 3/4" x 4" HHCS bolt (19), two 3/4" flat washers (26) and a 3/4" nylock nut (38).

   NOTE: *Do not tighten the bolts (10 and 19) and nut (38). It should be snug-tightened to pivot freely. There should only be 1-2 threads visible on the HHCS bolt (19) after nut (38) is snug-tightened.*

Figure 5-8 *Attaching the flighting shield pivot bracket to pivot bracket*



10	3/8" x 1-1/4" flange bolt	38	3/4" nylock nut
19	3/4" x 4" HHCS bolt	43	Backshield
26	3/4" flat washer	50	Pivot bracket
29	3/8" flange nut	51	Shield pivot bracket

NOTE: *Pick up at pivot bolt location PRIOR to tightening the four gearbox bolts and four backshield bolts. This will help raise the sweep arm for additional floor clearance.*

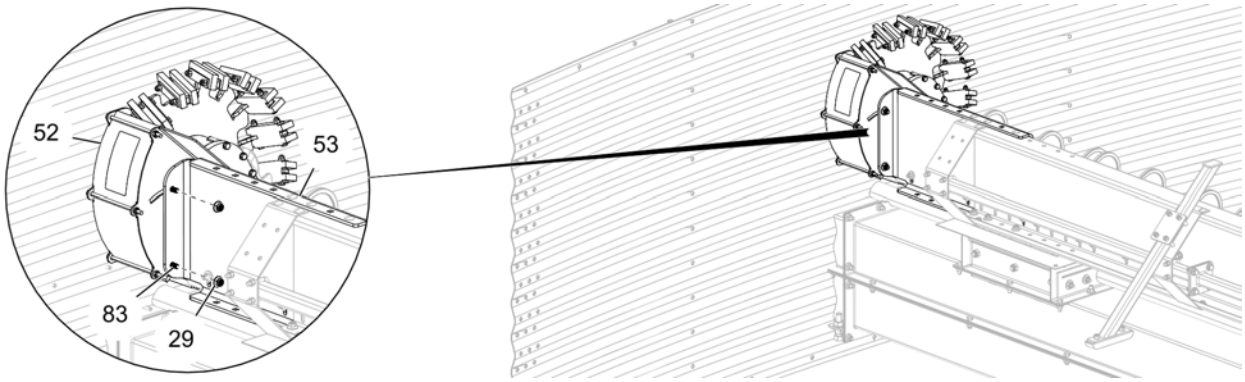
Installing the Sweep Wheel Assembly

Before You Begin
Make sure the wheel mount is installed to the flighting shield assembly.

1. Slide the sweep wheel assembly (52) shaft into the last flight section (86). Attach the sweep wheel assembly (52) to the wheel mount (53) using two 3/8" x 1" carriage bolts (83) and 3/8" flange nuts (29).

   NOTE: *Install the carriage bolts (24) with bolt head on the inside of the sweep wheel assembly (91).*

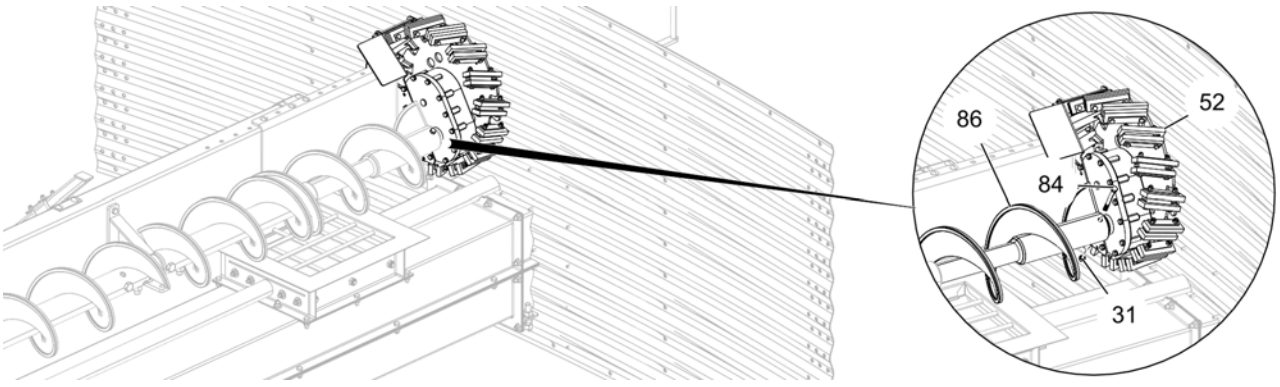
Figure 5-9 *Installing the sweep wheel assembly to the wheel mount*



29	3/8" flange nut	53	Wheel mount
52	Sweep wheel assembly	83	3/8" x 1" carriage bolt

2. Secure the sweep wheel assembly (52) shaft to the last flight section (86) using a 3/8" x 3-1/2" HHCS bolt (84) and a 3/8" stover nut (31).

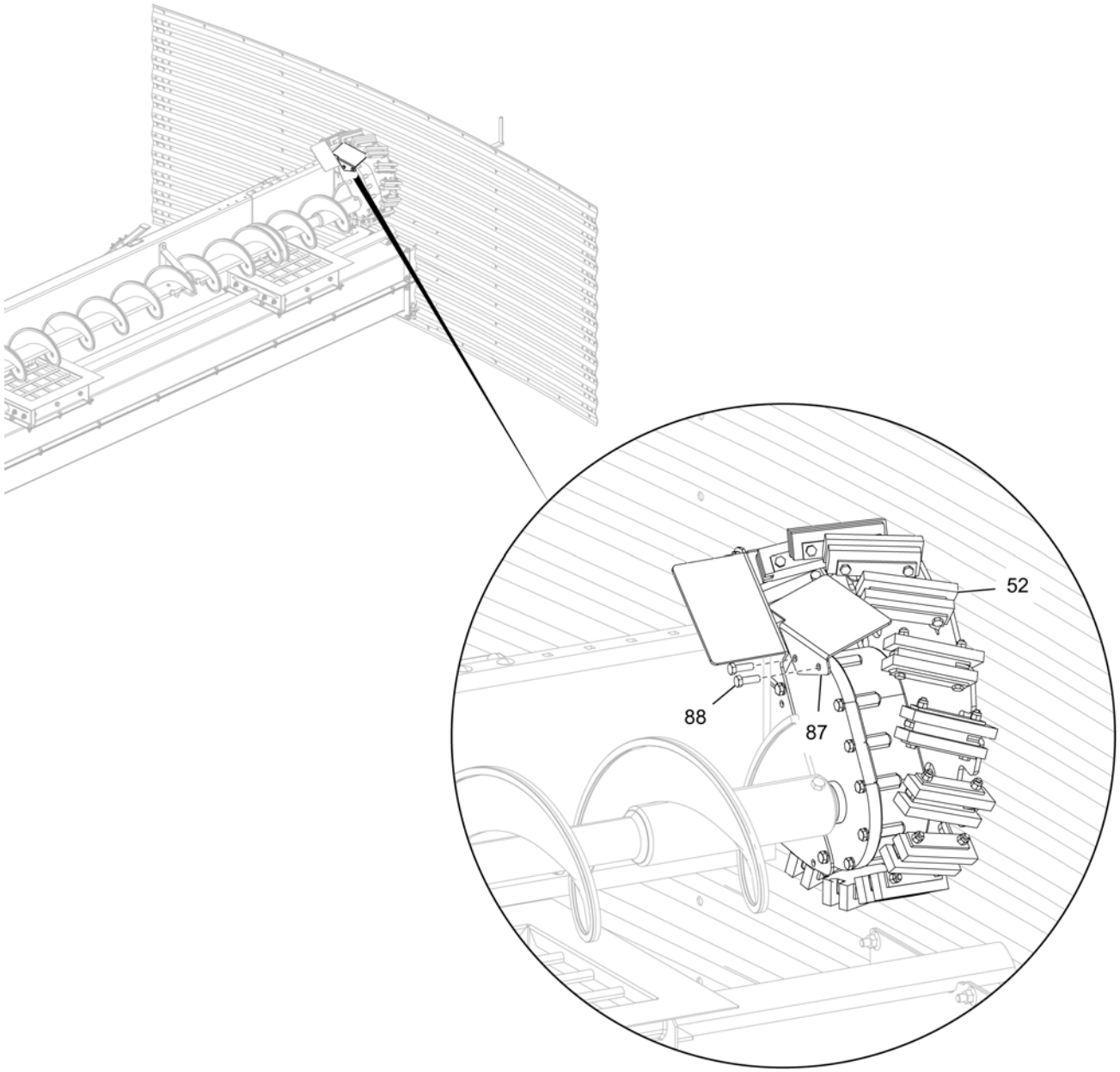
Figure 5-10 *Attaching the sweep wheel assembly to the last flight section*



31	3/8" stover nut	84	3/8" x 3-1/2" HHCS bolt
52	Sweep wheel assembly	86	Last flight section

3. Attach the deflector plate (87) to the sweep wheel assembly (52) using the supplied 5/16" bolts (88).

Figure 5-11 *Attaching the deflector plate to the sweep wheel assembly*

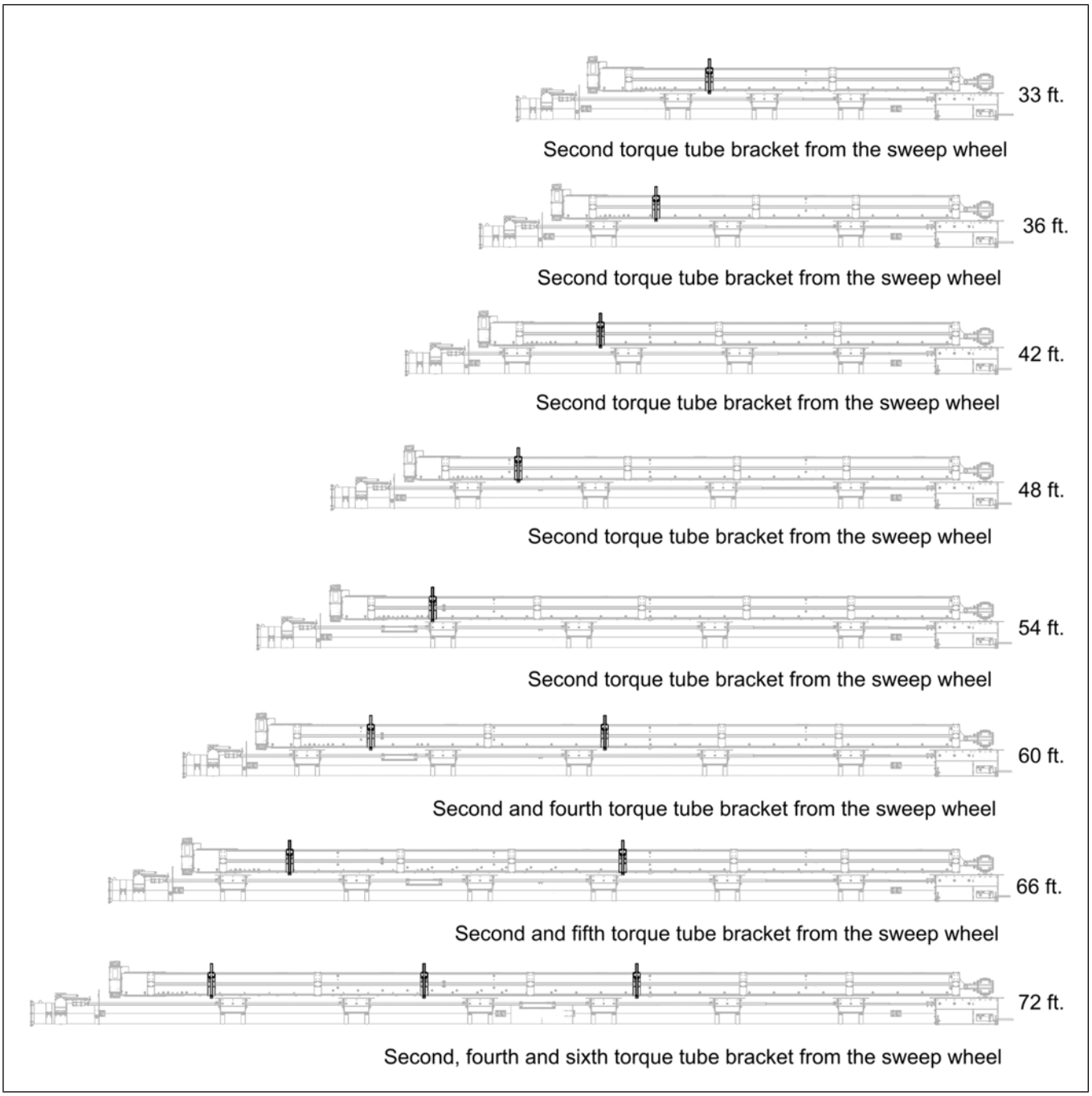


52	Sweep wheel assembly	88	5/16" bolt
87	Deflector plate		

Installing the Backshield Support Assembly

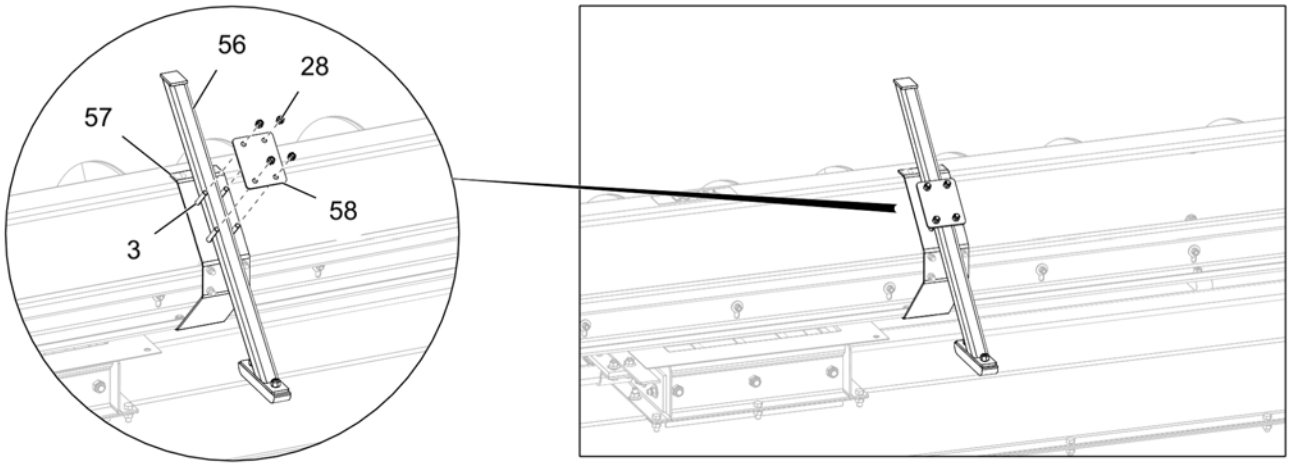
1. The position of the backshield support assembly varies with sweep length. Refer to the below layout to install the backshield support assembly at correct locations for each sweep.

Figure 5-12 *Backshield support assembly layout*



2. Install the backshield support assembly (56) to the torque tube bracket (57) using mounting plate (58), 5/16" x 2" HHCS bolts (3) and 5/16" nylock nuts (28).

Figure 5-13 *Installing the backshield support assembly*

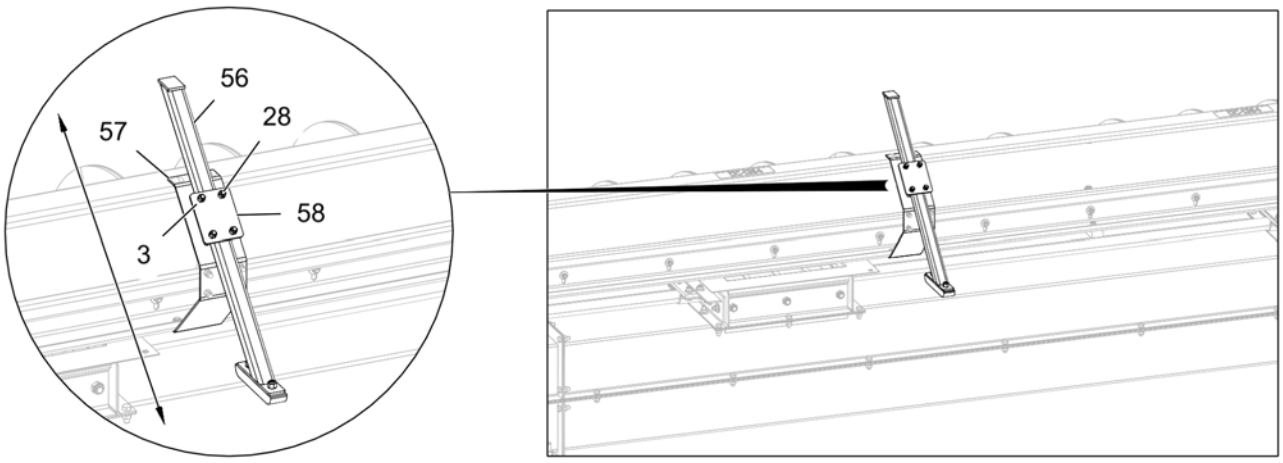


3	5/16" x 2" HHCS bolt	57	Torque tube bracket
28	5/16" nylock nut	58	Mounting plate
56	Backshield support assembly		

3. The backshield support assembly (56) can be adjusted in the direction (as shown) for proper sweep clearance.

NOTE: *When sliding the support down closer to the floor, it will raise the sweep off the floor and put down pressure onto the reduction wheel. Adjust until the backshield is level front to back.*

Figure 5-14 *Adjusting the backshield assembly*



3	5/16" x 2" HHCS bolt	57	Torque tube bracket
28	5/16" nylock nut	58	Mounting plate
56	Backshield support assembly		

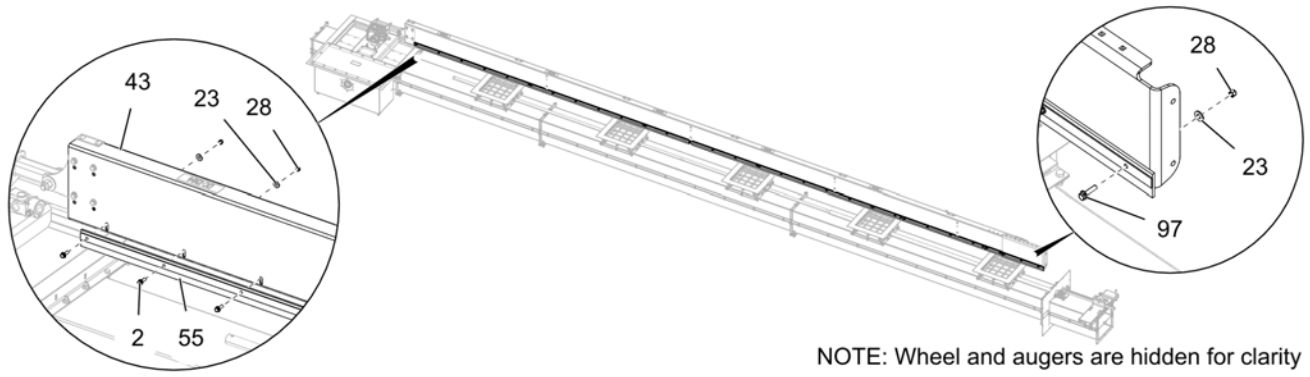
Adjusting the Wiper

What You Should Know

The wiper should be adjusted based on the highest point of the floor so that the sweep can run around the bin with proper clearance. Otherwise the sweep will not work as intended.

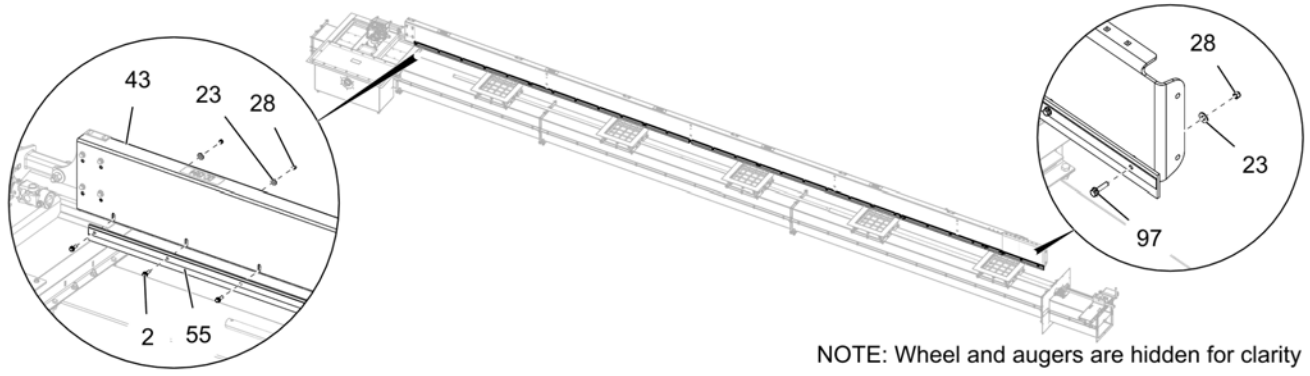
1. Loosen the 5/16" flange bolts (2 and 97) in the backshield assembly to adjust the wiper (55) position.
2. Adjust the wiper (55) UP/DOWN depending on the highest point of the floor within the slots in the backshield assembly. For ideal operation, the wiper should be 1/4"-1/2" off the floor.
3. Tighten the wiper (55) in position after adjustment using 5/16" flange bolts (2 and 97), 5/16" flat washers (23) and 5/16" nylock nuts (28).

