Swing Away Conveyor

Portable Grain Belt Conveyor
Assembly Manual

This manual applies to the following brands and models:

Batco, Westfield WCX, and Hutchinson HCX:

2000 Series: 2065SA, 2075SA, 2085SA, 2095SA, 20105SA, 20110SA, 20120SA

2400 Series: 2465SA, 2475SA, 2485SA, 2495SA, 24105SA, 24110SA, 24120SA

Original Instructions

Read this manual before using product. Failure to follow instructions and safety precautions can result in serious injury, death, or property damage. Keep manual for future reference.

Part Number: P1512114 R6

Revised: November 2018

New in this Manual

The following changes have been made in this revision of the manual:

Description	Section
Important note about using a second “Square washer”.	Section 3.7. – Install the Spout Roller and Hex Roller on page 22

CONTENTS

1. Safety

1.1. Safety Alert Symbol and Signal Words

This safety alert symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of injury or death, carefully read the message that follows, and inform others.

Signal Words: Note the use of the signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTICE** with the safety messages. The appropriate signal word for each message has been selected using the definitions below as a guideline.

DANGER Indicates an imminently hazardous situation that, if not avoided, will result in serious injury or death.

WARNING Indicates a hazardous situation that, if not avoided, could result in serious injury or death.

CAUTION Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.

NOTICE Indicates a potentially hazardous situation that, if not avoided, may result in property damage.

1.2. General Product Safety

YOU are responsible for the **SAFE** use and maintenance of your conveyor. **YOU** must ensure that you and anyone else who is going to work around the conveyor understands all procedures and related **SAFETY** information contained in this manual.

Remember, **YOU** are the key to safety. Good safety practices not only protect you, but also the people around you. Make these practices a working part of your safety program. All accidents can be avoided.

- It is the conveyor owner, operator, and maintenance personnel's responsibility to read and understand **ALL** safety instructions, safety decals, and manuals and follow them when operating, or maintaining the equipment.

- Owners must give instructions and review the information initially and annually with all personnel before allowing them to operate the conveyor. Untrained users/operators expose themselves and bystanders to possible serious injury or death.
- The conveyor is not intended to be used by children.
- Use the conveyor for its intended purposes only.
- Do not modify the conveyor in any way without written permission from the manufacturer. Unauthorized modification may impair the function and/or safety, and could affect the life of the conveyor. Any unauthorized modification will void the warranty.

1.3. Moving Conveyor Belt Safety

⚠ WARNING

- DO NOT step on or touch moving conveyor belt.
- Shut off and lock out power to adjust, service, or clean.

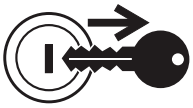
1.4. Rotating Parts Safety

⚠ WARNING

- Keep body, hair, and clothing away from rotating pulleys, belts, chains, and sprockets.
- Do not operate with any guard removed or modified. Keep guards in good working order.
- Shut off and remove key or lock out power source before inspecting or servicing machine.

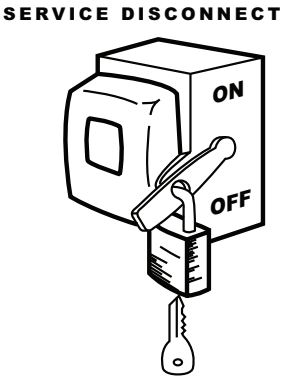
1.5. Drives and Lockout Safety

Inspect the power source(s) before using and know how to shut down in an emergency. Whenever you service or adjust your equipment, make sure you shut down the power source and unplug or remove the key (as applicable) to prevent inadvertent start-up and hazardous energy release. Know the procedure(s) that applies to your equipment from the following power source(s). Ensure that all personnel are clear before turning on power to equipment.



1.5.1 Electric Motor Safety

⚠ WARNING **Power Source**



- Electric motors and controls shall be installed and serviced by a qualified electrician and must meet all local codes and standards.
- A magnetic starter should be used to protect your motor.
- You must have a manual reset button.
- Reset and motor starting controls must be located so that the operator has full view of the entire operation.
- Locate main power disconnect switch within reach from ground level to permit ready access in case of an emergency.
- Motor must be properly grounded.
- Guards must be in place and secure.
- Ensure electrical wiring and cords remain in good condition; replace if necessary.
- Use a totally enclosed electric motor if operating in extremely dusty conditions.

Lockout

- The main power disconnect switch should be in the locked position during shutdown or whenever maintenance is performed.
- If reset is required, disconnect all power **before** resetting motor.

1.5.2 Hydraulic Power Safety

⚠ WARNING **Power Source**

- Refer to the rules and regulations applicable to the power source operating your hydraulic drive.
- Do not connect or disconnect hydraulic lines while system is under pressure.
- Keep all hydraulic lines away from moving parts and pinch points.
- Escaping hydraulic fluid under pressure will cause serious injury if it penetrates the skin surface (serious infection or toxic reaction can develop). See a doctor immediately if injured.
- Use metal or wood as a backstop when searching for hydraulic leaks and wear proper hand and eye protection.
- Check all hydraulic components are tight and in good condition. Replace any worn, cut, abraded, flattened, or crimped hoses.
- Clean the connections before connecting to equipment.
- Do not attempt any makeshift repairs to the hydraulic fittings or hoses with tape, clamps, or adhesive. The hydraulic system operates under extremely high pressure; such repairs will fail suddenly and create a hazardous and unsafe condition.

Lockout

- Always place all hydraulic controls in neutral and relieve system pressure before disconnecting or working on hydraulic system.

1.6. Tire Safety

⚠ WARNING Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion that may result in serious injury or death.

- DO NOT attempt to mount a tire unless you have the proper equipment and experience to do the job.
- Have a qualified tire dealer or repair service perform required tire maintenance.
- When replacing worn tires, make sure they meet the original tire specifications. Never undersize the replacement tire.
- DO NOT weld to the tire rim with the tire mounted on the rim. This action may cause an explosion which could result in serious injury or death.
- Inflate tires to the manufacturer's recommended pressure.
- Tires should not be operated at speeds higher than their rated speed.
- Keep wheel lug nuts tightened to manufacturer's recommendations.
- Never reinflate a tire that has been run flat or seriously under-inflated without removing the tire from the wheel. Have the tire and wheel closely inspected for damage before remounting.

1.7. Personal Protective Equipment

The following Personal Protective Equipment (PPE) should be worn when assembling the equipment.

Safety Glasses

- Wear safety glasses at all times to protect eyes from debris.

Work Gloves

- Wear work gloves to protect your hands from sharp and rough edges.

Steel-Toe Boots

- Wear steel-toe boots to protect feet from falling debris.

Coveralls

- Wear coveralls to protect skin.

Hard Hat

- Wear a hard hat to help protect your head.

1.8. Safety Equipment

The following safety equipment should be kept on site:

Fire Extinguisher

- Provide a fire extinguisher for use in case of an accident. Store in a highly visible and accessible place.

First-Aid Kit

- Have a properly-stocked first-aid kit available for use should the need arise, and know how to use it.

1.9. Safety Decals

- Keep safety decals clean and legible at all times.
- Replace safety decals that are missing or have become illegible. See decal location figures that follow.
- Replaced parts must display the same decal(s) as the original part.
- Replacement safety decals are available **free of charge** from your distributor, dealer, or factory as applicable.

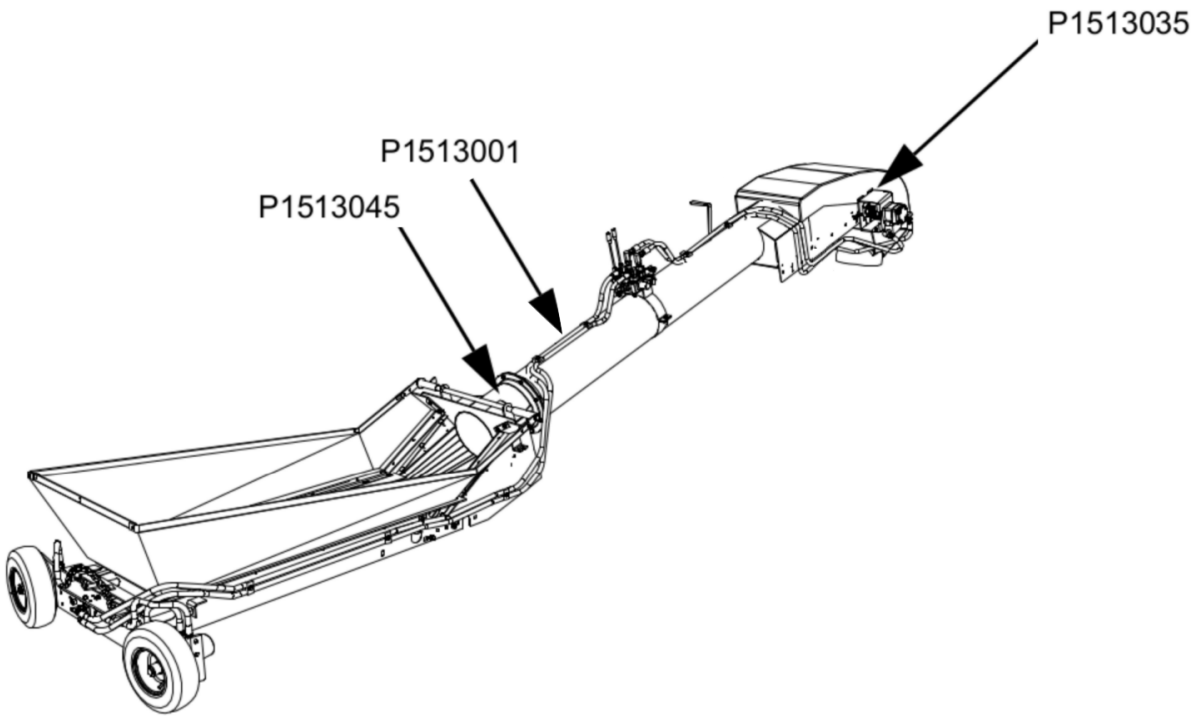
1.9.1 Decal Installation/Replacement

1. Decal area must be clean and dry, with a temperature above 50°F (10°C).
2. Decide on the exact position before you remove the backing paper.
3. Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.
4. Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.
5. Small air pockets can be pierced with a pin and smoothed out using the sign backing paper.

1.9.2 Safety Decal Locations and Details

Replicas of the safety decals that are attached to the conveyor and their messages are shown in the figure(s) that follow. Safe operation and use of the conveyor requires that you familiarize yourself with the various safety decals and the areas or particular functions that the decals apply to, as well as the safety precautions that must be taken to avoid serious injury, death, or damage.

Figure 1. Safety Decal Locations (Hydraulic and Electric Power Swings)



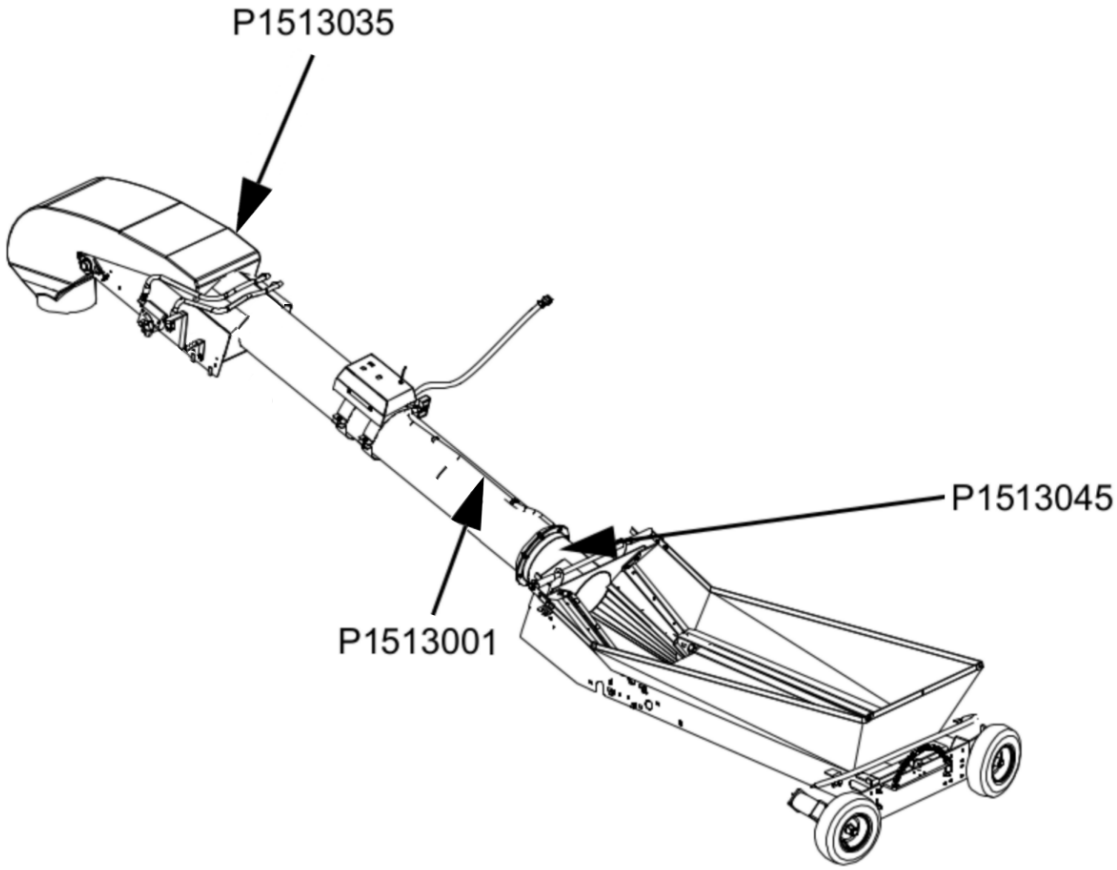


Figure 2. Transport Arm Safety Decal Locations

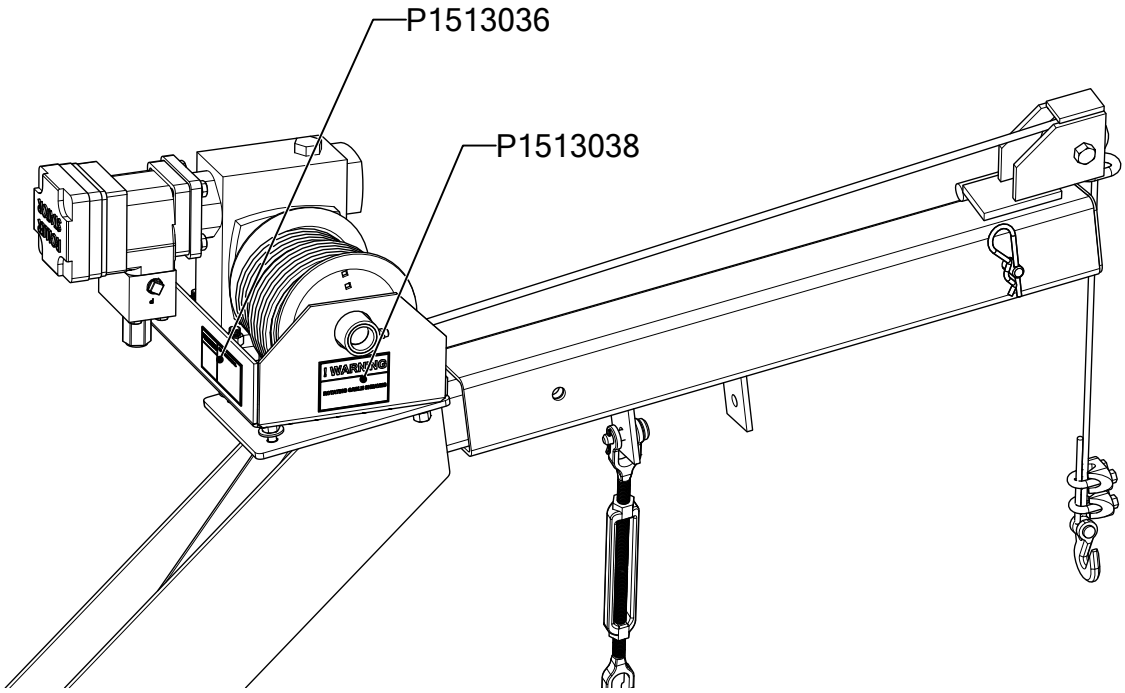


Table 1. Safety Decals

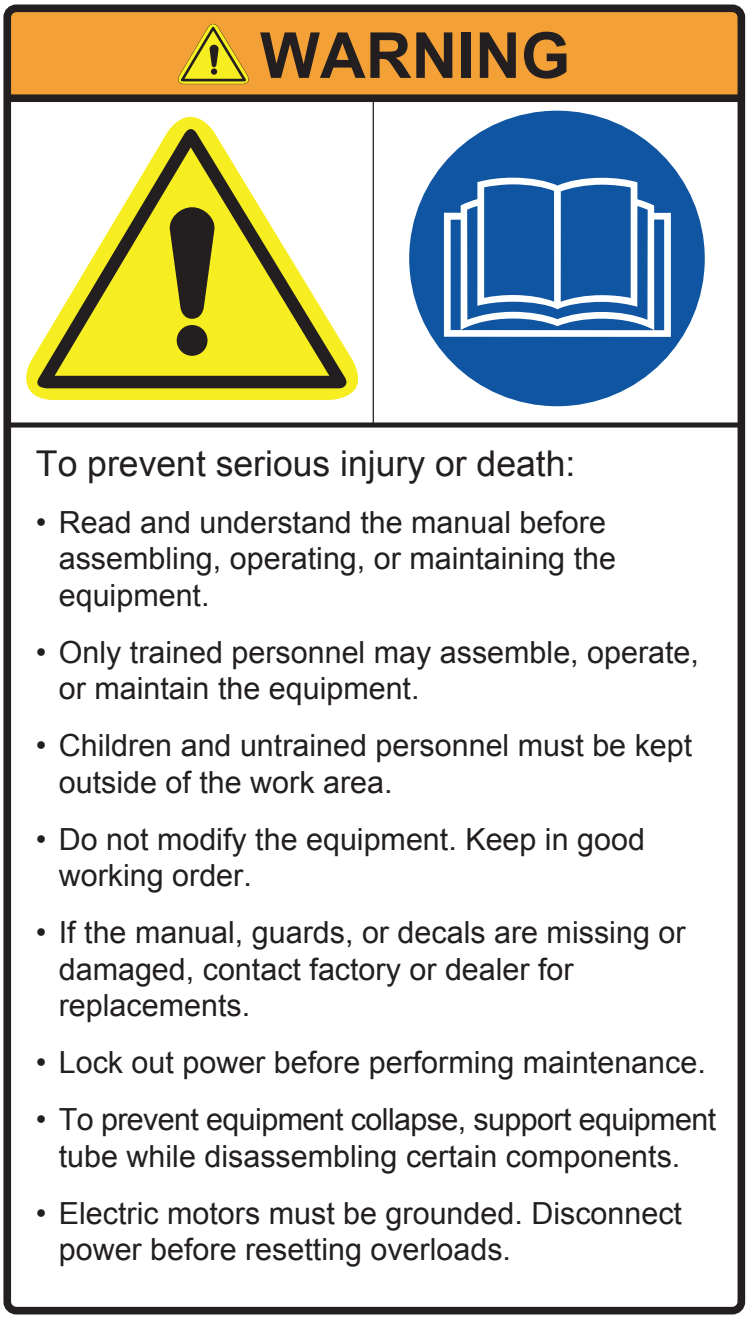
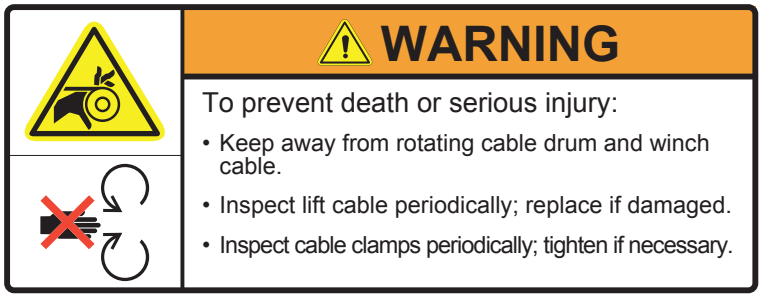
Part Number	Description
P1513001	

Table 1 Safety Decals (continued)

Part Number	Description
P1513035	
P1513036	

Table 1 Safety Decals (continued)

Part Number	Description
P1513038	
P1513045	

2. Features

This section covers the main features of the conveyor.

Figure 3. Typical Swing Away Conveyor Components

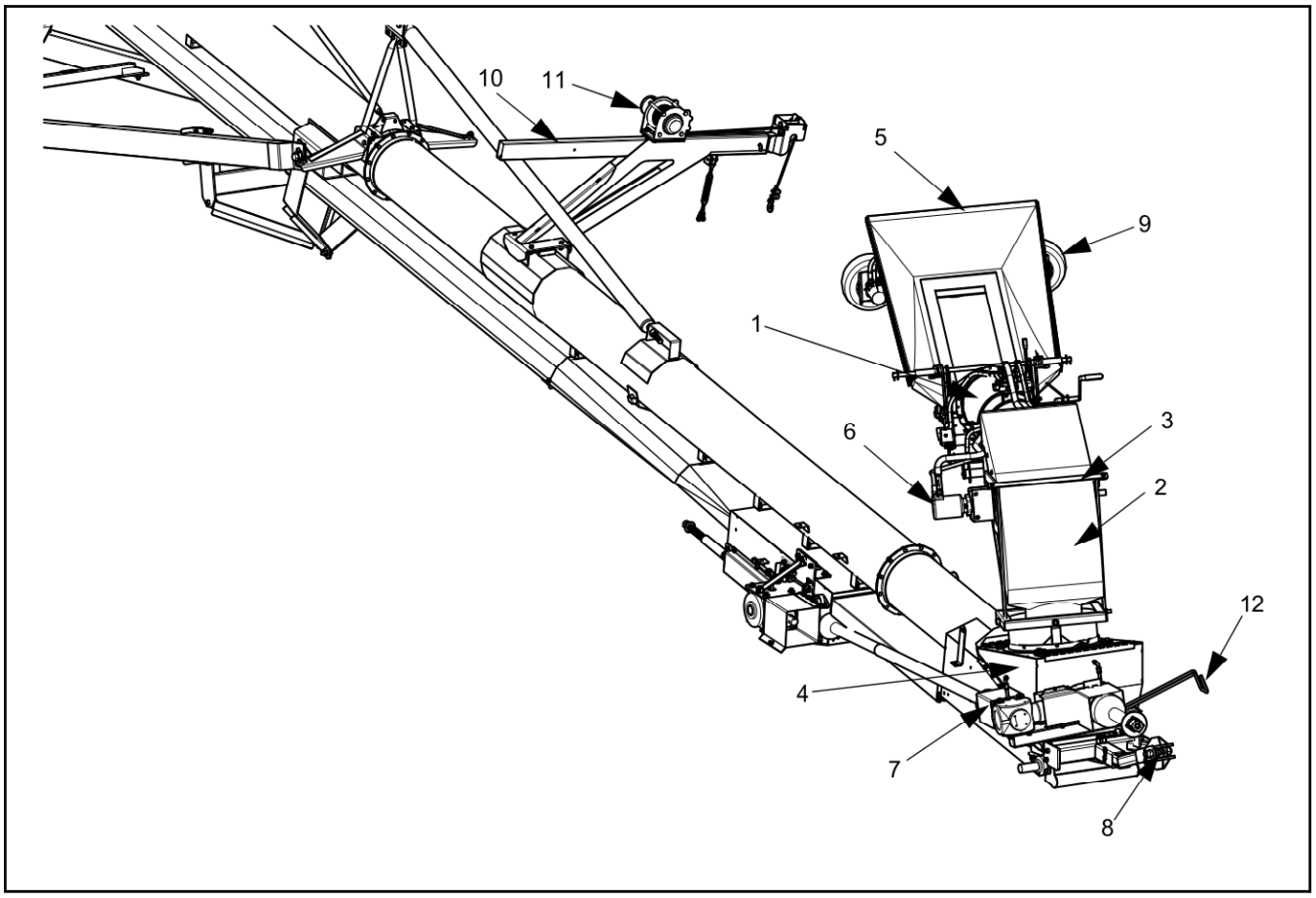
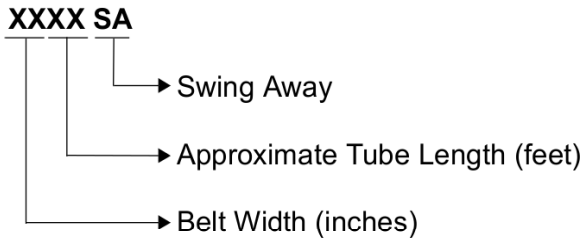


Table 2. Typical Swing Away Conveyor Components

Item	Description
1	Swing Away Hopper Conveyor
2	Spout Assembly
3	Spout Support Braces
4	Main Conveyor Boot
5	Hopper
6	Hydraulic Motor

Item	Description
7	Front PTO Drive
8	Hitch
9	Swing Away Wheels
10	Transport Arm
11	Hydraulic Winch
12	PTO Cradle

2.1. Model Number



3. Assembly

Before continuing, ensure you have completely read and understood this manual's Safety section, in addition to the safety information in the section(s) below.

3.1. Assembly Safety

WARNING

- Do not take chances with safety. The components can be large, heavy, and hard to handle. Always use the proper tools, rated lifting equipment, and lifting points for the job.
- Carry out assembly in a large open area with a level surface.
- Always have two or more people assembling the conveyor.
- Make sure you have sufficient lighting for the work area.
- Tighten all fasteners according to their specifications. Do not replace or substitute bolts, nuts, or other hardware that is of lesser quality than the hardware supplied by the manufacturer.

3.2. Check Shipment

Unload the conveyor parts at the assembly site and compare the packing slip to the shipment. Ensure that all items have arrived and that none are damaged.

Report missing or damaged parts immediately to ensure that proper credit is received from or your distributor/dealer, and to ensure that any missing parts can be shipped quickly to avoid holding up the assembly process.

Important

Do not assemble or install damaged components.

3.3. Required Tools

- 2 sawhorse(s) (1200 lb [544.3 kg])
- 1 jack or forklift or overhead crane
- 1 standard socket set(s)
- 1 wrench set(s)
- 1 torque wrench(es)
- 1 power drill(s)
- 1 self-tapping screw bit (3/8")
- 1 tape measure(s) (25' [7.6 m])
- 1 level (2' [61 cm])
- 1 level magnetic (2' [61 cm])
- 1 ratchet strap
- 2 C-clamp(s) or vise grip(s)
- 1 tire pressure gauge
- 1 fish tape (120' [36.6 m])
- 1 tire chuck

3.4. Before You Begin

Before you assemble the conveyor:

- Familiarize yourself with all the sub-assemblies, components, and hardware that make up the equipment.
- Have all parts and components on hand, and arrange them for easy access.
- Separate the hardware (bolts, nuts, etc.) and lay them out into groups for easier identification during assembly.
- Ensure there is adequate space to remove the assembled conveyor from the assembly area.

3.5. Hydraulic Fittings and Bolt Tightening

Remember the following basic considerations when tightening hydraulic fittings and bolts:

- Tighten all fasteners to the torque specified in Section 5.1. – Bolt Torque on page 110. Do not replace or substitute bolts, nuts, or other hardware that is of lesser quality than the hardware supplied by the manufacturer.

  All hydraulic fittings should be torqued to the recommended specifications. See Section 5.2. – Fittings Torque Values on page 111.

NOTICE Do not over-tighten fittings! Over-tightening hose fittings can crack the fittings or motor body and will void the warranty.

3.6. Connect the Conveyor Tube to the Hopper

1. Align the conveyor tube and hopper.
2. Fasten the tube flanges together with 7/16" x 1" bolts (2) and 7/16" locknuts (1) (see Figure 4). Ensure the bolts are straight.

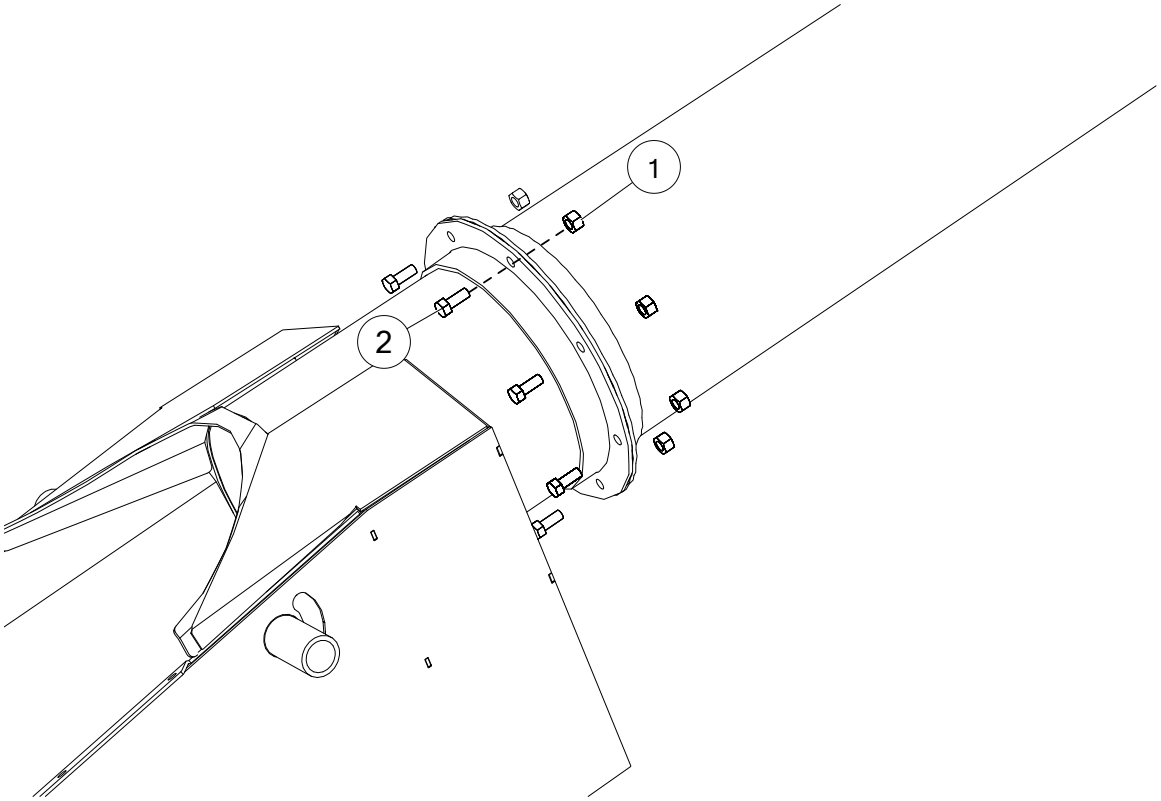
   Note

   A punch can be used to assist alignment. If you are not careful, it is possible to bolt the flanges together non-concentrically with the bolts crooked through the holes.

Table 3. Tube Connection Components

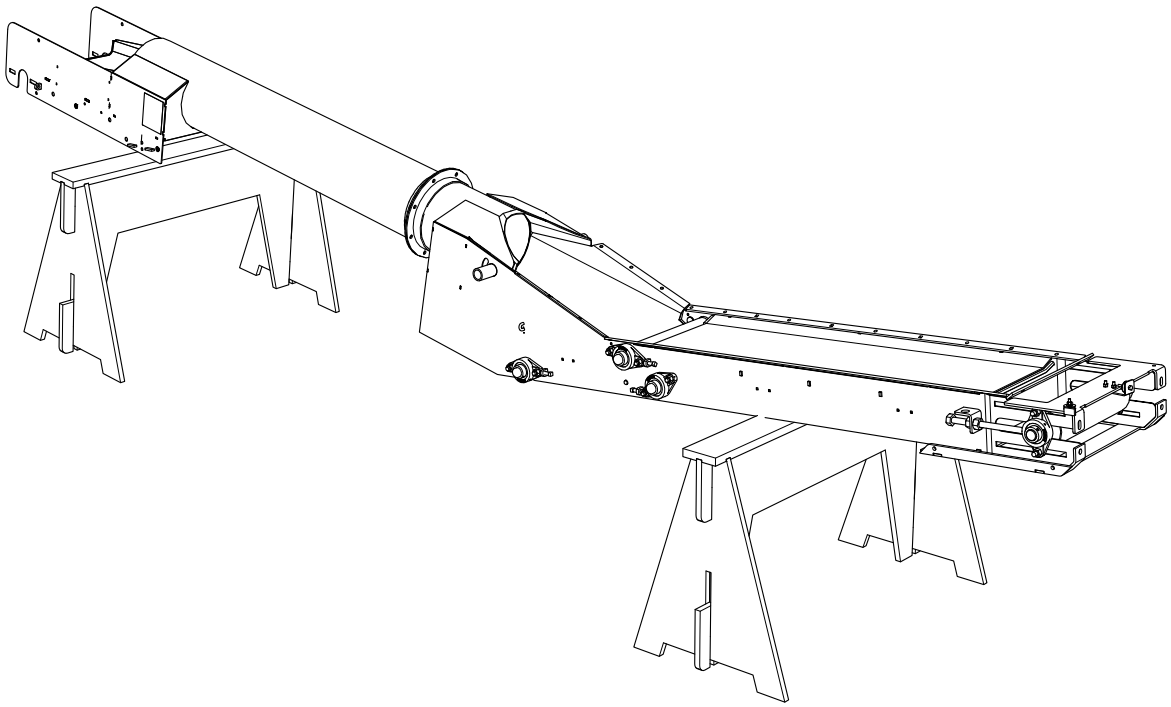
Item	Description
1	7/16" Locknut
2	7/16" x 1" Bolt GR8

Figure 4. Typical Tube Connection



3. Place the assembled conveyor tube and hopper on two support stands (see Figure 5).

Figure 5. Assembled Transfer Tube and Hopper



3.7. Install the Spout Roller and Hex Roller

1. Insert the roller (2) into the spout (1) (see Figure 6).

   Important

   Make sure the keyway in the spout roller is installed on the same side of the conveyor as the motor used to drive it (see appropriate drive assembly section).

2. Slide a bearing (5) on each end of the roller and secure to the spout using carriage bolts (3), square flat washers (4), and locknuts (6).

   Important

   If the square shoulder of the carriage bolt still sticks through the spout side plates, you must either add a 2nd square washer or tighten up the nut slowly as to not crack the bearing body.

3. Center the roller (2) in the spout.
4. Make sure the roller (2) is positioned straight by measuring the distance (d) from the end of the roller to the end of the spout weldment sidewall on both sides (it should be the same distance).
5. For each bearing, use a hammer and punch to rotate the lock collar so that it seats onto the inner race of the bearing. Tighten the lock collar securely to the shaft with its hex set screw.
6. Insert the 7/16" x 2-1/2" square-head set screws (7) in the spout.

Note

The square-head set screws are used to set the alignment of the belt, after the belt is installed.

7. Install the spring-loaded return hex roller (8) into the spout weldment (see Figure 7, Figure 8, or Figure 9).

Table 4. Spout Roller Components

Item	Description	Quantity for Series	
		1500/2000	2400
1	Spout	1	1
2	Vulcanized Spout Roller	1	1
3	1/2" x 2" Carriage Bolt	4	—
	5/8" x 2" Carriage Bolt	—	4
4	Square Flat Washer (0.531"-1.00"-0.060")	4	—
	Square Flat Washer (0.656" -1.25"-0.060")	—	4
5	1-1/4" Bearing Flange Unit (SAF FL206–20)	2	—
	1-15/16" Bearing Flange Unit (SAF FL210–31)	—	2
6	1/2" Nylon Locknut	4	—
	5/8" Nylon Locknut	—	4
7	7/16" x 2-1/2" Square-Head Set Screw	2	2
8	Hex Roller	1	1

Figure 6. Installing Spout Roller

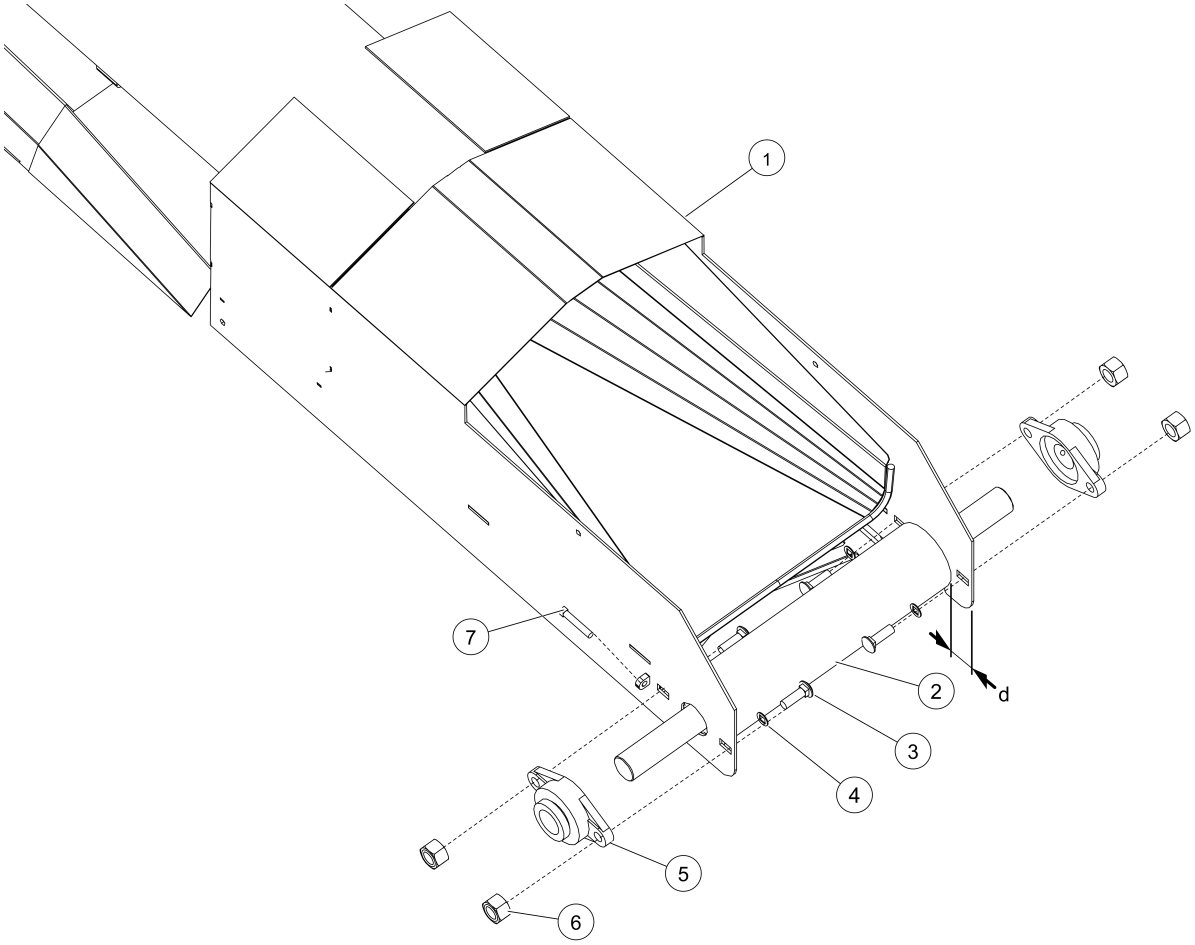


Figure 7. Installing Hex Roller (1500 Series)

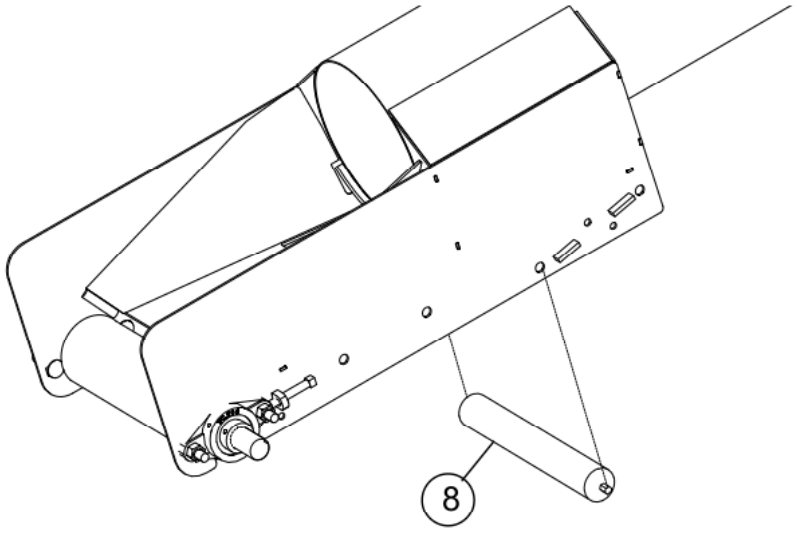


Figure 8. Installing Hex Roller (2000 Series)

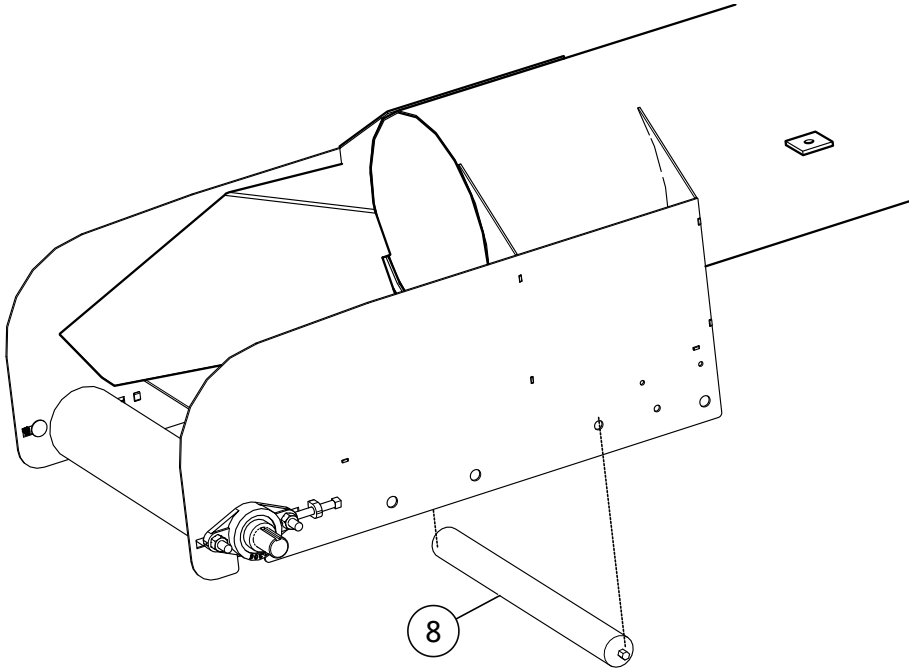
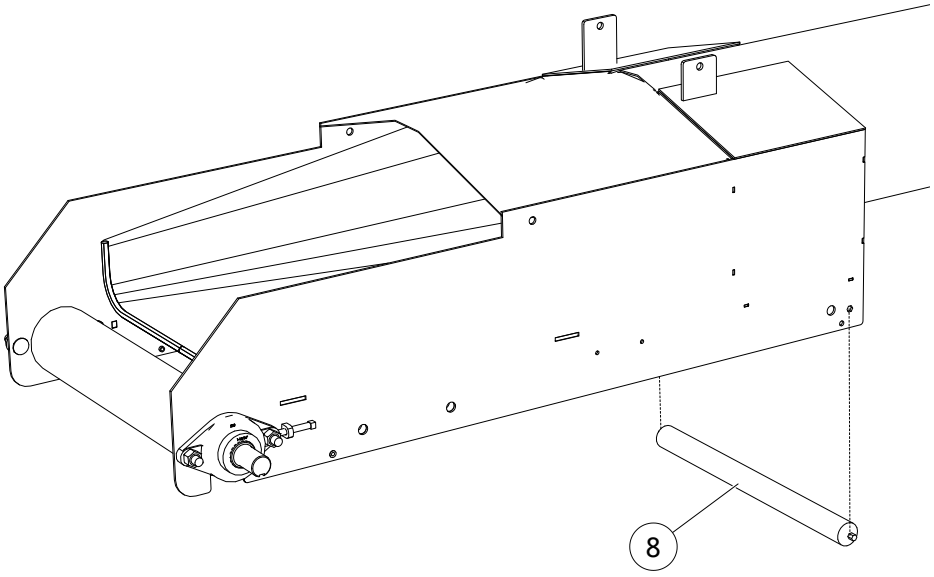


Figure 9. Installing Hex Roller (2400 Series)



3.8. Install the Return Roller (2000 and 2400 Series)

For 2000 Series:

1. Locate the position of the roller bracket (1) on the tube. See Figure 10.
2. Attach the return roller bracket (1) to the tube using u-clamp (2), 1/2" x 2-1/2" bolts (3), and 1/2" locknuts (4).
3. Tighten the u-clamp until tube begins to crimp.
4. Attach the spring-loaded return hex roller (5).