Figure 5-15 *Wiper in UP position*



2	5/16" x 1" flange bolt	43	Flighting shield
23	5/16" flat washer	55	Backshield wiper
28	5/16" nylock nut	97	5/16" x 1-1/4" flange bolt

Figure 5-16 *Wiper in DOWN position*



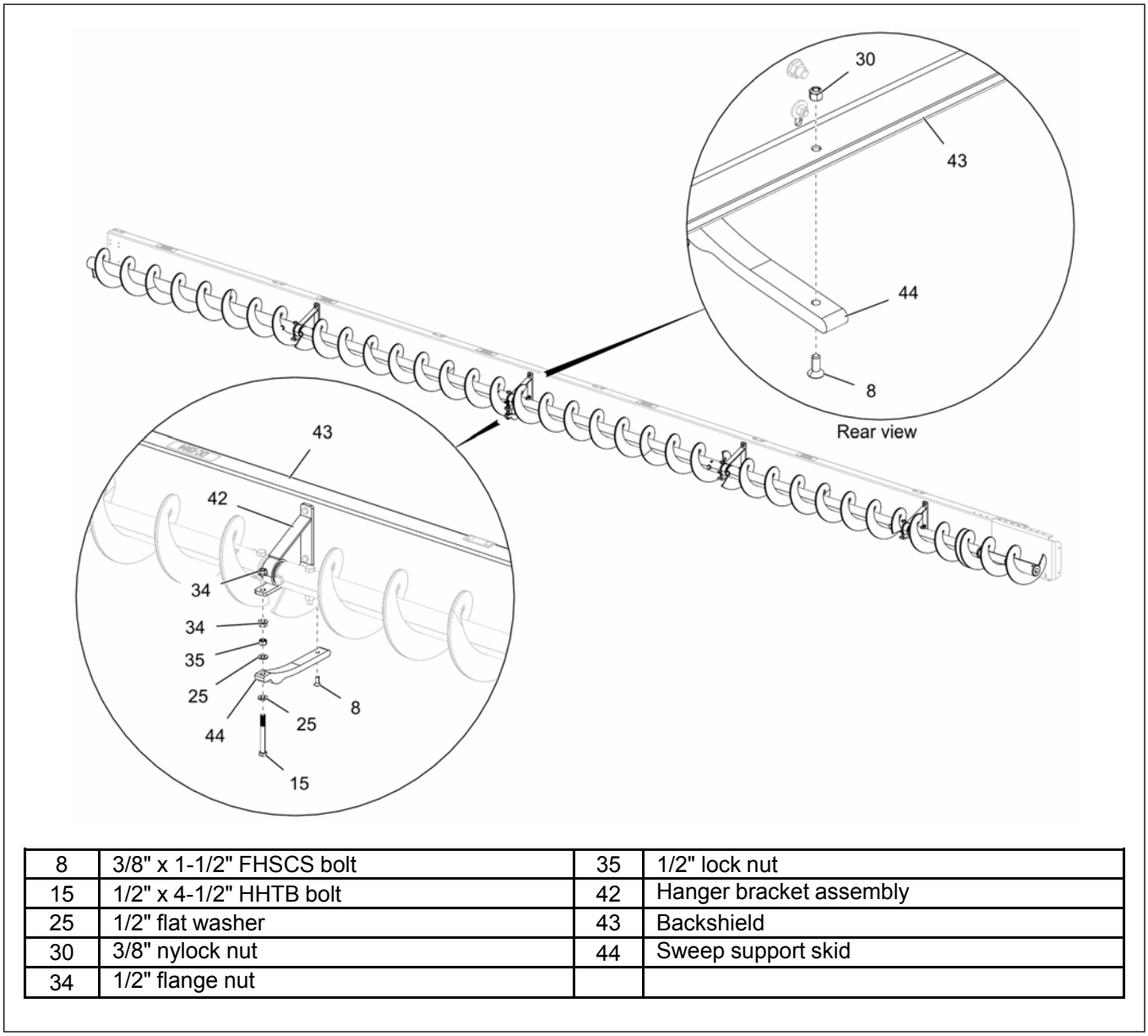
2	5/16" x 1" flange bolt	43	Flighting shield
23	5/16" flat washer	55	Backshield wiper
28	5/16" nylock nut	97	5/16" x 1-1/4" flange bolt

Assembling and Adjusting the Sweep Support Skid

For sweeps up to 54' diameter bins, the sweep support skid is pre-assembled to the shield before being shipped. For sweeps above 60' diameter bins, the sweep support skid is not pre-assembled and will need to be assembled to the shield before connecting the sweep flighting to the U-joint shaft attached to the gearbox.

1. Attach the sweep support skid (44) to the hanger bracket assembly (42) using 1/2" x 4-1/2" HHTB bolt (15), two 1/2" flat washers (25), 1/2" lock nut (35) and two 1/2" flange nuts (34) at the front side of the shield.
2. Attach the sweep support skid (44) to the backshield (43) using 3/8" x 1-1/2" FHSCS bolt (8) and 3/8" nylock nut (30) at the backside of the shield.

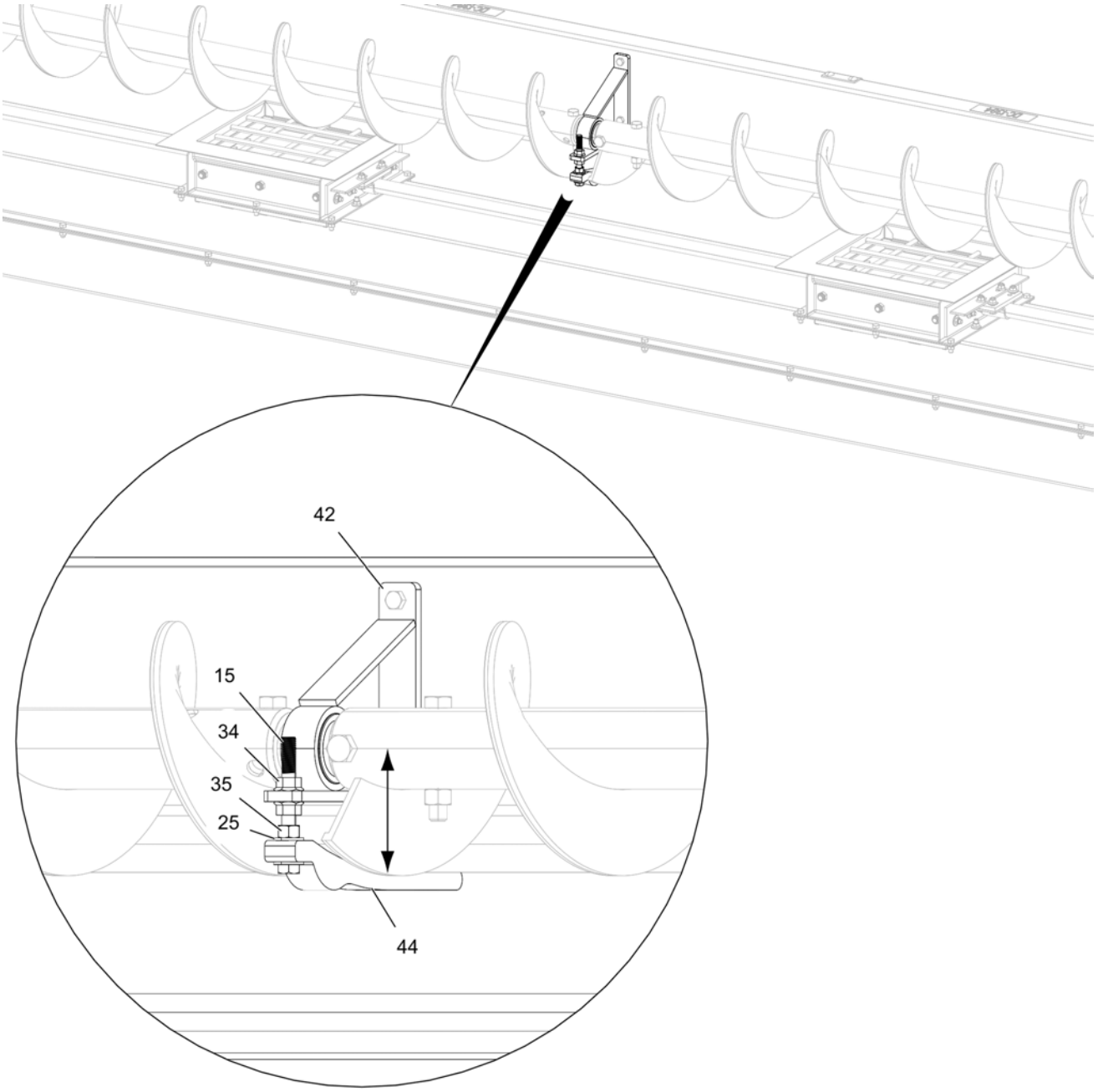
Figure 5-17 *Assembling the sweep support skid*



8	3/8" x 1-1/2" FHSCS bolt	35	1/2" lock nut
15	1/2" x 4-1/2" HHTB bolt	42	Hanger bracket assembly
25	1/2" flat washer	43	Backshield
30	3/8" nylock nut	44	Sweep support skid
34	1/2" flange nut		

3. If necessary, use the 1/2" x 4-1/2" HHTB bolts (15) and 1/2" flange nuts (34) in the hanger bracket assembly (42) to adjust the height of the auger off the floor for clearance.

Figure 5-18 *Adjusting the sweep support skid*



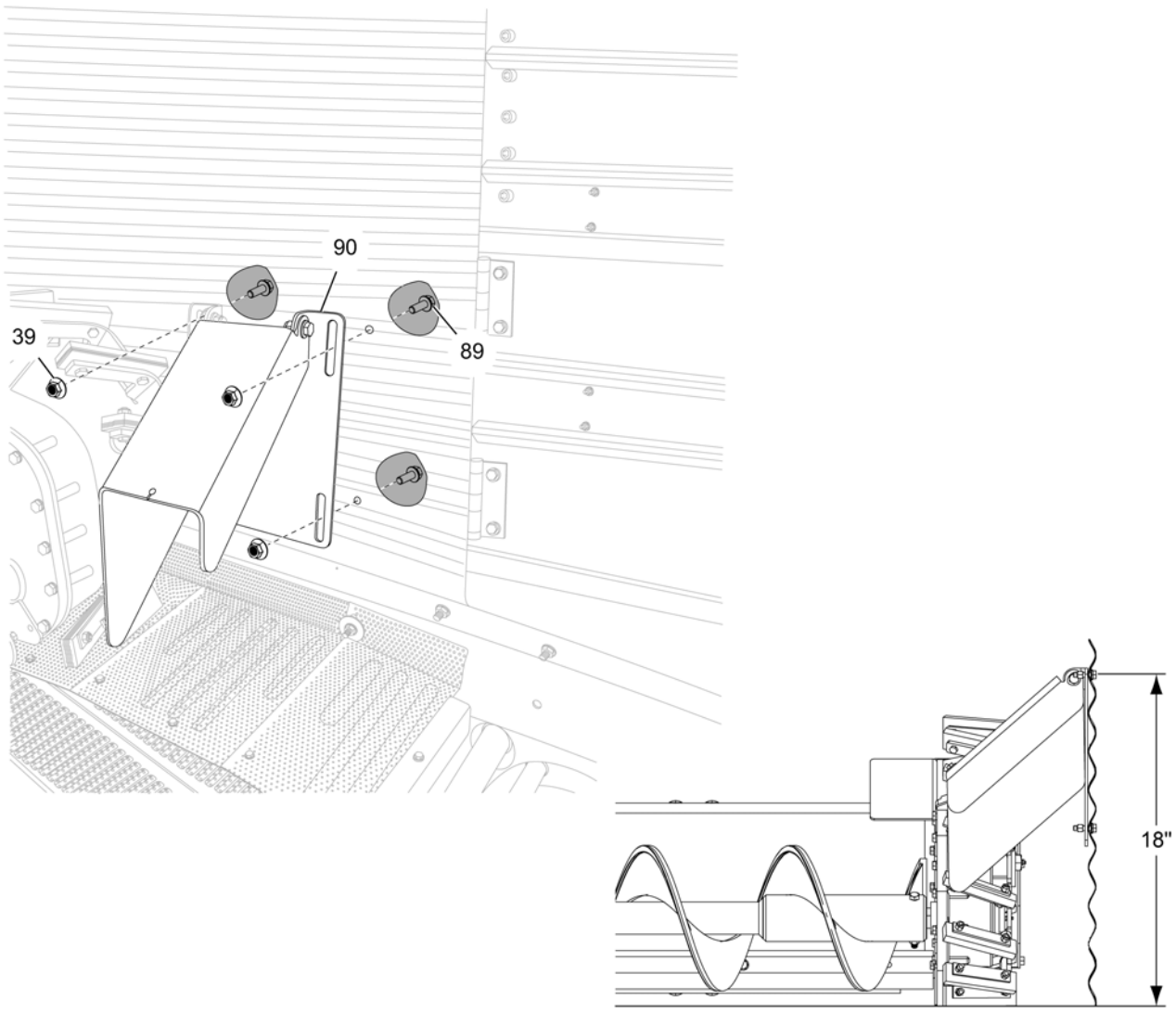
15	1/2" x 4-1/2" HHTB bolt	35	1/2" lock nut
25	1/2" flat washer	42	Hanger bracket assembly
34	1/2" flange nut	44	Sweep support skid

Installing the Sweep Stop

1. Place the pivot point of the sweep stop assembly (90) approximately 18" from the bin floor. Using it as a template, field drill four 3/8" holes and mount it to the bin wall using four 3/8" bin bolts (89) and flange nuts (39).

   NOTE: *The sweep stop assembly should be installed in such a way that it will stop the sweep before it reaches the walk-through door.*

Figure 5-19 *Installing the sweep stop assembly to the bin wall*

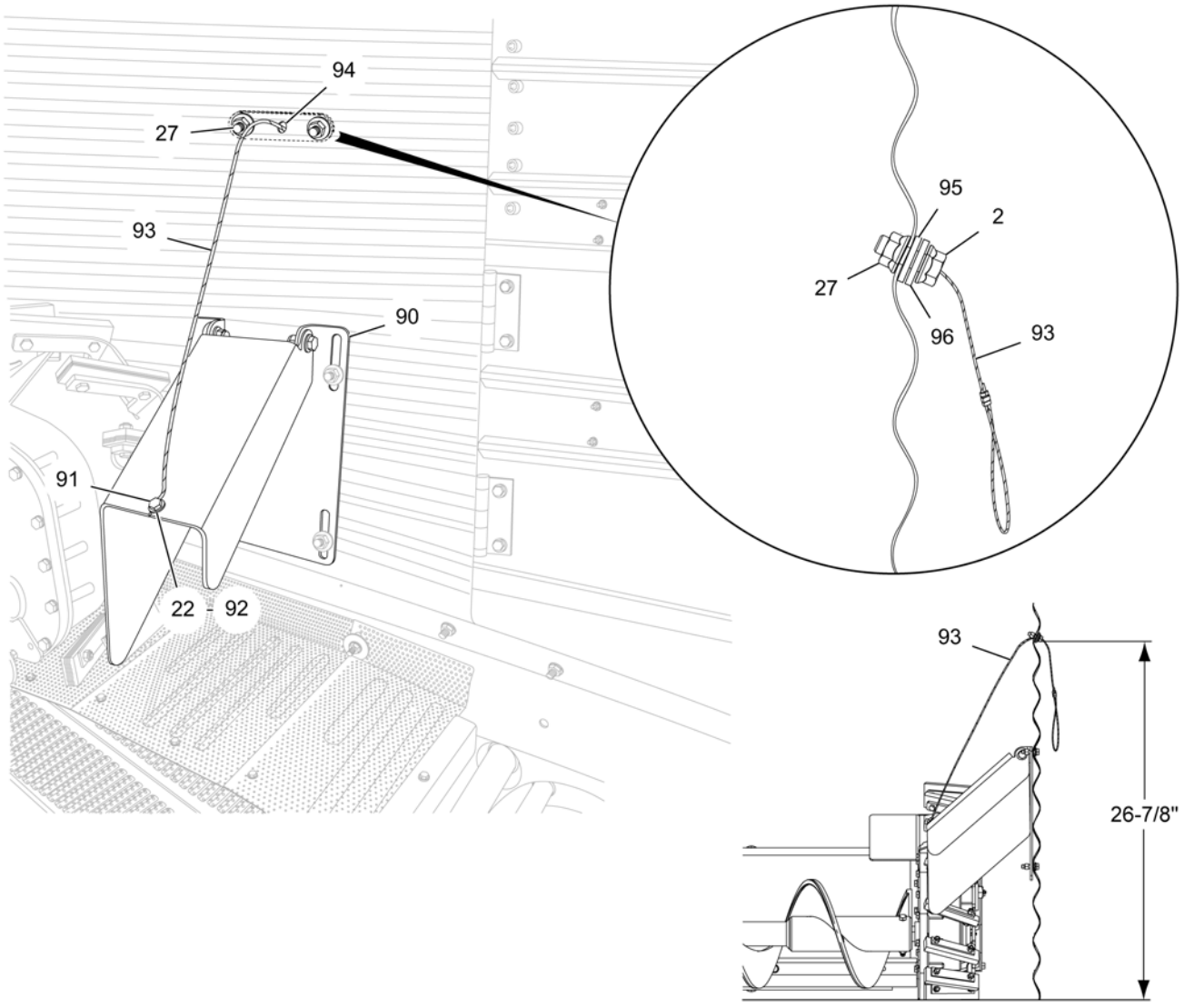


39	Flange nut	90	Sweep stop assembly
89	3/8" bin bolt		

2. Measure approximately 26-7/8" from the bin floor and field drill a 1/2" hole (94) in the sidewall. Pass the free end of the cable (93) from the outside of the bin (make sure cable wall plates (95 and 96) are pre-assembled to the cable) and attach it to the sweep stop assembly (90) using a 1/4" x 3/4" HHCS bolt (91), two 1/4" flat washers (22) and 1/4" nylock nut (92).
3. Using the wall plates as template, field drill two 3/8" holes (with reference to the 1/2" hole) and install the cable wall plates (95 and 96) from outside the bin using 5/16" x 1" flange bolts (2) and 5/16" flange nuts (27).

   NOTE: *Exact location of the cable bracket position may vary depending on the floor type, floor height, and bin corrugation. The measurement value shown here is only approximate.*

Figure 5-20 *Connecting the cable to the sweep stop*

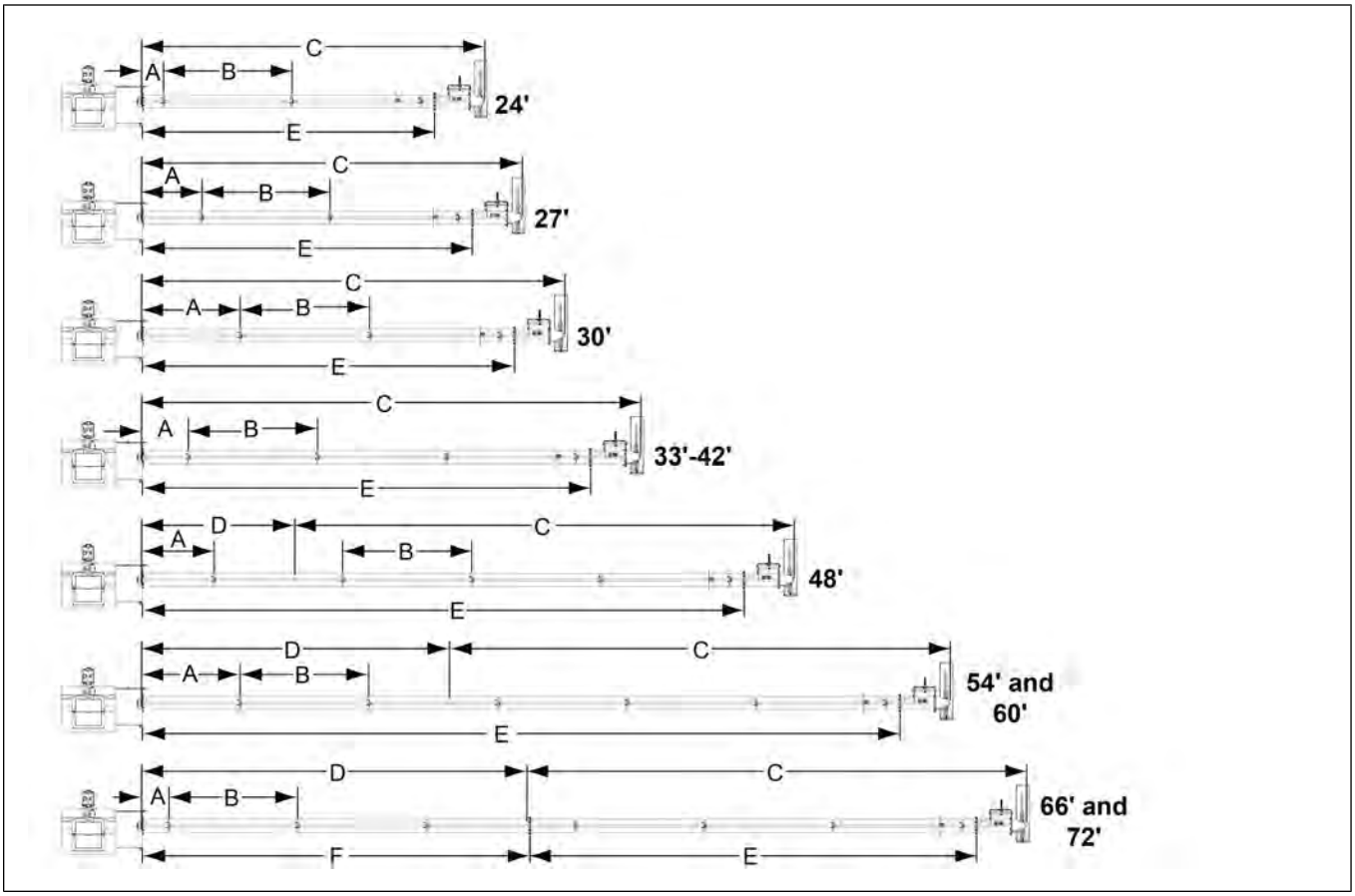


2	5/16" x 1" flange bolt	92	1/4" nylock nut
22	1/4" flat washer	93	Cable
27	5/16" flange nut	94	1/2" field drilled hole
90	Sweep stop assembly	95	Sweep stop cable UHMW wall plate
91	1/4" x 3/4" HHCS bolt	96	Sweep stop cable wall plate

Drive Assembly and Power Tube Layout

The drive shaft and its housing tube can now be assembled. On bin diameters of 48' through 72', there will be two sections of drive shafts. On bin diameters of 66' and 72', there will be two housing tubes that will be joined together. Lay the sections of housing tubes and drive shafts in an open area and using the chart and illustration below, determine the proper order of each prior to actual placement in the bin.

Figure 5-21 *Drive assembly and power tube layout*

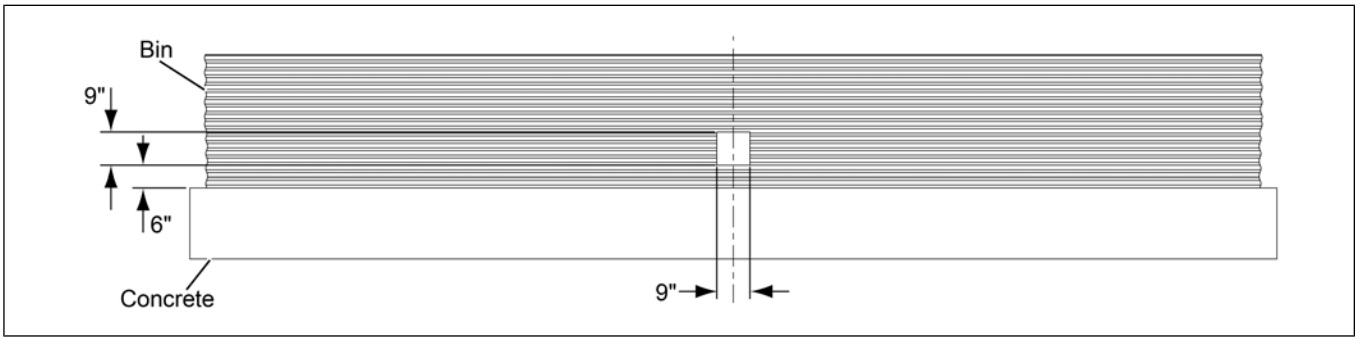


Bin diameter	# of bearings	Distance from drive coupler to first bearing (A)	Distance between support bearings (B)	Power shaft length (C)	Power shaft extension length (D)	Power housing tube length (E)	Power housing tube length (F)
24'	3	10-5/8"	60"	13' – 4-5/8"		11' – 4"	
27'	3	2' – 4-5/8"	60"	14' – 10-5/8"		12' – 10"	
30'	3	3' – 10-5/8"	60"	16' - 4-5/8"	-	14' - 4"	-
33'	4	4-5/8"	60"	17' - 10-5/8"	-	15' - 10"	-
36'	4	1' – 10-5/8"	60"	19' - 4-5/8"	-	17' - 4"	-
39'	4	4 - 5/8"	60"	17' - 10-5/8"	-	15' - 10"	-
42'	4	4' – 10-5/8"	60"	19' - 4-5/8"	3'	20' - 4"	-
48'	5	2' – 10-5/8"	60"	19' - 4-5/8"	6'	23' - 4"	-
54'	6	10-5/8"	60"	19' - 4-5/8"	9'	26' - 4"	-
60'	6	3' – 10-5/8"	60"	19' - 4-5/8"	12'	29' - 4"	-
66'	7	1' – 1-3/4"	60"	19' - 4-5/8"	15' - 7/16"	17' - 4"	15' - 3/8"
72'	7	4' – 1-3/4"	60"	19' - 4-5/8"	18' - 7/16"	17' - 4"	15' - 3/8"

Installing the Power Tube

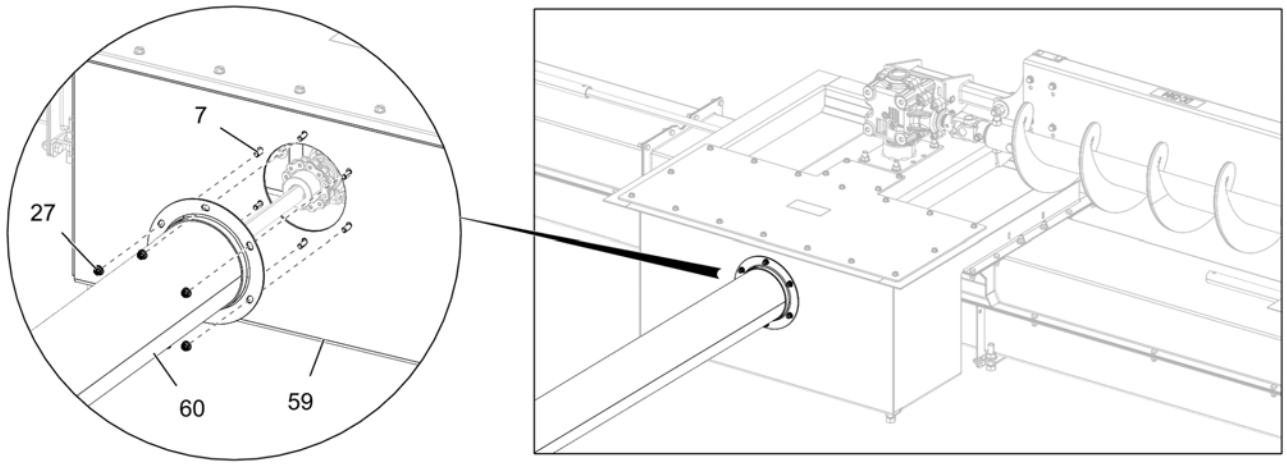
1. Mark the location for the power tube in the bin wall and cut an opening for the power tube to pass through.

Figure 5-22 *Sidewall opening details (power tube)*



2. Insert the power tube (60) through the hole in the bin wall and align the tube flange with the outside of the center well (59).
3. Secure the power tube (60) to the center well (59) using 5/16" x 3/4" flange bolts (7) and 5/16 in. flange nuts (27).

Figure 5-23 *Secure the power tube to the center well*



7	5/16" x 3/4" flange bolt	59	Center well
27	5/16" flange nut	60	Power tube

The chart shows the minimum number of supports that should be placed beneath the span of tubing. Even though the smaller diameter bins may not require any supports, it is always a good idea to have at least one support positioned in the center of these shorter spans.

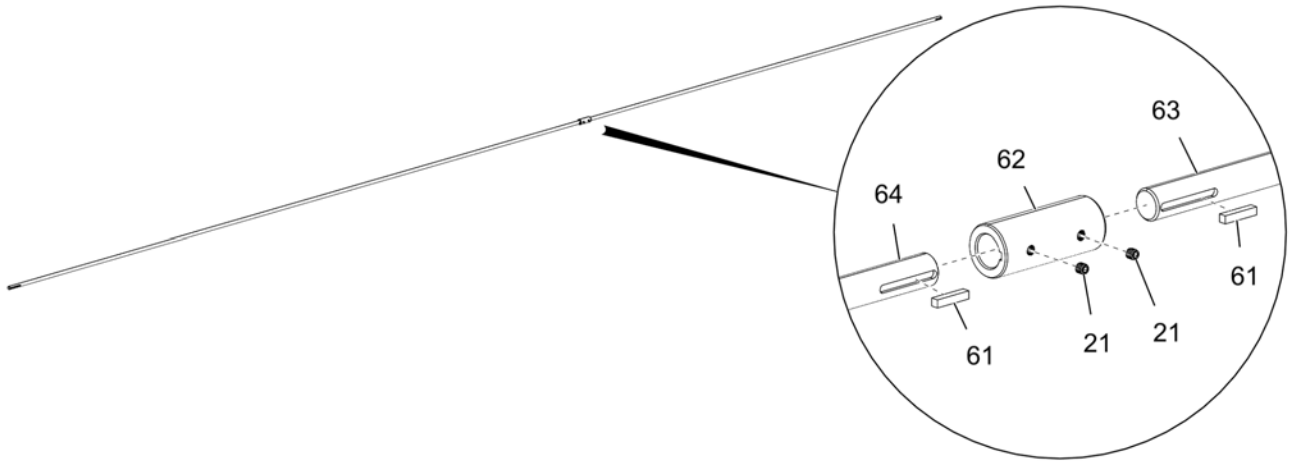
Bin diameter	Minimum No. of Supports
24'-42'	1
48'-60'	2
66'-72'	3

Assembling the Drive Shafts (42' - 72' Only)

1. Assemble the drive shaft (64) and drive shaft extension (63) together using the coupler (62), 5/16" x 3/8" set screws (21) and keys (61).

   NOTE: *Loosen the set screws (21) from the coupler (62) before sliding in the shafts (63 and 64). After the shafts are inserted completely, re-tighten the set screws (21).*

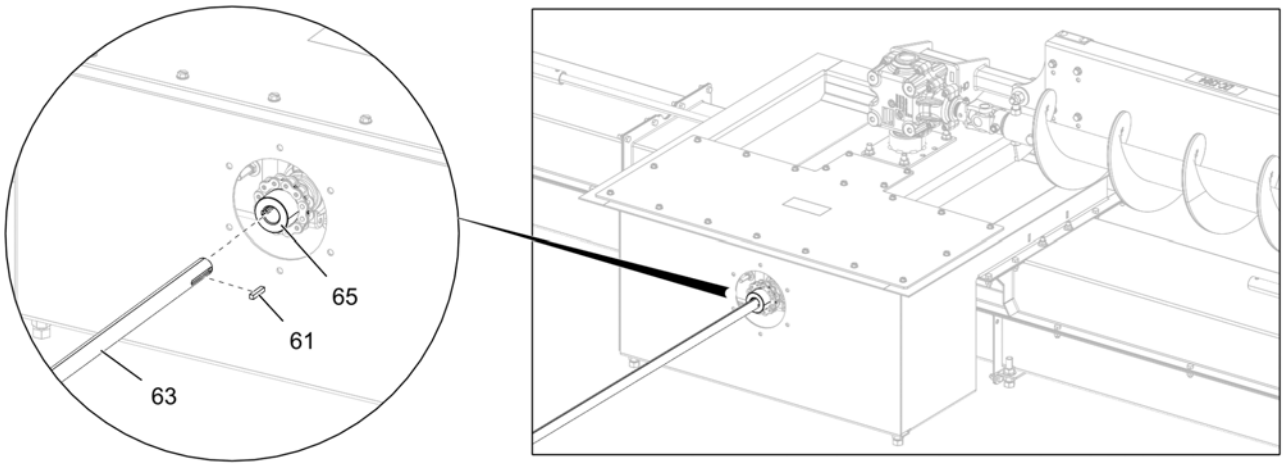
Figure 5-24 *Assembling the drive shafts (42' - 72' only)*



21	5/16" x 3/8" set screws	63	Drive shaft extension
61	Key	64	Drive shaft
62	Coupler		

2. Loosen the set screws on the drive coupler (65) in the center well and insert the drive shaft (63) into the drive coupler (65). Secure the drive shaft (63) with a key (61) and re-tighten the set screws.

Figure 5-25 *Installing the drive shaft to the center well drive coupler*

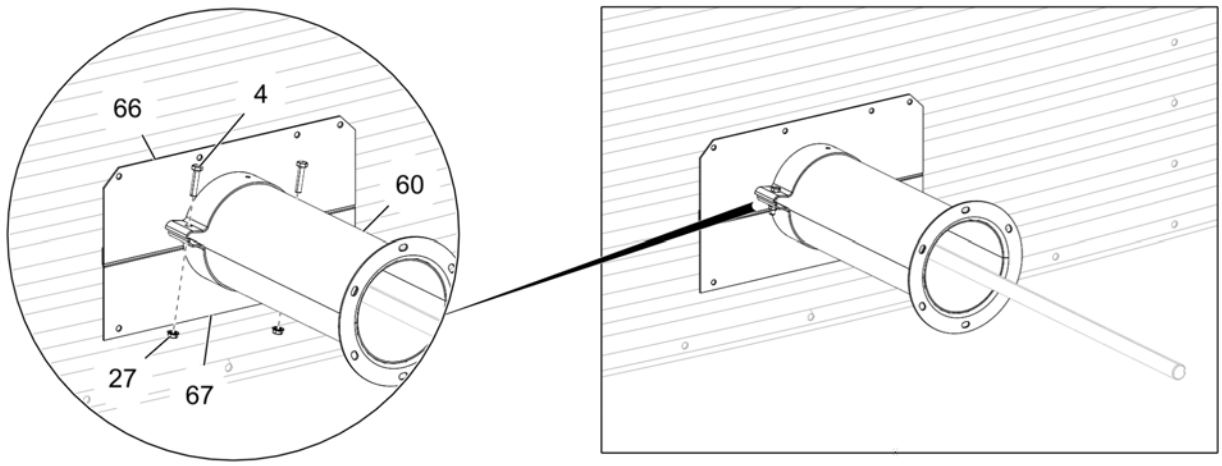


61	Key	65	Drive coupler
63	Drive shaft extension		

Installing the Bin Flanges for Power tube

1. Attach the upper bin flange (66) and lower bin flange (67) loosely to the power tube (60) using 5/16" x 1-1/2" HHCS bolts (4) and 5/16" flange nuts (27).

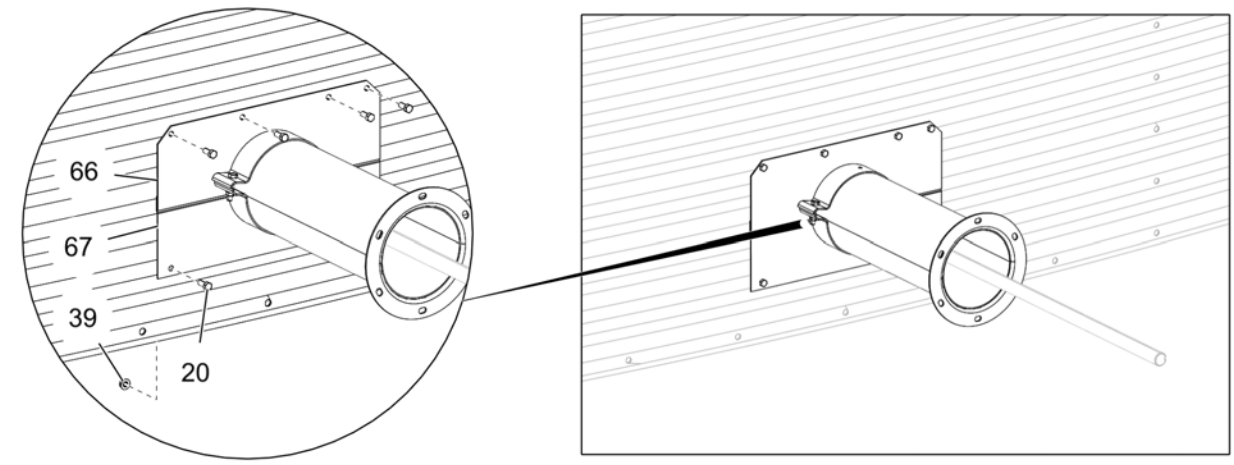
Figure 5-26 *Installing the upper and lower bin flanges for power tube*



4	5/16" x 1-1/2" HHCS bolt	66	Power tube upper bin flange
27	5/16" flange nut	67	Power tube lower bin flange
60	Power tube		

2. Slide the bin flanges (66 and 67) flush with the bin wall and tighten the bolts (4) connecting the two flanges.
3. Drill the holes in the bin wall through the four holes located in the upper bin flange (66) and two holes located in the lower bin flange (67) and secure the bin flanges to the bin wall using six standard bin bolts (20) and flange nuts (39).

Figure 5-27 *Secure the upper and lower bin flanges*

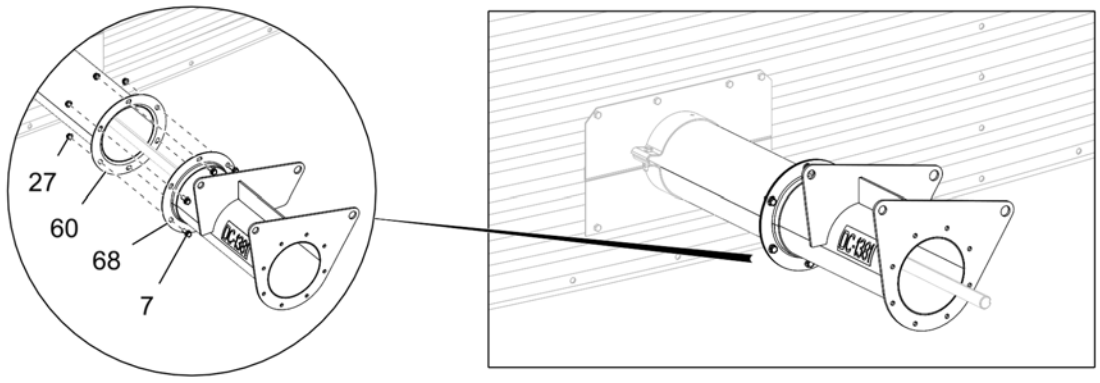


20	Standard bin bolt	66	Power tube upper bin flange
39	Flange nut	67	Power tube lower bin flange

Assembling the Drive Head

1. Align the flange of the power tube (60) with the flange of the drive tube assembly (68) and install using 5/16" x 3/4" flange bolts (7) and 5/16" flange nuts (27).