Table 5. Return Roller and Fasteners (2000 Series)

Item	Description	Quantity
1	Guiding Return Roller Bracket	1
2	U-clamp with Handle Mount	1
3	1/2" x 2-1/2" Hex Bolt	2
4	1/2" Nut Nylock	2
5	Hex Roller	1

Figure 10. Return Roller Position (2000 Series)

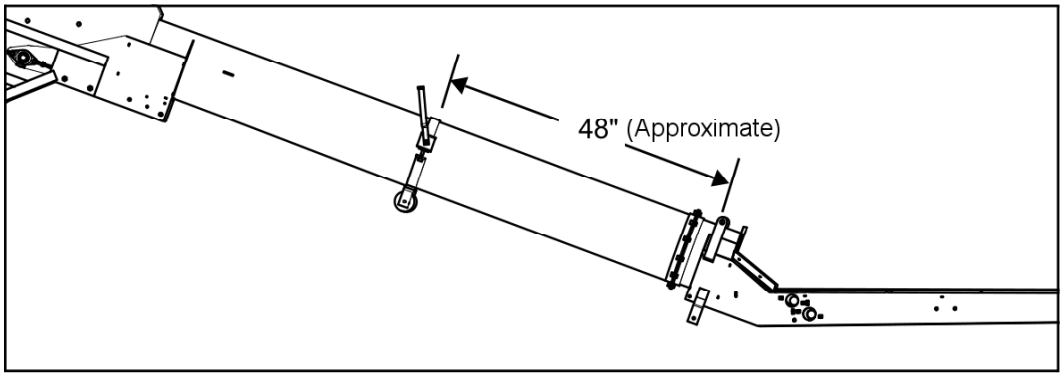
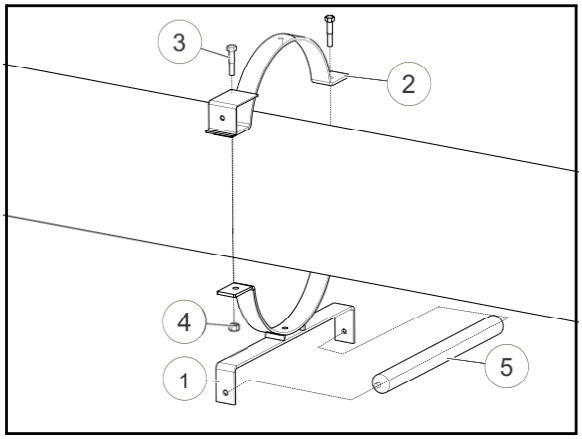


Figure 11. Installing the Return Roller (2000 Series)

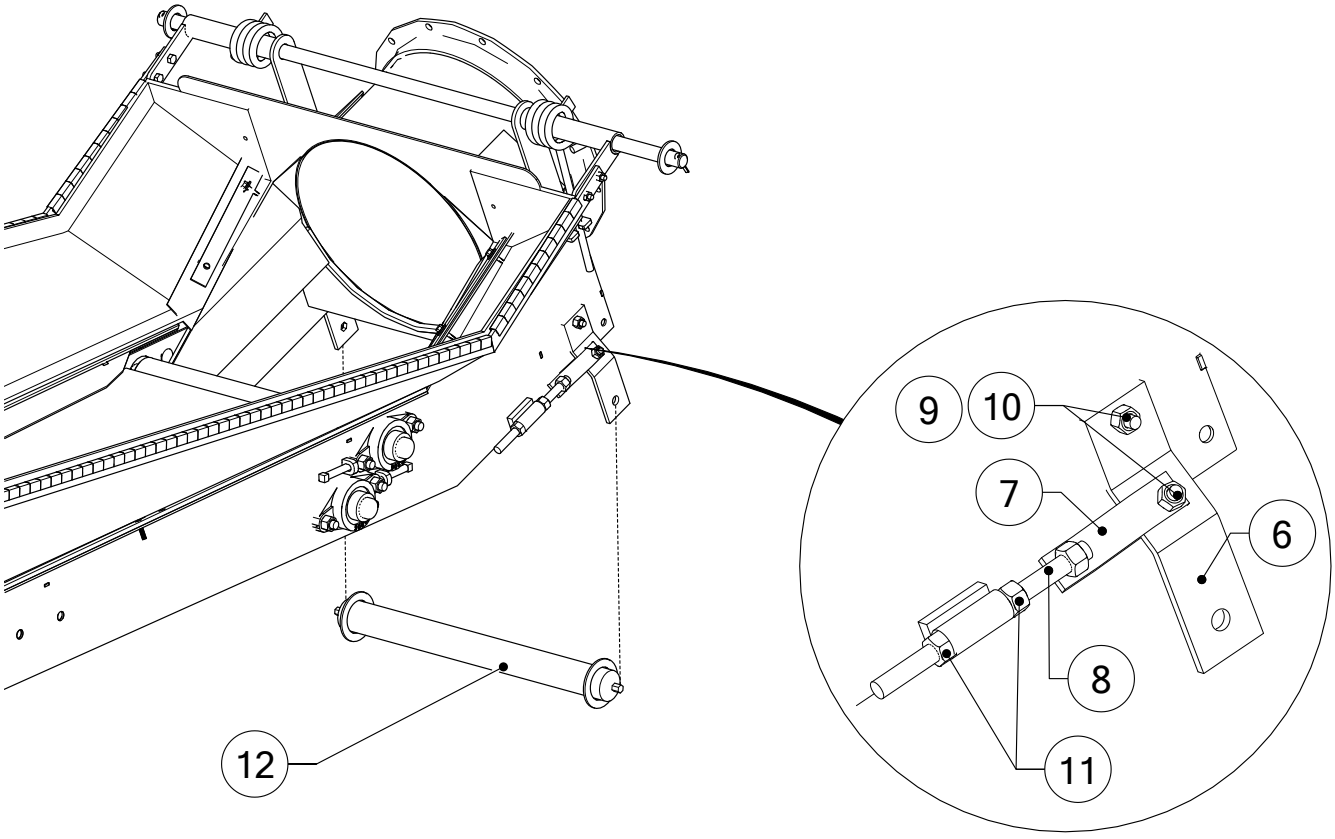


5. Assemble the bent adjustment arm (6), adjustment link (7) and tab adjuster rod (8) to the hopper weldment as shown in Figure 12. Attach the return roller (12).

Table 6. Guiding Return Roller and Fasteners (2000 Series)

Item	Description	Quantity
6	Bent Adjustment Arm Left	1
7	Adjustment Link Left	1
8	1/2" x 7" Tab Adjuster Rod	1
9	3/8" x 1" Bolt Gr8 Plated	2
10	3/8" Nut Nylock	2
11	1/2" Hex Nut	2
12	Guiding Return Roller	1

Figure 12. Installing the Guiding Return Roller (2000 Series)



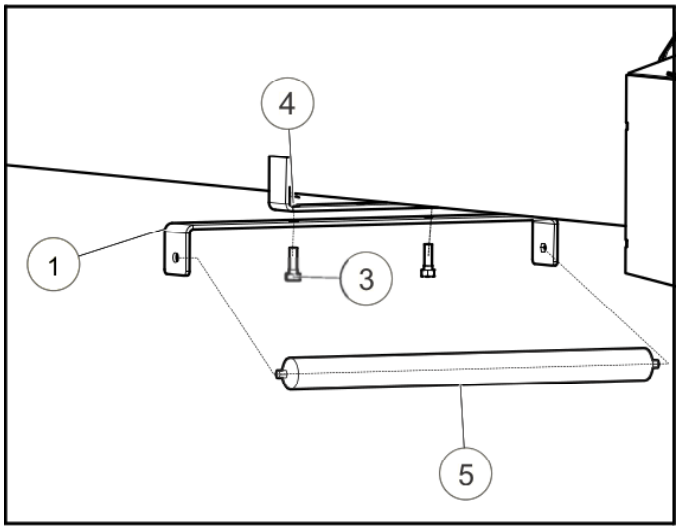
For 2400 Series:

1. Attach the return roller bracket (1) to the mount bracket welded on the tube using 1/2" x 1-1/2" bolts (3) and 1/2" locknuts (4).
2. Attach the spring-loaded return hex roller (5).

Table 7. Return Roller and Fasteners (2400 Series)

Item	Description	Quantity
1	Return Roller Bracket	1
3	1/2" x 1-1/2" Hex Bolt	2
4	1/2" Nut Nylock	2
5	Hex Roller	1

Figure 13. Installing the Return Roller (2400 Series)



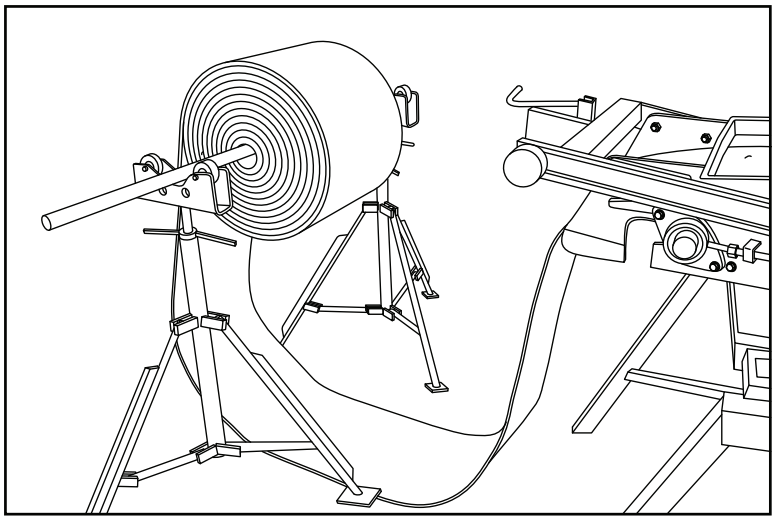
3.9. Install the Belt

This section describes how to install the conveyor belt in the tube. Refer to the packing slip for the length of the conveyor belt used in the installation.

Thread a Fish Tape through the Conveyor Tube

1. Place the rolled belt on a stand behind the hopper.
2. Pull the conveyor belt over the top of the hopper roller, until just inside the hopper, as shown below.

Figure 14. Rolled Belt Behind a Typical Hopper



3. Feed a fish tape in at the spout, through the tube, and into the hopper.
4. Manually thread the belt around the transition rollers (1) in the hopper.

Figure 15. Belt Through Transition Rollers (1500 and 2400 Series)

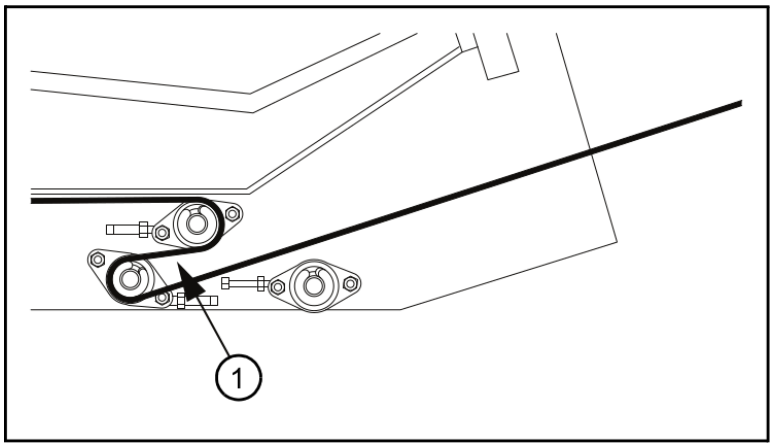
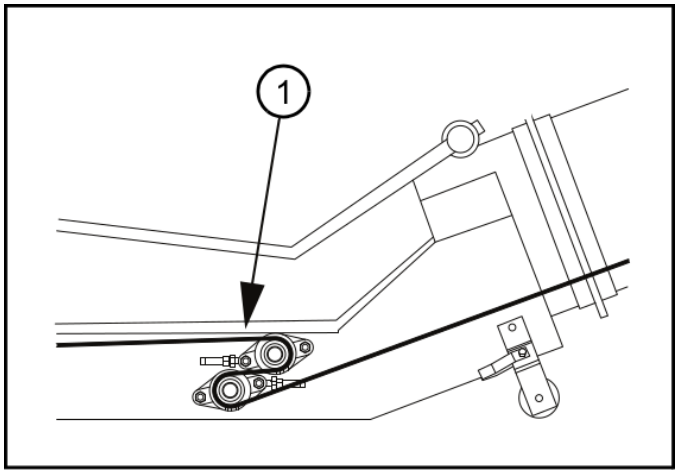


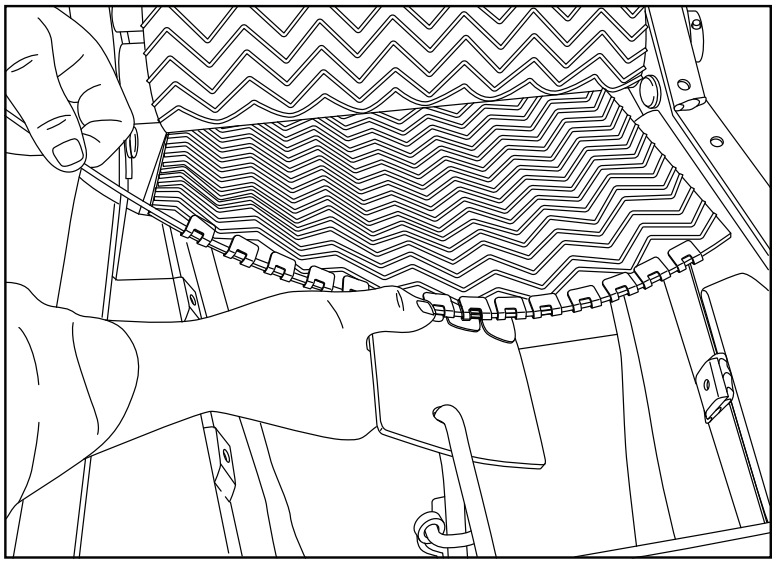
Figure 16. Belt Through Transition Rollers (2000 Series)



Item	Description
1	Transition Roller

5. Attach the end of the belt to the fish tape using a clamp, or use a short piece of belt and thread the connector wire through the lacing clips to connect.

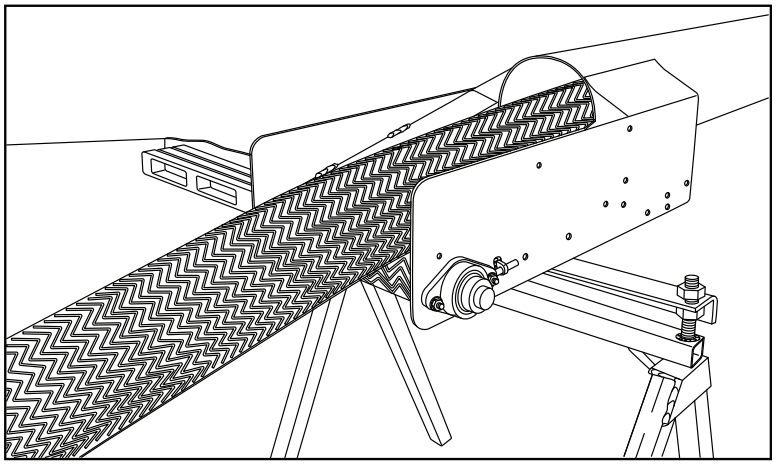
Figure 17. Attaching the Short Belt Piece to the Belt



Thread the Conveyor Belt

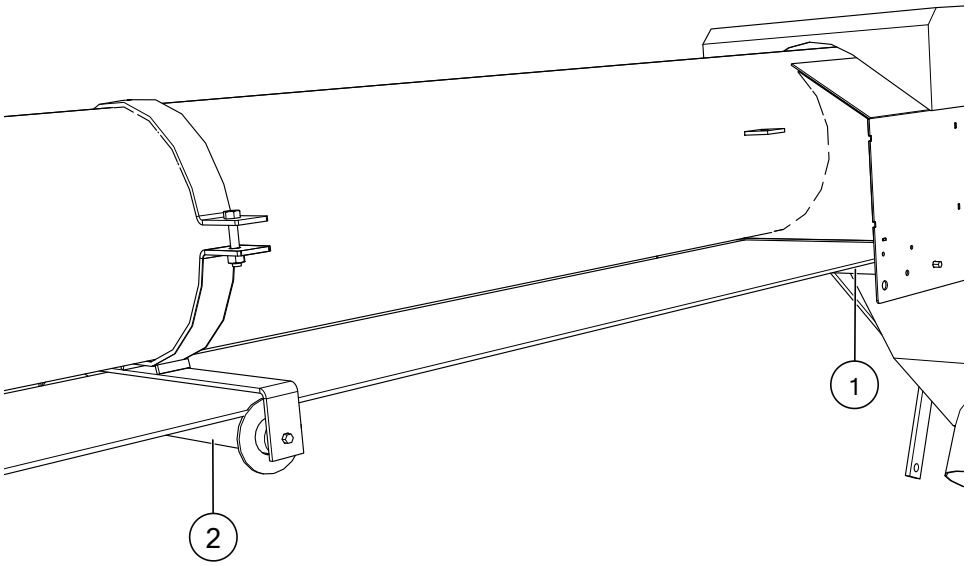
1. From the spout end, pull the fish tape until the belt emerges from the spout.

Figure 18. Conveyor Belt Pulled Through the Spout



2. Wrap the belt around the spout roller.
3. **For 2000 and 2400 Series:** Pull the belt back and route the belt overtop of the hex and return rollers.

Figure 19. Belt Passes Overtop of the Return and Hex Rollers



Item	Description
1	Hex Roller
2	Return Roller

4. Pull the belt under the conveyor tube to the hopper until approximately 6' (1.8 m) of excess belt remains on the stand behind the hopper.

Figure 20. Conveyor Belt Bottom Path (1500 and 2400 Series)

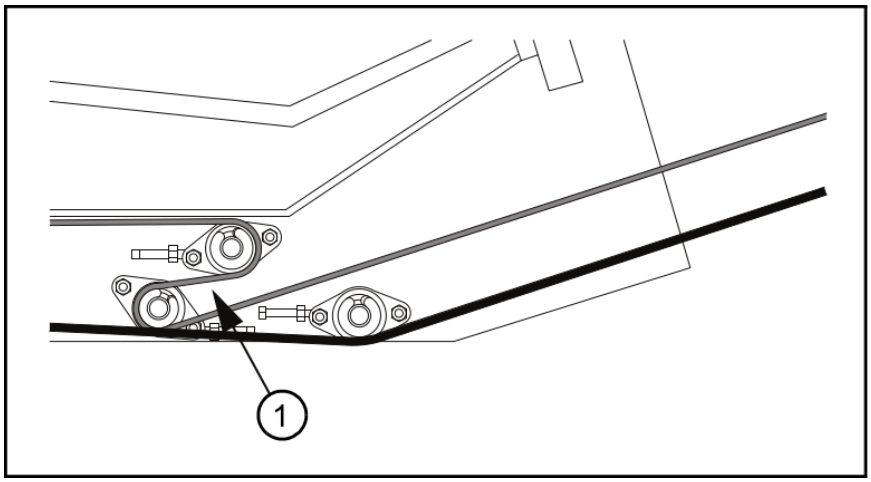
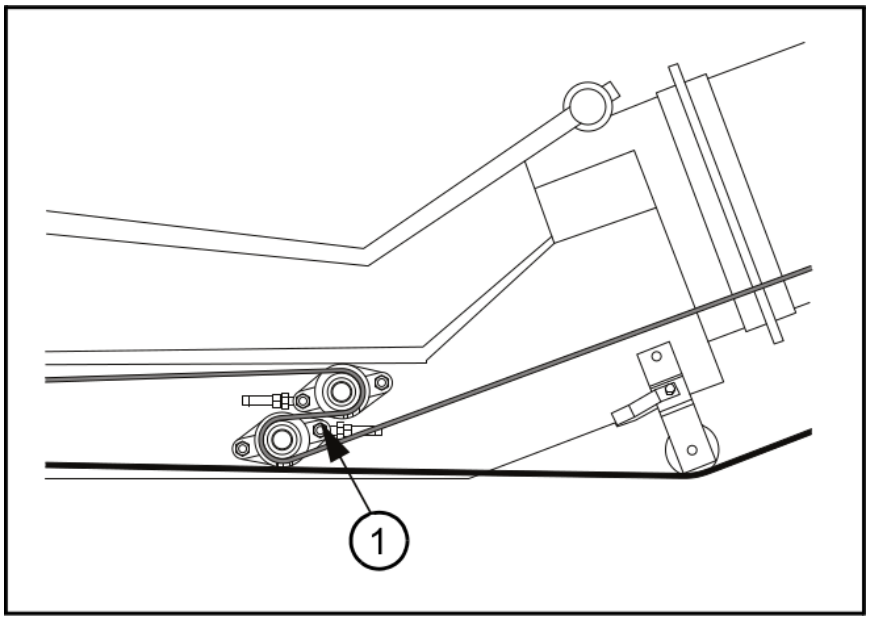


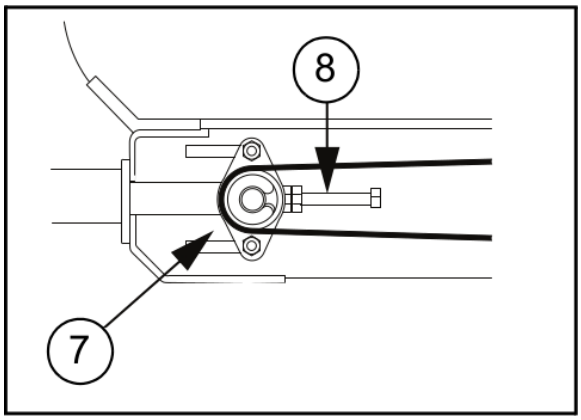
Figure 21. Conveyor Belt Bottom Path (2000 Series)



Item	Description
1	Transition Roller

5. Wrap the remaining conveyor belt around the hopper roller (7) and under the tube.

Figure 22. Conveyor Belt Around Hopper Roller



Item	Description
7	Hopper Roller
8	Take-up Bolt

The conveyor belt is now ready to be connected.

Connect the Conveyor Belt

1. Attach a strap puller (1) to each end of the belt and secure with vise-grips (2).

   NOTICE Do not attach the vise grips too tightly, this can damage the belt.

2. Pull the ends of the belt together.
3. Install connector wire through the belt lacing (3).

Figure 23. Using a Strap Puller

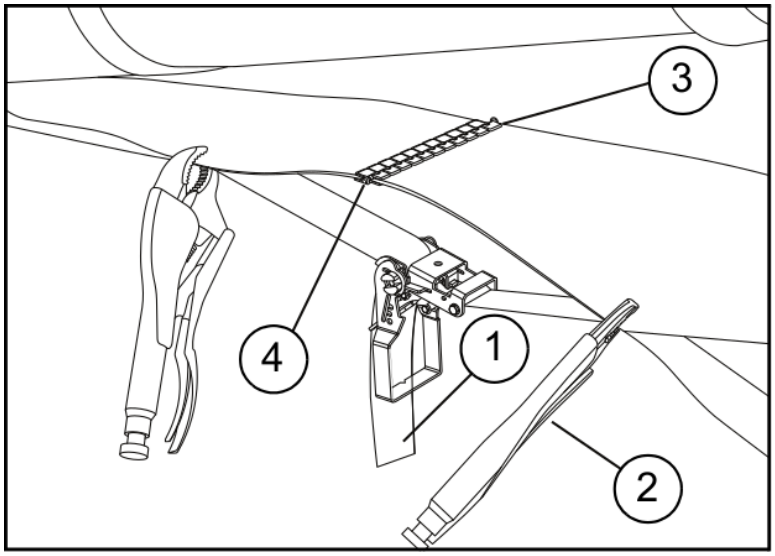
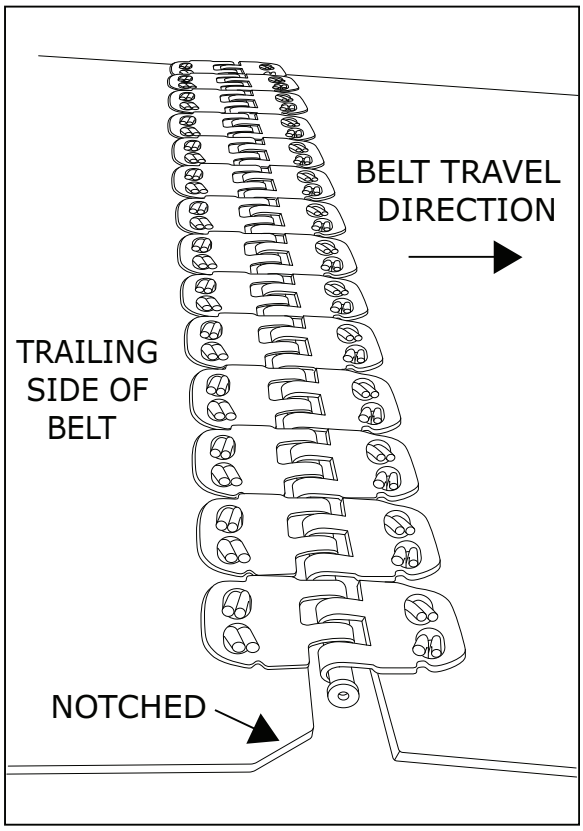


Figure 23 Using a Strap Puller (continued)

Item	Description
1	Strap Puller
2	Vise Grip
3	Belt Lacing
4	Lacing Pin

4. On both corners of the trailing edge of the belt, trim a tapered notch to prevent fraying.

Figure 24. Tapering the Trailing Edge of the Belt



Tighten the Conveyor Belt

Use the hopper roller bolts to set the belt tension.

1. Tighten the hopper roller bolts until the conveyor belt deflects 1–2” when pushed down with a 5 lb force.
2. Measure to be sure both sides are set at the same position.

The belt will require final tension and alignment after the conveyor is fully assembled. Refer to the conveyor operation manual for complete instructions.

3.10. Install the Collapsible Hopper Cloth

Install the Flashing

1. Lay the front flashing (1) on the hopper while ensuring it is flush with the edge of the main hopper frame (see Figure 25, Figure 26, or Figure 27).

   Note

   The textured side of the flashings should be facing down.

2. Install transition flashing.

   - **For 1500 Series:** install transition flashing (3) using 1/4" x 1" self-tapping screws (4), 1/4" flat washers (5), 1/4" x 1-1/4" flange bolts (6), and 1/4" hex nuts (7).
   - **For 2000 & 2400 Series:** install transition flashing (3) with 1/4" x 1" self-tapping screws (4) and 1/4" flat washers (5). Also see the following for screw positions: Figure 36 on page 44 or Figure 37 on page 44.

3. Lay the side flashings (2) on the hopper while ensuring they are flush with the edge of the main hopper frame and overlapping the front flashing.

Table 8. Flashings

Item	Description	Quantity for Series		
		1500	2000	2400
1	Front Flashing	1	1	1
2	Side Flashing	2	2	2
3	Transition Flashing	2	2	2
4	1/4" x 1" Self Tapping Screw	2	6	18
5	1/4" Flat Washer	4	6	18
6	1/4" x 1-1/4" Flange Bolt	2	-	-
7	1/4" Hex Bolt	2	-	-

Figure 25. Flashings (1500 Series)

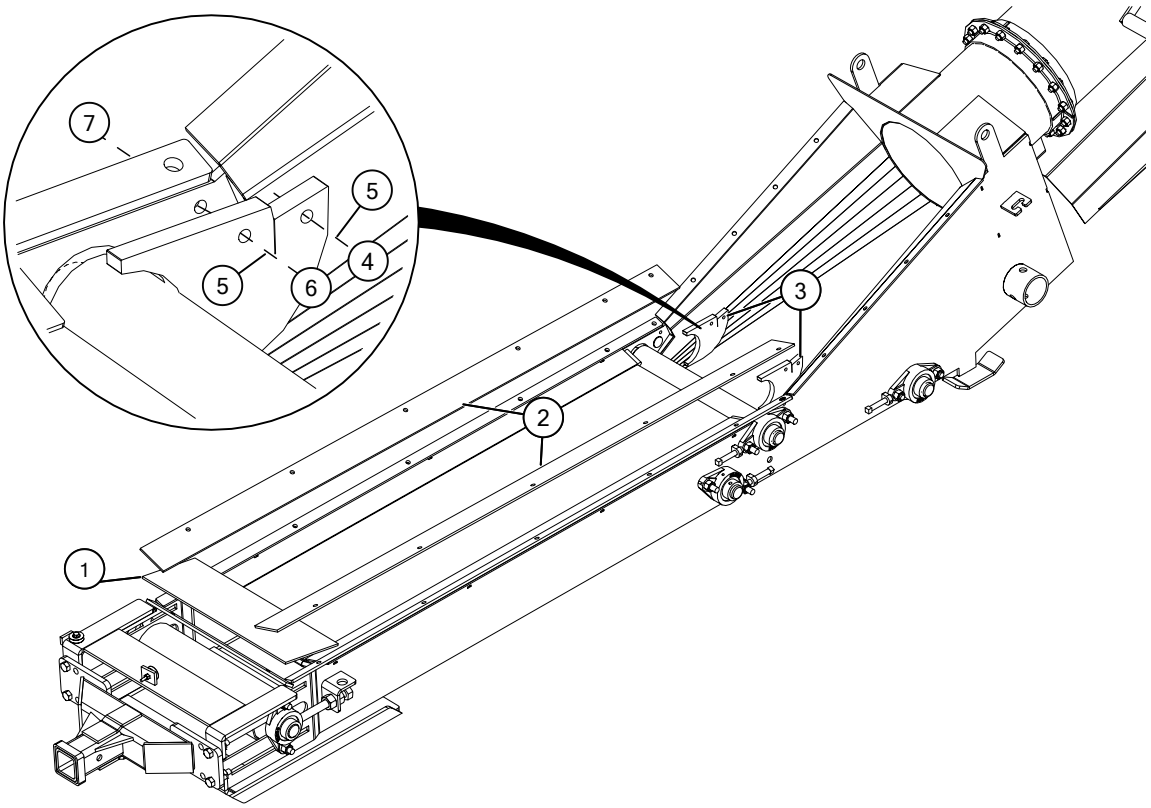


Figure 26. Flashings (2000 Series)

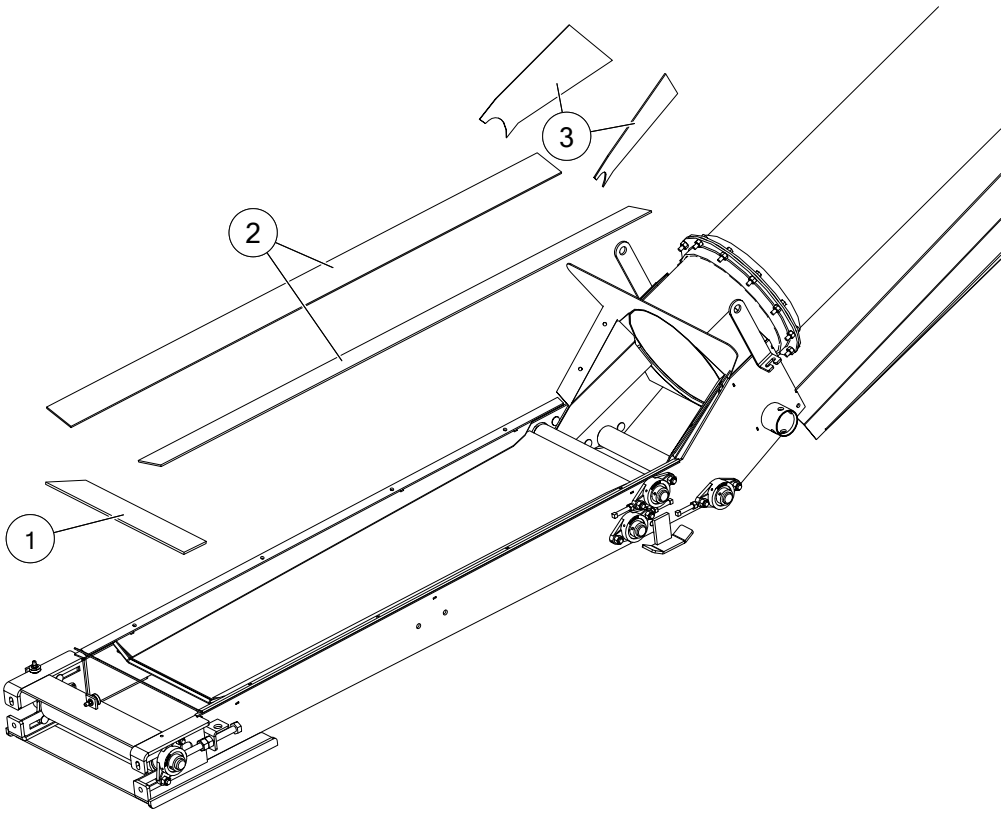
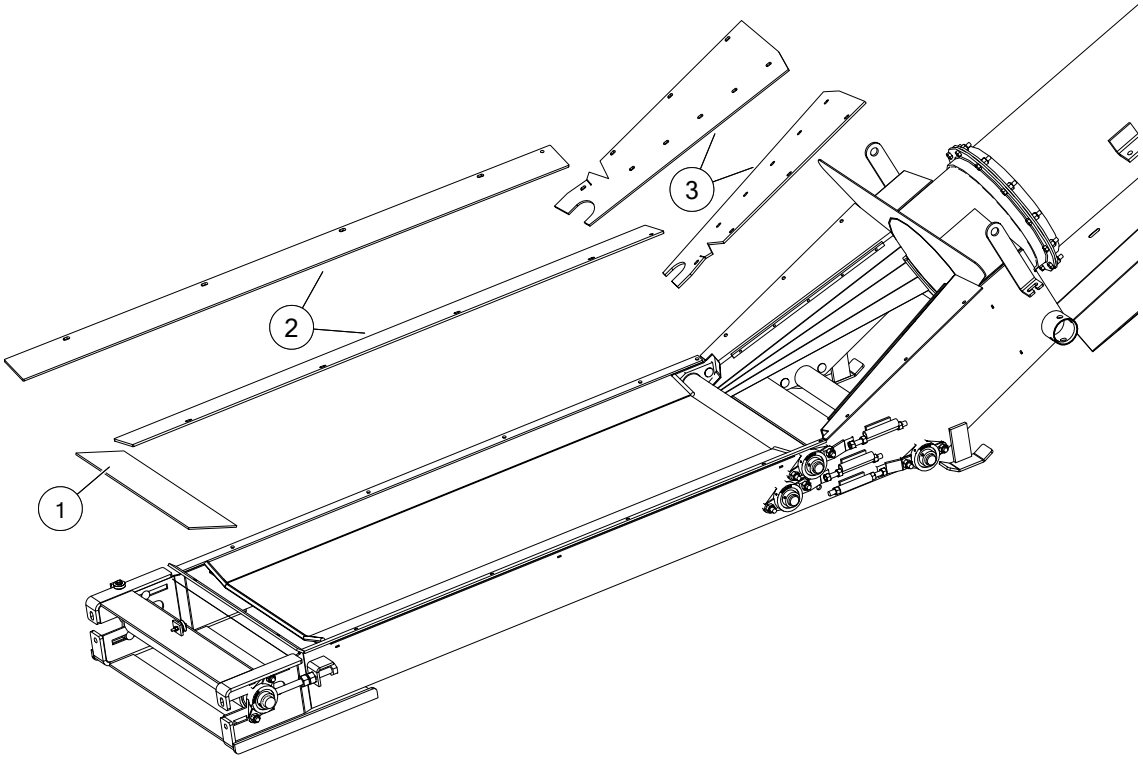


Figure 27. Flashings (2400 Series)



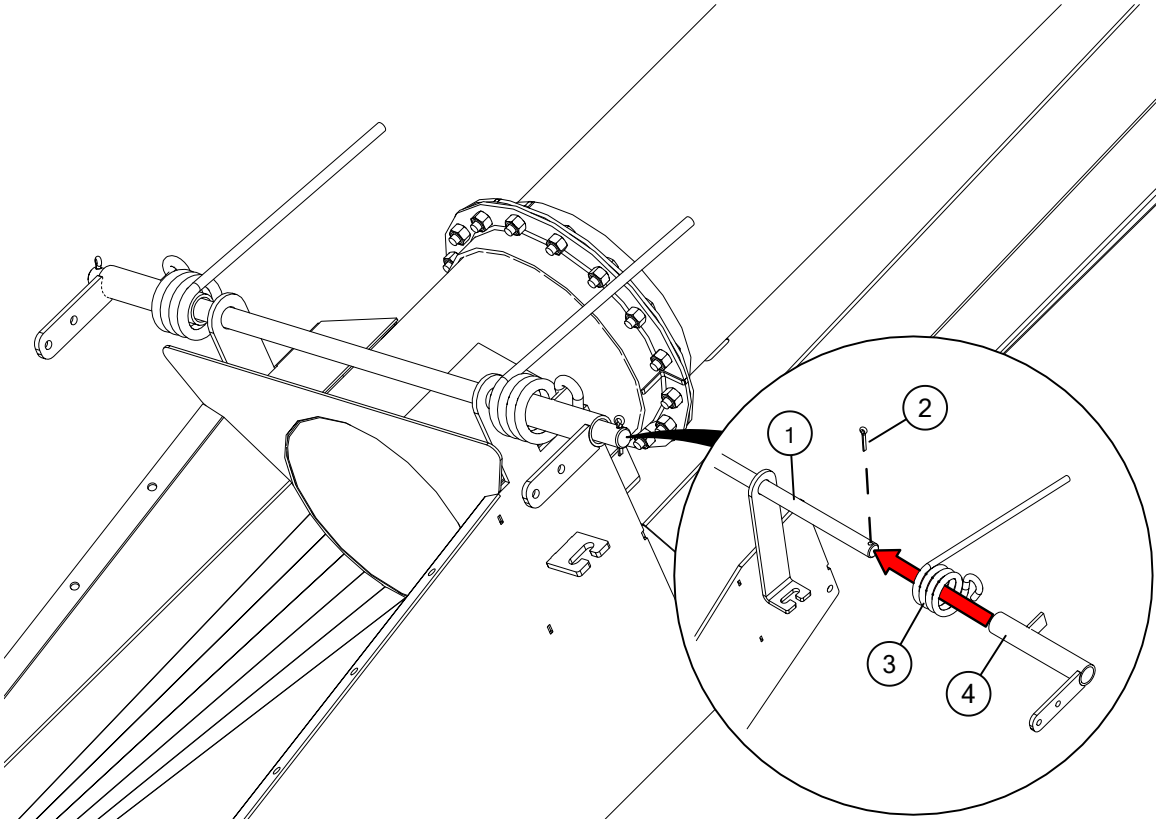
Install the Pivot Shaft

1. Slide the pivot shaft (1) through the mounting holes (see Figure 28).
2. Slide the hopper spring (3) over the end of the pivot shaft.
3. Slide the shaft bracket (4) onto the end of the pivot shaft, and orient the tab on the shaft bracket into the loop in the spring coil.
4. Secure the pivot shaft with a cotter pin (2).