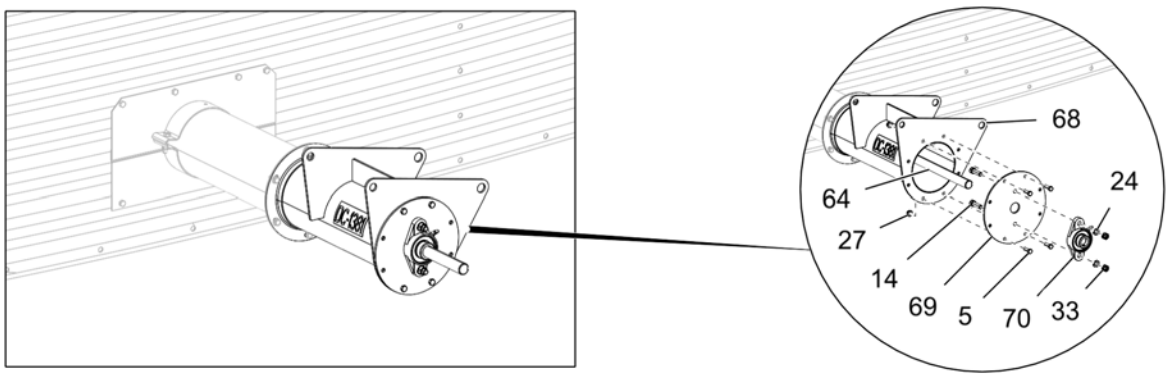
Figure 5-28 *Attaching the power tube assembly to the drive head tube assembly*



7	5/16" x 3/4" flange bolt	60	Power tube
27	5/16" flange nut	68	Discharge tube assembly

2. Install the bearing (70) to the bearing plate (69) using 7/16" x 1-1/2" HHCS bolts (14), 7/16" lock washers (24) and 7/16" hex nuts (33).
3. Slide the bearing plate assembly over the drive shaft (64) and attach it to the motor end of the tube assembly (68) using four 5/16" x 1" HHCS bolt (5) and four 5/16" flange nuts (27) as shown.

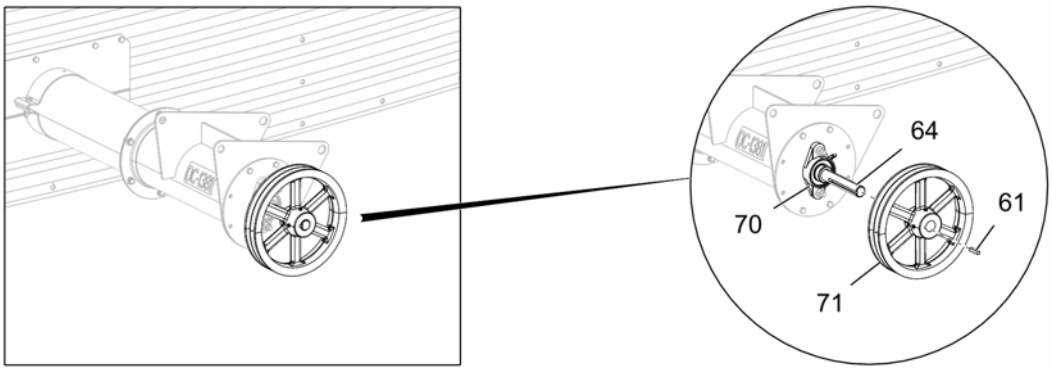
Figure 5-29 *Assembling the bearing and bearing plate to the drive head tube*



5	5/16" x 1" HHCS bolt	64	Drive shaft
14	7/16" x 1-1/2" HHCS bolt	68	Discharge tube assembly
24	7/16" lock washer	69	Bearing plate
27	5/16" flange nut	70	Bearing
33	7/16 in. hex nut		

4. Install the lock collar in the bearing (70) over the drive shaft but DO NOT tighten the lock collar at this time.
5. Slide the sheave (71) over the drive shaft (64) close to the bearing assembly. Once the sheave (71) is set at the correct position, secure the sheave (71) using the square key (61). Tighten the lock collar on the bearing (70) and then the set screws in the sheave (71).

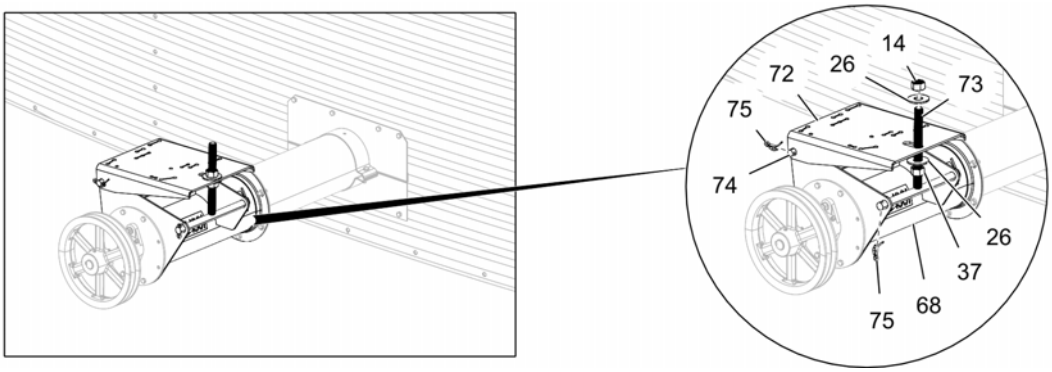
Figure 5-30 *Installing the sheave to the drive shaft*



61	Square key	70	Bearing
64	Drive shaft	71	Sheave

6. Install the threaded weld rod (73) to the tube assembly (68) using cotter pins (75).
7. Install one end of motor mount plate (72) to the support plate of the tube assembly (68) using motor mount pivot rod (74) and cotter pins (75).
8. Install the other end of the motor mount plate (72) to the threaded weld rod (73) with 3/4" flat washers (26) and 3/4" hex nuts (37). This rod allows for the adjustment of the mount plate (72).

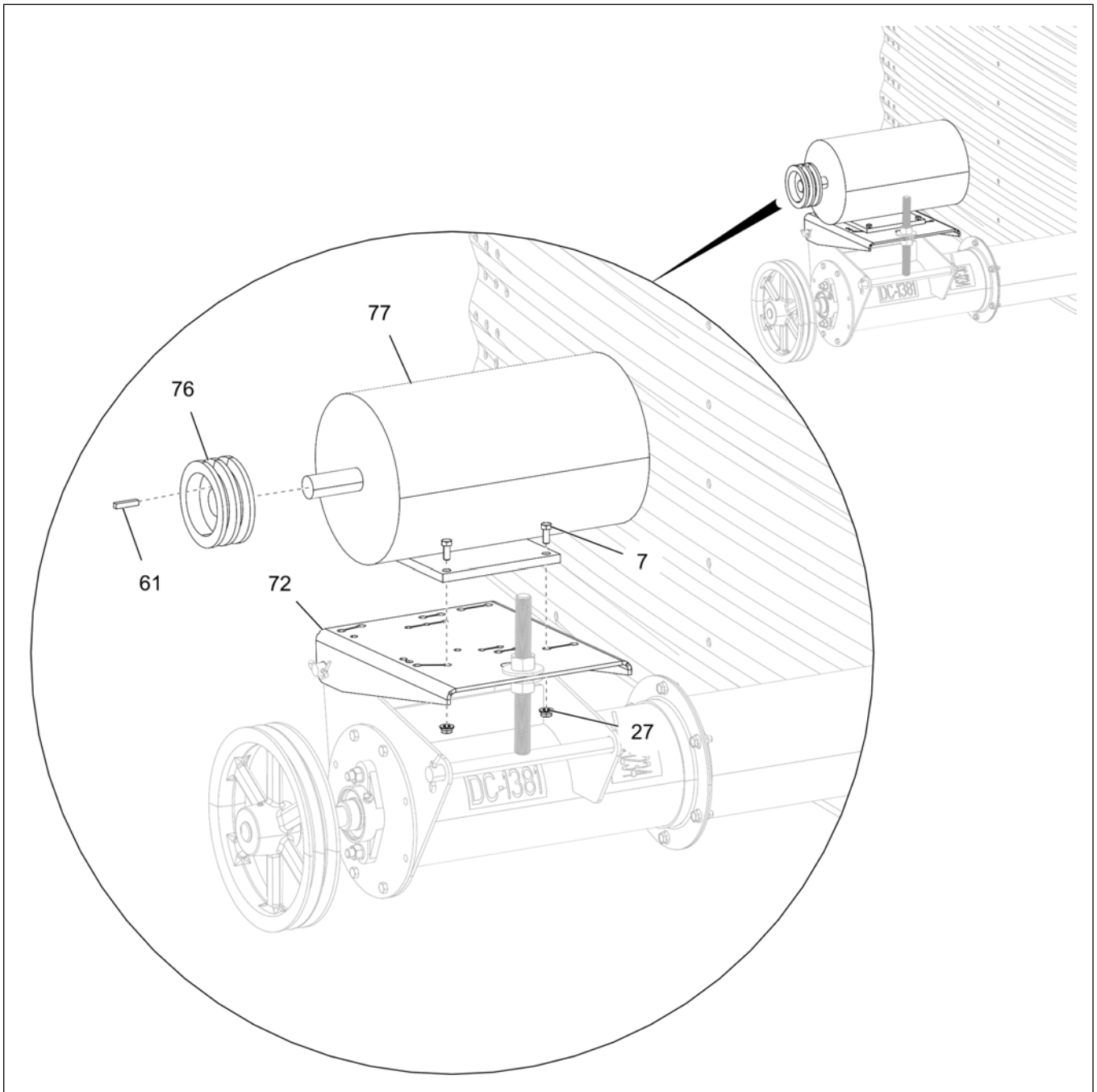
Figure 5-31 *Installing the motor mount plate*



26	3/4" flat washer	73	Adjustment weld rod
37	3/4" hex nut	74	Pivot rod
68	Discharge tube assembly	75	Cotter pin
72	Motor mount plate		

9. Install the motor sheave (76) to the motor shaft (77) using key (61).
10. Install the motor (77) along with pulley (76) to the motor mount plate (72) using 5/16" x 3/4" flange bolts (7) and 5/16" flange nuts (27).

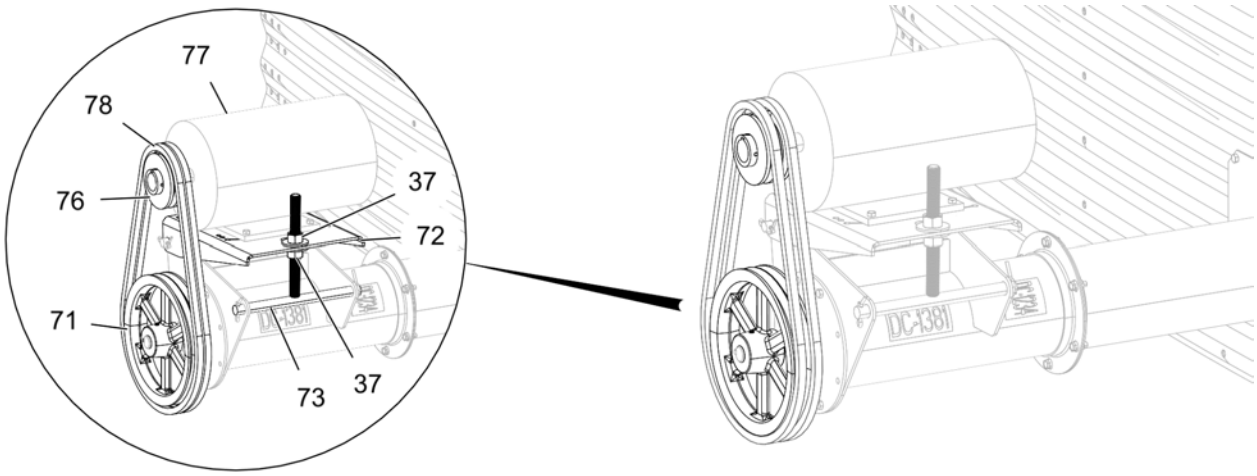
Figure 5-32 *Installing the motor*



7	5/16" x 3/4" flange bolt	72	Motor mount plate
27	5/16" flange nut	76	Motor sheave
61	Key	77	Motor

11. Untie and align the belts (78) to the sheaves (71 and 76) and tighten them by adjusting the nuts (37) of the weld rod (73) on the motor mount plate (72).

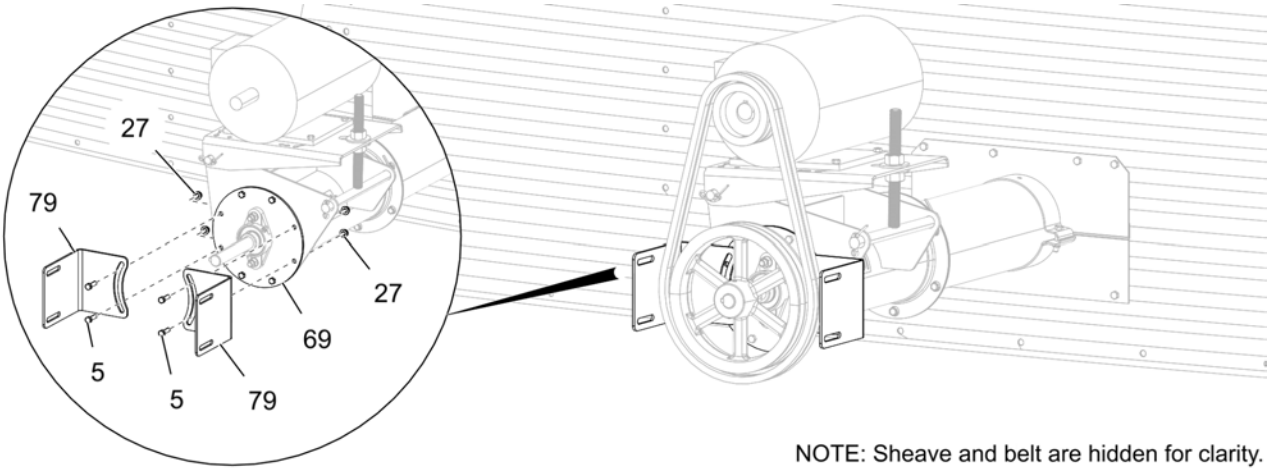
Figure 5-33 *Installing the belt*



37	3/4" hex nut	76	Motor sheave
71	Sheave	77	Motor
72	Motor mount plate	78	Belt
73	Adjustment weld rod		

12. Install the belt guard brackets (79) to the bearing plate assembly (69) using 5/16" x 1" HHCS bolt (5) and 5/16" flange nuts (27).

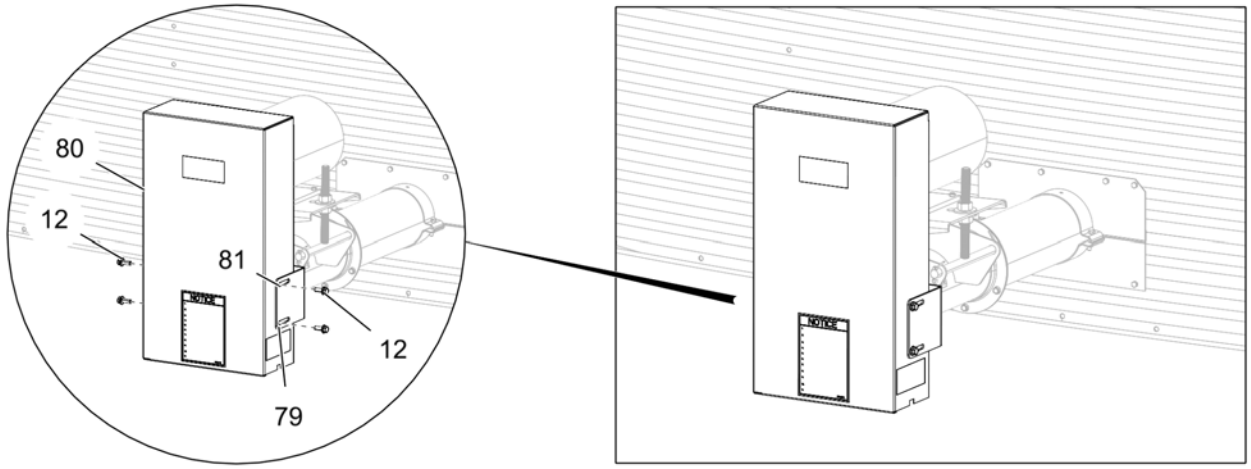
Figure 5-34 *Installing the belt guard brackets*



5	5/16" x 1" HHCS bolt	69	Bearing plate
27	5/16" flange nut	79	Belt guard brackets

13. Assemble the belt guard (80) to the belt guard brackets (79) using 3/8" x 1" flange bolts (12) and 3/8" threaded insert (81).

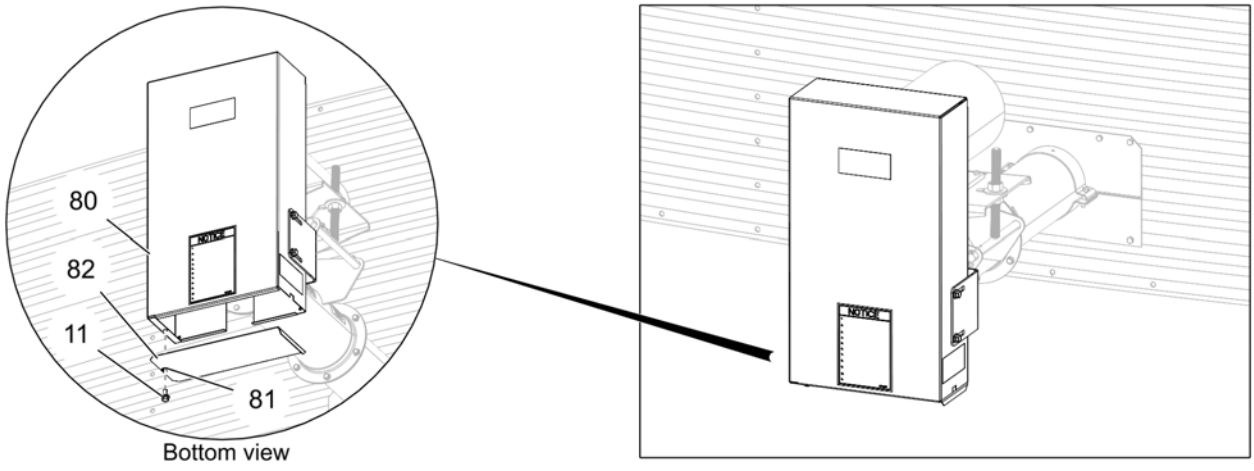
Figure 5-35 *Installing the belt guard*



12	3/8" x 1" flange bolt	80	Belt guard
79	Belt guard brackets	81	3/8" threaded insert

14. Slide the belt guard bottom cover (82) into the belt guard (80) and install using a 3/8" x 3/4" flange bolt (11) and 3/8" threaded insert (81).

Figure 5-36 *Installing the belt guard bottom cover*



11	3/8" x 3/4" flange bolt	81	3/8" threaded insert
80	Belt guard	82	Belt guard bottom cover

NOTES

6 Installing the Drive Assembly

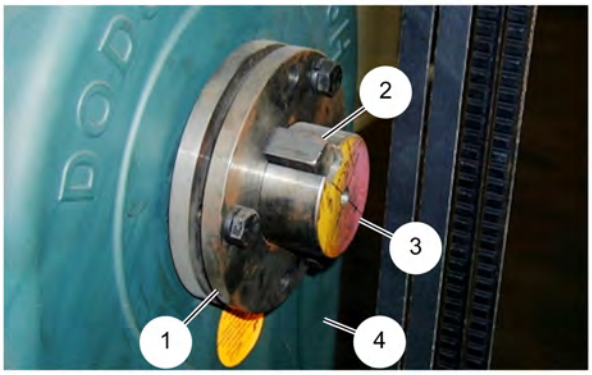
Topics Covered in this Chapter

- Installing the Reducer to the Drive Shaft
- Installing the Torque Arm Bracket and Turnbuckle
- Installing the Shaft Guard to the Reducer Drive
- Installing the Bracket Clips
- Cutting the First Shield
- Cutting the Second Shield
- Installing the Reducer Drive Shaft Guard
- Adjusting the Motor Plate using Motor Mount Brackets
- Part Number Breakdown
- Installing the Motor Mount Adjustment Plates
- Installing the Drive Guard Rear Panel
- Installing the Sheaves and Belts
- Adjusting the V-Belt
- Installing the Front Guard Panel
- Lubricating the Reducer Drive
- Initial Start-Up and Break-In Section
- Installation Instructions (Whirligig® - WG1-4B)

Installing the Reducer to the Drive Shaft

1. To aid in the installation of the shaft mount reducer (4) onto the conveyor drive shaft (3), remove any protective coating film from the shaft.
2. Place key (2) in the keyway on the conveyor drive shaft (3).
3. Attach inside bushing (1) back-up plate and secure with supplied retaining ring to the reducer hub.