Table 9. Pivot Shaft Components

Item	Description
1	Pivot Shaft
2	Cotter Pin
3	Hopper Spring
4	Shaft Bracket

Figure 28. Installing the Pivot Shaft, Hopper Springs, and Shaft Brackets



Install the Hopper Cloth Frame

1. Slide the two upper side frames (1, 6) into the hopper cloth (2) (see Figure 29, Figure 30, or Figure 31).
2. Slide the upper front frame (8) into the hopper cloth.
3. Fasten the upper side frames to the upper front frame using 3/8" x 1" hex bolts (9) and 3/8" nuts (10).

   Note

   Steps 4–6 will be performed later in the hopper cloth installation.

4. Slide the four lower side frames (4, 5) into the hopper cloth.
5. Slide the lower front frame (7) into the hopper cloth.
6. Slide the two lower back frames (3) into the hopper cloth.

Table 10. Hopper Cloth Frame Components

Item	Description
1	TR Upper Side Frame (left)
2	Hopper Cloth
3	TR Lower Back Frame
4	TR Lower Side Frame (short)
5	TR Lower Side Frame (long)
6	TR Upper Side Frame (right)

Table 10 Hopper Cloth Frame Components (continued)

Item	Description
7	TR Lower Front Frame
8	TR Upper Front Frame
9	3/8" x 1" Hex Bolt
10	3/8" Nut

Figure 29. Installing the Hopper Cloth Frame (1500 Series)

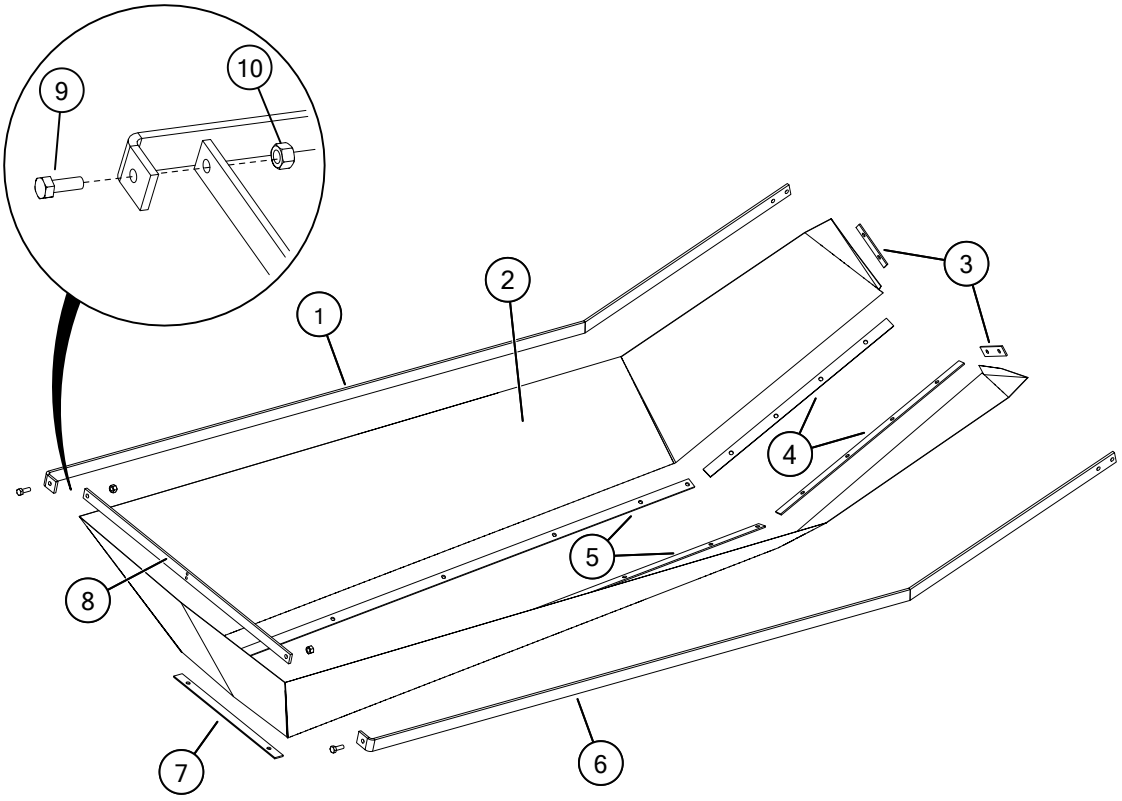


Figure 30. Installing the Hopper Cloth Frame (2000 Series)

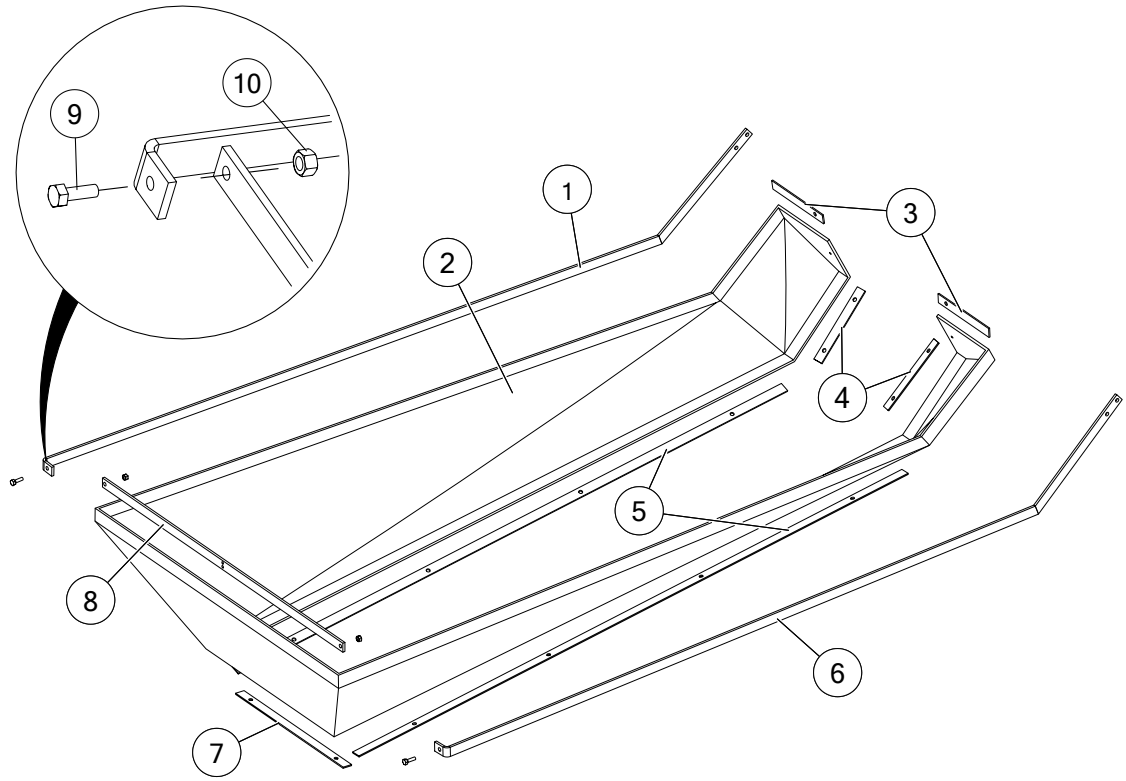
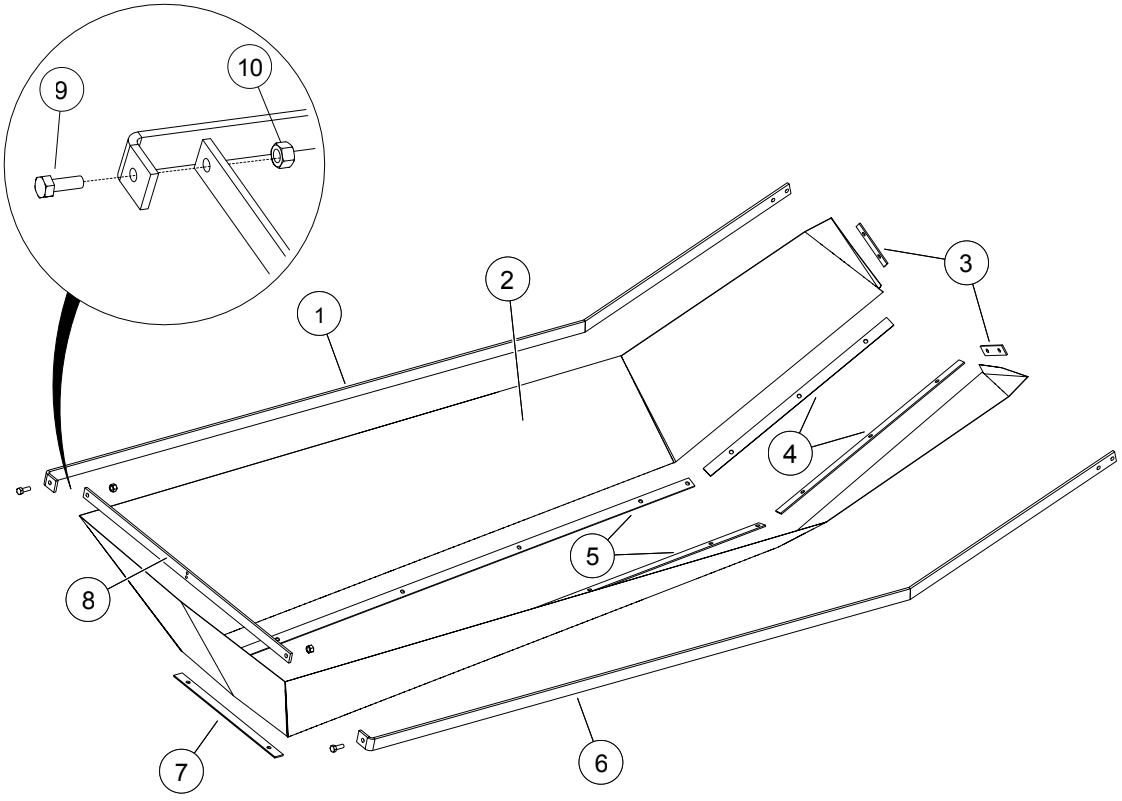


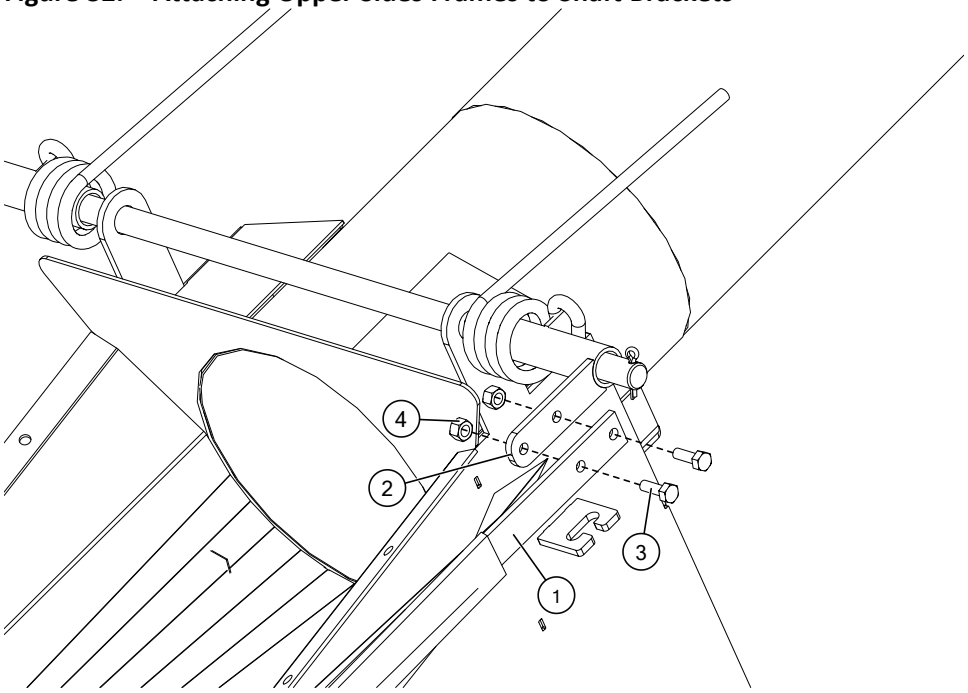
Figure 31. Installing the Hopper Cloth Frame (2400 Series)



Install the Hopper Cloth

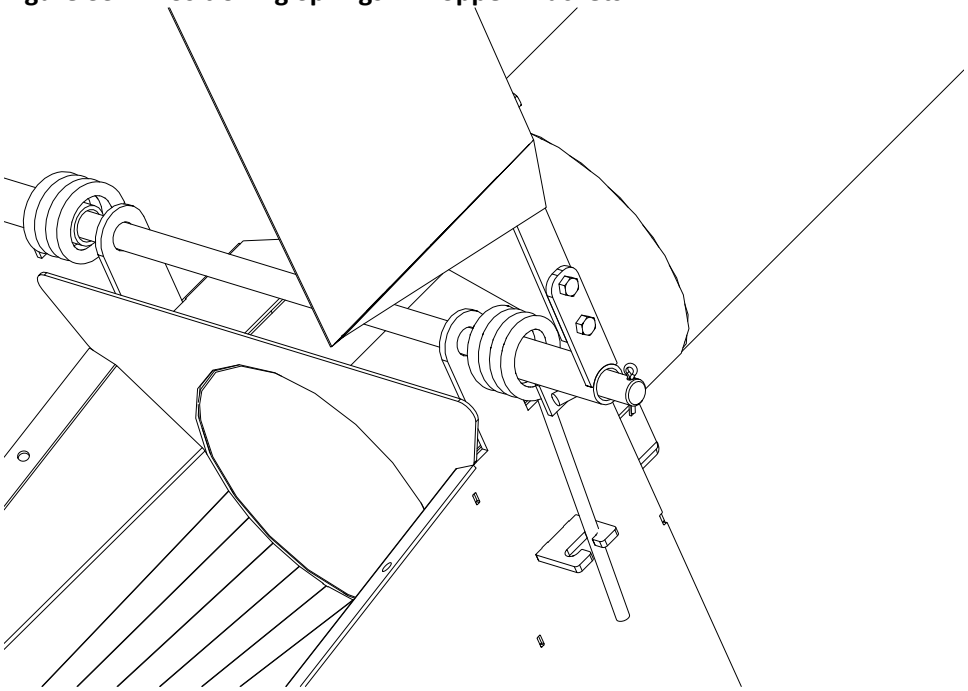
1. Attach the upper side frames (1) to the shaft brackets (2) using 3/8" x 1" hex bolts (3) and 3/8" nuts (4) (see Figure 32).

Figure 32. Attaching Upper Sides Frames to Shaft Brackets



2. Lift the upper frame (with the cloth on it) until it is nearly vertical, and position the springs in their brackets welded to the sides of the hopper (see Figure 33).

Figure 33. Positioning Springs in Hopper Brackets

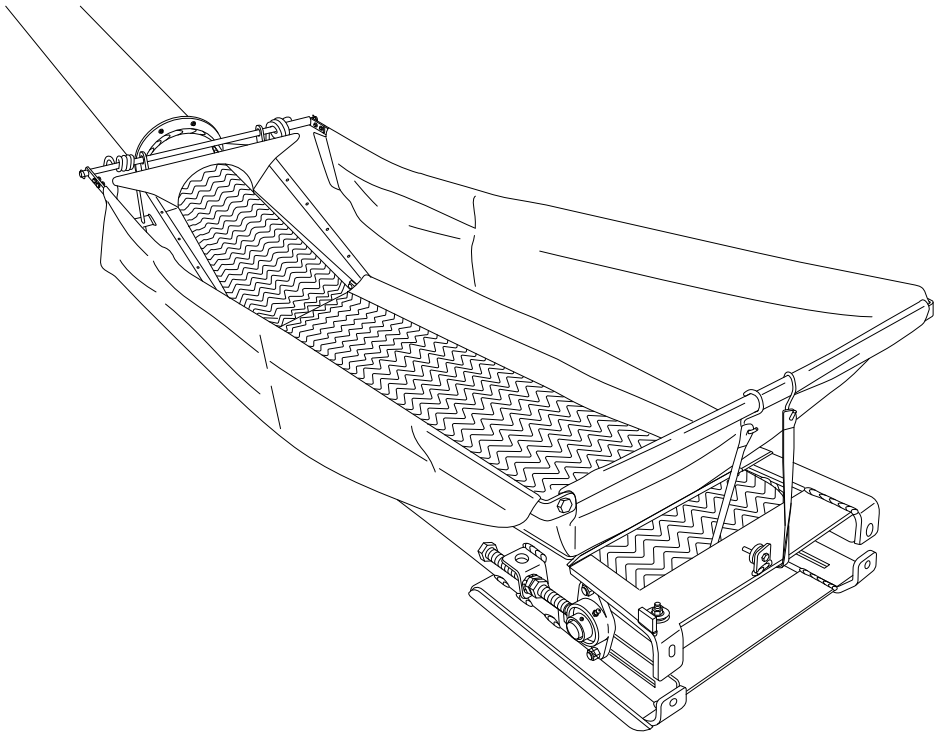


3. Pull the upper front frame down until the bottom of the cloth touches the front flashing, and hold it in place with a bungee cord around the front frame of the hopper weldment (see Figure 34).

Note

The length of the upper side frames provides leverage to pull the upper front frame down against the opposing torque of the springs.

Figure 34. Holding Upper Frame with Bungee Cord



4. Slide the lower frames into the hopper cloth, as described in a previous hopper cloth section (see Figure 29 on page 39, Figure 30 on page 40, or Figure 31 on page 40).
5. Attach the hopper cloth to the conveyor (see Figure 35, Figure 36, or Figure 37):
   - First, attach the front of the hopper cloth to the front flashing. Afterward, attach the sides.
   - Drill through the hopper cloth and use the existing holes as a guide through the lower frames, flashings, and hopper weldment.
   - Fasten using 1/4" x 1-1/4" elevator bolts (5) and 1/4" nuts (6).
6. Attach the lower back frames to the hopper using 1/4" x 1" self-tapping screws (7), 1/4" flat washers (8), and vinyl screw caps (10).
7. Install trimlock (9) onto the upper frame of the hopper cloth.

Table 11. Components for Installing the Hopper Cloth onto the Conveyor

Item	Description	Quantity for Series		
		1500	2000	2400
1	Upper Side Frame	2	2	2
2	Shaft Bracket	2	2	2
3	3/8" x 1" Hex Bolt	4	4	4
4	3/8" Nut	4	4	4

Table 11 Components for Installing the Hopper Cloth onto the Conveyor (continued)

Item	Description	Quantity for Series		
		1500	2000	2400
5	1/4" x 1-1/4" Elevator Bolt	22	14	18
6	1/4" Nut	22	14	18
7	1/4" x 1" Self-tapping Screw	4	2	4
8	1/4" Flat Washer	4	2	4
9	Trimlock (length in feet)	16	16	18
10	Vinyl Screw Cap	4	2	4

Figure 35. Installing the Hopper Cloth onto the Conveyor (1500 Series)

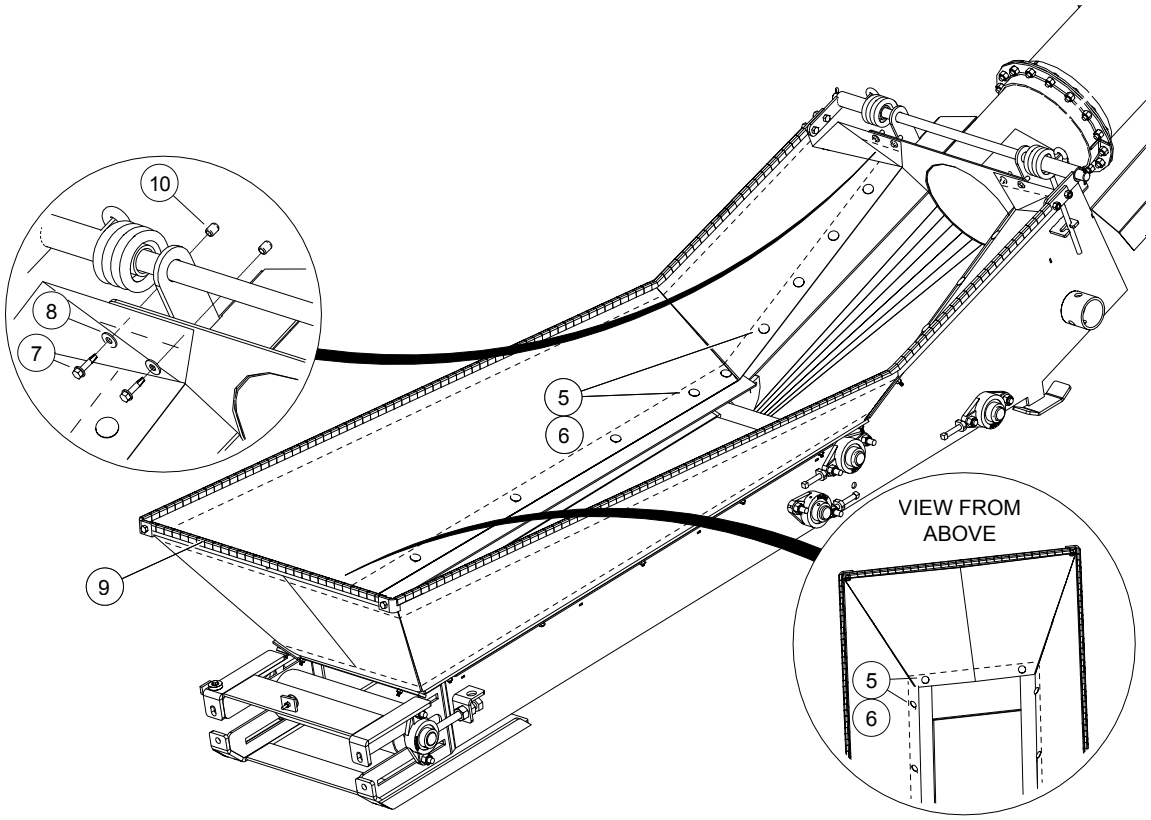


Figure 36. Installing the Hopper Cloth onto the Conveyor (2000 Series)

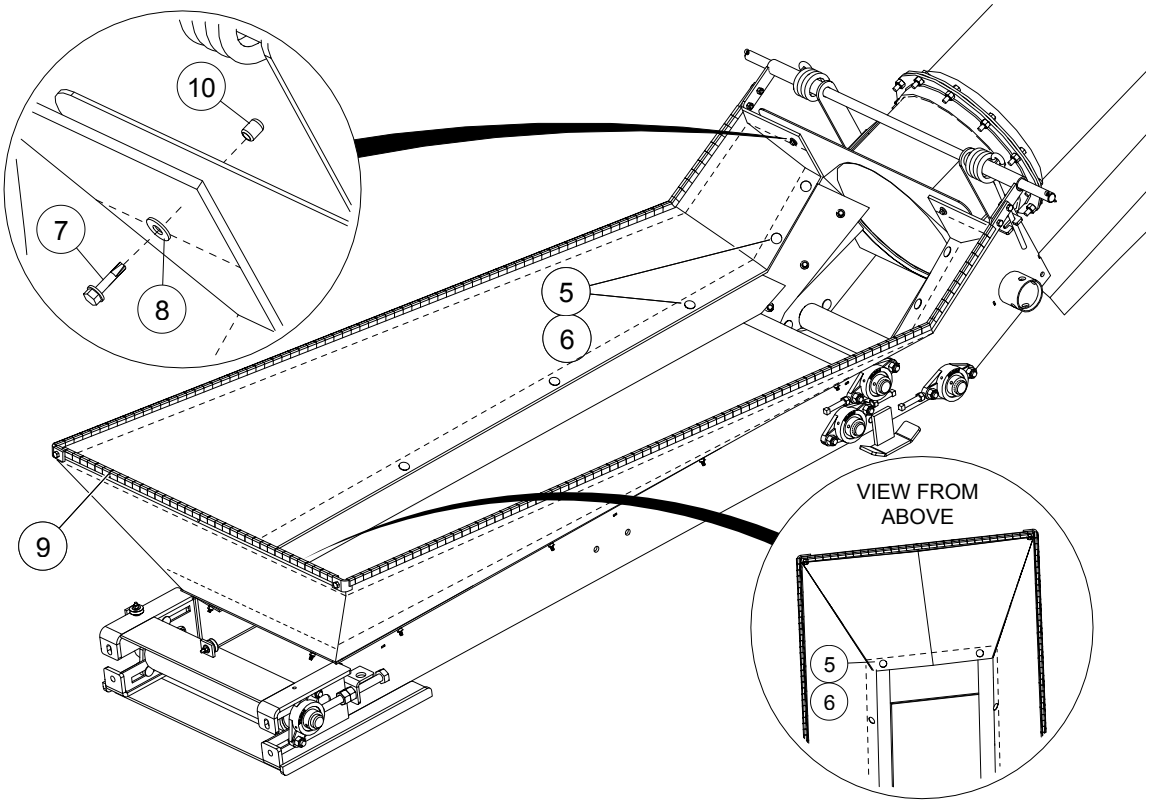
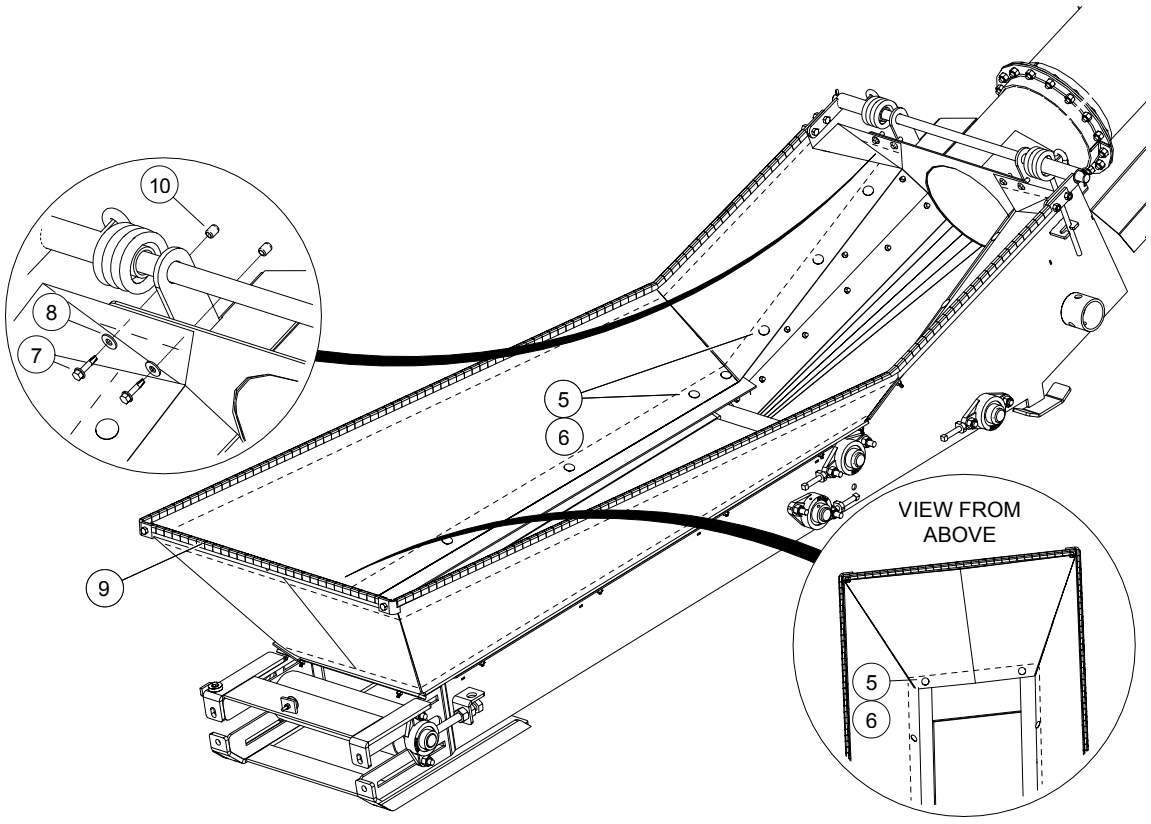


Figure 37. Installing the Hopper Cloth onto the Conveyor (2400 Series)



3.11. Install the Collapsible Hopper Cloth Controls

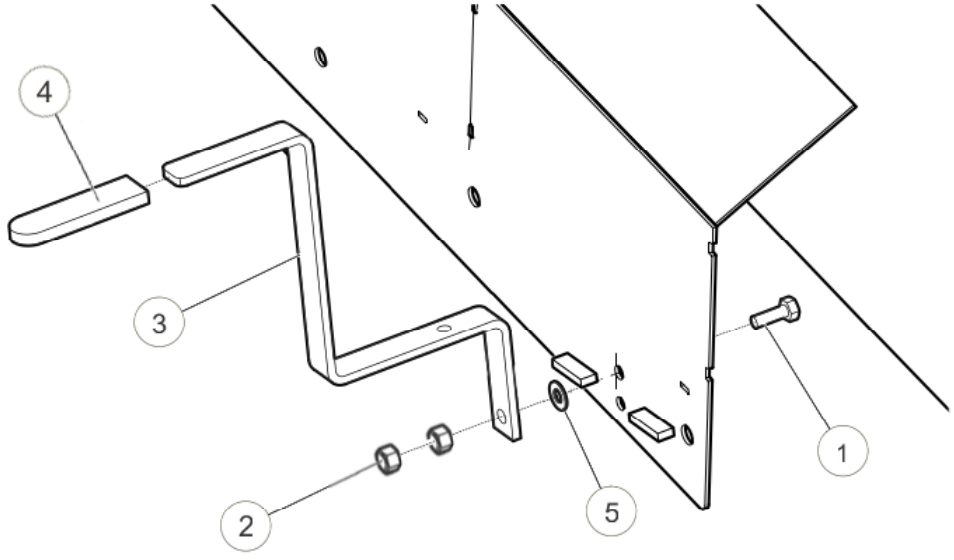
Install the Hopper Handle

1. **For 1500 Series:** Attach the hopper handle (3) to the spout weldment using a 3/8" x 1–1/2" bolt (1), 3/8" nylon washer (5), and two 3/8" hex nuts (2) (see Figure 38).

Table 12. Collapsible Hopper Cloth Controls Components (For 1500, 2000, and 2400 Series)

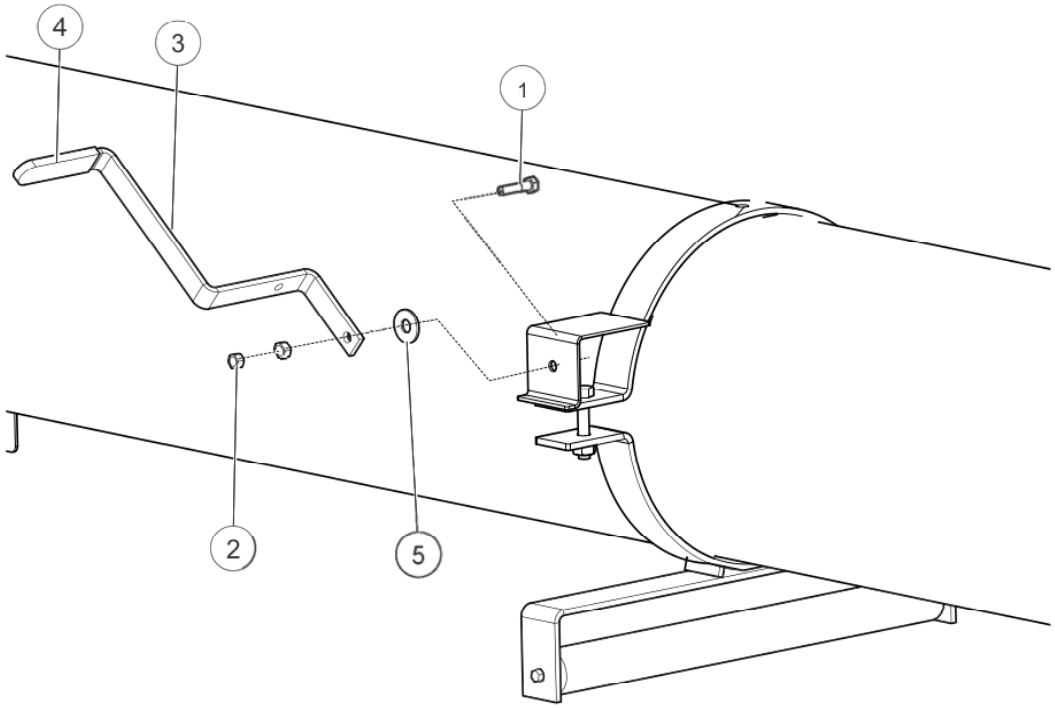
Item	Description	Quantity
1	3/8" x 1-1/2" Hex Bolt	1
2	3/8" Hex Nut	2
3	Hopper Handle	1
4	Rubber Handle	1
5	3/8" Washer Nylon USS	1
6	Handle Mount	1
7	2" U-clamp	1
8	1/2" x 2-1/2" Hex Bolt	2
9	1/2" Nylock Nut	2

Figure 38. Installing Hopper Handle (1500 Series)



2. **For 2000 Series:** Attach the hopper handle (3) to the handle bracket using a 3/8" x 1–1/2" bolt (1), 3/8" nylon washer (5), and two 3/8" hex nuts (2) (see Figure 39).

Figure 39. Installing Hopper Handle (2000 Series)



3. **For 2400 Series:**
   a. Locate the position of the handle mount (see Figure 40).
   b. Attach the handle mount (6) onto the tube using 2" u-clamp (7), 1/2" x 2-1/2" bolt (8), and 1/2" locknut (9) (see Figure 41).
   c. Tighten the u-clamp until the tube begins to crimp.
   d. Attach the hopper handle (3) to the handle mount using a 3/8" x 1-1/2" bolt (1), 3/8" nylon washer (5), and two 3/8" hex nuts (2).

Figure 40. Hopper Handle Position (2400 Series)

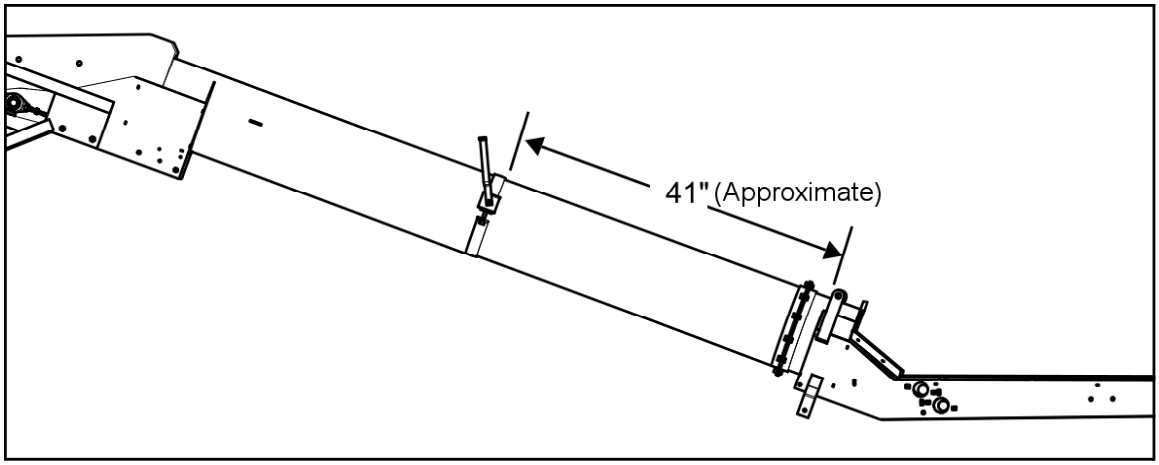
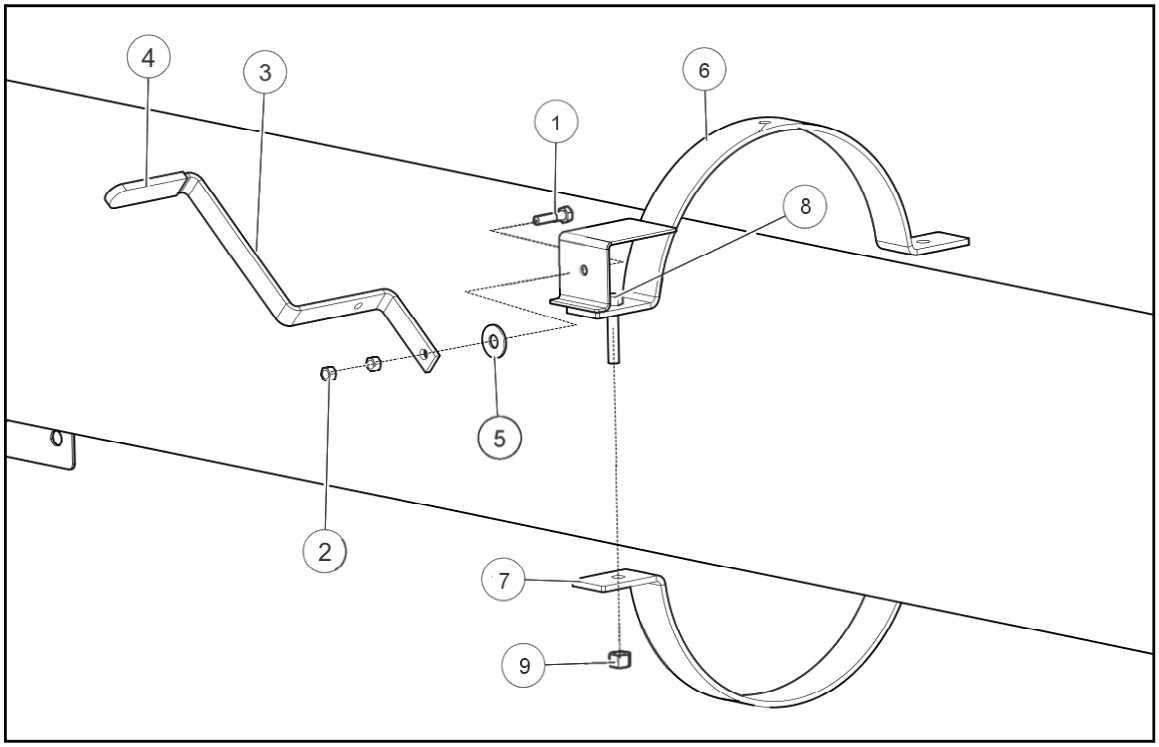


Figure 41. Installing Hopper Handle (2400 Series)



Note

Ensure the handle can pivot after tightening the bolt.

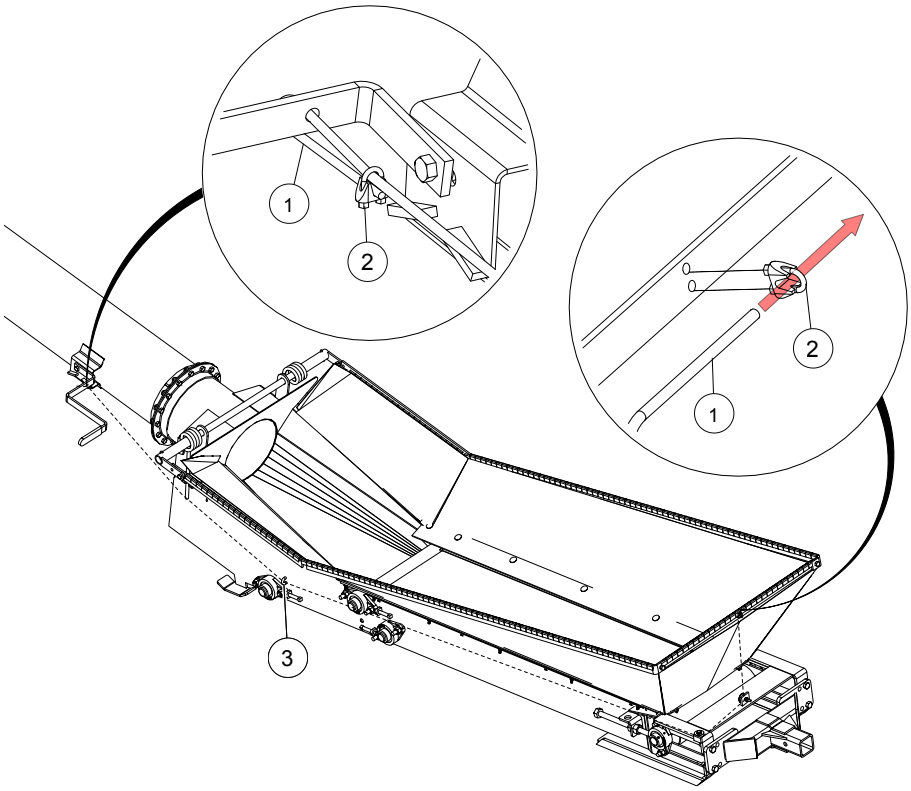
Install the Cable and Clamps

1. Point the hopper handle toward the hopper (see Figure 42).
2. Secure the cable (1) to the handle with a cable clamp (2).
3. Route the cable through the cable rung (3) and around the cable sheaves.
4. Secure the cable (1) to the hopper frame using a cable clamp (2) and the pre-drilled holes in the frame.
5. Test the function of the collapsible hopper cloth controls by raising and lowering the handle. Adjust cable tension as required.

Table 13. Cable and Clamp Components

Item	Description
1	1/8" Cable - (for 1500 Series: 13' [4.0 m])
	1/8" Cable - (for 2000 Series: 17' [5.2 m])
	1/8" Cable - (for 2400 Series: 18' [5.5 m])
2	1/4" Cable Clamp
3	Cable Rung

Figure 42. Installing the Cable and the Clamps



3.12. Install the Hood

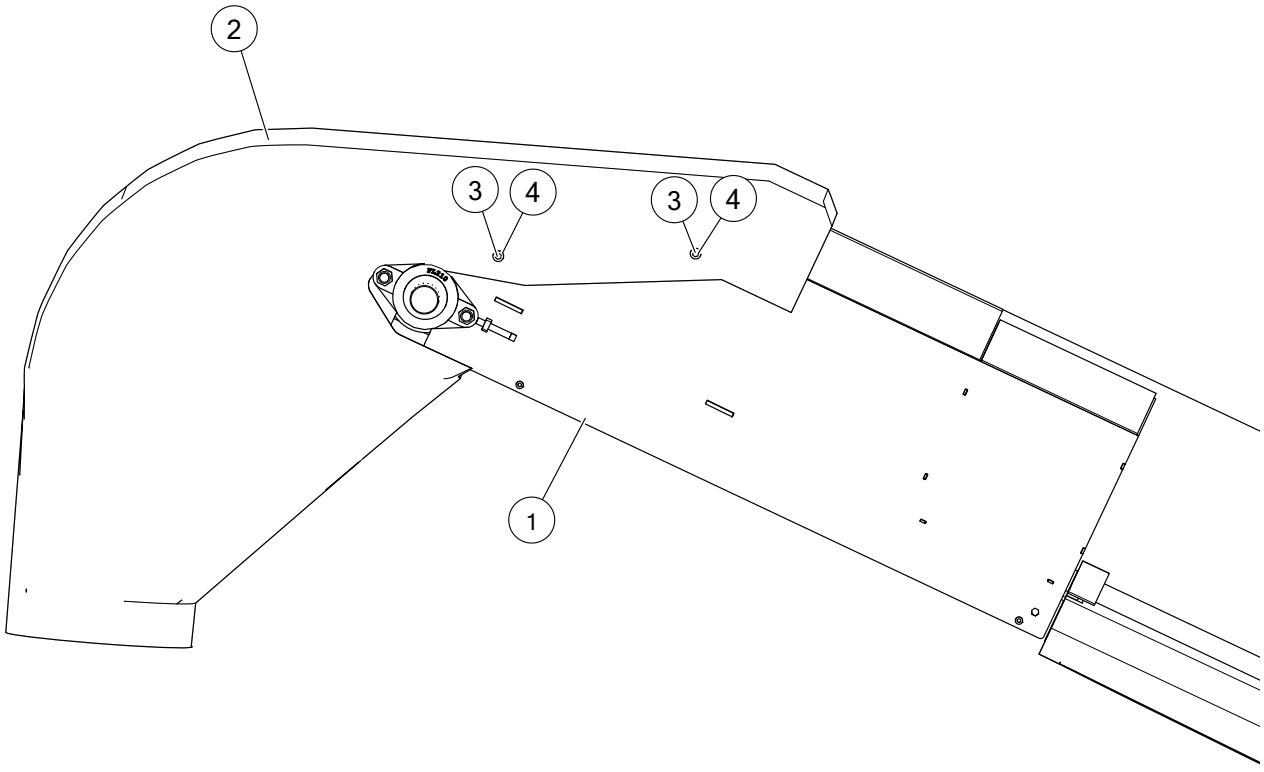
1. Place the hood (2) around the bearing assembly (see Figure 43).
2. Use self-tapping screws (3) and 1/4" flat washers (4) to tighten the hood (2) to the conveyor spout (1).

Note
Make sure the screws will not interfere with belt operation.

Table 14. Spout Hood and Support Braces Components

Item	Description	Quantity for Series		
		1500	2000	2400
1	Spout Assembly	1	1	1
2	Hood	1	1	1
3	1/4" x 1" Self-Tapping Screw	4	—	—
	1/4" x 1-1/2" Self-Tapping Screw	—	4	4
4	1/4" Flat Washer	4	4	4

Figure 43. Installing Spout Hood



3. Install the spout support braces as shown in the figure for your series below.

Table 15. Spout Hood and Support Braces Components

Item	Description	Quantity for Series		
		1500	2000	2400
5	Support Brace RH	1	1	1
6	Support Brace LH	1	1	1
7	Support Brace Spacer	1	1	1
8	Lower Lateral Brace	—	—	1
9	1/2" x 1-1/2" Hex Bolt	6	2	6
10	5/8" x 2" Hex Bolt	—	4	—
11	3/4" x 2" Bolt	—	—	4
12	1/2" Nut Nylock	6	2	6
13	5/8" Nut Nylock	—	4	—
14	3/4" Nut	—	—	4

Figure 44. Installing Support Braces (1500 Series)

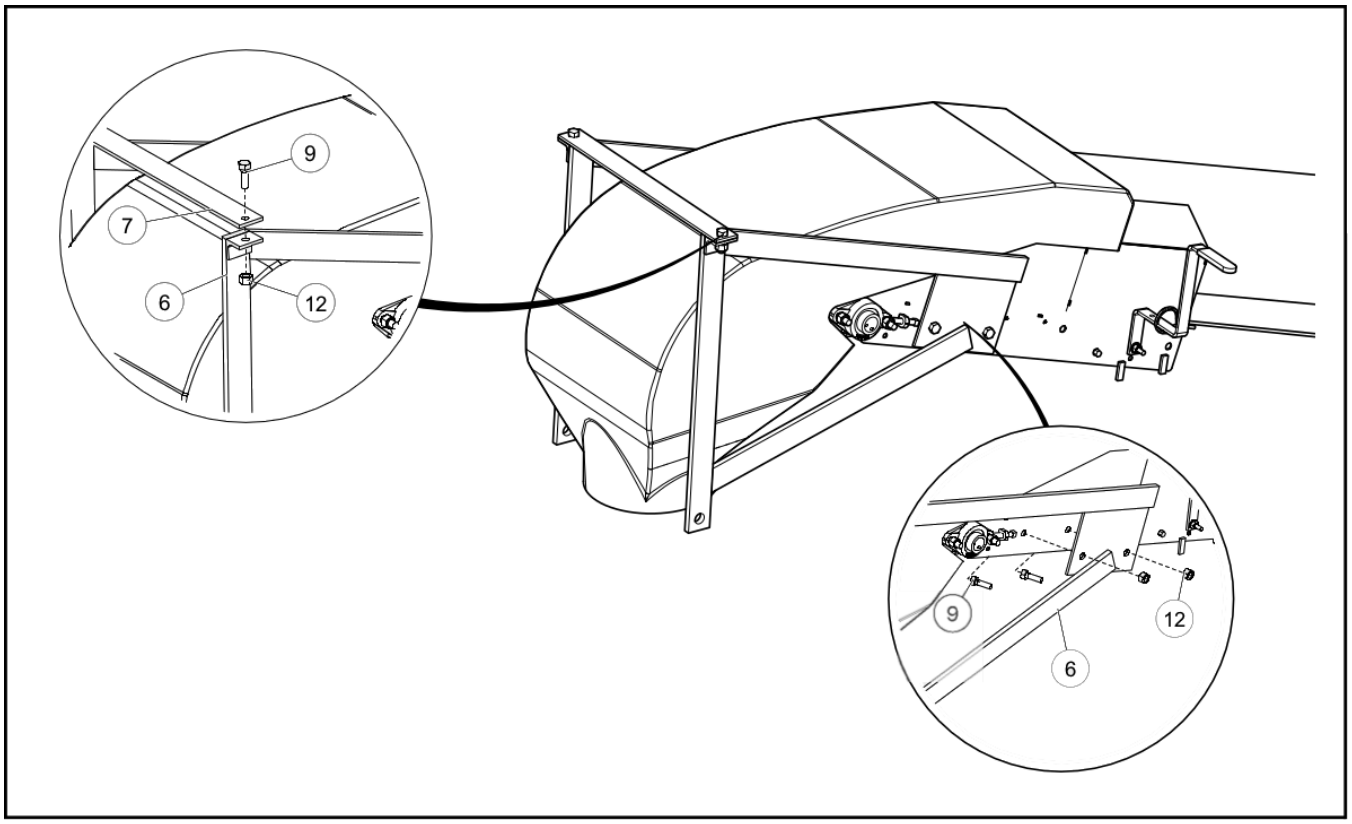


Figure 45. Installing Support Braces (2000 Series)

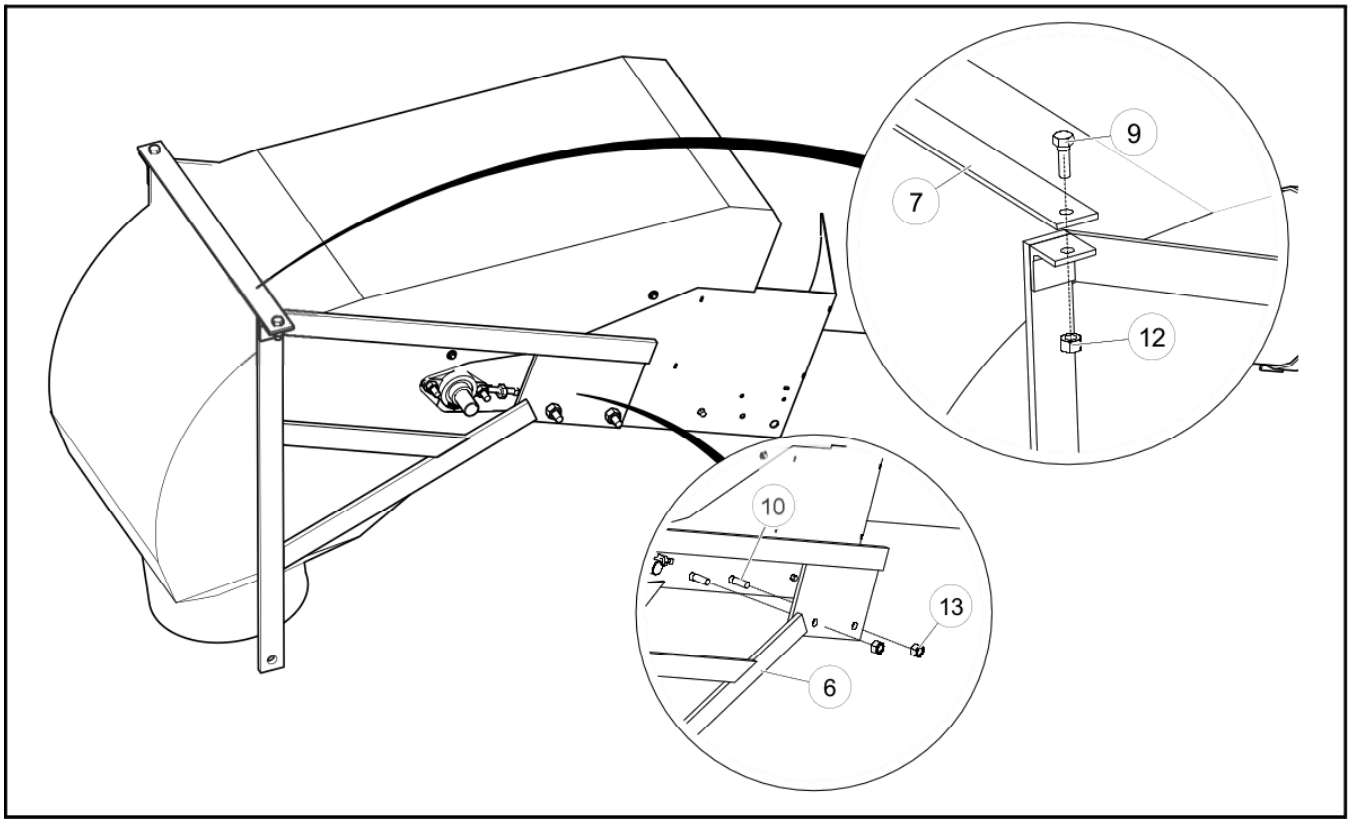
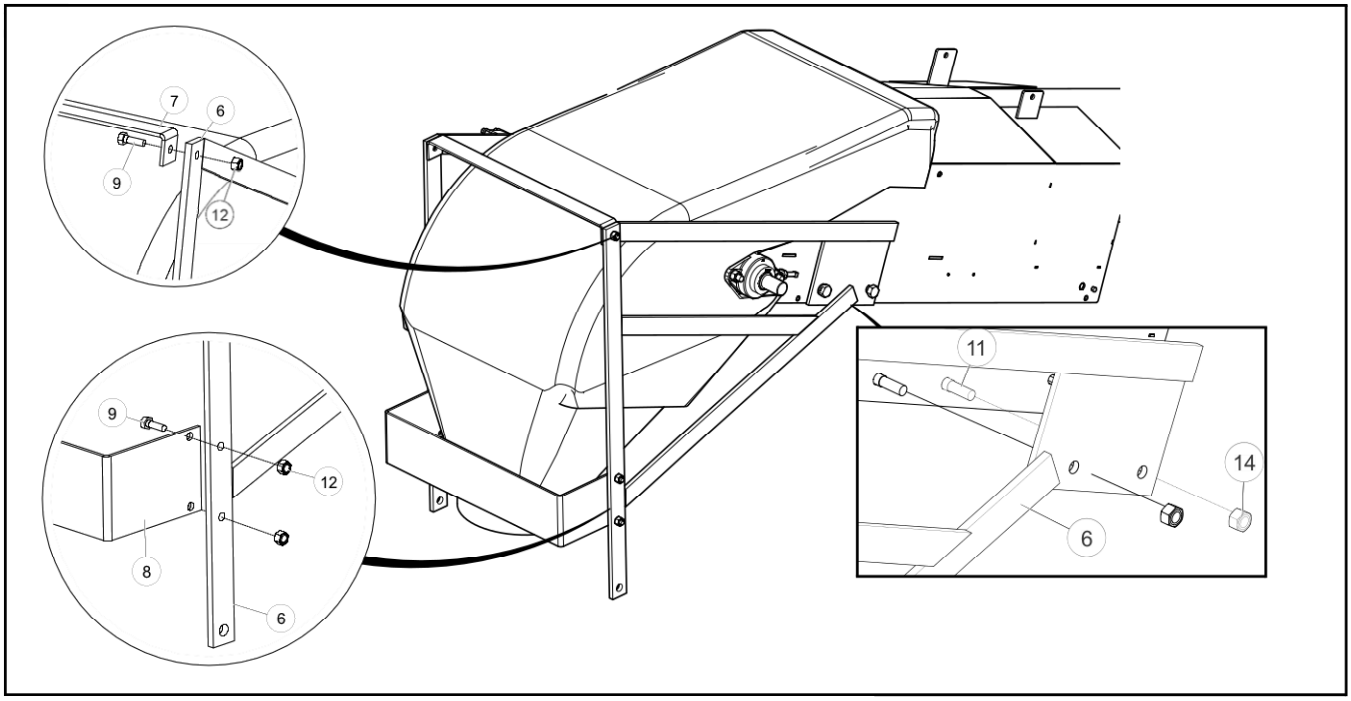


Figure 46. Installing Support Braces (2400 Series)



3.13. Install the Hydraulic Drive (1500 Series)

Install the Motor Mount and Sprocket/Chain Assembly

1. Remove the 1/2" locknuts (2) from the drive roller flange bearing (7).

   Note

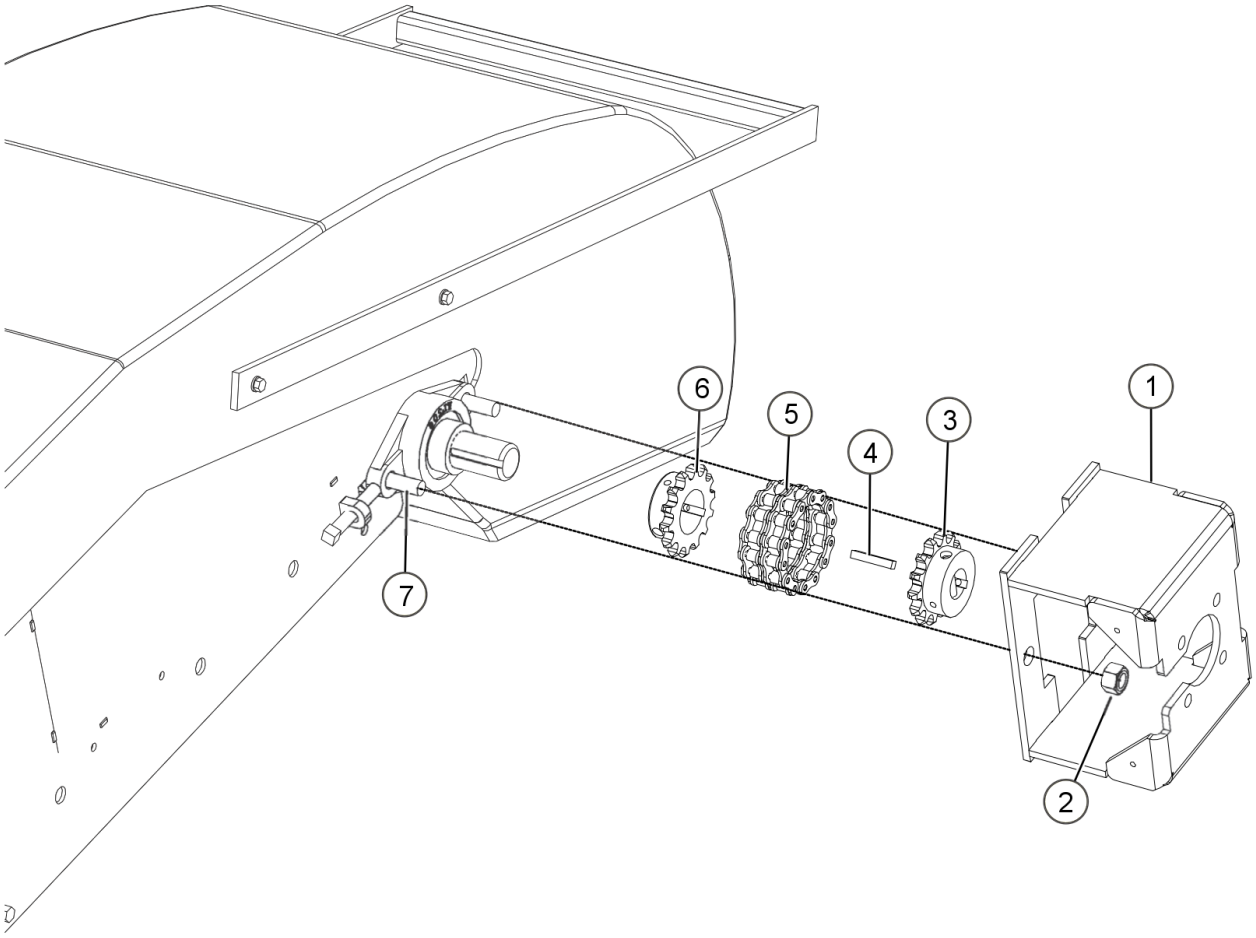
   These bolts will be used to fasten the motor mount (1) to the conveyor.

2. Install the square key (4) into the drive roller shaft. See Figure 47.
3. Loosely fasten the motor mount (1) to the drive roller flange bolts using the nuts removed in step 1.
4. Install the sprocket and chain assembly:
   a. Assemble the 1" bore sprockets (3, 6) and chain (5) with the connector link.
   b. Slide the sprocket and chain assembly onto the drive roller shaft.

Table 16. Mount and Sprocket Components

Item	Description
1	Motor Mount
2	1/2" Nylock Nut (removed from bearing)
3	1" Bore Sprocket (5014 Half Thick)
4	1/4" x 1-1/2" Key
5	Chain Coupling (5014)
6	1–1/4" Bore Sprocket (5014 Half Thick)
7	Drive Roller Flange Bearing

Figure 47. Installing the Motor Mount and Sprocket/Chain Assembly



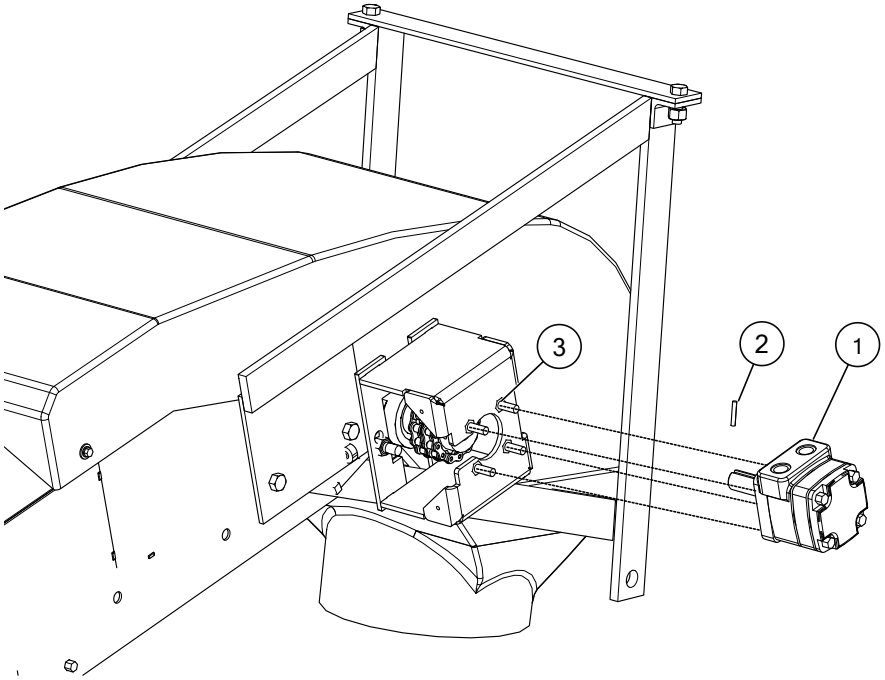
Install the Hydraulic Motor

1. Slide the drive shaft of the hydraulic motor (1) into the sprocket and chain assembly. See Figure 48.
2. Secure the motor to the sprocket and chain assembly with the 3/8" x 2" spring pin (2).
3. Loosely fasten the motor onto the motor mount using 3/8" x 3/4" bolts (3).
4. Tighten fasteners in sequence starting with the bolts connecting the motor mount to the bearing, followed by the bolts connecting the motor to the motor mount, and finally the set screws on the sprockets.

Table 17. Hydraulic Motor Components

Item	Description
1	Hydraulic Motor
2	3/8" x 2" Spring Pin
3	3/8" x 3/4" Hex Bolt

Figure 48. Installing the Hydraulic Motor



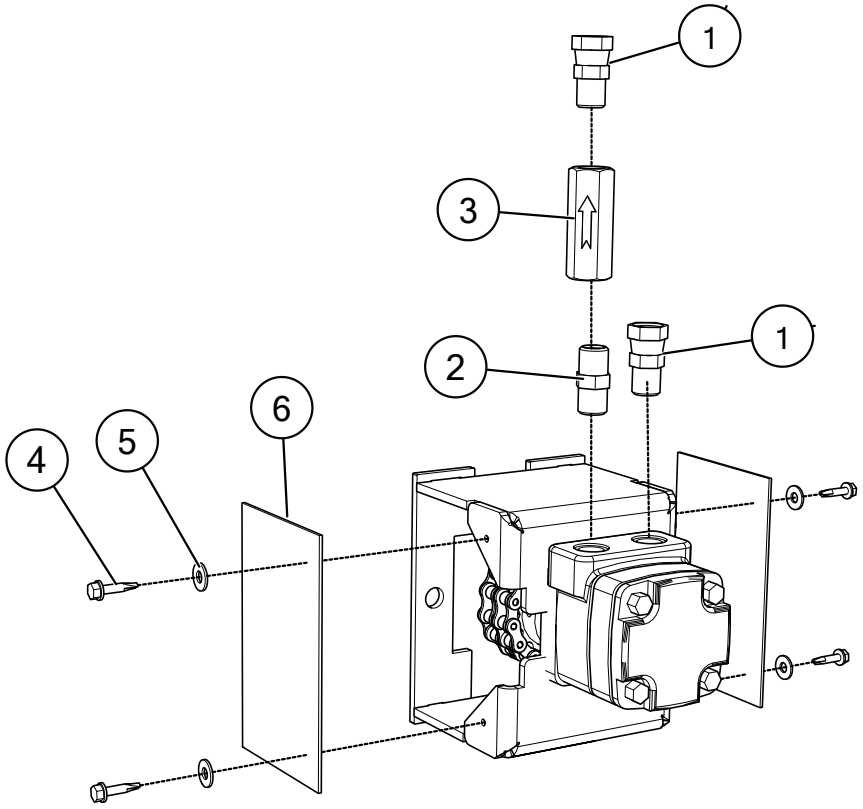
Install the Hydraulic Fittings and Coupler Guard

1. Insert the 1/2" x 3/8" nipple (2) into the input (pressure) port and 1/2" swivel (1) into the return port of the hydraulic motor. See Figure 49.
2. Insert the 1/2" check valve (3) into the 1/2" x 3/8" nipple (1).
3. Insert 1/2" swivel (1) into the check valve.
4. Install the coupler guard (6) using 1/4" self-tapping screws (4) and 1/4" flat washers (5).

Table 18. Hydraulic Fittings and Coupler Guard Components

Item	Description
1	1/2" x 3/8" Hex Nipple (S1022DC)
2	Swivel 90 - 1/2" Straight
3	1/2" Check Valve (No Rev Flow)
4	1/4" Self-tapping Screw
5	1/4" Flat Washer
6	1-1/4" Hydraulic Motor Guard 4.5 x 6.25

Figure 49. Installing the Coupler Guard and Hydraulic Fittings



5. Install the shaft guard (see Section 3.24. – Install the Shaft Guard on page 106 for instructions).
6. Place the safety decal above the hydraulic motor assembly as indicated in 1.9.2 Safety Decal Locations and Details on page 11.
7. Attach and secure hydraulic hoses (A, B) to the motor. See Figure 50.
8. **For models without Power Swing option (Standard Swing Away):** Attach the quick coupling nipple (7) onto the hydraulic hose ends. Securely store the hydraulic hoses close to the spout.
9. **For models with Power Swing option:**
   - Hydraulic Power Swing — See Section 3.22.2 – Install the Hydraulic Spool Valve and Hoses on page 87.
   - Electric Remote Power Swing — See Section 3.23.3 – Install the Flow Control Half Valve on page 100.

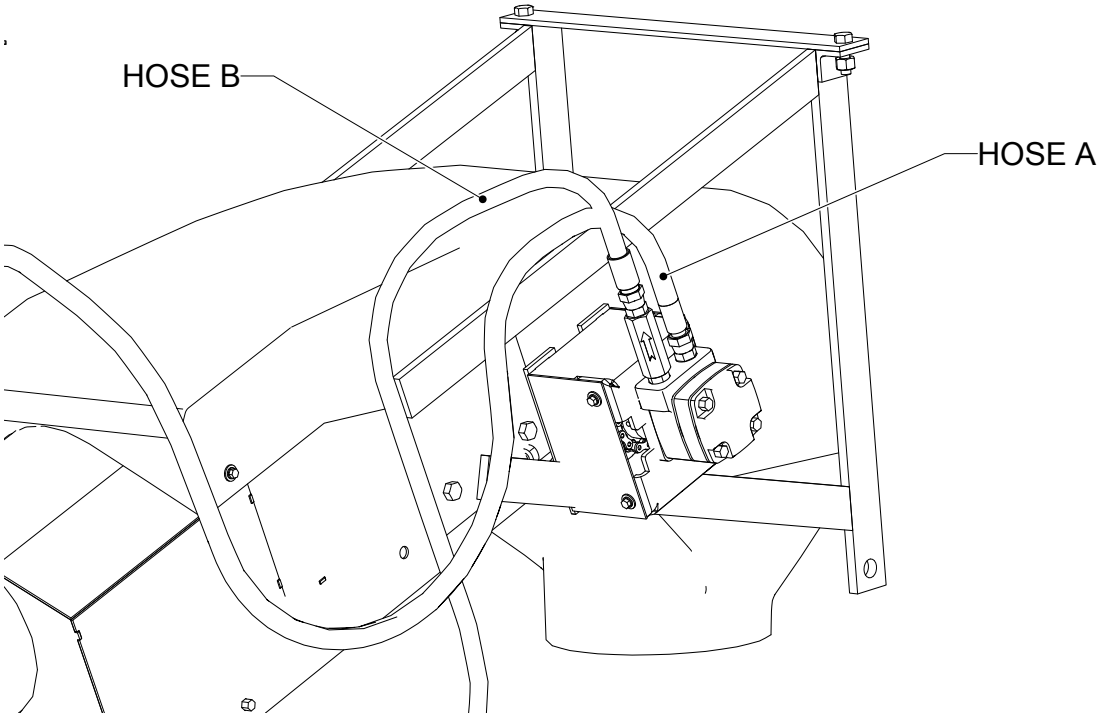
   Important

   Protect hose ends from dirt.

Table 19. Hydraulic Hoses (1500 Series)

Item	Description	Quantity
For Models without Power Swing:		
A (hydraulic motor hose — pressure line)	3/8" Hydraulic Hose - 1/2" MPT - 1/2" MPT, 15' (P0832017)	1
B (hydraulic motor hose — return line)	1/2" Hydraulic Hose - 1/2" MPT - 1/2" MPT, 15' (P0832031)	1
7	1/2" FPT Quick Coupling Nipple (not shown)	2
For Models with Power Swing:		
A (hydraulic motor hose — pressure line), B (hydraulic motor hose — return line)	3/8" Hydraulic Hose - 1/2" MPT - 1/2" MPT, 6' (P0832051)	2

Figure 50. Installing the Hydraulic Hoses



Note

Attach hydraulic hoses to:

- spool valve for Swing Away with Hydraulic Power Swing
- half valve flow control for Swing Away with Electric Remote Power Swing
- tractor for Standard Swing Away

3.14. Install the Hydraulic Drive (2000 Series)

Install the Motor Mount and Sprocket/Chain Assembly

1. Remove the 1/2" locknuts (2) from the drive roller flange bearing (7).

   Note

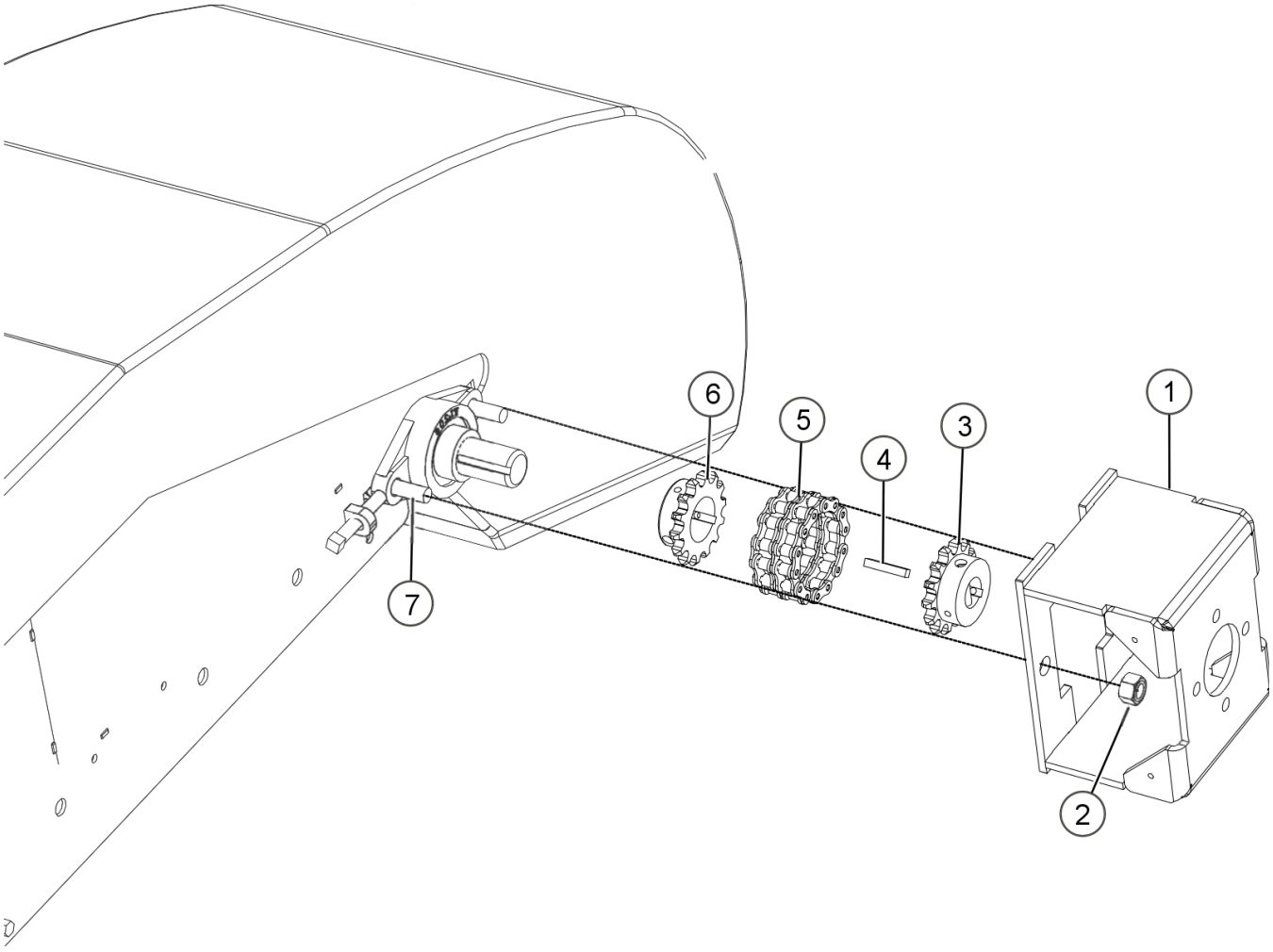
   These bolts will be used to fasten the motor mount (1) to the conveyor.

2. Install the square key (4) into the drive roller shaft. See Figure 51.
3. Loosely fasten the motor mount (1) to the drive roller flange bolts using the nuts removed in step 1.
4. Install the sprocket and chain assembly:
   a. Assemble the sprockets (3, 6) and chain (5) with the connector link.
   b. Slide the sprocket and chain assembly onto the drive roller shaft.

Table 20. Mount and Sprocket Components

Item	Description
1	2000 Series Pitstop Motor Mount
2	1/2" Nylock Nut (removed from bearing)
3	1" Bore 5014 Sprocket (Key0.25)
4	1/4" x 1-1/2" Key
5	R/Chain-Drive (50–2RX14+CL)
6	1–1/4" 5014 Bore Sprocket (Key0.25)
7	Drive Roller Flange Bearing

Figure 51. Installing the Motor Mount and Sprocket/Chain Assembly



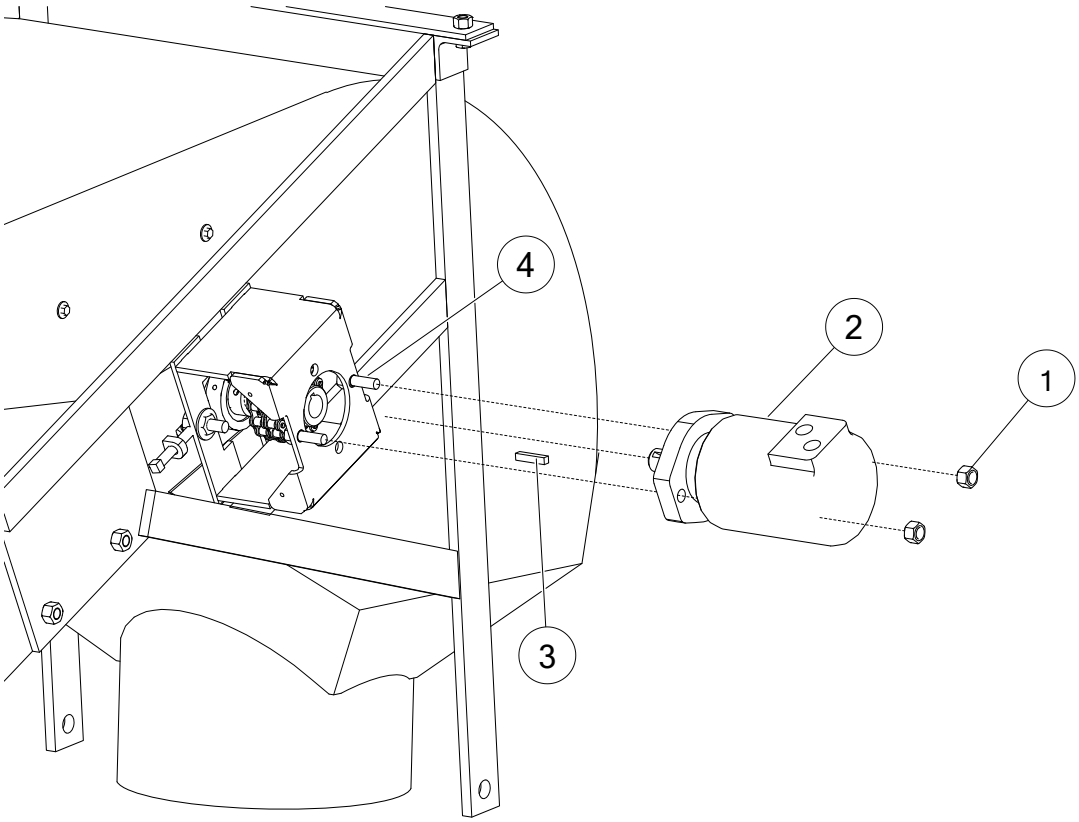
Install the Hydraulic Motor

1. Install the 1/4" x 1-1/2" key (3) into the drive shaft of the hydraulic motor (2). See Figure 52.
2. Slide the drive shaft of the hydraulic motor (2) into the sprocket and chain assembly.
3. Loosely fasten the motor onto the motor mount using 1/2" x 2" bolts (4) and 1/2" locknuts (1).
4. Secure the sprocket and chain assembly to the shafts by centering it then loosely fastening the set screws on each sprocket.
5. Tighten fasteners in sequence starting with the bolts connecting the motor mount to the bearing, followed by the bolts connecting the motor to the motor mount, and finally the set screws on the sprockets.

Table 21. Hydraulic Motor Components

Item	Description
1	1/2" Nylock Nut
2	Hydraulic Motor (2000) 6.2 —1"
3	1/4" x 1-1/2" Key
4	1/2" x 2" Hex Bolt GR8

Figure 52. Installing the Hydraulic Motor



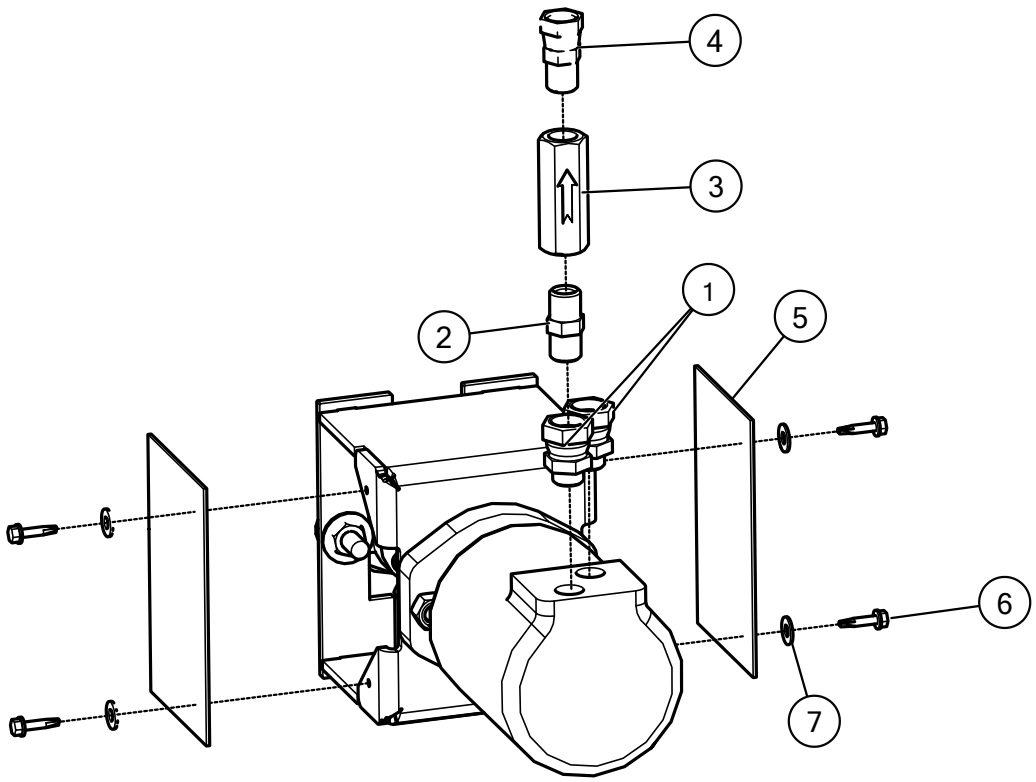
Install the Hydraulic Fittings and Coupler Guard

1. Insert the 1/2" swivels (1) into the inflow and return lines of the hydraulic motor. See Figure 53.
2. Insert the hex nipple (2) into the swivel fastened into the return line of the hydraulic motor.
3. Insert the 1/2" check valve (3) into the hex nipple (2).
4. Insert a 1/2" swivel (4) into the check valve (3).
5. Install the coupler guard (5) using 1/4" x 1" self-tapping screws (6) and 1/4" flat washers (7).