Figure 6-1 *Installing the bushing to the reducer*

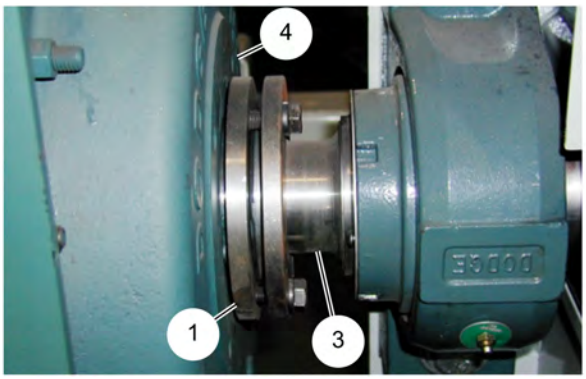


1	Bushing	3	Conveyor drive shaft
2	Key	4	Shaft mount reducer

4. Line up the keyway on reducer (4) with key on shaft and slide the reducer drive onto the drive shaft (3).
5. Slide outside back-up bushing onto shaft and secure with supplied retaining ring to reducer hub. Once reducer drive is in place, fully tighten both bushings.

   NOTE: *For more detailed motor mounting details specific to the installation, refer to the manual provided with the motor.*

Figure 6-2 *Installing the reducer to the drive shaft*

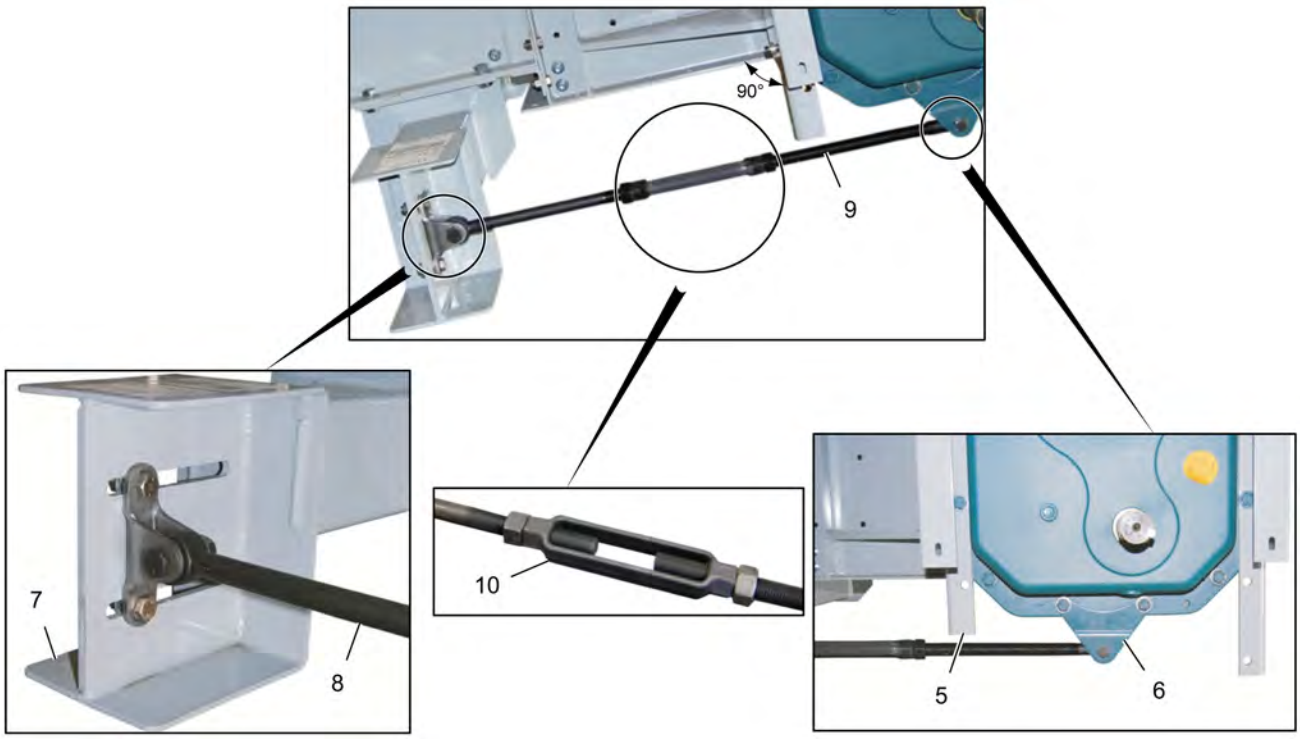


1	Bushing	4	Shaft mount reducer
3	Conveyor drive shaft		

Installing the Torque Arm Bracket and Turnbuckle

1. When a drive package is ordered with the conveyor system, a torque arm bracket (7) is provided.
2. The torque arm bracket (7) is pre-punched for easy installation to the unit. Begin installation of this option by determining the location of the torque arm bracket (7) relative to the range of extension allowed by the shaft mount reducer's torque arm assembly (9). The bracket will extend on the same side of the conveyor as the head shaft. Remove the four bolts from the bottom of the conveyor plate as necessary.
3. Next, match the size of the hardware to the reducer manufacturer's torque arm (8). Use this hardware to attach the torque arm (8) to the bracket (7). Adequately tighten all hardware.
4. The torque arm bracket (7) is mounted under the first intermediate section. Locate bracket by matching an existing set of holes in the intermediate side that allows the turnbuckle assembly (10) to be as short as possible with the reducer in a position perpendicular to the length of the conveyor.
5. Install the torque arm turnbuckle (10) between the two plates (6) that are located on the bottom of the reducer drive. Secure using bolt with washer and lock nut. Attach the other end to the torque arm bracket (7) on the conveyor using two bolts, washers and lock nuts. Adjust the torque arm (8) by turning the turnbuckle (10).

Figure 6-3 *Installing the torque arm and turnbuckle to the reducer*

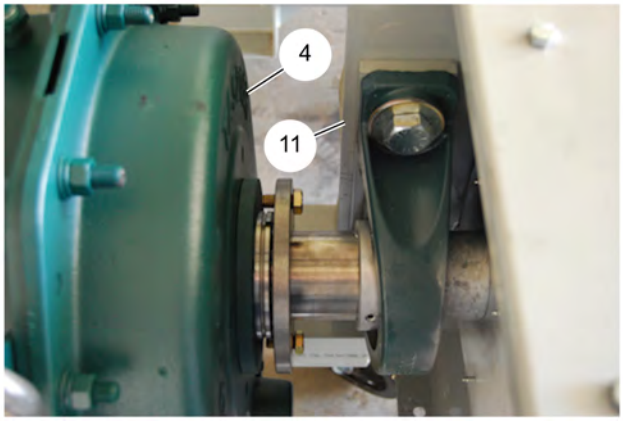


5	Motor mount upright bracket	8	Torque arm
6	Plates on reducer drive	9	Torque arm assembly
7	Torque arm bracket	10	Turnbuckle

Installing the Shaft Guard to the Reducer Drive

Install the guarding for the shaft protrusion between the reducer (4) and the conveyor (11) head side.

Figure 6-4 *Installing the shaft guarding*



4	Reducer	11	Conveyor

Installing the Bracket Clips

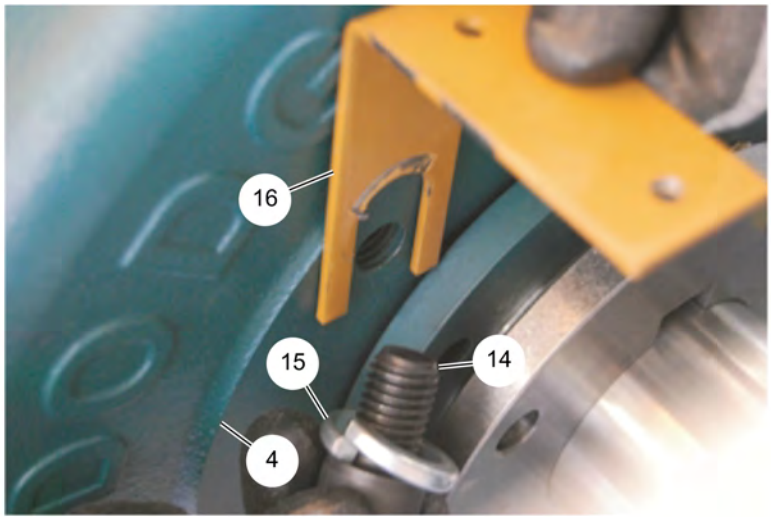
1. Measure the height (13) of shaft shield guard (12). This will determine the distance between the shaft guard clips.

Figure 6-5 *Measuring the shaft shield guard height*

12	Shield guard	13	Height measurement of shield guard

2. Install four reducer shaft guard clips (16) to the gear reducer (4) using supplied bolts (14) and lock washers (15). Tighten only finger tight at this time.

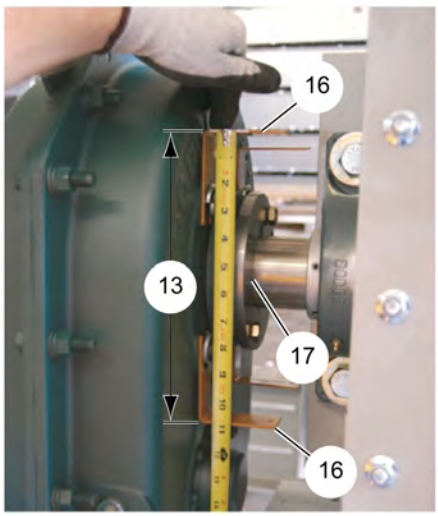
Figure 6-6 *Installing the shaft guard clips*



4	Reducer	15	Lock washer
14	Bolt	16	Shaft guard clip

3. Adjust the shaft guard clips (16) so the distance between the clips (16) is the same as the height measurement (13) of the shield guard (12) taken in step 1. Center distance on the center of the reducer shaft. Clips (16) should line up horizontally and vertically across. Tighten the bolts on clips (16).

Figure 6-7 *Adjusting the clips for shield guard height*

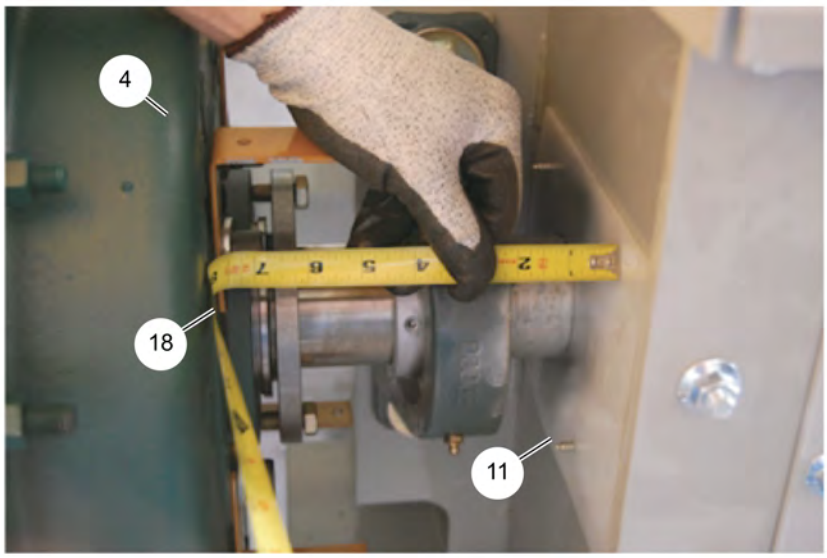


13	Height measurement of shield guard	17	Shaft center
16	Shaft guard clip		

Cutting the First Shield

1. Measure distance (18) from the gear reducer (4) to the conveyor side (11).

Figure 6-8 *Measuring distance between conveyor and reducer*



4	Reducer	18	Distance measured between reducer and conveyor
11	Conveyor		

2. Transfer measurement (18) to the shield guard (12) and cut with tin snips (19).

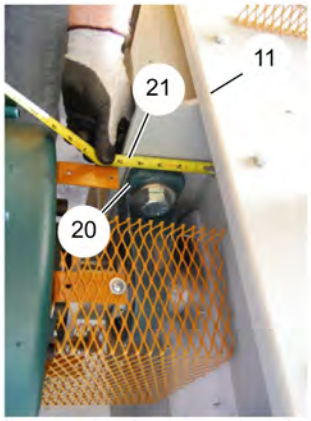
Figure 6-9 *Cutting the shield guard for measurement*

12	Shield guard	19	Tin snips
18	Distance measured between reducer and conveyor		

Cutting the Second Shield

1. Measure distance (21) from the conveyor (11) side to the outside of the bearing mount (20). Record measurement. Use this measurement (21) to cut the depth of the second shield (12).

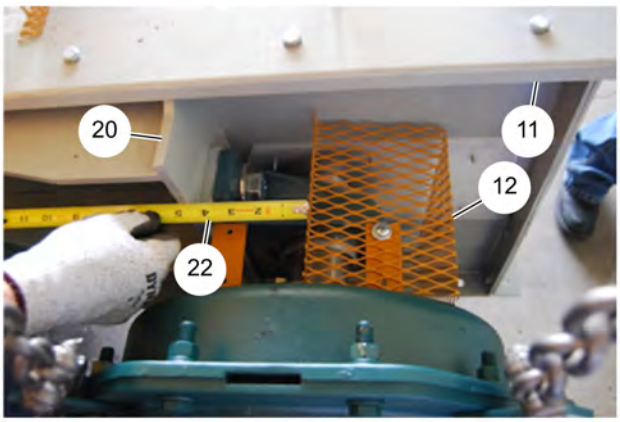
Figure 6-10 *Measuring distance between conveyor and bearing mount*



11	Conveyor	21	Distance measured between conveyor and bearing mount
20	Bearing mount		

2. Measure distance (22) from the first shield (12) half to the outside of the bearing mount (20). Record measurement. Use this measurement to cut the width of the second shield (12).

Figure 6-11 *Measuring distance between first shield half and bearing mount*



11	Conveyor	20	Bearing mount
12	Shield guard	22	Distance measured between first shield and bearing mount

3. Transfer measurements (21) and (22) to the second shield (12) and cut.

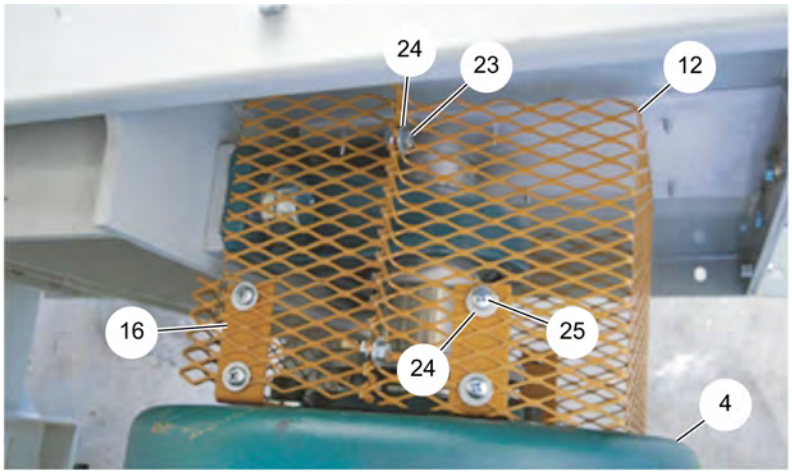
Figure 6-12 *Cutting the second shield for measurements*

12	Shield guard	21	Distance measured between conveyor and bearing mount
19	Tin snip	22	Distance measured between first shield and bearing mount

Installing the Reducer Drive Shaft Guard

1. Install the shield guards (12) to the reducer (4) using supplied bolts and washers. Insert self-tapping screws (25) through washer (24) and guard screen and then into guard clips (16).
2. Secure the guards together by inserting bolts (23) through washers (24), top and bottom flanges on shield guards (12) and install nuts.

Figure 6-13 *Installing the reducer drive shaft guard*



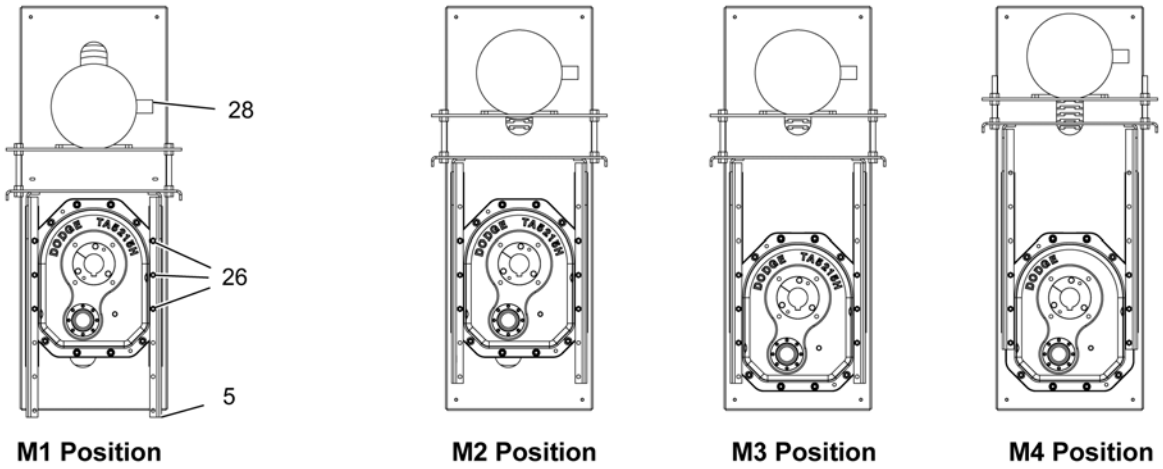
4	Reducer	23	Bolts
12	Shield guard	24	Washers
16	Shaft guard clips	25	Self-drilling screws

Adjusting the Motor Plate using Motor Mount Brackets

1. Remove three bolts (26) from each side of the reducer housing
2. Use a set of holes in the motor mount upright brackets (5) that allows the motor plate to be as close as possible to the top of the conveyor.
3. Check this location by temporarily positioning the belt guard (27) on the reducer with the hole in the guard centered over the reducer input shaft. This will show the correct motor (28) position for the lengths of V-belts provided.
4. Attach by replacing bolts (26) through brackets and housing and tighten the bolts (26).

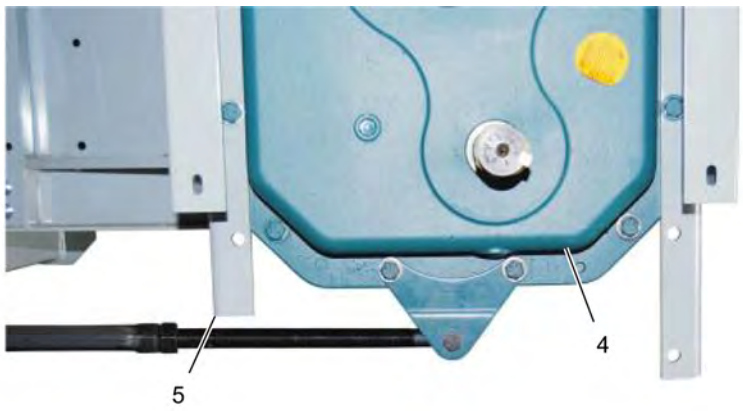
   NOTE: *Motor mount upright bracket may have to be trimmed for torque arm clearance.*

Figure 6-14 *Adjusting the motor plate*



5	Motor mount upright bracket	27	Belt guard
26	Three bolts to be removed from motor bracket	28	Motor

Figure 6-15 *Trimming the mount upright bracket*



4	Reducer	5	Motor mount upright bracket (Trimmed)

Part Number Breakdown

Part number as written: 53918T2BV2

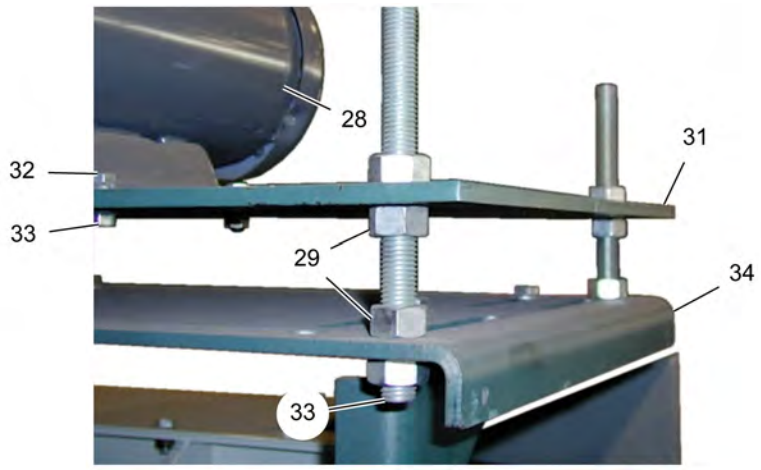
5	39	18	T	2	B	V	2
Horsepower*	**Output RPM**	**Input Motor RPM (x 100)**	**Manufacturer**	**Motor Mount Configuration**	**Reducer Bushing Bore Size**	**Drive Config-uration**	**Drive Class**
		“18” = 1750 RPM@60HTZ “15” = 1450 RPM@50HTZ	“T” for Dodge TA II Reducer	“1” = M1 Position “2” = M2 Position “3” = M3 Position “4” = M4 Position	“A” = 1-7/16" “B” = 1-15/16" “C” = 2-3/16" “D” = 2-7/16" “E” = 2-15/16" “F” = 3-7/16" “G” = 3-15/16" “H” = 4-7/16" “I” = 4-15/16"	“V” = V-Belt Drive “H” = HTD Belt Drive	“1” or “2”

NOTE: **Horsepower identification may contain 1 to 3 digits.*

Installing the Motor Mount Adjustment Plates

1. Install two nuts (29) to each of the jack screws (30), with one nut (29) under the base plate (34) and another nut (29) above the base plate (34).
2. Install one more nut (29) onto all four jack screws (30). Place the motor mount adjustment plate (31) onto jack screws (30) and secure using another nut (29).Use these nuts (29) above and below the adjustment plate (31) to adjust the motor (28) height.
3. Attach the motor (28) to the motor mount adjustment plate (31) using bolts (32) and lock nuts (33).
4. The base plate (34) is adjustable. Use the slots to flush the face of the motor (28) to the face of the outer bushing of the reducer. This will ensure the maximum guard covering and motor shaft utilization.