Table 22. Hydraulic Fittings and Coupler Guard Components

Item	Description
1	10 ORB x 1/2" FPT Swivel
2	1/2" Hex Nipple (S1022–D)
3	1/2" Check Valve - (No Rev Flow)
4	1/2" Straight Swivel (S1120-DD)
5	1-1/4" Hydraulic Motor Guard 4.5 x 6.25
6	1/4" x 1" Self-Tapping Screw
7	1/4" Flat Washer, USS Plated

Figure 53. Installing the Hydraulic Fittings and Coupler Guard



6. Install the shaft guard (see Section 3.24. – Install the Shaft Guard on page 106 for instructions).
7. Place the safety decal above the hydraulic motor assembly as indicated in 1.9.2 Safety Decal Locations and Details on page 11.
8. Attach and secure hydraulic hoses (A, B) to the motor. See Figure 54.
9. **For models without Power Swing option (Standard Swing Away):** Attach the quick coupling nipple (8) onto the hydraulic hose ends. Securely store the hydraulic hoses close to the spout.

10. **For models with Power Swing option:**

- Hydraulic Power Swing — See Section 3.22.2 – Install the Hydraulic Spool Valve and Hoses on page 87.
- Electric Remote Power Swing — See Section 3.23.3 – Install the Flow Control Half Valve on page 100.

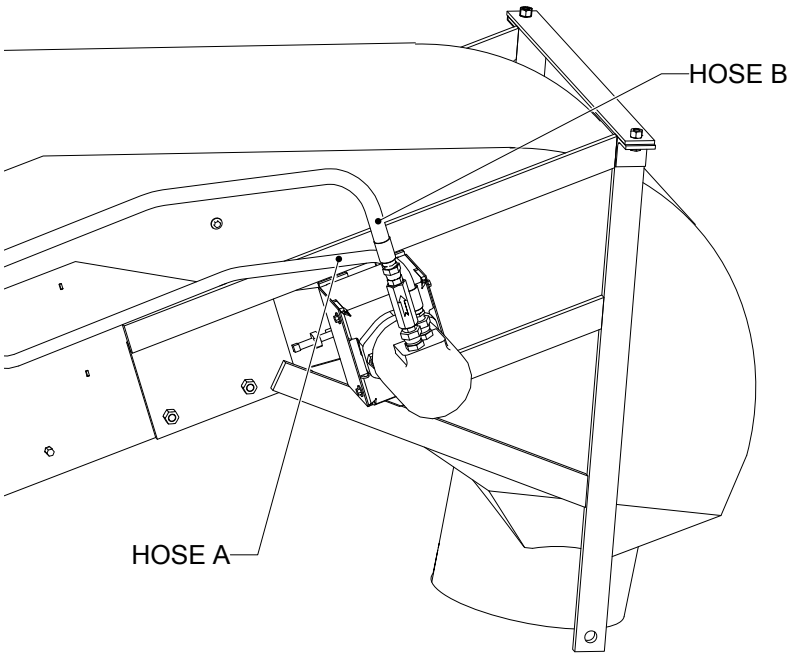
Important

Protect hose ends from dirt.

Table 23. Hydraulic Hoses (2000 Series)

Item	Description	Quantity
For Models without Power Swing:		
A (hydraulic motor hose — pressure line)	1/2" Hydraulic Hose - 1/2" MPT - 1/2" MPT, 15' (P0832031)	1
B (hydraulic motor hose — return line)	3/4" Hydraulic Hose - 1/2" MPT - 1/2" MPT, 15' (P0832064)	1
8	1/2" FPT Quick Coupling Nipple (not shown)	2
For Models with Power Swing:		
A (hydraulic motor hose — pressure line)	1/2" Hydraulic Hose - 1/2" MPT - 1/2" MPT, 6' (P0832059)	1
B (hydraulic motor hose — return line)	3/4" Hydraulic Hose - 1/2" MPT - 1/2" MPT, 6' (P0832062)	1

Figure 54. Installing the Hydraulic Hoses



Note

Attach hydraulic hoses to:

- spool valve for Swing Away with Hydraulic Power Swing
- half valve flow control for Swing Away with Electric Remote Power Swing
- tractor for Standard Swing Away

3.15. Install the Hydraulic Drive (2400 Series)

Install the Motor Mount and Sprocket/Chain Assembly

1. Remove the 1/2" locknuts (2) from the drive roller flange bearing (7).

   Note

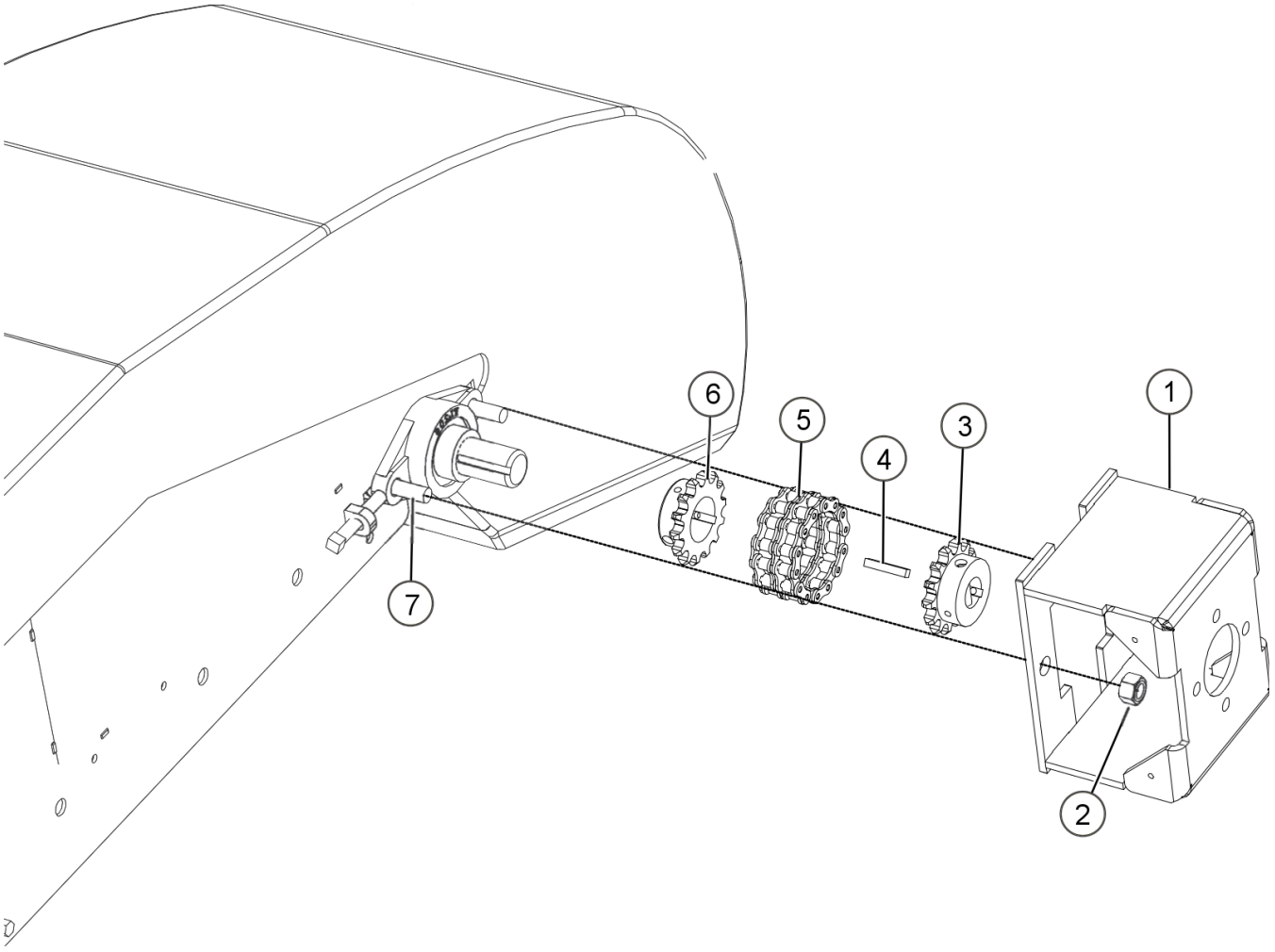
   These bolts will be used to fasten the motor mount (1) to the conveyor.

2. Install the square key (4) into the drive roller shaft. See Figure 55.
3. Loosely fasten the motor mount (1) to the drive roller flange bolts using the nuts removed in step 1.
4. Install the sprocket and chain assembly:
   a. Assemble the sprockets (3, 6) and chain (5) with the connector link.
   b. Slide the sprocket and chain assembly onto the drive roller shaft.

Table 24. Mount and Sprocket Components

Item	Description
1	1–15/16" Hyd Mount 2000 Ser
2	1/2" Nylock Nut (removed from bearing)
3	1" Bore 6015 Sprocket
4	3/8" x 2" Key
5	R/Chain-Drive (60–2RX14+CL+OL)
6	1–1/2" 6015 Bore Sprocket
7	Drive Roller Flange Bearing

Figure 55. Installing the Motor Mount and Sprocket/Chain Assembly



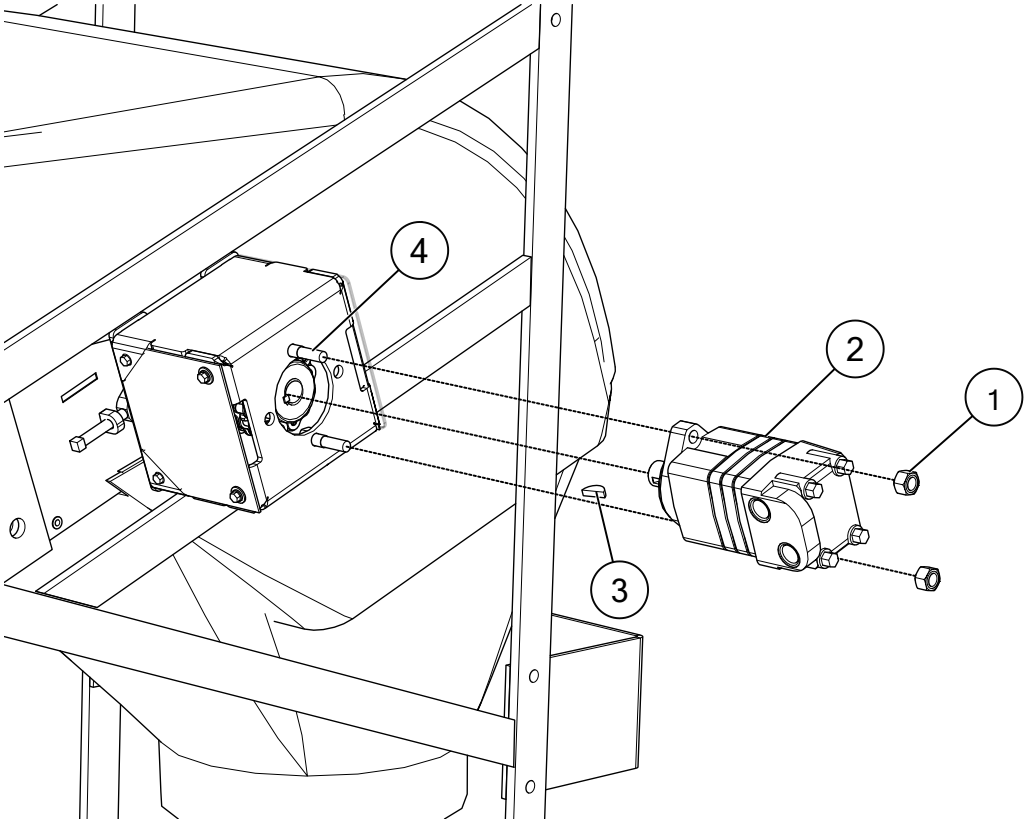
Install the Hydraulic Motor

1. Install the 1/4" x 1–1/2" woodruff key (3) into the drive shaft of the hydraulic motor (2). See Figure 56.
2. Slide the drive shaft of the hydraulic motor (2) into the sprocket and chain assembly.
3. Loosely fasten the motor onto the motor mount using 1/2" x 2" bolts (4) and 1/2" locknuts (1).
4. Secure the sprocket and chain assembly to the shafts by centering it then loosely fastening the set screws on each sprocket.
5. Tighten fasteners in sequence starting with the bolts connecting the motor mount to the bearing, followed by the bolts connecting the motor to the motor mount, and finally the set screws on the sprockets.

Table 25. Hydraulic Motor Components

Item	Description
1	1/2" Nylock Nut GR8
2	Hydraulic Motor (2000S) 8.0
3	1/4" x 1" Woodruff Key (#808)
4	1/2" x 2" Hex Bolt GR8

Figure 56. Installing the Hydraulic Motor



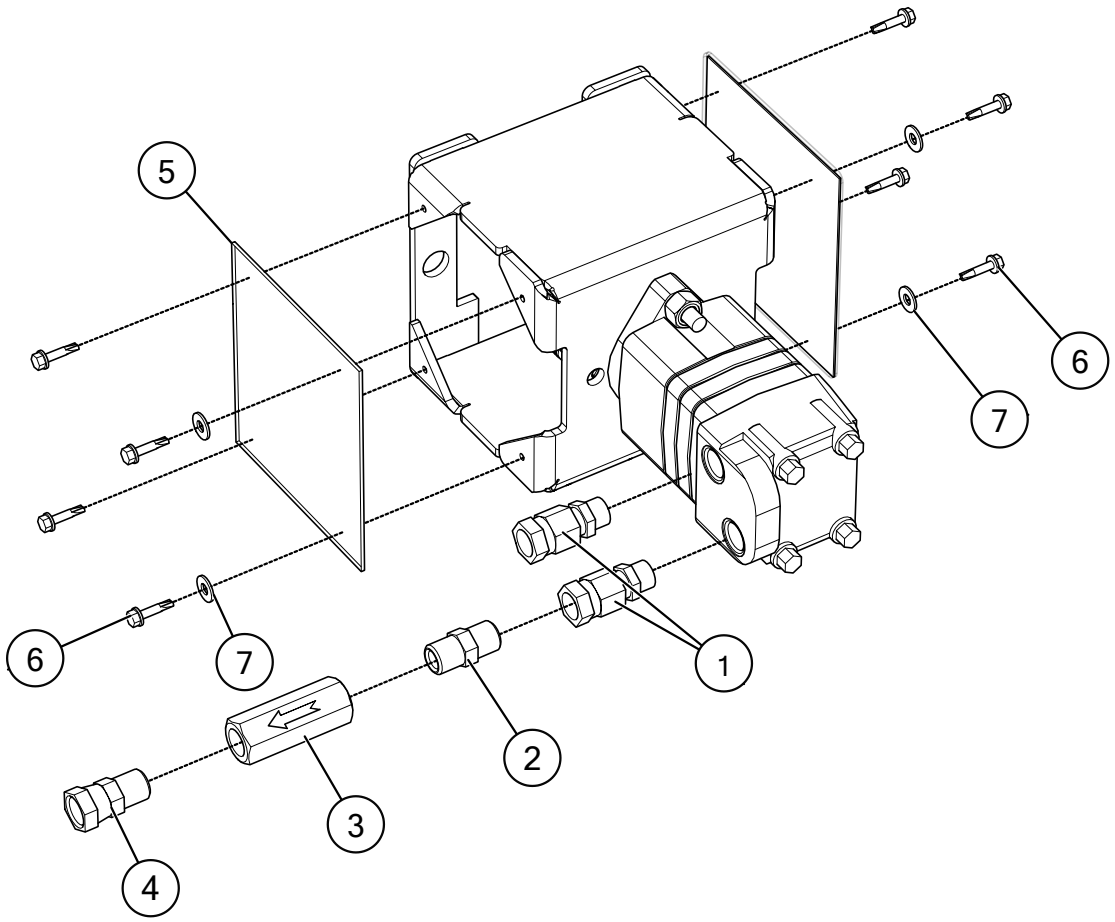
Install the Hydraulic Fittings and Coupler Guard

1. Insert the 1/2" swivels (1) into the inflow and return lines of the hydraulic motor.
2. Insert the hex nipple (2) into the swivel fastened into the return line of the hydraulic motor.
3. Insert the 1/2" check valve (3) into the hex nipple (2).
4. Insert a 1/2" swivel (4) into the check valve (3).
5. Install the coupler guard (5) using 1/4" x 1" self-tapping screws (6) and 1/4" flat washers (7).

Table 26. Hydraulic Fittings and Coupler Guard Components

Item	Description
1	10 ORB x 1/2" FPT Swivel
2	1/2" Pt Hex Nipple
3	1/2" Check Valve - (No Rev Flow)
4	1/2" MPT x 1/2" FPT Swivel
5	24" Pit Hydraulic Drive Guard
6	1/4" x 1" Self-Tapping Screw
7	1/4" Flat Washer, USS Plated

Figure 57. Installing the Hydraulic Fittings and Coupler Guard



6. Install the shaft guard (see Section 3.24. – Install the Shaft Guard on page 106 for instructions).
7. Place the safety decal above the hydraulic motor assembly as indicated in 1.9.2 Safety Decal Locations and Details on page 11.
8. Attach and secure hydraulic hoses (A, B) to the motor. See Figure 58.
9. **For models without Power Swing option (Standard Swing Away):** Attach the quick coupling nipple (8) onto the hydraulic hose ends. Securely store the hydraulic hoses close to the spout.
10. **For models with Power Swing option:**
    - Hydraulic Power Swing — See Section 3.22.2 – Install the Hydraulic Spool Valve and Hoses on page 87.
    - Electric Remote Power Swing — See Section 3.23.3 – Install the Flow Control Half Valve on page 100.

    Important

    Protect hose ends from dirt.

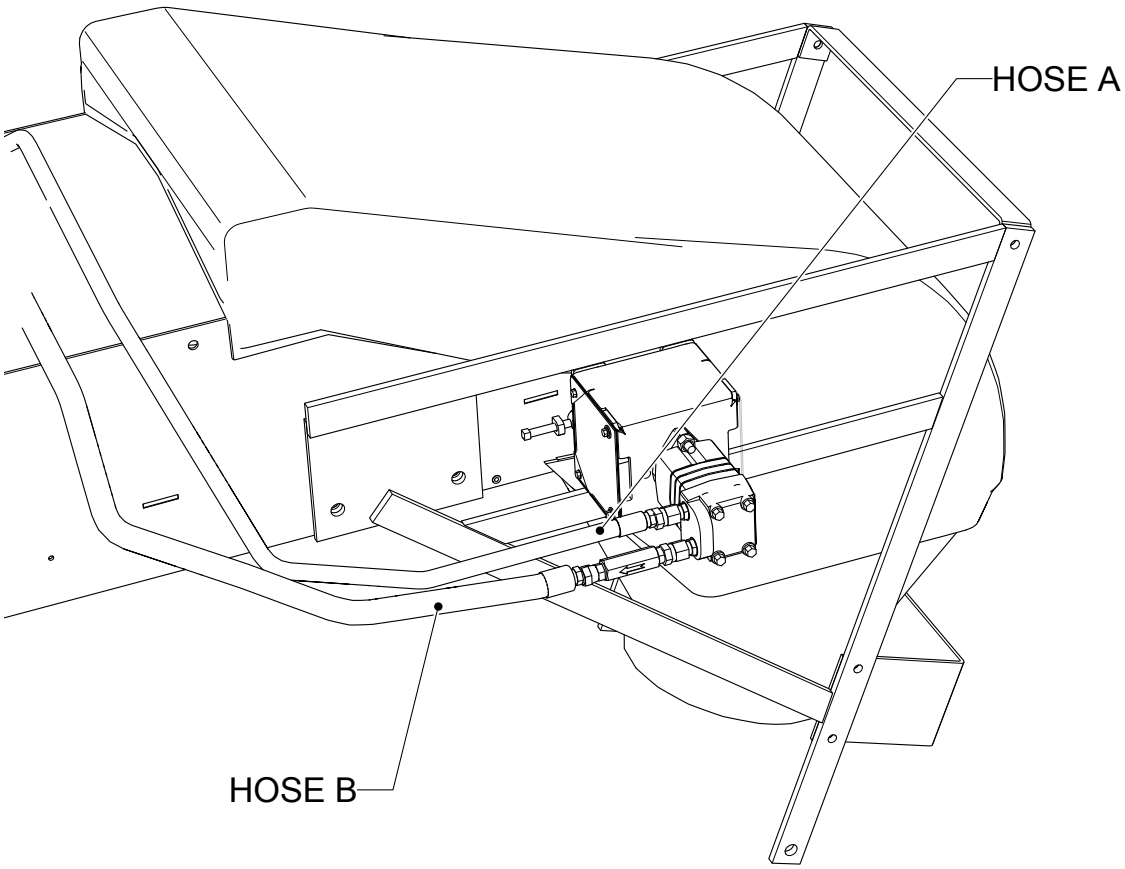
Table 27. Hydraulic Hoses (2400 Series)

Item	Description	Quantity
For Models without Power Swing:		
A (hydraulic motor hose — pressure line)	1/2" Hydraulic Hose - 1/2" MPT - 1/2" MPT, 15' (P0832031)	1

Table 27 Hydraulic Hoses (2400 Series) (continued)

Item	Description	Quantity
B (hydraulic motor hose — return line)	3/4" Hydraulic Hose - 1/2" MPT - 1/2" MPT, 15' (P0832064)	1
8	1/2" FPT Quick Coupling Nipple (not shown)	2
For Models with Power Swing:		
A (hydraulic motor hose — pressure line)	1/2" Hydraulic Hose - 1/2" MPT - 1/2" MPT, 9' (P0832060)	1
B (hydraulic motor hose — return line)	3/4" Hydraulic Hose - 1/2" MPT - 1/2" MPT, 9' (P0832063)	1

Figure 58. Installing the Hydraulic Hoses



Note

Attach hydraulic hoses to:

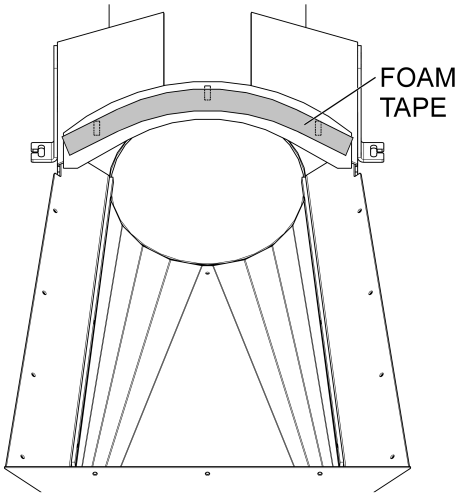
- spool valve for Swing Away with Hydraulic Power Swing
- half valve flow control for Swing Away with Electric Remote Power Swing
- tractor for Standard Swing Away

3.16. Assemble the Main Conveyor Boot

Install the Boot Flashing

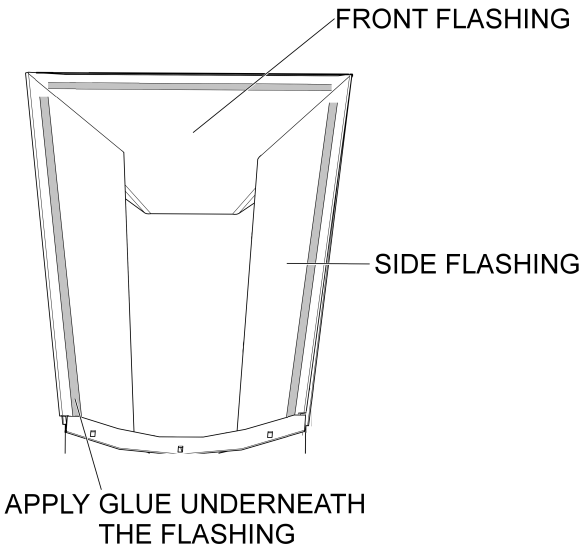
1. Attach foam tape onto the hopper weldment. See Figure 59.

Figure 59. Foam Tape



2. Drill 3/8" holes through the foam tape using the existing hopper holes as guides.
3. Apply glue underneath the flashing pieces as shown in Figure 60.
4. Place the front flashing onto the hopper.
5. Place the side flashing on top of the front flashing.
6. Make sure all flashing pieces are flush. Ensure that there are no gaps between the flashing and the belt. Secure into place until the Swing Away is mounted on.

Figure 60. Rubber Flashing



The main conveyor hopper is now ready for the installation of the boot base.

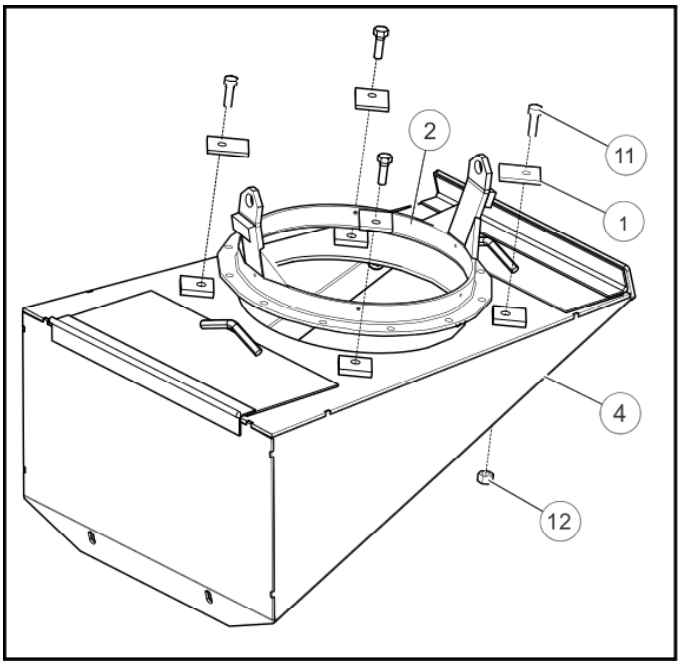
Install the Boot Base

1. Position the hopper base (4) on top of the hopper.
2. Secure the hopper base and the rubber flashing to the hopper using 3/8" x 1-1/2" bolts (6), 3/8" flat washers (9), and 3/8" locknuts (7).
3. Attach the swivel base (2) to the hopper base (4) using hopper base tabs (1), 3/8" x 1-1/2" bolts (6), and 3/8" locknuts (7). See Figure 61.

Table 28. Hopper Base Components

Item	Description	Quantity		
		1500	2000	2400
1	Hopper Base Tab	4	4	4
2	Swivel Base	1	1	1
3	Swivel Top	1	1	1
4	Hopper Base	1	1	1
5	Bolt Hex 3/4" x 2"	4	4	4
6	Bolt Hex 3/8" x 1-1/2"	8	11	13
7	Nut Nylock 3/8"	8	11	13
8	Nut Nylock 3/4"	4	4	4
9	Flat Washer 3/8" USS	11	11	13
10	Swing Belt Shield	1	1	1
11	Bolt Hex 1/2" x 1-1/2"	4	4	4
12	Nut Nylock 1/2"	4	4	4

Figure 61. Installing Swivel Base



4. Attach the swivel top (3) to the swivel base (2) using 3/4" x 2" bolts (5) and 3/4" locknuts (8). See Figure 62.

Figure 62. Installing Swivel Top

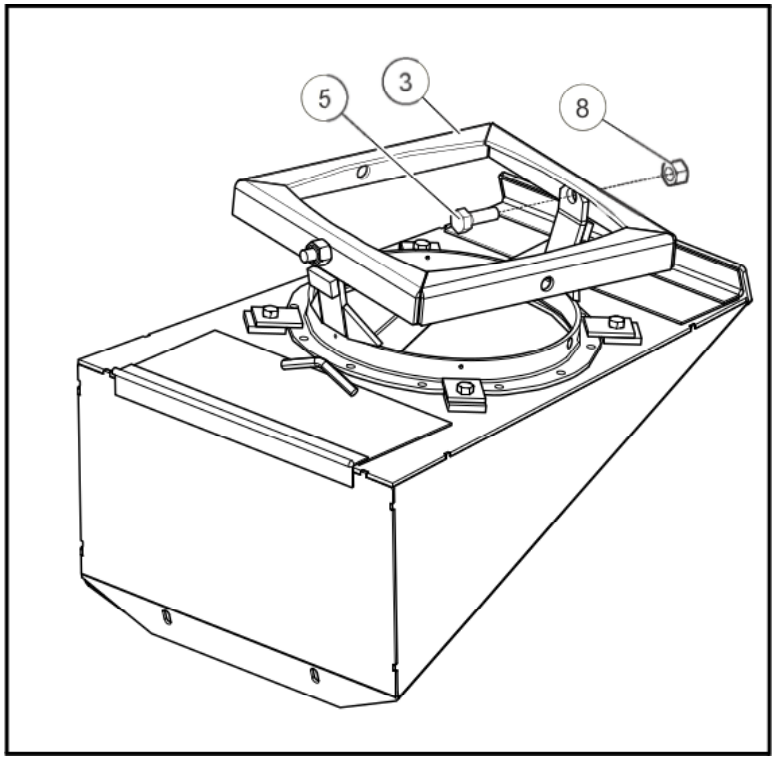
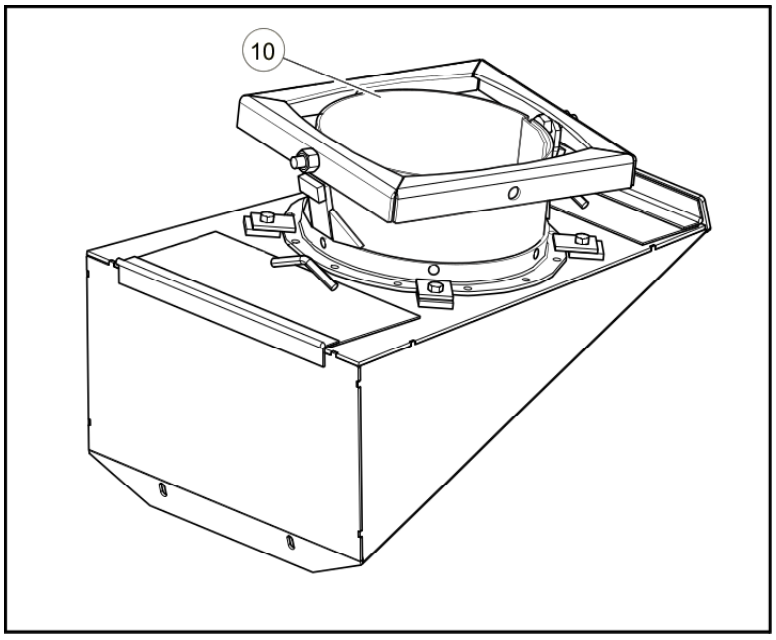


Figure 63. Main Conveyor Boot



3.17. Attach the Swing Frame Stiffener (2000 and 2400 Series)

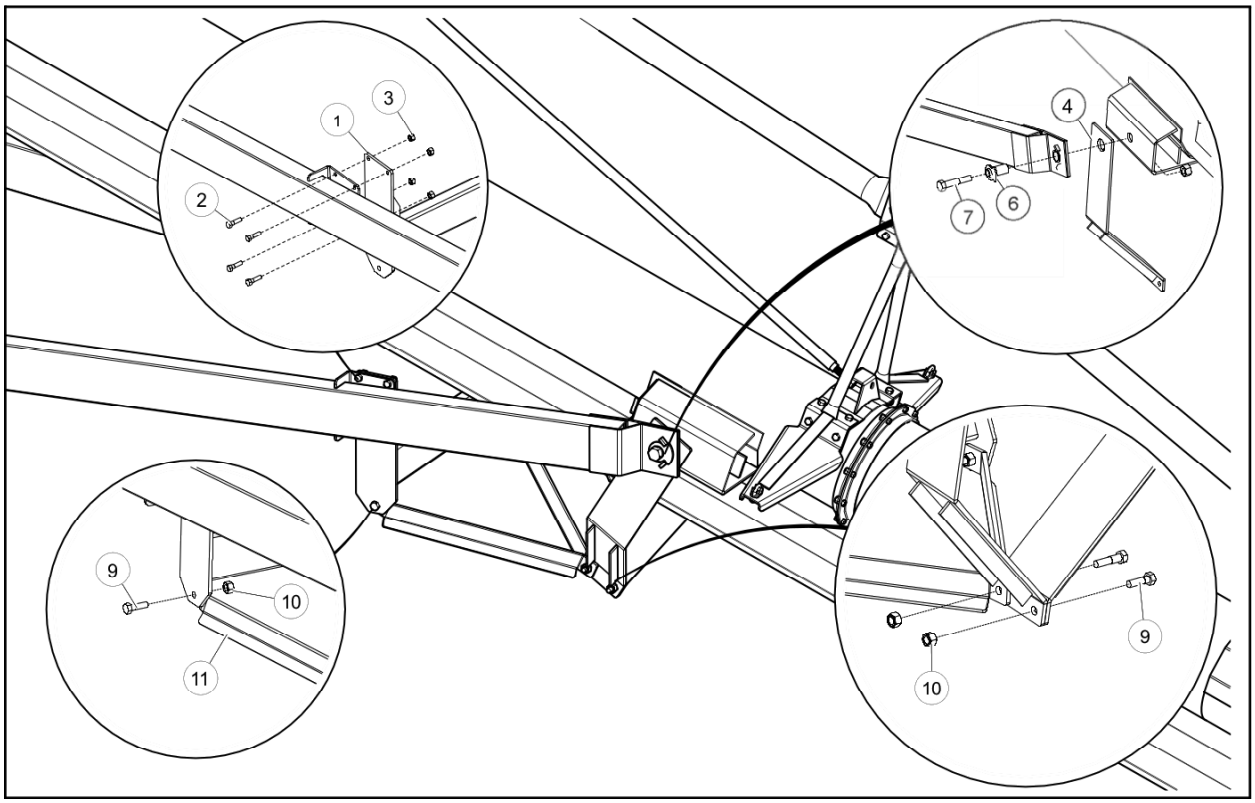
1. Attach the stiffener cross brace (1) to the mount plate (welded on the axle arm) with eight 1/2" x 1-3/4" bolts (2) and 1/2" locknuts (3). See Figure 64.

2. Attach the stiffener bracket (4) between the axle arm and suspension bracket with two frame washers (6), 1" x 5" bolts (7), and 1" locknuts.
3. Attach the stiffener brace (11) to the stiffener cross brace (1) and stiffener bracket (4) with four 5/8" x 2" bolts (9) and 5/8" locknuts (10).
4. Tighten the bolts securely.

Table 29. Swing Frame Stiffener Components (2000 and 2400 Series)

Item	Description	Quantity
1	Stiffener Cross Brace	1
2	1/2" x 1-3/4" Hex Bolt	8
3	1/2" Nylock Nut	8
4	Stiffener Brackets (LH and RH)	2
6	Frame Washer	2
7	1" x 5" Hex Bolt Gr8	2
9	5/8" x 2" Hex Bolt	4
10	5/8" Nylock Nut	4
11	Stiffener Braces (LH and RH)	2

Figure 64. Installing Swing Frame Stiffener



3.18. Assemble the Transport Arm (1500 Series)

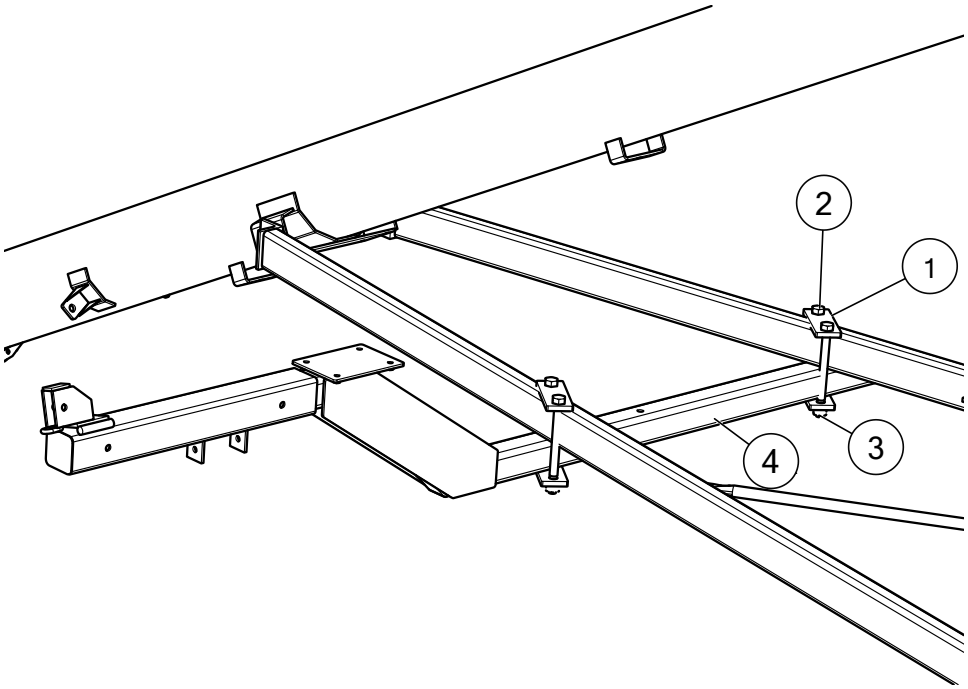
Attach the Transport Arm

1. Attach the transport arm mount plates (1) to the axle arms with 3/4" x 9" bolts (2) and 3/4" locknuts (3) while making sure that there is enough space for the transport arm offset (4). See Figure 65.
2. Orient the transport arm so it is overhanging to the side of the conveyor where the Swing Away conveyor will be operating on.
3. Insert the transport arm offset (4) between the mount plate and axle arm.

Table 30. Transport Arm Offset Components

Item	Description	Quantity
1	Transport Arm Mount Plate	4
2	3/4" x 9" Hex Bolt	4
3	3/4" Nylock Nut	4
4	Transport Arm Offset	1

Figure 65. Attaching Mount Plates and Transport Arm Offset

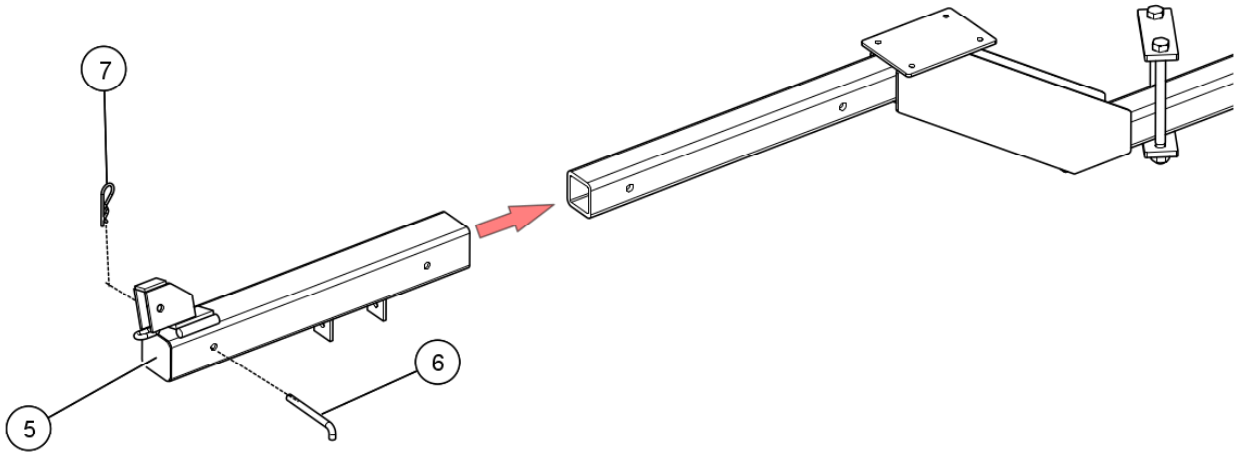


4. Slide the transport adjustment arm (5) onto the transport arm offset. See Figure 66.
5. Lock the transport adjustment arm in place by inserting the 1/2" x 5" hitch pin (6) through the hole close to the outer edge of the transport arm. Secure using a 3/16" x 3-1/4" hairpin (7).

Table 31. Transport Adjustment Arm Components

Item	Description	Quantity
5	Transport Adjustment Arm	1
6	1/2" x 5" Pin Hitch	1
7	3/16" x 3-1/4" Hair Pin	1

Figure 66. Attaching Transport Adjustment Arm



Attach the Hydraulic Winch and Lift Cable

1. Attach the hydraulic winch (1) to the winch plate using 3/8" x 1-1/4" bolts (2), 3/8" flat washers (3), and 3/8" locknuts (4). See Figure 67.
2. Install the cable sheave (5) to the transport adjustment arm using 1/2" x 3" bolts (6) and 1/2" locknuts (7).
3. Feed the winch cable (8) over the cable sheave and attach it to the spool (minimum 3 wraps around the spool, feed the cable through hole in side of spool, and secure with clamp and clamp hardware). See Figure 68.
4. Attach the grab hook (9) to the end of the cable using two 5/16" cable clamps (10).

Table 32. Hydraulic Winch and Lift Cable Components

Item	Description	Quantity
1	Hydraulic Winch	1
2	3/8" x 1-1/4" Hex Bolt	4
3	3/8" Flat Washer USS Plated	4
4	3/8" Nylock Nut	4
5	2-3/4" OD Cable Sheave	1
6	1/2" x 3" Hex Bolt	1
7	1/2" Nylock Nut	1
8	5/16" (26') Cable	1
9	1/4" Grab Hook	1
10	5/16" Clamp Cable	2

Figure 67. Attaching Hydraulic Winch and Pulley

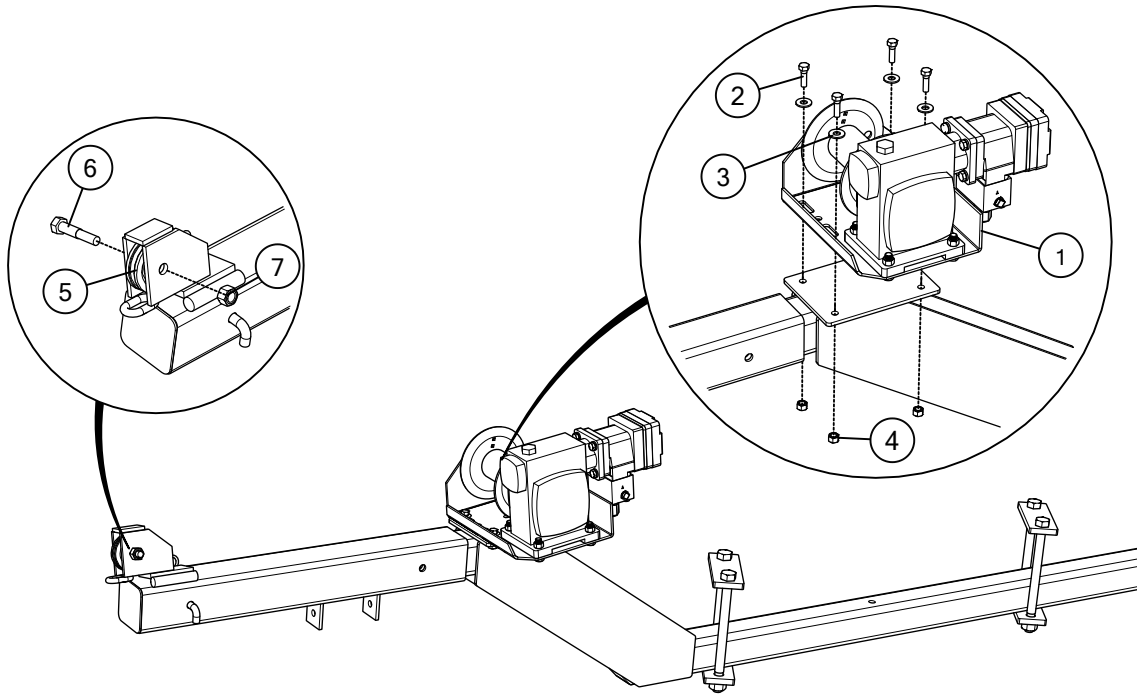
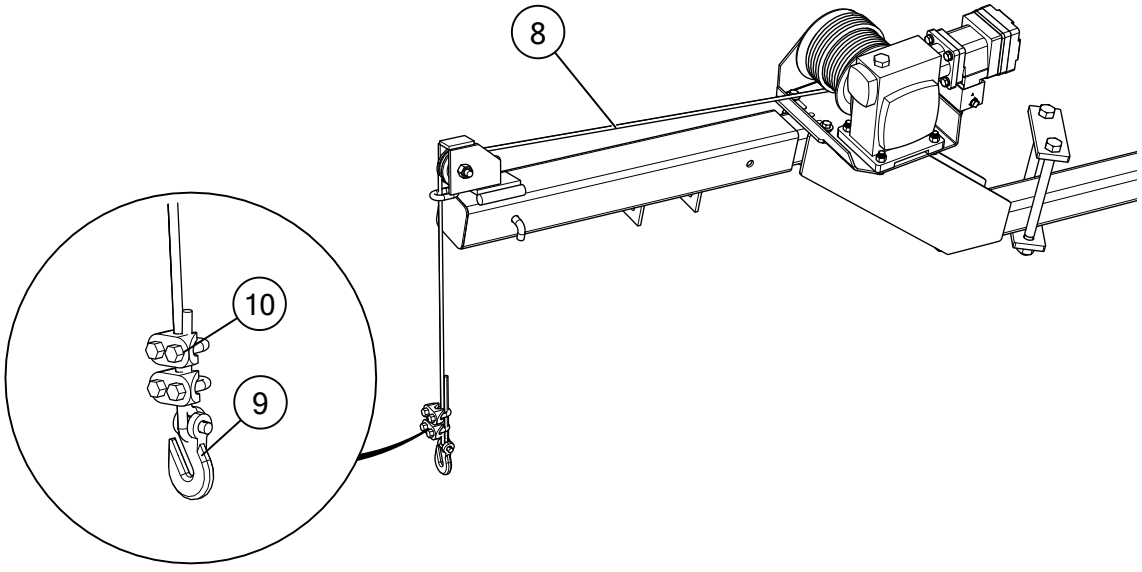


Figure 68. Attaching Lift Cable



Adjust the Transport Arm Position

1. Adjust the position of the transport arm offset on the axle arm to align the grab hook with the front edge of the Swing Away hopper.
2. Tighten the bolts on the mount plates.

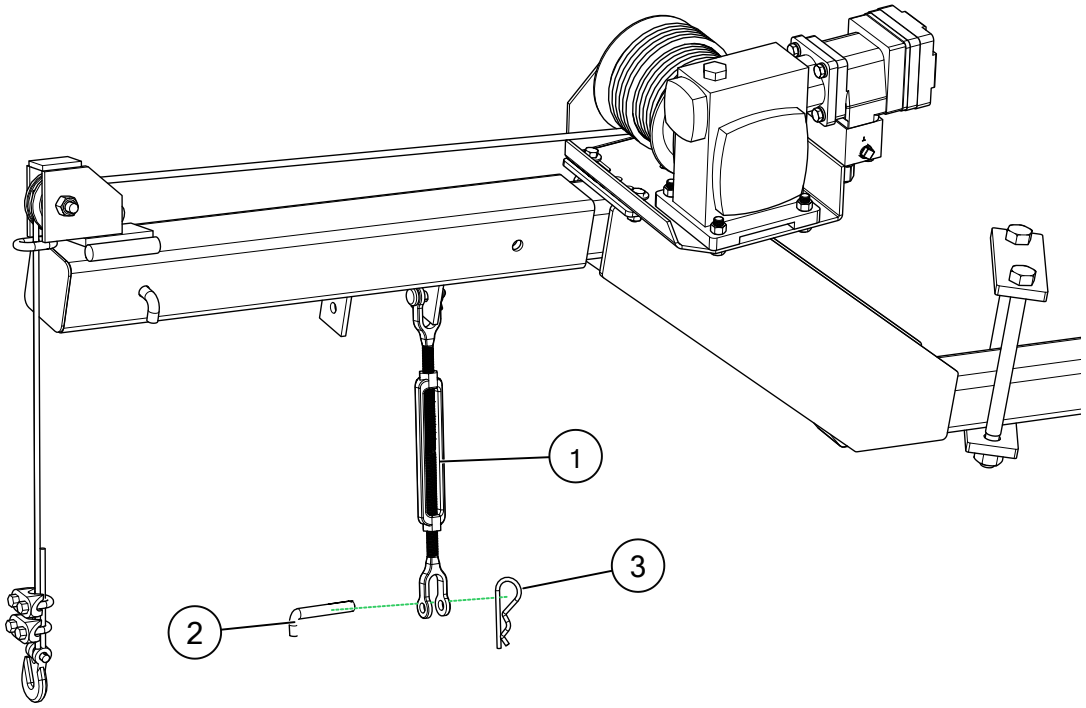
Attach the Turnbuckle

1. Attach the turnbuckle (1) to the tab on the bottom surface of the adjustment arm using pin and cotter pin. See Figure 69.

Table 33. Turnbuckle Components

Item	Description	Quantity
1	5/8" x 6" Turnbuckle	1
2	1/2" x 3" Hitch Pin Plated	1
3	3/16" x 3-1/4" Hair Pin	1

Figure 69. Attaching Turnbuckle



3.19. Assemble the Transport Arm (2000 and 2400 Series)

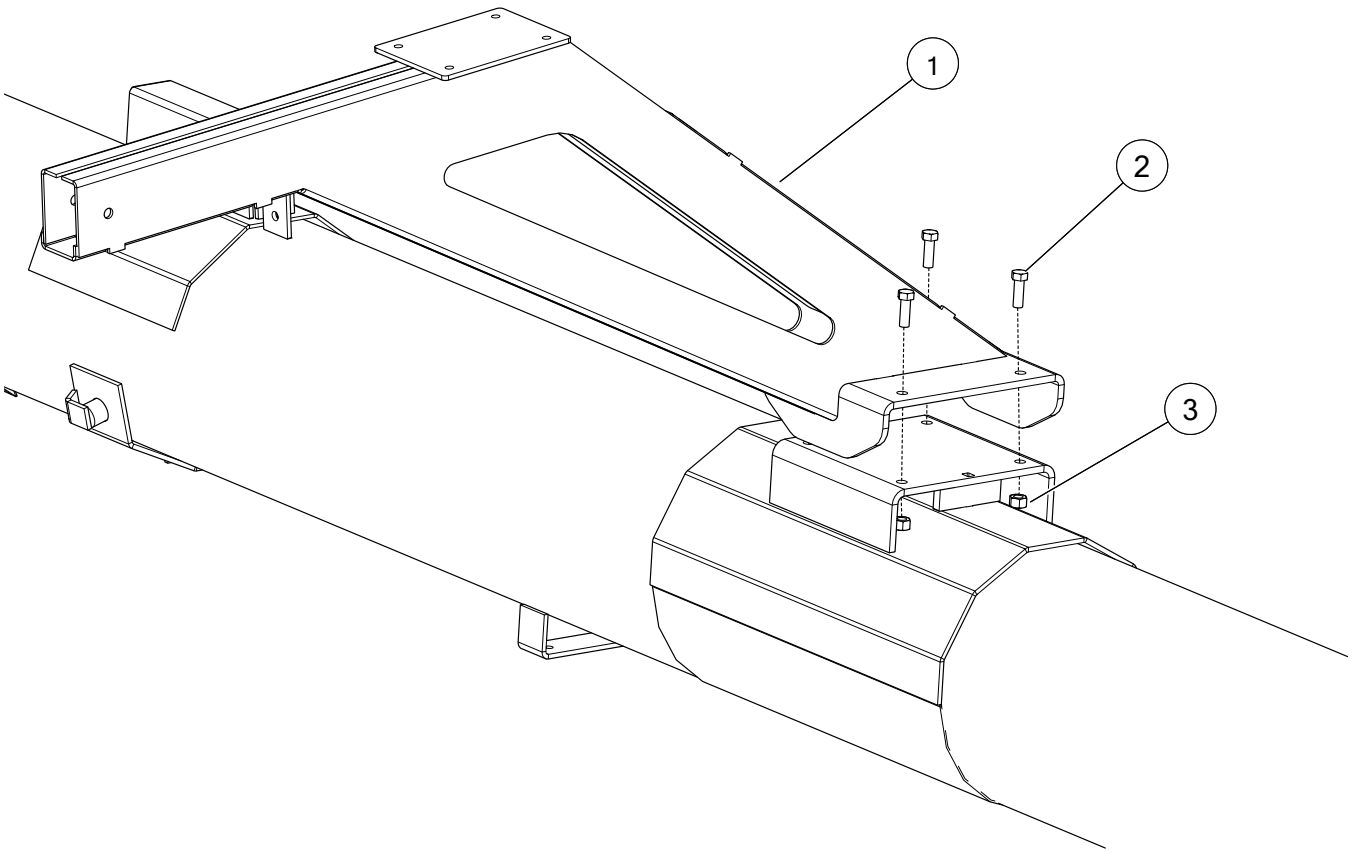
Attach the Transport Arm

1. Orient the transport arm weldment (1) so it is overhanging to the side of the conveyor where the Swing Away conveyor will be operating on. See Figure 70.
2. Fasten the transport arm weldment to the main conveyor mount bracket using 1/2" x 1-1/2" bolts (2) and 1/2" nuts (13).

Table 34. Transport Arm Components

Item	Description	Quantity
1	Transport Arm Weldment	1
2	1/2" x 1-1/2" Hex Bolt Gr8	4
3	1/2" Nylock Nut	4

Figure 70. Attaching the Transport Arm Weldment

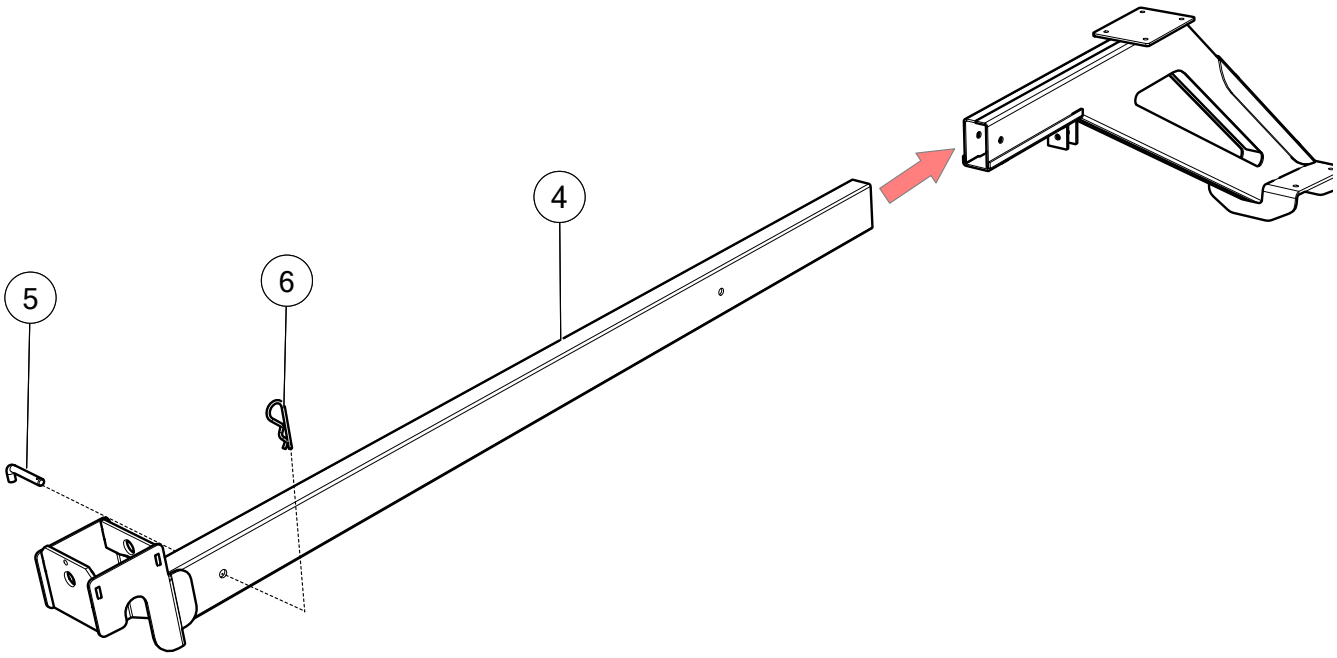


3. Insert the transport adjustment arm (4) into the transport arm weldment. See Figure 71.
4. Lock in place by inserting a 1/2" x 3" hitch pin (5) through the hole close to the outer edge of the transport arm. Secure with 3/16" x 3-1/4" hairpin (6).

Table 35. Transport Adjustment Arm Components

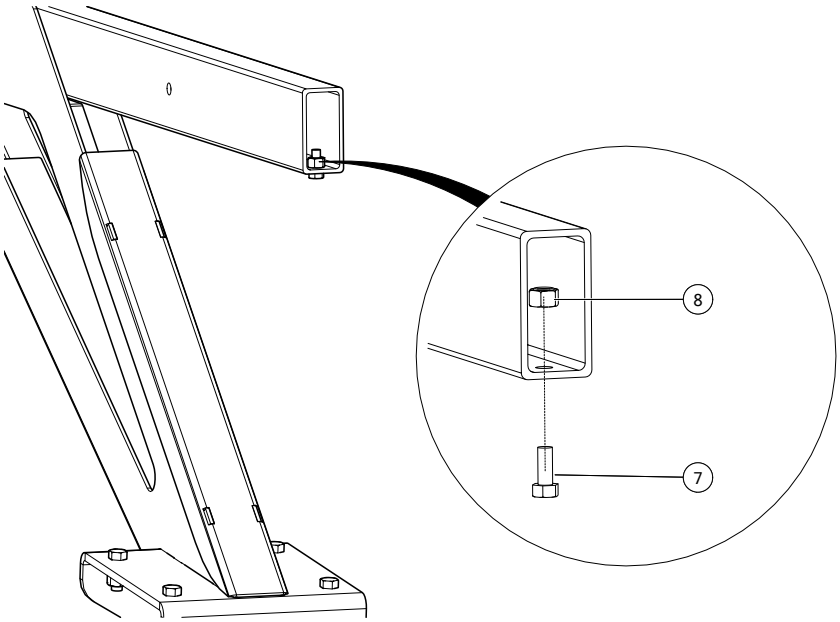
Item	Description	Quantity
4	Transport Adjustment Arm	1
5	1/2" x 3" Hitch Pin	1
6	3/16" x 3-1/4" Hair Pin	1
7	7/16" x 1" Hex Bolt	1
8	7/16" Nylock Nut	1

Figure 71. Attaching the Transport Adjustment Arm



5. Fasten a 7/16" x 1" bolt (7) and a 7/16" nut (8) into the pre-drilled hole on the bottom edge of the transport adjustment arm (4). See Figure 72.

Figure 72. End View of the Transport Adjustment Arm



Attach the Hydraulic Winch and Lift Cable

1. On the top surface of the transport arm weldment, attach the hydraulic winch (1) using 3/8" x 1-1/4" bolts (2), 3/8" flat washers (4), and 3/8" locknuts (3). See Figure 73.
2. Attach the cable sheave (5) to the pin sleeve (6) using a 1/2" x 2" bolt (7) and a 1/2" nut (8).
3. Insert the assembled pulley into the transport adjustment arm using a pulley pin (9), a 5/16" x 1" bolt (10), and a 5/16" locknut (11).

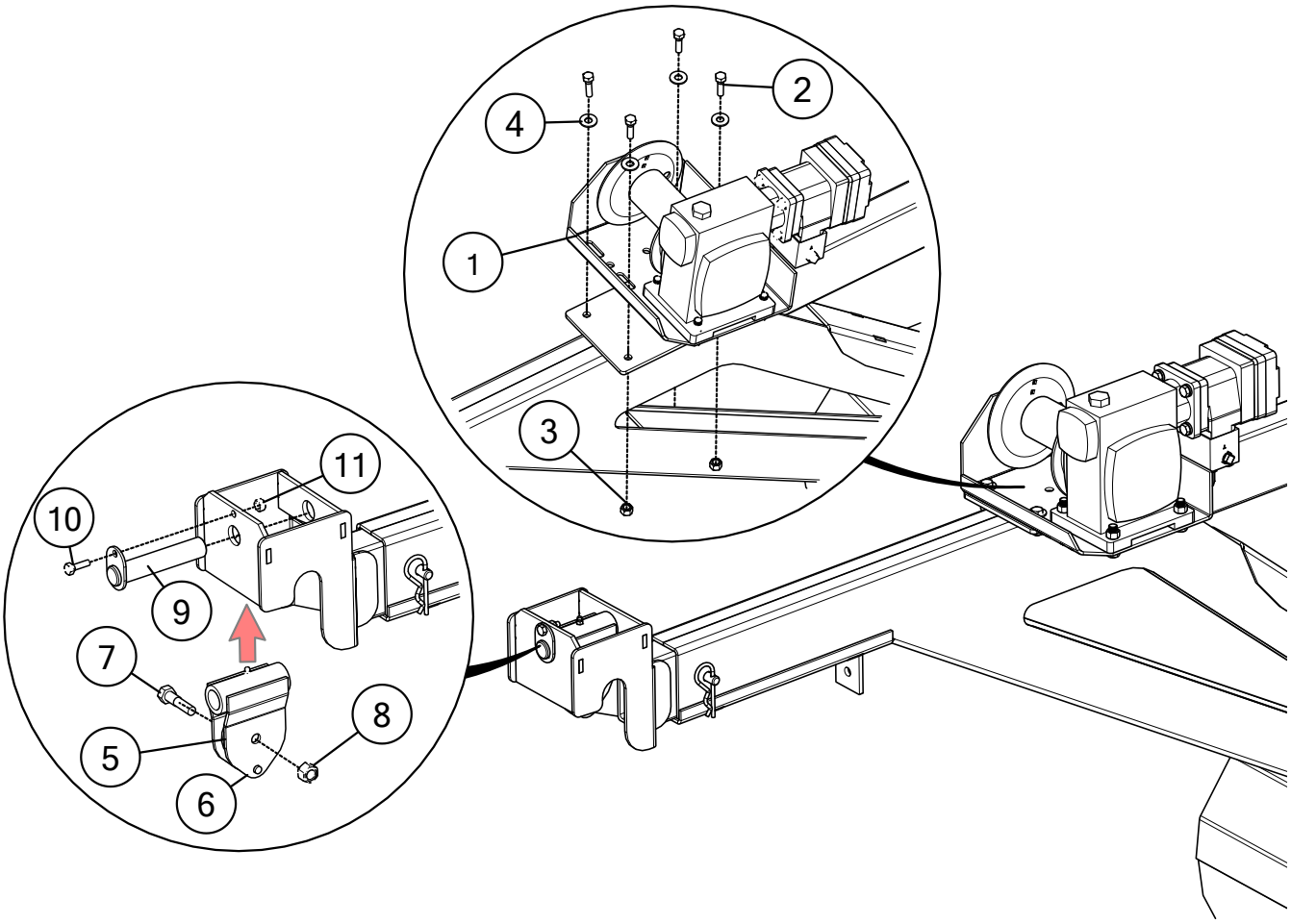
Table 36. Transport Arm Components

Item	Description	Quantity
1	Hydraulic Winch	1
2	3/8" x 1-1/4" Hex Bolt	4
3	3/8" Nylock Nut	4
4	3/8" Flat Washer USS Plated	4
5	Cable Sheave	1
6	Transport Arm Pin Sleeve	1
7	1/2" x 2" Bolt Gr8 Plated	1
8	1/2" Nylock Nut Gr8	1
9	Transport Arm Pulley Pin	1
10	5/16" x 1" Bolt Gr8 Plated	1
11	5/16" Nylock Nut Gr8	1
12	Cable 5/16" (26')	1
13	1/4" Grab Hook	1

Table 36 Transport Arm Components (continued)

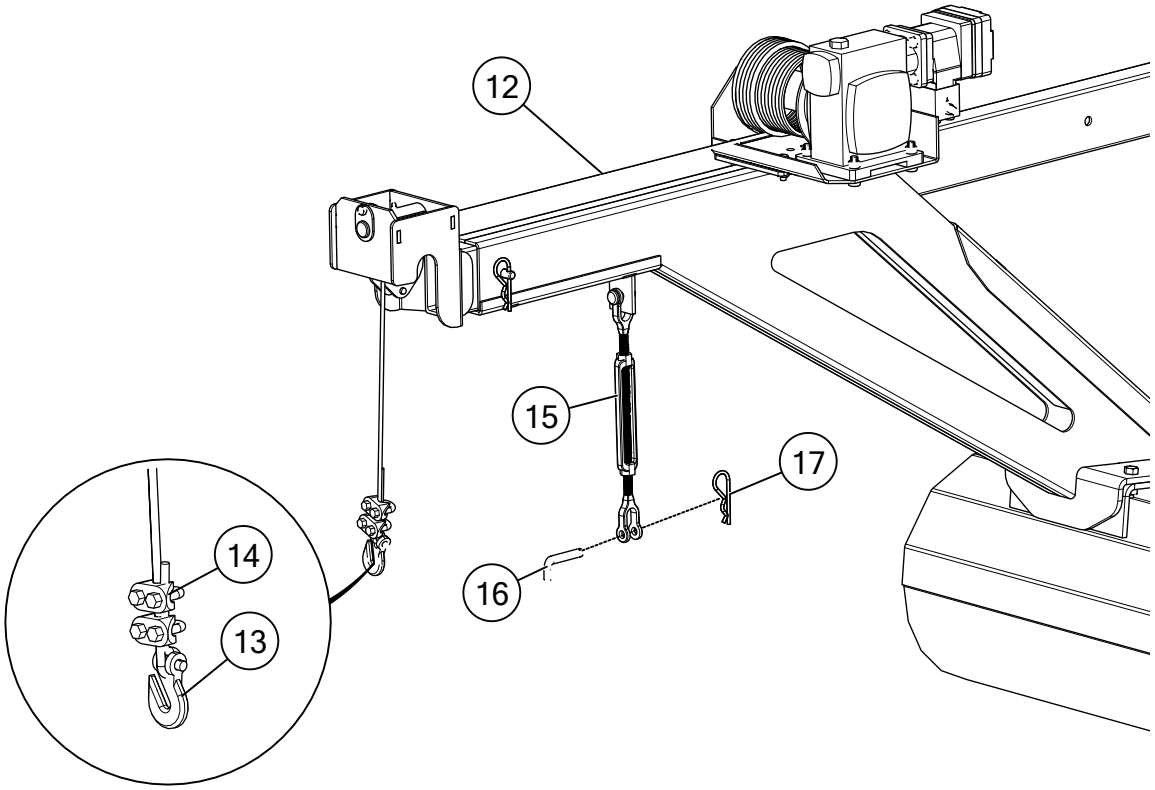
Item	Description	Quantity
14	5/16" Cable Clamp	2
15	5/8" x 6" Turnbuckle	1
16	1/2" x 3" Hitch Pin	1
17	3/16" x 3-1/4" Hitch Pin	1

Figure 73. Attaching the Hydraulic Winch and Pulley



4. Feed the winch cable (12) over the cable sheave and attach it to the spool (minimum 3 wraps around the spool, feed the cable through hole in side of spool, and secure with clamp and clamp hardware). See Figure 74.
5. Attach a 1/4" grab hook (13) onto the cable. Secure in place using two 5/16" cable clamps (14). Make sure that the grab hook is aligned with the front edge of the Swing Away hopper.
6. Attach the turnbuckle (15) to the tab on the bottom surface of the transport adjustment arm using pin and cotter pin.

Figure 74. Attaching the Winch Cable and Turnbuckle



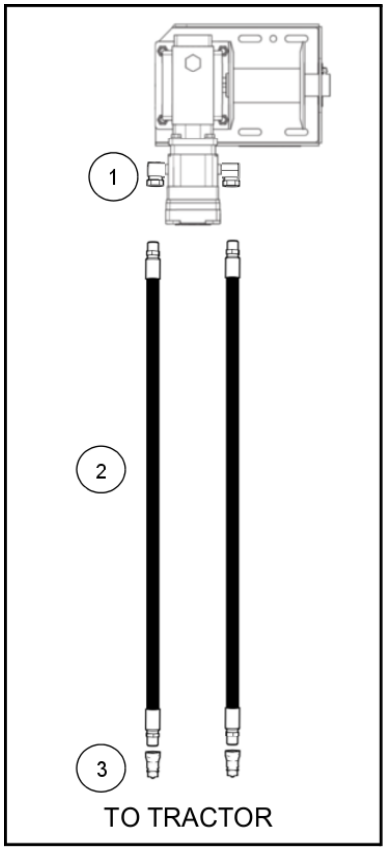
3.20. Attach the Hydraulic Winch Hose

1. Wrap threaded seal tape around the exposed thread of the hydraulic fittings.
2. Attach the fittings (1, 3) to the hydraulic hoses (2). See Figure 75.

Table 37. Hydraulic Hoses and Fittings

Item	Description	Quantity
1	3/8" PT/90D Swivel	2
2	3/8" Hose (35') — 1/2" MPT–3/8" MPT PC	2
3	1/2" Quick Coupling Nipple FPT	2

Figure 75. Hydraulic Winch and Hoses

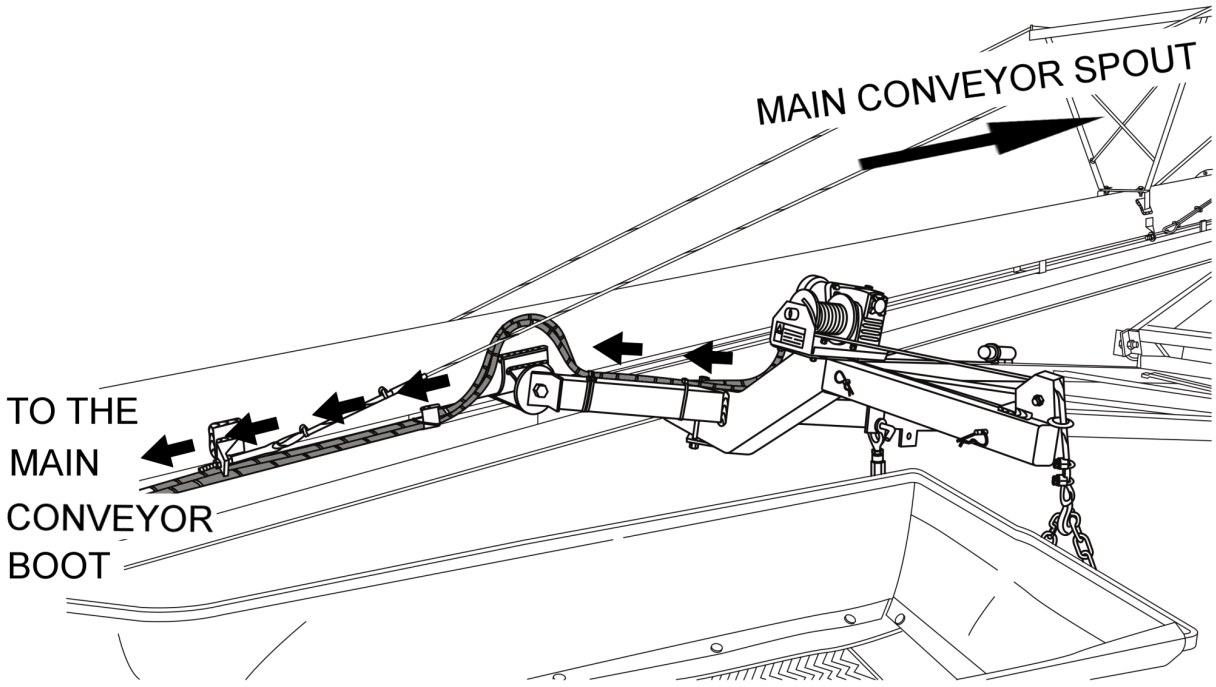


3. Attach two hydraulic hoses to the winch.
4. Route the hydraulic hoses along the axle arm and towards the tractor through the brackets underneath the main conveyor tube (see Figure 76 and Figure 77).
5. **For 1500SA:** Secure the hydraulic hoses to the axle arm using zip ties. See Figure 76.
6. **For 2000SA and 2400SA:** Secure the hydraulic hoses to the transport arm weldment using hose clamp (4), 1/4" flat washer (5), and 1/4" self tapping screw (6). See Figure 77 inset.

Important

Protect hose ends from dirt.

Figure 76. Hydraulic Winch Hose Routing (1500SA)



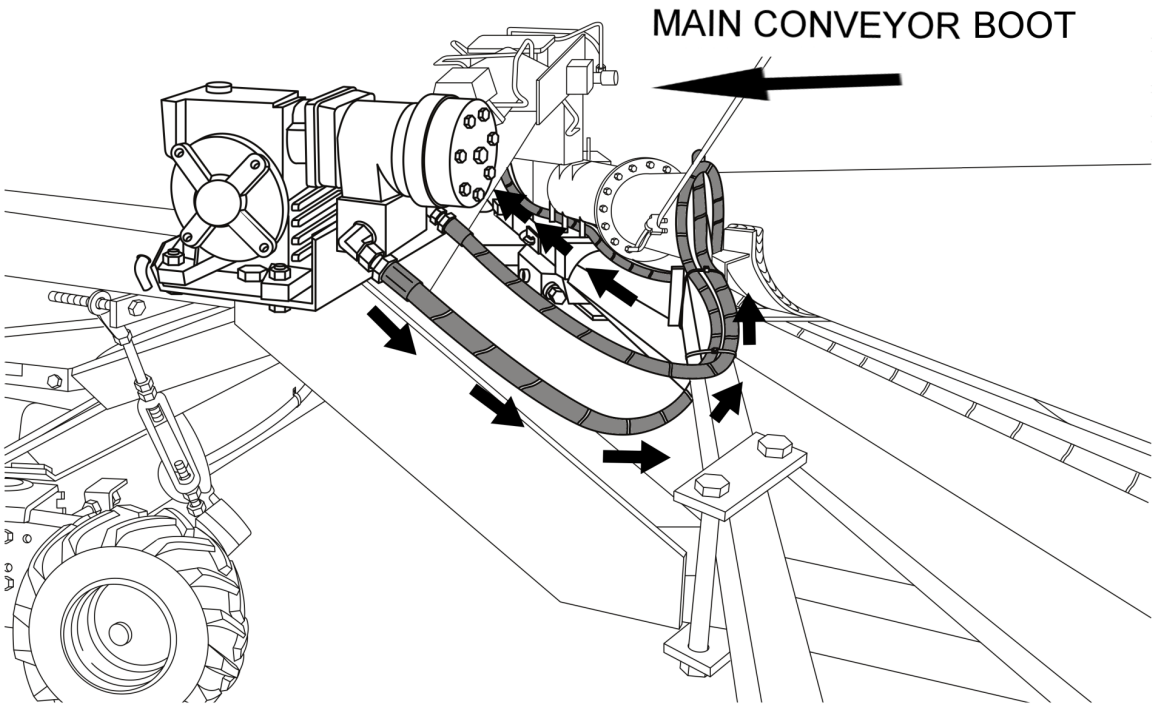


Figure 77. Hydraulic Winch Hose Routing (2000SA and 2400SA)

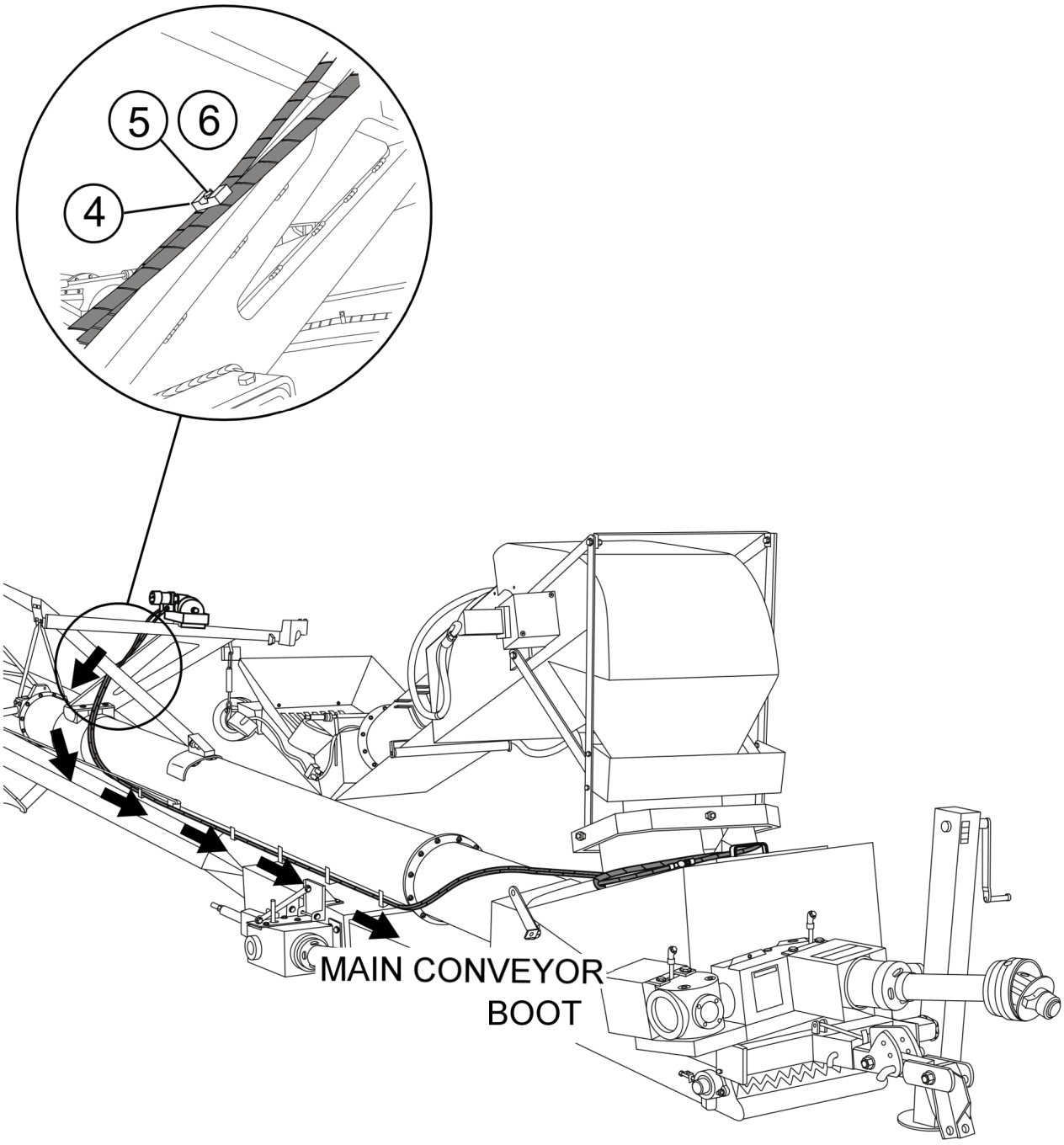


Table 38. Components to Fasten the Hydraulic Hoses

Item	Description
4	Hose Clamp
5	1/4" Flat Washer
6	1/4" Self Tapping Screw

3.21. Install the Basic Hopper Wheel (Optional)

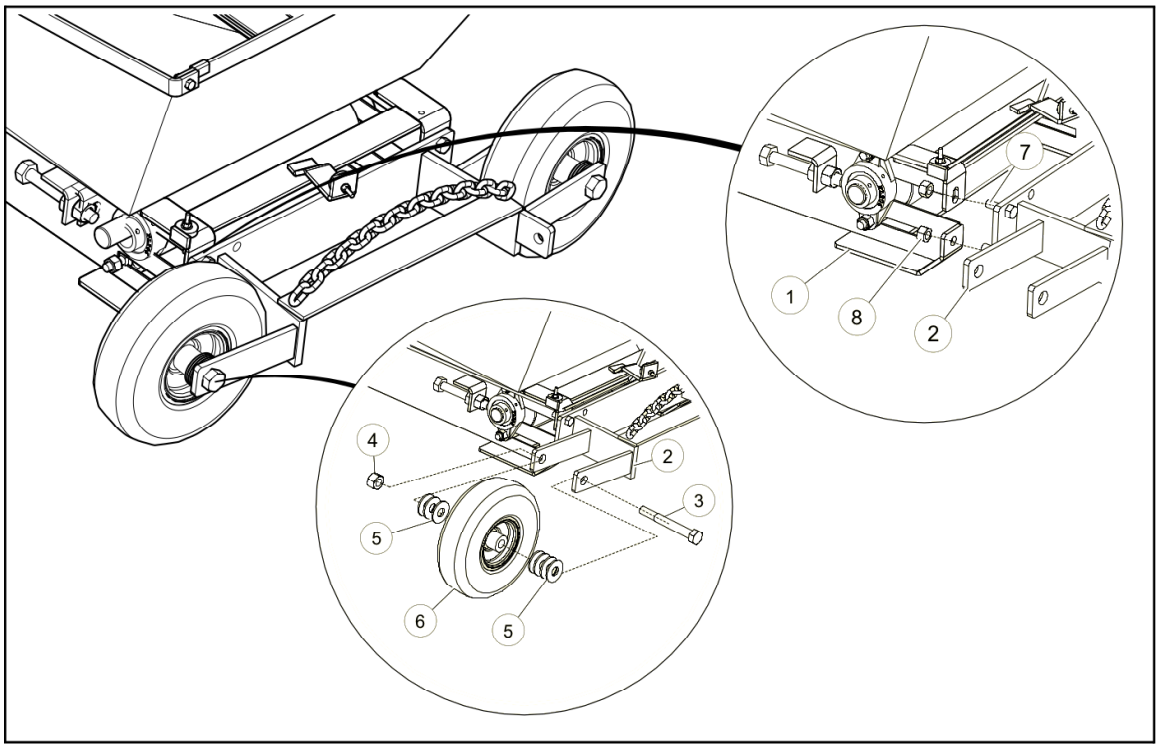
➡ This section is applicable to the Swing Away models without hydraulic or electric power swing options.

1. Attach the wheel mount (2) to the hopper weldment (1) using 1/2" x 1-1/2" bolts (7) and 1/2" locknuts (8). See Figure 78.
2. Attach each tire (6) to the wheel mount weldment (2) using a 3/4" x 6" bolt (3), seven 3/4" flat washers (5), and a 3/4" locknut (4).

Table 39. Hopper Wheel Components

Item	Description	Quantity
1	Transfer Hopper Assembly	1
2	Swing Transfer Wheels Front Mount	1
3	3/4" x 6" Hex Bolt	2
4	3/4" Nylock Nut	2
5	3/4" Flat Washer Plated USS	14
6	Tire	2
7	1/2" x 1-1/2" Bolt	4
8	1/2" Nylock Nut	4

Figure 78. Installing Hopper Wheel



3.22. Install the Hydraulic Power Swing (Optional)

➡ This section is applicable to the Swing Away models with hydraulic power swing option.