Figure 6-16 *Installing the motor mount adjustment plate*



28	Motor	32	Motor bolt
29	Nut	33	Motor nut
30	Jack screw	34	Base plate
31	Adjustment plate		

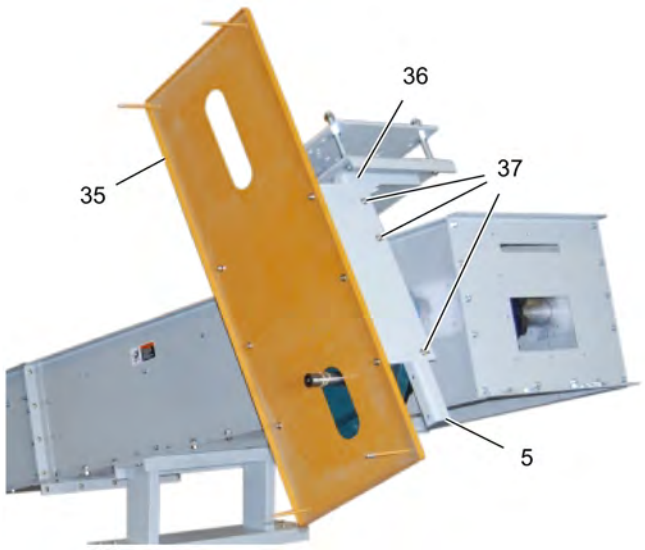
Installing the Drive Guard Rear Panel

Install the drive guard rear panel before mounting the sheaves.

1. The drive guard rear panel (35) includes belt guard mounting brackets (36) with slotted holes (37) for adjustment. Attach the left hand and right hand belt guard mounting brackets (36) to the motor mount upright brackets (5).
2. Install the drive guard rear panel (35) to the belt guard mounting brackets (36).

   NOTE: *Guards should be set as close to the outer bushing of the reducer as possible without contacting the bushing.*

Figure 6-17 *Installing the drive guard panel*



5	Motor mount upright bracket	36	Belt guard mounting bracket
35	Drive guard rear panel	37	Slotted holes

Installing the Sheaves and Belts

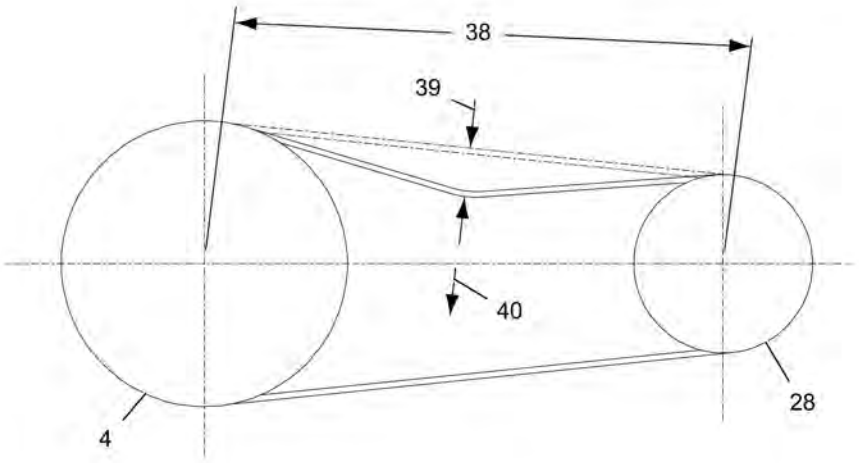
1. Assemble the V-belt driven sheave to the input shaft of the shaft mount reducer.
2. Insert the bushing into sheave hub. Match holes in bushing and hub (not threads).
3. Put screws into holes that are farthest apart. Slip entire unit with key onto shaft. Align the driver and driven sheaves and tighten the retaining screws.
4. During tightening, it is possible for the sheave to move out of alignment or become out of square.
5. For maximum V-belt life, the driven sheave should remain both perpendicular to the drive shaft and aligned with the drive sheave. Slip the V-belts over both the driver and driven sheaves.

Adjusting the V-Belt

1. Adjustment of V-belt tension is achieved by tightening the hex nuts located on the four jack screws of the motor base. Adjust motor base equally at all four jack screws to maintain shaft alignment.
2. Belts are designed to fit loosely upon installation. When the V-belt tension is correct, tighten the top nut on the jack screws to lock the motor base in position.
3. Proper tension) is 1/64 inch of deflection per one inch (1") of sheave centers on one side of belt, centered between sheaves.

   NOTE: *Too much tension shortens belt life. Check belt tension frequently during the first 24-48 hours of operation.*

Figure 6-18 *Adjusting the V-belt*



4	Reducer	39	Belt deflection
28	Motor	40	Force
38	Span		

Sample Deflection Problem:

3-1/2' Span = 21/32" of Deflection (approximately 11/16")

1. 3-1/2' = 42" (Span)
2. 1/64" = 0.015625" (Belt deflection per inch of span)
3. 42" x 0.015625" = 0.65625" (Span x Belt deflection)
4. 0.65625" = 21/32" of Deflection for 3-1/2" span

Installing the Front Guard Panel

Install the front drive guard panel over the four corner mounting studs. Secure with washers and nuts provided.

Lubricating the Reducer Drive

Fill the shaft mount reducer with the manufacturer's recommended oil.

Initial Start-Up and Break-In Section

What You Should Know

A certified electrician must perform electrical wiring for equipment.

1. Connect the conveyor motor to a power source according to the motor manufacturer's instructions and recommendations.
2. A shut off switch should be placed near the motor so that the system may easily be shut down.
3. Check proper motor shaft rotation before installing drive belts.
4. Rotate the chain, now on the sprockets, at least one complete revolution. Check to see that the chain and its wear pads are not catching on flanges or rubbing on the trough sides due to the sprockets not being centered within the box.
5. Ensure a "break-in" period whereby the chain is allowed to run and seat itself.
6. After running it for an adequate period of time, stop the machine, disconnect and lock out the power source.
7. Re-tighten as necessary and remove any excess chain portions.
8. Repeat this process as necessary.

Installation Instructions (Whirligig® - WG1-4B)

What You Should Know

WARNING

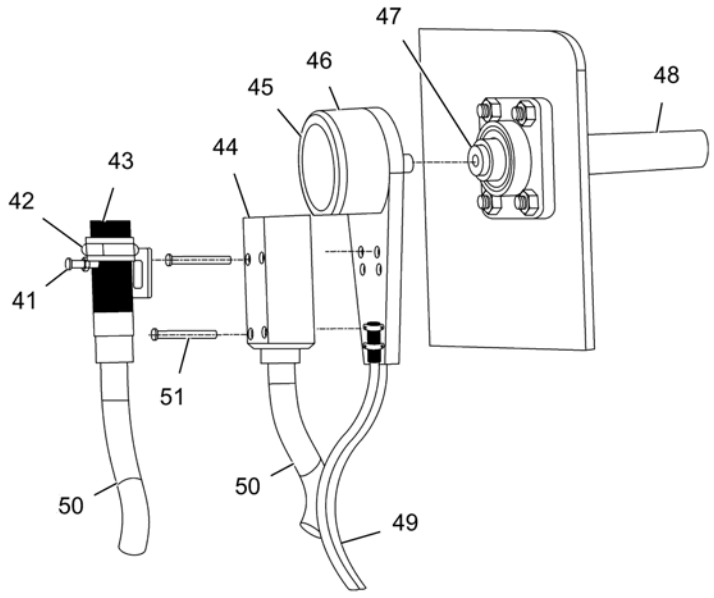
Always observe lock out and tag out procedures before, during and after installation.

Do not remove the Whirligig cover. The rotating components under the cover could cause serious injury.

1. Tail shaft ends (47) are pre-drilled and tapped from the factory.
2. Thread the Whirligig (45) onto the machine shaft (48) using 5/8" open ended wrench and suitable thread locking adhesive (Loctite® or similar).
3. Install the sensor (44) to the Whirligig base plate. Two sets of pre-drilled holes are provided for M800 sensor (44). Fit the sensor to leave an approximate 2 mm gap between sensor face and cover (46). A universal bracket (42) (WGB18/30) is supplied for fitting 18 mm or 30 mm sensors.
4. Connect the sensor in accordance with manufacturer's instructions and observe all relevant electrical and O.S.H.A., regulations.
5. Fix the flexible strap (49) securely to the static structure (if required).

   TIP: *The M800 speed switch and system function can be tested by placing a thin metal plate between the sensor and the cover of the Whirligig. When installing other industry standard sensors, leave a small gap between the sensor and the Whirligig cover for this purpose.*

Figure 6-19 *Installing the motion sensor*



41	10 mm screws four (supplied)	47	Tap shaft for 1/2" UNC centered
42	18/30 mm bracket (supplied)	48	Machine shaft
43	Cylindrical sensor	49	Flexible strap
44	M800 sensor	50	Flexible conduit
45	Whirligig	51	50 mm screws four (supplied)
46	Cover		

7 Bridging

Topics Covered in this Chapter

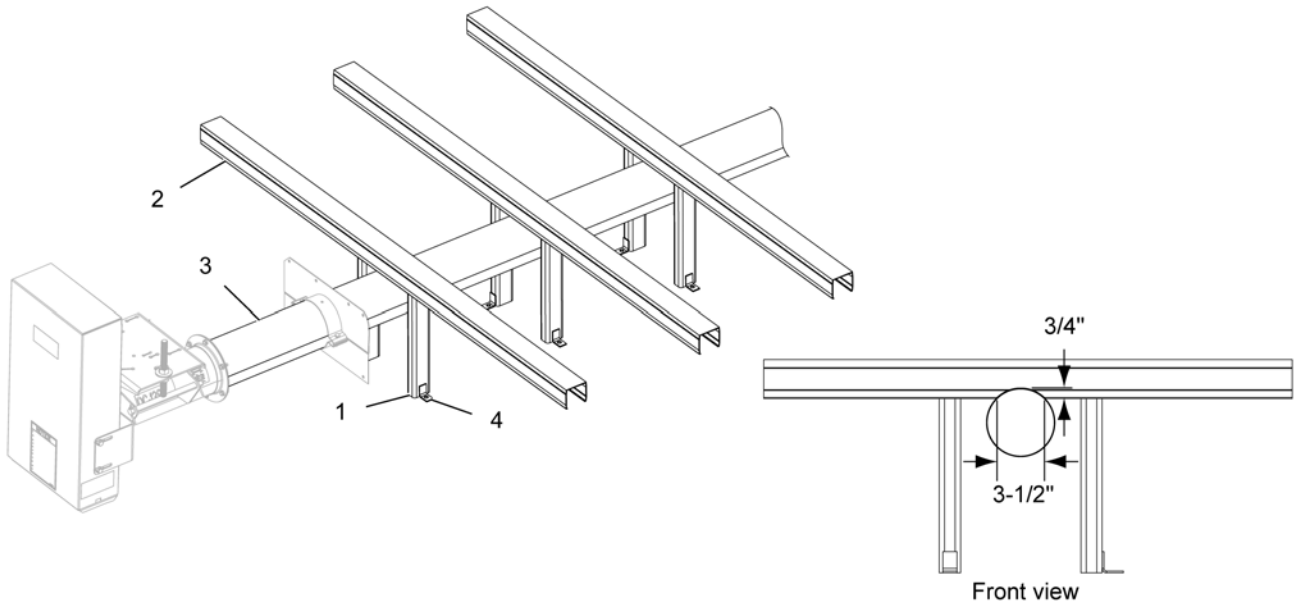
- Installing the Bridging for the Drive Tube
- Installing the Dura-Lok Bridging for the Conveyor
- Installing the Cut-Lok/Cor-Lok Bridging for the Conveyor

Installing the Bridging for the Drive Tube

1. Place and push the monorails (2) onto the bridge beam weldments (1), so that the monorail (2) inside surface becomes flush with the beam (1) surface. Check for levelness.
2. The monorail (2) will require field cutting to provide clearance for the drive tube (3). Using the center of drive tube (3) as a reference, mark and trim a 3-1/2" wide semi-circular segment with 3/4" depth.

   NOTE: *Do not cut the bridge beam weldment (1). Make sure a gap of 1" is maintained between the monorail (2) and bridge beam weldment (1).*
3. Install the bridge beam weldments (1) with monorails (2) for the half of the floor where the chain loop power sweep drive shaft tube (3) will be installed. Use standard rail spacing based on the bin size.
4. Attach a leg adjustment (4) to each leg of the bridge beam weldment (1) and anchor each bridge column to the concrete floor using 3/8" installed anchor and washer.

Figure 7-1 *Bridging for the drive tube*



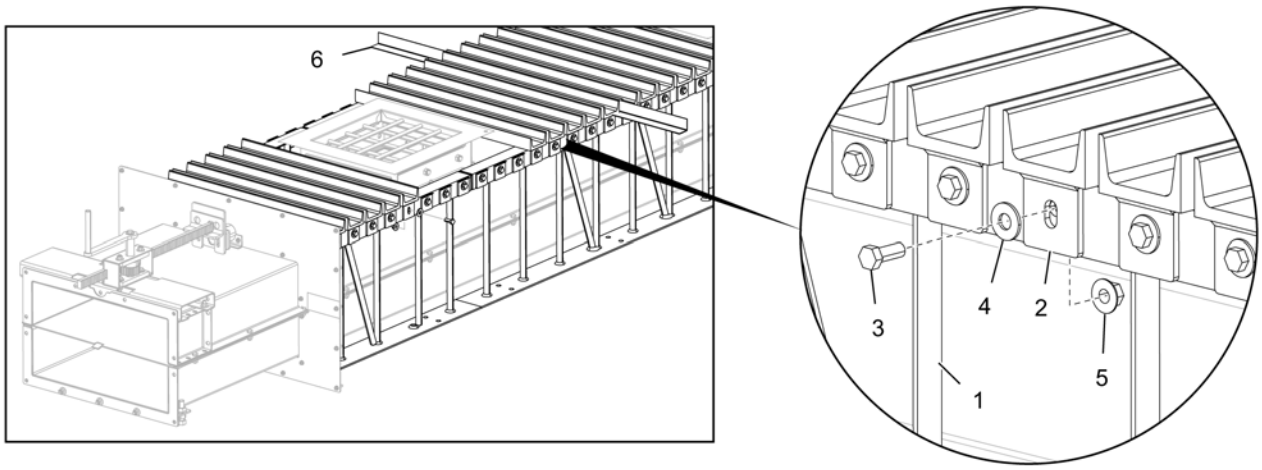
1	Bridge beam weldment	3	Drive tube
2	Monorail	4	Leg adjustment bracket

Installing the Dura-Lok Bridging for the Conveyor

1. Place the dura-lok floor support weldments (1) on each side of the conveyor. Make sure to align the outer edges of the support weldments (1) with the previously placed floor support weldments (1).
2. Place the 27-1/4" dura-lok support channels (2) over the floor support weldments (1). Align and install the dura-lok support channels (2) to the floor support weldments (1) on each side using a 3/8" x 1" hex bolt (3), two 3/8" flat washers (4) and 3/8" flange nut (5).
3. Continue installing the dura-lok support channels (2) to the floor support weldments (1) for the length of the conveyor.

   NOTE: *Do not install floor support channels (2) at the intermediate well opening locations. Use monorail tie straps (6) at places as per the requirement.*

Figure 7-2 *Installing the dura-lok bridging*



1	Dura-lok floor support weldment	4	3/8" flat washer
2	Dura-lok support channel	5	3/8" flange nut
3	3/8" x 1" hex bolt	6	Monorail tie straps

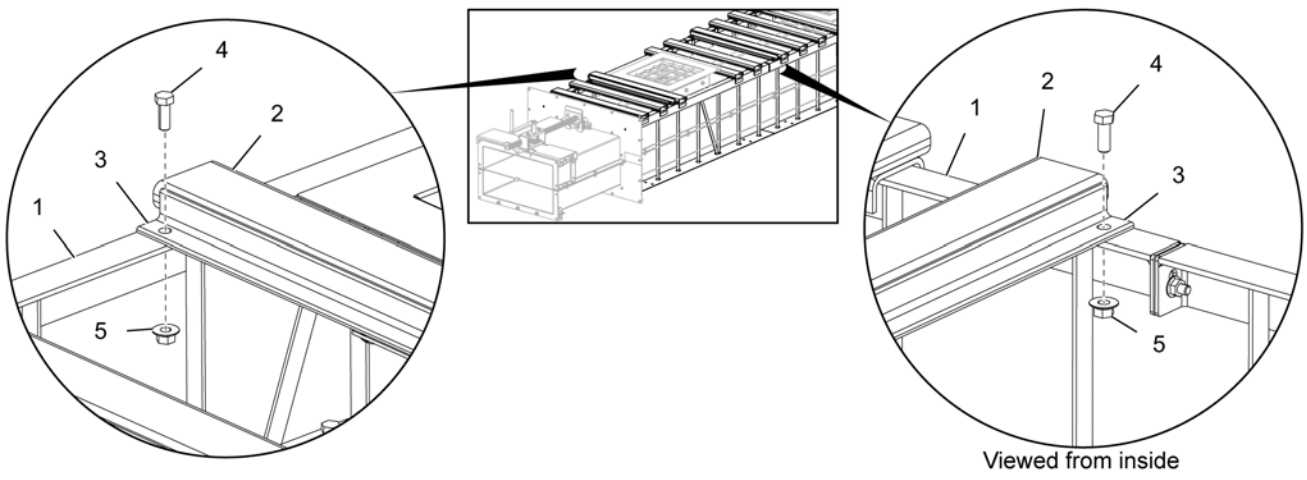
Installing the Cut-Lok/Cor-Lok Bridging for the Conveyor

1. Place the cut-lok/cor-lok floor support weldments (1) on each side of the conveyor. Make sure to align the outer edges of the support weldments (1) with the previously placed floor support weldments (1).
2. Place the cut-lok/cor-lok support beams (2) over the floor support weldments(1).
3. Install support struts (3) over the floor support weldments (1) near the support beams (2) using 3/8" x 1" bolt (4), and 3/8" nut (5).

   NOTE: *Make sure to install the support struts (3) near the intermediate wells, center well and support weldment joints.*
4. Continue placing the cut-lok/cor-lok support beams (2) to the floor support weldments (1) for the length of the conveyor.

   NOTE: *Do not install floor support channels (2) at the intermediate well opening.*

Figure 7-3 *Installing the cut-lok/cor-lok bridging*



1	Cut-lok/cor-lok floor support weldment	4	3/8" x 1" bolt
2	Cut-lok/cor-lok support beam	5	3/8" nut
3	Support strut		

NOTES

8 Operation

Topics Covered in this Chapter

- Power Recommendations
- Before Filling the Bin
- Performing Pre–Start Checks
- Operating the Conveyor
- Adjusting the Sweep Wheel
- Operating the Sweep Stop
- Final Clean Out

Power Recommendations

1. The horsepower recommendations are to auger reasonably dry grain. High moisture grain above (15%) will require greater power if maximum capacity is to be maintained. The maximum possible capacity will be less with high moisture grain that with dry grain. Use the electric motor of the correct size that operates at 1750 RPM. DO NOT use a motor size that is greater than what is shown for the largest bin size in the column.
2. Consideration should be given to the proper size auger for a batch drying or any intermittent type operations. When augers are stopped and restarted under full load, it may result in damage to the auger. Using a larger diameter auger and reducing its load level will be far better than subjecting a smaller diameter auger to big loads. If an auger is kept from absolute filling, it will make start-up easier and will convey more efficiently.

NOTE: *The auger capacity can fluctuate greatly under varying conditions. Moisture content, different commodities, amount of foreign matter and speeds all play a part in the performance of the auger. Twenty-five percent (25%) moisture may cut capacity by as much as forty percent (40%) under some conditions.*

DANGER

Electric motors and controls must be installed by a qualified electrician and must meet the standards set by the National Electrical Code and all local and state codes.