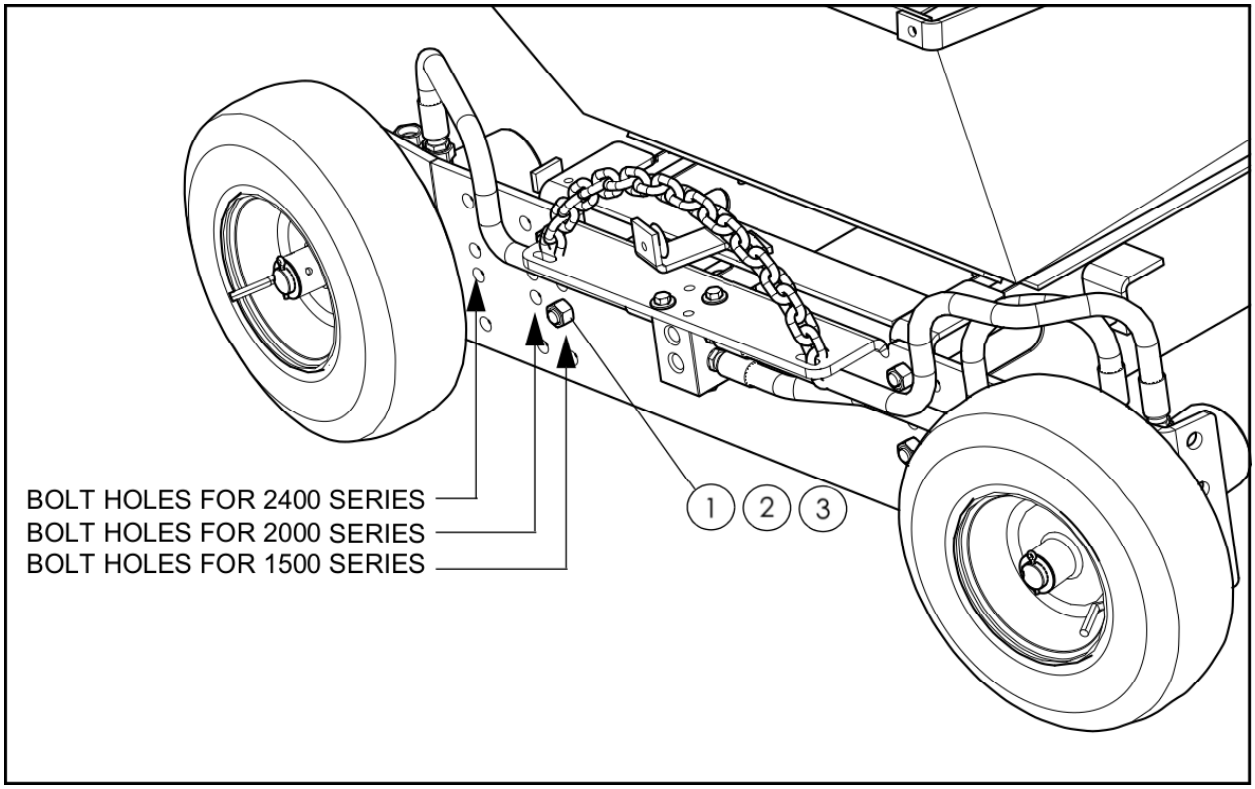
3.22.1 Attach the Power Swing Axle to the SA Hopper

1. Attach the assembled power swing axle to the hopper weldment using 1/2" x 1-1/2" hex bolts (1), 1/2" lock washers (2), and 1/2" locknuts (3). See Figure 79.

Table 40. Fasteners

Item	Description	Quantity
1	1/2" x 1-1/2" Bolt Hex Gr8 Plated	4
2	1/2" Lock Washer Plated	4
3	1/2" Nylock Nut Gr8	4

Figure 79. Attaching Hydraulic Power Swing Axle to the Swing Away Hopper



3.22.2 Install the Hydraulic Spool Valve and Hoses

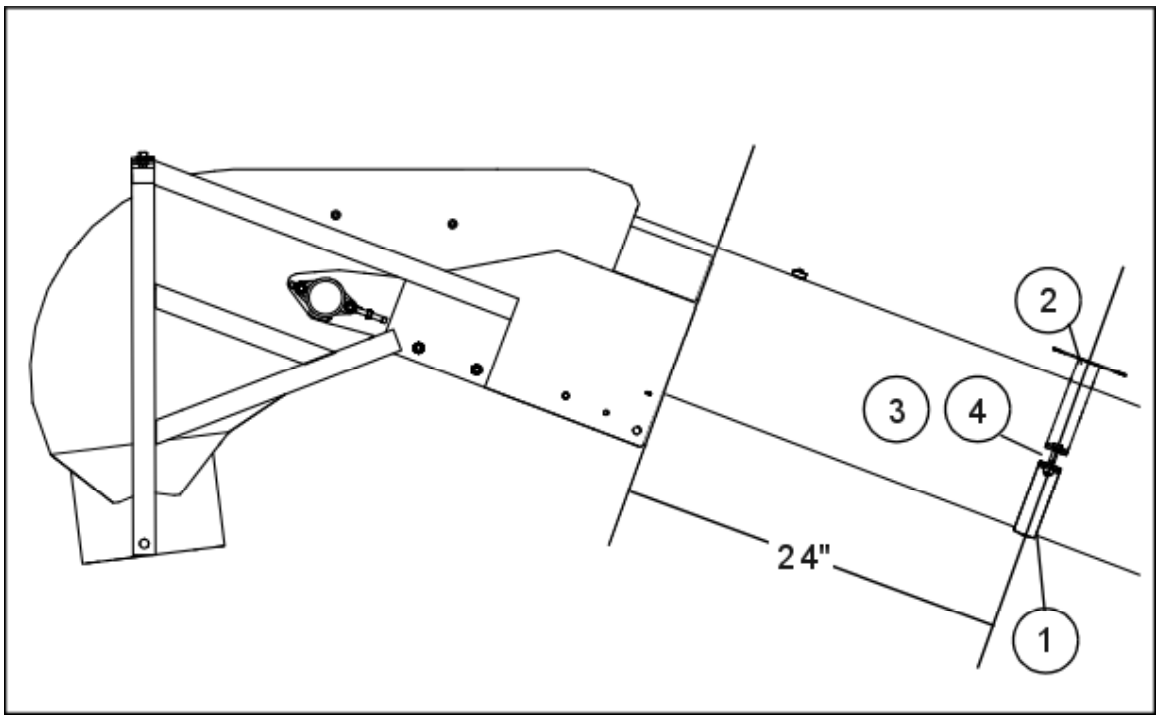
Attach the Hydraulic Spool Valve

1. Mark a distance of approximately 24" from the edge of the spout to determine the location of the valve bracket (2). See Figure 80.
2. Attach the u-clamp (1) and valve bracket (2) to the Swing Away conveyor tube using hex bolt (3) and locknuts (4).
3. Tighten the u-clamp until the tube begins to crimp.

Table 41. Hydraulic Spool Valve Bracket

Item	Description	Quantity for Series		
		1500	2000	2400
1	10" x 2-1/2" U-Clamp	1	1	1
2	Valve Bracket	1	1	1
3	7/16" x 1-1/2" Hex Bolt GR8	2	—	—
	1/2" x 2-1/2" Hex Bolt GR8	—	2	2
4	7/16" Nylock Nut	2	—	—
	1/2" Nylock Nut	—	2	2

Figure 80. Installing Bracket

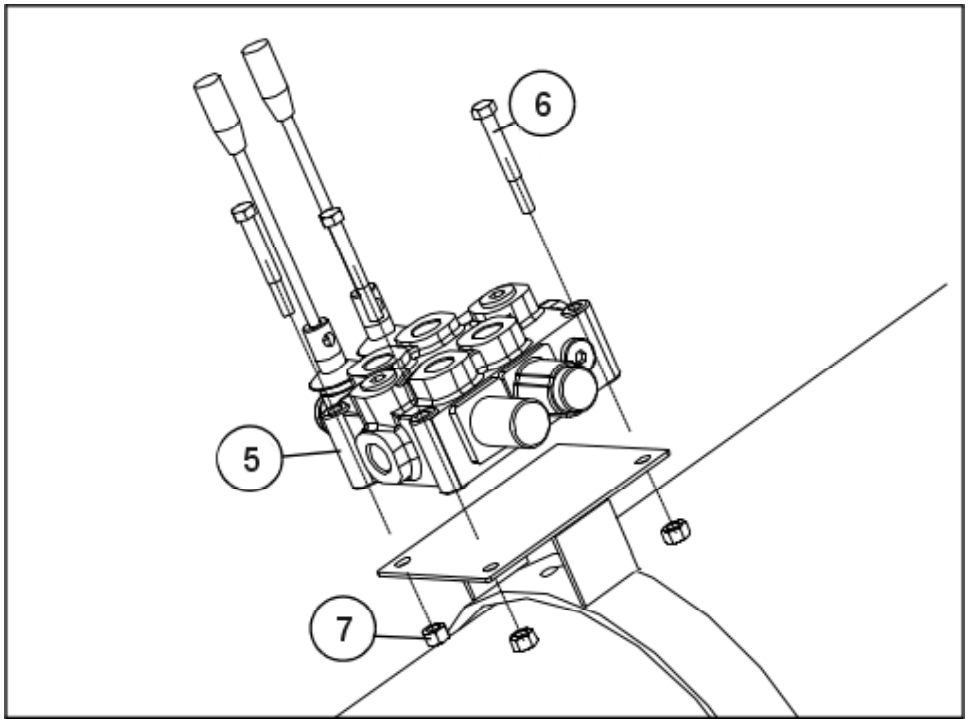


4. Attach the valve (5) to the valve bracket (2) using 3/8" x 3" bolts (6) and 3/8" locknuts (7). See Figure 81.

Table 42. Hydraulic Valve

Item	Description	Quantity
5	Valve-2 SPL-Hyspec-1 Detent-22gal	1
6	3/8" x 3" Hex Bolt	3
7	3/8" Nylock Nut	3

Figure 81. Installing Valve



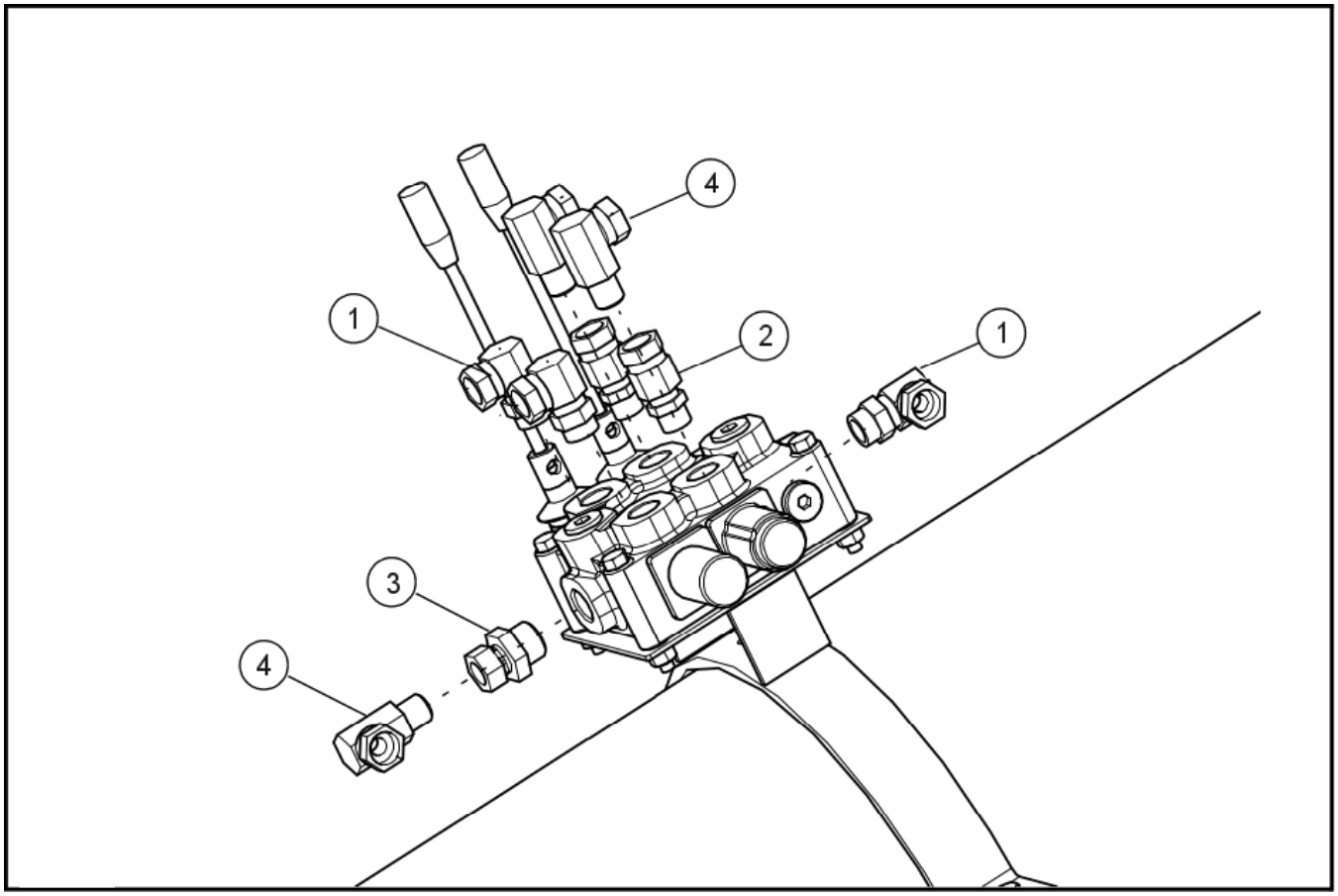
Attach the Hydraulic Fittings and Hoses

1. Wrap threaded seal tape around the exposed thread of swivels (1, 2, 3, 4). Attach the swivels to the valve. See Figure 82.

Table 43. Hydraulic Valve Fittings

Item	Description	Quantity
1	90 - #10 ORB x 1/2" FPT Swivel	3
2	#10 ORB x 1/2" FPT Swivel	2
3	12 ORB x 1/2" FS Swivel	1
4	90 - 1/2" MPT x 1/2" FPT Swivel	3

Figure 82. Hydraulic Valve Fittings

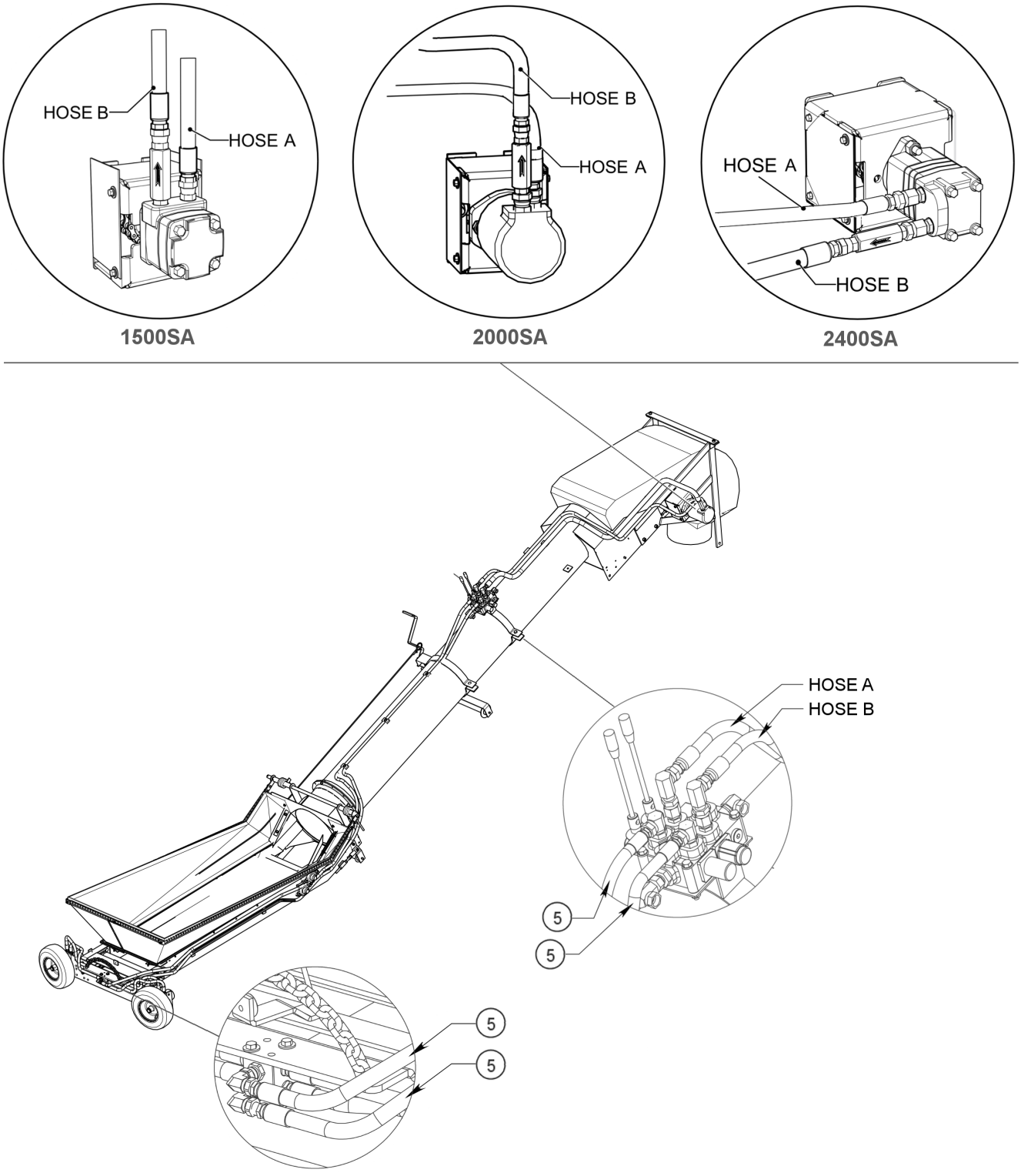


2. Attach the hydraulic motor hoses (A, B) to the valve. See Figure 83.
3. Attach two hydraulic hoses (5) to the swivels on the valve.
4. Route the hydraulic hoses (5) towards the Swing Away hopper.
5. Secure the hoses to the tube and to the side of the hopper using hose clamps (6), 1/4" flat washers (7), and 1/4" x 2" Tek screws (8). See Figure 84.
6. Attach the other ends of the hoses to the cushion block attached on the power swing axle.

Table 44. Hydraulic Valve Hoses

Item	Description	Part Number	Quantity for Series		
			1500	2000	2400
A (hydraulic motor hose — pressure line)	3/8" Hose (6') - 1/2" MPT-1/2" MPT PC	P0832051	1	—	—
	1/2" Hose (6') - 1/2" MPT-1/2" MPT PC	P0832059	—	1	—
	1/2" Hose (9') - 1/2" MPT-1/2" MPT PC	P0832060	—	—	1
B (hydraulic motor hose — return line)	3/8" Hose (6') - 1/2" MPT-1/2" MPT PC	P0832051	1	—	—
	3/4" Hose (6') - 1/2" MPT-1/2" MPT PC	P0832062	—	1	—
	3/4" Hose (9') - 1/2" MPT-1/2" MPT PC	P0832063	—	—	1
5	3/8" Hose (14') - 1/2" MPT-3/8" PC	P0832033	2	—	—
	3/8" Hose (17') - 1/2" MPT-3/8" PC	P0832032	—	2	2

Figure 83. Hydraulic Valve Hoses

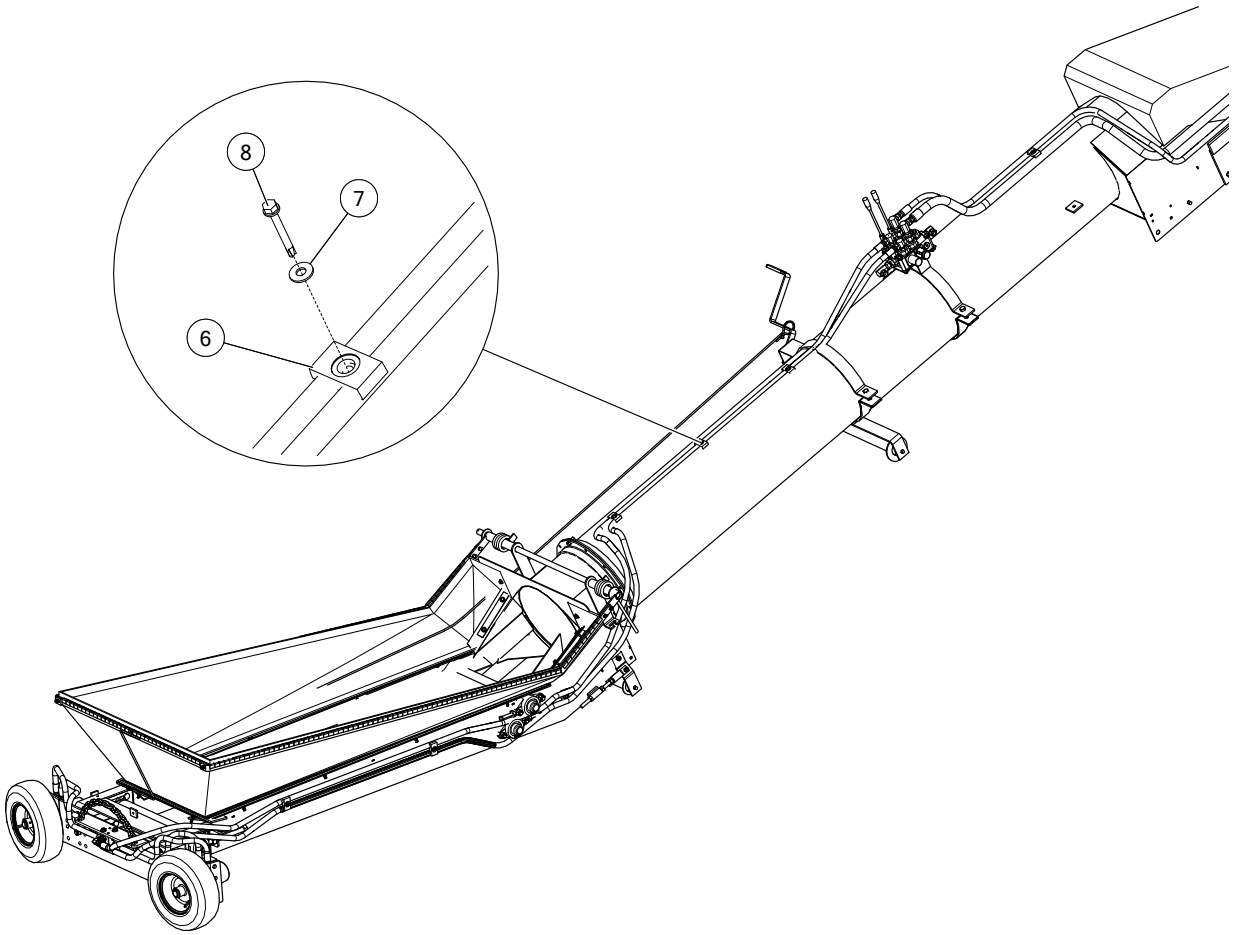


For hydraulic hoses that run from the hydraulic valve to the tractor, see Table 46 and Figure 85.

Table 45. Securing Hydraulic Hose

Item	Description	Quantity for Series		
		1500	2000	2400
6	3/8" Hose Clamp Plastic Hyd	7	7	8
7	1/4" Flat Washer USS Plated	7	7	8
8	1/4" x 2" Tek Screw	7	7	8

Figure 84. Securing Hydraulic Hose

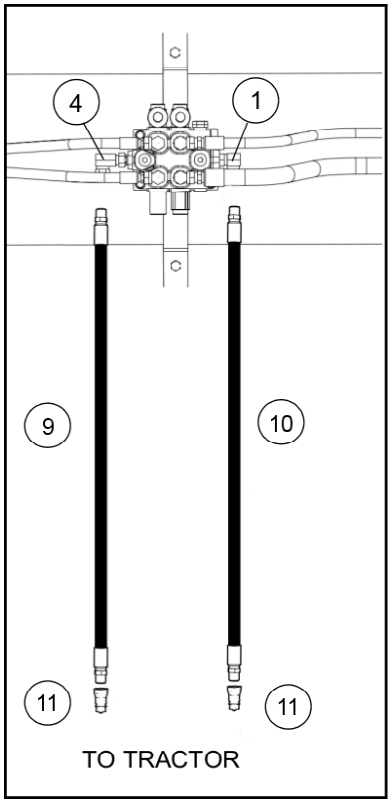


7. Attach the hydraulic hoses (9, 10) to the swivels (1, 4). See Figure 85.

Table 46. Hydraulic Hoses and Fittings

Item	Description	Part Number	Quantity for Series		
			1500	2000	2400
9	3/8" Hose (15') — 1/2" MPT–1/2" MPT PC	P0832017	1	—	—
	1/2" Hose (15') — 1/2" MPT–1/2" MPT PC	P0832031	—	1	—
	1/2" Hose (20') — 1/2" MPT–1/2" MPT PC	P0832061	—	—	1
10	1/2" Hose (15') — 1/2" MPT–1/2" MPT PC	P0832031	1	—	—
	3/4" Hose (15') — 1/2" MPT–1/2" MPT PC	P0832064	—	1	—
	3/4" Hose (20') — 1/2" MPT–1/2" MPT PC	P0832065	—	—	1
11	1/2" Quick Coupling Nipple FPT	P0820401	2	2	2

Figure 85. Spool Valve and Hoses (Top View)



8. Attach the fittings (11) to the hydraulic hoses (9, 10). When not in use, securely store hoses close to the main conveyor boot.

Important

Protect hose ends from dirt.

3.23. Install the Electric Remote Power Swing (Optional)

➡ This section is applicable to the Swing Away models with electric power swing option.

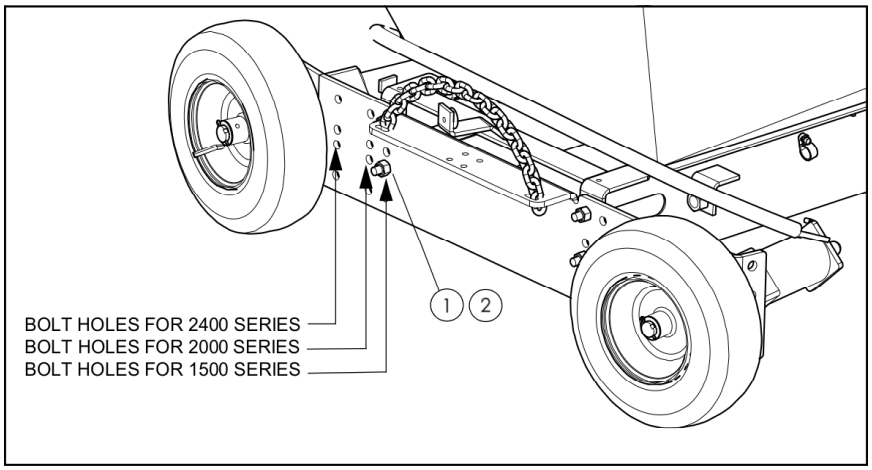
3.23.1 Attach the Power Swing Axle to the SA Hopper

1. Attach the assembled power swing axle to the hopper weldment using 1/2" x 1-1/2" hex bolts (1) and 1/2" locknuts (2). See Figure 86.

Table 47. Fasteners

Item	Description	Quantity
1	1/2" x 1-1/2" Hex Bolt Gr8 Plated	4
2	1/2" Nylock Nut Gr8	4

Figure 86. Attaching Electric Power Swing Axle to the Swing Away Hopper



3.23.2 Install the Receiver Box

Attach the Receiver Box

1. Mark a distance of approximately 24" from the edge of the spout to determine the location of the receiver box assembly (2). See Figure 87.
2. Attach the u-clamps (1) and receiver box assembly (2) to the swing away conveyor tube using hex bolts (3) and locknuts (4).
3. Tighten the u-clamps until the tube begins to crimp.

Table 48. Electric Receiver Box Components

Item	Description	Quantity for Series	
		1500	2000/2400
1	10" x 2-1/2" U-Clamp	2	—
	2" U-Clamp	—	2

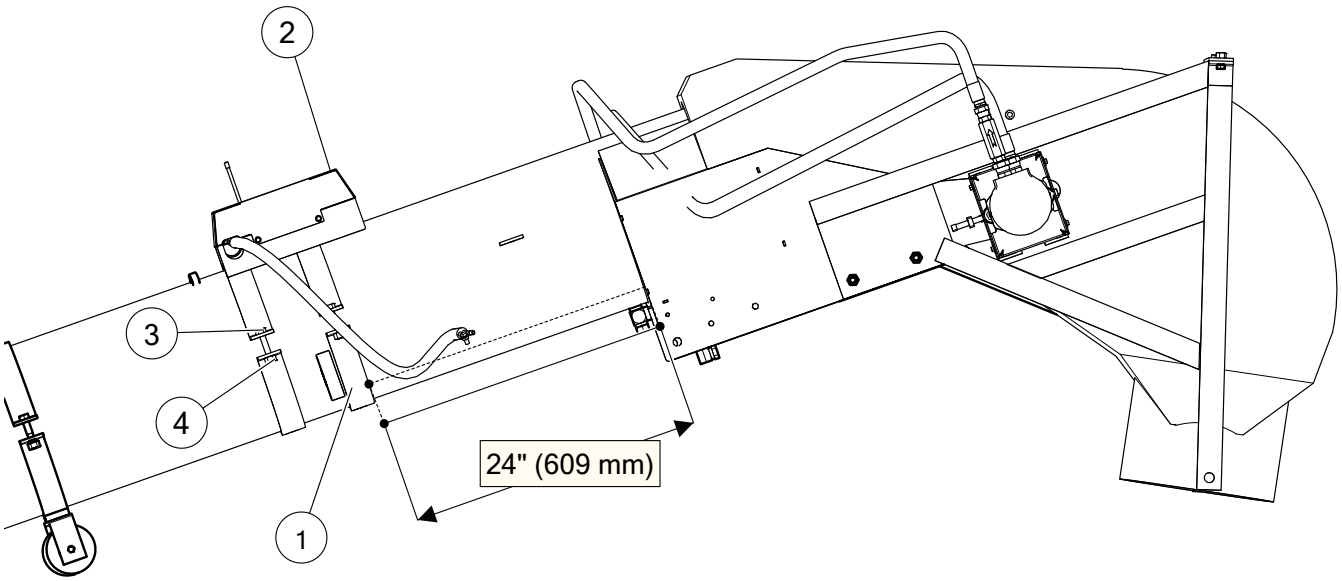
Table 48 Electric Receiver Box Components (continued)

Item	Description	Quantity for Series	
		1500	2000/2400
2	Receiver Box Assembly	1	1
3	7/16" x 1-1/2" Bolt Gr8 Plated	4	—
	1/2" x 2-1/2" Bolt Gr8 Plated	—	4
4	7/16" Nut Nylock Gr8	4	—
	1/2" Nut Nylock Gr8	—	4

Note

The electrical cables are pre-installed to the receiver box.

Figure 87. Installing Receiver Box



Connect the Short Electrical Cable

1. Uncoil the short electrical cable from the receiver box.
2. Run the short cable towards the hopper.
3. Identify the positive and negative wires.

   Note

   The positive wire has a red boot on it.

4. Attach the wires to the motor located on the same side as the receiver box electrical cables. See Figure 88. To connect:
   a. Unscrew the nut on the motor terminal.
   b. Connect the positive wire (with the red boot) to the positive (+) terminal on the electric motor. Connect the negative wire (black) to the negative (-) terminal on the electric motor. See Figure 88 and Figure 89.
   c. Replace the nut.

Figure 88. Receiver Electrical Cables

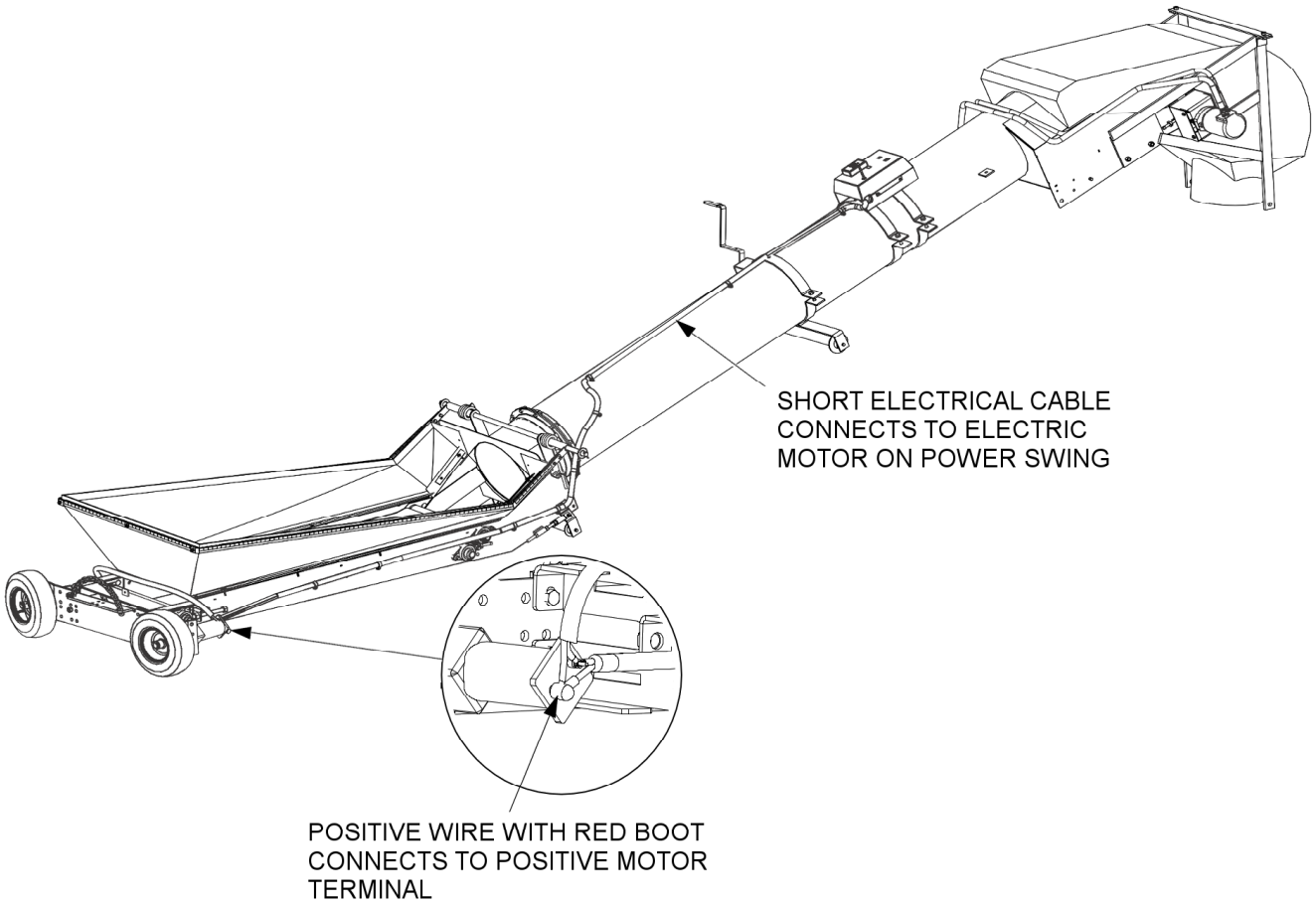
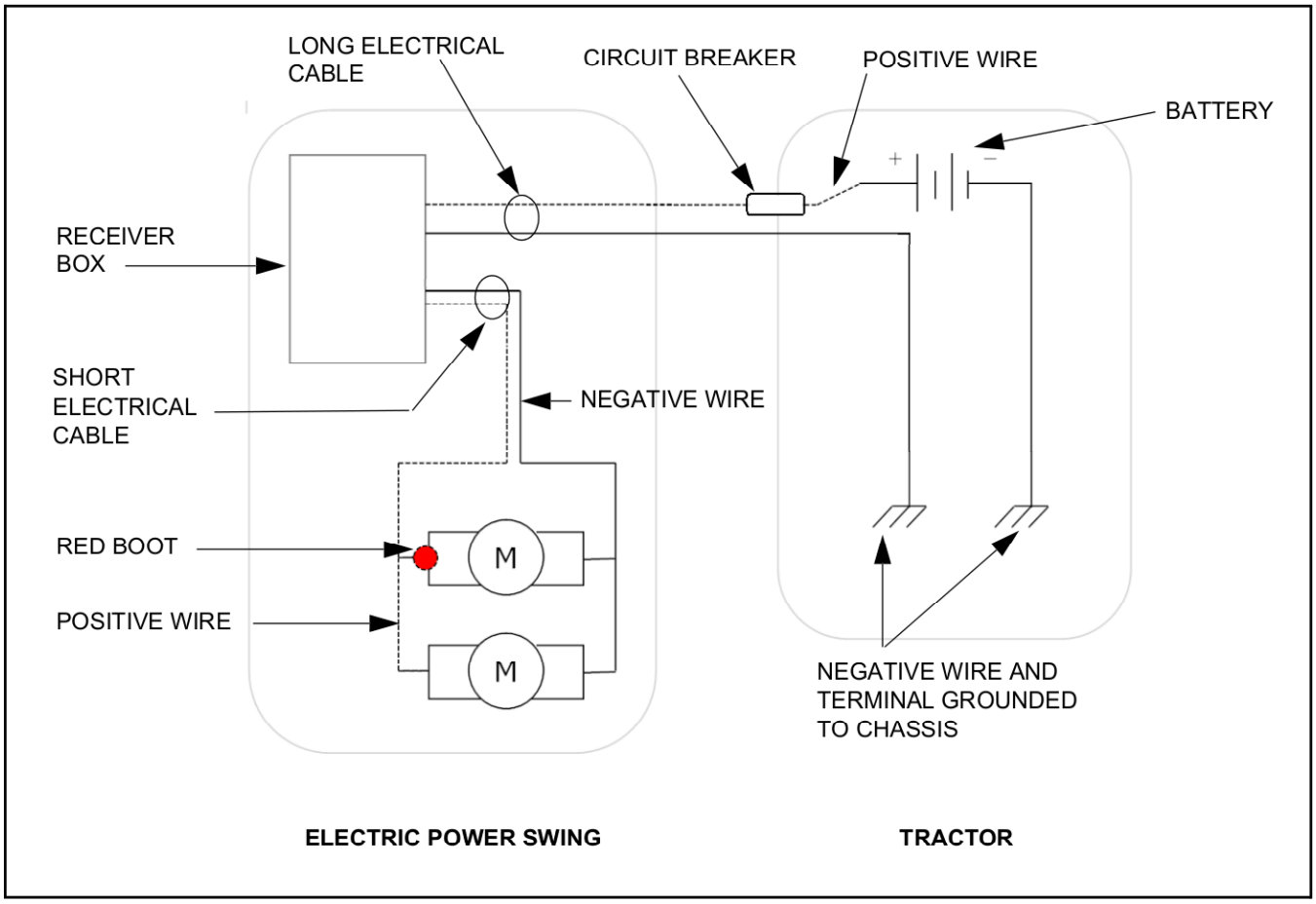


Figure 89. Electric Remote Power Swing Wiring Diagram

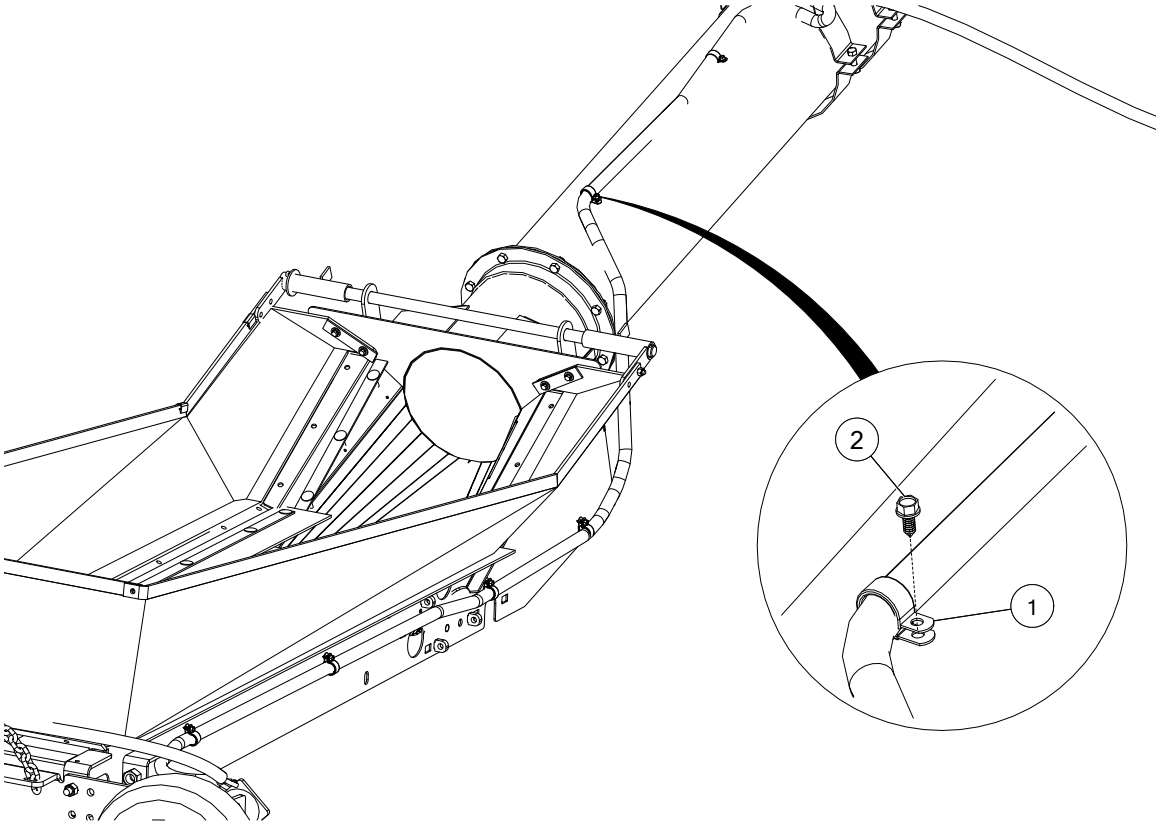


5. Securely tighten the nuts on the motor terminals on both motors.
6. Secure the short cable to the tube and to the side of the hopper using 1/2" cable clamps (1) and 1/4" x 1" Tek screws (2).

Table 49. Cable Clamp

Item	Description	Quantity for Series	
		1500	2000/2400
1	1/2" Cable Clamp Insulated	6	8
2	1/4" x 1" Tek Screw	6	8

Figure 90. Installing Receiver Box



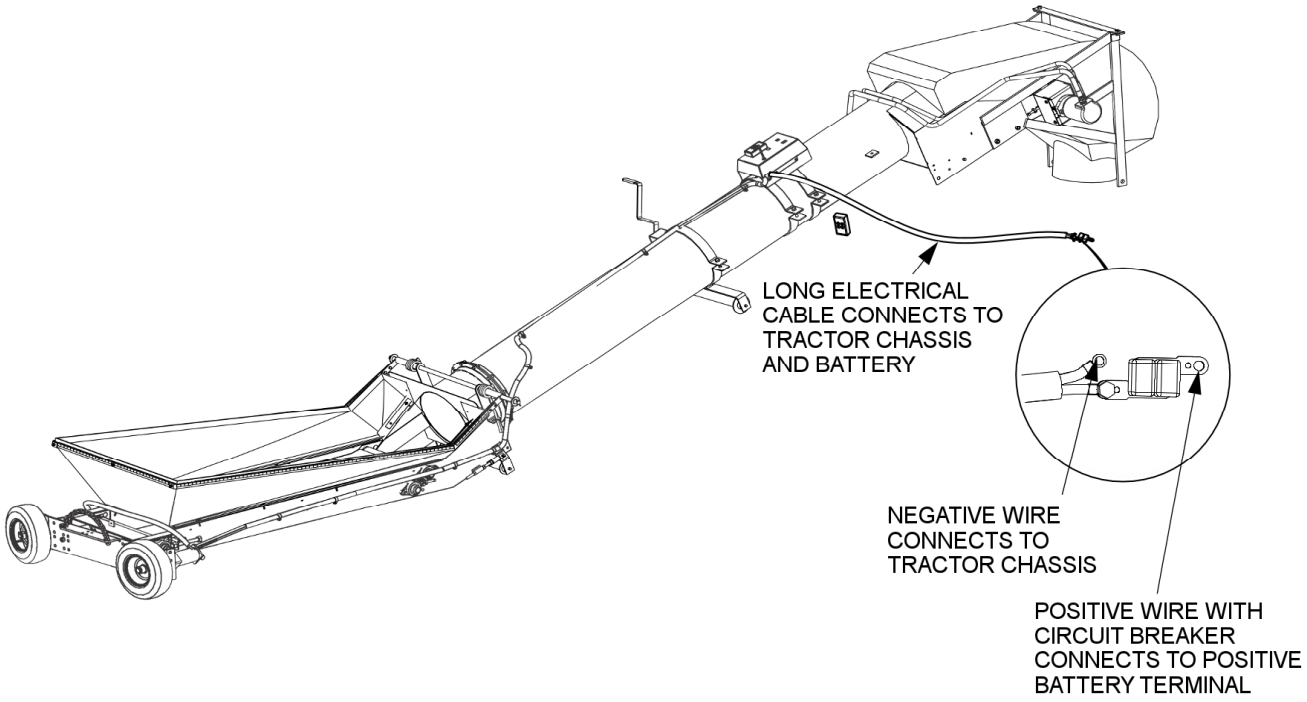
Connect the Long Electrical Cable

1. Uncoil the long electrical cable from the receiver box.
2. Identify the positive and negative wires.

Note

The positive wire has a circuit breaker and printing on it. See Figure 91.

Figure 91. Connecting Long Electrical Cable



3. Route the long electrical cable over top of the Swing Away spout.

Note

When operating, attach the positive wire directly to the positive terminal on the tractor battery and the negative wire to the tractor chassis as shown in Figure 91 and Figure 89. The negative terminal on the tractor battery should also be grounded to the chassis. There are 5/16" lugged terminals supplied with the kit.

Important

If the electric power swing will need to be moved from one tractor to another on a regular basis, 200 Amp booster-style cable clamps can be installed at the owner's own risk and expense.

Note

Secure the electrical cable to the spout support braces when not in use.

NOTICE If these electrical cables are not hooked up properly the electric controller will be damaged.

3.23.3 Install the Flow Control Half Valve

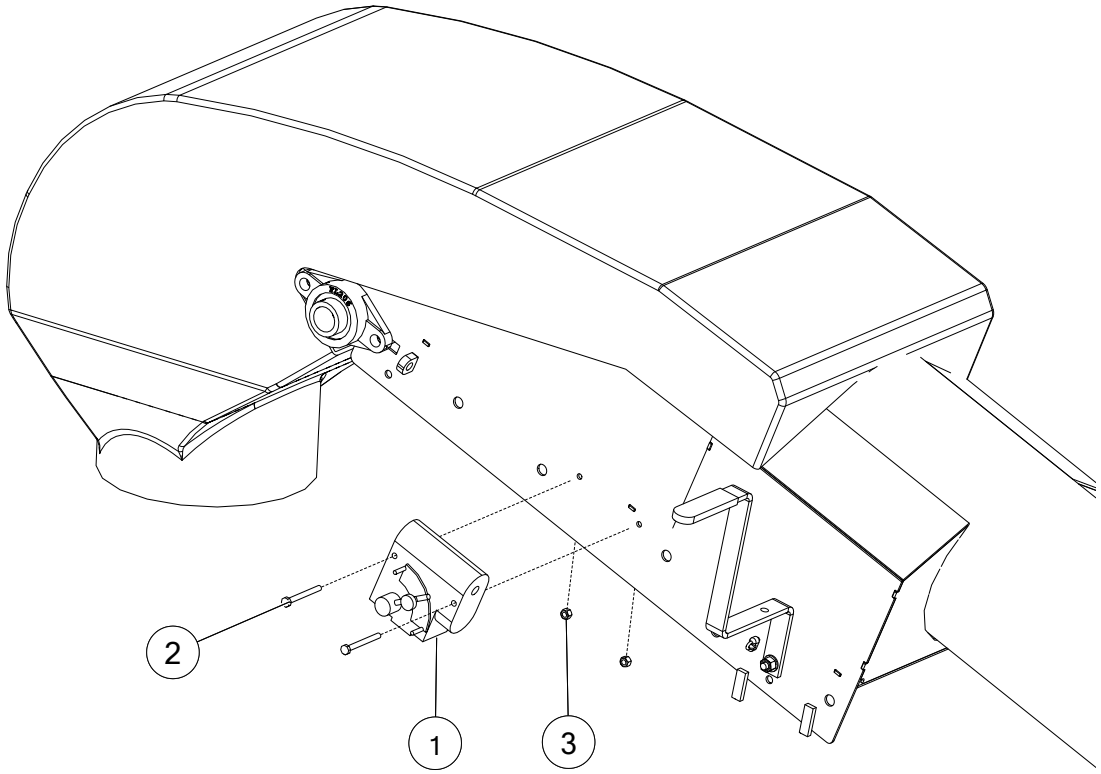
Attach the Half Valve

1. Attach the flow control half valve (1) to the pre-drilled holes on the spout weldment using 1/4" x 2-1/2" bolts (2) and 1/4" locknuts (3).

Table 50. Flow Control Half Valve

Item	Description	Quantity
1	Flow Control 1/2 Valve	1
2	1/4" x 2-1/2" Bolt Gr8 Plated	2
3	1/4" Nylock Nut Gr8	2

Figure 92. Installing Flow Control Half Valve



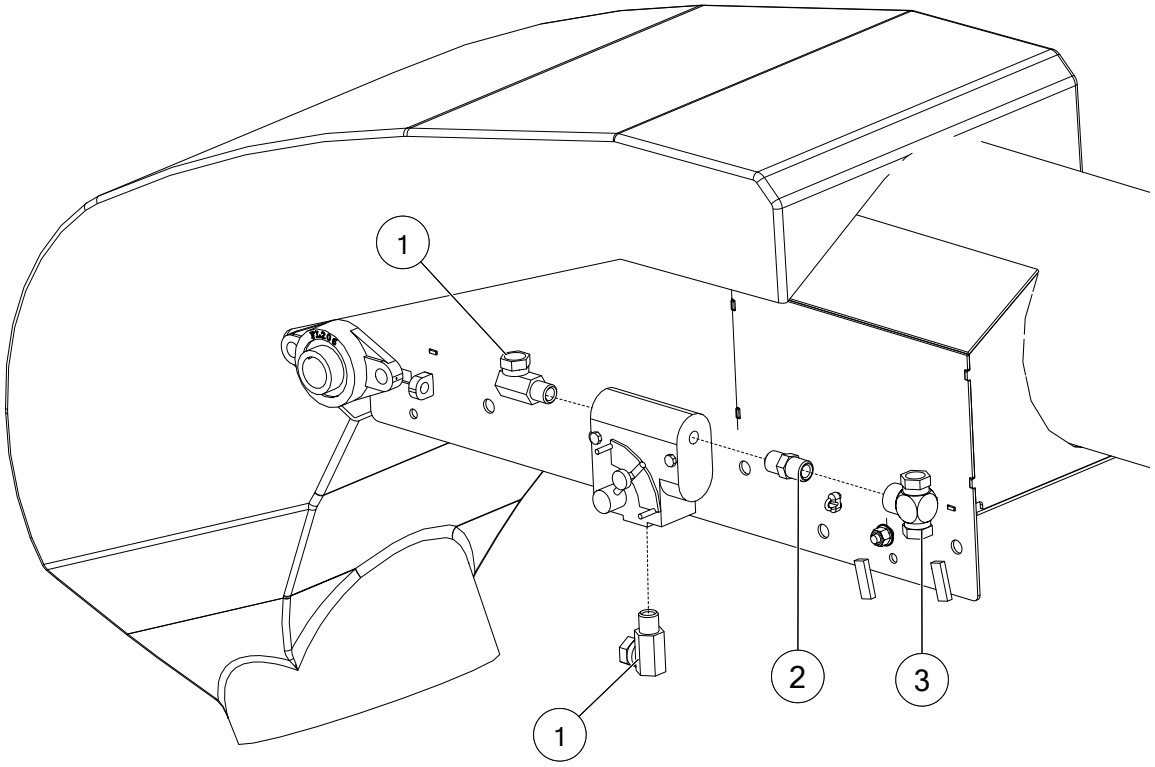
Attach the Hydraulic Fittings and Hoses

1. Wrap threaded seal tape around the exposed thread of the fittings (1, 2, 3).
2. Thread the fittings (1, 2, 3) into the ports of the flow control half valve.

Table 51. Flow Control Half Valve Fittings

Item	Description	Quantity
1	1/2" PT/90D Swivel	2
2	Nipple - 1/2" PT Hex	1
3	Tee - Swivel - 1/2" FEM	1

Figure 93. Attaching Flow Control Half Valve Fittings

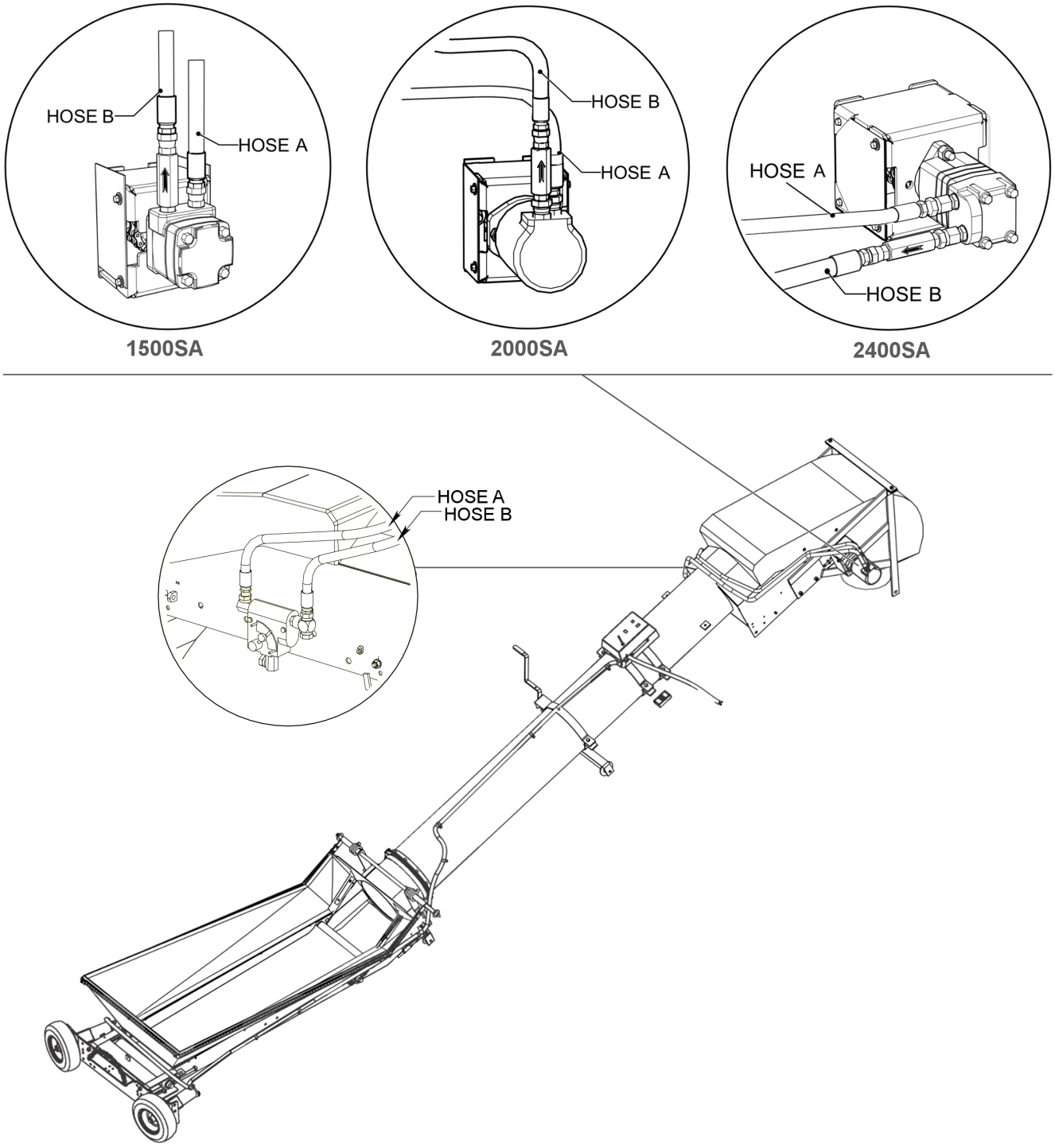


3. Route the motor hydraulic hoses (A, B) across the top of the spout weldment and attach to the flow control half valve.

Table 52. Hydraulic Valve Hoses

Item	Description	Part Number	Quantity for Series		
			1500	2000	2400
A (hydraulic motor hose — pressure line)	3/8" Hose (6') - 1/2" MPT-1/2" MPT PC	P0832051	1	—	—
	1/2" Hose (6') - 1/2" MPT-1/2" MPT PC	P0832059	—	1	—
	1/2" Hose (9') - 1/2" MPT-1/2" MPT PC	P0832060	—	—	1
B (hydraulic motor hose — return line)	3/8" Hose (6') - 1/2" MPT-1/2" MPT PC	P0832051	1	—	—
	3/4" Hose (6') - 1/2" MPT-1/2" MPT PC	P0832062	—	1	—
	3/4" Hose (9') - 1/2" MPT-1/2" MPT PC	P0832063	—	—	1

Figure 94. Hydraulic Hoses



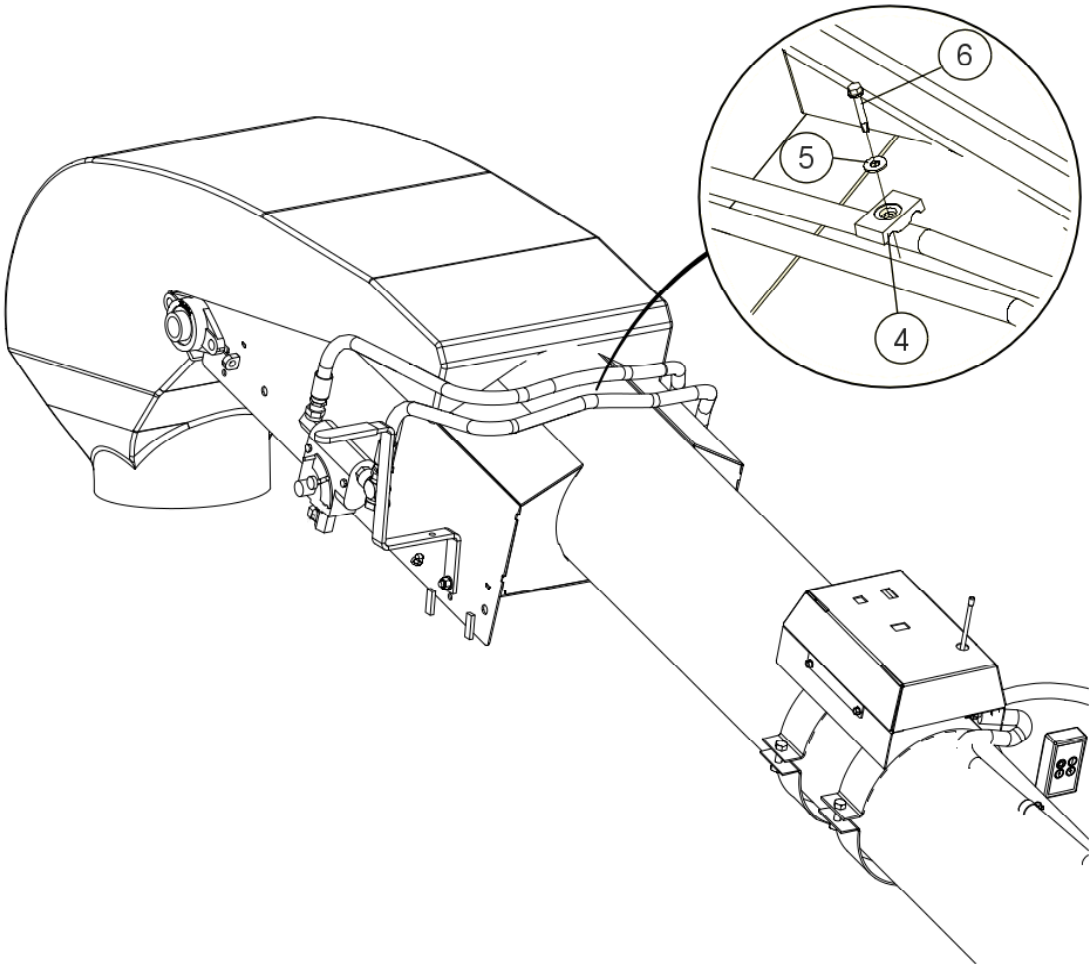
For hydraulic hoses that run from the flow control half valve to the tractor, see Table 54 and Figure 96.

4. Secure the hoses in place using 3/8" hose clamps (4), 1/4" flat washers (5), and 1/4" x 1" Tek screws (6). See Figure 95.

Table 53. Securing Hydraulic Hoses

Item	Description	Quantity
4	3/8" Hose Clamp Plastic Hyd	1
5	1/4" Flat Washer USS Plated	1
6	1/4" x 2" Tek Screw	1

Figure 95. Securing Hydraulic Hoses



5. Attach the hydraulic hoses (7, 8) to the fittings (1, 3). See Figure 96.

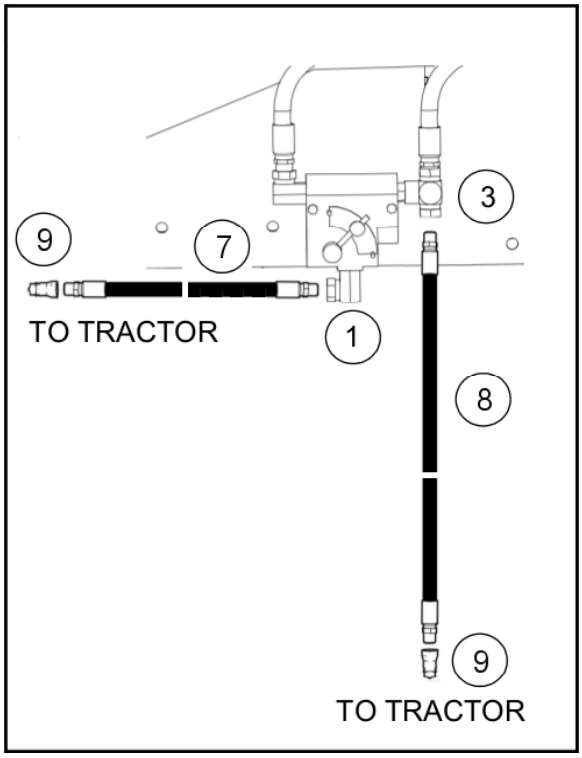
Important

Protect hose ends from dirt.

Table 54. Hydraulic Hoses and Fittings

Item	Description	Part Number	Quantity		
			1500	2000	2400
7	3/8" Hose (15') - 1/2" MPT–1/2" MPT PC	P0832017	1	—	—
	1/2" Hose (15') - 1/2" MPT–1/2" MPT PC	P0832031	—	1	—
	1/2" Hose (20') -1/2" MPT–1/2" MPT PC	P0832061	—	—	1
8	1/2" Hose (15') - 1/2" MPT–1/2" MPT PC	P0832031	1	—	—
	3/4" Hose (15') - 1/2" MPT–1/2" MPT PC	P0832064	—	1	—
	3/4" Hose (20') - 1/2" MPT–1/2" MPT PC	P0832065	—	—	1
9	1/2" Quick Coupling Nipple FPT	P0820401	2	2	2

Figure 96. Half Valve Flow Control



6. Attach the hydraulic fittings (9) to the hydraulic hose (7, 8). When not in use, securely store hoses close to the main conveyor boot.

Important

Protect hose ends from dirt.

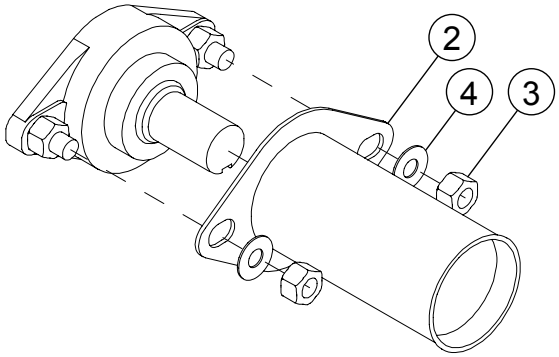
3.24. Install the Shaft Guard

1. Mount the shaft guard (2) over the roller shaft and onto the flange bearing carriage bolts (see Figure 97).
2. Secure the shaft guard in place using two locknuts (3) and two flat washers (4).

Note

When mounting onto a 15/16" bearing (FL210), use 5/8" locknuts and flat washers.
When mounting onto a 1-1/4" bearing (FL206) or 1-1/2" bearing (FL208), use ½" locknuts and flat washers.

Figure 97. Installing Shaft Guard



3.25. Attach the Swing Away to the Main Conveyor

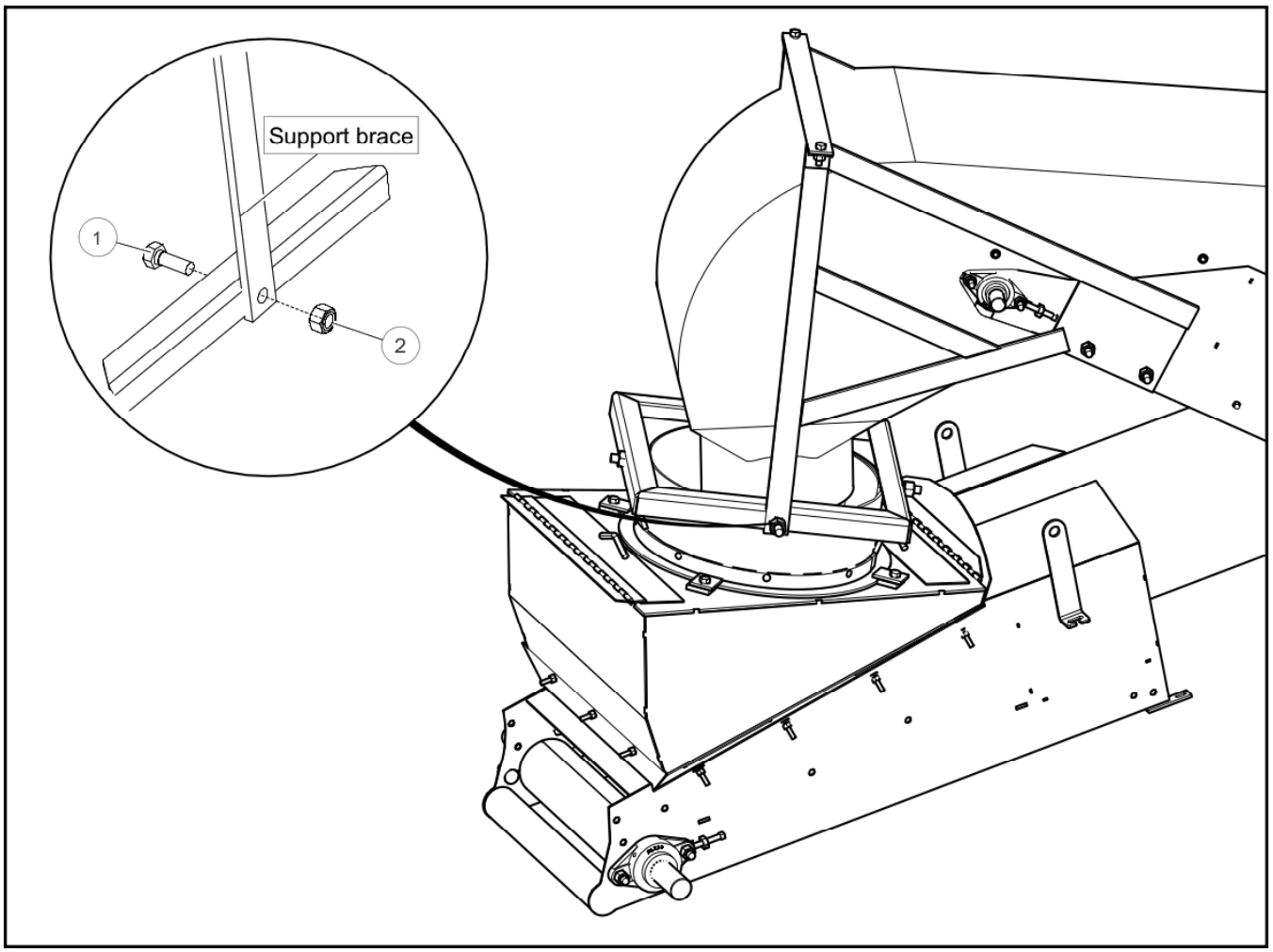
1. Lower the Swing Away spout onto the main conveyor hopper base.
2. Secure the support braces to the swivel top using bolts (5) and locknuts (8). See Figure 98.

Note
DO NOT over-tighten as these bolts act as pivot points.

Table 55. Hopper Base Components

Item	Description
1	3/4" x 2" Hex Bolt
2	3/4" Nylock Nut

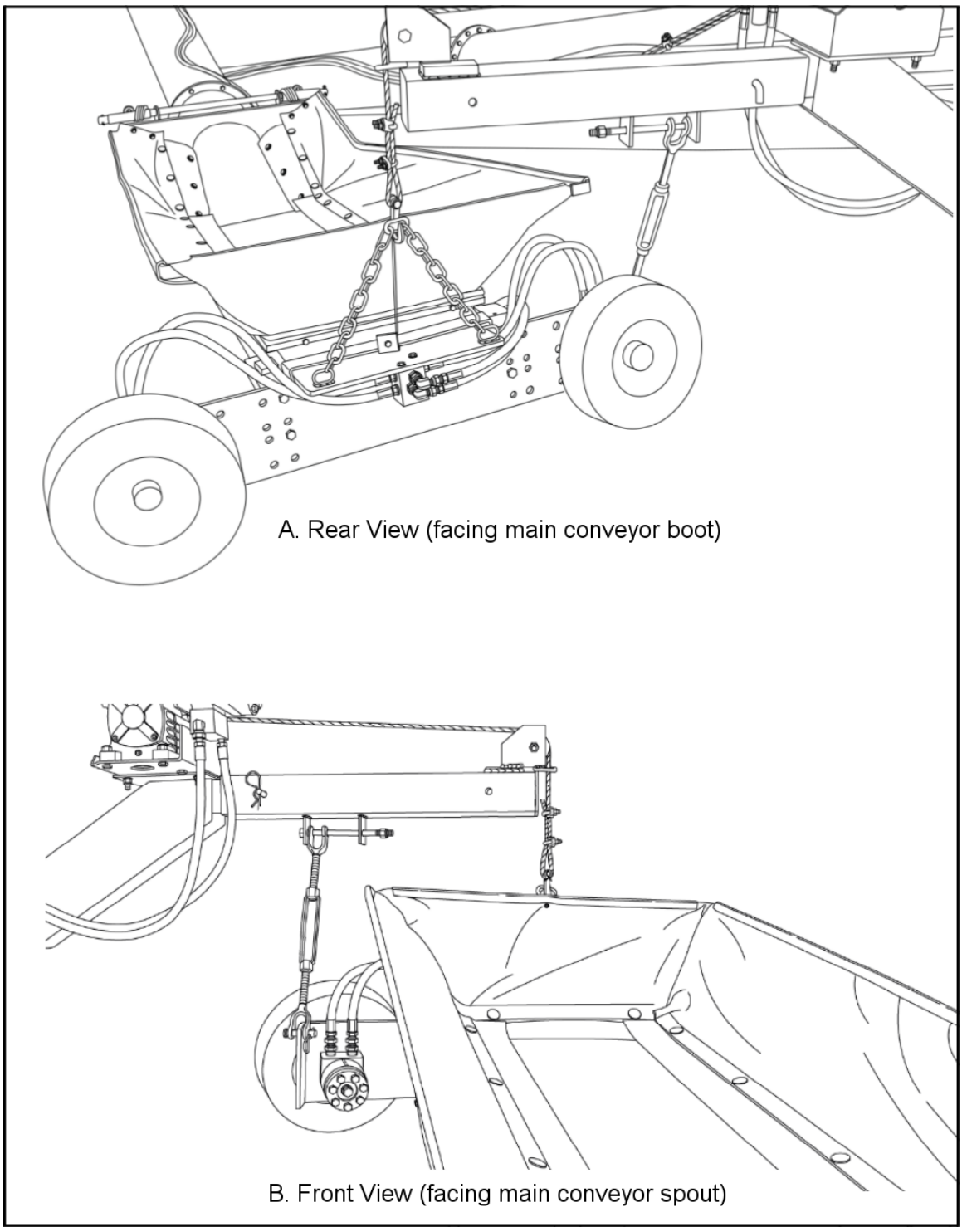
Figure 98. Attaching Support Braces to the Hopper Base



3. Loosen the winch cable and attach the winch grab hook to swing away hopper chain.
4. Lift the Swing Away to transport position. Position the tab located on the side of the wheel base weldment in between the turnbuckle jaws and secure in place using a 1/2" x 3" hitch pin and hair pin. See Figure 99.

⚠ WARNING Ensure the lifting apparatus is secure. Lockout the lifting apparatus before working around or under the raised components. Failure to do so may cause serious personal injury.

Figure 99. Attaching the Swing Away to the Transport Arm



4. Specifications

Table 56. Swing Away Conveyor

Description	Model	
	2000	**2400**
Weight (lbs)	900	1300
Power Options		
Hydraulic (Cu.in)	6.2	8.0
Electric (Hp)	7.5	10.0

5. Appendix

5.1. Bolt Torque

Table 57 gives the correct torque values for various hardware. Tighten all bolts to the torque specified, unless otherwise noted. Check tightness periodically, using Table 57 as a guide. Replace the hardware with the same strength bolt, contact if you are unsure.

Table 57. Recommended Bolt Torque[a]

Size	Dry or Lubricated	Threads per inch (Course/ Fine)	Area of Bolt (sq in.)		Recommended Torque (ft-lb)							
					Grade 2		Grade 5		Grade 8		8.8 S/S	
			Coarse	Fine	Coarse	Fine	Coarse	Fine	Coarse	Fine	Coarse	Fine
1/4"	Dry	20/28	0.0318	0.0364	5.5	6.3	8	10	12	14	6.3	7.8
	Lubricated				6.3	4.7	6.3	7.2	9	10	-	-
5/16"	Dry	18/24	0.0524	0.058	11	12	17	19	24	27	11	11.8
	Lubricated				8	9	13	14	18	20	-	-
3/8"	Dry	16/24	0.0775	0.0878	20	23	30	35	45	50	20	22
	Lubricated				15	17	23	25	35	35	-	-
7/16"	Dry	14/20	0.1063	0.1187	32	36	50	55	70	80	31	33
	Lubricated				24	27	35	40	50	80	-	-
1/2"	Dry	13/20	0.1419	0.1599	50	55	75	85	110	120	43	45
	Lubricated				35	40	55	65	80	90	-	-
9/16"	Dry	12/18	0.182	0.203	70	80	110	120	150	170	57	63
	Lubricated				55	60	80	90	110	130	-	-
5/8"	Dry	11/18	0.226	0.256	100	110	150	170	210	240	93	104
	Lubricated				75	85	110	130	160	180	-	-
3/4"	Dry	10/16	0.334	0.373	175	200	260	300	380	420	128	124
	Lubricated				130	140	200	220	280	310	-	-
7/8"	Dry	9/14	0.462	0.508	170	180	430	470	600	670	194	193
	Lubricated				125	140	320	350	180	180	-	-
1"	Dry	8/14	0.606	0.679	250	280	640	720	910	1020	287	289
	Lubricated				190	210	480	540	680	760	-	-
1-1/8"	Dry	7/12	0.763	0.856	350	400	790	890	1290	1440	288	290
	Lubricated				270	300	590	670	970	1080	-	-
1-1/4"	Dry	7/12	0.989	1.073	500	550	1120	1240	1820	2010	289	291
	Lubricated				380	420	840	930	1360	1510	-	-
1-1/2"	Dry	6/12	1.405	1.581	870	960	1950	2200	3160	3560	-	-
	Lubricated				650	730	1460	1640	2370	2670	-	-

[a]Torque value for bolts and cap screws are identified by their head markings. Established at 75% of yield strength of bolt given the cross-sectional area.

Note

Torque figures in table are valid for non-greased or non-oiled threads and head unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

5.2. Fittings Torque Values

These specifications are for carbon steel. With Zinc plating always lubricate threads and seals. For stainless steel, use the high value of the torque range of steel. For brass, use 70% of the torque value of steel. For mixed metals, use the torque of the lower of the two metals. Torque range is normally calculated +/- 10%.

Table 58. Pipe Rigid - Tapered Pipe Threads (NPTF, N/NF) - Carbon Steel

Pipe Size	Turns-from-finger	Max ft-lbs	Max N-m
1/8" (-2)	3/4 - 1 3/4	12	16
1/4" (-4)	3/4 - 1 3/4	25	34
3/8" (-6)	3/4 - 1 3/4	40	54
1/2" (-8)	1/2 - 1 1/2	54	73
3/4" (-12)	1/2 - 1 1/2	78	106
1" (-16)	1/2 - 1 1/2	112	152
1 1/4" (-20)	1/2 - 1 1/2	154	209
1 1/2" (-24)	1/2 - 1 1/2	211	286
2" (-32)	1/2 - 1 1/2	300	407

Table 59. Pipe Swivel - Straight Pipe Threads (NPSM, N/NFS) - Carbon Steel

Pipe Size	Max ft-lbs	Max N-m
1/8" (-2)	12	16
1/4" (-4)	25	3
3/8" (-6)	40	54
1/2" (-8)	54	73
3/4" (-12)	78	106
1" (-16)	112	152
1 1/4" (-20)	154	209
1 1/2" (-24)	211	286
2" (-32)	300	407
Note: seals on an internal male 30° seat		

Table 60. Stud End O-Ring Boss (ORB) SAE (U/UF)

		Carbon Steel	
Tube Size	**Thread UNF-2A**	**Max ft-lbs**	**Max N-m**
-2	5/16" - 24	6-7	8-9
-3	3/8" - 24	8-9	11-12
-4	7/16" - 20	13-15	18-20

Table 60 Stud End O-Ring Boss (ORB) SAE (U/UF) (continued)

		Carbon Steel	
Tube Size	**Thread UNF-2A**	**Max ft-lbs**	**Max N-m**
-5	1/2" - 20	17-19	23-26
-6	9/16" - 18	22-24	29-33
-8	3/4" - 16	40-43	49-53
-10	7/8" - 14	43-48	59-64
-12	1 1'16" - 12	68-75	93-102
-14	1 3/16" - 12	90-99	122-134
-16	1 5/16" - 12	112-123	151-166
-20	1 5/8" - 12	146-161	198-218
-24	1 7/8" - 12	154-170	209-231

Table 61. JIC 37° Flare Tube Fitting (J/JFS)

Tube Size	Thread UNF-2A	Torque ft-lbs	Torque N-m
-2	5/16 - 24	6-7	8-9
-3	3/8 - 24	8-9	11-12
-4	7/16 - 20	11-12	15-16
-5	1/2 - 20	14-15	19-21
-6	9/16 - 18	18-20	24-28
-8	3/4 - 16	36-39	49-53
-10	7/8 - 14	57-63	77-85
-12	1 1/16 - 12	79-88	107-119
-14	1 3/16 - 12	94-103	127-140
-16	1 5/16 - 12	108-113	147-154
-20	1 5/8 - 12	127-133	172-181
-24	1 7/8 - 12	158-167	215-226
-32	2 1/2 - 12	245-258	332-350

5.3. Open to Closed Center Conversion

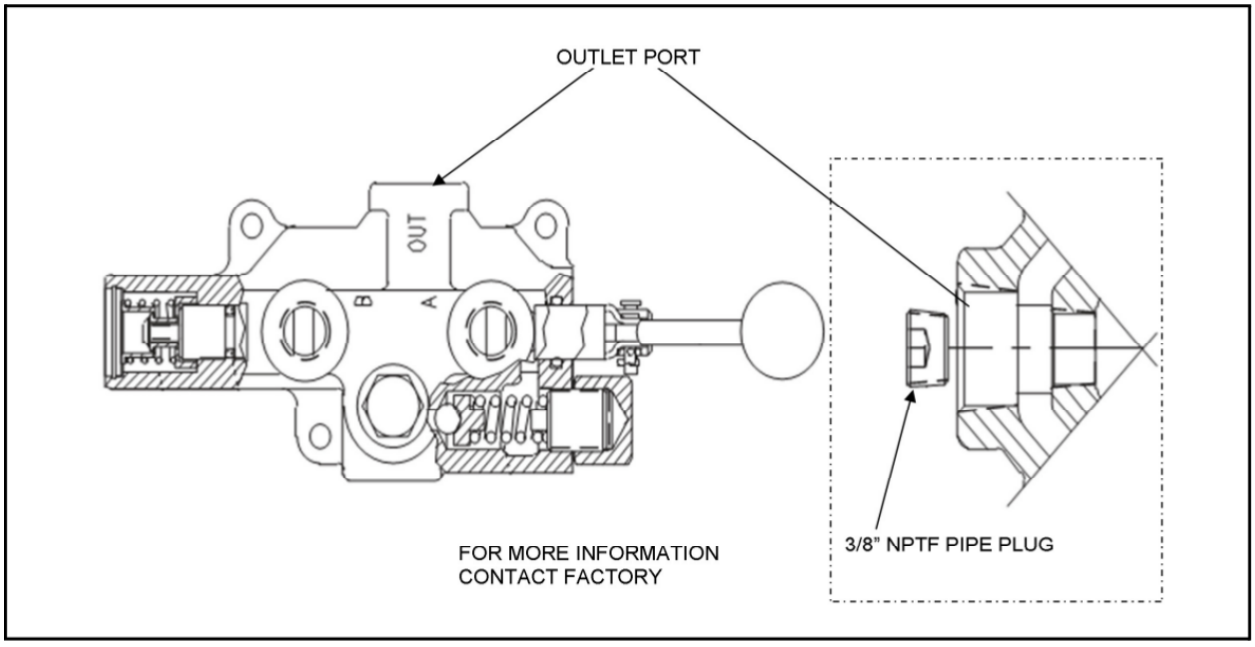
This feature allows an otherwise open center valve to be converted to a closed center operation. As shown below, a 3/8" NPTF pipe plug is installed in the bottom of the outlet port to block open center passage. A pipe thread sealant should be used.

This feature is standard on all valves with 3/4" NPTF inlet and outlet ports. The pipe plug is included with these models. Discard the pipe plug if the valve is used on an open center application.

Important

A closed center option does not provide for the drain of standby spool leakage. This can allow a very small amount of oil to enter the work ports when in neutral.

Figure 100. Open to Closed Center Conversion



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