A main power disconnect switch capable of being locked only in the OFF position shall be provided. This shall be locked whenever work is being done on the auger.

DANGER

A magnetic starter should be used to protect the motor when starting and stopping. It should stop the motor in case of power interruption, conductor fault, low voltage, circuit interruption or motor overload. Then the motor must be restarted manually. Some motors have built-in thermal overload protection. If this type motor is used, use only those with a manual reset.

The motor starting controls must be located outside the bin. Locate the motor starting controls outside the bin but near the bin door so the operator has full view of the operation inside the bin.

Disconnect power before resetting motor overloads.

Reset and motor starting controls must be located so that the operator has full view of the entire operation.

Make certain electric motors are grounded.

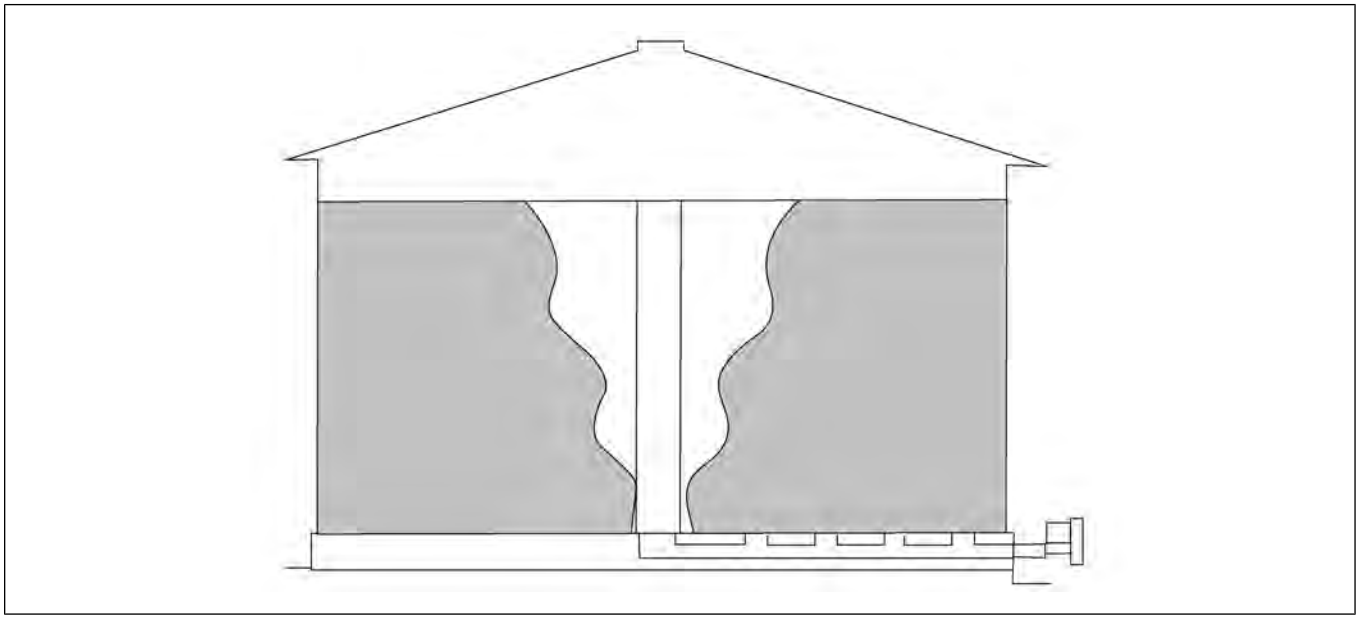
Shut OFF power to adjust, service or clean.

Before Filling the Bin

1. Read the instructional decal located on the upper bin flange to learn how to control the power sweep well gate slides.
2. Close the center well and the intermediate well gate slides.
3. Position the sweep auger alongside of the intermediate wells.
4. Make sure the motor is off and the power source is locked out.

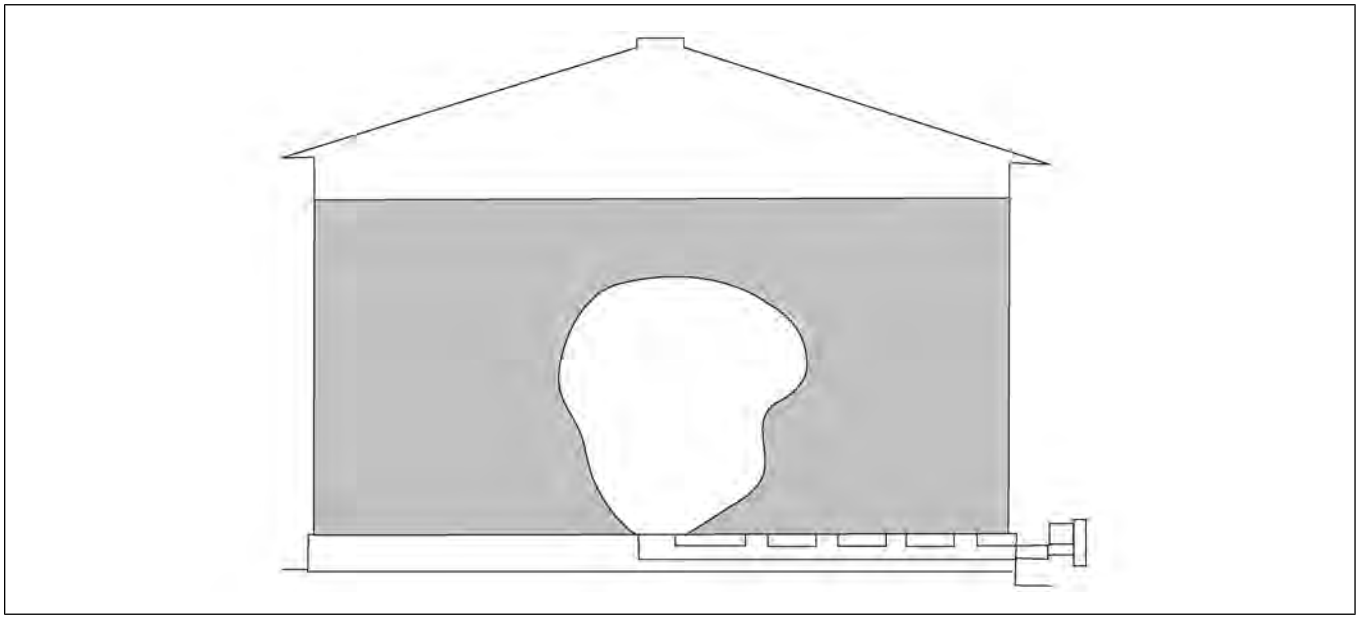
1. DO NOT enter the grain bin unless all power driven equipment has been shut down and locked out. Never enter the grain bin unless monitored by another person.
2. DO NOT enter the bin if the grain has bridged or has flowed abnormally out of the bin as shown. Suffocation can occur if grain suddenly breaks loose, burying persons who are inside the bin.

Figure 8-1 *Abnormal grain flow*



Abnormal grain flow can easily fall and bury a person, suffocating them. DO NOT enter a bin with abnormal grain flow.

Figure 8-2 *Bridged grain flow*



Bridged grain can easily break loose and bury a person, suffocating them. DO NOT enter a bin with bridged grain.

Performing Pre–Start Checks

CAUTION

Failure to perform any or all of these pre-start checks may cause damage to the equipment and/or cause SERIOUS INJURY or DEATH to those in the work area. Failure to perform any or all of these pre-start checks may also be a misuse of the equipment. Any misuse of the equipment may void the warranty.

1. Make sure ALL belts are tensioned properly.
2. Make sure ALL shields are in place and that the belt(s) and pulley(s) are able to move freely.

DANGER

ALWAYS keep ALL guards and shields in place, until all the power is disconnected and locked out.

3. Inspect the drive unit for any problems or potential problems.
4. Be aware of any emergency shut down procedures. Two people must always be in a position where the operation of the equipment can be monitored.
5. Before starting the auger for the first time, make sure that all parts are assembled correctly according to the instructions in this manual.

CAUTION

Make certain ONLY trained operators are in the work area before operating or moving the machine. Two (2) people must always be in a position where the operation of the equipment can be monitored.

Operating the Conveyor

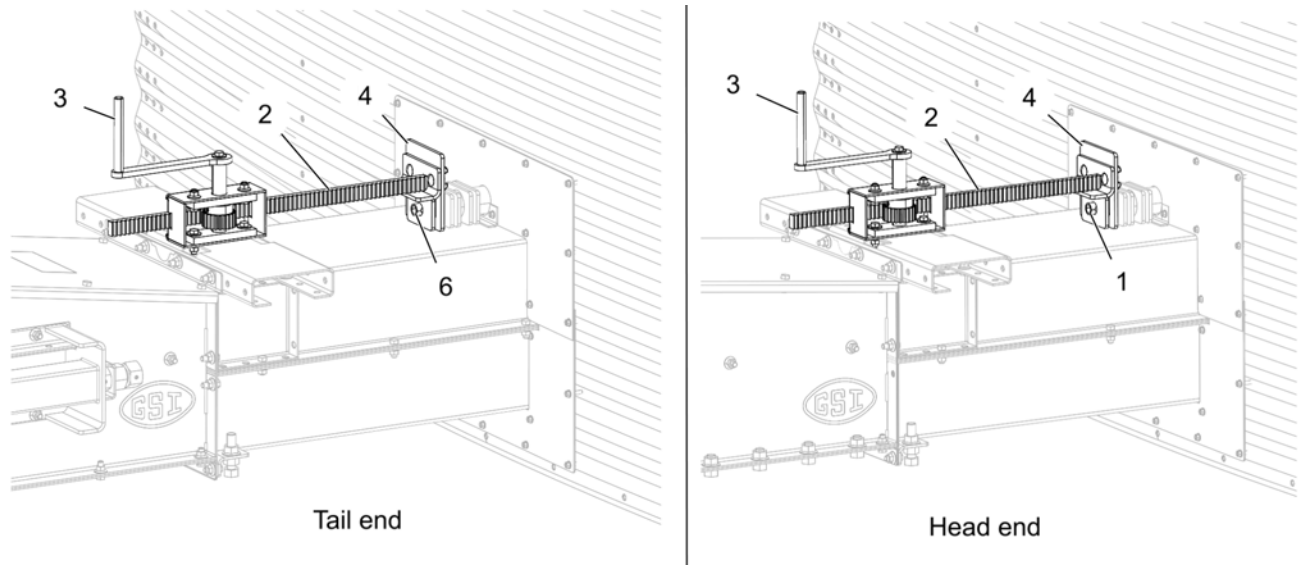
CAUTION ***DO NOT start/stop the conveyor while it is under load, this may cause the conveyor to "jam".***

CAUTION ***Failures may occur if the conveyor is run full before it has been "polished" during the "break-in" period.***

CAUTION ***Be aware of any unusual vibration or noises during the initial start-up and "break-in" period. If anything unusual is detected, immediately shut down the conveyor and disconnect and lock out the power supply before servicing. Visually inspect the conveyor periodically during operation.***

1. Start the conveyor drive motor. To figure out the horsepower needed for the equipment, use the horsepower chart.
2. Make sure the 'paw' plate (4) at the end of the rack arm (2) is captivated between the two welded plates of the center well control rod (1).

Figure 8-3 *Opening the center well gate slide*



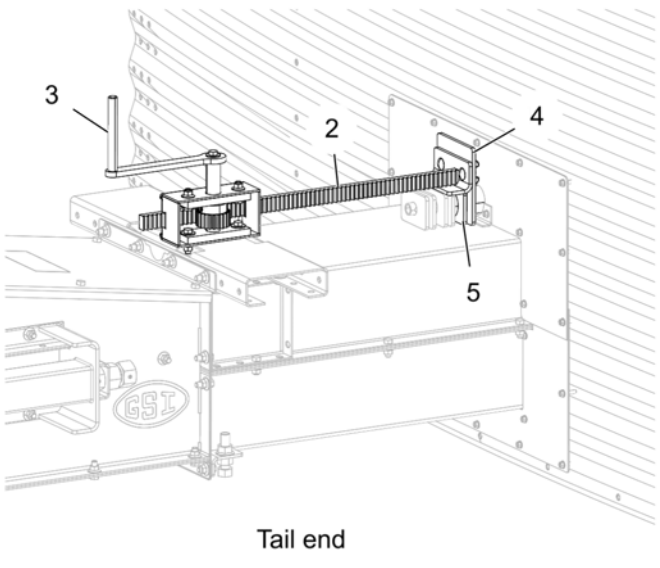
1	1/2" center well control rod (head end)	4	'Paw' plate
2	Rack arm	6	1/2" emergency/1" intermediate well control rod (tail end)
3	Jack handle		

3. Using the handle (3) of the jack assembly, rotate and open center well gate slide at the head end until desired flow is established. It should not be necessary to open gate slide more than 3" to 6". Do not open the gate slide more than 3" to 6" as the flow of grain into the center well will be at a higher rate than what the unload system can remove. This may cause the conveyor chains to plug or jam.

4. Always close the well gate slides and allow the conveyor to clean out before stopping the conveyor.
5. When grain flow stops from the center well, close the center well gate slide at the head end. Loosen the wing nuts and slide the 'paw' plate up (4). Rotate the jack handle (3) and move the rack arm (2) to position the 'paw' plate (4) over the intermediate control rod plates (5). Slide the 'paw' plate (4) down between the two welded plates of the intermediate control rod (5) and tighten the wing nuts. Rotate the jack handle (3) again to open the intermediate gate slides. Remaining grain should look like as shown below.

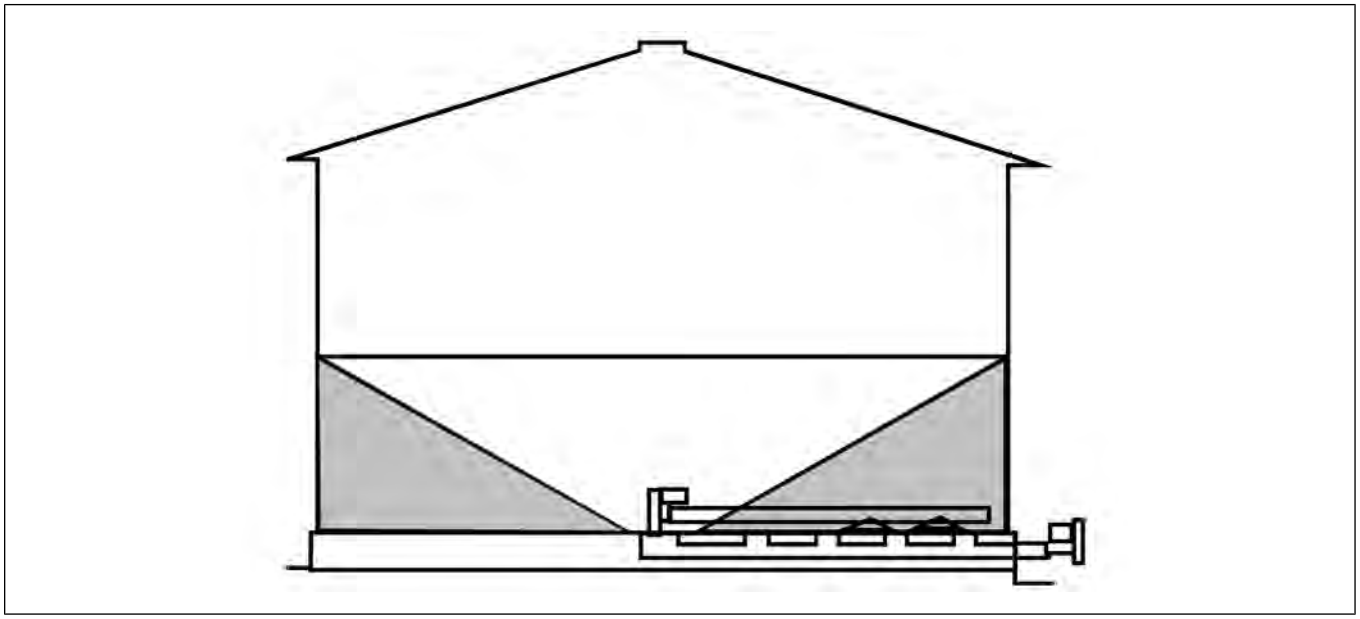
   NOTE: *If emergency gate slide with 1/2" emergency well control rod (6) is installed at tail end, open it before opening the intermediate gate slides.*

Figure 8-4 *Opening the intermediate well gate slide*



2	Rack arm	4	'Paw' plate
3	Jack handle	5	1" or 1-1/2 "intermediate well control rod

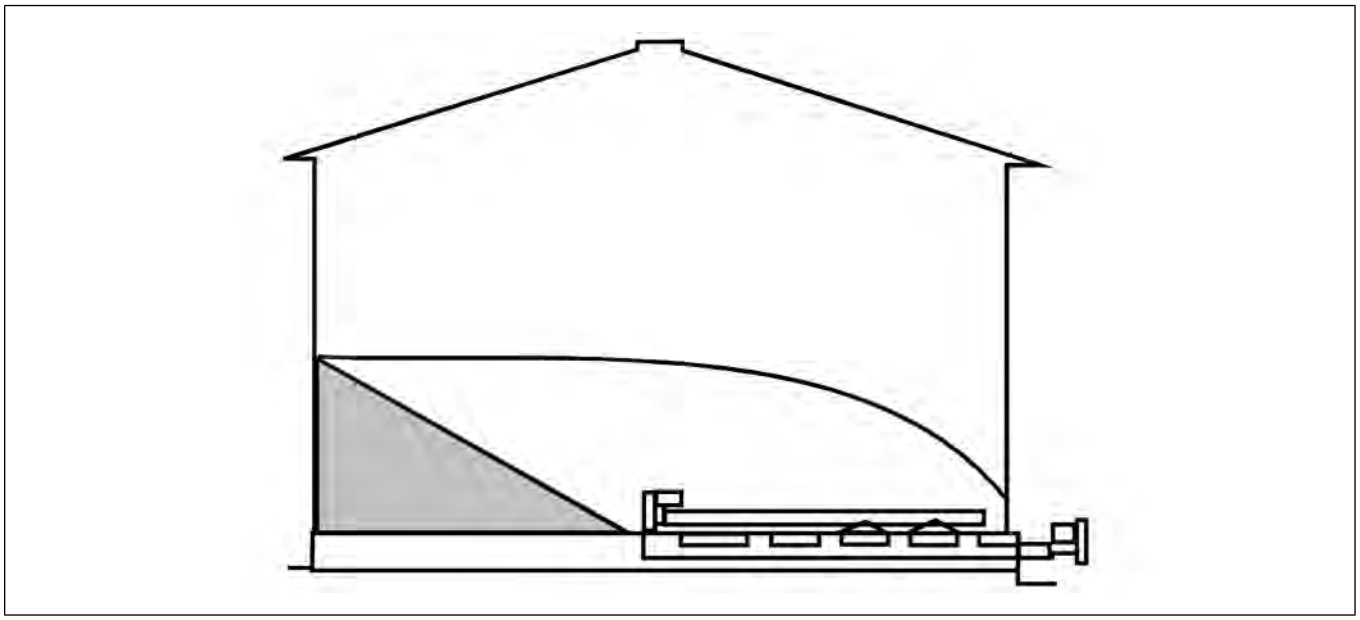
Figure 8-5 *Grain flow from the center well gate slide*



6. Gradually open the gate slides until the desired flow of grain is reached. You should not open the gate slide more than 2" to 4". The remaining grain should look like as shown below.

   NOTE: *If emergency gate slide is installed, open it before opening the intermediate gate slides.*

Figure 8-6 *Grain flow from the intermediate gate slides*



Adjusting the Sweep Wheel

If there is an interference between the sweep flight and bin door, the length of the auger and the backshield can be modified as required.

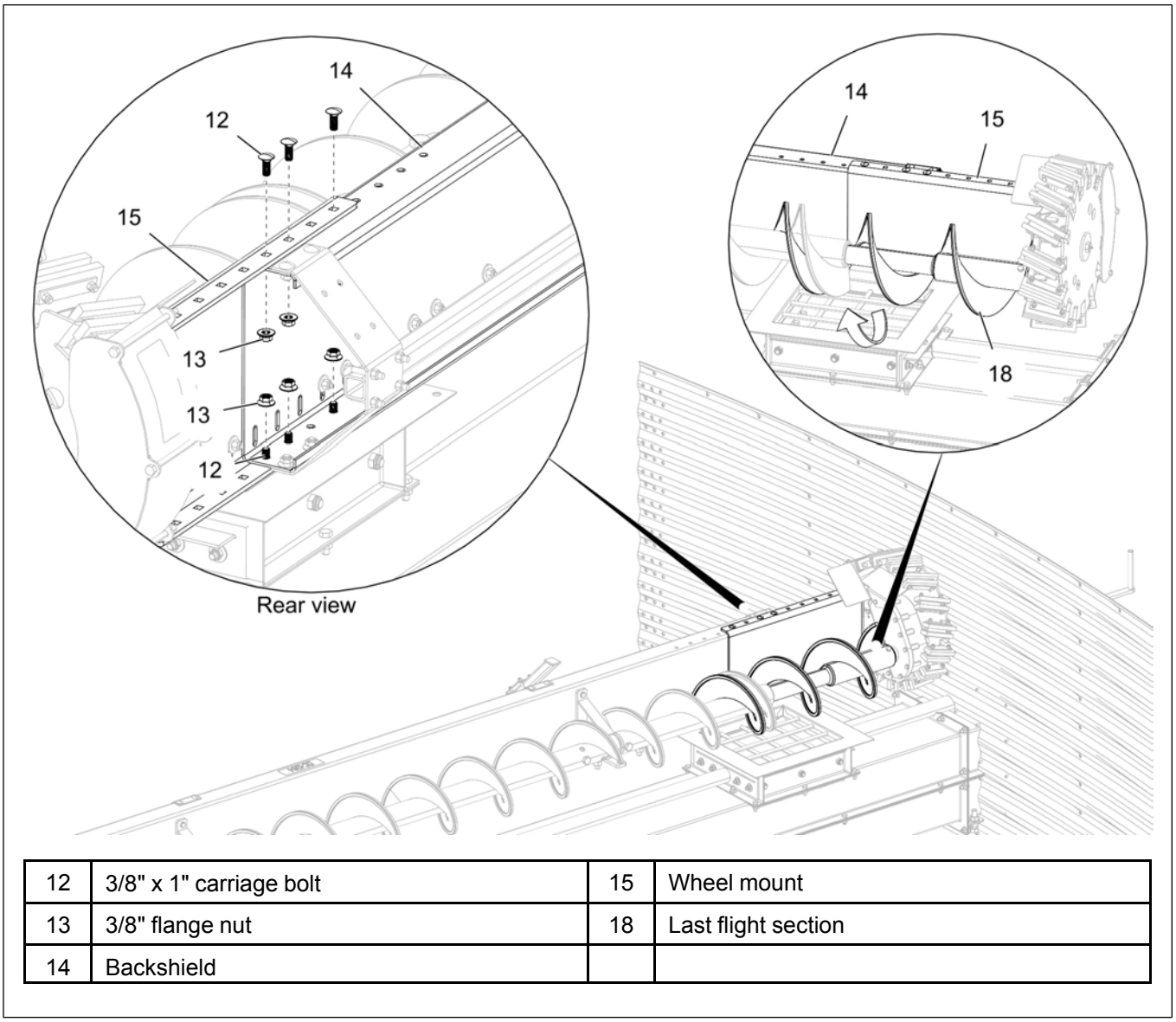
Remove the six 3/8" x 1" carriage bolts (12) and 3/8" flange nuts (13) installed to the wheel mount (15). Slide the wheel mount (15) in/out to the required length and align with the holes in the backshield (14). Re-install the 3/8" x 1" carriage bolts (12) and 3/8" flange nuts (13).

NOTE: *Sliding the wheel mount (15) will also change the position of the last flight section (18). Make sure to rotate the last flight section (18) while sliding the wheel mount.*

Tip

It is easier to rotate the last flight if the sweep wheel shaft is first disconnected from the last flight section (18), before making any length changes to the wheel mount (15). Re-connect the sweep wheel shaft to the last flight section (18).

Figure 8-7 *Adjusting the sweep wheel*

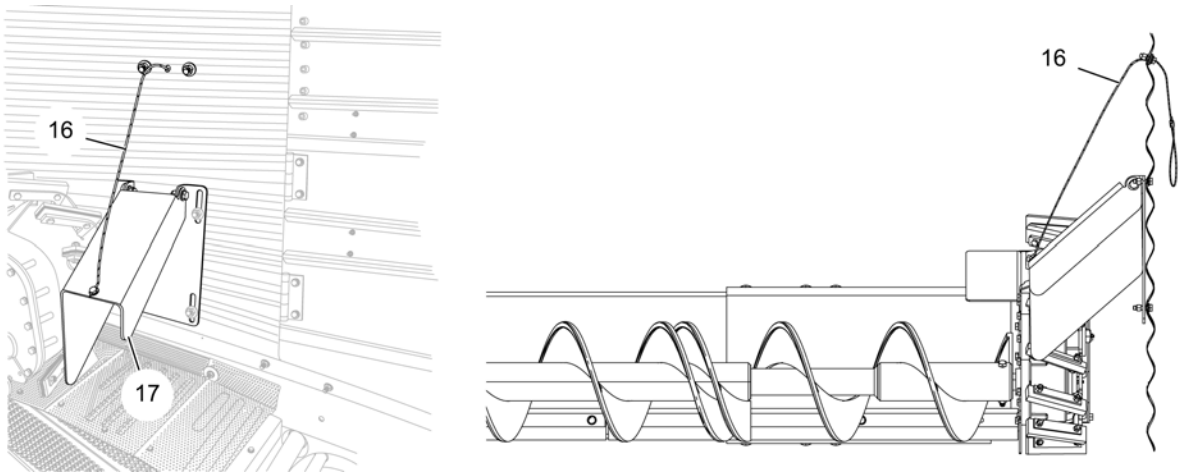


12	3/8" x 1" carriage bolt	15	Wheel mount
13	3/8" flange nut	18	Last flight section
14	Backshield		

Operating the Sweep Stop

1. Before filling the bin with grain, make sure to place the sweep stop (17) at the down position.
2. Operate to complete the sweep cycle until the sweep is stopped by the sweep stop (17).

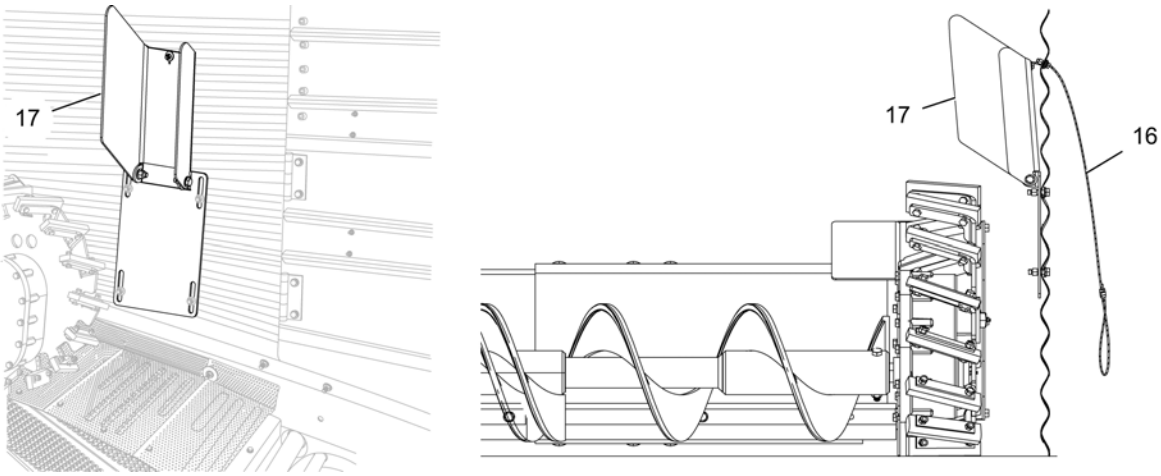
Figure 8-8 *Sweep stop at down position*



16	Cable	17	Sweep stop

3. If the sweep wheel will not pass by the door frame, adjust the wheel to have clearance from the door frame.
4. Once the wheel passes the door frame, adjust the wheel back to the extended position. For details, refer to .
5. If the wheel doesn't interfere with the door frame, lift the sweep stop (17) using the cable (16) to up position to let the wheel run through.

Figure 8-9 *Sweep stop at up position*



16	Cable	17	Sweep stop

Final Clean Out

The following procedure is recommended for cleaning the floor of the bin after the sweep auger has removed as much grain as possible.

DANGER ***Keep out of bin while sweep is in operation. Rapidly traveling sweep auger. The sweep auger will move rapidly around the bin when the bin is nearly empty.***

DANGER ***Stay clear of the under floor conveyor at the bin wells. The under floor conveyor is exposed at these locations in the bin floor.***

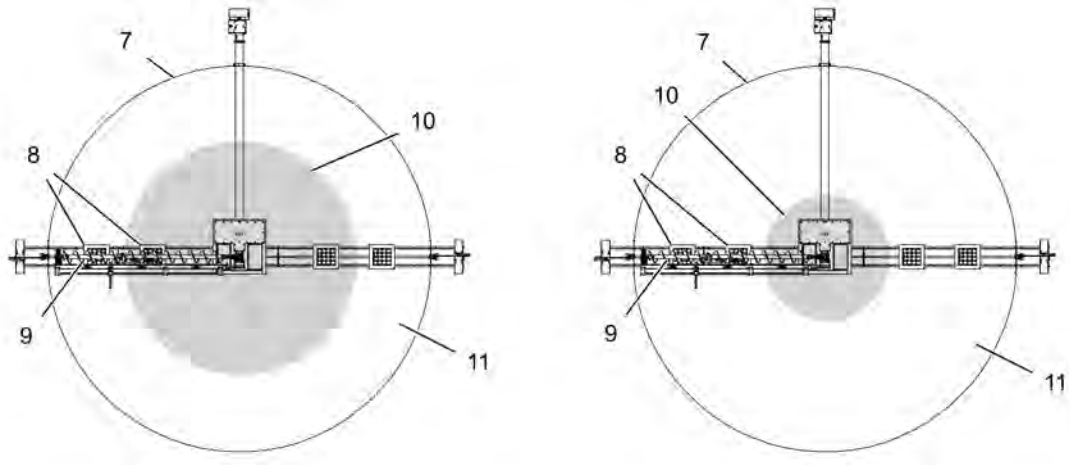
DANGER ***ALWAYS keep ALL guards and shields in place, until all the power is disconnected and locked out.***

1. Clean (scoop and sweep by hand) the outer area of the floor into a circular pile towards the center of the bin.
2. Get out of the bin.
3. After making sure everyone is outside the bin and clear of the equipment, start the under floor conveyor and the sweep auger. In a short time, the circular pile towards the center of the bin will have been removed.

   DANGER ***Stay clear of the under floor conveyor at the bin wells. The under floor conveyor is exposed at these locations in the bin floor.***

4. Scoop and sweep by hand the remaining floor area to the center of the bin.
5. Get out of the bin.
6. Repeat the above steps (step-3 to step-6) until all grain has been removed from the bin.

Figure 8-10 *Cleaning the floor*



7	Bin wall	10	Remaining grains
8	Intermediate wells	11	Cleaned area
9	Sweep auger		

9 Shut Down

Topics Covered in this Chapter

- Normal Shut Down
- Emergency Shut Down
- Storage Preparation

Normal Shut Down

1. Before shutting down the unit, be sure the conveyors are empty.
2. Disconnect and lock out the power source before leaving the work area.

Emergency Shut Down

1. Know how to shut down the conveyor and sweep auger in case of an emergency.
2. Do not restart the conveyor while it is under load.

> DANGER
> ***NEVER start the equipment under load. Doing so may cause damage. This type of damage is considered a misuse of the equipment. Any misuse of the equipment may void the warranty.***

3. Close the bin well control gate slides.
4. Reconnect and unlock the power source.
5. Clear the conveyor gradually, until there is no grain and there are no obstructions.

Storage Preparation

1. Read the instructional decal located on the upper bin flange to learn how to control the conveyor well gate slides.
2. Close the center well and the intermediate well gate slides.
3. Position the sweep auger alongside of the intermediate wells.
4. Make sure the motor is off and the power source is locked out.
5. Be sure the conveyor is empty.
6. Shut down the conveyor.
7. Make sure all fasteners are tight.

> DANGER
> ***DO NOT enter the grain bin unless all power driven equipment has been shut down.***

NOTES

10 Maintenance and Troubleshooting

Topics Covered in this Chapter

- Maintenance
- Troubleshooting

Maintenance

Maintaining the Auger

IMPORTANT: *For locations that will be operating, the sweep in temperatures colder than -5° Fahrenheit, the grease in both gearboxes should be removed and replaced with 80W90 gear oil (40 fluid oz. each).*

Properly maintaining this equipment will help to ensure it continues to work properly. Failure to properly maintain this equipment may result in damage to the equipment or may cause SERIOUS INJURY or DEATH to the operator.
Failure to properly maintain this equipment may also be a misuse of the equipment. Any misuse of the equipment may void the warranty.

1. The U-joint must be lubricated with SAE multipurpose grease every 10 operational hours or after each use.
2. The upper and lower gearboxes are grease filled and do not need operational maintenance. If repairing the gearboxes, it is recommended to fill them each with 40 fluid oz. of Mobilux EP 023 grease. If this grease is not used, 40 fluid oz. of SAE 80W90 gear oil is suggested.
3. Use caution when repairing or replacing equipment parts.
4. Make sure ALL decals are legible and tightly attached to the auger. If necessary, replace them **FREE OF CHARGE** by contacting the dealer, warehouse or the manufacturer.
5. Mount controls for any electric motors at a safe distance from the machine and in a location accessible in case of an emergency.
6. Make sure ALL electrical wiring is not damaged and that it meets proper wiring codes.
7. Make sure ALL components are in good working condition before use.

Maintaining the Conveyor

Before any maintenance is performed on the conveyor, power must be shut OFF and locked out to prevent accidental start-up.

The maintenance section is provided to help extend the life of the unit. Like all equipment, the useful life of the conveyor is greatly reduced if not used properly and well-maintained.
Make sure you follow the below steps to ensure the safety and longevity of the equipment.

1. Check all bearings and moving parts daily during use.
2. Lubricate bearings at regular intervals to bearing manufacturer's recommendations. If one bearing is re-lubricated, all other bearings should also be lubricated. Do not over lubricate as this will destroy bearing seals.
3. Follow manufacturer's recommendations for gear reducer lubrication and maintenance.
4. Inspect the V-belts periodically for proper tension and wear. V-belts should be replaced as necessary. If replacement or tension adjustment is required, please refer to *Adjusting the V-Belt, page 94*.

If the unit is to be inactive for an extended period, the following procedures are recommended.

1. Ensure all material is conveyed out of the unit.
2. Thoroughly clean the unit.
3. Loosen the V-belt tension to relieve the stress placed on the bearings and shafts of the drive and tail sections.
4. Lubricate shafts and drive chain components with a good grade of light machine oil.
5. Loosen the drag chain tension to relieve the stress placed on the bearings and shafts of the drive and tail sections.

Troubleshooting

Table 10-1 *Troubleshooting guide for sweep flighting*

Problem	Possible Cause	Solution
Capacity is too low.	There may not be enough grain reaching the auger.	Make sure the intake has not bridged over, restricting flow. The flighting at the intake should be covered with grain for maximum capacity.
	The auger is moving too slowly.	Check the auger speed. Low capacity will result from speeds slower than recommended.
The sweep flight and shield are no longer moving.	Too much drag.	Check the clearance between the shield and the bin floor. Make sure there is room for the auger to move. Adjusting the shield may be necessary.
	Worn sweep wheel.	The sweep wheel wears down over time. Replace the wheel.
	Unconditioned grain.	Moisture and/or insects can cause the grain to harden or “Cake-up”. Disconnect and lock out the power to the auger before going into the bin to correct this problem or to address any other problem.

Table 10-2 *Troubleshooting guide for conveyor*

Problem	Possible Cause	Solution
Low capacity	Improper chain speed.	Check the shaft RPM.
	Loose chain.	Check the sag between idlers.
	Improper feed.	Check the grain level at inlet.
	Plugging.	Check the discharges.
Noisy operation	Loose UHMW paddles.	Check all bolts on chain.
	Bottom not aligned.	Check intermediate trough section joints and make flush.
	Worn drive components.	Check oil level and shaft seals; belt misalignment; loose belts.
	Worn sprocket.	Replace.
	Return rail alignment.	Check rail alignment.
Uneven UHMW paddle wear	Conveyor misalignment.	Check the conveyor alignment.
	Sprocket slipped.	Check set screws on sprockets.
	Return rail alignment.	Check rail alignment.
Excessive carry-over	Gate slides not fully opening.	Check the gate slide operation.
Uneven sprocket wear	Worn chain.	Replace chain.
	Improper alignment.	Check the sprocket alignment.
	Material carry-over into discharge sprocket.	Check for improper location of inlet.

NOTES

Limited Warranty — N.A. Grain Products

The GSI Group, LLC. (“GSI”) warrants products which it manufactures, to be free of defects in materials and workmanship under normal usage and conditions for a period of 12 months from the date of shipment (or, if shipped by vessel, 14 months from the date of arrival at the port of discharge). If, in GSI’s sole judgment, a product is found to have a defect in materials and/or workmanship, GSI will, at its own option and expense, repair or replace the product or refund the purchase price. This Limited Warranty is subject to extension and other terms as set forth below.

Warranty Enhancements: The warranty period for the following products is enhanced as shown below and is in lieu of (and not in addition to) the above stated warranty period. (Warranty Period is from date of shipment.)

	Product	Warranty Period
Storage	Grain Bin Structural Design ▪ Sidewall, roof, doors, platforms and walkarounds ▪ Flooring (when installed using GSI specified floor support system for that floor) ▪ Hopper tanks (BFT, GHT, NCHT, and FCHT)	5 Years
Conditioning	Dryer Structural Design – (Tower, Portable and TopDry) ▪ Includes (frame, portable dryer screens, ladders, access doors and platforms)	5 Years
	All other Dryer parts including: ▪ Electrical (controls, sensors, switches and internal wiring)	2 Years
	All Non-PTO Driven Centrifugal and Axial Fans	3 Years
	Bullseye Controllers	2 Years
Material Handling	Bucket Elevators Structural Design	5 Years
	Towers Structural Design	5 Years
	Catwalks Structural Design	5 Years
	Accessories (stairs, ladders and platforms) Structural Design	5 Years

Conditions and Limitations:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY DESCRIPTION SET FORTH HEREIN; SPECIFICALLY, GSI DISCLAIMS ANY AND ALL OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH: (I) ANY PRODUCT MANUFACTURED OR SOLD BY GSI, OR (II) ANY ADVICE, INSTRUCTION, RECOMMENDATION OR SUGGESTION PROVIDED BY AN AGENT, REPRESENTATIVE OR EMPLOYEE OF GSI REGARDING OR RELATED TO THE CONFIGURATION, INSTALLATION, LAYOUT, SUITABILITY FOR A PARTICULAR PURPOSE, OR DESIGN OF SUCH PRODUCTS.

The sole and exclusive remedy for any claimant is set forth in this Limited Warranty and shall not exceed the amount paid for the product purchased. This Warranty only covers the value of the warranted parts and equipment, and does not cover labor charges for removing or installing defective parts, shipping charges with respect to such parts, any applicable sales or other taxes, or any other charges or expenses not specified in this Warranty. GSI shall not be liable for any other direct, indirect, incidental or consequential damages, including, without limitation, loss of anticipated profits or benefits. Expenses incurred by or on behalf of a claimant without prior written authorization from the GSI warranty department shall not be reimbursed. This warranty is not transferable and applies only to the original end-user. GSI shall have no obligation or responsibility for any representations or warranties made by or on behalf of any dealer, agent or distributor. Prior to installation, the end-user bears all responsibility to comply with federal, state and local codes which apply to the location and installation of the products.

This Limited Warranty extends solely to products sold by GSI and does not cover any parts, components or materials used in conjunction with the product, that are not sold by GSI. GSI assumes no responsibility for claims resulting from construction defects, unauthorized modifications, corrosion or other cosmetic issues caused by storage, application or environmental conditions. Modifications to products not specifically delineated in the manual accompanying the product at initial sale will void all warranties. This Limited Warranty shall not extend to products or parts which have been damaged by negligent use, misuse, alteration, accident or which have been improperly/inadequately maintained.

Notice Procedure:
In order to make a valid warranty claim a written notice of the claim must be submitted, using the RMA form, within 60 days of discovery of a warrantable nonconformance. The RMA form is found on the OneGSI portal.

Service Parts:
GSI warrants, subject to all other conditions described in this Warranty, Service Parts which it manufactures for a period of 12 months from the date of purchase unless specified in Enhancements above.

(Limited Warranty - N.A. Grain Products_ revised 01 October 2020)

This equipment shall be installed in accordance with the current installation codes and applicable regulations which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.

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